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IMPACT OF EMERGING MARKETING CHANNELS IN AGRICULTURE:
BENEFIT TO PRODUCER-SELLER AND MARKETING COSTS AND MARGINS OF POTATO AND KINNOW IN PUNJAB

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PREFACE

The predominance of rice – wheat cropping system has caused disastrous impacts on the environment, particularly in terms of reduction in the water table and deterioration in soil fertility in the state. To revitalize agriculture in Punjab, agricultural diversification towards high value commodities (HVCs) is considered as one of the most promising strategies. Facilitating the transition of an agricultural production system dominated by cereals towards HVCs requires greater understanding of the processes involved in diversification and its impact on agricultural performance. The major constraints inhibiting such diversification efforts have been the marketing opportunities for high value crops especially fruits and vegetables owing to their perishable nature. Hence, it is of paramount importance to examine how the farm producers of HVCs are integrated with the markets and how innovative supply chains are emerging for HVCs for speedy and remunerative disposal of fruits and vegetables.

The present report brings out the market practices and services of agencies involved in the emerging as well as the traditional marketing channels for potato and kinnow crops in Punjab.

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Authors

ABSTRACT

The greater emphasis on cereal production especially rice and wheat in the past to achieve food security, which undoubtedly resulted in lower output prices and higher profitability, is now dampening agricultural growth. To revitalize agriculture in Punjab, agricultural diversification towards high value commodities (HVCs) is considered as one of the most promising strategies. The major constraints inhibiting such diversification efforts have been the marketing opportunities for high value crops especially fruits and vegetables owing to their perishable nature. Thus there is need to evolve innovative marketing institutions that link farmers with the markets for speedy and remunerative disposal of fruits and vegetables. The present study attempts to examine the producers' share in the final consumer's rupee, degree of market efficiency and incidence of post harvest losses, market practices and services of agencies involved and constraints faced by farmers and different market functionaries in the emerging marketing channel as compared to the traditional marketing channel in the state. The study has been based on both primary as well as secondary data. The primary information for the purpose has been collected through primary surveys and informant interviews with growers, market committee members, processors, wholesalers, retailers and consumers in Jalandhar (Potato) and Ferozepur (Kinnow) districts for the study. Secondary data pertaining to the importance of these crops in study districts/state have been gathered from various secondary sources. The study has been based on a sample of 90 farmers (45 potato growers from Jalandhar west and Bhogpur blocks of Jalandhar district + 45 kinnow growers from Abohar block of Ferozepur district). The reference period for the primary data survey was 2009-10. The study has brought out that that share of farmer in the retailer's price under TMC for potato was 42.72 percent, while marketing costs as a percentage of retailer's price was 24.30 and marketing margins as 32.97 percent. With respect to sales through EMC, the net price received by the farmers was about 40 percent higher than the price received by farmers who sold through TMC. The Benefit Cost Ratio was found to be higher in EMC as compared to TMC. The post harvest losses are higher in TMC as compared to EMC. For every quintal of potato stored, a farmer loses about 8.14 kg under TMC while no loss in EMC since the potato purchased by PepsiCo is handled by the company after purchase. The share of the kinnow grower in the retailer's price under TMC was 33.70 percent, while marketing costs as a percentage of retailer's price was 20.70 and marketing margins was 33.70 percent while the corresponding figures in case of EMC was 55, 21.6 and 23.4 per cent, respectively. The Benefit Cost Ratio for kinnow turned out to be higher in EMC as compared to TMC. Majority of farmers were satisfied with the facilities of sorting, weighing, packing and banking facilities in the market. There was no major constraint observed by 80 per cent of the potato growers while only 20 per cent reported that EMC buys only selected quality produce of specific size, shape and colour. To ensure higher prices and to reduce marketing margins of the intermediaries, growers suggested that the produce should be exported when there is a glut in the market, provide subsidised waxing and transport facilities, Government intervention especially in case of bumper harvest, reduction of market charges and intermediaries' role. The potato growers emphasized the need to establish more processing units for value addition while kinnow growers opined that the processing plant established in the region should directly purchase kinnow from the farmers. In the absence of any government market/procurement support, the HVC acreage could not be augmented significantly in the state. Being these crops perishable in nature, providing adequate insurance cover to the growers could be one of the possible solutions to compensate for such damage to the crop in case of unseasonal rainfalls and natural calamities. There is also need of development of proper marketing mechanism with assured marketing system as in case of wheat and paddy for these crops in order to broad base HYC production in the state paving way for diversification of Punjab agriculture at this critical juncture of over-exploitation of the natural resources.

Chapter 1

Introduction

1.1 Backdrop

Agriculture continues to be a dominant sector of the economy in Punjab. Punjab is the second largest producer of wheat and third largest producer of rice in the country. The Rice-wheat system accounts for about three –fourth of the cropped area and over 85 percent of the gross value of crop output. The predominance of this cropping system has caused disastrous impacts on the environment, particularly in terms of reduction in the water table and deterioration in soil fertility. The changing scenario threatens the sustainability and competitiveness of this cropping system. The stagnating/ deteriorating performance of state agriculture and slowing of agricultural growth are major concerns for the policy makers, planners and the government. Such performance of the agricultural sector is attributed to declining investment, fatigue in technological change, deceleration or stagnation in the productivity growth of major crops, etc. The greater emphasis on cereal production (especially rice and wheat) in the past to achieve food security, which undoubtedly resulted in lower output prices and higher profitability, is now dampening agricultural growth .To revitalize agriculture in Punjab, agricultural diversification towards high value commodities (HVCs) is considered as one of the most promising strategies. Rising per capita income, growing urbanization and globalization are causing a shift in the consumption patterns in favour of HVCs among both rich as well as poor households. Such changes in consumption patterns clearly reveal that food security is no longer restricted to availability of cereals but involves a diversified food basket that includes high value commodities such as fruits and vegetables. The global trade of HVCs is growing rapidly. The share of HVCs in agricultural exports increased from 21 percent in 1990 to 36 percent in 2000 (Rao, P. *et al* 2004). At present, the country is a minor exporter; contributing merely about 0.5 percent of global exports of fruits and 1.5 percent of global exports of vegetables. The rapid increase in domestic and export demand for HVCs clearly demonstrates the opportunity for greater agricultural diversification. Punjab is a relatively minor producer of fruits and vegetables in India. The state has a meagre share (less than 2 percent) in the total area under fruits and vegetables in the country. It produces less than about 2.5 percent of total vegetables produced in the country.

Potato is the principal vegetable produced in Punjab, accounting for 60 percent of total production. The state is the fifth-largest producer of potatoes in the country, representing only 5 percent of national production. The major portion of the area is concentrated in the districts of Jalandhar, Kapurthala, Ludhiana, Moga, Bathinda and Patiala. About half of the produce is contracted at the farmer's fields by the traders from major potato producing states like U.P, Bihar, M.P, West Bengal, Rajasthan and Gujarat. Because of typical climatic conditions, the seed from Punjab is preferred by the other states as it gives relatively more yield as compared to their local produced seeds. The decline in potato production in other major potato producing states resulted in increased demand for seed potato from Punjab which ultimately led to rise in prices. Other vegetables like chilies and onion are minor in Punjab. The Pepsi initiative during late 1980s expanded the tomato area in selected regions due to access of better technology and higher, assured prices. Though Punjab is a small player in vegetable production, productivity levels in the state are relatively high compared to national average. Punjab state has large potential for cultivation of fruits especially the citrus. Among the citrus fruits, kinnow fruit cultivation in Punjab gained momentum among the fruit growers due to its profitability and good market value. Out of the total 67553 hectares under fruit cultivation in state, kinnow farming is carried out on 38837 hectares, thus accounting for about 58 per cent of the total area under fruits. The south-western region of Punjab comprising Ferozepur, Muktsar, Bathinda and Mansa districts is known as kinnow belt as it accounts for nearly 70 per cent of the total area under this fruit in the state.

Facilitating the transition of an agricultural production system dominated by cereals towards HVCs requires greater understanding of the processes involved in diversification and its impact on agricultural performance. The major constraints inhibiting such diversification efforts have been the marketing opportunities for high value crops especially fruits and vegetables owing to their perishable nature. Thus there is need to evolve innovative marketing institutions that link farmers with the markets for speedy and remunerative disposal of fruits and vegetables.

Supply chain status of fruits and vegetables

High value commodities especially fruits and vegetables are susceptible to inaccessibility of markets and high price volatility. Smallholders face the added problems of high transactions costs due to meagre marketable surplus and production risk. Though the demand for HVCs is increasing and there are considerable benefits emanating from their production, absence of well-developed market arrangements inhibit their expansion. The existing markets of HVCs are inefficient, unorganized and disintegrated. The entire

marketing process of HVCs, compared to foodgrains marketing, is complex and risky due to the perishable nature of produce, seasonal production, and bulkiness. It is further complicated by the absence of sufficient infrastructure, such as specialized markets, cold chains, packing, etc., and lack of agro-processing facilities. Regulated markets for HVCs are very few and cover only a few cities in the country. For HVCs marketing from production centres to retailing requires close coordination between producers, distributors, processors and retailers to maintain desired quality and quantity to meet consumers' demands. To promote agricultural diversification towards HVCs in the wake of urbanization liberalization and globalization, the agricultural marketing strategy requires a paradigm shift by strengthening marketing institutions, developing synergies between producers and agri-business, and consolidating the supply chain. Hence, it is of paramount importance to examine how the farm producers of HVCs are integrated with the markets and how innovative supply chains are emerging for HVCs to meet the growing domestic and global demands.

1.2 Objectives of the Study:

The "emerging" marketing channels are supposed to reduce transaction costs and ensure that high margins maintained by intermediaries in the supply chain are reduced so that the farmer benefits and gets a better price as compared to sale in regulated markets. Keeping this in mind the study has the following objectives:

1. To analyze the share of the farmer in the final consumer's rupee in an emerging marketing model vis-à-vis the traditional marketing channel;
2. To analyze the degree of market efficiency and incidence of post harvest losses in emerging marketing channel vis-à-vis traditional marketing channel;
3. To note the market practices and services of agencies involved in the emerging channel and observe if they are superior to that of traditional channels;
4. To analyze the constraints faced by farmers and different market functionaries in the emerging marketing channel as compared to the traditional marketing channel.

1.3 Review of literature

Chand (1986) revealed that more than 80 per cent of the kinnow orchardists in Himachal Pradesh had given their orchards either partly or wholly to the pre-harvest contractors. The reason reported by the orchardists was lack of time during fruit harvesting season and to avoid risks and uncertainties involved in the marketing of fruits. Kinnow

orchardists season and to avoid risks and uncertainties involved in the marketing of fruits. Kinnow orchardists in Kangra district received lower share in consumer's rupee when they marketed their produce through pre-harvest contractors while it was more than 53per cent when they adopted other marketing channels.

Sidhu (1993) conducted the study to examine the price spread of kinnow through producers to pre-harvest contractors to retailers to consumer in Delhi, Amritsar and local market. He revealed that about 70 per cent of kinnow was sold in Delhi market due to brisk demand and higher prices. Only small quantity was in Delhi market due to brisk demand and higher prices. The contract did not prefer to sell in the local markets like Malout, Abohar.

Toor and Poonia (1995) conducted a study on marketable surplus and price spreads in the marketing of kinnow in Hoshiarpur district of the Punjab State. It was found that the large farmers contributed the major part of the produce (58 per cent) and the small and medium farmers together shared rest of the production. The average marketable surplus on small, medium and large farms worked out to be 96.34, 97.72 and 98.72 per cent, respectively of total kinnow production. The pre-harvest contract system was predominant method of marketing kinnow fruits about 70 per cent of the marketable surplus was sold through this system. The producers received highest share of the consumer' rupee (50.86 per cent) by selling the produce to Punjab Agro-Industries Corporation.

Gupta and Bhardwaj (1997) analysed the underlying theme of Apni Mandi, which is to create a market mechanism where producers would be able to sell directly to consumers without involving any intermediary. These markets are modelled on the pattern of English Saturday markets involving objectives of creating better marketing alternatives, diversification of farm economy, and utilization of available manpower in rural areas, promoting the rural economy, providing higher income to farmers and to ensure the availability of larger share of consumer's rupee to the producer. There are number of operational problems which need immediate attention. They pertain to sanitation, conflict between farmers and retailers and between organizers and local administration. Further, the lack of grading, absence of market intelligence, lack of amenities like drinking water, electricity, toilets, lack of extension services and absence of protection from sun and rain for both producers and consumers were also observed. It was suggested that these Mandis should develop as a fulcrum around which the growth and prosperity of rural India should gravitate to improve the efficacy and efficiency.

Singh and Singh (1997) conducted a study in Hoshiarpur district of Punjab for the year 1994-95, which lies in the tomato-growing belt of the state. The study based on information collected from 100 farmers spread over 4 villages around Hoshiarpur and Tanda market was aimed to study the role of Pepsi Foods and Nijjer Agro Limited (Tomato Processing Industries) in improving the efficiency of tomato marketing and to identify the problems by tomato growers. It was observed that in the wake of modern technology of production, the area and production of tomato has increased by about 114 acres and 10343 quintals annually respectively. The marketing cost incurred to the producer was found to be lowest in the case of Pepsi Foods. It was suggested that the efficiency of marketing could be further improved by proper handling of the produce after harvest through better storage, transportation, good quality of packing material and above all assuring a remunerative price in terms of govt. intervention through Minimum Support Price (MSP).

Tomer *et al* (1997) studied the marketing cost of citrus (malta and kinnow) in Hisar and Sirsa district of Haryana. The study revealed that producer's share in consumer's rupee was around 50 per cent when the producers directly sold citrus in the market, however when the fruit were sold through pre-harvest contractors, the share declined to about 40 per cent. The marketing margin charged by the middleman for citrus were higher which ranged from 14 to 19 per cent of consumer's price.

Singh (2000) reported that the contract farmers growing tomato in Punjab had to face the problems of poor coordination of activities, poor technical assistance, delayed payments, outright cheating in dealing and manipulation of norms by the firms. The farmers had to wait at the factory gate for a day or more which leads to weight loss of the produce due to evaporation and the company ends up receiving more concentrated produce at the same price. The author opined a legal protection to contract growers as a group is a must to protect them from illness effects of contracting.

Malik *et al* (2000) conducted a study to examine producers share in consumer's rupee. The results revealed that net price received by the producer was lowest in traditional marketing channel i.e. 59.76, 60.82, 74.26, 64.28 per cent of purchase price of consumer in the case of potato, onion, okra and bottle gourd respectively whereas the percentage share of producer in consumer's purchase price was highest in Apni Mandi which ranged from 93.74 per cent in potato to 96.23 per cent in okra. It was reported that both producer and consumers were benefited in Apni Mandi.

Singh et al (2000) while evaluating the impact of soft loan schemes for development of post harvest infrastructure for horticultural crops in Punjab studied the prevalent marketing practices of various fruits and vegetable crops. Perishable nature of fruits and vegetables, financial needs and risks involved in production and marketing of the produce, were the major reasons which force the farmers to go for pre and post-harvest contracts. The practices of pre-harvest contracts were prevalent for the fruits only. Pre-harvest contractors are the professional buyers who usually buy the standing crop for a lump sum amount. They move place to place in the fruit growing region to purchase orchards and stay there during the market period to arrange for harvesting and preparation of fruits for sale in the market. Such pre-harvest contract shared about 40 percent of the total fruit production in the region. The remaining almost all the quantity of fruits was disposed of by the farmers through forwarding agents/commission agents in secondary wholesale markets. Only 8 percent fruits were disposed of in local primary wholesale markets through commission agents. Different vegetables were disposed of at the assembling points and in the primary wholesale market through commission agents. Most of potato was sold in the primary wholesale market through commission agents. Proper regulation of fruits and vegetables could help to reduce the selling problems of the growers. An intensive monitoring and implementation system to follow the market regulations would ensure better share to the fruits and vegetables producers in the consumer's rupee.

Singh *et al* (2001) conducted the study on the pattern of production and marketing of fruit crops in Punjab. The proportion of the total produce marketed was the highest for the grapes about 98 per cent followed by the pear 95 per cent. However, just 75 per cent of guava was sold in spite of high perishability and spoilage. Almost the whole produce was sold through commission agents. The cost of transportation accounted for more than the half of the total marketing cost of all the fruits. The same proportion of pear and grapes might be due to marketing immediately after harvesting. Non availability of sufficient manpower to the market the produce resulted in the practices of pre-harvest contracts ensuring the agreed returns to the farmers and eliminating the possibility of losses due to delay in the marketing. However, the agreed contact amount taken into discount the factors like expected yield on the lower side, market price in the preceding year at peak lines, the transit and other losses. The efficient market infrastructure of horticulture crops may help the farmers in selling their produce themselves and increasing their returns.

Singh and Chahal (2001) studied the market structure and performance for different vegetables in Punjab. The prices spread analysis showed that the producers received 60.42 per cent of consumer price and rest was gone as marketing margins of intermediaries in Channel-I (Producer → Wholesaler → Retailer → Consumer), whereas in Channel-II (Producer→ Consumer) the producer received 93.88 per cent of consumer's rupee and rest was the cost incurred by producer in marketing their produce. The consumer benefited more by buying through Channel II.

Anchal (2002) conducted study an economic analysis of litchi cultivation in Punjab. There were three market channels involved in study area for sale of litchi such as I) producer – pre-harvest contractors-retailers-consumers (local market) II) Producer-Pre-harvest contractors – retailers (through commission agent) – consumer (Amritsar market) III) producer-Pre-harvest contractors – (wholesaler)-retailer (through commission agent) - consumer (Delhi market). The producer and pre-harvest contractors received Rs.1396.64 from consumer rupee. In the second channel the litchi was sold to the consumer at a price of Rs.2383.93 per quintal which was 23.03 per quintal higher than that the first marketing channels. The producer could get only Rs.1257.90 i.e. 52.77 per cent of consumers purchase price. Thus there was a price spread of Rs.1126 per quintal of litchi in selected market channel. In the third marketing channel of litchi the consumers of Delhi paid Rs.2922.09 per quintal which was 50.81 per cent higher than that in the second channel. The producer's share in consumer's rupee was less than the previous two marketing channels of litchi. The producer's share in consumer's point of view because the producer received maximum benefit in the channel and consumer gets the litchi at the minimum price. The margins of the middleman in between producers and consumers were found to be of the order of Rs.255.80 in first channel, Rs.524.80 in the second channel and Rs.910.49 in the third channel of litchi under the study.

Pandey *et al.* (2003) estimated the price spread and producers and market intermediaries share in the consumer price in the channel: Producer – commission agent – retailer – consumer in potato marketing at Shimla. For the study samples of 25 potato growers, 10 commission agents and 25 retailers were selected purposively. The result showed that the producer realized around 73 per cent share in consumer's price. The retailer and commission agent earned profit of about 3.5 and 8.0 per cent of the consumer's rupee. The price spread and marketing efficiency was found to be about 27 per cent and 3 per cent, respectively.

Rana *et al* (2003) examined the needs of profitable selling of kinnow. Study shows that Agricultural produce marketing committees (APMCs) are totally under control of government and farmers are suffering due to corruption. Market being under developed and small is more prone to fluctuation. Middleman exploits both the farmers as well as consumers. To save the farmers from exploitation there is need for establishing more and more function farmer's marketing co-operatives, popularizing sale and purchase in "*Apni mandis"* minimum support price, farm inputs and services like spray pumps, polythene sheets, refrigerated vans, pesticides, fertilizers etc. should be produced by government at subsidized rates to make kinnow selling profitable.

Chahal *et al* (2004) revealed that major portion of farmers produce was sold at a lower price in the post-harvest period there by lowering their income. This has caused the wide variations in the prices of the peas outcome and space, the major reason was the perishable nature of produce and non-availability of storage facilities and techniques also farmer need of immediate cash requirement to meet their financial obligations for various purposes. It was observed that the intermediaries involved were highly benefited due to wide fluctuations in prices. They purchased peas at lower prices from farmers and sold at higher prices to consumers, ultimately both producers and consumers were exploited.

Singh (2004) conducted a study to examine production, performance and marketing of kinnow in Punjab. The study brought out that on an average sample farmer had 2.28 hectare of area under kinnow. Per holding production and productivity were about 359 quintals and 159 quintals respectively. The marketed surplus was high to the extent of about 99 per cent; about 69 per cent of the selected farmers had leased out their kinnow orchards to the pre harvest contractors while about 31 per cent retained it themselves. Majority of pre-harvest contractors sold kinnow in Delhi markets which is the biggest consuming and distribution market in the entire north India. The producer's share in Ferozepur and Hoshiarpur districts in the consumer's rupee was about 42 per cent and 40 per cent respectively for sale of kinnow through pre-harvest contractor in Delhi market in January, 2003.

Sekhon (2005) studied the production and marketing of pear in Amritsar District of Punjab state. The study revealed that 58 per cent of area under pear was leased out to pre-harvest contractors. The contractor's share in total production was about 57 per cent. It was found that about 99 per cent of the pear was sold in Delhi markets by the contractors and farmers. The sale in the local Amritsar market was just about one per cent. It happened

mainly on account of fact that Delhi is the big consuming and distraction market in the entire north India. The overall average rate of contract on per quintal basis was about rupees 604. A comparison of price spread through different channel revealed that producer's share in consumer's rupee was the highest (about 70%) in channel II (producer-wholesaler-retailer-consumer). It was due to self sale in local market where marketing costs were less.

IFPRI (2007) in Agricultural Diversification towards High Value Commodities report studied comparison of contract and non-contract farming in selected vegetables in Punjab. It has been indicated that the former was more profitable during 2003-04 in case of potato and green peas, but not in chilies . In both, potato and green peas, contracted farmers incurred higher variable costs (43.65 percent and 8.40 percent higher respectively) than noncontract producers. And, the yields of potato and green peas were also lower by 5.9 and 15.11 percent respectively in contract model. But by contracting, potato farmers realized 72.76 percent higher price and green peas farmers 27.10 percent higher prices compared to their respective non-contracted counterparts. Higher prices were responsible for more than double the net returns in potato and by about 49 percent higher in case of green peas. The productivity of potatoes under contract model was 5.9 per cent lower than the non-contract farming since the contracting firm (in this case Pepsi) mainly procures the Kufri Jyoti variety that is better suited for processing but is lower-yielding than Kufri badshah, Kufri sandhuri, and other varieties generally grown by the majority of farmers. The variable cost was 43.65 percent higher for contract farmers than non-contract farmers mainly due to higher costs on seed,grading, packing, transportation, etc. A comparison of contract and non-contract farmers in the production of chillies indicates slightly higher net profits (by 11.77 percent) for farmers outside of contracts. On an average, production cost was lower by about 16 percent for contract farmers, though the composition of such costs differed markedly. Contract farmers realized higher yields than non-contract farmers, but received lower prices than non-contract farmers. It is important to note that there was significant price variability for chilies in the open market, with prices ranging from Rs 500 to Rs 750 per quintal while the contracted price was Rs 600 per quintal. The threshold price, at which contract farmers of chilies, would receive same profit as their non-contract counterparts is Rs. 619.34; just 3 percent higher than the agreed prices. This suggests that if firms are flexible (5-10%) in agreed prices, the chances of breach of contract may be avoided. The constraints which inhibiting up-scaling of the contract farming to promote agricultural diversification included existing marketing

regulations, underdeveloped infrastructure towards fruits and vegetables, absence of organized food retailing, and farmers' instinct for household food security.

From the above, it can be observed that different studies have observed different marketing channels in marketing of agricultural produce and also varied marketing costs and margins.

1.4 Methodology:

The present study has been conducted in the state of Punjab covering two horticultural crops namely potato (vegetable) and kinnow (fruit) in Jalandhar and Ferozepur districts respectively owing to sizeable area under cultivation. The study has been based on both primary as well as secondary data. The primary information for the purpose has been collected through primary surveys and informant interviews with growers, market committee members, processors, buyers, retailers and consumers in Jalandhar (Potato) and Abohar (Kinnow) districts for the study. Secondary data pertaining to the importance of these crops in study districts/state have been gathered from various secondary sources. The study has been based on a sample of 90 farmers (45 potato growers from Jalandhar west and Bhogpur blocks of Jalandhar district + 45 kinnow growers from Abohar and Khuian Sarvar blocks of Ferozepur district). The required data/information on cost components, crop yields, input and output prices and inputs supplies to the farm producers, etc for potato and kinnow crops were collected through primary surveys and informant interviews with growers. The reference period for the primary data survey was 2009-10.

Traditional /Emerging marketing channels selected for the study:

Potato: The most prominent traditional supply chain involves farmers selling the fresh potato produced by them in the primary wholesale markets through commission agents to wholesalers who in turn further sell to secondary wholesalers located in small cities and towns and local retailers. In recent years new Supply chain for potato: Producer → Processor (Pepsi Co.) → consumer has also emerged.

Kinnow: The most prominent traditional supply chain for kinnow in the region involves Producer → Pre-harvest contractor → Commission agent → Wholesaler → Retailer → Consumer. Pre-harvest contractors provide advance payments to the farmers during the time of agreement. In this approach, farmers minimize risk due to price volatility and post-harvest losses of course with lesser producers' share in consumers' rupee resulting in marketing inefficiency. During recent years, the Farmers' Evening Markets for fruits especially kinnow have also come up in the study district. The practice of selling Kinnow crop to Pre-harvest

contractors has been on the decline and new supply chain: Producer → Farmers' Evening Markets → Local Wholesaler → Wholesaler at distant markets → Retailer → Consumer has been emerged.

Table 1.1: Sample selection/size for the farmers

Crop	District	Block	Traditional Channel	Emerging Channel
Potato	Jalandhar	Jalandhar West	35	10
		Bhogpur		
Kinnow	Ferozepur	Abohar	35	10
		Khuian Sarvar		

The information so collected was supplemented from, intermediaries, buyers/processors, retailers and consumers to maintain desired quality and quantity to meet consumers' demands under the set up of the existing supply chains in fruits and vegetables as well as under the innovative institutional arrangements, which are gradually emerging in fruits and vegetables. In order to observe the supply chain of the emerging channel and traditional channel, primary data were collected from the following respondents with the help of pre structured research instruments.

Table 1.2: Sample selection/size for the other intermediaries

Intermediary	Traditional Channel		Emerging Channel	
	Potato	Kinnow	Potato	Kinnow
Wholesalers	10	5	10	5
Retailer	10	5	10	5
Consumer	10	5	10	5

A focus group discussion with the Market Committee Members/officials was also held to get a lucid depiction of market charges, market practices, processes etc. The retail prices for potato were collected from Jalandhar and kinnow from Abohar and Ludhiana. Simple statistical tools were used to examine the share of farmer in terminal price in case of both traditional and emerging channel. The post harvest losses, market practices and constraints faced were also analysed using field level data.

Chapter 2

Agriculture Reform Processes and its impact on Traditional and Emerging Market Channels

The Royal Commission on Agriculture (1928) recommended the regulation of market practices and the establishment of regulated markets in India in view of the chaotic conditions prevailing in the agricultural produce markets. Central Banking Enquiry Committee endorsed these recommendations later. The Directorate of Marketing and Inspection (DMI, 1935) recommended the regulations of markets to the State governments. The DMI prepared a Model Bill in 1938 and circulated among the States. Since then, the State governments have enacted legislation for the regulation of the markets. This chapter has been divided under two heads:

2.1 Implementation process of Agriculture Market Reforms under the new Acts/Regulations

2.2 Impact of reforms processes on Traditional Market Channels and Emerging Market Channels

2.1 Implementation process of Agriculture Market Reforms under the new Acts/Regulations

A regulated market is one, which aims at eliminating the unhealthy and unscrupulous practices, reducing marketing charges and providing facilities to producers- sellers in the market. The basic philosophy of the establishment of regulated markets is elimination of malpractices in the system and assignment of dominating power to the farmers and their representatives in the functioning of their markets.

The specific objectives of the regulated markets are as followers:

- To prevent the exploitation of farmers by overcoming the handicaps in the marketing of their product;
- To make the marketing system most effective and efficient so that the farmers may get better prices for their produce, and goods are made available to the consumers at reasonable prices;
- To provide incentive prices to farmers for a better production program, both in quantitative and qualitative terms; and

- To promote an orderly marketing of agricultural produce by improving the infrastructural facilities.

Nearly 94 per cent of the wholesale markets in the country are functioning under the regulation program.

The Punjab Agricultural Produce Markets Act, 1961

The Punjab Agriculture Produce Markets Act, 1961 received the accent of the President of India on May 18, 1961. The act aimed to consolidate and amend the law relating to better regulation of the purchase, sales, storage and processing of agricultural produce in Punjab. The act provides for the establishment of an apex body at the State level to perform the functions under this act. The Punjab State Agricultural Marketing Board (PSAMB) was established. The board is an executive-cum-advisory body and is concerned with bringing about improvements in the regulation scheme. It also supervises the functioning of regulated markets and advises market committees and the State Government on related matters.

Membership of the Board:

The PSAMB consists of a Chairman to be nominated by the State Government and sixteen other members, of whom eight are official and other eight as non-officials to be nominated by the State Government in the follower manner:

i. Official members include a joint secretary from the Department of Finance, Director Horticulture Punjab, Secretary of the board and one representative from each of the Department of Agriculture, Department of Co-operation, Department of Animal Husbandry, Colonization Department and the Food and Supplies Department.
ii. The producers, market intermediaries, farmers' organizations, progressive farmers and cooperative societies represent non-official members. The non-official members are elected for a period of three years.

The Secretary of the board is responsible for the following:

i. For efficient administration of organization and to carry out the provisions of the Act define the provisions of these rules and to exercise general control over the employees of the Board and those of the committees.
ii. To be the competent authority for approving the budget of the committee.

iii. For preparation of the annual budget of the board.

Functioning of the Board:

The board may frame and implement laws on the following:

i. Better marketing and marketing of agricultural produce on co-operative lines.
ii. The grading and standardization of agricultural produce.
iii. The general improvement in the markets or their respective notified market areas.
iv. Maintenance and regulation of rest houses and other buildings of the Board.
v. The procedure for giving aid to financially weal committees.
vi. The allowance payable to the members of the Boards or Advisory Committees.
vii. Propaganda, demonstration, publicity and education for improvement of marketing and agriculture.
viii. The classification of the committees on the basis of their income for the purpose of fixing their grades of their secretaries and other employees.
ix. The person or persons by whom, and the matter in which, a contract may be entered on behalf of the board, and
x. Any other purpose, which in the opinion of the board, is calculated to promote the interests of the board or the committees, or to lead to improvement of marketing and agriculture in general.

Source of income:

The sources of income of the Board include the contributions from market committees, loans and grants etc. All the receipts of the Board are credited into a fund called as the Market Development Fund. The market Development Fund is utilized for the following purposes:

i. For better marketing of agricultural produce.
ii. For marketing of agricultural produce on co-operative lines.
iii. For collection and dissemination of marketing rates and news.
iv. For grading and standardization of agricultural produce.
v. For general improvement in the markets and respective notified market areas.
vi. For maintenance of the office of the board and construction and repair of its office buildings, rest house and staff quarters.
vii. For giving aid to financially weak committees in the shape of loans and grants.

viii. For payment of salary, allowances and compensation to the employees.

ix. For propaganda, demonstration and publicity for agricultural improvements.

x. For production and betterment of agricultural produce.

xi. For imparting education in marketing or agriculture

xii. For promoting the general interests of the board and committees; and

xiii. For other miscellaneous purposes such as legal expenses, construction of godowns, loans to employees etc.

Sale of Agricultural Produce:

The board closely monitors the sale of agricultural produce and formulates laws for the sale/purchase of the agricultural commodities. Following are the rules for promotion of regulated marketing of the produce in Punjab.

i. All agricultural produce brought into the market for sale shall be sold by open auction in the principal or sub market yard.

ii. Nothing in sub rule 1 shall apply to a retail sale as may be specified in the byelaws of the committee.

iii. A committee may, and on being directed by the secretary of the board shall fix timings for the start and closing of the auction in respect of any agricultural produce, other than fruits and vegetables.

iv. The price of agricultural produce shall not be settled by secret sings or secret bid. No deduction shall be made from the agreed price of the consignment.

v. Any person other than the person engaged by the committee shall not conduct the auction.

vi. The highest bid offered by the buyer at an auction and at which the seller of the produce gives his consent to sell his produce, shall be the sale prices of the produce.

vii. The buyer shall be considered to have thoroughly inspected the produce for which he has made a bid and he shall have no right to retract it.

viii. As soon as the auction for a lot is over, the auctioneer shall fill in the particulars in a book to be maintained in Form H and shall secure the signatures of both the buyer and seller or their respective representatives, whoever present at the spot.

ix. The buyer shall be responsible to get the agricultural produce weighed immediately after the auction or on the same day, he purchases the produce.

x. A person engaged by a producer to sell agricultural produce on his behalf shall not act as a buyer either for himself or on behalf of another person in respect of such produce.

xi. The Kacha Arhtiya shall make payment to the seller immediately after the weighment is over.

xii. Every Kacha Arhitya shall, on delivery of agricultural produce to a buyer, execute a memorandum in form I and deliver the same to the buyer on the same day or the following day, mentioning sale proceeds plus market charges admissible under rules and byelaws.

xiii. In absence of any written agreement to the contrary the buyer shall pay the sale price of agricultural produce purchased under these rules to the Kacha Arhtiya on delivery of form I.

xiv. Delivery of agricultural produce after sale shall not be made or taken unless or until the Kacha Arhtiya or, if the seller does not employ a Kacha Arhtiya, the budget has given to the seller a sale voucher in form J, the counterfoil whereof shall be retained by the Kacha Arhtiya or the buyer, as the case may be.

APMC Act amendments since 2003

Agricultural Marketing laws, particularly the Agricultural Produce Market Committee (APMC) Act, inhibit the up-scaling of innovative institutional arrangements, such as contract farming and linking farmers with markets and agri-business. As per the APMC Act, it is mandatory that all notified agricultural commodities, including horticulture products, must be marketed through regulated markets. The mandatory regulated system of marketing prevents producers from direct sales (except limited sales in farmers' markets) to market functionaries such as processors and exporters. This obstructs the firms from entering into contract farming and buying directly from the farmers. One of the major problems of marking through regulated markets is obligatory market charges that add to the cost. The market fee, commission charges and other market charges for performing various market functions including sales tax etc accounted for about 11 percent in Punjab. These were fixed a long time ago and are high in view of the limited services provided by the regulated markets.

Since 2003, APMC Act was partially amended to safeguard the interest of farmers through provisions for private markets and contract farming. Though establishment of private market yards was allowed but the direct purchase was not permitted. Similarly, amendments regarding registration of contract farming agreement with the appropriate authority, dispute settlement mechanism and specifications of model agreement for contract farming were made

but not adopted. The amendments regarding registration (not licensing) of market functionaries and single registration for trade/ transaction in more than one market has also been made but not implemented. The act has also been amended with respect to double market fee i.e. market fee shall not be levied for the second time in any market area of the State by market committee as well as market fee not to be levied more than once in commercial transactions between traders or sale to consumers. This amendment has been adopted by the state. Since 2003, Government of Punjab has launched contract farming in a number of crops such as maize, barley, sunflower, hyola, basmati rice, etc. to substitute for a sizable area under rice–wheat system. This model involves four parties in the contracted transaction: farmer, extension firm, buyer (marketing firm) and the Punjab Agro Foods Corporation (PAFC) acting as facilitator between farmer, the extension firm and the buyer. As a means to encourage contract farming in the state, the government of Punjab reduced the combination of market fees (2%), rural development fund charges (2%), and infrastructure taxes (1%) from a total of 5 percent to 0.5 percent. Organizations that wish to engage in direct linkages with farmers without contracts do not receive such exemptions (Source: www.agmarknet.nic.in).

2.2 Impact of reforms processes on Traditional Market Channels and Emerging Market Channels

The Punjab State has more or less been able to achieve the above stated objectives of regulated markets. However, it may be argued that the success in terms of providing incentives for the quality of the produce has not been significant. Till now the emphasis of the farmers has been on producing more irrespective of the quality. Assured purchases of food grains by the government during the last three decades may also be termed as a culprit for deterioration of farmers' quality consciousness. The benefits of regulated markets seem not to be percolating (in terms of quality and quantity) to the fruit and vegetable growers. Many studies have shown in recent past that the producer's share in consumer's rupee has still been low. It is a common fact that the increased production has often resulted into decline in the farmer's profits. Similarly, no incentives to the farmers for better quality have been reported till now.

Traditional marketing channels:

The existing supply chains of fruits and vegetables involve numbers of intermediaries that add to market inefficiency and increase price spread between farmers and the consumers.

Most of the traditional supply chains are conducted in spot markets. Producers typically sell to traders or wholesalers who market the product in other markets. Coordinated sales between producers and processors are uncommon but slowly emerging with changing demand scenario. Important supply chains for vegetables and fruits include:

Supply chains for vegetables

- Supply chain 1:
  Producer → commission agent → wholesaler → retailer→ consumer

- Supply chain 2:
  Producer → commission agent → primary wholesaler →secondary wholesaler → retailer → consumer

- Supply chain 3:
  Producer →Collector/Consolidator /Agent →Wholesaler at distant markets→ Retailer → Consumer

The most prominent supply chain involves farmers selling the fresh vegetables produced by them in the primary wholesale markets through commission agents to wholesalers who in turn further sell to secondary wholesalers located in small cities and towns and local retailers (supply chain 1). This supply chain accounts for about half of the total vegetables sold in the state.

Supply chains for fruits

- Supply chain 1:
  Producer → Pre-harvest contractor → Commission agent →Wholesaler→ Retailer →Consumer

- Supply chain 2:
  Producer→ commission agent → wholesaler → retailer →consumer

- Supply chain 3:
  Producer → Collector/consolidator /agent →Wholesaler at distant markets → Retailer → Consumer

- Supply chain 4:
  Producer → Processor → consumer

Supply chain 1 is the most prominent marketing channels in fruits, accounting for about 70-80 percent of total sales of fruits. Pre-harvest contractors provide advance payments to the farmers during the time of agreement. In this approach, farmers minimize risk due to price volatility and post-harvest losses. Owing to number of intermediaries in the supply chain, the transactions and marketing costs increase, resulting in low marketing efficiency.

The Commission Agents also exploit the farmers by charging higher commissions, since most of the farmers have taken loans/advances from commission agents and are forced to sell the produce to them. These all results into increase the price spread and reduce the producer's share in consumer's price. In the case of vegetables, producer's share in retail prices varies from 35 to 45 percent and for fruits from 25-35 percent.

Innovations in marketing – Emerging marketing channels:

Farmers' markets (Apni mandi) are an innovative marketing approach especially for vegetables introduced in the state mainly to tackle the problems of marketing and exploitation of farmers by the middlemen. Thus, the market is totally devoid of middlemen. The main aim of farmers' market is to ensure fresh vegetables at remunerative prices to the farmers and reasonable prices to consumers. The total transactions through these markets form just negligible portion (less than 1%) of the marketed surplus, as only few farmers are able to sell in these markets. Similarly, in vegetables, **Supply chain: Producer → Processor → consumer** has also emerged in recent years. The producer's shares in consumer's prices for selected vegetables in these markets varied between 80-90 percent, compared to 35-45 percent for sale in the traditional supply chain.

During recent years, the Farmers' Evening Markets for fruits especially kinnow have also come up in the study district. The practice of selling Kinnow crop to Pre-harvest contractors has been on the decline and new supply chain: **Producer →Farmers' Evening Markets → Local Wholesaler → Wholesaler at distant markets → Retailer →Consumer** has been emerged.

Other innovative/emerging marketing mechanisms

Contract farming for promoting high value agriculture: The smallholders often lack production and marketing information necessary for new commodities. They also they lack financial resources necessary for profitable investment for realizing the economies of scale in production. The smallholders are also risk averters and sacrifice production of HVCs despite prospects of higher returns. Contract farming is an institutional response to missing markets for credit, insurance, information, factors of production in an environment of pervasive risks (Simmons, Winters and Patrick 2005,). The concept has potential to reduce transactions costs by coordinating production, marketing, processing and retailing. It also distributes risks between producers and the agri-business firm. It is defined as a system for the production and supply of agricultural produce under forward contracts, the essence of such contracts being a commitment to provide an agricultural commodity of a type and in the quality required by a

known buyer (Sukhpal Singh 2002). It is defined as agricultural production carried out according to an agreement between farmers and buyers which places conditions on the production and marketing of the commodity (Minot 1986). The concept is gradually emerging with growing demand for fruits and vegetables and entry of corporate agribusiness houses in export, processing and retailing of these agricultural commodities. Each firm is evolving its own model depending upon its requirements and needs of final consumers. The model eliminates the intermediaries and a part of saving is distributed between producers and consumers. The Punjab government is engaged in aggressively promoting contract farming. Therefore a number of corporate agri-business firms have signed a memorandum of understanding with the government of Punjab to take up contract farming in the state to promote number of commodities. The benefits of contract farming over non-contract farming are compared in terms of reducing transactions costs, increasing profits and enabling access to markets. Different forms of models can be broadly divided in to three categories: (a) government promoted contract-farming; (b) corporate sector driven contract farming; and (c) informal contract farming. The type of contract depends upon the commodity and the nature and destination of the final product.

Government-promoted contract farming: Since 2003, the government of Punjab has launched contract farming in a number of crops such as maize, barley, sunflower, hyola, basmati rice, etc. to substitute for a sizable area under rice–wheat system. This model involves four parties in the contracted transaction: farmer, extension firm, buyer (marketing firm) and the Punjab Agro Foods Corporation (PAFC) acting as facilitator between farmer, the extension firm and the buyer. The basic philosophy of this program is to provide technical know-how to the producers, mitigate price fluctuations and strengthen the marketing infrastructure for selected agricultural commodities. The contract is a formal written agreement between the farmer and the extension firm, but is not considered a legal document. The contract specifies the quality, quantity, prices, and time of delivery. As per the contract, the farmer brings produce as per the specified quality at the designated place. In case the farmer can get a higher price from the market, he is free to sell his produce to the highest bidder/buyer, bypassing the contract as per the open-end clause provided in the contract. If the market prices are lower than the contracted prices, the PAFC offers a 'comfort price' that are slightly higher than the market price. As a means to encourage contract farming in the state, the government of Punjab reduces the combination of market fees (2%), rural development fund charges (2%), and infrastructure taxes (1%) from a total of 5 percent to 0.5 percent. Organizations that wish to engage in direct linkages with farmers without contracts

do not receive such exemptions. Examples of companies that entered into this type of contract arrangement with farmers included Advanta for sunflower; Punjab Agro Foods Corporation for Hyola; Pro-Agro and Mahindra Shubh Labh for winter maize; United Beverages for Barley;and Rallis India,, Mahindra Shubhlabh, Escorts and DCM Shriram for basmati rice. The program is in the evolution stage and government is making all efforts to bring more farmers and crops into its fold.

Private industry-driven contract farming: This is the most common model of contract farming, driven by private industry comprising processors, exporters and domestic wholesalers /retailers. This model has different variants promoted by different agro-firms: (i) processors; (ii) exporters; and (iii) vertically integrated franchises. Processor-driven contract farming: The first type of arrangement consists of a processor who enters into a contract with growers to regularly source raw material of a desired quality to the plant. An important example of this is 'PepsiCo model' that pioneered the concept of contract farming for the competitive bulk procurement of a variety of vegetables like potato, tomato and chilies in Punjab. Initially the Pepsi Co. initiative was quite successful in augmenting tomato yields by 25-50 percent and incomes by about 40 percent. Later due to dispute and breach of contract, the tomato processing plant was closed but the firm is continuing contract farming in other commodities. In this model, the processors supply seeds and seedlings of specific varieties to the producers for meeting the processing requirements. The firms regularly supervise and monitor their production throughout the growing season. The firms also provide technical advice to farmers. Purchasing decisions vary by company in terms of the amount and quality of products that are accepted. For instance, Pepsi applies stringent quality standards prescribed in the contract in their procurement. Another example is Nijjer Foods Ltd. (started in 1991 in Amritsar), which started contract farming in Punjab to process tomatoes and chilies. By contrast, Nijjer Foods accepts all production that is brought to the factory and engages in the cleaning of red ripe chilies at the factory to ensure that aflatoxin levels are low. In both cases, farmers are required to bring the produce to the factory, but transportation costs are adjusted in the contracted price. While the contract is a written agreement and signed by both parties (farmer and processor), it is not a legally valid document. A slight variation in this model involves contract farming facilitated by the Punjab Agro Industries Corporation (PAIC) through joint ventures with private processors. In this model, the PAIC acts as a facilitator and broker in the joint venture company through equity participation. It also procures some of the commodities. For example, PAIC procures green peas grown in the district of Patiala for local processors. In this case, farmers grow the improved varieties21,

Box I Pepsi co Model- Originator of Contract Farming in the Punjab

The model of contract farming in perishables in the Punjab started with Pepsi Co. in1989, which began engaging in contractual relationships with farmers to produce potatoes and tomatoes. Pepsi was allowed to enter the Indian market for its soft drinks business on the condition that it also contributes to the processing of fruits and vegetables and establish linkages with farmers. Pepsi remained in the Punjab for over a decade and successfully utilized contract farming to supply its processing plants. However, in 2001, Pepsi Co sold its tomato processing facility to Hindustan Lever Ltd. (HLL). It re-acquired the facility shortly afterwards, but completely disbanded production by 2004-05. Pepsi's departure from the market was not due to problems with contract farming per se, but rather the poor profitability of the plant on account of subsidized imports of tomato paste from China and difficulties obtaining year-round supplies of raw material from the Punjab (World Bank, 2003). Transportation costs from the Punjab to international port were also prohibitive. Pepsi maintains contract farming arrangements to supply its potato chip processing unit in the district of Sangrur. The germplasm is provided by the company, with production taking place under its direct supervision. Quality standards in terms of size, shape, and other parameters are specified in the contract. Produce that does not fulfil those exacting parameters is not accepted. Contracts are renewed every year for almost all contracting farmers, unless farmers break the contract or fail to follow company recommendations on production practices. The incidence of breaking contracts is less than 5 per cent. Pepsi recently partnered with the Punjab Agro Industries Corporation (PAIC) to support the Government of Punjab's (GOP) initiative of promoting citrus production in the state. Pepsi aims to establish a processing plant for processing oranges, though is currently constrained by unsuitable varieties for juice production. Pepsi plans to invest Rs. 50 million to establish state-of-the-art facilities for raising citrus saplings which will be provided to farmers. It is hoped that farmers will be enticed by such a program, since orange production can yield income of up to Rs. 60,000/acre/year compared to only 20,000/acre/year from paddy. By 2006, 250,000 plants will be ready for transplantation. GOP has established a goal of bringing 1 million acres under citrus cultivation by 2015.

Sources: Presentation by Mr. Abhiram Seth, Executive Director, Pepsi Co. India at the Rural Marketing Summit, 7-8 October 2005; Rashme Sehgal, "Contract Farming in the Punjab," Info Charge News and Features, June 2005.

which are procured by the processing unit. Pea processors do not provide any inputs or technical advice to the farmers. The processing unit grades the produce and rejects those not conforming to their prescribed specifications and standards. Prices are fixed on the basis of the market prices that prevailed in the local markets over the last 3 to 4 years.

Contract farming in vegetables: In Punjab, some corporate houses are establishing their presence in vegetables through contract farming for export, processing and/or retailing; the major companies are Mahendra Subhlabh, Bharti, and Pepsi. Recently, one of the India's leading corporate house (namely the Reliance Industries Ltd.), announced a mega project on agribusiness and retailing in Punjab and other states in India.

Box 2 Experiences with Contract Farming in the Punjab

The experiences of farmers in contract farming in the Malwa region of the Punjab have been less than ideal. While the PAFC has been active in establishing private sector partnerships to encourage contract farming, there have been reports that buyers have not kept their promises. In one instance, paddy farmers engaged in contract farming arrangements were promised Rs. 1,350 per quintal prior to planting, but were offered only Rs. 700 per quintal at harvest; after protests and negotiations, farmers eventually received Rs. 900 per quintal. A farmer's organization estimated that farmers have to incur additional costs of about Rs. 750 per ha towards a fee for private extension services. Farmers claim that such arrangement never materialized despite paying the fee. Farmers are also not convinced that contract farming would provide any sort of income and/or food security as was through the prevailing rice-wheat system. Despite these problems, the private sector is aggressively promoting contract farming. For instance, Pepsi has maintained its presence in potato sector for over a decade and plans to import 15,000 citrus plants to facilitate citrus and juice production in the state.

A number of millers are also convincing farmers to diversify towards basmati rice, while United Breweries is working with PAFC to establish contract farming arrangements in barley. The possible entry of AWB from Australia into contract farming and food retail could further strengthen this initiative. One of the areas that AWB specializes in is the use of multi-period contracts that enable farmers to repay loans over a longer period of time in case of crop failures. Such risk mitigation measures may be the key to reduce the perceived uncertainty associated by many farmers with contract farming.

Source: Rashme Sehgal, "Contract Farming in the Punjab," InfoChange India News and Features, June 2005; Nidhi Nath Srinivas, "Indian farm retail to get its first foreigner," The Economic Times, New Delhi, 7 December 2005.

Existing marketing regulations

Agricultural Marketing laws, particularly the Agricultural Produce Market Committee (APMC) Act, inhibit the up-scaling of innovative institutional arrangements, such as contract farming and linking farmers with markets and agri-business. As per the APMC Act, it is mandatory that all notified agricultural commodities, including horticulture products, must be marketed through regulated markets. While Punjab has a dense market system with purchase centres within the radius of 10 km from most villages, the system has not adapted to the changing demands for horticulture products. The existing markets have been developed to handle mainly food grains and not the fruits and vegetables in the state. In Punjab, rice and wheat accounted for a big chunk of the market fee while the share of fruits and vegetables hovered around only 5-6 percent. The mandatory regulated system of marketing has two major implications. First, the regulated marketing system prevents producers from direct sales (except limited sales in farmers' markets) to market functionaries such as processors and exporters. This obstructs the firms from entering into contract farming and buying directly from the farmers. Secondly, it reduces the competitiveness of production and adds unnecessary intermediaries to the supply chain. Such increase in intermediaries normally results in producers receiving a smaller share of the final sales price of the commodity. To encourage contract farming the central government has formulated a model market Act that provides option for farmers to sell their produce to processors and contracted buyers at reduced market charges. Though a few states have agreed to implement the Act, it is yet to be operationalized. One of the major problems of marking through markets is obligatory market charges that add to the cost. The market fee, commission charges and other market charges for performing various market functions including sales tax etc accounted for about 11 percent in Punjab. These were fixed a long time ago and are high in view of the limited services provided by the regulated markets. The World Bank (2003) has indicated that the facilities for grading, storage, and information are poor in *mandis*, and market charges add 11.5 percent to the cost of commodities sold there. Reducing the marketing charges can help farmers in realizing higher prices and in making the agricultural products more export competitive.

Absence of organized food retailing

Organized food retail is a relatively recent phenomenon and comprises a very small part of the food retail business in the country. However, it is growing and will capture a considerable segment of the food retail trade. Rising incomes, changing family structures,

and increased women employment are driving the modern makeover of the retail sector in India, particularly that of fresh fruits and vegetables. The evolution of supermarkets and organized retail chains in food sector in India is very low but is growing fast. Punjab, although dominated by large farmers is gradually responding to the revolution. Punjab has also been part of this retail race and has been the hub of high value operations of Bharti Field Fresh Food Limited (in Ladhowal). While Field Fresh targets the export market for fruits and vegetables, Reliance Fresh and ITC Choupal Fresh are entering the state with similar retail and wholesale ventures they have been experimenting in other states. This is a good opportunity for the state to successfully swing out of the rice wheat cycle and reap the benefits of high value farming, processing and retailing.

Role of agro-processing sector in promoting the growth of fruits and vegetables

Punjab is way behind in food processing despite being the leading producer of foodgrains in the country. The agro-processing industry in the state is mainly devoted to grains processing, flourmills, oil mills, cotton ginning, and rice milling. Processing of fruits and vegetables is relatively underdeveloped in Punjab. Specific processed products that are produced from the horticulture sector in Punjab include tomato paste, potato chips, juices, squashes, jams, chutney pickles, *murabbas*, frozen vegetables, and ready-to-eat items.

Box 3 Processing of Fruits and Vegetables in Punjab

The Punjab has three categories of processing firms: (i) small scale (annual turnover of less than Rs. 10 million), (ii) medium scale (Rs. 10-100 million annual turnover); and large scale (>Rs 100 million turn over). Small firms universally rely on spot purchases and do not coordinate upstream with suppliers for raw materials. Such firms have limited contact with growers and relatively weak marketing and branding capabilities. On the other hand, large firms have high levels of market coordination, both in terms of the procurement of raw materials and in the creation and development of the market. One of the larger units (a mushroom canning unit) coordinates all production activities, from the growing of mushrooms, final packaging of end products in cans, and sales in foreign markets. Similarly, PepsiCo and Nijjer Agro Foods Ltd. were found to have a high level of market coordination in their activities. These firms procure raw potatoes, tomatoes and chilies under contract farming arrangements and sold its finished products (potato chips, tomato and chili paste) in both national and international markets under pre-negotiated conditions. Medium-sized firms had either medium or high levels of market coordination. Small units operate in small local markets that rarely transcend state boundaries. Because most small companies produce traditional products, their sales are further limited by the small size of these markets in terms of demand. Medium sized units largely covered regional and state markets, yet their market penetration is low. Larger companies operate in national and global markets, tend to view their market as sufficiently large, and are confident of expanding their market. For example, Pepsi Co sells its potato chips throughout the country, while the mushroom processor exports its products to the US, EU, and other developed Asian countries.

In Punjab, some of the large scale firms have strong backward linkages within and outside the state. For example, the Nijjer Agro in Punjab is successful in sourcing raw materials by resorting to backward integration through contract farming and captive farming (Box 4). One of the units imported its raw materials of tomato paste from China to meet the quality standards, particularly related to *lycopene*32 content, fixed by the marketing firm to whom it supplied the final product. Similarly, Pepsi procures raw material from outside the state during the off- season, when potatoes are not produced in Punjab.

Box 4 Overcoming raw material constraints by the Nijjer Agro Ltd

Non-availability of raw material throughout the year has been one of the reasons for the failure of many processing units. Since the production of vegetables and fruits is seasonal, many units have to remain idle during the off-season, which increases their overhead and production costs, leading to unviable finance. The success of Nijjer Agro Ltd., in processing of vegetables is attributed to a good network of value-chain and adoption of multi-utility lines which facilitate cheaper and regular procurement and processing of vegetables. The multi-utility units optimize overheads and other capacities by diversifying product types and product ranges. The required raw materials are organized by entering into contract farming as well by practicing captive farming through leasing-in of land. The processing unit is optimally using the installed capacity through these arrangements.

To sum up the markets for HVCs are thin, fragmented and unorganized, which lead to inefficiencies in marketing. The farmers' share in retail price is low in the existing supply chains. However, innovative marketing arrangements are evolving. One way is by creating farmers' markets that bring farmers and consumers together at one place by eliminating middlemen. But transactions through such markets are limited and concentrated around urban centres. More recently, agri-business is entering in HVCs for export, retailing and processing. Punjab is encouraging corporate houses for promoting contract farming to replace a sizable area under rice-wheat system that is threatening the sustainability of farming in the state. Poor infrastructure, absence of organized retailing and farmers' (particularly smallholders) instinct for food security pose as serious constraints in up-scaling the success of contract farming. However, given the scale of operations and the pace of growth of the organized food industry, back-end operations will scale up rapidly inducting more and more suppliers i.e. farmers, big or small for feeding these stores. Similarly there will tremendous pressure to build up the processing mechanism in place to ensure sustainability. Therefore what will be essential are massive investments in R & D in production techniques, extension services, and infrastructure. These in turn will steer in incentives and insurance for the farmers who are most vulnerable to production and market risks.

Chapter 3

Agro– Socio – Economic Profile of the Study Region

This Chapter has been divided into four sub-heads:

3.1 Backdrop

3.2 Socio-Economic Profile of the Study Region

3.3 Importance of Study Crops in Agricultural Scenario of State

3.4 Socio-Economic Characteristics of the Sample Farmers

3.1 Backdrop

The study on emerging marketing channel for fruits and vegetables in Punjab state and its comparison with traditional marketing channel is conducted to observe the supply chain and the benefits accruing to farmers in both the systems. Punjab is the leading agricultural state of country with total area of 50362 square kilometer occupying 1.53 per cent of country's total geographical area. On account of its climatic conditions, Punjab however, is not a very important producer of horticultural crops in country. National Horticulture Mission (NHM) launched by the Government of India is being implemented in Punjab to promote growth of the horticulture sector covering fruits and vegetables. The area under fruits has increased from 30 thousand hectares in 1999-2000 to 67.55 thousand hectares in 2009-10. During the same time period the area under vegetables in state increased from 101.70 to 183.35 thousand hectares. During 2009-10, Punjab accounted for 1.07 and 1.91 per cent of total area under fruits and vegetables in India respectively. Share of state in total production of fruits and vegetables of country was 2.29 and 2.63 per cent, respectively (Table 3.1.1). The present study has been conducted in state for two major horticultural crops namely potato and kinnow.

Potato is the most important vegetables crop of state occupying 45.29 per cent of the total area under vegetable crops with 60.10 per cent share in total vegetable production in the state. Similarly, citrus is one of the most important fruit of country as well as of state. Among different citrus species commonly grown in Punjab, kinnow mandarin occupies a prominent position with respect to acreage and production. During 2009-10 it accounted for about 58 per cent of total area and 64.20 per cent in state production of fruits (Table 3.1.2). In case of potato, as per traditional practice, the produce is sold in the regulated market by the farmers to the wholesalers through the commission agent. Mostly farmers take their produce to their known commission agent with whom they have been making transactions since long time. The function of the commission agent is to facilitate the marketing process for which

commission is charged from the purchaser/wholesaler. Wholesaler further sells the produce to retailers which finally reaches consumer through retailer. As most of the potato output of state is transacted through this channel, it has been taken as Traditional Marketing Channel (TMC). In recent times, Pepsico Company also started the purchase of some specific varieties of potato from the farmers keeping in view their quality specifications leading to the elimination of a number of intermediaries in potato marketing. In this case farmers have to transport their produce at the door steps of Pepsico for sale. This channel has been identified as the Emerging Marketing Channel (EMC) for this crop. In order to study the marketing operations followed in TMC and EMC in potato, Jalandhar being the largest potato producing district of state was selected purposively.

Traditionally, the kinnow orchards are leased out by growers to the pre-harvest contractors. Such contracts are undertaken only for a season and price is determined by pre-harvest contractor through looking at the condition of orchard, expected yield and price in the previous season. Farmers prefer this channel due to the difficulties in watch and ward, picking of fruits, to avoid the risk of price and other marketing related responsibilities like packing, grading, transportation, etc. This channel has been taken as the Traditional Marketing Channel (TMC) for the kinnow. In recent years many farmers has started retaining their orchards for marketing the produce themselves especially in the farmers' evening markets, thus eliminating the role of pre-harvest contractor. This channel has been taken as an Emerging Marketing Channel (EMC) in order to observe if this change in supply chain has reduced inefficiencies in agricultural marketing which arise due to multi-layer intermediaries operating with high margins and depriving the farmer a fair share in the price paid by final consumer. In order to study marketing operations in TMC and EMC of kinnow, Ferozepur district covering more than half of the total area under kinnow in state was selected purposively.

Table 3.1.1: Share of Punjab in area and production of fruits and vegetables in India (2009-10)

Particulars	**Fruits**		**Vegetables**	
	Area (000 ha)	**Production (000 mt)**	**Area (000 ha)**	**Production (000 mt)**
Punjab	67.55	1365.06	183.35	3521.55
India	6326	71516	8011	134102
Share (%) of Punjab	1.07	1.91	2.29	2.63

Source: GOP (2010), Statistical Abstract, Punjab

Table 3.1.2: Area and production of potato and kinnow in Punjab (2009-10)

Particulars	Area (000 ha)	Production (000 mt)
Potato	83.1	2116.5
% share in total Vegetable	45.29	60.10
Kinnow	38.84	876.36
% share in total fruits	57.49	64.20

Source: GOP (2010), Statistical Abstract, Punjab

3.2 Socio-Economic Profile of the Study Region

Location and Geographical Units

The Punjab state lies between the 29°33'-32°3'N latitude and 73°53'- 76°55'E longitude and is bounded on the, west by Pakistan, on the north by Jammu and Kashmir, on the north-east by Himachal Pradesh and on the south by Haryana and Rajasthan. Study district Jalandhar is located on the intensively irrigated central plain region of state between the Beas and Sutlej rivers. It is surrounded by Ludhiana district in east, Kapurthala in west, Hosiharpur in north and Moga in south. The district Ferozepur is situated in south-western region of state along the India Pakistan border. Ganganagar district of state Rajasthan touches the boundaries on the south-west side of this district and the united stream of the Sutlej and Beas generally separates it from the Tarntaran district in the north-west. Each of the selected districts consists of 5 tehsils/subdivisions and 10 development blocks. The number of inhabited villages in these districts was 1003 and 954, respectively. The geographical area of Jalandhar and Ferozepur districts is 2660 square km. and 5850 square km covering 5.28 per cent and 11.61 per cent of the total geographical area of the State, respectively.

The topography of the selected districts is generally plain of alluvial formation. However, the south east side of Ferozepur district which is dominated by the light soils has brackish underground water. The climate of both districts is on the whole, dry and is characterized by hot summer, a short rainy season and a bracing with winter. The cold season is from November to March, followed by the summer season which lasts up to about end of the June. January happens to be the coldest month when the minimum temperature occasionally drops to about the freezing point of water. June is generally the hottest month and on individual days, the maximum temperature may be above 45°C. The period from July to the middle of September constitutes the monsoon season. The latter half of September and

October may be termed as the post-monsoon or the transition period. About 70 percent of the annual rainfall in the both of the districts is received during the period from July to September. Some rainfall occurs during the pre-monsoon months, mostly in the form of thunder showers. In the winter season, some rainfall occurs under the influence of westerly disturbances.

Socio-Economic Indicators

The selected socio-economic indicators of the study districts as well as of Punjab state are presented in Table 3.2.1. According to 2001 census, total population of Jalandhar district and Ferozepur district constituted 8.06 per cent (19.63 lakh) and 7.17 per cent (17.46 lakh) of the total state population, respectively. The number of females after 1000 males was found 887 in Jalandhar and 885 in Ferozepur district. The population density per square km which was 746 and 329 in the respective districts indicated that Jalandhar district was densely populated. Jalandhar district was found more urbanized as about 52.51 per cent of its population lived in urban area as against only 25.81 per cent in case of Ferozepur district. The overall rural literacy was also more (78 per cent) in Jalandhar as compared to Ferozepur district (60.70 per cent).

During 2009-10, the cropping intensity in Jalandhar and Ferozepur districts was found to be 175 and 184 per cent, respectively. Area put under high yielding varieties was found out to be 81 and 75 per cent of the gross cropped area in Jalandhar and Ferozepur districts, respectively. Though, almost whole of the net sown area in these two districts was irrigated, yet the source of irrigation was found much different. In Jalandhar district, under groundwater is providing assured irrigation to 98.31 per cent of the total net area sown as compared to that of 66.03 per cent in Ferozepur district. The rest of the area depended on Government canals in the respective districts. Electricity use in agriculture constituted 27.98 and 52.77 per cent of the total electricity consumption in Jalandhar and Ferozepur districts, respectively. Use of fertilizer, the most important agricultural input was found out to be relatively high at 502 kg per ha in Jalandhar district as compared to that 0f 410 kg per ha in Ferozepur district. Similarly the number of tractors for every thousand hectare of net sown area was higher in case of Jalandhar district (146) as compared to Ferozepur district (122). Productivity of foodgrains which accounted for 81.19 and 75.98 per cent of the gross cropped area in Jalandhar and Ferozepur districts, respectively was found to be much higher in Jalandhar district (6650 kg/ha) as compared to the that in Ferozepur district (3988 kg/ha).

Table 3.2.1: Selected socio-economic indicators of sample districts and Punjab

Particulars		Jalandhar	Ferozepur	Punjab
Population (2001)	Total (thousand)	1962.7	1746.11	24358.99
	Rural (thousand)	1030.72	1295.38	8262.51
	Urban (thousand)	931.98	450.73	16096.49
	Rural agricultural workers (% is to total workers)	52.52	74.19	66.08
Population Density (per sq km.)		746	329	484
Female per thousand males		887	885	876
Percentage of SC Population to total		37.69	22.82	28.85
Percentage of ST Population to total		-	-	-
Rural Literacy rate (percent) 2001		73.9	45.3	64.7
Human Development Index (2000)		NA	NA	0.537
Percentage of rural families below poverty line (2002)		NA	NA	9.1
Per capita income at current prices at 1999-00 series in Rs.		NA	NA	62153
Share of agriculture sector in GDP/SDP (in 2007-2008 current prices)		NA	NA	29.01
Average annual rainfall (mm), 2009-10		543.90	170.9	384.9
Average size of holdings (2000-01)		5.41	6.02	3.95
Percentage of irrigated area to net sown area (2008-09)		100	99.80	97.40
Percent of groundwater irrigated area to NIA (2004-05)		98.31	66.03	72.59
Electricity use in Agriculture (% to total) 2008-09		27.98	52.77	33.54
Cropping intensity (%) 2009-10		177.64	184.42	189.69
No. of fair price/ration shops per lakh population		NA	NA	13989
No. of banking offices per lakh population		28	12	18
No. of regulated markets per Sq. Km (2008-09)		239	482	345
Total road length per lakh population (2008-09)		241	262	256
Input use:				
	Fertiliser (kg/ha) (2008-09)	502	410	447
	HYVs area of wheat and paddy (%), 2008-09	100	100	100
	HYVs coverage as % of GCA (2008-09)	81	75	81.6
	Wheeled Tractors (per 000 ha of NSA) 2010	146	122	120
Area under major crops (percent to GCA): 2009-10*				
	Total Cereals	81.00	75.47	81.90
	Total Pulses	0.19	0.51	0.24
	Total Foodgrains	81.19	75.98	82.14
	Total Oilseeds	1.78	0.67	0.78
	Sugarcane	1.66	0.11	0.76
	Cotton	0.00	14.38	6.46
	Fruits and Vegetables	5.88	3.21	2.31
Productivity (kg/ha): 2009-10				
	Total Cereals	6663	4010	4156
	Total Pulses	1000	689	784
	Total Foodgrains	6650	3988	4146
	Total Oilseeds	1480	1610	1345
	Sugarcane	6058	6222	6167
	Cotton	0	563	668

Source: GOP (2010), Statistical Abstract, Punjab

Classification of Workers

Overtime, though agricultural sector of Punjab experienced a decline in the importance in terms of its share in GSDP and work force, yet it remains the single most important sector of the state economy. As per 2001 census data total main workers and marginal workers constituted the 85.85 and 14.15 per cent of the total workforce in state. The workforce of state was 9127474, out of which 3554928 were dependent on agriculture and allied activities (Table 3.2.2). Cultivators and agricultural labours directly dependent on agriculture accounted for about 39 percent of the total workforce of state. Out of the total agricultural work force cultivators and agricultural labours accounted for 58.09 and 41.91 per cent, respectively. While in Jalandhar district the main workers constituted 88.55 per cent of the total workforce, in Ferozepur district their share was 82.61 per cent. The share of marginal workers in total workforce was 11.45 and 17.39 per cent in the respective districts. Proportionate share of cultivators and agricultural labours directly dependent on agriculture was found to be much higher in Ferozepur district (36.55 per cent) as compared to that in Jalandhar district (24.97 per cent). The reason behind is the relative higher industrialization and urbanization of Jalandhar district.

Table 3.2.2: Classification of main & marginal workers in sample districts and Punjab

(Population Census 2001)

Class of Workers	Jalandhar		Ferozepur		Punjab	
	No.	***% to Total workers***	***No.***	***% to Total workers***	***No.***	***% to Total workers***
Cultivators	94511	13.96	198722	30.64	2065067	22.62
Agricultural Labourers	74501	11.01	166785	25.71	1489861	16.32
Workers engaged in Household Industries	30161	4.46	16631	2.56	333770	3.66
Others	477662	70.57	266538	41.09	5238776	57.40
Total main worker	599324	88.55	535889	82.61	7835732	85.85
Total marginal worker	77511	11.45	112787	17.39	1291742	14.15
Total main & marginal workers	**676835**	**100.00**	**648676**	**100.00**	**9127474**	**100.00**

Source: GOP (2010), Statistical Abstract, Punjab

Land Use Pattern

The total geographical area of the state is 50.36 lakh ha. During 2009-10, the net sown area was at 41.71 lakh ha which indicated that about 83 per cent of the area in state is already under cultivation. As indicated by the data given in Table 3.2.3, state has been virtually reached the saturation point in the matter of addition to the physical area horizontally. The

forest wealth of state is very poor with only 5.88 per cent of the total area under the forest cover. The area under permanent barren and unculturable land has been almost found to be negligible at 0.46 per cent of the state area for last many years. District wise, out of total geographical area, about 89 and 81 per cent was under cultivation in Jalandhar and Ferozepur districts, respectively. The proportionate area under forest cover and that put to non-agricultural uses in Jalandhar district was found to be only at 1.88 and 9.02 per cent, respectively. In Ferozepur district area under forest and non-agricultural uses was 9.02 and 6.67 per cent of the geographical area.

Table 3.2.3: Land use pattern in sample districts and Punjab

Sr. No.	District	Total Geographical Area (000' Ha)	Area under Forest	Land Not Available for Cultivation		Other un-cultivated land	Fallow land		Net Area Sown
				Land put to non-agricultural uses	Barren and Un-cultivable land		Current Fallow	Other Fallows	
1.	Jalandhar	266	5 (1.88)	24 (9.02)	-	-	-	-	237 (89.10)
2.	Ferozepur	585	12 (9.02)	39 (6.67)	-	-	-	-	475
3	Punjab	5036	296 (5.88)	494 (9.81)	23 (0.46)	2 (0.04)	38 (0.75)	1 (0.02)	4171 (82.82)

Source: GOP (2010), Statistical Abstract, Punjab.
Figures in parenthesis denotes per cent share in total geographical area

Land Holdings

The information on distribution of operational holdings in districts of Jalandhar, Ferozepur and in state of Punjab during 2000-01 is depicted in Table 3.2.4. The figure shows that during 2000-01 there were total 10.04 lakh operational holdings in state, out of which about 32 per cent were small and marginal holdings. The proportionate share of semi-medium, medium and large farm holdings in state was 31.85, 29.44 and 7.06 per cent, respectively and average size of holding in state was 3.95 ha. In Jalandhar district the proportion of smaller size holdings was relatively more as compared to that in Ferozepur district with average size of holdings in respective districts at 5.41 and 6.01 ha. As compared to 17 per cent in district of Ferozepur, the small and marginal holdings accounted for about 25 per cent of the total holdings in Jalandhar district. On the other hand large holdings constituted 9.90 and 16.02 per cent of the total holdings in Jalandhar and Ferozepur districts, respectively.

Table 3.2.4: Number of operational holdings in sample districts and Punjab (2000-01)

District	Marginal (<1 ha)	Small (1-2 ha)	Semi-medium (2-4ha)	Medium (4-10 ha)	Large (>10 ha)	Total	Av. Size of holdings (ha)
Jalandhar	3912 (8.94)	7041 (16.09)	14108 (32.23)	14379 (32.85)	4332 (9.90)	43772 (100)	5.41
Ferozepur	4120 (5.22)	9305 (11.80)	22523 (28.56)	30286 (38.40)	12634 (16.02)	78868 (100)	6.02
Punjab	**134762 (13.42)**	**183062 (18.22)**	**319933 (31.85)**	**295749 (29.44)**	**70960 (7.06)**	**1004466 (100)**	**3.95**

Source: GOP (2010), Statistical Abstract, Punjab
Figures in parenthesis denotes the per cent share in total

Irrigation

Source wise irrigated area in study districts along with state of Punjab is presented in Table 3.2.5. As indicated by the figures the net irrigated area as proportion to the net cropped area in state was 97.43 per cent. It turns out to be 100 per cent in Jalandhar district and 99.79 per cent in Ferozepur district.

Table 3.2.5: Source wise area irrigated in sample districts and Punjab

(Area in Thousand ha)

Sr. No.	District	Irrigated Area by source		Net Area Irrigated (NIA)	% area under groundwater (net)	Net Cropped Area (NCA)	% NIA to NCA	Net Dry land (%)
		Surface	Tubewell &Well					
1	Jalandhar	4	233	237	98.31	237	100	0
2	Ferozepur	161	313	474	66.03	475	99.79	0.21
3	Punjab	1114	2950	4064	72.59	4171	97.43	2.57

Source: GOP (2010), Statistical Abstract, Punjab

In Ferozepur district a negligible area (0.21%) was found to be under dry land agriculture. Proportionate share of tube-wells (electric and diesel) as source of irrigation in net irrigated area was 98.31 and 66.03 per cent in Jalandhar and Ferozepur district, respectively. Surface irrigation (Government canals) turn out to be the source of irrigation

for one third of the net irrigated area in Ferozepur district, while its share in Jalandhar was less than 2 per cent.

Cropping Pattern

The cropping pattern in study districts and Punjab state is given in Table 3.2.6. It can be observed that cropping pattern of state as well as of the study districts is dominated by the food grains mainly wheat and paddy which together constituted about 80 per cent of the gross cropped area in state. Wheat constituted 40.38 and 45.10 per cent and paddy constituted 38.24 and 29.91 of the gross cropped in Jalandhar and Ferozepur districts, respectively. In Jalandhar district the maize and vegetables were the other important crops. In Ferozepur district cotton and fruits were the other two important crops constituting significant proportion of gross cropped area. Potato accounted for the 4.63 per cent of gross cropped area in Jalandhar district. Whereas kinnow accounted for 0.49 per cent of the gross cropped area in Ferozepur district.

Table 3.2.6: Cropping pattern in sample districts and Punjab, 2009-10

(Percentage to total GCA)

District	Jalandhar	Ferozepur	Punjab
Rice	38.24	29.91	35.41
Wheat	40.38	45.10	44.51
Maize	2.38	0	1.76
Total Cereals	81.00	75.47	81.9
Total Pulses	0.19	0.51	0.24
Total Foodgrains	81.19	75.98	82.14
Sugar-cane	1.66	0.11	0.76
Cotton	0	14.38	6.46
Kinnow	0.06	2.23	0.49
Total Fruits	0.35	2.59	0.85
Potato	4.63	0.11	1.05
Total Vegetables	5.53	0.62	1.46

Source: GOP (2010), Statistical Abstract, Punjab

Infrastructure

The information on infrastructure in districts of Jalandhar, Ferozepur and Punjab state is provided in Tables 3.2.7 to 3.2.9. Out of the total electricity consumption in state, about 33.54 per cent was used in agriculture sector and 22.45 and 35.08 per cent was used in domestic and industrial sector, respectively (Table 3.2.7). Share of agriculture sector in total electricity consumption in Jalandhar and Ferozepur districts was turned out to be 27.98 and 52.77 per cent, respectively. The share of industrial sector in electricity consumption was relatively much higher in case of Jalandhar district (26.09 per cent) in comparison to Ferozepur district (13.70 per cent). In both of the study districts, 100 per cent villages are

electrified and linked with the roads. In comparison to state average of 146 km the road length per square km of area were 210 and 102 km in Jalandhar and Ferozepur districts, respectively (Table 3.2.8). Each of the study districts consists of 11 regulated markets, whereas the number of sub yards was 24 and 14 in the Jalandhar and Ferozepur district, respectively. In Jalandhar district there were 551 bank offices and 254 primary agricultural cooperative societies. The number of same in Ferozepur district was 215 and 310, respectively. There were 92 veterinary clinics and 29 primary health centres in district of Jalandhar as compared to 113 and 34 in Ferozepur district. The total number of registered industrial units in Jalandhar and Ferozepur district were 1982 and 704, respectively.

Table 3.2.7: Sector wise use of electricity in sample districts and Punjab (2008-09)

(Million KWH)

Sr. No.	Particulars	Jalandhar		Ferozepur		Punjab	
		Total use	% to total	Total use	% to total	Total use	% to total
1	Domestic	784.01	31.62	313.61	23.17	7007.49	22.45
2	Commercial	274.30	11.06	78.32	5.79	2032.50	6.51
3	Industrial	646.92	26.09	185.49	13.70	10947.57	35.08
4	Public Lighting	80.38	3.24	61.88	4.57	754.15	2.42
5	Agriculture	693.80	27.98	714.27	52.77	10469.30	33.54
6	Total	2479.41	100	1353.57	100	31211.01	100

Source: GOP (2010), Statistical Abstract, Punjab

Table 3.2.8: Road length by type of road in sample districts and Punjab

Road	Jalandhar	Ferozepur	Punjab
National Highway (Kms)	70 (1.27)	205 (3.80)	1330 (1.81)
State Highway (Kms)	3963 (71.73)	4756 (88.10)	58517 (79.52)
Other Roads (Kms)	1491 (27.00)	438 (8.10)	13737 (18.66)
Roads per sq. kms of area (km)	210	102	146
Roads per lakh of population (km)	241	262	256
Total Roads (Kms)	5524	5399	73584

Source: GOP (2010), Statistical Abstract, Punjab

Table 3.2.9: Other important development indicators of sample districts and Punjab

Particulars	Jalandhar	Ferozepur	Punjab
Area (Sq. Kms.)	2660	5850	50362
Geographical Area (000 Ha)	266	585	5036
Total Cropped Area (000 Ha)	421	876	4171
No. of Villages	934	968	12278
No. of Gram-panchayat	901	1126	12775
No. of Towns	14	9	157
No. of Families (000)	364	301	4348.58
Percent of BPL Families (2004-05)*	NA	NA	5.2
No. of Regulated markets	11	11	146
No. of Sub-yards	24	14	294
% of Villages Electrified	100	100	100
% of villages linked with roads	100	100	100
No. of Bank offices	551	215	8269
No. of PACS	254	310	3990
No. of Veterinary Clinics	92	113	1367
No. of Dispensaries & Insemmination Units	92	82	1485
No. of Wells & Tubewells (000)	90.75	133.92	1341.49
Wells with Electric Motors (000)	73.52	92.62	1032.62
Wells with Oil Engines (000)	17.23	41.32	308.87
No. of Industrial Units (Registered)	1982	704	17517
No. of Poultry Birds (000)	2885.08	176.08	18999.70
No. of Goats (000)	13.96	32.70	286.39
No. of Buffaloes (000)	248.97	392.11	5035.63
No. of Local Cows (000)	8.43	47.61	275.95
No. of C.B. Cows (Actual) (000)	96.92	102.05	1062.80
No. of Bullocks (000)	15.38	34.41	423.86

Source: GOP (2010), Statistical Abstract, Punjab
***Economic Survey, Punjab, 2009-10**

State Income

The sector wise total and per capita state income at constant (2004-05) and current prices is presented in Table 3.2.10. It can be observed that in 2009-10 at constant prices, the agriculture sector contributed about 24 per cent of the Gross State Domestic Product (GSDP). The respective share of secondary and territory sector in GSDP was about 32 and 44 per cent. Per capita state income during 2009-10 was recorded at Rs 43539 at constant prices (Rs 62153 at current prices).

Table 3.2.10: Sector-wise total and per capita income, Punjab, 2009-10

(Rs. Crore)

Sl. No.	Area	At Constant Prices		At Current Prices	
		Gross Domestic Income	Net Domestic Income	Gross Domestic Income	Net Domestic Income
1.1	Agriculture & Livestock	33397.37	31182.97	55257.02	52223.28
1.2	Forestry & Logging	1382.05	1360.75	2116.66	2089.39
1.3	Fishery	317.97	269.84	411.80	360.92
1.4	Mining and Quarrying	40.20	34.66	75.71	61.35
Primary Sector		35137.59	32848.22	57860.99	54734.94
2.1	Manufacturing	27181.79	22553.93	35530.12	29748.24
2.2	Registered	16576.86	13027.60	22170.08	17791.27
2.2	Unregistered Manufacturing	10604.93	9526.33	13360.04	11956.97
2.3	Construction	12387.64	11758.76	17016.45	16243.64
2.4	Electricity , Gas and Water supply	4904.04	2896.38	5072.11	1862.73
Secondary Sector		44473.47	37209.07	57618.68	47854.61
3.1	Railway	1669.05	1271.35	2012.69	1575.30
3.2	Transportation by other means and Storage	4719.85	3956.43	6711.61	5774.61
3.3	Communication	3055.32	2793.35	2750.92	2417.22
3.4	Trade Hotels and Restaurants	15717.96	14766.91	24747.36	23556.31
3.5	Banking and Insurance	10006.34	9884.94	9409.50	9272.33
3.6	Real estate, ownership of dwellings	6994.09	4748.23	11227.58	8147.51
3.7	Public Administration	6692.67	5354.19	9132.68	7438.14
3.8	Other Services	12516.06	11283.34	17986.69	16408.10
Territory Sector		61365.34	54058.74	83979.03	74589.52
Total State Income		140976.40	124116.03	199458.70	177179.07
Per capita State Income (Rs.)			43539		62153

Source: GOP (2010), Statistical Abstract, Punjab

3.3 Importance of study crops in agricultural scenario of State

Status of potato in Punjab

Potato, popularly known as the king of vegetables and a native of South America, has now become an indispensable part of Indian cuisine. It is ranked 4th in terms of important staple food after wheat, rice and maize. Potato is rich in carbohydrates, comprising 22-24%. About 60 % of potato is used for table purpose and 20 % as seed. A very small quantity

(0.5%) is processed and only 0.03 % is exported to Sri Lanka, Nepal, Mauritius, Singapore, UAE and Japan while the rest is lost in post harvest handling.

The total potato production in India has been stagnant at nearly 20 million tonnes from 1.30 million hectares until 2005-06 which increased to 30 million tonnes from 1.50 million hectares in 2008 and again declined to 25 million tonnes from 1.40 million hectares in 2009. The major potato producing states are Uttar Pradesh producing 39% of total production followed by West Bengal (35%), Gujarat (6%), Punjab (5%), Bihar (4%), MP and Assam (2% each) and Karnataka (1%). In Punjab during 2000-01 to 2009-10, the area under potato varied between 57 to 80 thousand hectares and the production ranged between 11-21 lakh tonnes. The area under potato during 2008-09 and 2009-10 was 81 and 83 thousand hectares respectively. The corresponding production was 20 and 21 lakh metric tonnes.

District-wise area and production of Potato

The district-wise potato area and proportionate share in total area of major potato growing districts of state is presented in Table 3.3.1 and 3.3.2. Similarly, the district wise potato production and proportionate share of major potato producing districts in total state production is depicted in Table 3.3.3 and 3.3.4. It can be observed that about two- third area of the total area under potato cultivation fall in five districts, namely, Jalandhar, Hoshiarpur, Kapurthala, Ludhiana and Bathinda. During 2009-10, Jalandhar was the leading district with 25.35 per cent share in total potato production in state. Among other major districts, Hoshiarpur accounted for 19.08 per cent of state production of potato followed by Kapurthala (8.88 per cent), Bathinda (7.20 per cent) and Ludhiana (6.83 per cent).

Table 3.3.1: Area under potato of major growing districts, Punjab

(000ha)

Year	Jalandhar	Kapurthala	Hoshiarpur	Ludhiana	Bathinda	Punjab
2000-01	14.8	7.2	13.3	5.8	3.5	59.6
2001-02	12.7	8.5	8.0	6.3	3.5	57.2
2002-03	16.8	8.5	8.0	7.6	4.8	67.4
2003-04	17.1	7.8	7.8	7.7	4.8	66.4
2004-05	18.4	8.4	7.7	7.9	5.4	67.8
2005-06	21.4	12	8.1	7.8	7.2	70.8
2006-07	17.4	14.6	7.6	8.0	7.2	75.6
2007-08	20.4	15.5	6.9	10.8	8.3	89.8
2008-09	21.4	13.2	6.8	7.9	6.6	82.1
2009-10	19.5	7.2	16.8	5.4	6.1	83.1

Source: GOP (2010), Statistical Abstract, Various issues, Punjab

Table 3.3.2: Share of major potato growing districts in total area under potato, Punjab

(% to state total)

Year	Jalandhar	Kapurthala	Hoshiarpur	Ludhiana	Bathinda	Punjab
2000-01	24.83	12.08	22.32	9.73	5.87	100.00
2001-02	22.20	14.86	13.99	11.01	6.12	100.00
2002-03	24.93	12.61	11.87	11.28	7.12	100.00
2003-04	25.75	11.75	11.75	11.60	7.23	100.00
2004-05	27.14	12.39	11.36	11.65	7.96	100.00
2005-06	30.23	16.95	11.44	11.02	10.17	100.00
2006-07	23.02	19.31	10.05	10.58	9.52	100.00
2007-08	22.72	17.26	7.68	12.03	9.24	100.00
2008-09	26.07	16.08	8.28	9.62	8.04	100.00
2009-10	23.47	8.66	20.22	6.50	7.34	100.00

Source: GOP (2010), Statistical Abstract, Various issues, Punjab

Table 3.3.3: Production of potato in major producing districts, Punjab

(000' mt)

Year	Jalandhar	Kapurtahala	Hoshiarpur	Ludhiana	Bathinda	Punjab
2000-01	272.4	158.2	224.7	129.3	77.4	1166
2001-02	249.3	175	129.1	151.4	92.4	1147.1
2002-03	333.3	175.2	129.5	175.3	113.2	1390
2003-04	342.1	146.6	102.8	175.3	126.6	1381.6
2004-05	400.0	179.3	115.6	156.1	125.9	1400.4
2005-06	350.1	172.7	106	144.6	115.2	1137.9
2006-07	227.3	308.2	103.9	184.2	125.5	1352.5
2007-08	413.2	325.2	96.4	213.1	115.9	1713.8
2008-09	552.4	296.3	155.1	202.4	165.9	2013.5
2009-10	536.6	187.9	403.9	144.6	152.4	2116.5

Source: GOP (2010), Statistical Abstract, Various issues, Punjab

Table 3.3.4: Share of major potato producing districts in total potato production, Punjab

(% to state total)

Year	Jalandhar	Kapurtahala	Hoshiarpur	Ludhiana	Bathinda	Punjab
2000-01	23.36	13.57	19.27	11.09	6.64	100.00
2001-02	21.73	15.26	11.25	13.20	8.06	100.00
2002-03	23.98	12.60	9.32	12.61	8.14	100.00
2003-04	24.76	10.61	7.44	12.69	9.16	100.00
2004-05	28.56	12.80	8.25	11.15	8.99	100.00
2005-06	30.77	15.18	9.32	12.71	10.12	100.00
2006-07	16.81	22.79	7.68	13.62	9.28	100.00
2007-08	24.11	18.98	5.62	12.43	6.76	100.00
2008-09	27.43	14.72	7.70	10.05	8.24	100.00
2009-10	25.35	8.88	19.08	6.83	7.20	100.00

Source: GOP (2010), Statistical Abstract, Various issues, Punjab

Status of kinnow in Punjab

Underlining the importance of horticultural crops, it has been observed that the Punjab state has large potential for cultivation of fruits especially the citrus. Among the citrus fruits, kinnow fruit cultivation in Punjab gained momentum among the fruit growers due to its profitability and good market value. Out of the total 67553 hectares under fruit cultivation in state, kinnow farming is carried out on 38837 hectares, thus accounting for about 58 per cent of the total area under fruits. Kinnow originated as a hybrid of king and willow leaf mandarins (*Citrus nobilis* × *C. deliciosa*) at Riverside, California (Sharma *et al.,* 2007). Kinnow fruits are medium oblate base flattered, deep orange yellow in colour and very juicy and have lot of market potential, which can help in increasing the farm income. The south-western region of Punjab comprising Ferozepur, Muktsar, Bathinda and Mansa districts is known as kinnow belt as it accounts for nearly 70 per cent of the total area under this fruit in the state.

District-wise area and production of kinnow

Though the Punjab state is the leading state in kinnow production, area under its cultivation is concentrated in a few districts. The district-wise kinnow area and proportionate share in total area of major kinnow growing districts of state is presented in Table 3.3.5 and 3.3.6. Similarly, the district wise kinnow production and proportionate share of major kinnow producing districts in total state production is depicted in Table 3.3.7 and 3.3.8. It can be observed from that more than 85 per cent of the total area under kinnow cultivation fall in four districts, namely, Ferozepur, Hoshiarpur, Muktsar and Bathinda. It is significant to note that Ferozepur district alone constitutes about half of the total area and production of kinnow in state. Among other major districts, Hoshiarpur accounted for 17.46 per cent of state production of kinnow followed by Muktsar (14.56 per cent) and Bathinda (6.89 per cent).

Table 3.3.5: Area under kinnow in major growing districts, Punjab

(ha)

Year	Ferozepur	Hoshiarpur	Muktsar	Bathinda	Punjab
2000-01	5258	2527	1696	570	11434
2001-02	6211	2808	2040	755	13401
2002-03	7183	3074	2251	880	15155
2003-04	8100	3488	2522	1059	17189
2004-05	9076	3934	2793	1270	19360
2005-06	10809	4549	3132	1592	22887
2006-07	13304	5166	3859	1983	27606
2007-08	15237	5661	4499	2380	31788
2008-09	17581	5949	4877	2736	35619
2009-10	19551	6339	5074	2968	38837

Source: GOP (2010), Statistical Abstract, Various issues, Punjab

Table 3.3.6: Share of major kinnow growing districts in total area under kinnow, Punjab

(% to state total)

Year	Ferozepur	Hoshiarpur	Muktsar	Bathinda	Punjab
2000-01	45.99	22.10	14.83	4.99	100.00
2001-02	46.35	20.95	15.22	5.63	100.00
2002-03	47.40	20.28	14.85	5.81	100.00
2003-04	47.12	20.29	14.67	6.16	100.00
2004-05	46.88	20.32	14.43	6.56	100.00
2005-06	47.23	19.88	13.68	6.96	100.00
2006-07	48.19	18.71	13.98	7.18	100.00
2007-08	47.93	17.81	14.15	7.49	100.00
2008-09	49.36	16.70	13.69	7.68	100.00
2009-10	50.34	16.32	13.06	7.64	100.00

Source: GOP (2010), Statistical Abstract, Various issues, Punjab

Table 3.3.7: Production of kinnow in major producing districts, Punjab

(mt)

Year	Ferozepur	Hoshiarpur	Muktsar	Bathinda	Punjab
2000-01	78870	37905	25440	8550	171510
2001-02	93165	42120	30600	11325	201015
2002-03	107745	46110	33765	13200	227325
2003-04	121500	52320	37830	15885	257835
2004-05	136140	59010	41895	19050	290400
2005-06	162135	68235	46980	23880	343305
2006-07	199560	76590	57885	29745	414090
2007-08	292855	103257	86111	40746	591319
2008-09	359180	115660	99686	50403	706645
2009-10	478022	128124	116448	57935	876358

Source: GOP (2010), Statistical Abstract, Various issues, Punjab

Table 3.3.8: Share of major producing districts in total kinnow production, Punjab

(% to state total)

Year	Ferozepur	Hoshiarpur	Muktsar	Bathinda	Punjab
2000-01	45.99	22.10	14.83	4.99	100.00
2001-02	46.35	20.95	15.22	5.63	100.00
2002-03	47.40	20.28	14.85	5.81	100.00
2003-04	47.12	20.29	14.67	6.16	100.00
2004-05	46.88	20.32	14.43	6.56	100.00
2005-06	47.23	19.88	13.68	6.96	100.00
2006-07	48.19	18.50	13.98	7.18	100.00
2007-08	49.53	17.46	14.56	6.89	100.00
2008-09	50.83	16.37	14.11	7.13	100.00
2009-10	54.55	14.62	13.29	6.61	100.00

Source: GOP (2010), Statistical Abstract, Various issues, Punjab

3.4 Socio-Economic Characteristics of Sample Farmers

Socio-economic characteristics of sample potato farmers

The socio- economic characteristics of sample farmers for potato crop have been indicated in Table 3.4.1. It can be seen from the table that in case of potato, all the households were Sikhs, owned a ration card and were APL families. Similarly, all the farmers were having pucca houses and mobile phone. Almost fifty per cent of the farmers were having computer and internet facility. Average age of the head of the family was nearly 50 years. Nearly 94 per cent of the farmers following TMC were having tractor, trolley and tiller while all the farmers in EMC were having these facilities at their disposal. Maximum size of farm on farms following TMC was almost double than EMC. Entire land was ground water irrigated in both the categories.

Land holding pattern of sample potato farmers

The landholding pattern of selected households and irrigated area is indicated in Table 3.4.2. In case of potato households, the average operated land was 13.70 hectares while in case of EMC, it was 15.64 hectares. Thus, EMC farmers had higher farm size operated as compared to TMC. It was observed that ground water facilities were available on total area operated across all the farm households.

Cropping Pattern of Sample Potato Farmers

The cropping pattern of selected households is indicated in Table 3.4.3. In *kharif* season paddy was the major crop with 10.64 ha. being the area per household. In *rabi* season, wheat and potato were the major crops with 5.96 and 9.04 hectare being the area per household. After digging of potato crop, various zaid season and summer season crops were grown by the sample households. The cropping intensity ranged between 232 - 257 per cent on the selected households.

Table: 3.4.1: Socio-economic characteristics of sample farmers -Potato

Particulars	Potato	
	TMC	EMC
A. Religion and Caste of Farm Household		
% of Hindu Household	0.00	0.00
% of Muslim Household	0.00	0.00
% SC household	0.00	0.00
% ST household	0.00	0.00
% OBC household	0.00	0.00
% Other households (Sikhs)	100.00	100.00
B. Household Characteristics		
% Of household owning a ration card	100.00	100.00
% Of APL household	100.00	100.00
%Of BPL household	0.00	0.00
% Of pucca house	100.00	100.00
% of kuccha & semi-kuccha house	0.00	0.00
% Household Owning telephone landline	37.14	20.00
% Of household owning at least one mobile phone	94.25	100.00
% Of household owning at computer	56.14	50.00
% Of household owning internet	20.00	40.00
% Of household owning internet as well as computer	20.00	40.00
C. Head of The Household		
Avg. Age of head (years)	49.60	47.60
% Female head of household	0.00	0.00
Years of avg. Education of the head	7.29	10.7
D. Education of the household member *(% to total)*		
Av. Education of the household members (years)	63	55
% Household member with primary education	22.86	20.00
% Household member with matriculate education	51.43	50.00
% Household member -graduation education	14.28	20.00
% household member who have completed post-graduation	11.42	10.00
E. Transport, farm, and storage assets		
% of owning Bullock Cart	31.43	20.00
% of owning Tractor	94.29	100.00
% of owning Trolley	94.29	100.00
% of owning Harvest	0.00	0.00
% of owning Bicycle	85.71	90.00
% of owning Motorcycle	94.14	100.00
% of owning Four-wheeler	68.57	50.00
% of owning Tiller	94.29	100.00
% of owning Pumpset	100.00	100.00
.F. Landholding		
Maximum size of the farm (ha)	71.20	36.0
Minimum size of the farm (ha)	2.0	2.0
Median size (ha)	12.0	14.8
% Own land	100.00	100.00
%Leased land	74.29	80.00
% Dry land farmer	0.00	0.00
% Of irrigated farmer (groundwater)	100.00	100.00
% Of irrigated farmer (surface)	0.00	0.00

Source: Field Survey Data.

Table 3.4.2: Land holdings and irrigated area of selected potato farmers

(Area in ha)

Sr. No	Land Details	Potato		
		TMC	EMC	Overall
A	**Total Owned Land**			
1	Dry land	0.00	0.00	0.00
2	Surface Irrigated	0.00	0.00	0.00
3	Well Irrigated	3.34	5.64	3.80
4	Total Irrigated	3.34	5.64	3.80
5	Total land	3.34	5.64	3.80
B	**Leased-in land**			
1	Dry land	0.00	0.00	0.00
2	Surface Irrigated	0.00	0.00	0.00
3	Well Irrigated	10.36	10.00	10.28
4	Total Irrigated	10.36	10.00	10.28
5	Total land	10.36	10.00	10.28
C	**Leased Out land**			
1	Dry land	0.00	0.00	0.00
2	Surface Irrigated	0.00	0.00	0.00
3	Well Irrigated	0.00	0.00	0.00
4	Total Irrigated	0.00	0.00	0.00
5	Total land	0.00	0.00	0.00
D	**Net Operated Land**			
1	Dry land	0.00	0.00	0.00
2	Surface Irrigated	0.00	0.00	0.00
3	Well Irrigated	13.70	15.64	14.08
4	Total Irrigated	13.70	15.64	14.08
5	Total land	13.70	15.64	14.08
E	**Av. Land holdings**			
1	Own Land	3.34	5.64	3.85
2	By Net Operated Land	13.70	15.64	14.08
3	% NIA to NCA	100.00	100.00	100.00

Source: Field Survey Data.

Table 3.4.3: Cropping pattern of the selected potato farmers

(Area in ha)

Sr. No.	Season/Crops	Potato		
		TMC	EMC	Overall
A	***Kharif***			
1	Paddy	10.64	10.82	10.64
2	Bamati	0.29	2.32	0.74
3	Sugarcane	0.38	0.84	0.47
4	Maize	0.92	0.96	0.93
5	Fodder	1.48	0.7	1.30
B	***Rabi***			
1	Wheat	5.63	7.2	5.96
2	Winter Maize	0.02	0.64	0.16
3	Potato	9.50	7.52	9.04
4	Fodder	0.47	0.28	0.43
C	***Zaid***			
1	Spring maize	2.35	4.00	2.72
2	Muskmelon	0.92	0.18	0.75
3	Watermelon	1.15	0.00	0.90
4	Sunflower	1.02	0.00	0.79
5	Mentha	0.06	0.00	0.04
D	***Summer***			
1	Summer moong	0.03	0.08	0.04
2	Janter	0.41	0.72	0.48
	Cropping intensity (%)	257.37	231.84	251.34

Source: Field Survey Data.

Socio-Economic Characteristics of Sample Kinnow Growers

The socio- economic characteristics of sample kinnow growers are indicated in Table 3.4.4. It can be seen from the table that more than 70 per cent of the selected kinnow growers were belonging to the Hindu religion. About 37 per cent of the kinnow growers following traditional marketing channel (TMC) were the scheduled caste households as compared to about 30 per cent in case of emerging marketing channel (EMC). All the households owned a ration card and all were belonging to the APL families. All the houses were pucca in nature and more than 80 per cent of the kinnow growers owned at least one mobile phone. The heads of the household were about 52 years of age. Most of the household members had the education up to the primary level and more than 90 per cent of these were literate. The Punjab agriculture is highly mechanized as about 94 per cent of the kinnow growers following traditional marketing channel possessed tractors as compared to about 70 per cent in case of emerging marketing channel. Leasing in of land was only prevalent among the kinnow

Table: 3.4.4: Socio –economic characteristics sample selected kinnow growers

Particulars	Kinnow	
	TMC	EMC
A. Religion and Caste of Farm Household		
% of Hindu Household	71.00	70.00
% of Muslim Household	3.00	-
%% Other households	26.00	30.00
% SC household	11.00	-
% ST household	-	-
% OBC household	37.00	30.00
% Other households	52.00	70.00
B. Household Characteristics		
% Of household owning a ration card	100.00	100.00
% Of APL household	100.00	100.00
%Of BPL household		-
% Of pucca house	100.00	100.00
% of kuccha & semi-kuccha house	-	-
% Household Owning telephone landline	11.00	40.00
% Of household owning at least one mobile phone	86.00	80.00
% Of household owning at computer	3.00	40.00
% Of household owning internet	-	10.00
% Of household owning internet as well as computer	-	10.00
C. Head of The Household		
Avg. Age of head (years)	52.40	52.20
% Female head of household	-	-
Years of avg. Education of the head	7.80	7.40
D. Education of the household member *(% to total)*		
Av. Education of the household members (years)		
% Household member with primary education	60.00	58.00
% Household member with matriculate education	20.00	22.00
% Household member -graduation education	8.00	9.00
% household member who have completed post-graduation	4.00	6.00
E. Transport, farm, and storage assets		
% of owning Bullock Cart	54.00	60.00
% of owning Tractor	94.00	70.00
% of owning Trolley	94.00	68
% of owning Harvest		
% of owning Bicycle	100.00	100.00
% of owning Motorcycle	100.00	100.00
% of owning Four-wheeler	54.00	60.00
% of owning Tiller	94.00	70.00
% of owning Pumpset	66.00	50.00
.F. Landholding		
Maximum size of the farm (ha)	24.00	22.00
Minimum size of the farm (ha)	1.800	0.80
Median size (ha)	9.600	7.40
% Own land	100.00	100.00
%Leased- in land	17.00	-
% Of irrigated farmer (groundwater)	66.00	50.00
% Of irrigated farmer (surface)	100.00	100.00
% of Irrigated(ground water +surface)	66.00	50.00

Source: Field Survey Data.

growers following traditional marketing channel to expand the operational size and improve resource use efficiency through economies of size and scale. Canal as well as tube wells were used by the sample kinnow growers for irrigating their orchards. Canal water was used by all the kinnow growers, while about 66 per cent of the kinnow growers in case of TMC and 50 per cent for EMC were also using the owned pump set.

Land Holding Pattern of Sample Kinnow Growers

The landholding pattern of selected households and irrigated area is indicated in Table 3.4.5. In case of kinnow growers, the average operated land was 10 hectares for kinnow growers following traditional marketing channel (TMC) while in case of EMC, it was 8.3 hectares. Leasing in of land was more prevalent among the kinnow growers as compared to leasing out. The irrigation facilities were excellent as all area operated was irrigated across all households.

Cropping Pattern of Sample Kinnow Growers

The cropping pattern of selected households is indicated in Table 3.4.6. The net operated area for the onion farmers under TMC was 3.3 hectares and 1 hectare or 21.7 percent of net operated area was used for onion cultivation while in case of EMC it was 25 percent of net cropped area. Cotton was the major *kharif* crop grown by the kinnow growers as it was grown on about 47 per cent of the NCA (Net cultivated area) during *kharif* season (Table 3.3). Paddy was the other major *kharif* crop grown by the occupying about 3 per cent of NCA. Wheat was the major *rabi* season crop in the study area, grown on about 53 per cent of the NCA during the season. Fodder was grown in more than 3 per cent of the NCA (Net cultivated area) during the season. Kinnow is the important fruit and the NCA under the crop was about 43 and 37 per cent for farmers under TMC and EMC respectively.

Table 3.4.5: Land holdings and irrigated area of selected kinnow growers ***(Area in ha)***

Sr.No.	Land Details	Kinnow		
		TMC	EMC	Overall
A	**Total Owned Land**			
1	Dry land	-	-	-
2	Surface Irrigated	9.50	8.30	9.20
3	Well Irrigated	-	-	-
4.	Both(Surface+well)	7.30	6.0	6.50
5	Total Irrigated	9.50	8.30	9.20
6	Total land	9.50	8.30	9.20
B	**Leased-in land**			
1	Dry land	-	-	-
2	Surface Irrigated	0.70	-	0.60
3	Well Irrigated	-	-	-
4.	Both(Surface+well)	0.60	-	0.50
5	Total Irrigated	0.70	-	0.60
6	Total land	0.70	-	0.60
C	**Leased Out land**			
1	Dry land	-	-	-
2	Surface Irrigated	0.20	-	0.10
3	Well Irrigated	-	-	-
4.	Both(Surface+well)	0.20	-	0.10
5	Total Irrigated	0.20	-	0.10
6	Total land	0.20	-	0.10
D	**Net Operated Land**			
1	Dry land	-	-	-
2	Surface Irrigated	10.0	8.30	9.80
3	Well Irrigated	-	-	
4	Both(Surface+well)	7.70	6.0	7.0
5	Total Irrigated	10.0	8.30	9.80
6	Total land	10.0	8.30	9.70
E	**Av. Land holdings**			
1	Own Land	9.50	8.30	9.20
2	By Net Operated Land	10.0	8.30	9.70
3	% NIA to NCA	100.0	100.0	100.0

Source: Field Survey Data.

Table 3.4.6: Cropping pattern of the selected kinnow growers

Sr. No.	Season/Crops	Kinnow		
		TMC	EMC	Overall
A	***Kharif***			
1	Bt-Cotton	4.80 (48.10)	3.60 (43.30)	4.53 (47.20)
2	Paddy	0.20 (1.60)	0.90 (11.10)	0.33 (3.40)
3	Guara	0.13 (1.30)	-	0.10 (1.0)
4	Maize	0.07 (0.70)	-	0.06 (0.60)
5	Fodder	0.40 (3.80)	0.40 (5.10)	0.39 (4.1)
B	***Rabi***			
1	Wheat	5.10 (51.50)	4.70 (56.80)	5.05 (52.50)
2	Sarson	0.10 (0.60)	-	0.04 (0.5)
3	Gram	0.05 (0.50)	-	0.04 (0.4)
4	Fodder	0.40 (3.60)	0.40 (5.1)	0.37 (3.9)
C	***Summer***			
1	Moungbean	0.14 (1.40)	-	0.11 (1.1)
D	**Perennial**			
1	Kinnow	4.20 (42.5)	3.0 (36.60)	3.98 (41.40)
2	Guava	0.03 (0.3)	0.20 (2.40)	0.03 (0.3)
3	Malta	0.02 (0.2)	0.040 (0.50)	0.03 (0.3)
4	Kinnow Nursery	0.05 (0.5)	0.040 (0.50)	0.04 (0.5)
5	Plum	0.02 (0.2)	-	0.02 (0.2)
6	Peach	0.02 (0.2)	--	0.02 (0.2)
7	Beri	0.01 (0.05)	-	0.04 (0.40)
Cropping Intensity		157.40	161.40	157.70
NCA		10.0	8.30	9.61
GCA		15.70	13.40	15.20

Source: Field Survey Data.

Chapter 4

Comparison of Benefits and Constraints for Farmers and other agent in the Traditional Marketing Channel and Emerging Marketing Channel

There were many channels followed by the potato and kinnow farmers to sell their produce. But major portion of the produce is still traded through the TMC's due to convenience to the farmers. In Punjab, Apni Mandi concept for the vegetables was introduced with the sole objective of removal of intermediaries. But potato and kinnow trading through this channel is almost negligible. In this chapter an attempt has been made to compare the marketing operations in TMC and EMC and observe the benefits as well as constraints in each channel with the help of field level data collected from sample farmers. This chapter has been divided under two following sub heads:

4.1 Comparison of Benefits and Constraints for TMC and EMC for potato

4.2 Comparison of Benefits and Constraints for TMC and EMC for kinnow

4.1 Comparison of Benefits and Constraints for TMC and EMC for potato

Distribution of sample farmers as per operation holdings:

The profile of the sample potato farmers is briefly discussed before analyzing the marketing operations of TMC and EMC. In Table 4.1.1 the sample farmers are classified according to their land holding size. It can be observed that for the entire sample of potato farmers, maximum (60 percent) were in large farm category with 70 per cent in EMC and about 57 per cent in TMC category. In aggregate there were nearly 26 per cent medium and 13 per cent small farmers.

Table 4.1.1: Distribution of sample households based on operational holding size classification

Sr. No.	Classification	Potato		
		TMC	EMC	Overall
1.	Small (1-2 ha)	5 (14.29)	1 (10.00)	6 (13.33)
2.	Medium (4-10 ha)	10 (28.57)	2 (20.00)	12 (26.67)
3.	Large (10 & >10 ha)	20 (57.14)	7 (70.00)	27 (60.00)
	Total	35 (100.0)	10 (100.0)	45 (100.0)

Source: Field Survey Data.
Note: Figures in parentheses are the per cent to total in each column.

The characteristics of selected households as per land holding classification have been presented in Table 4.1.2. It can be seen from table that the average age of the head of the household for potato farmers was highest in case of small farmers in TMC while it was highest among large farmers in case of EMC. The education of Head of the family was more in EMC as compared to TMC. The average family size was highest for large and small farmers in TMC across the sample size while it was highest for medium farmers in EMC. The major occupation of the selected farmers was agriculture followed by allied activities such as dairy farming.

Table 4.1.2: Characteristics of selected households as per land holding classification

Sr. No.	Characteristics	Potato		
		TMC	EMC	Overall
A	***Av Age of Head (years)***			
1	Small	51.60	38.00	49.33
2	Medium	46.50	39.00	45.25
3	Large	50.65	51.43	50.85
B	***Av. Education of Head (Years)***			
1	Small	5.60	15.00	7.17
2	Medium	8.40	11.00	8.83
3	Large	7.15	10.00	7.89
C	***Av. Family Size (No.)***			
1	Small	6.20	4.00	5.83
2	Medium	4.30	8.50	5.00
3	Large	6.20	4.29	5.70
D	***Main Occupation (% to total)***			
1	**Small**			
a	Agriculture	100.00	100.00	100.00
b	Allied	60.00	0.00	50.00
c	Other	20.00	100.0	33.33
2	**Medium**			
a	Agriculture	100.00	100.00	100.00
b	Allied	60.00	50.00	58.33
c	Other	10.00	10.00	8.33
3	**Large**			
a	Agriculture	100.00	100.00	100.00
b	Allied	70.00	57.14	29.63
c	Other	10.00	14.29	11.11
4	**Average**			
a	Agriculture	100.00	100.00	100.00
b	Allied	63.33	35.71	45.98
c	Other	13.33	41.43	17.59

Source: Field Survey Data.

The method of cultivation and farming practices adopted by farmers are indicated in Table 4.1.3. It can be observed that all the farmers in the sample used fertilizers and besides this 14.29 per cent of the farmers also used organic fertilizers in TMC. All farmers in the sample had irrigation facilities. As far as number of irrigations is concerned, nearly 11 irrigation were given to potato crop by the selected households. No farmer was having the facility of sprinkler and drip irrigation on their farms.

Table 4.1.3: Modern practices and methods of cultivation of selected households

Sr. No.	Particulars	Potato		
		TMC	EMC	Overall
1	Av Area under crop (ha)	9.50	7.52	9.04
2	Fertiliser used			
	a) % of farmers to total	100.00	100.00	100.00
	b) Per ha fertliser use (qtls)	12.85	14.17	12.68
3	Organic/No Fertiliser Use			
	a) % of farmers to total	14.29	0.00	11.11
4	Irrigation Use			
	a) % of farmers to total	100.00	100.00	100.00
	b) No. of Irrigation/ha	11.52	10.78	11.26
	c) Sprinkler-% of farmers to total	0.00	0.00	0.00
	d) Drip-% of farmers to total	0.00	0.00	0.00

Source: Field Survey Data.

The amount of family labour and hired labour in case of potato cultivation is indicated in Table 4.1.4. It can be observed that out of total labour employed, on an average across the entire sample of farmers, about 87 percent was hired, while 13 percent was family labour. In case of hired labour male labour was more than female labour. In case of TMC the family labour was more than EMC while reverse was true in case of hired labour. Out of total labour cost, 56.52 percent of the cost was for hired labour while 43.48 percent was for the family labour. Machine labour cost was more in case of family labour than hired labour.

Table 4.1.4: Comparison of labour hiring and labour cost

Sr. No.	Labour	Potato		
		TMC	EMC	Overall
I	**No. of Labour (days/ha)**			
A	***Family Labour***			
1	Male	4.47	3.07	4.21
2	Female	0	0	0
3	Animal labour	0	0	0
4	Machine	3.40	3.37	3.39
	Total Family labour	7.87	6.44	7.60
	% to Total Labour	13.26	11.60	12.96
B	***Hired Labour***			
1	Male	29.84	28.07	29.51
2	Female	21.59	21.01	21.48
3	Animal labour	0	0	0
4	Machine	0.06	0	0.05
	Total Hired labour	51.49	49.08	51.04
	% to Total Labour	86.74	88.40	87.04
C	***Total Labour***			
1	Male	34.31	31.14	33.72
2	Female	21.59	21.01	21.48
3	Animal labour	0	0	0
4	Machine	3.46	3.37	3.44
	Total Labour	59.36	55.52	58.64
II	**Cost of Labour**			
A	***Family Labour***			
1	Male	710.06	495.68	670.53
2	Female	0	0	0
3	Animal labour	0	0	0
4	Machine	5504.33	5187.02	5445.82
	Total Family labour cost	6214.39	5682.7	6116.35
	% to Total Labour Cost	43.68	42.59	43.48
B	***Hired Labour***			
1	Male	4907.78	4516.29	4835.59
2	Female	3026.86	3143.80	3048.43
3	Animal labour	0	0	0
4	Machine	82.68	0	67.43
	Total Hired labour cost	8017.32	7660.09	7951.45
	% to Total Labour Cost	56.32	57.41	56.52
C	***Total Labour Cost***			
1	Male	5617.84	5011.97	5506.12
2	Female	3026.86	3143.80	3048.43
3	Animal labour	0	0	0
4	Machine	5587.01	5187.02	5513.25
	Total Labour Cost	14231.17	13342.79	14067.80

Source: Field Survey Data.

Economics of Cost of Cultivation:

Per hectare cost of cultivation of potato is indicated in Table 4.1.5. The paid out cost for sample farmers in TMC was higher than that for those in EMC. Out of total paid out costs, maximum cost in both channels was on home grown and purchased seed followed by hired labour. Large area was under leased in land and, therefore, rent paid for leased in land was also as high as Rs. 22070/- in TMC and 22875/- in EMC. Share of family labour was more due to higher machine labour owned by the potato growing families.

Table 4.1.5 : Economics of cost of cultivation of potato (Rs/ha)

Sr. No.	Items	Potato	
		TMC	EMC
1	*Hired Labour*		
i)	Male	4907.78	4516.29
ii)	Female	3026.86	3143.80
iii)	Animal labour	0	0
iv)	Machine	82.68	0
	Total	8017.32	7660.09
2	*Maintenance Expenses*		
i)	Owned Animal	0	0
ii)	Machinery	1226	1372
	Total	1226	1372
3	*Cost on Material Input*		
i)	Seed		
a	Home grown	22927.84	17929.30
b	Purchased	1388.00	0
c	Total	24315.84	17929.30
ii)	Fertilisers		
a	NPK	9456.37	6882.44
iii)	Manure	0	0
a	Owned	248.30	0
b	Purchased	0	0
c	Total	248.30	0
iv)	*Pesticides*		
v)	Irrigation	829.13	660
vi)	Micro Nutrients	1209.65	1209.75
4	*Depreciation*	3031	3454
5	*Land Revenue*	0	0
6	*Rent Paid for Leased in land*	22070	22875
	PAID OUT COST	70403.61	62042.58
7	Family Labour		
i)	Male	710.06	495.68
ii)	Female	0	0
iii)	Animal labour	0	0
iv)	Machine	5504.33	5187.02
	Total	6214.39	5682.70
8	Total Cost of Cultivation	76618.00	67725.28

Source: Field Survey Data.

Overall, it was observed that the total paid out cost for TMC was Rs 70403.61/- per hectare while in case of EMC it was Rs 62042.58/- per hectare. However, if imputed value of family labour is included, the cost of cultivation increases by about 9 percent per hectare for both the channels.

The technology used in crop cultivation is indicated in Table 4.1.6. It can be seen from table that the per hectare chemical fertilizers in case of potato was higher in EMC than TMC. Organic fertilizer use was only in TMC and very few farmers applied it. Seed use was more by farmers following EMC, however, average area cultivated and total production was more in case of TMC.

Table 4.1.6 : Technology used for crop cultivation

(Average/ha)

Sr. No.	Particulars	Potato	
		TMC	EMC
A	**Inputs**		
1	Chemical Fertilizer (qtls)	12.85	14.17
	Standard deviation	1.64	0.55
2	Organic Fertilizer (qtls)	14.29	0
	Standard deviation	42.45	0
	% using composted fertilizer (may specify)	0	0
3	Organic Pesticide (Kgs)	0	0
	% Farm certified as organic	0	0
4	Machinery used (days	3.46	3.37
5	% irrigated area	100.00	100.00
6	Seed (kg)	3579	3741
	Standard deviation	403.71	354.01
	Sources (% of total)		
	Home grown (%)	94.29	100.00
	Purchased (%)	5.71	0.00
	Home grown & Purchased (%)	100.00	100.00
7	Av. Area Cultivated (ha)	9.50	7.52
	Standard deviation	11.52	7.09
8	Total Production (qtls/ha)	279	264
	Standard deviation	45.07	20.03

Source: Field Survey Data.

Table 4.1.7 indicates the production and productivity of potato. It can be seen that the productivity was higher in case of TMC. The productivity was less in case of EMC due to early digging of potato due to quality measures of the Pepsico.

Table 4.1.7: Details of production of potato

Sr. No.	Items	Potato	
		TMC	EMC
1	Main Product (Qt)	92738.50	19884.00
2.	Main Product (Qt/farm)	2649.00	1988.40
3	By Product (qt)	0.00	0.00
4	Productivity (qt/ha)	278.83	264.41

Source: Field Survey Data.

The details on cost of production of potato and net returns accruing to farmers in case of sales to TMC and EMC have been indicated in Table 4.1.8. It can be seen that the productivity of potato per hectare is higher in TMC (278.83 qt/ha) as compared to EMC (264.41 qt/ha). It can be seen that the average price realized in TMC was less than that of the farmers who sold their produce through EMC. The average price in the regulated market was Rs 373.80 /- per quintal, those who sold in EMC received Rs 520.20/- per quintal. Farmers selling their produce through regulated market sell some part of their potato crop in December by harvesting raw potato and then remaining produce is harvested in the month of February just to avoid distress sales due to glut in the market. Thus, after final digging of potato, some portion of the produce is directly sold in the regulated market and some part of the produce is kept in the cold store as seed for next season and for sale in the remaining months of the year. Farmers in TMC stock their produce in cold store to gain advantage of lean period rise in price. In EMC after checking the quality specifications by the company official's farmers sold their produce to PepsiCo soon after harvest and realized higher prices. However, the important point is that farmers who sold in TMC had to incur marketing costs which reduced the net price received by them, whereas farmers who sold through EMC did not have to incur marketing costs but only transportation cost to sell their produce to the company.

The net profit made by farmers (including cost of family labour) who sold potato under TMC was Rs 99.02 per quintal whereas in case of EMC, it was Rs 264.06 per quintal.

Table 4.1.8: Details of cost of production and net returns

Sr. No.	Items	Potato	
		TMC	EMC
1	Per ha Cost of Cultivation (including family labour)	76618	67725.28
2	Gross return/Output (Rs./ha)	104226.55	137549.47
3	Cost of Production (Rs./qtls) including family labour	274.78	256.14
4	Cost of Production (Rs per quintal) considering only Paid Out Cost	252.50	234.65
5	Productivity (qt/ha)	278.83	264.41
6	Per Quintal Price realized by farmer (Rs/qtls)	373.80	520.20
7	Per ha Net Profit (including family labour) (Rs/.ha)	27608.55	69824.19
8	Per ha Net Profit (Rs/.ha) considering Paid Out cost	33822.94	75506.89
9	Per Quintal Net Profit (Rs/qtl) considering only Paid out cost	121.30	285.55
10	Per Quintal Net Profit (Rs/.qtls) including family labour	99.02	264.06

Source: Field Survey Data.

Disposal pattern of potato

The disposal patterns of potato through TMC and EMC have been given in Appendix-I (a). In TMC, net quantity sold was 85.80 per cent of the total production while 13.22 per cent produce was kept for home consumption, seed for next year and gifts to the social institutions and poor people. The rejected quantity before sale in the market was 0.98 per cent of the total production on the sample farms. The quantity sold through Traditional marketing channel (TMC) was 86.30 per cent of the net quantity sold while in alternate channels, quantity sold was13.70 per cent.

In EMC, net quantity sold was 83.74 per cent of the total production on the sample farms. The home consumption, seed for next year and gifts in EMC were 15.13 per cent of the total production while 1.13 per cent quantity was damaged during transportation or rejected before marketing of the produce. The percent of rejection was more in EMC due to quality parameters followed by the company before purchasing the final produce. The quantity sold through emerging marketing channel (EMC) was 94.60 per cent of the net quantity sold while rest 5.40 per cent was sold through alternate channels on the sample farms.

Operations of Emerging Markets

The emerging market in case of potato sale was direct selling of the produce by the farmers to PepsiCo Company. This channel was found to be beneficial to the farmers due to non existence of any intermediary. As per the advice of the company, varieties recommended by it were sown by the selected farmers. But no seeds were made available to the farmers by the company during the year under investigation. Free technical knowhow was provided by the company officials, however, at the time of maturity, sugar content in potato was checked by company technicians to find out the suitability of the produce for purchase by the company. No packaging and marketing support was provided by the company to the farmers. Therefore, the farmers after proper packaging, transported their produce to the company's processing plant at Channo, district Sangrur. Thus, entire packaging and transportation cost was borne by the farmer. The price of the produce was settled exclusively by the company and farmers by mutual bargaining. No mandi prices were taken into consideration while fixing the price to be given for the quantity of produce purchased by the company.

Price Spread and Marketing Costs of Potato:

The difference between the price paid by the consumer and the price received by the producer for an equivalent quantity of farm produce is called as price spread. In Table 4.1.9 the price spread and marketing costs for potato based on the data collected from the field survey is indicated.

It can be seen from table that in TMC although the sample farmers received Rs 373.80/- per quintal, they had to incur marketing costs of Rs 65.07/- per quintal and hence their net price after deducting marketing costs was Rs 308.73/- per quintal. The farmers sold to wholesalers who incurred marketing costs and margins of Rs 57.44/- per quintal. There was also wastage of potatoes during the time taken to transport the produce from the regulated market to the retail outlets. The sale price of the potato retailer was Rs 722.53 /- per quintal. Finally, it can be seen that the share of the farmer in the retailer's price under TMC is 42.72 percent, while marketing costs as a percentage of retailer's price is 24.30 and marketing margins as percentage of retailer's price is 32.97 percent.

With respect to sales through EMC, it can be observed that although the sample farmers received a higher price than the auction price in TMC. They have to incur loading & unloading, sorting & packing and transportation cost up to the gate of company. Hence Rs 520.20/- was the net price received by the farmers under EMC which was about 40 percent higher than the price received by farmers who sold through TMC. Since there were no

intermediaries in EMC hence the price received by the farmers was much higher than the farmers following TMC.

Table 4.1.9: Price spread and marketing costs for potato (2009-10)

Rs/ quintal

Sr. No.	Price Spread	TMC	EMC
I	**Price received by farmer**	373.80	520.20
II	**Total Marketing costs of farmer**	**65.07**	**61.50**
	(a) transportation	4.50	7.44
	(b) loading & unloading	2.13	1.10
	(c) Sorting & packing	57.76	52.64
	(d) weighing & other related expenses	0.68	0.32
	(e) commission	0	0
	Net Price received by farmer	**308.73**	**458.70**
	Net Profit (Net price received- Paid Out cost)	56.23	224.05
III	Marketing Costs and margins of wholesaler (through commission agent	57.44	-
	(a) market fee	5.81	**-**
	(b) RDF	5.81	-
	(c) wastage during transport	0.56	-
	(d) Commission	14.49	-
	(d) transportation charges	8.12	-
	(e) wholesaler's margin	22.65	-
	Purchase price of wholesaler plus marketing costs & margins	**431.24**	**-**
IV	Marketing cost and margins of Retailer	291.29	-
	(a) Hamali from point of purchase to tempo	0	-
	(b) Transport to retail outlet	11.15	-
	(c) Miscellaneous expenses such as cess to corporation, watchman for unsold stock	9.46	-
	(d) Wastage	6.58	-
	(e) Loading/ Unloading	4.45	-
	(f) Packing material	36.20	-
	(g) Shop rent	7.88	-
	(h) Retailer's margin	215.57	-
	(f) sale price of retailer	**722.53**	**-**
V	Share of farmer (%) in retailer's price	42.72	**-**
VI	Marketing Costs as % of retailer's price	24.30	**-**
VII	Marketing margins as % of retailer's price	32.97	**-**
VIII	Modified Measure of Marketing Efficiency (MME)	0.74	**-**

Source: computed from field survey data

The Benefit Cost Ratio (BCR) for the potato crop has been given in Table 4.1.10. It can be seen that the BCR reduces for potato when family labour is included in cost of production. The BCR is higher in EMC as compared to TMC. This is because, the price received in case of sales through EMC was nearly 40 percent higher than that through TMC.

Table 4.1.10: Benefit Cost Ratio for potato

Particulars	TMC (cost of production includes only Paid out costs)	EMC (cost of production includes only Paid out costs)	TMC (cost of production includes family labour)	EMC (cost of production includes family labour)
BCR for potato	1.48	2.22	1.36	2.03

Source: field survey data

Reason for Preferring the Marketing Channel:

The reasons for preferring the marketing channel is indicated in Table 4.1.11. It can be seen that in case of potato under TMC maximum responses pertained to assured sales followed by low cost of marketing and fair price. They were also influenced by friends and relatives to participate in auctions and were in the habit of selling in regulated market. In case of EMC, assured sales, low cost of marketing, fair price, less physical loss and superior services were the main reasons for preferring this channel.

Table 4.1.11: Reason for preferring the marketing channel

(% to total responses)

Sr. No.	Particulars	Potato	
		TMC	EMC
1	Habit	0	0
2	Influence of friend, relatives, neighbours	5.71	0
3	Assured sales	51.43	80.00
4	Higher/Fair price	28.57	40.00
5	Low cost of Marketing	51.43	70.00
6	Less Physical loss	0	30.00
7	Proximity	0	0
8	Logistical Support	0	0
9	Access to Inputs	0	0
10	Hidden cost/bribes in alternative channel	0	0
11	Longer waiting time and formalities in alternatives channel	0	0
12	Superior services	0	30.00
13	Superior Infrastructure	0	0

Source: Field Survey Data.

Post Harvest Losses:

Post harvest losses not only reduce the availability of vegetables but also increase per unit cost of transport and marketing. Due to less availability of the crop, the consumer's price increases. The post harvest losses take place at almost every stage of handling. Firstly, at the time of harvesting of potato, machinery used in digging damage some tubers which are not suitable for selling in the market and this produce is mostly given to the labour free of cost. The farmers themselves store their produce in cold stores for future sales and for seed

purpose. At the time of future sales also, there are handling losses at the time of withdrawal of potato from cold stores. Losses also arise during transport mainly if produce is sold in the distant markets.

Firstly, the farmers sell their potato crop in the month of December after digging raw crop due to scarcity of produce in the market and hence to get better price. At the time of harvesting of ripe potato in the month of February, some part of the produce is sold in the regulated market and remaining portion is kept in the cold store for future sales and seed for the next year. The produce from cold stores is withdrawn by the farmers in lean periods keeping in view the price prevailing in the market.

It can be seen from Table 4.1.12, that post harvest losses are higher in TMC as compared to EMC. For every quintal of potato stored, a farmer loses about 8.14 kg under TMC while no loss in EMC since the potato purchased by PepsiCo is handled by the company after purchase. Due to quality specifications, losses in transport were more in EMC than TMC.

Table 4.1.12: Per quintal Post-harvest Losses

Post Harvest loss	**Potato**			
	TMC		**EMC**	
	Quantity	***SD***	**Quantity**	***SD***
Loss during storage (kg)	8.14	0.58	0.00	0.00
Loss during transport	0.23	0.03	1.33	0.42
Loss at Retail level	1.40	0.74	0.00	0.00

Notes: SD- Standard deviation, Quantity in quintals.
Source: Field Survey Data.

The main reasons for the loss as explained by sample farmers are shown in Table 4.1.13.

Table 4.1.13: Reasons for post harvest loss (percentage of multiple responses)

Reason	**Potato**	
	TMC	**EMC**
Perishable nature of the commodity	77.14	70.00
Long distance to market	2.86	20.00
Loss as waited for better prices and the product perished	57.14	0.00

Source: Field Survey Data.

Potato is a perishable commodity and it has some day's shelf life, therefore, the alternative for future sales is cold storage. The quality begins to deteriorate as the length of the storage period increases. Thus, the major reason of post harvest loss was perishable nature of the potato crop as told by majority of the farmers. Potato is a very important ingredient for

various dishes in various parts of India. Hence, it is transported to distant markets such as Rajasthan, Gujarat and even West Bengal. Long distance to the market was, therefore, also responsible for post harvest losses. In case of potato there is often a huge difference between lean period and peak period prices. Hence, farmers store the produce in order to reap lean season rise in prices.

Information Regarding Price Available to farmers:

For the farmers receiving remunerative price of their produce, they must be aware of prevailing market prices in the regulated market where they sell their produce. This guides them regarding the right time to dispose off their produce. In Table 4.1.14 details about price information have been shown. The farmers did have information about price prevailing in the regulated markets. In case of TMC, the commission agent was an important source of price information followed by personal information and speaking with other farmers. Further, mostly the farmers were aware of the price soon after harvest. Some of the farmers in the sample got information from AGMARKNET. By and large sample farmers in both TMC and EMC revealed that the price received by them was more or less similar to that expected by them. Price agreement was also at the time of sale as revealed by all of the farmers.

Table 4.1.14: Details about the transaction cost-Information Costs

(% to total responses)

Sr. No.	Particulars	Potato	
		TMC	EMC
A	**Source of price information**		
1	Personal information	20.00	90.00
2	Speaking with other farmers	5.71	10.00
3	Speaking with Commission agent/Trader	74.29	0.00
4	Speaking with the E-choupal agent	0.00	0.00
5	Any other	0.00	0.00
6	**Two responses**		
a	1& 2	0.00	0.00
b	1&3	0.00	0.00
c	1&4	0.00	0.00
d	1&5	0.00	0.00
e	2&3	0.00	0.00
f	2&4	0.00	0.00
g	3&4	0.00	0.00
7	**Three responses**		
a	1,2 & 3	0.00	0.00
b	1, 2 & 4	0.00	0.00
c	2,3 &4	0.00	0.00
B	**Time of Price information**		
1	At the time of harvest/sale	77.14	60.00
2	At the time of sale	22.86	40.00
C	**Price Information from AGMARKNET**		

1	No	88.57	100.00
2	Yes	11.43	0.00
D	**Difference in Price Information**		
1	lower than expected	48.57	20.00
2	Similar to what expected	48.57	80.00
3	Higher than expected	2.86	0.00
F	**Time of Price Agreement**		
1	At the time of sale	100.00	100.00
2	By previous agreement	0.00	00.00

Source: Field Survey Data.

Enforcement Costs:

In case of sales in TMC, the farmer sells his produce in the regulated market through auction method. A commission agent acts between the farmer and the buyer who is normally a trader. Similarly, in case of sales under EMC, the crop is directly sold to the company. During the field survey it was found that some farmers were cheated by the commission agents while selling in regulated market. In order to observe this the farmers were asked about their experience with market intermediaries. This transaction cost is indicated in Table 4.1.15.

Majority of the farmers in EMC expressed that they received the same price as was agreed and did not have to go to the company to receive payment for the produce that was sold and received payment on time. In case of sales of potato in the regulated market it was revealed by the farmers that about fifty per cent of them received same price as agreed and there was no problem of payment as revealed by about 63 per cent of the farmers. Majority of the farmers in TMC did not get receipt of sale while reverse was true in case of EMC. There was no conflict between the majority of the farmers and agents on grounds of quality. There were no instances when produce was rejected because of rain and there was high confidence of farmers in the merchant.

Table 4.1.15: Transaction cost-enforcement costs

(% responses to total)

Sr. No.	Particulars	Potato	
		TMC	**EMC**
A	***Difference between agreed price and sale price***		
1	Less	42.86	20.00
2	Same	54.29	80.00
3	A bit more	2.86	0.00
B	***No. of times farmer went to agent to get payment***		
1	None	62.86	100.00
2	Various times	37.14	0.00
C	***Merchant fulfillment***		
1	Bad record	2.86	0.00
2	Satisfactory record	82.86	50.00

3	Good record	14.28	50.00
D	***Receipt for sales***		
1	No	85.71	10.00
2	Yes	14.29	90.0
E	***Conflict on quality***		
1	No	71.43	100.00
F	***Conflicts any other***		
1	Because of Rain	0.00	0.00
2	Production rejected	0.00	0.00
G	***How was it resolved***		
1	By APMC/Company Person	0.00	0.00
H	***Confidence in the merchant***		
1	Low	22.86	0
2	High	77.14	100.00

Source: Field Survey Data.

Perception on services provided by different agencies:

It is well known fact that farmers are in urgent need of credit for short term as well as medium to long term loans and for other investment purposes. This credit is available to them from institutional and non-institutional sources of finance. In Table 4.1.16 source and purpose of loan is indicated.

Table 4.1.16 : Perception on services provided by different agencies

Sr. No.	Particulars	Potato	
		TMC	EMC
A	**Taken any loan (% to selected hh)**	80	50
B	**Source of loan**		
1	Money Lender	2.86	0.00
2	Bank	54.29	10.00
3	Cooperative	80.00	30.00
4	Friends/Relatives	2.86	0.00
5	Self Help Group	0.00	0.00
6	Buyer of the produce	28.57	10.00
7	Other	0.00	0.00
C	**Purpose of loan**		
1	Crop Loan (inter-culture operations)	71.43	100.00
3	Well digging	0.00	0.00
D	**Reason for taking loan from buyer**		
1	Inter-culture Operation	71.43	100.00
E	**No. of times loan taken from the buyer in last 5 years**		
1	This year only	0.00	0.00
F	**Total amount of loan obtained from buyer in 2009-10**		
G	**Default of loan taken**	0.00	0.00
1	No	0.00	0.00
2	Yes	0.00	0.00
H	**Source of loan for default loan**		

1	Money Lender	0.00	0.00
2	Bank	0.00	0.00
3	Cooperative	0.00	0.00
4	Friends/Relatives	0.00	0.00
5	Self Help Group	0.00	0.00
6	Buyer of the produce	0.00	0.00
7	Other	0.00	0.00
I	**Reason for default**		
1	Less Production	0.00	0.00

Source: Field Survey Data.

About 80 per cent of the farmers in TMC and 50 per cent in EMC had taken loan for raising crops. In TMC, there were only a few cases when farmers had borrowed from moneylenders and it was mostly through banks and cooperative credit societies that loan had been availed in both TMC and EMC. Further, the main purpose of loan was for crop loan purposes. In both TMC and EMC there were no defaulters of loan.

Access to Inputs from Buyers:

In agricultural marketing, there is a link between input and output market. The farmers receive input such as pesticides and seeds in cash or kind from the market intermediary to whom he sells his produce. Keeping this in view, sample farmers were asked about the inputs received from their buyer. The farmers' response is indicated in Table 4.1.17. None of farmers under TMC received inputs in cash or kind from the wholesaler. The input received was mainly fertilizer and pesticide and the main reason of procuring inputs from buyer was surety of good quality.

Table 4.1.17: Access to inputs from the buyer

Sr. No.	Particulars	Potato	
		TMC	EMC
A	Received Input Advance for the reference period (% of responses)		
1	No	100.00	100.00
2	Yes	0.00	0.00
B	Value of the input (Rs./farmer)	-	-
C	Reason for the procuring the input of the Buyer (% of responses)		
1	Good quality seed & pesticide	-	-

Source: Field Survey Data.

Perception of the Market Infrastructure:

In order to improve the marketing of farm products, agricultural markets were being regulated by the Govt. The major purpose of regulated markets was to ensure free and fare sales by auction method. In these markets there were fixed market charges, accurate

weighing, and cash payment to farmers without any hidden deductions and to keep civic amenities in market yards. In Table 4.1.18 the facilities available in the market of Jalandhar district and market infrastructure as perceived by farmers has been shown.

Village roads are an important infrastructure for timely delivery of produce in the market. Good roads are necessary for the produce to reach the point of sale without much damage to it. Majority of farmers in TMC and EMC expressed that the village roads were in good condition. With respect to proximity to the market, it was observed that the regulated market was not in the sample villages and the majority of the farmers had to travel within 10 kms and even upto 25 kms to access the regulated market. In EMC the farmers have to travel more than 50kms to fetch the produce at the company gates. There were no cold store and godown facilities in the market and auction arrangements were good as reported by farmers following TMC. Sorting, weighing, packing and banking facilities were good in the market. However, there were no internal phone and computer facilities as reported by the farmers following TMC channel.

Table 4.1.18: Perception of the market infrastructure

(% to total selected hh)

Sr. No.	Particulars	Potato	
		TMC	EMC
1	**Condition of the road to market**		
a	Bad	5.71	0.00
b	Average	40.00	20.00
c	Good	54.29	80.00
2	**Proximity of market**		
a	Within the village	0.00	0.00
b	within 10 kms	54.29	0.00
c	between 10 & 25kms	42.86	0.00
d	>25 kms &<50 kms	2.86	0.00
e	more than 50 kms	0.00	100.00
3	**Go-down facilities**		
a	Not Available	100.00	0.00
b	Bad	0.00	0.00
c	Average	0.00	0.00
d	Good	0.00	100.00
4	**Cold storage**		
a	NA	100.00	0.00
b	Bad	0.00	0.00
c	Average	0.00	0.00
d	Good	0.00	100.00
5	**Auction arrangements (Open)**		
a	Bad	5.71	0.00
b	Average	22.86	0.00
c	Good	71.43	0.00
6	**Supervision of sale**		
a	Bad	0.00	0.00

b	Average	8.57	0.00
c	Good	91.43	100.00
7	**Loading facilities**		
a	Bad	0.00	0.00
b	Average	0.00	0.00
c	Good	100.00	100.00
8	**Sorting facilities**		
a	Bad	0.00	0.00
b	Average	0.00	0.00
c	Good	100.00	100.00
d	NA		
9	**Weighing facilities**		
a	Bad	0.00	0.00
b	Average	0.00	0.00
c	Good	100.00	100.00
10	**Packing facilities**		
a	Bad	0.00	0.00
b	Average	0.00	0.00
c	Good	100.00	0.00
11	**Internal Telephone**		
a	Bad	100.00	0.00
b	Average	0.00	0.00
c	Good	0.00	0.00
12	**Banking facilities**		
a	Bad	0.00	0.00
b	Average	8.57	0.00
c	Good	91.43	0.00
13	**Computer facilities**		
a	Bad	0.00	0.00
b	Average	0.00	0.00
c	Good	0.00	0.00
d	NA	100.00	100.00

Source: Field Survey Data.

Thus, with respect to certain market facilities majority farmers were satisfied, but at the same time there were also certain shortcomings and farmers felt the need to improve infrastructure.

Perception of the Farmer on Other Market Agents and Price:

As we know that the farmer sells his produce in regulated markets through auction sales to a trader and a commission agent facilitates the transaction. The commission agent ensures the timely payment to farmers. After receiving the payment the marketing operations normally come to an end. The farmers were asked about their knowledge about the intermediaries in various channels followed before retail market. Farmers' responses have been summarized in Table 4.1.19.

Table 4.1.19: Perception of the farmer on other market intermediaries, price spread and constraints in agricultural marketing

Sr. No.	Particulars	Potato	
		TMC	EMC
1	After the Buyer, who are the agents and how many channels are there between you and the retail market (% to Total)		
A	***Agents***		
a	Don't Know	48.57	100.00
b	Agent/Trader/Wholesaler/Retailer	14.29	0
c	Agent/APMC Agent	0	0
d	Trader	37.14	0
e	Traders and Others	0	0
B	***How many channels in between (% to total responses)***		
a	*1 Channel*	37.14	0
b	*2 Channels*	0	0
c	3-4 Channels	14.29	0
2	**Which are the wholesale markets in country where crop is sold** (% to Total responses)		
a	Calcutta	17.14	0
b	Ahmadabad	28.57	0
c	Nashik	0	0
d	Surat	0	0
e	Pimplgaon	0	0
f	Mumbai	0	0
g	Lasalgaon	0	0
h	Delhi	20.00	0
i	Other	34.29	0
3	**Did you know the price at which produce is sold in the retail market (% to Total hh)**		
a	Unaware	57.14	100.00
b	Aware	42.86	0
c	If you know, what is the price (Rs/qtls)	1150	0
4	**What is the margin that buyer of your produce earns from the sale of the produce (Rs/qtls)**		
5	**What is your opinion of margin that is realized** (% to total hh)		
a	High	88.57	0
b	Very High	11.43	0
c	Do Not know	0	100.00
6	**In future will you sell the produce to this agent again** (% to total hh)		
a	No	0	0
b	Yes	0	0
c	Uncertain	14.29	0
d	If give higher price	85.71	100.00
7	**Any other option for selling the produce (% to total hh)**		
a	No	100.00	100.00
b	Yes	0	0
c	If yes, what are the options for selling (% to total responses)		

i	City Trader	0	0
ii	Export	0	0
iii	Other Market/State	0	0
iv	Govt. if given higher price	0	0
8	**What are the enabling conditions and support that Government should do so that farmers can get a better price for the produce (% to total responses)**	100	100
a	Need Export Facility	22.86	40.00
b	Cold Storage & Higher MSP	22.86	10.00
c	Need Subsidy	28.57	50.00
d	Market and Other charges Should be reduced	11.43	-
e	Increase MSP	-	-
f	Reduce Commission Agent	8.57	-
g	Other Facilities	5.71	-
9	**What are the Constraints faced by you in EMC As compare to TC (% to total responses)**	-	100
a	Only Buys Selected Quality produce	-	20.00
b	Buys only in small Quantity	-	-
c	Delay in Payment	-	-
d	Buys from Trader and not from farmers	-	-
e	No Problem	-	80.00
f	Low rate of produce	-	-
g	EMC is not as strong as TC	-	-
h	Other Problems		-
10	**How do you think the constraints in the Emerging marketing channels can be overcome?**	**-**	100
a	Reduce the purchase from agent	-	-
b	Purchase entire produce	-	10.00
c	Need to Attract farmers by providing facilities and services	-	30.00
d	Increase rate -Emerging Market	-	60.00
e	Other Previsions	-	-
11	**Suggestions to ensure that farmers get higher price for the produce and the margins of the intermediaries are reduced?**	100	100
a	Govt. should help to export	22.86	60.00
b	Reduce Intermediaries in market	8.57	-
c	Provide good Transport Facilities	28.57	40.00
d	Good Market Facilities	5.71	-
e	Price Should be decided by Government during bumper harvest	17.14	-
f	Reduce Charges (market/processing)	5.71	-
g	Provide Credit facilities	-	-
h	Reduce Electricity Charges	-	-
i	Government should purchase	11.43	-
j	All Produce should be purchased by Merchants	-	-
k	Other	-	-

Source: Field Survey Data.

It can be observed from Table 4.1.19 that after sale of his produce, about 50 per cent farmers in TMC were aware of the supply chain that existed till the produce reached the ultimate consumer. In EMC there were no intermediary and farmers were not aware about the further process being followed by the company. Farmers selling produce in regulated market revealed that nearly half of them knew how their produce changed hands and reached the retail market. The farmers were only concerned with the price which they received. On the other hand, in case of EMC, none of the farmers in the sample had any awareness about further process followed for value addition to their produce by the company. Nearly half of the farmers in TMC knew about the places where potato was sold in the wholesale markets such as Calcutta, Ahmadabad, Delhi, Jodhpur and other places. Nearly half of the farmers knew about the price realized in the retail market. Farmers also felt that the margin realized by the buyer of their produce is high. In case of EMC 88.57 percent of farmers in the sample indicated that they would continue to sell in the same channel and to the same agent if given higher price. Farmers have no option of export of potato.

The farmers selling to EMC were asked about various constraints faced by them while selling through this channel. There was no major constraint as opined by 80 per cent of the potato farmers while only 20 per cent reported that EMC buys only selected quality produce of specific size, shape and colour. However, in TMC the entire produce is sold. The farmers also explained that since only quality produce is picked up by EMC, the balance produce is treated as low quality and sold at a lower price. The farmers were asked for their suggestions which would ensure them higher prices and also which would reduce marketing margins of the intermediaries. Farmers made several suggestions such as potato should be exported when there is a glut in the market; provide transport facilities, produce should be purchased by the Govt. in case of bumper harvest, market charges and intermediaries should be reduced.

Perception of the traders/ consumers

The potato traders and consumers emphasized the need for Govt. intervention by regulating the area under potato crop due to extreme fluctuation in prices each year adversely affecting both the farmers and the consumers. Traders also demanded the subsidization of cold storage charges bore by them in case of bumper harvest in the country which eventually results in crashing the wholesale and retail prices of potato affecting profitability of traders as well as farmers.

4.2 Comparison of Benefits and Constraints for TMC and EMC for kinnow

Distribution of sample farmers as per operation holdings:

Before analyzing the marketing operations of TMC and EMC, the profile of the farmers is briefly discussed. In Table 4.2.1 the sample farmers are classified according to their land holding size. It can be observed that for the entire sample of kinnow growers, maximum (about 68 per cent) were in large category while only about 2 per cent belonged to small category

Table 4.2.1: Distribution of sample households based on operational holding size classification

Sr. No.	Classification	Kinnow		
		TMC	EMC	Overall
1	Small (1-2 ha)	2.20	3.10	2.40
2	Medium (2-10 ha)	31.0	25.60	29.90
3	Large (>10 ha)	66.80	71.30	67.70
Total		**100.0**	**100.0**	**100.0**

Source: Field Survey Data.
Note: Figures in parentheses are the per cent to total in each column.

Further, the characteristics of selected households as per land holding classification is indicated in Table 4.2.2 It can be observed that the average age of the head of the household for kinnow growers was highest in case of medium farmers (about 54 years) for TMC and for small farmers (about 57 years) in case of EMC. The average family size was highest for large farmers (about 10) in case of TMC and for small farmers (about 10) in case of EMC. As expected agriculture is also the main economic activity of majority of farmers in the sample

Table 4.2.2: Characteristics of selected households as per land holding classification

Sr. No.	Characteristics	Kinnow		
		TMC	EMC	Overall
A	***Av Age of Head (years)***			
1	Small	52.50	56.50	53.80
2	Medium	53.80	50.25	53.0
3	Large	51.0	52.0	51.20
B	***Av. Education of Head (Years)***			
1	Small	9.25	5.0	7.8
2	Medium	5.70	9.50	6.5
3	Large	9.50	6.50	8.9
C	***Av. Family Size (No.)***			
1	Small	5.8	4.5	5.30
2	Medium	7.9	8.8	8.1
3	Large	7.3	6.0	7.1
D	***Main Occupation (% to total)***			
1	**Small**			

a	Agriculture	100.0	100.0	100.0
b	Allied	75.0	100.0	83.0
c	Other	25.0	-	17.0
2	**Medium**			
a	Agriculture	100.0	100.0	100.0
b	Allied	53.0	50.0	53.0
c	Other	7.0	25.0	11.0
3	**Large**			
a	Agriculture	100.0	100.0	100.0
b	Allied	50.0	25.0	45.0
c	Other	25.0	25.0	25.0
6	**Overall**			
a	Agriculture	100.0	100.0	100.0
b	Allied	54.0	50.0	53.0
c	Other	17.0	20.0	18.0

Source: Field Survey Data.

The method of cultivation and farming practices adopted by farmers are indicated in Table 4.2.3. It can be observed that all the kinnow growers in the sample used fertilizers and none of them practiced organic farming. All farmers in the sample had irrigation facilities and 9-10 irrigations were used per annum by the kinnow orchardists

Table 4.2.3: Modern practices and methods of cultivation of selected households

Sr. No.	Particulars	Kinnow		
		TMC	EMC	Overall
1	Av Area under crop (ha)	4.2	3.04	4.0
	Fertiliser used			
	a) % of farmers to total	100.0	100.0	100.0
2	b) Per ha fertliser use (qtls)	7.30	7.20	7.28
	Organic/No Fertiliser Use	-	-	-
3	a) % of farmers to total	-	-	-
	Irrigation Use			
	a) % of farmers to total	100.0	100.0	100.0
	b) No. of Irrigation/ha	10	9	10
	c) Sprinkler-% of farmers to total	-	-	-
4	d) Drip-% of farmers to total	-	-	--

Source: Field Survey Data

The amount of family labour and hired labour in case of kinnow cultivation is indicated in Table 4.2.4. It can be observed that out of total labour employed, on an average across the entire sample of farmers, about 82 per cent was hired, while only about 18 per cent was family labour. In case of hired labour, for kinnow, more male labour was used as compared to female labour. Out of total labour cost, about 56 per cent of the cost was for hired labour while about 44 per cent was for family labour

Table 4.2.4: Comparison of labour hiring and labour cost

Sr. No.	Labour	Kinnow		
		TMC	EMC	Overall
I	**No. of Labour (days/ha)**			
A	***Family Labour***			
1	Male	20.5	34.0	23.0
2	Female	0.30	0.50	0.40
3	Animal labour	-	-	-
4	Machine	2.70	3.0	2.80
	Total Family labour	23.50	37.50	26.20
	% to Total Labour	**17.0**	**24.40**	**18.40**
B	***Hired Labour***			
1	Male	76.0	89.0	79.0
2	Female	39.0	27.0	37.0
3	Animal labour	-	-	-
4	Machine	0.04	0.20	0.10
	Total Hired labour	115.04	116.20	116.10
	% to Total Labour	**83.0**	**75.60**	**81.60**
C	***Total Labour***			
1	Male	96.50	123.0	102.0
2	Female	39.30	27.50	37.40
3	Animal labour	-	-	-
4	Machine	2.74	3.20	2.90
	Total Labour	138.54	153.70	142.30
II	Cost of Labour(Rs/ha)			
A	***Family Labour***			
1	Male	2942.0	5114.0	3311.0
2	Female	34.0	55.0	38.0
3	Animal labour	-	-	-
4	Machine	8533.0	10487.0	8865.0
	Total Family labour cost	11509.0	15656.0	12214.0
	% to Total Labour Cost	**43.0**	**47.70**	**44.0**
B	***Hired Labour***			
1	Male	10941.0	13453.0	11368.0
2	Female	4153.0	3044.0	3964.0
3	Animal labour	-	-	-
4	Machine	135.0	671.0	226.0
	Total Hired labour cost	15229.0	17168.0	15558.0
	% to Total Labour Cost	**57.0**	**52.30**	**56.0**
C	***Total Labour Cost***			
1	Male	13883.0	18567.0	14679.0
2	Female	4187.0	3099.0	4002.0-
3	Animal labour	-	-	-
4	Machine	8668.0	11158.0	9091.0
	Total Labour Cost	26738.0	32824.0	27772.0

Source: Field Survey Data.

Economics of Cost of Cultivation:

Per hectare cost of cultivation of kinnow is indicated in Table 4.2.5. The per hectare paid out cost for sample farmers in EMC (Rs. 49534) was marginally higher than that for those in TMC (Rs. 46539). Out of total paid out costs, maximum cost in both channels was for hired labour which was about 35 for EMC and 33 per cent in case of TMC.

Table 4.2.5: Economics of cost of cultivation

(Rs/ha)

Sr. No	Items	Kinnow	
		TMC	**EMC**
1	***Hired Labour***		
i)	Male	10941	13453
ii)	Female	4153	3044
iii)	Animal labour	-	-
iv)	Machine	135	671
	Total	**15229**	**17168**
2	***Maintenance Expenses***		
i)	Owned Animal	-	-
ii)	Machinery	3303	2992
	Total	**3303**	**2992**
3	***Cost on Material Input***		
i)	Seed	-	-
a	Home grown	-	-
b	Purchased	-	-
c	Total	-	-
ii)	Fertilisers		-
a	NPK	15046	15513
iii)	Manure		
a	Owned	135	236
b	Purchased	319	540
c	**Total**	**454**	**776**
iv)	*Pesticides*	*8611*	*9451*
v)	Irrigation	-	-
vi)	Micro Nutrients	2225	2092
4	*Depreciation*	*1671*	*1542*
5	*Land Revenue*	-	-
6	*Rent Paid for Leased in land*	-	-
	PAID OUT COST	**46539**	**49534**
7	Family Labour		
i)	Male	2942	5114
ii)	Female	34	55
iii)	Animal labour	-	-
iv)	Machine	8533	10487
	Total	**11509**	**15656**
8	**Total Cost of Cultivation**	**58048.0**	**65190.0**

Source: Field Survey Data.

Expenses on fertilizers, pesticides and maintenance expenses for machinery and were the other important items of paid out cost. Fertilisers constituted about 34 per cent of paid out cost in case of TMC and about 32 per cent for EMC. The cost of pesticide was about 18 and 19 per cent for TMC and EMC respectively of paid out cost. Overall, it is observed that the total cost for TMC (including imputed value of family labour) was Rs 58048 per hectare while in case of EMC it was Rs 65190 per hectare. Therefore, if imputed value of family labour is included, the cost of cultivation increased by about 25 per cent for TMC and about 32 per cent for EMC.

The technology used in crop cultivation is indicated in Table 4.2.6. It can be observed that the per hectare chemical fertilizers in case of kinnow was slightly higher in TMC than EMC

Table 4.2.6: Technology used for crop cultivation

(Average Per ha)

Sr.No.	Particulars	Kinnow	
		TMC	EMC
A	**Inputs**		
1	Chemical Fertilizer (qtls)	7.30	7.20
	Standard deviation	20.40	22.80
2	Organic Fertilizer (qtls)	-	-
	Standard deviation	-	-
	% using composted fertilizer (may specify)	-	-
3	Organic Pesticide (Kgs)	-	-
	% Farm certified as organic	-	-
4	Machinery used(man days/ha)	2.90	2.74
5	% irrigated area	100.0	100.0
6	Seed (kg)	-	-
	Standard deviation	-	-
	Sources (% o total)	-	-
	Home grown (%)	-	-
	Purchased (%)	-	-
	Home grown & Purchased (%)	-	-
7	Av. Area Cultivated (ha)	4.20	3.04
	Standard deviation	2.70	2.90
8	Total Production (qtls/ha)	208.0	230.0
	Standard deviation	31.60	78.50

Source: Field Survey Data.

Table 4.2.7 indicates the production and productivity of kinnow. It can be observed that the productivity was higher in case of EMC (230 q/ha.) as compared to TMC (208q/ha.).

Table 4.2.7: Details of production

Sr. No	Items	Kinnow	
		TMC	EMC
1	Main Product (Qt)	30576.00	6992.00
2.	Main Product (Qt/farm)	873.60	699.20
3	By Product (qt)	-	-
4	Productivity (qt/ha)	208.0	230.0

Source: Field Survey Data.

The details on cost of production of kinnow and net returns accruing to farmers in case of sales to TMC and EMC are indicated in Table 4.2.8. It can be observed that the price realized by the kinnow growers in TMC (Rs. 860/q) was lower than that realized by those farmers who sold through EMC (Rs. 1296/q). However, the important point is that farmers who sold in EMC had to incur marketing costs which reduced the net price received by them, whereas farmers who sold through TMC did not have to incur marketing costs as the contractors purchased the produce from the farmer's field. Hence they did not incur any transport or commission charges or any other market charges.

The net profit made by farmers (after taking into consideration cost of family labour) who sold kinnow under TMC was about Rs 581 per quintal whereas in case of EMC, it was about Rs 1013 per quintal. However, the net returns per quintal increase by 10 per cent for TMC and 7 per cent for EMC when only Paid out costs were taken into consideration.

Table 4.2.8: Details of cost of production and net returns

Sr No.	Items	Kinnow	
		TMC	EMC
1	Per ha Cost of Cultivation (including family labour)	58048.0	65190.0
2	Gross return/Output (Rs./ha)	178880.0	298103.0
3	Cost of Production (Rs./qtls) including family labour	279.10	283.40
4	Cost of Production (Rs per quintal) considering only Paid Out Cost	223.70	215.40
5	Productivity (qt/ha)	208.0	230.0
6	Per Quintal Price realized by farmer (Rs/qtls)	860.0	1296.0
7	Per ha Net Profit (including family labour) (Rs/.ha)	120832.0	232913.0
8	Per ha Net Profit (Rs/.ha) considering Paid Out cost	132341.0	248569.0
9	Per Quintal Net Profit (Rs/qtl) considering only Paid out cost	636.30	1080.70
10	Per Quintal Net Profit (Rs/.qtls) including family labour	580.90	1012.70

Source: Field Survey Data.

Disposal pattern of kinnow

The output disposal patterns of sample kinnow growers selling through TMC and EMC have been given in Appendix-I (b). On sample farms selling their output through TMC, 0.38 per cent total proportion of the total output was consumed at home. The net quantity sold was observed to be 99.54 per cent of the total production and out of this 98.82 per cent was disposed through the pre-harvest contracts whereas a marginal proportion (1.18 per cent) was sold through other channels. As most of the produce was sold to the pre-harvest contractors, the rejected quantity before sale of produce in the alternate marketing channels was observed to be negligible (0.08 per cent).

On sample farms in EMC, the net quantity sold was 99.38 per cent of the total production and entire part of this was disposed off in the EMC taken for the study. On these farms the proportion of output consumed at home and rejected or discarded before sale was observed to be 0.41 per cent and 0.21 per cent, respectively.

Price Spread and Marketing Costs of Kinnow:

In the marketing of agricultural commodities, the difference between the price paid by the consumer and the price received by the producer for an equivalent quantity of farm produce is often known as price spread. In Table 4.2.9, the price spread and marketing costs for kinnow based on the data collected from our field survey is indicated.

It can be observed from Table 4.2.9 that in EMC although the farmers in the sample received Rs 1296 per quintal, they had to incur marketing costs of about Rs 265 per quintal and hence their net price after deducting marketing costs was about Rs 1031 per quintal, which were incurred by the contractor himself in TMC (It may be noted that Rs 1296 per quintal is the weighted average price of the sample farmers which is calculated by using quantity sold as weights). But still the receipt by the farmer in EMC was about 20 per cent higher than those received through TMC. The farmers/contractors sold the produce to wholesalers who incurred marketing costs and margins of about Rs 204 per quintal for TMC and about Rs. 195 per quintal in case of EMC. The sale price of the kinnow retailer was about Rs 1889 per quintal for TMC and about Rs. 1874 per quintal in case of EMC. Finally, the share of the kinnow grower in the retailer's price under TMC was 33.70 percent, while marketing costs as a percentage of retailer's price was 20.70 and marketing margins as percentage of retailer's price was 33.70 percent, while the corresponding figures in case of EMC was 55, 21.6 and 23.4 per cent, respectively.

Table 4.2.9: Price spread and marketing costs (2009)

(Rs per quintal)

Sr. No.	Price Spread	Kinnow	
		TMC	EMC
I	**Price received by farmer**	860.0	1296.10
II	**Total Marketing costs of farmer**	**-**	265.30
	(a) transport to APMC	-	34.30
	(b) loading & unloading	-	-
	(c) weighing & other related expenses (packing, waxing etc.)	-	231.0
	(d) commission	-	-
	Net Price received by farmer	860.0	1030.80
	Net Profit (Net price received- Paid Out cost)	636.30	815.40
111	Marketing Costs and margins of Pre-harvestor contractor	266.0	-
	(a) market fee	-	-
	(b) hamali	-	-
	(c) wastage during transport	6.90	-
	(d) transport to terminal market	32.30	-
	(e) weighing & other related expenses(packing, waxing etc.)	212.0	-
	(f) PHC's margin	215.0	-
	Purchase price of PHC plus marketing costs & margins	1326.0	-
IV	Marketing Costs and margins of wholesaler	204.40	194.70
	(a) market fee	119.40	116.70
	(b) hamali	-	-
	(c) wastage during transport	-	-
	(d) transport to terminal market	-	-
	(e) wholesaler's margin	85.0	78.0
	Purchase price of wholesaler plus marketing costs & margins	1530.40	1490.80
V	Marketing cost and margins of Retailer	358.40	382.90
	(a) Hamali from point of purchase to tempo	-	-
	(b) Transport to retail outlet	10.50	11.0
	(c) Miscellaneous expenses such as cess to corporation, watchman for unsold stock	-	-
	(d) Wastage	10.90	11.90
	(e) Retailer's margin	337.0	360.0
	(f) sale price of retailer	1888.80	1873.70
VI	Share of farmer (%) in retailer's price	33.70	55.0
VII	Marketing Costs as % of retailer's price	20.70	21.60
VIII	Marketing margins as % of retailer's price	33.70	23.40
IX	Modified Measure of Marketing Efficiency (MME)	1.53	1.22

Source: computed from field survey data

The Benefit Cost Ratio (BCR) for kinnow is indicated below in Table 4.2.10. It can be observed that the BCR obviously reduces when family labour is included in cost of production. The BCR is higher in EMC for kinnow in EMC as compared to TMC. This is because as explained earlier, the price received in case of sales through EMC is 50 percent higher than that through TMC.

Table 4.2.10: Benefit cost ratio

Particulars	**TMC** (cost of production includes only Paid out costs)	**EMC** (cost of production includes only Paid out costs)	**TMC** (cost of production includes family labour)	**EMC** (cost of production includes family labour)
BCR for kinnow	3.80	5.10	3.10	4.60

Source: computed from field survey data

Reason for Preferring the Marketing Channel:

The reasons for preferring the marketing channel is indicated in Table 4.2.11. It can be observed that in case of kinnow under TMC maximum responses pertained to the assured sales as the farmers did not want to sell their produce directly in the market to overcome the price risk as well as to save time as well as energy while selling the produce in the market. They were also influenced by friends and relatives to sell their produce to the contractor. In case of EMC, fair price and superior infrastructure were the main reasons for preferring this channel.

Table 4.2.11: Reason for preferring the marketing channel

(% to total responses)

Sr. No.	**Particulars**	**Kinnow**	
		TMC	EMC
1	Habit	11.40	10.0
2	Influence of friend, relatives, neighbours	5.70	10.0
3	Assured sales	28.70	-
4	Higher/Fair price	11.40	30.0
5	Low cost of Marketing	17.10	-
6	Less Physical loss	-	-
7	Proximity	-	-
8	Logistical Support	-	-
9	Access to Inputs	-	-
10	Hidden cost/bribes in alternative channel	14.30	10.0
11	Longer waiting time and formalities in alternatives channel	11.40	20.0
12	Superior services	-	-
13	Superior Infrastructure	-	20.0

Post Harvest Losses:

The post harvest losses take place at almost all stages of handling of kinnow. First of all, the standing crop itself may be partly destroyed or may deteriorate in quality due to disease. Most crops are susceptible to diseases which lead to fall in yield. Secondly, losses also arise during transport mainly due to friction between the produce, lack of availability of cold chains and also poor infrastructure. The longer the time taken and poorer the infrastructure, greater will be the post harvest losses. Kinnow crop is also subject to huge post harvest losses. The kinnow productivity is affected by cloudy weather and intermittent rainfall and discussion with farmers revealed that sometimes 30 to 40 per cent of the fruit drops pre maturely. After harvest, the fruits are normally graded, waxed and packed in boxes to be disposed of in the local as well as distant markets of Punjab and other states of India. In Table 4.2.13, the post harvest loss of the crops from the sample farmers are indicated. As in case of TMC, the crop was not marketed by the producer himself, therefore the post harvest losses in case of EMC were only considered. During transport, there is injury to the crop due to friction, and also secondary infection of the fruit, which leads to rotting of the fruit and the post harvest loss reported on this count, is less than one per cent as waxing increases the shelf life of the kinnow. At the retail stage, the post harvest loss reported was 0.5 percent. The spoilt produce is often sold at 40-50 per cent of the price.

Table 4.2.12: Per quintal post-harvest losses

Post Harvest Loss	**Kinnow**			
	TMC		**EMC**	
	Quantity	*SD*	Quantity	*SD*
Loss during storage (kg)	-	-	-	-
Loss during transport(kg)	-	-	0.80	780.10
Loss at Retail level	-	-	0.50	237.40

Notes: SD- Standard deviation, Quantity in Kgs

The main reasons for the loss as explained by sample farmers are tabulated in Table 4.2.13.

Table 4.2.13: Reasons for post-harvest loss (percentage of multiple responses)

Reasons	**Kinnow**	
	TMC	**EMC**
Perishable nature of the commodity	-	100.0
Long distance to market	-	30.0
Loss as waited for better prices and the product perished	-	40.0

Source: Field Survey Data.

Kinnow is a perishable crop which was an important reason for post harvest loss as revealed by all the kinnow growers. The introduction of waxing of the fruit before packing has increased the shelf life of the fruit and curtailed the losses up to certain extent. About 30 per cent of farmers reported that long distance to the market led to friction of the fruit and caused losses. In case of TMC however, since the crop is collected by the contractor in the farmer's field, the farmer does not bear such transport losses. The contractor normally buys selected fruits and has better packaging and transport facilities. Hence in TMC post harvest losses on this count were not reported. Sometimes, while disposing of the produce in local market for the wait of getting better prices, the produce perished.

Information Regarding Price Available to farmers:

In order that farmers receive best possible price for their produce, it is necessary that they must be aware of ruling market prices in the market where they sell their produce. This will guide them regarding the right time to dispose off their produce. It can be observed from Table 4.2.15 that farmers did have information about price prevailing in regulated markets. In case of EMC, the commission agent/trader was important source of price information. Further, most often, the farmers were aware of the price soon after harvest. None of the farmers in the sample got information from AGMARKNET. By and large sample farmers revealed that the price received by them was more or less similar to that expected by them. In case of TMC, personal information/experience was playing an important role in determining the price of the crop

Enforcement Costs:

As discussed earlier, in case of sales in EMC, the farmer sells his produce in the APMC through auction method. A commission agent acts between the farmer and the buyer who is normally a wholesaler. Similarly in case of sales under TMC, contractor buys the crop from the farmer at an agreed price. There have however been instances when farmers are cheated by the commission agent/contractor while selling in the market or to the contractor. In order to observe this the farmers in our sample were interrogated about their experience with market intermediaries. This transaction cost is indicated in Table 4.2.15.

Table 4.2.14: Details about the transaction cost-information costs

(% to total responses)

Sr. No.	Particulars	Kinnow	
		TMC	EMC
A	**Source of price information**		
1	Personal information	54.30	40.0
2	Speaking with other farmers	14.30	10.0
3	Speaking with Commission agent/Trader	31.40	50.0
4	Speaking with the E-choupal agent	-	-
5	Any other	-	-
6	Two responses	-	-
a	1& 2	-	-
b	1&3	-	-
c	1&4	-	-
d	1&5	-	-
e	2&3	-	-
f	2&4	-	-
g	3&4	-	-
7	Three responses	-	-
a	1,2 & 3	-	-
b	1, 2 & 4	-	-
c	2,3 &4	-	-
B	**Time of Price information**		
1	At the time of harvest/sale	100.0	-
2	At the time of sale	-	100.0
C	**Price Information from AGMARKNET**		
1	No	100.0	100.0
2	Yes	-	-
D	**Difference in Price Information**		
1	lower than expected	28.60	-
2	Similar to what expected	42.80	20.0
3	Higher than expected	28.60	80.0
F	**Time of Price Agreement**		
1	At the time of sale	-	100.0
2	By previous agreement	100.0	-

Source: Field Survey Data.

Table 4.2.15: Transaction cost-enforcement costs

(% responses to total)

Sr. No.	Particulars	Kinnow	
		TMC	**EMC**
A	***Difference between agreed price and sale price***		
1	Less	28.60	-
2	Same	42.80	20.0
3	A bit more	28.60	80.0
B	***No. of times went farmer went to agent to get payment***		
1	None	91.40	-
2	Various times	8.60	-
C	***Merchant fulfilment***		**-**
1	Bad record	-	-
2	Satisfactory record	80.0	-
3	Good record	20.0	-
D	***Receipt for sales***		**-**
1	No	100.	-
2	Yes	-	100.0
E	***Conflict on quality***		
1	**No**	100.0	100.0
F	***Conflicts any other***	**-**	**-**
1	Because of Rain	-	-
2	Production rejected	-	-
G	***How was it resolved***	**-**	**-**
1	**By APMC/Company Person**	**-**	**-**
H	***Confidence in the merchant***	**-**	**-**
1	**Low**	**5.70**	**-**
2	**High**	**94.30**	**-**

Source: Field Survey Data.

Majority of the farmers in TMC expressed that they received the same price as was agreed and did not have to go to the agent to receive payment for the produce that was sold and received payment on time. In case of EMC, about 80 per cent of the farmers expressed that they got a bit higher prices for their produce than their expectation. The contractor in TMC facilitated payment to the farmer and by and large they received timely payment, they expressed high confidence in the contractor.

Perception on services provided by different agencies:

Farmers are in need of credit for short term as well as medium to long term for crop loan and other investment purposes. This credit is available to them from formal and informal sources. In Table 4.16 source and purpose of loan is indicated. As expected, all farmers in the sample had taken loan and they had taken loans from multiple agencies. There were only a few cases when farmers had borrowed from moneylenders and it was mostly through banks

and cooperative credit societies that loan had been availed. Further, the main purpose of loan was for crop loan purposes though in a few instances farmers had taken loan for digging wells. None of the farmers had defaulted in repayment of the loan.

Table 4.2.16: Perception on services provided by different agencies

Sr No.	Particulars	Kinnow	
		TMC	EMC
A	**Taken any loan (% to selected hh)**	**100.0**	**100.0**
B	**Source of loan**		
1	Money Lender	28.60	40.0
2	Bank	14.30	80.0
3	Cooperative	90.0	100.0
4	Friends/Relatives	28.60	20.0
5	Self Help Group	-	-
6	Buyer of the produce	-	-
7	Other	-	-
C	**Purpose of loan**		
1	Crop Loan (inter-culture operations)	100.0	100.0
3	Well digging	14.30	30.0
D	**Reason for taking loan from buyer**		
1	Inter-culture Operation	-	-
E	**No. of times loan taken from the buyer in last 5 years**	**-**	**-**
1	**This year only**	**-**	**-**
F	**Total amount of loan obtained from buyer in 2009-10**	**--**	**-**
G	**Default of loan taken**		
1	No	-	-
2	Yes	-	-
H	**Source of loan for default loan**		
1	Money Lender	-	-
2	Bank	-	-
3	Cooperative	-	-
4	Friends/Relatives	-	-
5	Self Help Group	-	-
6	Buyer of the produce	-	-
7	Other	-	-
I	**Reason for default**		
1	Less Production	-	-

Source: Field Survey Data.

Access to Inputs from Buyers:

In agricultural marketing, there is a link between input and output market. The farmers receive input such as pesticides and seeds in cash or kind from the market intermediary to whom he sells his produce. Keeping this in view, sample farmers were asked about the inputs received from their buyer. The farmers' response is indicated in Table 4.2.17. None of kinnow growers received inputs in cash or kind from the wholesaler. The

input received was mainly fertilizer and pesticide and the main reason of procuring inputs from buyer was surety of good quality.

Table 4.2.17: Access to Inputs from the Buyer

Sr. No.	Particulars	Kinnow	
		TMC	EMC
A	Received Input Advance for the reference period (% of responses)		
1	No	100.00	100.00
2	Yes	0.00	0.00
B	Value of the input (Rs./farmer)	-	-
C	Reason for the procuring the input of the Buyer (% of responses)		
1	Good quality seed & pesticide	-	-

Source: Field Survey Data.

Perception of the Market Infrastructure:

It was discussed earlier that in case of TMC, since the crop is collected by the contractor in the farmer's field, the farmer does not take his produce to the market himself, hence in TMC perception of the market infrastructure were not reported. The main purpose of regulated markets was to ensure free and competitive sales by auction methods. Regulated markets were to also ensure standardized market charges, reliable weighing, payment of cash to farmers without undue deductions, and several other amenities in market yards. Accordingly, in Table 4.2.18 the market infrastructure facilities available in the APMC markets as perceived by farmers is indicated. Majority of farmers expressed that the village roads were average or good quality. With respect to proximity to the market, it was observed that the APMC was not in the same village and in a few cases the farmers in the sample had to travel within 10 kms to access the regulated market. In case of kinnow growers, 60 percent of respondents expressed that they had to travel more than 50 kms to access the market. With respect to other facilities such as auction, supervision of sale, loading, sorting, weighing was either satisfactory or good. They also opined that internal telephone facility, computer facilities and banking facilities were of the average quality. Thus with respect to certain market facilities majority farmers were satisfied, but at the same time there were also certain shortcomings and farmers felt the need to improve infrastructure.

Table 4.2.18: Perception of the market infrastructure

(% to total selected hh)

SR No.	Particulars	Kinnow	
		TMC	EMC
1	**Condition of the road to market**		
a	Bad	-	
b	Average	-	40.0
c	Good	-	60.0
2	**Proximity of market**		
a	Within the village	-	-
b	within 10 kms	-	-
c	between 10 & 25kms	-	20.0
d	>25 kms &<50 kms	-	20.0
e	more than 50 kms	-	60.0
3	**Go-down facilities**		
a	Not Available	-	-
b	Bad	-	-
c	Average	-	-
d	Good	-	-
4	**Cold storage**		
a	NA	-	-
b	Bad	-	-
c	Average	-	-
d	Good	-	-
5	**Auction arrangements (Open)**		
a	Bad	-	-
b	Average	-	20.0
c	Good	-	80.0
6	**Supervision of sale**		
a	Bad	-	-
b	Average	-	30.0
c	Good	-	70.0
7	**Loading facilities**		
a	Bad	-	-
b	Average	-	80.0
c	Good	-	20.0
8	**Sorting facilities**		
a	Bad	-	-
b	Average	-	-
c	Good	-	-
D	NA	-	100.0
9	**Weighing facilities**		
a	Bad	-	-
b	Average	28.60	40.0
c	Good	71.40	60.0
10	**Packing facilities**		
a	Bad	-	-
b	Average	42.90	50.0
c	Good	57.10	50.0
11	**Internal Telephone**		
a	Bad	-	-

b	Average	-	-
c	Good	100.0	100.0
12	**Banking facilities**		
a	Bad	-	-
b	Average	-	-
c	Good	100.0	100.0
13	**Computer facilities**		
a	Bad	-	-
b	Average	57.10	60.0
c	Good	42.90	40.0
d	NA	-	-

Source: Field Survey Data.

Perception of the Farmer on Other Market Agents and Price:

The selected kinnow growers were questioned on their awareness about other market intermediaries operating in agricultural markets, other wholesale markets where the produce is sold, retail price, role of government, etc. Their responses are summarized in Table 4.2.19.

It can be observed from Table 4.2.19 that after sale of his produce, the farmers were by and large aware of the supply chain that existed till the produce reached the ultimate consumer. The farmers were more concerned with the price which they received and their sale receipts. The farmers in the sample revealed that they were aware that their produce went to another commission agent or trader. About 91 per cent of the sample farmers in case of TMC and 50 per cent for EMC opined that their produce goes through 3 to 4 channels. The sample farmers were also aware of the other wholesale markets where their crop is sold both within and outside the state. About 43 percent of sample farmers in TMC and 20 percent in EMC for were not aware of retail price. Other farmers in the sample were however aware of the price.

Farmers also felt that the margin realized by the buyer of their produce is high. In case of EMC, 40 percent of farmers in the sample indicated that they would continue to sell in the same channel while in case of TMC the percentage of farmers was 51.4 percent. Sample farmers also indicated other options such as export markets or even to government where they would like to sell their produce. In order to obtain higher price for their produce, farmers felt that exports of their produce should be promoted, cold storage should be provided and subsides should also be extended. The farmers selling to EMC were questioned about constraints faced by them while selling through this channel. The main constraint faced by the kinnow growers in the market was that the commission agent in the market preferred the traders than the farmers for auctioning their produce. Further, some farmers felt that the wholesalers buy only selected quality produce and also delay payment.

The farmers were asked for their suggestions which would ensure them higher prices and also which would reduce marketing margins of the intermediaries. Farmers made several suggestions such as exports should be promoted and encouraged especially when global prices are ruling high, market charges and number of intermediaries should be reduced and credit should be easily available. Government intervention/purchase can also help to push up prices. Farmers also opined that the market committee should ensure the early sale of the produce in the market at remunerative prices so that the farmers could escape from the delay in the market.

Table 4.2.19: Perception of the farmer on other market intermediaries, price spread and constraints in agricultural marketing

Sr. No.	Particulars	Kinnow	
		TMC	EMC
1	**After the Buyer, who are the agents and how many channels are there between you and the retail market (% to Total)**		
A	***Agents***	**-**	**-**
a	Don't Know	28.60	20.0
b	Agent/Trader/Wholesaler/Retailer	-	40.0
c	Agent/APMC Agent	-	-
d	Trader	71.40	40.0
e	Traders and Others	-	-
B	***How many channels in between (% to total responses)***		
a	*1 Channel*		
b	*2 Channels*		
c	3-4 Channels		
2	**Which are the wholesale markets in country where crop is sold (% to Total responses)**		
a	Calcutta		
b	Ahmadabad		
c	Nashik		
d	Surat		
e	Pimplgaon		
f	Mumbai		
g	Lasalgaon		
h	Delhi	11.40	50.0
i	Other		
3	**Did you know the price at which produce is sold in the retail market (% to Total hh)**		
a	Unaware	85.70	20.0
b	Aware	14.30	80.0
c	If you know, what is the price (Rs/qtls)	1900	2000
4	**What is the margin that buyer of your produce earns from the sale of the produce (Rs/qtls)**	**250**	**80**
5	**What is your opinion of margin that is realized (% to total hh)**		
a	High	42.90	50.0
b	Very High	14.20	-
c	Do Not know	42.90	50.0
6	**In future will you sell the produce to this agent again (% to total hh)**		

a	No	11.40	10.0
b	Yes	51.40	40.0
c	Uncertain	5.70	20.0
d	If give higher price	31.50	30.
7	**Any other option for selling the produce (% to total hh)**		
a	No	85.70	70.0
b	Yes	14.30	30.0
c	**If yes, what are the options for selling (% to total responses)**		
i	City Trader	20.0	-
ii	Export	20.0	67.0
iii	Other Market/State	60.0	33.0
iv	Govt. if given higher price	-	-
8	**What are the enabling conditions and support that Government should do so that farmers can get a better price for the produce (% to total responses)**		
a	Need Export Facility	57.10	50.0
b	Cold Storage & Higher MSP	28.60	20.0
c	Need Subsidy	14.30	30.0
d	Market and Other charges Should be reduced	-	-
e	Increase MSP	-	-
f	Reduce Commission Agent	-	-
g	Other Facilities	-	-
9	**What are the Constraints faced by you in EMC As compare to TC (% to total responses)**		
a	Only Buys Selected Quality produce	-	20.0
b	Buys only in small Quantity	-	-
c	Delay in Payment	-	10.0
d	Buys from Trader and not from farmers	-	50.0
e	No Problem	-	10.0
f	Low rate of produce	-	-
g	EMC is not as strong as TC	-	-
h	Other Problems	-	10.0
10	**How do you think the constraints in the Emerging marketing channels can be overcome?**		
a	Reduce the purchase from agent	-	20.0
b	Purchase entire produce	-	-
c	Need to Attract farmers by providing facilities and services	-	50.0
d	Increase rate -Emerging Market	-	30.0
e	Other Previsions	-	-
11	**Suggestions to ensure that farmers get higher price for the produce and the margins of the intermediaries are reduced?**		
a	Govt. should help to export	-	10.0
b	Reduce Intermediaries in market	-	10.0
c	Provide good Transport Facilities	-	20.0
d	Good Market Facilities	-	50.0
e	Price Should be decided by Government during bumper harvest	-	-
f	Reduce Charges (market/processing)	-	-
g	Provide Credit facilities	-	-
h	Reduce Electricity Charges	-	-
i	Government should purchase	-	10.0
j	All Produce should be purchased by Merchants	-	-

Source: Field Survey Data.

Perception of the traders/ consumers

The most of the traders/middlemen involved in kinnow marketing were of the views that demand for Punjab kinnow is increasing at a significant rate in far away markets of country. Thus, to dispatch the produce to distant markets and avoid heavy transport losses they felt the need for refrigerated transport facilities. It was emphasized that to avoid the gluts in local markets during the harvesting period the government should promote the processing of kinnow fruits in the producing areas of the state. Further, to promote kinnow trade various services like grading, waxing, packaging and cold storage and transportation should be provided at subsidized rates.

Chapter 5

Summary, Conclusion and Policy Implications

Backdrop:

The Rice-wheat system accounts for about three –fourth of the cropped area and over 85 percent of the gross value of crop output. The predominance of this cropping system has caused disastrous impacts on the environment, particularly in terms of reduction in the water table and deterioration in soil fertility. The greater emphasis on cereal production (especially rice and wheat) in the past to achieve food security, which undoubtedly resulted in lower output prices and higher profitability, is now dampening agricultural growth .To revitalize agriculture in Punjab, agricultural diversification towards high value commodities (HVCs) is considered as one of the most promising strategies. The global trade of HVCs is growing rapidly. Facilitating the transition of an agricultural production system dominated by cereals towards HVCs requires greater understanding of the processes involved in diversification and its impact on agricultural performance. The major constraints inhibiting such diversification efforts have been the marketing opportunities for high value crops especially fruits and vegetables owing to their perishable nature. Thus there is need to evolve innovative marketing institutions that link farmers with the markets for speedy and remunerative disposal of fruits and vegetables.

Supply chain status of fruits and vegetables

High value commodities especially fruits and vegetables are susceptible to inaccessibility of markets and high price volatility. Smallholders face the added problems of high transactions costs due to meagre marketable surplus and production risk. Though the demand for HVCs is increasing and there are considerable benefits emanating from their production, absence of well-developed market arrangements inhibit their expansion. The existing markets of HVCs are inefficient, unorganized and disintegrated. The entire marketing process of HVCs, compared to foodgrains marketing, is complex and risky due to the perishable nature of produce, seasonal production, and bulkiness. It is further complicated by the absence of sufficient infrastructure, such as specialized markets, cold chains, packing, etc., and lack of agro-processing facilities. Regulated markets for HVCs are very few and cover only a few cities in the country. For HVCs marketing from production centres to retailing requires close coordination between producers, distributors, processors and retailers to maintain desired quality and quantity to meet consumers' demands. To promote

agricultural diversification towards HVCs in the wake of urbanization liberalization and globalization, the agricultural marketing strategy requires a paradigm shift by strengthening marketing institutions, developing synergies between producers and agri-business, and consolidating the supply chain. Hence, it is of paramount importance to examine how the farm producers of HVCs are integrated with the markets and how innovative supply chains are emerging for HVCs to meet the growing domestic and global demands.

Objectives:

The "emerging" marketing channels are supposed to reduce transaction costs and ensure that high margins maintained by intermediaries in the supply chain are reduced so that the farmer benefits and gets a better price as compared to sale in regulated markets. Keeping this in mind the study has the following objectives:

1. To analyze the share of the farmer in the final consumer's rupee in an emerging marketing model vis-à-vis the traditional marketing channel;
2. To analyze the degree of market efficiency and incidence of post harvest losses in emerging marketing channel vis-à-vis traditional marketing channel;
3. To note the market practices and services of agencies involved in the emerging channel and observe if they are superior to that of traditional channels;
4. To analyze the constraints faced by farmers and different market functionaries in the emerging marketing channel as compared to the traditional marketing channel.

Methodology

The present study has been conducted in the state of Punjab covering two horticultural crops namely potato (vegetable) and kinnow (fruit) in Jalandhar and Ferozepur districts respectively owing to sizeable area under cultivation. The study has been based on both primary as well as secondary data. The primary information for the purpose has been collected through primary surveys and informant interviews with growers, market committee members, processors, buyers, retailers and consumers in Jalandhar (Potato) and Abohar (Kinnow) districts for the study. Secondary data pertaining to the importance of these crops in study districts/state have been gathered from various secondary sources. The study has been based on a sample of 90 farmers (45 potato growers from Jalandhar west and Bhogpur blocks of Jalandhar district + 45 kinnow growers from Abohar block of Ferozepur district). The required data/information on cost components, crop yields, input and output prices and inputs supplies to the farm producers, etc for potato and kinnow crops were collected through

primary surveys and informant interviews with growers. The reference period for the primary data survey was 2009-10.

Traditional /Emerging marketing channels selected for the study:

Potato: The most prominent traditional supply chain involves farmers selling the fresh potato produced by them in the primary wholesale markets through commission agents to wholesalers who in turn further sell to secondary wholesalers located in small cities and towns and local retailers. In recent years new Supply chain for potato: Producer → Processor (Pepsi Co.) → consumer has also emerged.

Kinnow: The most prominent traditional supply chain for kinnow in the region involves Producer → Pre-harvest contractor → Commission agent → Wholesaler → Retailer → Consumer. Pre-harvest contractors provide advance payments to the farmers during the time of agreement. In this approach, farmers minimize risk due to price volatility and post-harvest losses of course with lesser producers' share in consumers' rupee resulting in marketing inefficiency. During recent years, the Farmers' Evening Markets for fruits especially kinnow have also come up in the study district. The practice of selling Kinnow crop to Pre-harvest contractors has been on the decline and new supply chain: Producer → Farmers' Evening Markets → Local Wholesaler → Wholesaler at distant markets → Retailer → Consumer has been emerged.

The sample size for the farmers was as follows:

Crop	Traditional Channel	Emerging Channel
Potato	35	10
Kinnow	35	10

The information so collected was supplemented from, intermediaries, buyers/processors, retailers and consumers to maintain desired quality and quantity to meet consumers' demands under the set up of the existing supply chains in fruits and vegetables as well as under the innovative institutional arrangements, which are gradually emerging in fruits and vegetables. In order to observe the supply chain of the emerging channel and traditional channel, primary data were collected from the following respondents with the help of pre structured research instruments. The sample size for other intermediaries was as follows:

Intermediary	Traditional Channel		Emerging Channel	
	Potato	Kinnow	Potato	Kinnow
Wholesalers	10	5	10	5
Retailer	10	5	10	5
Consumer	10	5	10	5

A focus group discussion with the Market Committee Members/officials was also held to get a lucid depiction of market charges, market practices, processes etc. Simple statistical tools were used to examine the share of farmer in terminal price in case of both traditional and emerging channel. The post harvest losses, market practices and constraints faced were also analysed using field level data.

Regulation of markets: rules, procedures and their evaluation

The Royal Commission on Agriculture (1928) recommended the regulation of market practices and the establishment of regulated markets in India in view of the chaotic conditions prevailing in the agricultural produce markets. Central Banking Enquiry Committee endorsed these recommendations later. The Directorate of Marketing and Inspection (DMI, 1935) recommended the regulations of markets to the State governments. The DMI prepared a Model Bill in 1938 and circulated among the States. Since then, the State governments have enacted legislation for the regulation of the markets. A regulated market is one, which aims at eliminating the unhealthy and unscrupulous practices, reducing marketing charges and providing facilities to producers- sellers in the market. The basic philosophy of the establishment of regulated markets is elimination of malpractices in the system and assignment of dominating power to the farmers and their representatives in the functioning of their markets.

The Punjab Agricultural Produce Markets Act, 1961/ **Sale of Agricultural Produce**

The Punjab Agriculture Produce Markets Act, 1961 received the accent of the President of India on May 18, 1961. The act aimed to consolidate and amend the law relating to better regulation of the purchase, sales, storage and processing of agricultural produce in Punjab. The act provides for the establishment of an apex body at the State level to perform the functions under this act. The Punjab State Agricultural Marketing Board (PSAMB) was established. The board is an executive-cum-advisory body and is concerned with bringing

about improvements in the regulation scheme. It also supervises the functioning of regulated markets and advises market committees and the State Government on related matters. The board closely monitors the sale of agricultural produce and formulates laws for the sale/purchase of the agricultural commodities.

Impact of reforms processes on Traditional and Emerging Market Channels

The Punjab State has more or less been able to achieve the above stated objectives of regulated markets. However, it may be argued that the success in terms of providing incentives for the quality of the produce has not been significant. Till now the emphasis of the farmers has been on producing more irrespective of the quality. Assured purchases of food grains by the government during the last three decades may also be termed as a culprit for deterioration of farmers' quality consciousness. The benefits of regulated markets seem not to be percolating (in terms of quality and quantity) to the fruit and vegetable growers. Many studies have shown in recent past that the producer's share in consumer's rupee has still been low. It is a common fact that the increased production has often resulted into decline in the farmer's profits. Similarly, no incentives to the farmers for better quality have been reported till now.

Traditional marketing channels:

The existing supply chains of fruits and vegetables involve numbers of intermediaries that add to market inefficiency and increase price spread between farmers and the consumers. Most of the traditional supply chains are conducted in spot markets. Producers typically sell to traders or wholesalers who market the product in other markets. Coordinated sales between producers and processors are uncommon but slowly emerging with changing demand scenario. Important supply chains for vegetables and fruits include:

Supply chains for vegetables

- Supply chain 1:
  Producer → commission agent → wholesaler → retailer→consumer

- Supply chain 2:
  Producer → commission agent → primary wholesaler →secondary wholesaler → retailer → consumer

- Supply chain 3:
  Producer → Processor → consumer

- Supply chain 4:

Producer →Collector/Consolidator /Agent→Wholesaler at distant markets→ Retailer → Consumer

The most prominent supply chain involves farmers selling the fresh vegetables produced by them in the primary wholesale markets through commission agents to wholesalers who in turn further sell to secondary wholesalers located in small cities and towns and local retailers (supply chain 1). This supply chain accounts for about half of the total vegetables sold in the state.

Supply chains for fruits

- Supply chain 1:
  Producer→Pre-harvest contractor→Commission agent →Wholesaler→ Retailer →Consumer

- Supply chain 2:
  Producer→ commission agent → wholesaler → retailer →consumer

- Supply chain 3:
  Producer → Collector/consolidator /agent→Wholesaler at distant markets → Retailer → Consumer

- Supply chain 4:
  Producer → Processor → consumer

Supply chains 1 and 2 are the most prominent marketing channels in fruits, accounting for about 90 percent of total sales of fruits. Pre-harvest contractors provide advance payments to the farmers during the time of agreement. In this approach, farmers minimize risk due to price volatility and post-harvest losses.

In the processing, marketing channels, processors procure the fresh vegetables and fruits from farmers through either contract farming or directly from the wet markets. Owing to number of intermediaries in the supply chain, the transactions and marketing costs increase, resulting in low marketing efficiency. The Commission Agents also exploit the farmers by charging higher commissions, since most of the farmers have taken loans/advances from commission agents and are forced to sell the produce to them. These all results into increase the price spread and reduce the producer's share in consumer's price. In the case of vegetables, producer's share in retail prices varies from 35 to 45 percent and for fruits from 25-35 percent.

Innovations in marketing – Emerging marketing channels:

Farmers' markets: Farmers' markets (Apni mandi) are an innovative marketing approach introduced in the state mainly to tackle the problems of marketing and exploitation of farmers by the middlemen. Thus, the market is totally devoid of middlemen. The main aim of farmers' market is to ensure fresh vegetables and fruits at remunerative prices to the farmers and reasonable prices to consumers. The total transactions through these markets form just negligible portion (less than 1%) of the marketed surplus, as only few farmers are able to sell in these markets. The producer's shares in consumer's prices for selected vegetables in these markets varied between 80-90 percent, compared to 35-45 percent for sale in the traditional supply chain.

Contract farming for promoting high value agriculture: The smallholders are also risk averters and sacrifice production of HVCs despite prospects of higher returns. Contract farming is an institutional response to missing markets for credit, insurance, information, factors of production in an environment of pervasive risks. The concept has potential to reduce transactions costs by coordinating production, marketing, processing and retailing. It is defined as a system for the production and supply of agricultural produce under forward contracts, the essence of such contracts being a commitment to provide an agricultural commodity of a type and in the quality required by a known buyer. The model eliminates the intermediaries and a part of saving is distributed between producers and consumers. The Punjab government is engaged in aggressively promoting contract farming. Therefore a number of corporate agri-business firms have signed a memorandum of understanding with the government of Punjab to take up contract farming in the state to promote number of commodities. The benefits of contract farming over non-contract farming are compared in terms of reducing transactions costs, increasing profits and enabling access to markets. Different forms of models can be broadly divided in to three categories: (a) government promoted contract-farming; (b) corporate sector driven contract farming; and (c) informal contract farming. The type of contract depends upon the commodity and the nature and destination of the final product.

Government-promoted contract farming: Since 2003, the government of Punjab has launched contract farming in a number of crops such as maize, barley, sunflower, hyola, basmati rice, etc. to substitute for a sizable area under rice–wheat system. This model involves four parties in the contracted transaction: farmer, extension firm__F, buyer (marketing firm) and the Punjab Agro Foods Corporation (PAFC) acting as facilitator

between farmer, the extension firm and the buyer. The basic philosophy of this program is to provide technical know-how to the producers, mitigate price fluctuations and strengthen the marketing infrastructure for selected agricultural commodities. The contract specifies the quality, quantity, prices, and time of delivery. As per the contract, the farmer brings produce as per the specified quality at the designated place. In case the farmer can get a higher price from the market, he is free to sell his produce to the highest bidder/buyer, bypassing the contract as per the open-end clause provided in the contract. If the market prices are lower than the contracted prices, the PAFC offers a 'comfort price' that are slightly higher than the market price. As a means to encourage contract farming in the state, the government of Punjab reduces the combination of market fees (2%), rural development fund charges (2%), and infrastructure taxes (1%) from a total of 5 percent to 0.5 percent. Examples of companies that entered into this type of contract arrangement with farmers included Advanta for sunflower; Punjab Agro Foods Corporation for Hyola; Pro-Agro and Mahindra Shubh Labh for winter maize; United Beverages for Barley; and Rallis India,, Mahindra Shubhlabh, Escorts and DCM Shriram for basmati rice. The program is in the evolution stage and government is making all efforts to bring more farmers and crops into its fold.

Private industry-driven contract farming: This is the most common model of contract farming, driven by private industry comprising processors, exporters and domestic wholesalers /retailers. This model has different variants promoted by different agro-firms: (i) processors; (ii) exporters; and (iii) vertically integrated franchises. Processor-driven contract farming: The first type of arrangement consists of a processor who enters into a contract with growers to regularly source raw material of a desired quality to the plant. An important example of this is 'PepsiCo model' that pioneered the concept of contract farming for the competitive bulk procurement of a variety of vegetables like potato, tomato and chilies in Punjab. Initially the Pepsi Co. initiative was quite successful in augmenting tomato yields by 25-50 percent and incomes by about 40 percent. Later due to dispute and breach of contract, the tomato processing plant was closed but the firm is continuing contract farming in other commodities. In this model, the processors supply seeds and seedlings of specific varieties to the producers for meeting the processing requirements. The firms regularly supervise and monitor their production throughout the growing season. The firms also provide technical advice to farmers. Purchasing decisions vary by company in terms of the amount and quality of products that are accepted. For instance, Pepsi applies stringent quality standards prescribed in the contract in their procurement. Another example is Nijjer Foods Ltd. (started in 1991 in Amritsar), which started contract farming in Punjab to process tomatoes and

chilies. While the contract is a written agreement and signed by both parties (farmer and processor), it is not a legally valid document.A slight variation in this model involves contract farming facilitated by the Punjab Agro Industries Corporation (PAIC) through joint ventures with private processors. In this model, the PAIC acts as a facilitator and broker in the joint venture company through equity participation. It also procures some of the commodities. For example, PAIC procures green peas grown in the district of Patiala for local processors. In this case, farmers grow the improved varieties__F21, which are procured by the processing unit. Pea processors do not provide any inputs or technical advice to the farmers. The processing unit grades the produce and rejects those not conforming to their prescribed specifications and standards. Prices are fixed on the basis of the market prices that prevailed in the local markets over the last 3 to 4 years.

Contract farming in vegetables: In Punjab, some corporate houses are establishing their presence in vegetables through contract farming for export, processing and/or retailing; the major companies are Mahendra Subhlabh, Bharti, and Pepsi. Recently, one of the India's leading corporate house (namely the Reliance Industries Ltd.), announced a mega project on agribusiness and retailing in Punjab and other states in India.

Existing marketing regulations:

Agricultural Marketing laws, particularly the Agricultural Produce Market Committee (APMC) Act, inhibit the up-scaling of innovative institutional arrangements, such as contract farming and linking farmers with markets and agri-business. As per the APMC Act, it is mandatory that all notified agricultural commodities, including horticulture products, must be marketed through regulated markets. While Punjab has a dense market system with purchase centres within the radius of 10 km from most villages, the system has not adapted to the changing demands for horticulture products. The existing markets have been developed to handle mainly food grains and not the fruits and vegetables in the state. In Punjab, rice and wheat accounted for a big chunk of the market fee while the share of fruits and vegetables hovered around only 5-6 percent. The mandatory regulated system of marketing has two major implications. First, the regulated marketing system prevents producers from direct sales (except limited sales in farmers' markets) to market functionaries such as processors and exporters. This obstructs the firms from entering into contract farming and buying directly from the farmers. Secondly, it reduces the competitiveness of production and adds unnecessary intermediaries to the supply chain. Such increase in intermediaries normally results in producers receiving a smaller share of the final sales price of the commodity. To

encourage contract farming the central government has formulated a model market Act that provides option for farmers to sell their produce to processors and contracted buyers at reduced market charges. Though a few states have agreed to implement the Act, it is yet to be operationalized. One of the major problems of marking through markets is obligatory market charges that add to the cost. The market fee, commission charges and other market charges for performing various market functions including sales tax etc accounted for about 11 percent in Punjab. Reducing the marketing charges can help farmers in realizing higher prices and in making the agricultural products more export competitive.

To sum up, the markets for HVCs are thin, fragmented and unorganized, which lead to inefficiencies in marketing. The farmers' share in retail price is low in the existing supply chains. However, innovative marketing arrangements are evolving. One way is by creating farmers' markets that bring farmers and consumers together at one place by eliminating middlemen. But transactions through such markets are limited and concentrated around urban centres. More recently, agri-business is entering in HVCs for export, retailing and processing. Punjab is encouraging corporate houses for promoting contract farming to replace a sizable area under rice-wheat system that is threatening the sustainability of farming in the state. Poor infrastructure, absence of organized retailing and farmers' (particularly smallholders) instinct for food security pose as serious constraints in up-scaling the success of contract farming. However, given the scale of operations and the pace of growth of the organized food industry, back-end operations will scale up rapidly inducting more and more suppliers i.e. farmers, big or small for feeding these stores.

Agro-Economic Profile of the Study Region

The total geographical area of the state is 50.36 lakh ha. Study district Jalandhar is located on the intensively irrigated central plain region of state between the Beas and Sutlej rivers. The district Ferozepur is situated in south-western region of state along the India Pakistan border. Each of the selected districts consists of 5 tehsils/subdivisions and 10 development blocks. The number of inhabited villages in these districts was 1003 and 954, respectively. The geographical area of Jalandhar and Ferozepur districts is 2660 square km. and 5850 square km covering 5.28 per cent and 11.61 per cent of the total geographical area of the State, respectively. The topography of the selected districts is generally plain of alluvial formation. However, the south east side of Ferozepur district which is dominated by the light soils has brackish underground water. The climate of both districts district is, on the

whole, dry and is characterized by hot summer, a short rainy season and a bracing with winter.

The important socio-economic indicators of the study districts as well as of Punjab state are presented in Table 5.1. According to 2001 census, total population of Jalandhar district and Ferozepur district constituted 8.06 per cent (19.63 lakh) and 7.17 per cent (17.46 lakh) of the total state population, respectively. Relatively, Jalandhar district was found to be densely populated and more urbanized as compared to Ferozepur district. The overall rural literacy was also more (78 per cent) in Jalandhar as compared to Ferozepur district (60.70 per cent). During 2009-10, the cropping intensity in Jalandhar and Ferozepur districts was found to be 175 and 184 per cent, respectively. In Jalandhar district, underground is providing assured irrigation to 98.31 per cent of the total net area sown as compared to that of 66.03 per cent in Ferozepur district. The rest of the area depended on Government canals in the respective districts. Electricity use in agriculture constituted 27.98 and 52.77 per cent of the total electricity consumption in Jalandhar and Ferozepur districts, respectively. Use of fertilizer, the most important agricultural input was found out to be relatively high at 502 kg per ha in Jalandhar district as compared to that at 410 kg per ha in Ferozepur district. Similarly the number of tractors for every thousand hectare of net sown area was higher in case of Jalandhar district (146) as compared to Ferozepur district (122). Productivity of foodgrains which accounted for 81.19 and 75.98 per cent of the gross cropped area in Jalandhar and Ferozepur districts, respectively was found to be much higher in Jalandhar district (6650 kg/ha) as compared to the that in Ferozepur district (3988 kg/ha). Regarding infrastructure it was observed that in both of the study districts, 100 per cent villages are electrified and linked with the roads. In comparison to state average of 146 km the road length per square km of area were 210 and 102 km in Jalandhar and Ferozepur districts, respectively. Each of the study districts consists of 11 regulated markets, whereas the number of sub yards was 24 and 14 in the Jalandhar and Ferozepur district, respectively. In Jalandhar district there were 551 bank offices and 254 primary agricultural cooperative societies. The number of same in Ferozepur district was 215 and 310, respectively. There were 92 veterinary clinics and 29 primary health centres in district of Jalandhar as compared to 113 and 34 in Ferozepur district. The total number of registered industrial units in Jalandhar and Ferozepur district were 1982 and 704, respectively.

Table 5.1: Selected socio-economic indicators of sample districts and Punjab

Particulars		Jalandhar	Ferozepur	Punjab
Population (2001)	Total (thousand)	1962.7	1746.11	24358.99
	Rural (thousand)	1030.72	1295.38	8262.51
	Urban (thousand)	931.98	450.73	16096.49
	Rural agricultural workers (% is to total workers)	52.52	74.19	66.08
Population Density (per sq km.)		746	329	484
Female per thousand males		887	885	876
Percentage of SC Population to total		37.69	22.82	28.85
Percentage of ST Population to total		-	-	-
Rural Literacy rate (percent) 2001		73.9	45.3	64.7
Human Development Index (2000)		NA	NA	0.537
Percentage of rural families below poverty line (2002)		NA	NA	9.1
Per capita income at current prices at 1999-00 series in Rs.		NA	NA	62153
Share of agriculture sector in GDP/SDP (in 2007-2008 current prices)		NA	NA	29.01
Average annual rainfall (mm), 2009-10		543.90	170.9	384.9
Average size of holdings (2000-01)		5.41	6.02	3.95
Percentage of irrigated area to net sown area (2008-09)		100	99.80	97.40
Percent of groundwater irrigated area to NIA (2004-05)		98.31	66.03	72.59
Electricity use in Agriculture (% to total) 2008-09		27.98	52.77	33.54
Cropping intensity (%) 2009-10		177.64	184.42	189.69
No. of fair price/ration shops per lakh population		NA	NA	13989
No. of banking offices per lakh population		28	12	18
No. of regulated markets per Sq. Km (2008-09)		239	482	345
Total road length per lakh population (2008-09)		241	262	256
Input use:				
	Fertiliser (kg/ha) (2008-09)	502	410	447
	HYVs area of wheat and paddy (%), 2008-09	100	100	100
	HYVs coverage as % of GCA (2008-09)	81	75	81.6
	Wheeled Tractors (per 000 ha of NSA) 2010	146	122	120
Area under major crops (percent to GCA): 2009-10*				
	Total Cereals	81.00	75.47	81.90
	Total Pulses	0.19	0.51	0.24
	Total Foodgrains	81.19	75.98	82.14
	Total Oilseeds	1.78	0.67	0.78
	Sugarcane	1.66	0.11	0.76
	Cotton	0.00	14.38	6.46
	Fruits and Vegetables	5.88	3.21	2.31
Productivity (kg/ha): 2009-10				
	Total Cereals	6663	4010	4156
	Total Pulses	1000	689	784
	Total Foodgrains	6650	3988	4146
	Total Oilseeds	1480	1610	1345
	Sugarcane	6058	6222	6167
	Cotton	0	563	668

Source: GOP (2010), Statistical Abstract, Punjab

Out of total 10.04 lakh operational holdings in state the proportionate share of marginal, small, semi-medium, medium and large farm holdings in state was 13.42, 18.22, 31.85, 29.44 and 7.06 per cent, respectively and average size of holding in state was 3.95 ha (Table 5.2). In Jalandhar district the proportion of smaller size holdings was relatively more as compared to that in Ferozepur district with average size of holdings in respective districts at 5.41 and 6.01 ha. As compared to 17 per cent in district of Ferozepur, the small and marginal holdings accounted for about 25 per cent of the total holdings in Jalandhar district. On the other hand large holdings constituted 9.90 and 16.02 per cent of the total holdings in Jalandhar and Ferozepur districts, respectively.

Table 5.2: Number of operational holdings in sample districts and Punjab (2000-01)

District	Marginal (<1 ha)	Small (1-2 ha)	Semi-medium (2-4ha)	Medium (4-10 ha)	Large (>10 ha)	Total	Av. Size of holdings (ha)
Jalandhar	3912 (8.94)	7041 (16.09)	14108 (32.23)	14379 (32.85)	4332 (9.90)	43772 (100)	5.41
Ferozepur	4120 (5.22)	9305 (11.80)	22523 (28.56)	30286 (38.40)	12634 (16.02)	78868 (100)	6.02
Punjab	134762 (13.42)	183062 (18.22)	319933 (31.85)	295749 (29.44)	70960 (7.06)	1004466 (100)	3.95

Source: GOP (2010), Statistical Abstract, Punjab
Figures in parenthesis denotes the per cent share in total

The cropping pattern in Study districts and Punjab state is given in Table 5.3. It can be observed that cropping pattern of state as well as of the study districts is dominated by the food grains mainly wheat and paddy which together constituted about 80 per cent of the gross cropped area in state. Wheat constituted 40.38 and 45.10 per cent and paddy constituted 38.24 and 29.91 of the gross cropped in Jalandhar and Ferozepur districts, respectively. In Jalandhar district the maize and vegetables were the other important crops. In Ferozepur district cotton and fruits were the other two important crops constituting significant proportion of gross cropped area. Potato accounted for the 4.63 per cent of gross cropped area in Jalandhar district. Whereas kinnow accounted for 0.49 per cent of the gross cropped area in Ferozepur district.

Table 5.3: Cropping pattern in sample districts and Punjab, 2009-10

(Percentage to total GCA)

District	Jalandhar	Ferozepur	Punjab
Rice	38.24	29.91	35.41
Wheat	40.38	45.10	44.51
Maize	2.38	0	1.76
Total Cereals	81.00	75.47	81.9
Total Pulses	0.19	0.51	0.24
Total Foodgrains	81.19	75.98	82.14
Sugar-cane	1.66	0.11	0.76
Cotton	0	14.38	6.46
Kinnow	0.06	2.23	0.49
Total Fruits	0.35	2.59	0.85
Potato	4.63	0.11	1.05
Total Vegetables	5.53	0.62	1.46

Source: GOP (2010), Statistical Abstract, Punjab

Status of selected crops

On account of its climatic conditions Punjab however, is not a very important producer of horticultural crops in country. National Horticulture Mission (NHM) launched by the Government of India is being implemented in Punjab to promote growth of the horticulture sector covering fruits and vegetables. The area under fruits has increased from 30 thousand hectares in 1999-2000 to 67.55 thousands hectares in 2009-10. During the same time period the area under vegetables in state increased from 101.70 to 183.35 thousands hectares. During 2009-10, Punjab accounted for 1.07 and 1.91 per cent of total area under fruits and vegetables in India, respectively. Among major potato producing states of India, during 2009-10, Punjab ranked 4th with about 5 per cent share in total potato production of the country. Potato is the most important vegetables crop of state occupying 45.29 per cent of the total area under vegetable crops with 60.10 per cent share in total vegetable production. During 2009-10, area under potato in state was 83 thousand hectares with corresponding production at 21 lakh metric tonnes. About two third area of the total area under potato cultivation in state fall in five districts, namely, Jalandhar, Hoshiarpur, Kapurthala, Ludhiana and Bathinda. During 2009-10, Jalandhar was the leading district with 25.35 per cent share in total potato production in state. Among other major districts, Hoshiarpur accounted for 19.08 per cent of state production of potato followed by Kapurthala (8.88 per cent), Bathinda (7.20 per cent) and Ludhiana (6.83 per cent). Among different citrus species commonly grown in Punjab, kinnow mandarin occupies a prominent position with respect to acreage and production. During 2009-10 it accounted for about 58 per cent of total area and 64.20 per cent share in state production of fruits. Out of the total 67553 hectares under fruit cultivation in

state, kinnow farming is carried out on 38837 hectares. Though the Punjab state is the leading state in kinnow production, area under its cultivation is concentrated in a few districts. About 85 per cent of the total area under kinnow cultivation fall in four districts, namely, Ferozepur, Hoshiarpur, Muktsar and Bathinda. The study district Ferozepur alone constitutes about half of the total area and production of kinnow in state. Among other major districts Hoshiarpur accounted for 17.46 per cent of state production of kinnow followed by Mukatsar (14.56 per cent) and Bathinda (6.89 per cent).

Comparison of Benefits and Constraints for TMC and EMC for potato

It can be seen from Table 5.4 that in TMC although the farmers in the sample received Rs 373.80/- per quintal of potato, they had to incur marketing costs of Rs 65.07/- per quintal and hence their net price after deducting marketing costs was Rs 308.73/- per quintal. The farmers sold to wholesalers who incurred marketing costs and margins of Rs 57.44/- per quintal. There was also wastage of potatoes during the time taken to transport the produce from the regulated market to the retail outlets. The sale price of the potato retailer was Rs 722.53 /- per quintal. Finally, it can be seen that the share of the farmer in the retailer's price under TMC is 42.72 percent, while marketing costs as a percentage of retailer's price is 24.30 and marketing margins as percentage of retailer's price is 32.97 percent. With respect to sales through EMC, it can be observed that although the sample farmers received a higher price than the auction price in TMC. They have to incur loading & unloading, sorting & packing and transportation cost up to the gates of company. Hence Rs 520.20/- was the net price received by the farmers under EMC which was about 40 percent higher than the price received by farmers who sold through TMC. Since there were no intermediaries in EMC hence the price received by the farmers was much higher than the farmers following TMC.

The Benefit Cost Ratio (BCR) for the potato crop reduces when family labour is included in cost of production (Table 5.5). The BCR is higher in EMC as compared to TMC. This is because, the price received in case of sales through EMC was nearly 40 percent higher than that through TMC.

The post harvest losses are higher in TMC as compared to EMC. For every quintal of potato stored, a farmer loses about 8.14 kg under TMC while no loss in EMC since the potato purchased by PepsiCo is handled by the company after purchase. Due to quality specifications, losses in transport were more in EMC than TMC.

Table 5.4: Price spread and marketing costs for Potato (2009)

Rs per quintal

Sr. No.	Price Spread	TMC	EMC
I	**Price received by farmer**	373.80	520.20
II	**Total Marketing costs of farmer**	**65.07**	**61.50**
	(a) transportation	4.50	7.44
	(b) loading & unloading	2.13	1.10
	(c) Sorting & packing	57.76	52.64
	(d) weighing & other related expenses	0.68	0.32
	(e) commission	0	0
	Net Price received by farmer	308.73	458.70
	Net Profit (Net price received- Paid Out cost)	56.23	224.05
III	Marketing Costs and margins of wholesaler (through commission agent	**57.44**	-
	(a) market fee	5.81	**-**
	(b) RDF	5.81	-
	(c) wastage during transport	0.56	-
	(d) Commission	14.49	-
	(d) transportation charges	8.12	-
	(e) wholesaler's margin	22.65	-
	Purchase price of wholesaler plus marketing costs & margins	**431.24**	**-**
IV	Marketing cost and margins of Retailer	**291.29**	-
	(a) Hamali from point of purchase to tempo	0	-
	(b) Transport to retail outlet	11.15	-
	(c) Miscellaneous expenses such as cess to corporation, watchman for unsold stock	9.46	-
	(d) Wastage	6.58	-
	(e) Loading/ Unloading	4.45	-
	(f) Packing material	36.20	-
	(g) Shop rent	7.88	-
	(h) Retailer's margin	215.57	-
	(f) sale price of retailer	**722.53**	**-**
V	Share of farmer (%) in retailer's price	**42.72**	**-**
VI	Marketing Costs as % of retailer's price	**24.30**	**-**
VII	Marketing margins as % of retailer's price	**32.97**	**-**
VIII	Modified Measure of Marketing Efficiency (MME)	**0.74**	**-**

Source: computed from field survey data

Table 5.5: Benefit cost ratio for Potato

Particulars	TMC (cost of production includes only Paid out costs)	EMC (cost of production includes only Paid out costs)	TMC (cost of production includes family labour)	EMC (cost of production includes family labour)
BCR for potato	1.48	2.22	1.36	2.03

Source: computed from field survey data

Table 5.6: Per quintal post-harvest losses

Post Harvest loss	Potato			
	TMC		EMC	
	Quantity	*SD*	Quantity	*SD*
Loss during storage (kg)	8.14	0.58	0.00	0.00
Loss during transport(kg)	0.23	0.03	1.33	0.42
Loss at Retail level(kg)	1.40	0.74	0.00	0.00

Notes: SD- Standard deviation, Quantity in quintals.
Source: Field Survey Data.

The reasons for preferring the marketing channel indicated that in case of potato under TMC maximum responses pertained to assured sales followed by low cost of marketing and fair price. They were also influenced by friends and relatives to participate in auctions and were in the habit of selling in regulated market. In case of EMC, assured sales, low cost of marketing, fair price, less physical loss and superior services were the main reasons for preferring this channel. Majority of farmers in TMC and EMC expressed that the village roads were in good condition. With respect to proximity to the market, it was observed that the regulated market was not in the sample villages and the majority of the farmers had to travel within 10 kms and even upto 25 kms to access the regulated market. In EMC the farmers have to travel more than 50kms to fetch the produce at the company gates. There were no cold store and godown facilities in the market and auction arrangements were good as reported by farmers following TMC. Sorting, weighing, packing and banking facilities were good in the market. However, there were no internal phone and computer facilities as reported by the farmers following TMC channel.

Awareness of the farmers regarding market intermediaries showed that about 50 per cent farmers in TMC were aware of the supply chain that existed till the produce reached the ultimate consumer. In EMC there were no intermediary and farmers were not aware about the further process being followed by the company. Nearly half of the farmers in TMC knew about the places where potato was sold in the wholesale markets such as Calcutta, Ahmadabad, Delhi, Jodhpur and other places. Nearly half of the farmers knew about the price realized in the retail market. Farmers also felt that the margin realized by the buyer of their produce is high. In case of EMC, 88.57 percent of farmers in the sample indicated that they would continue to sell in the same channel and to the same agent if given higher price. Farmers have no option of export of potato.

There was no major constraint observed as opined by 80 per cent of the potato farmers while only 20 per cent reported that EMC buys only selected quality produce of specific size, shape and colour. However, in TMC the entire produce is sold. The farmers also explained that since only quality produce is picked up by EMC, the balance produce is treated as low quality and sold at a lower price. To ensure higher prices and to reduce marketing margins of the intermediaries, potato growers made several suggestions such as potato should be exported when there is a glut in the market, provide transport facilities, produce should be purchased by the Govt. in case of bumper harvest, market charges and intermediaries should be reduced.

Comparison of Benefits and Constraints for TMC and EMC for kinnow

Table 5.7 shows that for kinnow in EMC, although the sampled farmers received Rs 1296 per quintal, they had to incur marketing costs of about Rs 265 per quintal and hence their net price after deducting marketing costs was about Rs 1031 per quintal, which were incurred by the contractor himself in TMC. But still the received by the farmer in EMC was about 20 per cent higher than those received through TMC. The farmers/contractors sold the produce to wholesalers who incurred marketing costs and margins of about Rs 204 per quintal for TMC and about Rs. 195 per quintal in case of EMC. The sale price of the kinnow retailer was about Rs 1889 per quintal for TMC and about Rs. 1874 per quintal in case of EMC. Finally, the share of the kinnow grower in the retailer's price under TMC was 33.70 percent, while marketing costs as a percentage of retailer's price was 20.70 and marketing margins as percentage of retailer's price was 33.70 percent, while the corresponding figures in case of EMC was 55, 21.6 and 23.4 per cent, respectively.

It can be observed that the Benefit Cost Ratio (BCR) for kinnow obviously reduces when family labour is included in cost of production (Table 5.8). The BCR is higher in EMC for kinnow in EMC as compared to TMC. This is because as explained earlier, the price received in case of sales through EMC is 50 percent higher than that through TMC. During transport, there is injury to the crop due to friction, and also secondary infection of the fruit, which leads to rotting of the fruit and the post harvest loss reported on this count is less than one per cent as waxing increases the shelf life of the kinnow (Table 5.9). At the retail stage, the post harvest loss reported was 0.5 percent. The spoilt produce is often sold at 40-50 per cent of the price.

Table 5.7: Price spread and marketing costs (2009)

(Rs per quintal)

Sr. No.	Price Spread	Kinnow	
		TMC	**EMC**
I	**Price received by farmer**	860.0	1296.10
II	**Total Marketing costs of farmer**	**-**	265.30
	(a) transport to APMC	-	34.30
	(b) loading & unloading	-	-
	(c) weighing & other related expenses(packing, waxing etc.)	-	231.0
	(d) commission	-	-
	Net Price received by farmer	860.0	1030.80
	Net Profit (Net price received- Paid Out cost)	636.30	815.40
111	Marketing Costs and margins of Pre-harvestor contractor	266.0	-
	(a) market fee	-	-
	(b) hamali	-	-
	(c) wastage during transport	6.90	-
	(d) transport to terminal market	32.30	-
	(e) weighing & other related expenses(packing, waxing etc.)	212.0	-
	(f) PHC's margin	215.0	-
	Purchase price of PHC plus marketing costs & margins	1326.0	-
IV	Marketing Costs and margins of wholesaler	204.40	194.70
	(a) market fee	119.40	116.70
	(b) hamali	-	-
	(c) wastage during transport	-	-
	(d) transport to terminal market	-	-
	(e) wholesaler's margin	85.0	78.0
	Purchase price of wholesaler plus marketing costs & margins	1530.40	1490.80
V	Marketing cost and margins of Retailer	358.40	382.90
	(a) Hamali from point of purchase to tempo	-	-
	(b) Transport to retail outlet	10.50	11.0
	) (c) Miscellaneous expenses such as cess to corporation, watchman for unsold stock	-	-
	(d) Wastage	10.90	11.90
	(e) Retailer's margin	337.0	360.0
	(f) sale price of retailer	1888.80	1873.70
VI	Share of farmer (%) in retailer's price	33.70	55.0
VII	Marketing Costs as % of retailer's price	20.70	21.60
VIII	Marketing margins as % of retailer's price	33.70	23.40
IX	Modified Measure of Marketing Efficiency (MME)		

Source: computed from field survey data

Table 5.8: Benefit cost ratio for Kinnow

Particulars	TMC (cost of production includes only Paid out costs)	EMC (cost of production includes only Paid out costs)	TMC (cost of production includes family labour)	EMC (cost of production includes family labour)
BCR for kinnow	3.80	5.10	3.10	4.60

Source: computed from field survey data

Table 5.9: Per quintal post-harvest losses

Post Harvest Loss	Kinnow			
	TMC		EMC	
	Quantity	*SD*	Quantity	*SD*
Loss during storage (kg)	-	-	-	-
Loss during transport(kg)	-	-	0.80	780.10
Loss at Retail level	-	-	0.50	237.40

Notes: SD- Standard deviation, Quantity in Kgs

The reasons for preferring the marketing channel indicated that in case of kinnow under TMC maximum responses pertained to the assured sales as the farmers did not want to sell their produce directly in the market to overcome the price risk as well as to save time as well as energy while selling the produce in the market. They were also influenced by friends and relatives to sell their produce to the contractor. In case of EMC, fair price and superior infrastructure were the main reasons for preferring this channel.

The farmers did have information about price prevailing in regulated markets. In case of EMC, the commission agent/trader was important source of price information. Further, most often, the farmers were aware of the price soon after harvest. None of the farmers in the sample got information from AGMARKNET. By and large sample farmers revealed that the price received by them was more or less similar to that expected by them. In case of TMC, personal information/experience was playing an important role in determining the price of the crop. There have however been instances when farmers are cheated by the commission agent/contractor while selling in the market or to the contractor. Majority of the farmers in TMC expressed that they received the same price as was agreed and did not have to go to the agent to receive payment for the produce that was sold and received payment on time. In case

of EMC, about 80 per cent of the farmers expressed that they got a bit higher prices for their produce than their expectation.

Majority of farmers expressed that the village roads were average or good quality. With respect to proximity to the market, it was observed that the APMC was not in the same village and in a few cases the farmers in the sample had to travel within 10 kms to access the regulated market. In case of kinnow growers, 60 percent of respondents expressed that they had to travel more than 50 kms to access the market. With respect to other facilities such as auction, supervision of sale, loading, sorting, weighing was either satisfactory or good. They also opined that internal telephone facility, computer facilities and banking facilities were average quality.

After sale of his produce, the farmers were by and large aware of the supply chain that existed till the produce reached the ultimate consumer. The farmers were more concerned with the price which they received and their sale receipts. The farmers in the sample revealed that they were aware that their produce went to another commission agent or trader. About 91 per cent of the sample farmers in case of TMC and 50 per cent for EMC opined that their produce goes through 3 to 4 channels. The sample farmers were also aware of the other wholesale markets where their crop is sold both within and outside the state. About 43 percent of sample farmers in TMC and 20 percent in EMC for were not aware of retail price. Other farmers in the sample were however aware of the price. Farmers also felt that the margin realized by the buyer of their produce is high. In case of EMC, 40 percent of farmers in the sample indicated that they would continue to sell in the same channel while in case of TMC the percentage of farmers was 51.4 percent. The main constraint faced by the kinnow growers in the market was that the commission agent in the market preferred the traders than the farmers for auctioning their produce. Further, some farmers felt that the wholesalers buy only selected quality produce and also delay payment.

Farmers made several suggestions such as exports should be promoted and encouraged especially when global prices are ruling high, market charges and number of intermediaries should be reduced and credit should be easily available.

Policy Implications

1 Potato and kinnow growers faced problem regarding the sharp decline in the prices in case of bumper harvest. So, there is a need for providing facilities/concessions for promoting the export of the produce in case of glut in the market to stop the distress sale.

2 Cold storage cost for potato crop is very high. Sometimes in case of low prices in the retail market in lean periods, farmers are not able to cover their storage cost. In that case, Govt. should provide subsidy for the storage to augment the income of the potato growing farmers.

3 There is a need to establish more processing units for value addition of potato to increase the farmers' share in consumer rupee. Kinnow growers opined that the processing plant established in the region was not directly purchasing kinnow from the farmers. There is a need to persuade the processing units to purchase the produce from the farmers, so that they may also get the benefit of the plant.

4 The facilities of waxing, grading and transportation of the fruits and vegetables to distant markets should be subsidized so that the farmers get remunerative price of their produce.

5 The farmers as well as traders reported the unhygienic conditions due to improper disposal of the waste material and problem of stray animals in the market. So, the market committees should be emphasized to ensure the proper cleanliness in the market yards.

6 As the net price received by the farmers was higher in case of EMC, therefore the farmers should try to sell more produce through this channel. With respect to EMC, the main constraint was that EMC purchased limited quantity and only superior quality produce. EMC has to therefore increase the scale of its operations to purchase more agricultural products so that more farmers are benefitted by selling through this channel.

On the whole, it has been found that farmers have been benefitted by selling their produce through EMC both in case of potato as well as kinnow crops mainly because they avoid/save marketing costs. However, the marketing operations of EMC are very limited and restricted to purchase of superior quality produce which enables only a few farmers to secure higher price. Thus, expansion of such innovative/emerging marketing channels for fruits and vegetables in an organized manner, coupled with upgraded market infrastructure in regulated markets can go a long way to promote horticultural base in the state, through reducing post harvest losses, reducing intermediaries, increasing net returns for the producers as well as for the benefit of the consumers.

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Appendix I (a): Disposal pattern of potato in TMC and EMC channels

(Qtls)

Sr. No.	Particulars	Potato	
		TMC	EMC
1	Total Production	92738.5 (100.00)	19884 (100.00)
2	Net quantity sold	79560.0 (85.80)	16651.5 (83.74)
	(i) Study channel	68660.28 (86.30)*	15752.32 (94.60)*
	(ii) Alternate channels	10899.72 (13.70)*	899.18 (5.40)*
3.	Home consumption, seed and gifts etc.	12265.5 (13.22)	3009.0 (15.13)
4.	Rejected and damaged	913.0 (0.98)	223.5 (1.13)

Figures in parentheses denote per cent to total production

* per cent of net quantity sold

Appendix I (b): Disposal pattern of kinnow in TMC and EMC channels

(Qtls)

Sr. No.	Particulars	Kinnow	
		TMC	EMC
1	Total Production	30576.0 (100.00)	6992.2 (100.00)
2	Net quantity sold	30435.0 (99.54)	6949.2 (99.38)
	(i) Study Channel	30076.5 (98.82)*	6949.2 (100.00)*
	(ii) Alternate channels	358.5 (1.18)*	-
3.	Home consumption/ gifts etc.	116.3 (0.38)	28.10 (0.41)
4.	Rejected and damaged	24.7 (0.08)	14.90 (0.21)

Figures in parentheses denote per cent to total production

* denote per cent of net quantity sold

Appendix-II

Comments on the draft report

This report covers an important region undergoing a transition with respect to Indian agriculture and provides a broad background of the changes taking place in the marketing regime for agricultural products. The report is fairly exhaustive and the analysis is done with reasonable care.

Some further attention to details would make the report more complete and reader friendly in the coordinator's view.

1. Please provide a section in Chapter 2 to update the reader on the status of reforms in the state and related legislation.
2. In page 11 (table numbers are missing and may be added) in the first table please insert rows giving the district names and also the block names. This will help to maintain uniformity with other reports.
3. In Chapter 3 or chapter 4 there should be a section outlining how the new markets are operating (information such as where the purchaser from the farmer takes place, whether any packaging or marketing support is provided, whether inputs or technology provided, where the product is taken to and its final destination). This is more relevant for the potato case where a processor is involved. Most important, some light has to be thrown here how the price is decided (based on past mandi prices, mutual bargaining etc.). A consolidated picture of the emerging markets specifically under study will give the right background to the analysis.
4. There is no information on disposal of production in this report. A table can be provided if break- up of the disposal as home consumption, marketed, marketed in the specific channel, wastage, rejection etc are available. In particular the reader would like to know if the producer disposes the entire marketed product in the specific channel or distributes among alternate channels, if the production equals the marketed amount and if that is also equal to the sales. If there is rejection this should certainly be mentioned along with comments on the issue.
5. The report provides the data on the price received by the farmer. Is this adjusted for possible wastage and forced sales outside the specific market. In that case the announced price in the channel may be mentioned. Otherwise, the announced price and the price received should be same.

6. Headings in Tables 4.1.1 and 4.2.1 are not clear. The title can mention this is % of households (not area).
7. There is a lack of uniformity between certain tables as Tables 4.1. and 4.2.1 and between 4.1.7 and 4.2.7. It would be desirable that these tables give the total production, total area and productivity (Qtls/hect) per farm only so that the calculation is clear.
8. In the section on perceptions, the perceptions of other agents such as the traders/company/functionaries and consumers (if possible) can also be reported.
9. In table 4.2.9 MME is blank.

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Appendix III
Action Taken Report on the Comments of Draft Report

All the comments were taken into consideration while finalizing the report. These comments have been incorporated, wherever necessary, in the relevant chapters. The point-wise detail of the answers to various queries is as follow:

1. Comment incorporated.
2. Comment incorporated.
3. Comment incorporated and section on operations of emerging markets in case of potato has been added.
4. Tables incorporated.
5. The price received by the farmer for the most prominent channel followed for the sale of potato and kinnow has been considered which is not adjusted for possible wastage and forced sales outside the specific market.
6. Comment incorporated.
7. Tables modified and incorporated.
8. Perceptions of other agents have been incorporated.
9. Comment incorporated.

D.K. Grover