

Value Chain Analysis for High Value Crops (HVCs) in the Punjab State

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Decline in farm incomes, almost stagnant food grain productivity and changes in the consumption pattern, call for increase in the production of high value crops such as fruits and vegetables. The present study was undertaken in order to estimate the economics of production and marketing of important high-value crops; to ascertain the Domestic Resource Cost (DRC) and to highlight the problems faced by the producers in production and marketing of these high-value crops. The study was conducted in the Punjab state focusing on two most important fruit crops namely kinnow and guava and six vegetables such as peas, potato, onion, cauliflower, tomato and chillies.

Amongst different vegetables, the net returns were as low as Rs 24,172 per ha for potato and as high as Rs 2,92,204 per ha for tomato. In case of fruit crops, the net returns from kinnow turned positive only after four years when the fruit trees started full bearing and the product started to be brought to the markets. The DRC analysis reveals a fall in profitability in fruits and vegetable cultivation with the withdrawal of subsidies. The ratios of protection and efficiency (NPC, EPC and DRC) of different vegetables and fruits showed the presence of input subsidies, taxes and trade restrictions but Punjab has a comparative advantage in producing these commodities. Wholesaler was the major marketing agency in case of vegetables and guava, with more than 60 per cent of the produce being marketed through them while Pre-harvest contractors were dominating in kinnow. Producer-consumer channel was observed to be the most efficient channel and the producer's share in consumer's rupee was found decrease with the increase in number of market intermediaries involved. Lack of scientific and technical skills, weak extension efforts by the public and private agencies and the prevalence of poor quality seeds/seedlings were perceived to be the other major production problems. Lack of market information, frequent and large fluctuations in prices, congestion in the wholesale markets and lack of cheaper grading and packing facilities to the farmers were the major marketing problems. The study highlighted the need for the provision for adequate short-term credit facilities to high value crop growers, avoidance from purchasing large machines by the small and marginal farmers, the strict vigilance on the poor quality of seeds/seedlings and pesticides being supplied by the dealers, sale of good quality seeds and pesticide through cooperative societies, introduction of crop insurance scheme, formulation of effective price policy for these crops, and to establish processing units, cold storages and dry freezing plants in the areas where horticultural crops are grown, which can help the farmers in getting remunerative returns for the produce.

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Authors

Chapter 1

Introduction

1.1. Background

Declining farm incomes, almost stagnant foodgrain production and growing demand for high value crops like fruits and vegetables due to increase in per capita income and changes in the consumption pattern call for increase in the production of high value crops. These crops not only enhance income of the cultivators but also generate more employment through diversified farming and having been labour intensive crops. These are more beneficial for the marginal and small farmers, where family labour availability per unit of land is high. Small and marginal holdings constitute bulk of the rural poor in our country. Because of their small operational base, it will not be possible to improve incomes of these households merely by raising the yields of existing crops. So, poverty as well as food and nutritional insecurity of large number of farm households can be reduced with the introduction of the high value crops on these holdings. Besides, in several cases diversification is needed to restore the degraded natural resource base caused by monoculture of grain crops.

The monoculture of paddy-wheat, particularly in the Indo Gangetic plains, has resulted into the emergence of various problems like over-exploitation of the ground water resources, depletion of soil fertility and higher susceptibility of crops to the attack of various insect pests and diseases. Further, income of the farmers growing grain crops like wheat and paddy has fallen in recent years. The Punjab state showcases the classic example of fast agricultural development based on few grain crops culminating to

agrarian crisis of stagnating productivity, falling income and growing indebtedness. Thus, in order to improve incomes, provide gainful employment and save the natural resources from further degradation, diversification from grain crops to high value crops like fruits and vegetables emerges as a major strategy for agricultural growth. The most important factor determining the pattern, if not the pace, of diversification is 'the market'. There are a number of studies in India and other developing countries, which suggest high elasticity of demand of HVCs in response to income and prices. Price response however is one aspect of the impact of the market on the cropping pattern. Equally important is the production and marketing efficiency. Profitability of the crop/enterprise is the guiding force for resource allocation decisions of the farmers. Income is another important determinant of growth in demand for HVCs. It has been seen that the consumption for fruits and vegetables has gone up in 1999-2000 as compared with 1986-87 (NSSO data). On supply side, the delivery system for inputs and credit are important factors. The agronomic conditions in a given region and the technology available for various crops are two other important forces which condition diversification. Public interventions also significantly influence the nature of cropping pattern and the extent of diversity. This study will therefore focus on these issues and try to highlight the production and marketing efficiency of entire value chain of HVCs in the Punjab state.

1.2. Need for study

The costs and returns analysis for various high-value crops will be helpful to examine the relative profitability of these crops with respect to traditional foodgrain crops. The momentum for the increased production of high-value crops cannot be sustained unless simultaneous efforts are made to improve marketing of these crops through the

development of effective marketing system and marketing agencies. The farmers will get the remunerative prices for their surplus produce only when the effective and efficient marketing system is in place. It is also important to study the Domestic Resource Cost (DRC) of different high value crops so that the comparative export competitiveness of these crops from this region may be ascertained, keeping in view the various government incentives/subsidies and social costs. The experience of the initiatives taken for the promotion of these crops through contract/co-operative/corporate farming will be helpful to identify the factors responsible for the success/failure of these programmes and to explore the possibilities of their strengthening and replication in the other areas.

1.3. Objectives of the study

The study was carried out to accomplish the following objectives:

1. To estimate the costs of production and returns associated with the cultivation of important high-value crops;
2. To identify the value chain systems and to estimate the costs and returns at each link for these high-value crops;
3. To ascertain the Domestic Resource Cost (DRC) for important high value crops;
4. To highlight the case studies of contract/co-operative/corporate farming for important high value crops;
5. To study the problems faced by the producers in production and marketing of these high-value crops.

Chapter 2

Methodology

The methodology adopted for the selection of study area, sampling design, data collection and analytical framework used in the light of specific objectives of the study have been discussed in the present chapter.

2.1 Sampling Design

2.1.1 Selection of Sample Farm Households

The study was conducted in the Punjab state. High-value crops in this study included important fruits and vegetables in the state. The present study focused on two important fruit crops in the state namely Kinnow and Guava. Further six vegetable crops were covered in the study such as peas, potato, onion, cauliflower, tomato and chillies. The study was based on primary as well as secondary data. The primary data were collected from the growers and different market functionaries associated with the production and marketing of fruits and vegetables in the selected states of the country. For each of the eight selected crops, one/two districts with the highest area/production in the state were selected purposively. Further based on the availability of the data, one/two blocks with the largest area/production from each of the selected districts were selected to ensure wider coverage of the sample. Village clusters were identified in each block. Finally, a sample of up to 50 farmers were selected randomly for each of the selected crops for primary data collection by the personal interview method. The reference period for the study was 2006-07. The details of sample tomato growers selected is as follow:

Table 2.1: Distribution of sample farmers for different crops

Crops	Districts	Block	No. of sample farmers	Total
Tomato	Kapurthala	Sultanpur lodhi	25	25
Chilies	Jalandhar	Shahkot	22	46
	Tarntarn	Bhikhiwind	24	
Onion	Patiala	Rajpura	25	25
Cauliflower	Hoshiarpur	Haryana	25	50
	Patiala	Rajpura	25	
Potato	Hoshiarpur	Hoshiarpur-II	24	36
	Jalandhar	Bhogpur	12	
Peas	Hoshiarpur	Mahalpur	25	50
	Amritsar	Jandiala	25	
Kinnow	Hoshiarpur	Bhunga	25	50
	Ferozpur	Abohar	25	
Guava	Sangrur	Malerkotla	7	7

2.1.2 Selection of Traders

Different marketing channels for the disposal of high value crops in the study area were examined to assess the cost and margins of different intermediaries in the marketing till the produce reaches in the hands of the consumers. Suitable number of market functionaries were selected for the data collection. Secondary data regarding the area under high value crops in Punjab and its different districts and blocks were collected from the Directorate of Horticulture, Punjab, Chandigarh.

2.2 Analytical framework

Tabular analysis was adopted to analyze the cost and returns associated with different high value crops, marketing channels, marketing costs and to study various problems faced by the farmers and solutions there of.

2.2.1 Cost and Return Analysis

The cost of cultivation has been worked out by using the variable and fixed cost components and standard cost concepts. The variable cost includes value of hired and family labour, owned and hired machinery labour, seed, manure, fertilizer, pesticides, irrigation, interest on working capital and other miscellaneous expenses. The fixed cost includes rental value of owned land, rent paid for leased-in land, depreciation on implements and farm buildings and interest on the fixed capital.

The gross return has been calculated as:

Gross return = Total production x average price

The net returns over different cost concepts has been calculated as the difference between the gross return and particular cost. The benefit cost ratios for different vegetables over different cost concepts is calculated by dividing the gross return by a particular cost.

The cost and return during the economic life of kinnow and guava orchards has been estimated for all the stages of cultivation of these crops at the present prices by using standard cost concepts. The commercial fruiting of kinnow and guava in the study area was observed to be since 5th and 4th year respectively. Further, age groups were framed based on the productivity pattern of these fruits over the life of the orchards. Until the fruiting stage, the cost and return analysis were done on year-wise basis.

The costs and gross returns for fruits were estimated by taking sample of fruit growers representing all stages of life of the kinnow orchards. These economic parameters were valued at 2006-07 prices and therefore represented present values of respective parameters. B:C ratio was thus, worked out by dividing average annual gross returns with average annual cost during the entire life period of the orchard, using the following formula:

$$\text{BCR} = \frac{\text{Average of Annual Return}}{\text{Average of Annual Costs}}$$

The Average annual return is the equalized yearly value over the life of the project which can be calculated by taking the average of the net return for the useful life of the orchard. The net return in fruit cultivation for selected fruit growers was computed by summing up the annual differences of gross returns and gross costs which estimated at current prices during the useful life of the fruit orchard, using the following formula:

$$\text{Net Return from useful life of the orchard} = \sum_{i=t}^T \text{Gross Income} - \text{Gross Cost}$$

t= Age of orchard (in year), and

T= Economic life of orchard (in years)

2.2.2 Domestic Resource Cost (DRC)

In Punjab, the govt. provides the subsidy on fertilizer as well as on power for the irrigation. The Domestic Resource Cost (DRC) can be calculated by including these two subsidies in the present cost analysis for the selected crops. The subsidy on Rs. per tonne

basis on for different fertilizers for the reference year of study (2006-07) were as follow (Fertiliser Statistics (2005-06) and www.urvark.co.in):

Urea	5159
DAP	6737
MOP	7024
SSP	975

In Punjab, the flat rate for the supply of power for agriculture was fixed at Rs. 60 per BHP per month, but later in 2006-07, the Government decided that no tariff will be levied on the farmers. As per the Punjab State Regulatory Commission, Chandigarh calculations without government subsidy the flat rate for the supply of power for agriculture should be Rs. 208 per BHP per month. Therefore, this whole amount is the subsidy for the supply of power for agriculture in the state.

2.2.3 Price Spread

To study the price spread and marketing efficiency in marketing channels of kinnow, the marketing costs and margins ;for each link of the channel were worked out as under (Acharya and Agarwal, 2005):

Marketing Cost

Total cost of marketing was calculated as under:

$$C = C_F + C_{m1} + C_{m2} + C_{m3} \dots\dots\dots + C_{mn}$$

Where,

C= Total cost of marketing

C_F= Cost borne by the orchardists in marketing his produce

C_m= Cost incurred by the middlemen in the process of buying and selling

I= 1,2, 3n

N is the number of middlemen involved in the channel.

Absolute and Percent Margins

Absolute and percent margins for each middleman involved in the marketing were calculated as under:

$$\text{Absolute margin} = P_{R3} - (P_{pi} + C_{mi})$$

$$\text{Percentage Margin} = \frac{P_{R3} - (P_{pi} + C_{mi})}{P_{Ri}}$$

Where,

P_{Ri} = Total value of receipts (sale price)

P_{pi} = Total purchase value of goods (purchase price) , and

C_{mi} = Cost incurred in marketing

Producer's Share in Consumer's rupee

The producer's share in the consumer rupee was worked out as under (Acharya and Agarwal, 2005):

$$P_s = \frac{P_F}{P_C} \times 100$$

Where,

P_s = Producer's share in consumer's rupee,

P_F = Price of the produce received by the farmers, and

P_C = Price of the produce paid by the consumer.

Apart from percentage, absolute values were also used to make the picture clearer.

Chapter 3

Socio economic characteristics of high value crops growers

The socio-economic characteristics are the important parameters, which affect the production and marketing decisions of the households. This section deals with the important socio economic indicators of the sample households like family size, age of the head of the household and literacy level, land utilization and cropping pattern.

3.1 Family size, age of the head of the household and literacy level

Most of the fruit and vegetable growers were found to be living in the joint family system as more than 55 per cent of the farm families were having the family size of more than 5 (Table 3.1). Literacy rate in the study area was observed to be higher than the state and national average. It was in the range of about 71 per cent to 96 per cent for different fruit and vegetable growers. Most of the heads of the household were less than 45 years of age, except for the tomato and kinnow growers, where mostly of the heads of the household were more than 45 years of age.

3.2 Land resources

The average operational holding size of fruit and vegetable growers was found to vary between 2.5 hectares for tomato growers to 12.8 hectares for the kinnow growers (Table 3.2). It was strange to observe that mostly the practice of leasing in was more prevalent among the fruit and vegetable growers while only the small area was leased out, that's too in some of the crops only.

Table: 3.1 General Characteristics of sample Farmers, Punjab, 2006-07

Sr No.	Particulars	Tomoto Growers	Chilli Growers	Onion Growers	Cauliflower Growers	Potato Growers	Peas Growers	Kinnow Growers	Guava Growers
1	Average Family Size (Per cent)								
	Less than 5	32	11	44	30	33	27	27	14
	5--10	60	74	48	68	58	56	67	86
	Above 10	8	15	8	2	9	17	6	-
	Total	100	100	100	100	100	100	100	100
2	Educational status (Per cent)								
	Illiterate	8	22	16	12	8	29	4	29
	Primary	28	46	36	34	8	29	22	29
	Matric	48	24	40	42	56	28	35	14
	Secondary	4	2	4	6	8	10	10	14
	Higher	12	6	4	6	20	4	29	14
	Total	100	100	100	100	100	100	100	100
3	Age of Head of the family (Years) (Per cent)								
	Up to 25 Years	-	2	12	6	3	6	-	-
	25-45	44	52	52	46	53	50	20	71
	Above 45	56	46	36	48	44	44	80	29
	Total	100	100	100	100	100	100	100	100

Table 3.2: Distribution of Operational holdings, sample households, Punjab, 2006-07
(Hectare/farm)

Particulars	Tomato Growers	Chilli Growers	Onion Growers	Cauliflower Growers	Potato Growers	Peas Growers	Kinnow Growers	Guava Growers
Owned Land	2.0	4.2	3.2	2.9	5.5	5.2	10.0	3.5
Leased- In	0.6	3.2	1.7	1.7	10.1	2.2	2.4	-
Leased- out	0.1	0.1	-	-	0.1	0.03	-	-
Total operational holdings	2.5	7.3	4.9	4.6	15.5	7.37	12.4	3.5

3.3 Cropping pattern

Paddy was the major kharif crop grown by the tomato, chillies, onion, peas and guava growers in the study area as it is grown on more than 48 per cent of the NCA (Net cultivated area) during kharif season (Table 3.3). Maize was the major kharif crop grown by the cauliflower and potato growers as it was the important crop of the season in Hoshiarpur district of the state. Cotton was the major kharif crop grown by the kinnow growers as it was the important crop of the season in Firozpur district of the state. Wheat was the major rabi season crop in the study area grown, except for potato in case of potato growers. Tomato is grown in the rabi and summer seasons in the study area. Onion, peas and potato are the rabi season crops while cauliflower is grown in the kharif , rabi and summer seasons in the state. Chillies is grown in the rabi and summer seasons in the state. Fodder is grown in more than 3 per cent of the NCA (Net cultivated area) during the season. For kinnow and guava growers, the NCA under these crops were about 27 and 44 per cent respectively.

Table 3.3: Cropping Pattern of Vegetables and Fruits growers in Punjab, 2006-07
(Per cent to Net cropped area)

Crops	Tomato Growers	Chilli Growers	Onion Growers	Cauliflower Growers	Potato Growers	Peas Growers	Kinnow Growers	Guava Growers
Kharif								
Paddy	81.5	75.8	69.6	31.1	20.8	48.1	4.2	27.6
Basmati	-	4.4	-	-	-	-	-	-
Maize	0.5	3.6	7.6	31.2	53.8	40.2	10.2	5.0
Cotton	-	-	-	-	-	-	22.9	-
Jantar	-	-	-	-	17.7	-	0.1	-
Sugarcane	-	1.0	-	0.4	1.7	0.8	5.8	5.0
Fodder	5.9	9.6	7.5	8.2	3.3	7.6	4.2	10.4
Cauliflower	4.7	0.1	11.4	32.7	-	-	-	3.3
Kerela	11.3	-	-	-	-	-	-	-
Other vegetables	0.3	0.1	0.5	0.6	0.6	0.2	-	5.0
Pulses	-	-	-	-	-	0.2	1.0	-
Rabi								
Wheat	62.9	55.6	61.5	71.9	56.5	76.0	39.3	47.7
Sunflower	4.7	14.8	6.6	1.8	18.6	6.5	-	-
Maize	-	9.4	-	3.4	10.1	-	3.1	-
Sugarcane	-	1.0	-	0.4	1.7	0.8	5.8	5.0
Karnoli	-	-	-	-	-	2.1	-	-
Fodder	5.2	10.0	10.2	8.8	3.3	6.5	4.1	8.7
Potato	13.0	39.3	25.5	23.4	75.4	22.9	2.3	-
Onion	0.3	-	11.2	3.0	-	-	-	-
Cauliflower	1.3	0.4	6.8	10.8	0.1	-	-	-
Tomato	21.1	0.3	0.2	0.1	-	-	-	-
Peas	-	0.1	-	-	-	37.1	-	-
Other vegetables	4.6	4.6	0.8	1.5	-	2.4	-	-
Pulses	-	-	-	-	-	-	0.6	-
Summer								
Cauliflower	2.8	-	-	-	-	-	-	-
Tomato	7.7	-	-	-	-	-	-	-
Chillies	0.4	5.4	-	-	0.1	-	-	-
Other vegetables	-	-	2.2	-	1.6	-	-	-
Pulses	3.7	-	-	-	-	-	-	-
Fruits								
Kinnow	-	-	-	-	-	-	27.3	-
Guava	-	-	-	-	-	-	0.69	43.5
Other fruits	-	-	-	-	-	-	12.9	-
Net cropped area (ha.)	2.5	7.3	4.9	4.6	15.5	7.37	12.4	3.5

Chapter 4

Economics of production for high value crops

Production of high value crops is highly input intensive in nature. It requires higher level of expenditure on labour, fertilizer, plant protection etc. as compared to food grains. The analysis regarding cost and returns would be beneficial for the farmers and policy planners to know about the comparative benefit in cultivation of these crops in the state.

4.1 Economics of production of vegetable crops

The total cost on per hectare basis was found to vary from Rs 33889 for cauliflower to Rs 116296 for tomato. The per hectare gross returns from the tomato cultivation were found vary from Rs 408500 for tomato to Rs 74284 for cauliflower. The net returns were found to vary from Rs 292204 for tomato to Rs 24172 for potato. The benefit-cost ratio was also found to be vary from 3.51 for tomato to 1.43 for potato, which shows that tomato cultivation is a very profitable venture as one rupee invested on the cultivation of the crop fetches return of Rs. 3.51. The cost of cultivation and associated returns have been calculated for different vegetables and presented in Table 4.1 and Table 4.2.

i) Tomato

For tomato, the total cost on per hectare basis was found to be Rs 116296. The variable cost components contributed about 81 per cent to the total cost. Amongst variable cost components, the share of human labour was more than 39 per cent. It shows that tomato cultivation is highly labour intensive. Expenses on plant protection,

Table 4.1: Cost of cultivation of Vegetable Crops in Punjab, 2006-07

(Rs/ha)

Sr No	Particulars	Tomato	Chilli	Onion	Cauliflower	Potato	Peas
A	Variable cost						
	For Seed and nursery raising	8662 (9.16)	1207 (1.84)	9400 (25.75)	4012 (16.36)	25707 (57.15)	5563 (24.51)
	Permanent Fixtures	12478 (13.19)	-	-	-	-	-
	Manures	632 (0.67)	349 (0.53)	1037 (2.84)	953 (3.89)	453 (1.01)	196 (0.86)
	Fertilizers	8411 (8.89)	4217 (6.43)	3231 (8.85)	4009 (16.35)	5225 (11.62)	3332 (14.68)
	Plant Protection	17804 (18.83)	7649 (11.66)	4219 (11.56)	3754 (15.31)	3400 (7.56)	1938 (8.54)
	Micro Nutrients	375 (0.40)	127 (0.19)	190 (0.52)	93 (0.38)	549 (1.22)	93 (0.41)
	Hired Labour	36523 (38.62)	39983 (60.97)	14695 (40.26)	7305 (29.79)	5292 (11.77)	7685 (33.86)
	Family Labour	475 (0.50)	7823 (11.93)	639 (1.75)	1371 (5.59)	220 (0.49)	571 (2.52)
	Machine Labour	2561 (2.71)	2311 (3.52)	2030 (5.56)	2658 (10.84)	3468 (7.71)	2981 (13.14)
	Dori	3895 (4.12)	-	-	-	-	-
	Interest on Working capital @12% for half of period under these crops	2754 (2.91)	1910 (2.91)	1063 (2.91)	363 (1.48)	665 (1.48)	336 (1.48)
	Total variable Cost	94570 (81.32)	65576 (74.77)	36504 (73.66)	24518 (72.35)	44979 (80.61)	22695 (64.58)
B	Fixed Cost						
	Rental value of owned land	14736 (67.83)	11302 (51.07)	6758 (51.77)	4326 (46.16)	3405 (31.48)	7581 (60.91)
	Rent paid for leased-in land	4653 (21.72)	8880 (40.12)	3639 (27.87)	2541 (27.12)	6323 (58.45)	3249 (26.10)
	Depreciation on farm implements and buildings	1030 (4.74)	774 (3.50)	1157 (8.86)	1024 (10.93)	424 (3.92)	603 (4.84)
	Interest on fixed capital	1307 (6.02)	1176 (5.31)	1501 (11.50)	1480 (15.79)	665 (6.15)	1013 (8.14)
	Total fixed cost	21726 (18.68)	22132 (25.23)	13055 (26.34)	9371 (27.65)	10817 (19.39)	12446 (35.42)
Total Cost	116296	87708	49559	33889	55796	35141	

Note: Figures in parentheses for different components of variable cost and fixed cost are the per centages to there respective totals, while the per centages to the total variable cost and fixed cost are to the total cost

Table 4.2: Returns from vegetable crops in Punjab, 2006-07

(Rs./ha)

Particulars	Tomato	Chillies	Onion	Caulifl	Potato	Peas
Yield(qtls/ha)	817	201	256	196	224	60
Price(Rs/qtls)	500	987	535	379	357	1498
Gross returns	408500	198387	136960	74284	79968	89880
Total Variable cost	94570	65576	36504	24518	44979	22695
Total cost	116296	87708	49559	33889	55796	35141
Returns over variable cost	313930	132811	100456	49766	34989	67185
Net return	292204	110679	90401	40395	24172	54739
Benefit cost ratio	3.51	2.26	2.82	2.19	1.43	2.56

permanent fixtures and fertilisers were the other important components of the variable cost. Amongst different fixed cost components, rental value of owned land alone contributed more than 68 per cent to the fixed cost. The per hectare gross returns from the tomato cultivation were found to be Rs 408500. The net returns were found to be Rs 292204/hectare. The benefit-cost ratio was also found to be 3.51, which shows that tomato cultivation is a very profitable venture as one rupee invested on the cultivation of the crop fetches return of Rs. 3.51.

ii) Chillies

For chillies, the total cost on per hectare basis was found to be Rs 87708 (Table 4.1). The variable cost components contributed about 75 per cent to the total cost. Amongst variable cost components, the share of human labour was about 73 per cent. It shows that chillies cultivation is highly labour intensive. The growers were finding hard to get the labour during the harvesting season and sometimes they had to incur losses due to delayed harvesting. Expenses on plant protection, fertilisers and machine labour were the other important components of the variable cost. Amongst different fixed cost components, rental value of owned land alone contributed more than 51 per cent to the

fixed cost. Per hectare gross returns from the chillies cultivation were found to be Rs 198387. The net returns were found to be Rs 110679/hectare. The benefit-cost ratio was also found to be 2.26, which shows that chillies cultivation is a very profitable venture as one rupee invested on the cultivation of the crop fetches return of Rs. 2.26 (Table 4.2).

iii) Onion

For onion, the total cost on per hectare basis was found to be Rs 49559 (Table 4.1). The variable cost components contributed about 74 per cent to the total cost. Amongst variable cost components, the share of human labour was about 42 per cent. It shows that onion cultivation is highly labour intensive. Expenses on seed and nursery raising, plant protection and fertilisers were the other important components of the variable cost. Amongst different fixed cost components, rental value of owned land alone contributed about 52 per cent to the total fixed cost. Per hectare gross returns from the onion cultivation were found to be Rs 136960. The net returns were found to be Rs 90401/hectare. The benefit-cost ratio was also found to be 2.82, which shows that onion cultivation is a very profitable venture as one rupee invested on the cultivation of the crop fetches return of Rs. 2.82, but crop takes more days for the maturity (about 6 months) as compared to the other vegetables grown in the region (Table 4.2).

iv) Cauliflower

The total cost on per hectare basis for cauliflower was found to be Rs 33889 (Table 4.1). The variable cost components contributed about 72 per cent to the total cost.

Amongst variable cost components, the share of human labour was about 35 per cent. Expenses on seed and nursery raising, plant protection and fertilisers were the other important components of the variable cost. Amongst different fixed cost components, rental value of owned land alone contributed about 46 per cent to the total fixed cost. Per hectare gross returns from the cauliflower cultivation were found to be Rs 74284. The net returns were found to be Rs 40395/hectare (Table 4.2). The benefit-cost ratio was also found to be 2.19, which shows that onion cultivation is a very profitable venture as one rupee invested on the cultivation of the crop fetches return of Rs. 2.19.

v) Potato

For potato, the total cost on per hectare basis was found to be Rs 55796. The variable cost components contributed about 81 per cent to the total cost (Table 4.1). Amongst variable cost components, the share of seed and nursery raising was about 57 per cent. Expenses on, labour, fertilisers and plant protection were the other important components of the variable cost. Amongst different fixed cost components, rent paid for leased in land alone contributed about 58 per cent to the total fixed cost. Per hectare gross returns from the potato cultivation were found to be Rs 79968 (Table 4.2). The net returns were found to be Rs 24172/hectare. The benefit-cost ratio was also found to be 1.43, which was the least amongst different vegetables selected for the study. Potato crop was observed to be highly sensitive in terms of the production as well as the price risk.

vi) Peas

For peas, the total cost on per hectare basis was found to be Rs 35141 (Table 4.1). The variable cost components contributed about 65 per cent to the total cost. Amongst variable cost components, the share of human labour was about 34 per cent. Expenses on seed and nursery raising, fertilisers and machine labour were the other important components of the variable cost. Amongst different fixed cost components, rental value of owned land alone contributed about 61 per cent to the total fixed cost. Per hectare gross returns from the peas cultivation were found to be Rs 89880. The net returns were found to be Rs 54739/hectare (Table 4.2). The benefit-cost ratio was also found to be 2.56, which shows that onion cultivation is a very profitable venture as one rupee invested on the cultivation of the crop fetches return of Rs. 2.56.

4.2 Economics of production for fruit crops

The cost and return during the economic life of kinnow and guava orchards has been estimated for all the stages of cultivation of these crops at the present prices by using standard cost concepts. The cost, gross returns for fruits were estimated by taking sample of fruit growers representing all stages of life of the kinnow and guava orchards. These economic parameters were valued at 2006-07 prices and therefore represented present values of respective parameters. The commercial fruiting of kinnow and guava in the study area was observed to be since 5th and 4th year respectively. Further, age groups were framed based on the productivity pattern of these fruits over the life of the orchards. Until the fruiting stage, the cost and return analysis were done on year-wise basis. The productive life of the respective fruits which was 22, and 20 years for kinnow and guava, respectively.

i) Kinnow

Kinnow have a long gestation period i.e. they take a long time (about 4 years) to bear fruit on commercial basis after being planted in the field. A farmer has to incur huge expenses on various operations before the returns start pouring in. The total cost on per hectare basis for kinnow plantations was found to vary between Rs 47413 for the first year to Rs. 35967 for the fourth year (Table 4.3). The higher cost of cultivation during the first year was due to high expenses on plantation, machine and human labour. In the first year, the variable cost components contributed about 36 per cent to the total cost. Amongst variable cost components, the share of plantation, human labour and machine labour was about 38, 33 and 18 per cent, respectively. Amongst different fixed cost components, rental value of owned land alone contributed more than 75 per cent to the total fixed cost. During the second to fourth year of plantations, the share of fixed costs was more than 83 per cent of the total cost. After fruiting, the total cost on per hectare basis marginally increased from Rs. 66133 for 5-7 year plantations to Rs. 66254 for 8-22 years of kinnow plantations. After fruiting, the variable cost components contributed about 54 per cent to the total cost. Amongst variable cost components, the share of human labour was more than 40 per cent. Expenses on fertilisers and plant protection were the other important components of the variable cost. The average productivity of kinnow plantations on per hectare basis was found to vary between 119q in the age group of 5-7 to 155q in the age group of 8-22 (Table 4.4). Although, intercropping is not recommended in guava orchards, but about 38 per cent of the sample farmers used to

Table 4.3: Cost of cultivation of Kinnow in Punjab, 2006-07

(Rs/ha)							
Sr No	Particulars/Years	First	Second	Third	Fourth	5-7	8-22
A	Variable Cost						
	Plantation	6475 (37.62)	-	-	-	-	-
	Manures	450 (2.61)	600 (16.35)	700 (15.87)	900 (15.16)	1763 (4.89)	1811 (5.05)
	Fertilizers	311 (1.81)	427 (11.63)	578 (13.10)	806 (13.58)	6528 (18.11)	7694 (21.46)
	Plant Protection	485 (2.82)	600 (16.35)	600 (13.60)	800 (13.47)	6376 (17.69)	7541 (21.04)
	Micro Nutrients	139 (0.82)	200 (5.45)	325 (7.37)	550 (9.26)	877 (2.43)	710 (1.98)
	Family Labour	238 (1.38)	85 (2.32)	90 (2.04)	120 (2.02)	137 (0.38)	272 (0.76)
	Hired Labour	5457 (31.71)	1591 (43.35)	1870 (42.39)	2275 (38.32)	17052 (47.30)	14637 (40.83)
	Machine Labour	3155 (18.33)	60 (1.63)	120 (2.72)	150 (2.53)	1278 (3.54)	1154 (3.22)
	Interest on Working capital @12% for half of period under these crops	501 (2.91)	107 (2.92)	128 (2.90)	336 (5.66)	2041 (5.66)	2029 (5.66)
	Total Variable cost	17211 (36.30)	3670 (10.89)	4411 (12.81)	5937 (16.51)	36052 (54.51)	35848 (54.37)
B	Fixed Cost						
	Rental value of owned land	22831 (75.59)	22831 (76.03)	22831 (76.03)	22831 (76.03)	22831 (75.90)	22831 (75.90)
	Rent paid for leased-in land	5355 (17.73)	5355 (17.83)	5355 (17.83)	5355 (17.83)	5355 (17.80)	5355 (17.80)
	Depreciation on farm implements and buildings	834 (2.76)	747 (2.49)	747 (2.49)	747 (2.49)	776 (2.58)	776 (2.58)
	Interest on fixed capital	1182 (3.91)	1097 (3.65)	1097 (3.65)	1097 (3.65)	1119 (3.72)	1119 (3.72)
	Total fixed cost	30202 (63.70)	30030 (89.11)	30030 (87.19)	30030 (83.49)	30081 (45.49)	30081 (45.63)
Total Cost	47413	33700	34441	35967	66133	66254	

Note: Figures in parentheses for different components of variable cost and fixed cost are the per centages to their respective totals, while the per centages to the total variable cost and fixed cost are to the total cost

Table 4.4: Returns from Kinnow in Punjab, 2006-07

Particulars/Years	(Rs/hectare)					
	First	Second	Third	Fourth	5-7	8 -22
Yield(qtls/ha)	-	-	-	-	119	155
Price(Rs/qtls)	-	-	-	-	747	701
Gross returns	18300	16500	12700	18725	88643	108943
Total cost	47413	33700	34441	35967	66133	66254
Net return	-29113	-17200	-21741	-17242	22510	42000

practice the intercropping of wheat, cowpea, moong, haldi, gram and pea in the guava orchards till third year of plantations. The net returns from these crops were considered while calculating the gross returns till third year of plantations. The net returns during these years were found negative and these became positive once the commercial production of kinnow started in the fifth year. The average net returns on per hectare basis from kinnow plantations were found to vary between Rs. 22510 in the age group of 5-7 to Rs. 42000 in the age group of 8-22. To have a clear picture regarding the viability of kinnow plantations, Annual average returns and Benefit cost ratios were also calculated. The benefit cost ratio from kinnow plantations was found to be 1.46, while the annual average returns were to the tune of Rs. 28299 per hectare, which shows the economic worthiness of the kinnow plantations (Table 4.5).

Table 4.5: Average Costs and Returns from Kinnow and Guava in Punjab, 2006-07

Existing/fruits	(Rs/hectare)	
	Kinnow	Guava
Gross returns	89377	97361
Total cost	61079	70958
Annual returns	28299	26403
Benefit cost ratio	1.46	1.37

ii) Guava

The fruit crops have a long gestation period i.e. they take a long time to bear fruit after being planted in the field. A farmer has to incur huge expenses on various

operations before the returns start pouring in. The total cost on per hectare basis for guava plantations was found to vary between Rs 51093 for the first year to Rs. 37475 for the third year (Table 4.6). The higher cost of cultivation during the first year is due to high expenses on plantation, machine and human labour. In the first year, the variable cost components contributed about 33 per cent to the total cost. Amongst variable cost components, the share of machine labour, plantation and human labour was about 33, 31 and 29 per cent, respectively. Amongst different fixed cost components, rental value of owned land alone contributed more than 90 per cent to the fixed cost. During the second and third year of plantation, the share of fixed costs was more than 89 per cent of the total cost. After fruiting, the total cost on per hectare basis increased from Rs. 57048 to Rs. 81482 with the age of plantations, which was mainly due to the increase in total variable cost. The expenses on fertilizer, plant protection and human labour required for various operations like pruning, harvesting etc. increased with the age of plantations. The average productivity of guava plantations on per hectare basis was found to vary between 130q in the age group of 4-6 to 192q in the age group of 7-10 (Table 4.7). Although, intercropping is not recommended in guava orchards, but about 24 per cent of the sample farmers used to practice the intercropping of wheat, cowpea, moong, haldi, gram and pea in the guava orchards till third year of plantations. The net returns from these crops were considered while calculating the gross returns till third year of plantations. The net

Table 4.6: Cost of cultivation of Guava in Punjab, 2006-07

(Rs/ha)

Sr No	Particulars/Age of plantations	1	2	3	4-6	7-10	11-20
A	Variable Cost						
	Plantation	5201 (30.58)	-	-	-	-	-
	Manures	212 (1.25)	300 (10.67)	500 (13.18)	650 (2.79)	364 (0.84)	387 (0.81)
	Fertilizers	338 (1.99)	410 (14.58)	512 (13.50)	2500 (10.73)	4599 (10.62)	4590 (9.61)
	Plant Protection	141 (0.83)	200 (7.11)	250 (6.59)	3500 (15.02)	5558 (12.84)	8645 (18.11)
	Micro Nutrients	71 (0.42)	100 (3.56)	200 (5.27)	200 (0.86)	-	309 (0.65)
	Family Labour	222 (1.31)	140 (4.98)	220 (5.80)	425 (1.82)	589 (1.36)	296 (0.62)
	Hired Labour	4755 (27.96)	1530 (54.41)	1900 (50.09)	14500 (62.22)	29667 (68.53)	30480 (63.85)
	Machine Labour	5572 (32.76)	50 (1.78)	100 (2.64)	210 (0.90)	62 (0.14)	329 (0.69)
	Interest on Working capital @12% for half of period under these crops	495 (2.91)	82 (2.92)	111 (2.93)	1319 (5.66)	2451 (5.66)	2702 (5.66)
	Total Variable costs	17007 (33.29)	2812 (7.71)	3793 (10.12)	23304 (40.85)	43290 (56.20)	47738 (58.59)
B	Fixed Cost						
	Rental value of owned land	30755 (90.23)	30755 (91.31)	30755 (91.31)	30755 (91.14)	30755 (91.14)	30755 (91.14)
	Rent paid for leased-in land	-	-	-	-	-	-
	Depreciation on farm implements and buildings	1239 (3.63)	1065 (3.16)	1065 (3.16)	1103 (3.27)	1103 (3.27)	1103 (3.27)
	Interest on fixed capital	2092 (6.14)	1862 (5.53)	1862 (5.53)	1886 (5.59)	1886 (5.59)	1886 (5.59)
	Total fixed cost	34086 (66.71)	33682 (92.29)	33382 (89.88)	33744 (59.15)	33744 (43.80)	33744 (41.41)
Total Cost	51093	36494	37475	57048	77034	81482	

Note: Figures in parentheses for different components of variable cost and fixed cost are the per centages to their respective totals, while the per centages to the total variable cost and fixed cost are to the total cost

Table 4.7: Returns from Guava in Punjab, 2006-07

Particulars/Age of plantations	(Rs/hectare)					
	1	2	3	4-6	7-10	11-20
Yield(qtls/ha)	-	-	-	130	192	187
Price(Rs/qtls)	-	-	-	610	643	623
Gross returns	19400	17800	13500	79300	123599	116423
Total cost	51093	36494	37475	57048	77034	81482
Net return	-31693	-18694	-23975	22252	46565	34941

returns during these years were found negative and these became positive once the commercial production of guava started in the fourth year. The average net returns on per hectare basis from guava plantations were found to vary between Rs. 22252 in the age group of 4-6 to Rs. 46565 in the age group of 7-10. To have a clear picture regarding the viability of guava plantations, Annual average returns and Benefit cost ratios were also calculated. The benefit cost ratio from guava plantations was found to be 1.37, while the annual average returns were to the tune of Rs. 26443 per hectare, which shows the economic worthiness of the guava plantations (Table 4.5).

4.3. Domestic Resource Cost (DRC) for vegetables

In Punjab, the govt. provides the subsidy on fertilizer as well as on power for the irrigation. The Domestic Resource Cost (DRC) can be calculated by including these two subsidies in the present cost analysis for the selected crops. The cost of cultivation and associated returns, after including these two subsidy components, have been calculated for different vegetables and presented in Table 4.8. The total cost on per hectare basis, after including the subsidy, was found to increase of by 13 to 19 per cent for different vegetables in the presently existing level. After including the subsidy, the expenses on fertilisers have increased by more than 83 per cent, while the expenses on irrigation have increased by more than Rs. 1542/ha for different vegetables from the presently existing

level. For different vegetables, the benefit-cost ratio was also found vary from 3.11 for tomato to 1.28 for potato, which shows that vegetable cultivation is a still very profitable venture even after including the subsidy.

i) Tomato

For tomato, the total cost on per hectare basis, after including the subsidy, was found to be Rs 131418, showing an increase of about 13 per cent in the presently existing level (Table 4.7). After including the subsidy, the expenses on fertilisers have almost doubled while the expenses on irrigation have increased Rs. 7338/ha from the presently existing level. The net returns, after including the subsidy, were found to be Rs 277082/hectare. The benefit-cost ratio was also found to be 3.11, which shows that tomato cultivation is a still very profitable venture even after including the subsidy.

ii) Chillies

The total cost on per hectare basis for chillies, after including the subsidy, was found to be Rs 101441, showing an increase of about 16 per cent in the presently existing level (Table 4.7). After including the subsidy, the expenses on fertilisers have increased by about 83 per cent, while the expenses on irrigation have increased Rs. 10248/ha from the presently existing level. The net returns, after including the subsidy, were found to be Rs 96946/hectare. The benefit-cost ratio was also found to be 1.96, which shows that chillies cultivation is a still very profitable venture even after including the subsidy.

Table 4.8: Costs and returns from vegetable crops after including the subsidies in Punjab, 2006-07
(Rs/ha)

Crops	Tomato	Chilies	Onion	cauliflower	Potato	Peas
Existing costs and returns						
Expenses on fertilizer	8411	4217	3231	4009	5225	3332
Expenses on irrigation	0	0	0	0	0	0
Total variable cost	94570	65576	36504	24518	44979	22695
Total cost	116296	87708	49559	33889	55796	35141
Yield(qtl/ha)	817	201	256	196	224	60
Price(Rs/qtl)	500	987	535	379	357	1498
Gross return	408500	198387	136960	74284	79968	89880
Return over variable cost	313930	132811	100456	49766	34989	67185
Net Return	292204	110679	90401	40395	24172	54739
Benefit cost ratio	3.51	2.26	2.82	2.19	1.43	2.56
Costs and returns after including the subsidies						
Expenses on fertilizer	16195	7702	6808	7674	10308	6296
Expenses on irrigation	7338	10248	5832	2328	1542	1812
Total variable cost	109692	79309	45913	30511	51604	27471
Total cost	131418	101441	58968	39882	62421	39917
Yield(qtl/ha)	817	201	256	196	224	60
Price(Rs/qtl)	500	987	535	379	357	1498
Gross return	408500	198387	136960	74284	79968	89880
Return over variable cost	298808	119078	91047	43773	28364	62409
Net Return	277082	96946	77992	34402	17547	49963
Benefit cost ratio	3.11	1.96	2.32	1.86	1.28	2.25

iii) Onion

The total cost on per hectare basis for onion, after including the subsidy, was found to be Rs 58968, showing an increase of about 19 per cent in the presently existing level (Table 4.7). After including the subsidy, the expenses on fertilisers have increased by about 111 per cent, while the expenses on irrigation have increased Rs. 5832/ha from the presently existing level. The net returns, after including the subsidy, were found to be Rs 77992/hectare. The benefit-cost ratio was also found to be 2.32, which shows that onion cultivation is a still very profitable venture even after including the subsidy.

iv) Cauliflower

The total cost on per hectare basis for cauliflower, after including the subsidy, was found to be Rs 39882, showing an increase of about 18 per cent in the presently existing level (Table 4.7). After including the subsidy, the expenses on fertilisers have increased by about 91 per cent, while the expenses on irrigation have increased Rs. 2328/ha from the presently existing level. The net returns, after including the subsidy, were found to be Rs 34402/hectare. The benefit-cost ratio was also found to be 1.86, which shows that cauliflower cultivation is a still very profitable venture even after including the subsidy.

v) Potato

The total cost on per hectare basis for potato, after including the subsidy, was found to be Rs 62421, showing an increase of about 12 per cent in the presently existing level (Table 4.7). After including the subsidy, the expenses on fertilisers have almost doubled, while the expenses on irrigation have increased Rs. 1542/ha from the presently existing level. The net returns, after including the subsidy, were found to be Rs 17547/hectare. The benefit-cost ratio was also found to be 1.28, which shows that potato cultivation is a still very profitable venture even after including the subsidy.

vi) Peas

The total cost on per hectare basis for peas, after including the subsidy, was found to be Rs 39917, showing an increase of about 14 per cent in the presently existing level (Table 4.7). After including the subsidy, the expenses on fertilisers have increased by about 89 per cent, while the expenses on irrigation have increased Rs. 1812/ha from the

presently existing level. The net returns, after including the subsidy, were found to be Rs 49963/hectare. The benefit-cost ratio was also found to be 2.25, which shows that peas cultivation is a still very profitable venture even after including the subsidy.

4.4 Domestic Resource Cost (DRC) for fruits

For fruits, after including the subsidy, with the increase in age of plantation the increase in expenses on fertilizers was observed, mainly due to the use of higher doses of fertilizers with the increase in age of plantation. The increase in total cost, after including the subsidy, was with the increase in age of plantation. The average net returns, showed a decrease of more than 61 per cent in the presently existing level. The benefit-cost ratio was also found to be more than 1.24, which shows that fruit cultivation is a still very profitable venture even after including the subsidy.

i) Kinnow

For kinnow, after including the subsidy, with the increase in age of plantation the increase in expenses on fertilizers was observed, mainly due to the use of higher doses of fertilizers with the increase in age of plantation. The increase in total cost, after including the subsidy, was with the increase in age of plantation (Table 4.9). The average net returns, after including the subsidy, were found to be Rs 17294/hectare showing a decrease of about 61 per cent in the presently existing level (Table 4.10).. The benefit-cost ratio was also found to be 1.24, which shows that kinnow cultivation is a still very profitable venture even after including the subsidy.

Table 4.9: Costs and returns from Kinnow after including the subsidies in Punjab, 2006-07
(Rs/ha)

Particulars/Age of plantations	First	Second	Third	Fourth	5-7	8 -22
Existing costs and returns						
Expenses on fertilizer	311	427	578	806	6528	7694
Expenses on irrigation	-	--	-	--	--	-
Total variable cost	17211	3670	4411	5937	36052	35848
Total cost	47413	33700	34441	35967	66133	66254
Yield(qtl/ha)	-	-	-	-	119	155
Price(Rs/qtl)	-	-	-	-	747	701
Gross return	18300	16500	12700	18725	88643	108943
Return over variable cost	1089	12830	8289	12788	52591	73095
Net Return	-29113	-17200	-21741	-17242	22510	42689
Benefit cost ratio	0.39	0.49	0.37	0.52	1.34	1.64
Costs and returns after including the subsidies						
Expenses on fertilizer	606	877	1090	1632	13054	15720
Expenses on irrigation	768	768	768	1152	2304	2304
Total variable cost	18274	4888	5691	7915	44882	46178
Total cost	48476	34918	35721	37945	74963	76259
Yield(qtl/ha)	0	0	0	0	119	155
Price(Rs/qtl)	0	0	0	0	747	701
Gross return	18300	16500	12700	18725	88643	108943
Return over variable cost	26	11612	7009	10810	43761	62765
Net Return	-30176	-18418	-23021	-19220	13680	32684
Benefit cost ratio	0.38	0.47	0.36	0.49	1.18	1.43

Table 4.10: Average Costs and Returns from Kinnow and Guava in Punjab, 2006-07
(Rs/hectare)

Particulars	Kinnow	Guava
Gross returns	89377	97361
Total cost	61079	70958
Annual returns	28299	26403
Benefit cost ratio	1.46	1.37
After including the subsidies		
Gross returns	89377	97361
Total cost	72083	77390
Annual returns	17294	19971
Benefit cost ratio	1.24	1.26

ii) Guava

For guava, after including the subsidy, with the increase in age of plantation the increase in expenses on fertilizers was observed, mainly due to the use of higher doses of fertilizers with the increase in age of plantation. The increase in total cost, after including the subsidy, was with the increase in age of plantation (Table 4.11). The average net returns, after including the subsidy, were found to be Rs 19971/hectare showing a decrease of about 56 per cent in the presently existing level (Table 4.10).. The benefit-cost ratio was also found to be 1.26, which shows that kinnow cultivation is a still very profitable venture even after including the subsidy.

**Table 4.11: Costs and returns from Guava after including the subsidies in Punjab, 2006-07
(Rs./ha)**

Particulars/Age of plantations	1	2	3	4-6	7-10	11-20
Expenses on fertilizer	338	410	512	2500	4599	4590
Expenses on irrigation	0	0	0	0	0	0
Total variable cost	17007	2812	3793	23304	43290	47738
Total cost	51093	36494	37475	57048	77034	81482
Yield(qtl/ha)	-	-	-	130	192	187
Price(Rs/qtl)	-	-	-	610	643	623
Gross return	19400	17800	13500	79300	123599	116423
Return over variable cost	2393	14988	9707	55996	80309	68685
Net Return	-31693	-18694	-23975	22252	46565	34941
Benefit cost ratio	0.38	0.49	0.36	1.39	1.60	1.43
After including the subsidies						
Expenses on fertilizer	660	805	1037	6109	8798	9969
Expenses on irrigation	948	948	948	2844	2844	2844
Total variable cost	18277	4155	5266	29757	50333	55371
Total cost	52363	37837	38648	63501	84077	89115
Yield(qtl/ha)	-	-	-	130	192	187
Price(Rs/qtl)	-	-	-	610	643	623
Gross return	19400	17800	13500	79300	123599	116423
Return over variable cost	1123	13645	8234	49543	73266	61052
Net Return	-32963	-20037	-25148	15799	39522	27308
Benefit cost ratio	0.37	0.47	0.35	1.25	1.47	1.31

Chapter 5

Marketing system for high value crops

Punjab farmers are getting the assured prices of paddy and wheat through effective price policy for these crops in the state. The experts are in favour of diversification of agriculture and cultivation of high value crops is one of the alternatives to this, but the Punjab farmers are facing the problems during marketing of these crops. The markets are highly volatile to the arrivals in the market and the prices reduce tremendously whenever there is glut in the market.

5.1 Disposal pattern for vegetables

There were five marketing agencies operating in the study area which are handling the vegetables sold by the growers. These are wholesaler, itinerant merchant/local trader, corporate (Reliance fresh), retailer and consumer. The proportion of produce disposed of through these agencies is shown in Table 5.1 and explained in the following paragraphs.

i) Tomato

The farmers preferably sold the tomatoes through wholesaler followed by retailer, corporate (Reliance fresh) and consumer. About 87 per cent of the produce was directly sold to the wholesalers (through the commission agent) by about 96 per cent of the tomato growers. About 7 per cent of the produce was directly sold to the retailers (through the commission agent) by about 40 per cent of the tomato growers. Reliance fresh was also purchasing about 6 per cent of the tomato sold by about 32 per cent of the tomato growers. They used to sell the

Table 5.1: Disposal pattern of vegetable crops in Punjab, 2006-07

(quantity in quintals)

Crops	wholesaler		Retailer		Corporate		Itinerant merchant/ Local trader		Consumer		Total	
	N0.	Quantity	N0.	Quantity	N0.	Quantity	N0.	Quantity	N0.	Quantity	N0.	Quantity
Tomato	24 (96.0)	18158.0 (86.7)	10 (40.0)	1360.0 (6.5)	8 (32.0)	1275.0 (6.1)	-	-	12 (48.0)	152.0 (0.7)	25 (100.0)	20945.0 (100.0)
Chillies	46 (100.0)	3586.0 (97.6)	27 (59.0)	74.0 (2.0)	-	-	-	-	21 (46.0)	15.45 (0)	46 (100.0)	3675.45 (100.0)
Onion	21 (84.0)	2375.25 (70.1)	3 (12.0)	139.0 (4.1)	-	-	5 (20.0)	833.0 (24.6)	10 (40.0)	43.0 (0.4)	25 (100.0)	3390.25 (100.0)
Cauliflower	50 (100.0)	10164.50 (96.1)	25 (50.0)	289.0 (2.7)	-	-	-	-	15 (30.0)	123.5 (1.3)	50 (100.0)	10577.0 (100.0)
Potato	31 (86.0)	63016.0 (90.5)	14 (39.0)	390.0 (0.6)	-	-	7 (19.0)	6162.5 (8.8)	17 (47.0)	77.0 (0.1)	36 (100.0)	69645.5 (100.0)
Peas	39 (81.0)	4677.25 (60.0)	19 (40.0)	232.0 (3.0)	-	-	13 (27.0)	2824.0 (36.2)	22 (46.0)	60.0 (0.8)	48 (100.0)	7793.25 (100.0)

Note: Figures in parentheses indicate the per cent of growers selling the produce through a particular market functionary and in case of quantity the per cent to total produce sold

produce directly to the consumers at their outlets in the local market. Consumer was the other agencies purchasing less than 1 per cent of the tomato sold directly by the tomato growers. It shows that growers preferred to take their produce directly to the wholesaler through the commission agents in the market.

ii) Chillies

Chillies were preferably sold by the farmers through wholesaler followed by retailer and consumer. About 98 per cent of the produce was directly sold to the wholesalers (through the commission agent) by all the tomato growers. About 2 per cent of the produce was directly sold to the retailers (through the commission agent) by about 59 per cent of the chillies growers. Consumer was the other agencies purchasing less than 1 per cent of the chillies sold directly by the growers. It shows that growers preferred to take their produce directly to the wholesaler through the commission agents in the market.

iii) Onion

The farmers preferably sold the onion through wholesaler followed by itinerant merchant/local trader, retailer and consumer. About 70 per cent of the produce was directly sold to the wholesalers (through the commission agent) by about 84 per cent of the onion growers. Itinerant merchant/local trader was also purchasing about 25 per cent of the produce sold by about 20 per cent of the onion growers. They used to sell the produce in the distant market. About 4 per cent of the produce was directly sold to the retailers (through the commission agent) by about 12 per cent of the onion growers. Consumer was the other agencies purchasing less than 1 per cent of the onion sold directly by the growers. It shows that growers preferred to take their produce directly to the wholesaler through the commission agents in the market. Itinerant merchant/local trader was also purchasing about 25 per cent of the produce sold by the onion growers.

iv) Cauliflower

The farmers preferably sold the cauliflower through wholesaler followed by retailer and consumer. About 96 per cent of the produce was directly sold to the wholesalers (through the commission agent) by all the cauliflower growers. About 3 per cent of the produce was directly sold to the retailers (through the commission agent) by about 50 per cent of the cauliflower growers. Consumer was the other agencies purchasing about 1 per cent of the cauliflower sold directly by the growers. It shows that growers preferred to take their produce directly to the wholesaler through the commission agents in the market.

v) Potato

The farmers preferably sold the potato through wholesaler followed by itinerant merchant/local trader, retailer and consumer. About 90 per cent of the produce was directly sold to the wholesalers (through the commission agent) by about 86 per cent of the potato growers. Itinerant merchant/local trader was also purchasing about 9 per cent of the produce sold by about 19 per cent of the potato growers. Retailer and consumer were the other agencies purchasing less than 1 per cent of the potato sold directly by the growers. It shows that growers preferred to take their produce directly to the wholesaler through the commission agents in the market. Itinerant merchant/local trader was also purchasing about 19 per cent of the produce sold by the potato growers.

vi) Peas

The farmers preferably sold the peas through wholesaler followed by itinerant merchant/local trader, retailer and consumer. About 60 per cent of the produce was directly sold to the wholesalers (through the commission agent) by about 81 per cent of the peas growers. Itinerant merchant/local trader was also purchasing about 36 per cent of the produce sold by about 27 per cent of the peas growers. They used to sell the produce in the distant market. About 3 per cent of the produce was directly sold to the retailers (through the commission agent) by about 40 per cent of the peas growers. Consumer was the other agencies purchasing less than 1 per cent of the peas sold directly by the growers. It shows that growers preferred to take their produce directly to the wholesaler through the

commission agents in the market. Itinerant merchant/local trader was also purchasing about 36 per cent of the produce sold by the peas growers.

5.2 Disposal pattern for fruits

There were four marketing agencies operating in the study area which are handling the vegetables sold by the growers. These are pre harvest contractor, wholesaler, retailer and consumer. The proportion of produce disposed of through these agencies is shown in Table 5.2 and explained in the following paragraphs.

i) Kinnow

The farmers preferably sold the kinnows through pre harvest contractor followed by wholesaler, retailer and consumer. The pre harvest contractor were more popular in the Hoshiarpur area as most of the producers were making the contract with the pre harvest contractor after the fruiting of kinnow in the area. About 74 per cent of the produce was directly sold to the pre harvest contractor by about 62 per cent of the kinnow growers. About 26 per cent of the produce was directly sold to the wholesalers (through the commission agent) by about 42 per cent of the kinnow growers. Retailer and Consumer were the other agencies purchasing less than 1 per cent of the kinnow directly sold by the kinnow growers. It shows that growers preferred to take their produce directly to the pre harvest contractor.

ii) Guava

The farmers preferably sold the guava through wholesaler followed by retailer and consumer. About 95 per cent of the produce was directly sold to the

wholesalers (through the commission agent) by all the guava growers. About 5 per cent of the produce was directly sold to the retailers (through the commission agent) by about 57 per cent of the guava growers. Consumer was the other agencies purchasing less than 1 per cent of the guava sold directly by the growers. It shows that growers preferred to take their produce directly to the wholesaler through the commission agents in the market.

Table 5.2: Disposal pattern of Fruit crops in Punjab, 2006-07

(Quantity in quintals)

Crops	Pre-harvest Contract		wholesaler		Retailer		Consumer		Total	
	No.	Quantity	No.	Quantity	No.	Quantity	No.	Quantity	No.	Quantity
Kinnow	31 (62.0)	26270.0 (73.74)	21 (42.0)	9100.0 (25.54)	9 (18.0)	237.0 (0.67)	7 (14.0)	20.0 (0.05)	50 (100.0)	35627.0 (100.0)
Guava	-	-	7 (100.0)	1441.0 (95.02)	4 (57.0)	75.0 (4.95)	2 (29.0)	0.45 (0.03)	7 (100.00)	1516.45 (100.0)

Note: Figures in parentheses indicate the per cent of growers selling the produce through a particular market functionary and in case of quantity the per cent to total produce sold

5.3 Marketing channels for the disposal of vegetables

The following six marketing channels were followed by the vegetable growers in the study area for disposal of their produce.

Channel-I: Producer-Wholesaler (through the commission agent) -Retailer-Consumer (local market)

Channel-II: Producer –Retailer (through the commission agent) –Consumer (local market)

Channel-III: Producer –Retailer –Consumer

Channel-IV: Producer-Itinerant merchant/local trader (through the commission agent) -Retailer-Consumer (distant market)

Channel-V: Producer –Corporate -Consumer

Channel-VI: Producer –Consumer

Channel-VI was observed to be the most efficient channel as producers were fetching maximum price through direct sale to the consumer. The producer's share in consumer's rupee was found to be the highest in channel-VI and the lowest in case of channel-1 due to the more number of market intermediaries involved. In channel-I, the producer sold the produce to the secondary wholesaler through commission agent which was further sold to the retailer in the local market and finally came in the hands of consumer. In channel-II, the producer sold the produce to the retailer through commission agent in the local market who finally sold the produce to the consumer. In channel-III, the producer sold the produce to the retailer who finally sold the produce to the consumer. In channel-IV, the producer sold the produce to the Itinerant merchant/local trader (through the commission agent) who sold it to the retailer in the distant market who finally sold the produce to the consumer. In channel-V, the corporate purchasing tomatoes in study area, had already made contract with the producers for the purchase of good quality tomatoes. In channel-VI, producer sold the produce directly to the consumer at the farm gate.

i) Tomato

In channel-I for the sale of tomato, the producer's share in consumer's rupee was found to be about 43 per cent (Table 5.3). The marketing cost incurred by sample farmers, secondary wholesaler and retailer in channel-I was Rs. 40.43/q, Rs. 43.01/q and Rs. 57.84/q respectively. The marketing margin of secondary wholesaler and retailer was Rs. 84.95/q and Rs. 350/q respectively. In channel-II, the producer's share in consumer's rupee was found to be about 46 per cent. The marketing cost incurred by

producer and retailer was Rs. 43.54/q and Rs. 96.87/q respectively. The marketing margin fetched by retailer was Rs. 390/q. In channel-III, the producer's share in consumer's rupee was found to be about 51 per cent. The marketing cost incurred by retailer was Rs. 56.47/q and the marketing margin fetched by retailer was Rs. 450/q. In channel-V, the producer's share in consumer's rupee was found to the tune of about 62 per cent. The reliance fresh, the corporate purchasing tomatoes in study area, had already made contract with the producers for the purchase of good quality tomatoes. Therefore, the producer was getting remunerative prices for the produce and the consumer has to pay the highest price due to the quality of tomatoes sold through the outlets. The marketing cost incurred by corporate was Rs. 51.65/q and the marketing margin fetched by retailer was Rs. 367/q.

Table 5.3: Marketing costs, margins and price spread analysis of Tomato during peak season in different Channels in Punjab, 2006-07
(Rs/qtl)

Sr.No.	Particulars	Channel-I	Channel-II	Channel-III	Channel-IV	Channel-V	
1	Net price received by the producer	437.47 (43.16)	450.16 (45.91)	523.43 (50.82)	678.04 (61.83)	800.26 (100.0)	
	Marketing costs of producer						
	(i) Grading and packing	2.44 (0.24)	2.48 (0.25)	-	-	-	
	(ii) Loading/unloading	4.87 (0.48)	4.77 (0.49)	-	-	-	
	(iii) Transportation	33.12 (3.27)	36.29 (3.70)	-	-	-	
	Sub-total	40.43 (3.99)	43.54 (4.44)	-	-	-	
2	Purchase price of secondary wholesaler	477.9 (47.14)	-	-	-	-	
	Costs of Secondary wholesaler						
	(i)Market fee	9.56 (0.94)	-	-	-	-	
	(ii)Rural Development Fund	9.56 (0.94)	-	--	-	-	
	(iii)Commission charges	23.90 (2.36)	-	-	-	-	
	Sub-total	43.01 (4.24)	-	-	-	-	
	Net margins of secondary wholesaler	84.95 (8.38)	-	-	-	-	
3	Purchase price of Corporate	-	-	-	678.04 (61.83)	-	
	Costs of Corporate						
	(i) Grading and packing	-	-	-	6.15 (0.56)	-	
	(ii)Loading/unloading	-	-	-	5.20 (0.47)	-	
	(iii)Transportation	-	-	-	38.10 (3.47)	-	
	(iv) Miscellaneous	-	-	-	2.20 (0.20)	-	
	Sub-total	-	-	-	51.65 (4.71)	-	
	Net margins of reliance	-	-	-	367.0 (33.46)	-	
4	Purchase price of retailer	605.86 (59.77)	493.70 (50.35)	523.43 (50.82)	-	-	
	Costs of retailer						
	(i) Grading and packing	-	-	-	-	-	
	(ii)Loading/unloading	5.05 (0.50)	4.82 (0.49)	5.10 (0.50)	-	-	
	(iii) Market fee	-	9.87 (1.01)	-	-	-	
	(iv) Rural development fund	-	9.87 (1.01)	-	-	-	
	(v)Commission charges	-	24.69 (2.52)	-	-	-	
	(vi)Transportation	20.0 (1.97)	21.03 (2.14)	23.1 (2.24)	-	-	
	(vii)Losses @ 5%	30.29 (2.99)	24.69 (2.52)	26.17 (2.54)	-	-	
	(vii)Miscellaneous	2.50 (0.25)	1.90 (0.19)	2.1 (0.20)	-	-	
	Sub-total	57.84 (5.71)	96.87 (9.88)	56.47 (5.48)	-	-	
		Net margins of retailer	350.0 (34.53)	390.0 (39.77)	450.0 (43.69)	-	-
	5	Consumer' price	1013.70 (100.0)	980.57 (100.0)	1029.90 (100.0)	1096.69 (100.0)	800.26 (100.0)

Figures in parentheses show percentage of consumer 'price

ii) Chillies

In channel-I for the sale of chillies, the producer's share in consumer's rupee was found to be about 65 per cent (Table 5.4). The marketing cost incurred by sample farmers, secondary wholesaler and retailer in channel-I was Rs. 57.65/q, Rs. 88.87/q and Rs. 37.89/q respectively. The marketing margin of secondary wholesaler and retailer was Rs. 54.90/q and Rs. 250/q respectively. In channel-II, the producer's share in consumer's rupee was found to be about 65 per cent. The marketing cost incurred by producer and retailer was Rs. 57.30/q and Rs. 126.13/q respectively. The marketing margin fetched by retailer was Rs. 320/q. In channel-III, the producer's share in consumer's rupee was found to be about 77 per cent. The marketing cost incurred by retailer was Rs. 47/q and the marketing margin fetched by retailer was Rs. 250/q.

iii) Onion

In channel-I for the sale of onion, the producer's share in consumer's rupee was found to be about 60 per cent (Table 5.5). The marketing cost incurred by sample farmers, secondary wholesaler and retailer in channel-I was Rs. 35.23/q, Rs. 49.38/q and Rs. 12.46/q respectively. The marketing margin of secondary wholesaler and

Table 5.4: Marketing costs, margins and price spread analysis of Chilies during peak season in different Channels in Punjab, 2006-07 (Rs/qtl)

Sr. No	Particulars	Channel-I	Channel-II	Channel-III	Channel-IV
1	Net price received by the producer	928.64 (65.53)	953.49 (65.45)	1065.48 (77.07)	804.07 (100.00)
	Marketing costs of producer				
	(i) Grading and packing	27.43 (1.94)	27.10 (1.86)	-	-
	(ii) Loading/unloading	5.20 (0.37)	5.10 (0.35)	-	-
	(iii) Transportation	25.02 (1.77)	25.10 (1.72)	-	-
	Sub-total	57.65 (4.07)	57.30 (3.93)	-	-
2	Purchase price of secondary wholesaler	986.29 (69.60)	-	-	-
	Costs of Secondary wholesaler				
	(i) Market fee	19.73 (1.39)	-	-	-
	(ii) Rural Development Fund	19.73 (1.39)	-	-	-
	(iii) Commission charges	49.31 (3.48)	-	-	-
	Sub-total	88.77 (6.26)	-	-	-
	Net margins of secondary wholesaler	54.90 (3.82)	-	-	-
3	Purchase price of retailer	1129.26 (79.69)	1010.79 (69.38)	1065.48 (77.07)	-
	Costs of retailer				
	(i) Grading and packing	-	-	25.0 (1.81)	-
	(ii) Market fee	-	20.22 (1.39)	-	-
	(iii) Rural Development Fund	-	20.22 (1.39)	-	-
	(iv) Commission charges	-	50.54 (3.47)	-	-
	(v) Loading/unloading	6.10 (0.43)	5.35 (0.37)	2.50 (0.18)	-
	(vi) Transportation	20.50 (1.45)	19.70 (1.35)	8.85 (0.64)	-
	(vii) Losses @ 1%	11.29 (0.80)	10.11 (0.69)	10.65 (0.77)	-
	Sub-total	37.89 (2.67)	126.13 (8.66)	47.0 (3.40)	-
		Net margins of retailer	250.0 (17.64)	320.0 (21.96)	270.0 (19.53)
4	Consumer 'price	1417.15 (100.00)	1456.92 (100.0)	1382.48 (100.00)	804.07 (100.0)

Figures in parentheses show percentage of consumer 'price

Table 5.5: Marketing costs, margins and price spread analysis of Onion during peak season in different Channels in Punjab, 2006-07

(Rs/qtl)

Sr.No	Particulars	Channel-I	Channel-II	Channel-III	Channel-IV	Channel-V
1	Net price received by the producer	475.61 (59.92)	490.09 (61.49)	570.8 (67.05)	597.76 (57.03)	627.09 (100.0)
	Marketing costs of producer					
	(i) Grading and packing	5.07 (0.64)	5.09 (0.64)	-	-	-
	(ii) Loading/unloading	1.99 (0.25)	1.97 (0.25)	-	-	-
	(iii) Transportation	4.94 (0.62)	4.57 (0.57)	-	-	-
	Sub-total	35.23 (4.44)	35.75 (4.49)	-	-	-
2	Purchase price of secondary wholesaler	510.84 (64.36)	-	-	597.76 (57.03)	-
	Costs of Secondary wholesaler					
	(i) Grading and packing	-	-	-	26.45 (2.52)	-
	(ii) Loading/unloading	2.10 (0.26)	-	-	2.10 (0.20)	-
	(iii) Market fee	10.22 (1.29)	-	-	-	-
	(iv) Rural development fund	10.22 (1.29)	-	-	-	-
	(v) Commission charges	25.54 (3.22)	-	-	-	-
	(vi) Transportation	-	-	-	6.75 (0.64)	-
	(vii) Miscellaneous	1.30 (0.16)	-	-	1.50 (0.14)	-
	Sub-total	49.38 (6.22)	-	-	36.80 (3.51)	-
	Net margins of secondary wholesaler	26.0 (3.28)	-	-	56.0 (5.34)	-
3	Purchase price of retailer	586.22 (73.86)	525.84 (65.98)	570.8 (67.05)	690.56 (65.89)	-
	Costs of retailer					
	(i) Grading and packing	-	-	21.77 (2.56)	-	-
	(ii) Market fee	-	10.52 (1.32)	-	13.81 (1.32)	-
	(iii) Rural development fund	-	10.52 (1.32)	-	13.81 (1.32)	-
	(iv) Commission charges	-	26.29 (3.30)	-	34.53 (3.29)	-
	(v) Loading/unloading	2.10 (0.26)	2.05 (0.26)	2.0 (0.23)	2.25 (0.21)	-
	(vi) Transportation	4.50 (0.57)	6.50 (0.82)	8.0 (0.94)	6.25 (0.60)	-
	(vii) Losses @ 1%	5.86 (0.74)	5.26 (0.66)	5.71 (0.67)	6.91 (0.66)	-
	Sub-total	12.46 (1.57)	61.13 (7.67)	37.48 (4.40)	77.56 (7.40)	-
	Net margins of retailer	195.0 (24.57.)	210.0 (26.35)	243.0 (28.55)	280.0 (26.71)	-
4	Consumer' price	793.68 (100.0)	796.97 (100.0)	851.28 (100.0)	1048.12 (100.0)	627.09 (100.0)

Figures in parentheses show percentage of consumer 'price

retailer was Rs. 26/q and Rs. 195/q respectively. In channel-II, the producer's share in consumer's rupee was found to be about 61 per cent. The marketing cost incurred by producer and retailer was Rs. 35.75/q and Rs. 61.13/q respectively. The marketing margin fetched by retailer was Rs. 210/q. In channel-III, the producer's share in consumer's rupee was found to be about 67 per cent. The marketing cost incurred by retailer was Rs. 37.48/q and the marketing margin fetched by retailer was Rs. 243/q. In channel-IV, the producer's share in consumer's rupee was found to be about 57 per cent. The itinerant merchant/local trader purchased the produce directly from the producer and sold in the Chandigarh market through the commission agent. The marketing cost incurred by Itinerant merchant/local trader and retailer was Rs. 36.80/q and Rs. 77.56/q respectively and the marketing margin fetched by Itinerant merchant/local trader and retailer was Rs. 56/q and Rs. 280/q respectively.

iv) Cauliflower

In channel-I for the sale of cauliflower, the producer's share in consumer's rupee was found to be about 52 per cent (Table 5.6). The marketing cost incurred by sample farmers, secondary wholesaler and retailer was Rs. 12.53/q, Rs. 65.62/q and Rs. 22.59/q respectively. The marketing margin of secondary wholesaler and retailer consumer was Rs. 40/q and Rs. 190/q respectively. In channel-II for the sale of cauliflower, the producer's share in consumer's rupee was found to be about 55 per cent. The marketing cost incurred by retailer was Rs. 77.34/q and the marketing margin fetched by retailer was Rs. 205/q. In channel-III for the sale of cauliflower, the producer's share in consumer's rupee was found to be about 65 per cent. The marketing

Table 5.6 : Marketing costs, margins and price spread analysis of Cauliflower during peak season in different Channels in Punjab, 2006-07

(Rs/qtl)

Sr No	Particulars	Channel-I	Channel-II	Channel-III	Channel-IV	
1	Net price received by the producer	361.5 (52.27)	366.14 (55.40)	447.47 (64.77)	627.16 (100.0)	
	Marketing costs of producer					
	(i) Loading/unloading	2.91 (0.42)	2.89 (0.44)	-	-	
	(ii) Transportation	9.62 (1.39)	9.57 (1.45)	-	-	
	Sub-total	12.53 (1.81)	12.46 (1.89)	-	-	
2	Purchase price of secondary wholesaler	374.03 (54.08)	-	-	-	
	Costs of Secondary wholesaler					
	(i) Market fee	7.48 (1.08)	-	-	-	
	(ii) Rural development fund	7.48 (1.08)	-	-	-	
	(iii) Commission charges	18.70 (2.70)	-	-	-	
	Sub-total	33.66 (4.87)	-	-	-	
	Net margins of secondary wholesaler	42.0 (6.07)	-	-	-	
3	Purchase price of retailer	449.69 (65.02)	378.60 (57.28)	447.47 (64.77)	-	
	Costs of retailer					
	(i) Grading and packing	29.95 (4.33)	27.05 (4.09)	27.50 (3.98)	-	
	(ii) Market fee	-	7.57 (1.15)	-	-	
	(iii) Rural development fund	-	7.57 (1.15)	-	-	
	(iv) Commission charges	-	18.93 (2.86)	-	-	
	(v) Loading/unloading	4.0 (0.58)	1.12 (0.17)	1.02 (0.15)	-	
	(vi) Transportation	7.50 (1.08)	6.42 (0.97)	5.02 (0.73)	-	
	(vii) Losses @ 2%	8.99 (1.30)	7.57 (1.15)	8.95 (1.30)	-	
	(viii) Miscellaneous	1.50 (0.22)	1.10 (0.17)	0.90 (0.13)	-	
	Sub-total	51.94 (7.51)	77.34 (11.70)	43.39 (6.28)	-	
		Net margins of retailer	190.0 (27.47)	205.0 (31.02)	200.0 (28.95)	-
	4	Consumer' price	691.64 (100.0)	660.94 (100.0)	690.86 (100.0)	627.16 (100.0)

Figures in parentheses show percentage of consumer' price

cost incurred by retailer was Rs. 43.39/q and the marketing margin fetched by retailer was Rs. 200/q.

v) Potato

In channel-I for the sale of potato, the producer's share in consumer's rupee was found to be about 48 per cent (Table 5.7). The marketing cost incurred by sample farmers, secondary wholesaler and retailer was Rs. 32.11/q, Rs. 29.39/q and Rs. 17.07/q respectively. The marketing margin of secondary wholesaler and retailer consumer was Rs. 35/q and Rs. 205/q respectively. In channel-II for the sale of potato, the producer's share in consumer's rupee was found to be about 49 per cent. The marketing cost incurred by retailer was Rs. 46.42/q and the marketing margin fetched by retailer was Rs. 240/q. In channel-III for the sale of potato, the producer's share in consumer's rupee was found to be about 59 per cent. The marketing cost incurred by retailer was Rs. 45.46/q and the marketing margin fetched by retailer was Rs. 225/q. In channel-IV, the producer's share in consumer's rupee was found to be about 44 per cent. The itinerant merchant/local trader purchased the produce directly from the producer and sold in the distant market (Ludhiana) through the commission agent. The marketing cost incurred by Itinerant merchant/local trader and retailer was Rs. 39.27/q and Rs. 51.98/q respectively and the marketing margin fetched by Itinerant merchant/local trader and retailer was Rs. 45/q and Rs. 240/q respectively.

vi) Peas

In channel-I for the sale of peas, the producer's share in consumer's rupee was found to be about 75 per cent (Table 5.8). The marketing cost incurred by sample

Table 5.7: Marketing costs, margins and price spread analysis of Potato during peak season in different Channels in Punjab, 2006-07

(Rs/ctl)

Sr No	Particulars	Channel-I	Channel-II	Channel-III	Channel-IV	Channel-V
1	Net price received by the producer	294.46 (48.03)	301.54 (48.60)	394.38 (59.32)	298.83 (44.27)	481.88 (100.0)
	Marketing costs of producer					
	(i) Grading and packing	20.88 (3.41)	20.90 (3.37)	-		-
	(ii) Weighing/filling/sewing charges	5.24 (0.85)	5.36 (0.86)	-		-
	(iii) Loading/unloading	1.66 (0.27)	1.76 (0.28)	-		-
	(iv) Transportation	4.33 (0.71)	4.51 (0.73)	-		-
	Sub-total	32.11 (5.24)	32.53 (5.24)	-		-
2	Purchase price of secondary wholesaler	326.57 (53.24)	-	-	298.83 (44.27)	-
	Costs of Secondary wholesaler					
	(i) Grading and packing	-	-	-	18.90 (2.80)	-
	(ii) Weighing/filling/sewing charges	-	-	-	5.80 (0.86)	-
	(iii) Loading/unloading	-	-	-	1.7 (0.25)	-
	(iv) Transportation	-	-	-	12.87 (1.91)	-
	(v) Market fee	6.53 (1.07)	-	-		-
	(vi) Rural Development Fund	6.53 (1.07)	-	-		-
	(vii) Commission charges	16.33 (2.66)	-	-		-
	Sub-total	29.39 (4.71)	-	-	39.27 (5.82)	-
	Net margins of secondary wholesaler	35.0 (5.71)	-	-	45.0 (6.67)	-
3	Purchase price of retailer	390.96 (63.78)	334.07 (53.84)	394.38 (59.32)	383.10 (56.75)	-
	Costs of retailer					
	(i) Grading and packing	-	-	22.0 (3.31)		-
	(ii) Weighing/filling/sewing charges	-	-	6.10 (0.92)		-
	(iii) Market fee	-	6.68 (1.08)	-	7.66 (1.13)	-
	(iv) Rural Development Fund	-	6.68 (1.08)	-	7.66 (1.13)	-
	(v) Commission charges	-	16.70 (2.69)	-	19.16 (2.84)	-
	(vi) Loading/unloading	1.80 (0.29)	1.75 (0.28)	1.90 (0.29)	1.82 (0.27)	-
	(vii) Transportation	5.50 (0.90)	6.25 (1.01)	5.60 (0.84)	6.10 (0.90)	-
	(viii) Losses @ 2.5%	9.77 (1.59)	8.35 (1.35)	9.86 (1.48)	9.58 (1.42)	-
	Sub-total	17.07 (2.79)	46.42 (7.48)	45.46 (6.84)	51.98 (7.70)	-
	Net margins of retailer	205.0 (3340)	240.0 (38.68)	225.00 (33.84)	240.0 (35.55)	-

4	Consumer' price	613.03 (100.0)	620.49 (100.0)	664.84 (100.0)	675.08 (100.0)	481.88 (100.0)
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Figures in parentheses show percentage of consumer' price

Table 5.8: Marketing costs, margins and price spread analysis of Peas during peak season in different Channels in Punjab,2006-07
(Rs/qttl)

Sr No	Particulars	Channel-I	Channel-II	Channel-III	Channel-IV	Channel-V
1	Net price received by the producer	1469.64 (75.32)	1490.10 (73.72)	1575.34 (80.48)	1474.17 (71..93)	1736.0 (100.0)
	Marketing costs of producer					
	(i) Grading and packing	25.0 (1.28)	24.90 (1.23)	-	-	-
	(ii) Loading/unloading	1.67 (0.09)	1.68 (0.08)	-	-	-
	(iii) Transportation	10.84 (0.56)	10.85 (0.54)	-	-	-
	Sub-total	37.51 (1.92)	37.43 (1.85)	-	-	-
2	Purchase price of secondary wholesaler	1507.15 (77.24)	-	-	1474.17 (71.93)	-
	Costs of Secondary wholesaler					
	(i) Grading and packing	-	-	-	25.0 (1.24)	-
	(ii) Loading/unloading	-	-	-	1.95 (0.10)	-
	(iii) Transportation	-	-	-	11.0 (0.55)	-
	(iv)Market fee	30.14 (1.54)	-	-	-	-
	(v)Rural Development Fund	30.14 (1.54)	-	-	-	-
	(vi)Commission charges	75.36 (3.86)	-	-	-	-
	Sub-total	135.64 (6.95)	-	-	39 (1.88)	-
	Net margins of secondary wholesaler	75.0 (3.84)	-	-	140.0 (6.83)	-
3	Purchase price of retailer	1717.79 (88.04)	15237.53 (75.57)	1575.34 (80.48)	1652.77 (80.64)	-
	Costs of retailer					
	(i) Grading and packing	-	-	25.0 (1.20)	-	-
	(ii) Loading/unloading	1.97 (0.10)	1.91 (0.09)	1.80 (0.09)	2.10 (0.10)	-
	(iii) Transportation	8.50 (0.44)	11.25 (0.56)	16.0 (0.82)	9.55 (0.47)	-
	(iv)Market fee	-	30.55 (1.51)	-	33.06 (1.61)	-
	(v)Rural Development Fund	-	30.55 (1.51)	-	33.06 (1.61)	-
	(vi)Commission charges	-	76.38 (3.78)	-	82.64 (4.03)	-
	(vii) Losses @ 2.5%	42.94 (2.20)	38.19 (1.89)	39.38 (2.01)	41.32 (2.02)	-
	Sub-total	53.41 (2.74)	188.83 (9.34)	82.18 (4.20)	201.72 (9.84)	-
	Net margins of retailer	180.0 (9.23)	305.0 (15.09)	300.0 (15.33)	195.00 (9.51)	-
4	Consumer' price	1951.21 (100.0)	2021.36 (100.0)	1957.52 (100.0)	2049.49 (100.0)	1736.0 (100.0)

Figures in parentheses show percentage of consumer' price

farmers, secondary wholesaler and retailer was Rs. 37.51/q, Rs. 135.64/q and Rs. 53.41/q respectively. The marketing margin of secondary wholesaler and retailer was Rs. 75/q and Rs. 180/q respectively. In channel-II for the sale of peas, the producer's share in consumer's rupee was found to be about 74 per cent. The marketing cost incurred by producer and retailer was Rs. 37.43/q and Rs. 188.83/q. The marketing margin fetched by retailer was Rs. 305/q. In channel-III for the sale of peas, the producer's share in consumer's rupee was found to be about 80 per cent. The marketing cost incurred by retailer was Rs. 82.18/q and the marketing margin fetched by retailer was Rs. 300/q. In channel-IV, the producer's share in consumer's rupee was found to be about 44 per cent. The itinerant merchant/local trader purchased the produce directly from the producer and sold in the distant market (Jalandhar) through the commission agent. The marketing cost incurred by Itinerant merchant/local trader and retailer was Rs. 39/q and Rs. 201/q respectively and the marketing margin fetched by Itinerant merchant/local trader and retailer was Rs. 140/q and Rs. 195/q respectively.

5.4. Marketing channels for the disposal of fruits

i) Kinnow

The following seven marketing channels were followed by the kinnow growers in the Abohar area for disposal of their produce.

Channel-I: Producer-Pre harvest contractor-Wholesaler (through the commission agent) -Retailer-Consumer (Abohar market)

Channel-II: Producer-Wholesaler (through the commission agent) -Retailer-Consumer (Abohar market)

Channel-III: Producer-Pre harvest contractor-Wholesaler (through the commission agent) -Retailer-Consumer (Delhi market)

Channel-IV: Producer-Wholesaler (through the commission agent) -Retailer-Consumer (Delhi market)

Channel-V: Producer –Retailer (through the commission agent) –Consumer (Abohar market).

Channel-VI: Producer –Retailer –Consumer

Channel-VII: Producer –Consumer

Channel-VII was observed to be the most efficient channel as producers were fetching maximum price through direct sale to the consumer (Table 5.9). The producer's share in consumer's rupee was found to be the highest in channel-VII and the lowest in case of channel-III due to the more number of market intermediaries involved. In channel-I, the producer sold the produce to the pre harvest contractor who sold the produce to secondary wholesaler through commission agent in the local Abohar market which was further sold to the retailer and finally came in the hands of consumer. The contract between the producer and contractor is made after the fruiting of the orchards. After the contract, all the operations require for production and marketing of kinnow are performed by the pre harvest. In channel-II, the producer sold the produce to the secondary wholesaler through commission agent in the local Abohar market which was further sold to the retailer and finally came in the hands of consumer. In channel-III, the producer sold the produce to the pre harvest contractor who sold the produce to

secondary wholesaler through commission agent in the Delhi market which was further sold to the retailer and finally came in the hands of consumer. In channel-IV, the producer sold the produce to the secondary wholesaler through commission agent in the Delhi market which was further sold to the retailer and finally came in the hands of consumer. In channel-V, the producer sold the produce to the retailer through commission agent in the local Abohar market and finally sold to the consumer. In channel-VI, the producer sold the produce to the retailer who finally sold the produce to the consumer. In channel-VII, producer sold the produce directly to the consumer at the farm gate.

In channel-I for the sale of kinnow in Abohar block, the producer's share in consumer's rupee was found to be about 38 per cent. The marketing cost incurred by pre harvest contractor, secondary wholesaler and retailer in channel-I was Rs. 33.9/q , Rs. 104.60/q and Rs. 51.60/q respectively. The marketing margin of pre harvest contractor, secondary wholesaler and retailer was Rs. 395.5/q, Rs. 215.56/q and Rs. 301/q respectively. In channel-II, the producer's share in consumer's rupee was found to be about 44 per cent. The marketing cost incurred by sample farmers, secondary wholesaler and retailer in channel-I was Rs. 39.3/q, Rs. 76.21/q and Rs. 44.55/q respectively. The marketing margin of secondary wholesaler and retailer was Rs. 355.6/q and Rs. 475/q respectively. In channel-III for the sale of kinnow in Abohar block, the producer's share in consumer's rupee was found to be about 31 per cent. The marketing cost incurred by pre harvest contractor, secondary wholesaler and retailer in channel-I was Rs. 281.19/q , Rs. 59.87/q and Rs. 69.94/q respectively. The marketing margin of pre harvest contractor, secondary wholesaler and retailer was Rs.

Table 5.9: Marketing costs, margins and price spread analysis of Kinnow during peak season in different Channels in Abohar, Punjab, 2006-07

(Rs/qtls)

Sr No	Particulars/Channels	I	II	III	IV	V	VI	VII
1	Net price received by the producer	682.86 (38.26)	771.4 (43.78)	689.25 (31.48)	1134.01 (53.52)	942.51 (58.63)	990.85 (67.09)	1485.0 (100.00)
	Marketing costs of producer							
	(i)Grading and packing	-	8.9 (0.51)	-	72.25 (3.41)	9.1 (0.57)	-	-
	(ii)Waxing	-	-	-	41.00 (1.94)	-	-	-
	(iii)Transportation	-	17.45 (0.99)	-	50.61 (2.39)	17.82 (1.11)	-	-
	(iv)Octroi	-	-	-	10.05 (0.47)	-	-	-
	(v)Loading/unloading	-	4.82 (0.27)	-	6.25 (0.29)	4.98 (0.31)	-	-
	(vi)Commission@6%	-	-	-	84.79 (4.0)	-	-	-
	(vii)Spoilage@1%	-	8.11 (0.46)	-	14.13 (0.67)	9.84 (0.61)	-	-
	Sub-total	-	39.3 (2.23)	-	279.08 (13.17)	41.74 (2.60)	-	-
2	Purchase price of Pre-harvest contractor	682.86 (38.26)	-	689.25 (31.48)	-	-	-	-
	Costs of Pre-harvest contractor							
	(i)Grading and packing	9.80 (0.55)	-	65.64 (3.0)	-	-	-	-
	(ii)Waxing	-	-	34.91 (1.59)	-	-	-	-
	(iii)Transportation	17.35 (0.97)	-	49.51 (2.26)	-	-	-	-
	(iv)octroi	-	-	9.95 (0.45)	-	-	-	-
	(v)Loading/unloading	4.25 (0.24)	-	6.75 (0.31)	-	-	-	-
	(vi)Commission@6%	-	--	94.55 (4.32)	-	-	-	-
	(vii)Spoilage@1%	-	-	15.76 (0.72)	-	-	-	-
	(viii)Miscellaneous	2.5 (0.14)	-	4.12 (0.19)	-	-	-	-
	Sub-total	33.9 (1.90)	-	281.19 (12.84)	-	-	-	-
	Net margins of Contractor	395.5 (22.16)	-	605.36 (27.65)	-	-	-	-

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3	Purchase price of secondary wholesaler	1112.26 (62.31)	810.66 (46.01)	1575.80 (71.97)	1413.09 (66.70)	-	-	-
Costs of Secondary wholesaler								
	(i)Market fee	22.25 (1.25)	16.21 (0.92)	-	-	-	-	-
	(ii)Market fee@1%	-	-	15.76 (0.72)	14.13 (0.67)	-	-	-
	(iii)Rural development fund	22.25 (1.25)	16.21 (0.92)	-	-	-	-	-
	(iv)Commission charges	55.61 (3.12)	40.53 (2.30)	-	-	-	-	-
	(v)loading unloading	-	-	-	-	-	-	-
	(vi)Quantity loss @2%	-	-	31.52 (1.44)	28.26 (1.33)	-	-	-
	(vii)Miscellaneous	4.50 (0.25)	3.25 (0.18)	12.6 (0.58)	12.50 (0.59)	-	-	-
	Sub-total	104.60 (5.86)	76.21 (4.33)	59.87 (2.73)	54.89 (2.59)	-	-	-
	Net margins of secondary wholesaler	215.56 (12.08)	355.6 (20.18)	194.05 (8.86)	275 (12.98)	-	-	-
4	Purchase price of retailer	1432.42 (80.25)	1242.47 (70.51)	1829.72 (83.56)	1742.98 (82.27)	984.25 (61.23)	990.85 (64.09)	-
Costs of retailer								
	(i)Grading and packing	-	-	-	-	-	4.5 (0.29)	-
	(ii)Loading/unloading	5.2 (0.29)	5.75 (0.33)	6.75 (0.31)	8.25 (0.39)	5.00 (0.31)	5.75 (0.37)	-
	(iii)Market fee	-	-	-	-	19.69 (1.22)	-	-
	(iv)Rural development fund	-	-	-	-	19.69 (1.22)	-	-
	(v)Commission charges	-	-	-	-	49.21 (3.06)	-	-
	(vi)Transportation	14.50 (0.81)	11.45 (0.65)	19.10 (0.87)	18.75 (0.88)	11.70 (0.73)	12.5 (0.81)	-
	(vii)Losses @ 2%	28.65 (1.60)	24.85 (1.41)	36.59 (1.67)	34.86 (1.65)	19.69 (1.22)	19.82 (1.28)	-
	(viii)Miscellaneous	3.25 (0.18)	2.50 (0.14)	7.50 (0.34)	12.12 (0.59)	3.25 (0.20)	2.5 (0.16)	-
	Sub-total	51.60 (2.89)	44.55 (2.53)	69.94 (3.19)	65.73 (3.10)	128.22 (7.98)	45.07 (2.92)	-
	Net margins of retailer	301.00 (16.86)	475.00 (26.96)	290 (13.24)	310 (14.63)	495 (30.79)	510 (32.99)	-
5	Consumer' price	1785.02 (100.0)	1762.02 (100.0)	2189.67 (100.0)	2118.71 (100.0)	1607.47 (100.0)	1545.92 (100.0)	1485.0 (100.0)

Figures in parentheses show percentage of consumer' price

605.36/q, Rs. 194.05/q and Rs. 290/q respectively. In channel-IV, the producer's share in consumer's rupee was found to be about 54 per cent. The marketing cost incurred by sample farmers, secondary wholesaler and retailer in channel-IV was Rs. 279.08/q, Rs. 54.89/q and Rs. 65.73/q respectively. The marketing margin of secondary wholesaler and retailer was Rs. 275/q and Rs. 310/q respectively. In channel-V, the producer's share in consumer's rupee was found to be about 59 per cent. The marketing cost incurred by producer and retailer was Rs. 41.74/q and Rs. 128.22/q respectively. The marketing margin fetched by retailer was Rs. 495/q. In channel-VI, the producer's share in consumer's rupee was found to be about 67 per cent. The marketing cost incurred by retailer was Rs. 45.07/q and the marketing margin fetched by retailer was Rs. 510/q.

The following six marketing channels were followed by the kinnow growers in the Hoshiarpur area for disposal of their produce.

Channel-I: Producer-Pre harvest contractor-Wholesaler (through the commission agent) -Retailer-Consumer (Hoshiarpur market)

Channel-II: Producer-Wholesaler (through the commission agent) -Retailer-Consumer (Hoshiarpur market)

Channel-III: Producer-Pre harvest contractor-Wholesaler (through the commission agent) -Retailer-Consumer (Delhi market)

Channel-IV: Producer –Retailer (through the commission agent) –Consumer (Hoshiarpur market).

Channel-V: Producer –Retailer –Consumer

Channel-VI: Producer –Consumer

The marketing channels being followed by the kinnow growers in Hoshiarpur area are almost similar to that of Abohar area, except that the channel of direct sale of kinnow by the producer to the secondary wholesaler through commission agent in the Delhi market was not existing in Hoshiarpur area (Table 5.10). Channel-VI was observed to be the most efficient channel as producers were fetching maximum price through direct sale to the consumer. The producer's share in consumer's rupee was found to be the highest in channel-VI and the lowest in case of channel-1 due to the more number of market intermediaries involved. In channel-I, the producer sold the produce to the pre harvest contractor who sold the produce to secondary wholesaler through commission agent in the local Hoshiarpur market which was further sold to the retailer and finally came in the hands of consumer. The contract between the producer and contractor is made after the fruiting of the orchards. After the contract, all the operations require for production and marketing of kinnow are performed by the pre harvest. In channel-II, the producer sold the produce to the secondary wholesaler through commission agent in the local Hoshiarpur market which was further sold to the retailer and finally came in the hands of consumer. In channel-III, the producer sold the produce to the pre harvest contractor who sold the produce to secondary wholesaler through commission agent in the Delhi market which was further sold to the retailer and finally came in the hands of consumer. In channel-IV, the producer sold the produce to the retailer through commission agent in the local Hoshiarpur market and finally sold to the consumer. In channel-V, the producer sold the produce to the retailer who finally sold the produce to

Table 5.10: Marketing costs, margins and price spread analysis of Kinnow during peak season in different Channels in Hoshiarpur, Punjab, 2006-07
(Rs/qtls)

Sr No	Particulars/Channels	I	II	III	IV	V	VI
1	Net price received by the producer	619.63 (34.96)	809.17 (44.93)	666.85 (33.61)	951.30 (58.14)	990.7 (63.94)	1280.75 (100.0)
	Marketing costs of producer						
	(i) Grading and packing	-	8.35 (0.46)	-	8.95 (0.14)	-	-
	(ii) Transportation	-	17.5 (0.97)	-	17.95 (1.10)	-	-
	(iii) Loading/unloading	-	7.07 (0.39)	-	6.95 (0.42)	-	-
	(iv) Spoilage@1%	-	8.51 (0.47)	-	10.05 (0.61)	-	-
	Sub-total	-	41.4 (2.30)	-	43.90 (2.68)	-	-
2	Purchase price of Pre-harvest contractor	619.63 (34.96)	-	666.85 (33.61)	-	-	-
	Costs of Pre-harvest contractor						
	(i) Grading and packing	8.75 (0.49)	-	71.12 (3.58)	-	-	-
	(ii) Waxing	-	-	38.25 (1.93)	-	-	-
	(iii) Transportation	18.5 (1.04)	-	58.65 (2.96)	-	-	-
	(iv) Octroi	-	-	8.72 (0.44)	-	-	-
	(v) Loading/unloading	6.9 (0.39)	-	6.25 (0.31)	-	-	-
	(vi) Commission@6%	-	-	83.41 (4.20)	-	-	-
	(vii) Spoilage@1%	-	-	13.90 (0.70)	-	-	-
	(viii) Miscellaneous	2.25 (0.13)	-	3.95 (0.20)	-	-	-
	Sub-total	36.4 (2.05)	-	284.25 (14.32)	-	-	-
	Net margins of Contractor	425.25 (23.99)	-	439.0 (22.12)	-	-	-

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3	Purchase price of secondary wholesaler	1081.28 (61.01)	850.6 (47.23)	1390.1 (70.05)	-	-	-
Costs of Secondary wholesaler							
	(i)Market fee	21.63 (1.22)	17.01 (0.74)	-	-	-	-
	(ii)Market fee @1%	-	-	13.90 (0.70)	-	-	-
	(iii)Rural Development Fund	21.63 (1.22)	17.01 (0.94)	-	-	-	-
	(iv)Commission charges	54.06 (3.05)	42.53 (2.36)	-	-	-	-
	(v) Loading/unloading	-	-	-	-	-	-
	(vi)Quantity loss @2%	-	-	27.80 (1.40)	-	-	-
	(vii)Miscellaneous	0.00	1.05 (0.06)	8.25 (0.42)	-	-	-
	Sub-total	97.32 (3.49)	77.60 (4.31)	49.95 (2.52)	-	-	-
	Net margins of secondary wholesaler	225.25 (12.71)	390.25 (21.67)	190.25 (9.59)	-	-	-
4	Purchase price of retailer	1403.85 (79.21)	1318.45 (73.20)	1630.30 (82.16)	1005.26 (61.44)	990.7 (63.94)	-
Costs of retailer							
	(i) Packing/grading	-	-	-	-	4.5 (0.29)	-
	(ii) Loading/unloading	8.9 (0.50)	9.25 (0.51)	6.15 (0.31)	9.52 (0.58)	10.15 (0.66)	-
	(iii)Market fee	-	-	-	20.11 (1.23)	-	-
	(iv)Rural Development Fund	-	-	-	20.11 (1.23)	-	-
	(v)Commission charges	-	-	-	50.26 (3.07)	-	-
	(vi) Transportation	17.56 (0.99)	19.05 (1.06)	18.95 (0.95)	18.75 (1.15)	19.25 (1.24)	-
	(vii) Losses @ 2%	28.08 (1.58)	26.37 (1.46)	32.61 (1.64)	20.11 (1.23)	19.81 (1.28)	-
	(viii)Miscellaneous	1.45 (0.08)	2.50 (0.14)	6.25 (0.31)	1.75 (0.11)	2.75 (0.18)	-
	Sub-total	55.99 (3.16)	57.17 (3.17)	63.96 (3.22)	140.60 (8.59)	56.46 (3.64)	-
	Net margins of retailer	312.45 (17.63)	425.50 (23.62)	290.1 (14.62)	490.25 (29.96)	502.25 (32.42)	-
5	Consumer' price	1772.28 (100.0)	1801.12 (100.0)	1984.36 (100.0)	1636.11 (100.0)	1549.41 (100.0)	1280.75 (100.0)

Figures in parentheses show percentage of consumer' price

the consumer. In channel-VI, producer sold the produce directly to the consumer at the farm gate.

In channel-I for the sale of kinnow in Hoshiarpur area, the producer's share in consumer's rupee was found to be about 35 per cent. The marketing cost incurred by pre harvest contractor, secondary wholesaler and retailer in channel-I was Rs. 36.4/q , Rs. 97.32/q and Rs. 55.99/q respectively. The marketing margin of pre harvest contractor, secondary wholesaler and retailer was Rs. 425.25/q, Rs. 225.25/q and Rs. 312.45/q respectively. In channel-II, the producer's share in consumer's rupee was found to be about 45 per cent. The marketing cost incurred by sample farmers, secondary wholesaler and retailer in channel-II was Rs. 41.4/q, Rs. 77.60/q and Rs. 57.17/q respectively. The marketing margin of secondary wholesaler and retailer was Rs. 390.25/q and Rs. 425.50/q respectively. In channel-III for the sale of kinnow in Hoshiarpur area, the producer's share in consumer's rupee was found to be about 34 per cent. The marketing cost incurred by pre harvest contractor, secondary wholesaler and retailer in channel-III was Rs. 284.25/q , Rs. 49.95/q and Rs. 63.96/q respectively. The marketing margin of pre harvest contractor, secondary wholesaler and retailer was Rs. 439/q, Rs. 190.25/q and Rs. 290.1/q respectively. In channel-IV, the producer's share in consumer's rupee was found to be about 64 per cent. The marketing cost incurred by producer and retailer was Rs. 43.90/q and Rs. 140.60/q respectively. The marketing margin fetched by retailer was Rs. 490.25/q. In channel-V, the producer's share in consumer's rupee was found to be about 64 per cent. The marketing

cost incurred by retailer was Rs. 56.46/q and the marketing margin fetched by retailer was Rs. 502.25/q.

ii) Guava

The following four marketing channels were followed by the guava growers for disposal of their produce.

Channel-I: Producer-Wholesaler (through the commission agent) -Retailer-Consumer (Malerkotla market)

Channel-II: Producer-Retailer (through the commission agent)-Consumer (Malerkotla market).

Channel-III: Producer -Retailer -Consumer

Channel-IV: Producer -Consumer

Channel-IV was observed to be the most efficient channel as producers were fetching maximum price through direct sale to the consumer (Table 5.11). The producer's share in consumer's rupee was found to be the highest in channel-VI and the lowest in case of channel-I due to the more number of market intermediaries involved. In channel-I, the producer sold the produce to the secondary wholesaler through commission agent in the local Malerkotla market which was further sold to the retailer and finally came in the hands of consumer. In channel-II, the producer sold the produce to the retailer through commission agent in the local Malerkotla market and finally sold to the consumer. In channel-III, the producer sold the produce to the retailer who finally sold the produce to the consumer. In channel-IV, producer sold the produce directly to the consumer at the farm gate.

In channel-I, the producer's share in consumer's rupee was found to be about 65 per cent. The marketing cost incurred by sample farmers, secondary wholesaler and retailer in channel-I was Rs. 68.12/q, Rs. 56.21/q and Rs. 30.96/q respectively. The marketing margin of secondary wholesaler and retailer was Rs. 30/q and Rs. 110.25/q respectively. In channel-II, the producer's share in consumer's rupee was found to be about 67 per cent. The marketing cost incurred by producer and retailer was Rs. 69.38/q and Rs. 89.65/q respectively. The marketing margin fetched by retailer was Rs. 125/q. In channel-III, the producer's share in consumer's rupee was found to be about 71 per cent. The marketing cost incurred by retailer was Rs. 78.63/q and the marketing margin fetched by retailer was Rs. 170.45/q.

Table 5.11: Marketing costs, margins and price spread analysis of Guava during peak season in different Channels in Punjab,2006-07
(Rs/qtl)

Sr No	Particulars	Channel-I	Channel-II	Channel-III	Channel-IV	
1	Net price received by the producer	596.80 (58.41)	609.77 (61.86)	610.15 (66.03)	750.0 (100.0)	
	Marketing costs of producer					
	(i) Packing/grading	7.55 (0.74)	8.25 (0.84)	-	-	
	(ii) Loading/unloading	5.0 (0.49)	4.9 (0.50)	-	-	
	(iii) Transportation	15.15 (1.48)	15.23 (1.54)	-	-	
	Sub-total	27.70 (2.71)	28.38 (2.88)	-	-	
2	Purchase price of secondary wholesaler	624.5 (61.12)	-	-	-	
	Costs of Secondary wholesaler					
	(i)Market fee	12.49 (1.22)	-	-	-	
	(ii)Rural Development Fund	12.49 (1.22)	-	-	-	
	(iii)Commission charges	31.23 (3.06)	-	-	-	
	Sub-total	56.21 (5.50)	-	-	-	
	Net margins of secondary wholesaler	110.25 (10.79)	-	-	-	
3	Purchase price of retailer	771.21 (77.41)	638.15 (6.73)	610.15 (66.03)	-	
	Costs of retailer					
	(i) Packing/grading	-	-	6.75 (0.73)	-	
	(ii)Market fee	-	12.76 (1.29)	-	-	
	(iii)Rural Development Fund	-	12.76 (1.29)	-	-	
	(iv)Commission charges	-	31.91 (3.24)	-	-	
	(v) Loading/unloading	5.5 (0.54)	5.70 (0.58)	5.4 (0.58)	-	
	(vi) Transportation	10.00 (0.98)	11.25 (1.14)	10.90 (1.18)	-	
	(vii) Losses @ 2%	15.82 (1.55)	12.76 (1.29)	12.20 (1.32)	-	
	(viii)Miscellaneous	1.25 (0.12)	2.50 (0.25)	0.00	-	
	Sub-total	32.17 (3.19)	89.65 (9.09)	35.25 (3.82)	-	
		Net margins of retailer	198.25 (19.40)	258.0 (26.17)	278.60 (30.15)	-
	4	Consumer' price	1021.77 (100.0)	985.80 (100.0)	924.0 (100.0)	750.0 (100.0)

Figures in parentheses show percentage of consumer' price

Chapter 6

Problems faced by growers of high value crops

High value crop production requires the intensive use of inputs and is highly susceptible to the attack of insect, pest and diseases. On the marketing front, these being highly perishable in nature requires immediate disposal. The price in the market fluctuates vigorously with the supply in market. This chapter is devoted to assess the production and marketing problems faced by the tomato growers and the pertinent suggestions forwarded by them during production and marketing process in the study region.

6.1 Production problems

A cursory glance on Table 6.1 reveals that most of the high value crops growers were facing the difficulty due to deficiency in technical know how as the extension worker hardly visit the high value crops growers. More than 57 per cent of the fruit growers were facing the problems of supply of spurious seedlings in the study area. Farmers were also facing the problem of the poor quality of pesticides, as even after the frequent sprays of pesticides they were not able to reduce the losses due to the attack of insect pest and diseases. More than 64 per cent of the potato and cauliflower growers were facing the problem of infestation of these crop by various insect pest and diseases. In some of the areas, the infestation is so severe that it may reduce the yield up to 30 per cent. Some of the growers were also concerned about the increasing cost of inputs. About 80 per

**Table 6.1: Problems faced during production of different vegetable and fruit crops in Punjab, 2006-07
(per cent multiple response)**

Problems/Crops	Tomato	Chillies	Onion	Cauliflower	Potato	Peas	Kinnow	Guava
1.Seed quality	16	-	-	24	-	-	76	57
2.Input delivery	-	-	-	-	8	-	-	-
3.Expenditure on production	28	4	-	38	28	-	36	14
4.Insect-pests and diseases	20	7	16	64	72	4	38	29
5.Technical knowledge	76	76	72	64	53	58	68	43
6.Access to credit	-	-	-	-	-	-	-	-
7.Availability and cost of labour	40	85	16	12	28	21	32	57

cent of the chillies growers were facing the problem of shortage of labour force during peak season.

6.2 Marketing problems

Lack of market information was reported as the major marketing problem confronted by high value growers of the study area (Table 6.2). The price in the market abruptly changes with the arrivals in the market. Whenever there is glut in the market, the prices comes down and farmers find it very difficult to dispose of the produce at the remunerative prices in the market. Small farmers were most severely hit followed by medium and large farmers during such situation. Therefore, most of the fruit growers had to sell their orchards to the pre harvest contractors. Farmers disposing of the high value crops in wholesale markets were experiencing the problem of congestion in the market, as the markets are located in the center of the city. Farmers also told that they had to bear large grading and packing cost while selling the produce in the market. Farmers could sell only meager quantity to retailers due to high packing and transportation cost. Large

farmers were reluctant for direct sale to consumer due to shortage of manpower and longer time required for marketing of the produce in this manner.

**Table 6.2: Problems faced during marketing of different vegetable and fruit crops in Punjab, 2006-07
(per cent multiple response)**

Problems/Crops	Tomato	Chillies	Onion	Cauliflower	Potato	Peas	Kinnow	Guava
1. Market information	12	-	48	-	44	-	78	57
2. Output price related problems	52	-	-	56	56	-	64	71
3. Packing material	-	-	-	-	-	-	20	
4. Grading	-	-	-	-	-	-	54	57
5. Waxing	-	-	-	-	-	-	70	-
6. Packaging	-	-	-	-	-	-	30	-
7. Transportation	12	-	-	-	-	-	20	-
8. Congestion in the market	40	-	9	52	50	44	44	-
9. Delay in payments	-	-	-	-	-	-	-	-
10. Marketing costs	-	-	-	-	-	-	20	-
11. Role of intermediaries	16	-	24	20	-	-	38	-

Chapter 7

Summary and conclusions

Declining farm incomes, almost stagnant foodgrain production and growing demand for high value crops like fruits and vegetables due to increase in per capita income and changes in the consumption pattern call for increase in the production of high value crops. The costs and returns analysis for various high-value crops will be helpful to examine the relative profitability of these crops with respect to traditional food grain crops. The momentum for the increased production of high-value crops cannot be sustained unless simultaneous efforts are made to improve marketing of these crops through the development of effective marketing system and marketing agencies. The farmers will get the remunerative prices for their surplus produce only when the effective and efficient marketing system is in place. It is also important to study the Domestic Resource Cost (DRC) of different high value crops so that the comparative export competitiveness of these crops from this region may be ascertained, keeping in view the various government incentives/subsidies and social costs. The experience of the initiatives taken for the promotion of these crops through contract/co-operative/corporate farming will be helpful to identify the factors responsible for the success/failure of these programmes and to explore the possibilities of their strengthening and replication in the other areas.

The study was carried out to accomplish the following objectives:

1. To estimate the costs of production and returns associated with the cultivation of important high-value crops;

2. To identify the value chain systems and to estimate the costs and returns at each link for these high-value crops;
3. To ascertain the Domestic Resource Cost (DRC) for important high value crops;
4. To highlight the case studies of contract/co-operative/corporate farming for important high value crops;
5. To study the problems faced by the producers in production and marketing of these high-value crops.

Methodology

The study was conducted in the Punjab state. High-value crops in this study included important fruits and vegetables in the state. The present study focused on two important fruit crops in the state namely Kinnow and Guava. Further six vegetable crops were covered in the study such as peas, potato, onion, cauliflower, tomato and chillies. The study was based on primary as well as secondary data. The primary data were collected from the growers and different market functionaries associated with the production and marketing of fruits and vegetables in the selected states of the country. For each of the eight selected crops, one/two districts with the highest area/production in the state were selected purposively. Further based on the availability of the data, one/two blocks with the largest area/production from each of the selected districts were selected to ensure wider coverage of the sample. Village clusters were identified in each block. Finally, a sample of up to 50 farmers were selected randomly for each of the selected crops for primary data collection by the personal interview method.

Different marketing channels for the disposal of high value crops in the study area were examined to assess the cost and margins of different

intermediaries in the marketing till the produce reaches in the hands of the consumers. Suitable number of market functionaries were selected for the data collection. Secondary data regarding the area under high value crops in Punjab and its different districts and blocks were collected from the Directorate of Horticulture, Punjab, Chandigarh.

Socio economic characteristics of high value crops growers

Most of the fruit and vegetable growers were found to be living in the joint family system as more than 55 per cent of the farm families were having the family size of more than 5. Literacy rate in the study area was observed to be higher than the state and national average. It was in the range of about 71 per cent to 96 per cent for different fruit and vegetable growers. Most of the heads of the household were less than 45 years of age, except for the tomato and kinnow growers, where mostly of the heads of the household were more than 45 years of age.

The average operational holding size of fruit and vegetable growers was found to vary between 2.5 hectares for tomato growers to 12.8 hectares for the kinnow growers. It was strange to observe that mostly the practice of leasing in was more prevalent among the fruit and vegetable growers while only the small area was leased out, that's too in some of the crops only.

Paddy was the major kharif crop grown by the tomato, chilli, onion, peas and guava growers in the study area as it is grown on more than 48 per cent of the NCA (Net cultivated area) during kharif season. Maize was the major kharif crop

grown by the cauliflower and potato growers as it was the important crop of the season in Hoshiarpur district of the state. Cotton was the major kharif crop grown by the kinnow growers as it was the important crop of the season in Firozpur district of the state. Wheat was the major rabi season crop in the study area grown, except for potato in case of potato growers. For kinnow and guava growers, the NCA under these crops were about 27 and 44 per cent respectively.

Economics of production for high value crops

The total cost on per hectare basis was found to vary from Rs 33889 for cauliflower to Rs 116296 for tomato. The per hectare gross returns from the tomato cultivation were found vary from Rs 408500 for tomato to Rs 74284 for cauliflower. The net returns were found to vary from Rs 292204 for tomato to Rs 24172 for potato. The benefit-cost ratio was also found to be vary from 3.51 for tomato to 1.43 for potato, which shows that tomato cultivation is a very profitable venture as one rupee invested on the cultivation of the crop fetches return of Rs. 3.51. Potato crop was observed to be highly sensitive in terms of the production as well as the price risk.

The net returns from kinnow plantations were found negative upto fourth year of plantation and these became positive once the commercial production of kinnow started in the fifth year. The average net returns on per hectare basis from kinnow plantations were found to vary between Rs. 22510 in the age group of 5-7 to Rs. 42000 in the age group of 8-22. The benefit cost ratio from kinnow plantations was found to be 1.46, while the annual average returns were to the tune of Rs. 28299 per hectare, which shows the

economic worthiness of the kinnow plantations. The net returns from guava plantations were found negative and these became positive once the commercial production of guava started in the fourth year. The average net returns on per hectare basis from guava plantations were found to vary between Rs. 22252 in the age group of 4-6 to Rs. 46565 in the age group of 7-10. To have a clear picture regarding the viability of guava plantations, Annual average returns and Benefit cost ratios were also calculated. The benefit cost ratio from guava plantations was found to be 1.37, while the annual average returns were to the tune of Rs. 26443 per hectare, which shows the economic worthiness of the guava plantations.

In Punjab, the govt. provides the subsidy on fertilizer as well as on power for the irrigation. The Domestic Resource Cost (DRC) can be calculated by including these two subsidies in the present cost analysis for the selected crops. The total cost on per hectare basis, after including the subsidy, was found to increase of by 13 to 19 per cent for different vegetables in the presently existing level. After including the subsidy, the expenses on fertilisers have increased by more than 83 per cent, while the expenses on irrigation have increased by more than Rs. 1542/ha for different vegetables from the presently existing level. For different vegetables, the benefit-cost ratio was also found vary from 3.11 for tomato to 1.28 for potato, which shows that vegetable cultivation is a still very profitable venture even after including the subsidy. For fruits, after including the subsidy, with the increase in age of plantation the increase in expenses on fertilizers was observed, mainly due to the use of higher doses of fertilizers with the increase in age of plantation. The increase in total cost, after including the subsidy, was with the increase in age of plantation. The average net returns, showed a

decrease of more than 61 per cent in the presently existing level. The benefit-cost ratio was also found to be more than 1.24, which shows that fruit cultivation is a still very profitable venture even after including the subsidy.

Marketing system for high value crops

There were five marketing agencies operating in the study area which are handling the vegetables sold by the growers. These are wholesaler, itinerant merchant/local trader, corporate (Reliance fresh), retailer and consumer. There were four marketing agencies operating in the study area which are handling the fruits sold by the growers. These are pre harvest contractor, wholesaler, retailer and consumer. The farmers preferably sold the kinnows through pre harvest contractor followed by wholesaler, retailer and consumer. The pre harvest contractor were more popular in the Hoshiarpur area as most of the producers were making the contract with the pre harvest contractor after the fruiting of kinnow in the area. The farmers preferably sold the guava through wholesaler followed by retailer and consumer.

Producer –Consumer channel was observed to be the most efficient channel as producers were fetching maximum price through direct sale to the consumer. For vegetables, the producer's share in consumer's rupee was found to be the lowest in case of channel (Producer-Wholesaler (through the commission agent) -Retailer-Consumer) due to the more number of market intermediaries involved. For kinnow of Abohar area, the producer's share in consumer's rupee was the lowest in case of channel (Producer-Pre harvest contractor-Wholesaler (through the commission agent) -Retailer-Consumer)

selling the produce in Delhi market. For kinnnow of Hoshiarpur area, the the producer's share in consumer's rupee was the lowest in case of channel (Producer-Pre harvest contractor-Wholesaler (through the commission agent) -Retailer-Consumer) selling the produce in Hoshiarpur market. For guava, the producer's share in consumer's rupee was the lowest in case of channel (Producer- Wholesaler (through the commission agent) - Retailer-Consumer) selling the produce in Malerkotla market.

Problems faced by growers of high value crops

On production front, most of the high value crops growers were facing the difficulty due to deficiency in technical know how as the extension worker hardly visit the high value crops growers. More than 57 per cent of the fruit growers were facing the problems of supply of spurious seedlings in the study area. Farmers were also facing the problem of the poor quality of pesticides, as even after the frequent sprays of pesticides they were not able to reduce the losses due to the attack of insect pest and diseases. More than 64 per cent of the potato and cauliflower growers were facing the problem of infestation of these crop by various insect pest and diseases. In some of the areas, the infestation is so severe that it may reduce the yield up to 30 per cent. Some of the growers were also concerned about the increasing cost of inputs. About 80 per cent of the chillies growers were facing the problem of shortage of labour force during peak season.

On marketing front, lack of market information was reported as the major marketing problem confronted by high value growers of the study area. The price in the market abruptly changes with the arrivals in the market. Whenever there is

glut in the market, the prices comes down and farmers find it very difficult to dispose of the produce at the remunerative prices in the market. Small farmers were most severely hit followed by medium and large farmers during such situation. Therefore, most of the fruit growers had to sell threir orchards to the pre harvest contractors. Farmers disposing of the high value crops in wholesale markets were experiencing the problem of congestion in the market, as the markets are located in the center of the city. Farmers also told that they had to bear large grading and packing cost while selling the produce in the market. Farmers could sell only meager quantity to retailers due to high packing and transportation cost. Large farmers were reluctant for direct sale to consumer due to shortage of manpower and longer time required for marketing of the produce in this manner.

Policy implications

The fruit and vegetable cultivation is highly input-intensive in nature. Therefore, the primary agricultural credit cooperative societies and other funding agencies should be persuaded to provide adequate short-term credit facilities to cover the higher operational cost. The small and marginal farmers should desist themselves from purchasing large machines as the cost of maintenance along with fixed cost becomes higher than that of the rent to be paid for hiring of the same machinery. The agriculture department should have the strict vigilance on the poor quality of seeds/seedlings and pesticides being supplied by the dealers in the state. The sale of good quality seeds and pesticide through cooperative societies should also be encouraged. As these crops are highly sensitive in terms of the production as well as the price risk, a crop insurance scheme may be

introduced to compensate the farmers, even when there is very high occurrence of pest and diseases apart from adverse climatic conditions with a reasonable premium. The higher growth in use of nitrogenous fertilizer has resulted into disturbance of the soil structure in the state. The effective pricing of fertilizers not biased towards the use of a single nutrient will help in achieving the objective of balanced fertilizer use. It further indicates that there is need to rethink about the subsidies being provided on the nitrates. The electricity supplied in the state was made free of cost for the Punjab farmers, which further aggravated the shift to more water intensive crops like paddy thereby further worsening the over exploitation of underground water resources in the State. This is also the high time for the Government of Punjab to rethink their decision regarding free electricity to the farms as the underground water resources are being over exploited and the water table in the state is already going down. Also, due to this policy it is difficult to persuade the farmers to shift from water intensive rice-wheat crop rotation.

The economists are talking about the diversification of Punjab agriculture but due to assured prices of paddy and wheat and effective price policy for these crops has put the farmers in a dilemma. So even if the farmer opts for diversification to break the paddy-wheat rotation and grow any other crop including fruit and vegetable, the farmer are at the mercy of traders to buy the produce. Thus, there is need to make more efforts to formulate effective price policy for these crops and the Government agencies should evolve an effective market intervention programme for these crops. The momentum of production for fruit and vegetable cultivation in the state cannot be sustained unless there is an effective market improvements for these crops so that the problems faced by the farmers during marketing of these crops may be overcome. There is need to establish

processing units, cold storages and dry freezing plants in the areas where horticultural crops are grown, which can help the farmers in getting remunerative returns for the produce and can help in generation of non-farm employment opportunities in the villages itself. Proper training should be provided to the growers in agro-processing and handling of the produce. Regulation of markets and development of efficient market information system will ensure better share to the producer in consumer's rupee. Strengthening of extension services will help in creating awareness among the farmers.

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Appendix I: Comments on Draft Study Report entitled *Value Chain Analysis for High Value Crops (HVCs) in the Punjab State*

The study is timely and useful in view of the problems associated with monoculture in Punjab. The study has covered all the four objectives given on page-3. After going through the draft report, following suggestions are offered:

1. Criteria for the selection of the districts/blocks/number of farmers covered under the study for each crop needs to be explained (page-4).
2. Suitable number of market functionaries needs to be clarified (page-5) and define average price (page-6).
3. Higher proportion of variable cost on machine labour needs some explanation (page-19).
4. Information on profitability of main crops (wheat, paddy etc.) in Punjab is available. Please add a summary table on relative profitability of food grains vis-à-vis high value crops. It would enhance utility of the report.
5. You have calculated “Domestic Resource Cost” for the selected crops. Literature is available on DRCR. Your analysis seems inadequate. Please strengthen this aspect. It is very useful for policy purposes.
6. Provide a list of tables and abbreviations used in the report.

The study report is satisfactory in its coverage and analysis. I hope above suggestions will be incorporated before finalization and will be taken in the right spirit.

-sd-

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Appendix II: Action Taken Report on the Comments of Draft Report entitled *Value Chain Analysis for High Value Crops (HVCs) in the Punjab State*

All the comments were taken into consideration while finalizing the report. These comments have been incorporated, wherever necessary, in the relevant chapters.

Authors