A STUDY ON PATTERN, PRACTICES AND EFFICIENCY OF VEGETABLE MARKETING IN KANGRA DISTRICT OF HIMACHAL PRADESH

THESIS

By

RACHANA DEVKOTA

Submitted to

CHAUDHARY SARWAN KUMAR
HIMACHAL PRADESH KRISHI VISHVAVIDYALAYA
PALAMPUR 176 062 (H.P.) INDIA

IN

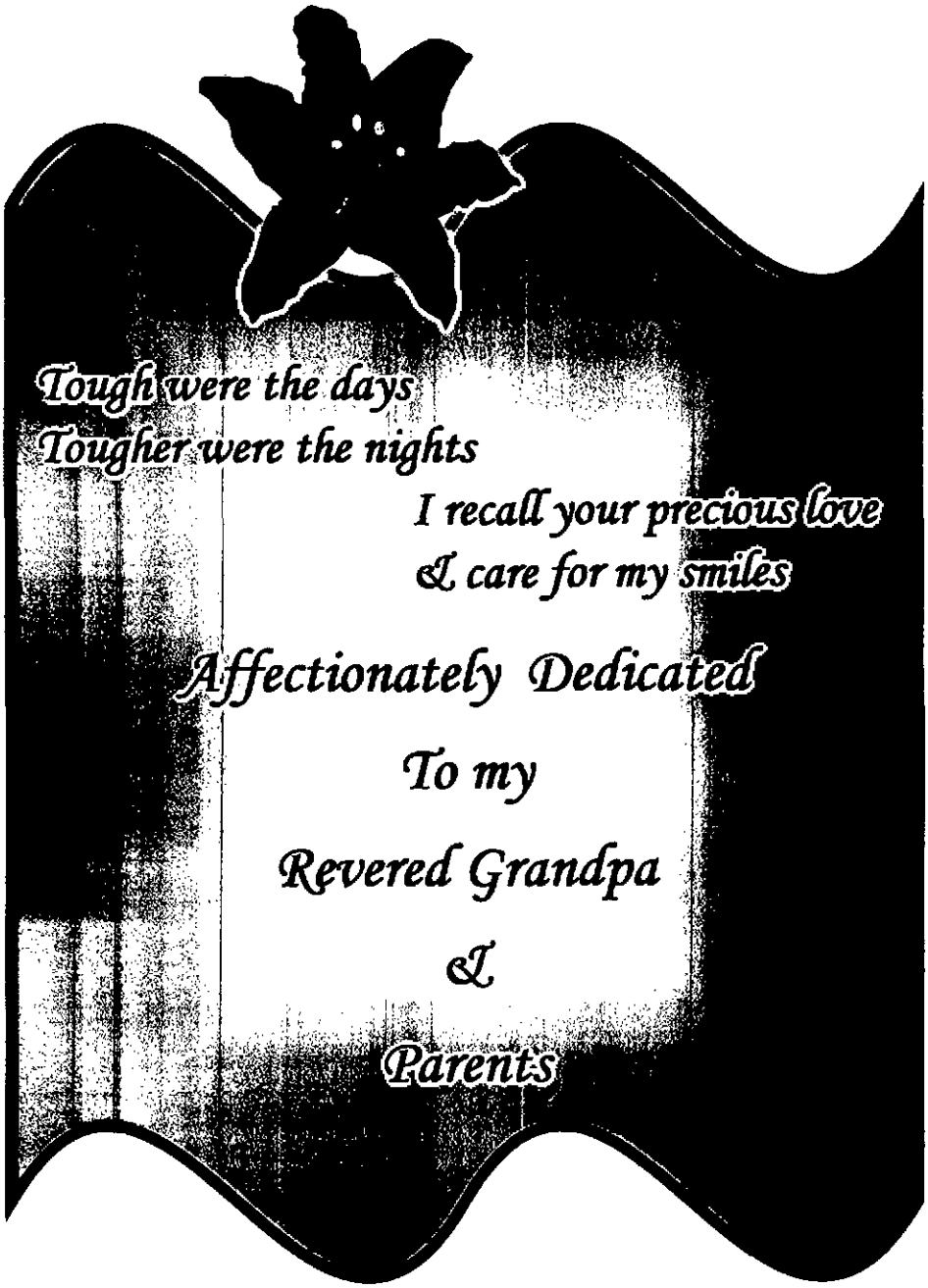
Partial fulfilment of the requirements for the degree

OF

MASTER OF SCIENCE IN AGRICULTURE

(AGRICULTURAL ECONOMICS)

2008


Tough were the days
Tougher were the nights
I recall your precious love
& care for my smiles
Affectionately Dedicated
To my
Revered Grandpa
&
Parents

Dr. K. D. Sharma
Sr. Scientist

Department of Agricultural Economics
CSK HP Krishi Vishvavidyalaya
Palampur – 176 062 (H.P) India

CERTIFICATE I

This is to certify that the thesis entitled **"A Study on Pattern, Practices and Efficiency of Vegetable Marketing in Kangra District of Himachal Pradesh"** submitted in partial fulfilment of the requirements for the award of the degree of **Master of Science (Agriculture)** in the subject of **Agricultural Economics** of CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur is a bonafide research work carried out by **Ms. Rachana Devkota** (A-2006-30-30) daughter of **Sh. Bhimsen Devkota** under my supervision and that no part of this thesis has been submitted for any other degree or diploma.

The assistance and help received during the course of this investigation have been fully acknowledged.

22.7.2008

(K. D. Sharma)
Chairman,
Advisory Committee

Place: Palampur
Dated: 22nd July, 2008

CERTIFICATE II

This is to certify that the thesis entitled **"A Study on Pattern, Practices and Efficiency of Vegetable Marketing in Kangra District of Himachal Pradesh"** submitted by **Ms. Rachana Devkota (A-2006-30-30)** daughter of **Sh. Bhimsen Devkota** to the Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya, Palampur in partial fulfilment of the requirements for the degree of **Master of Science (Agriculture)** in the subject of **Agricultural Economics** has been approved by the Advisory Committee after an oral examination of the student in collaboration with an External Examiner.

4.9.08
Dr. K. D. Sharma
(Chairman)
Advisory Committee

4/9/08
External Examiner
(Dr. D. Vasisht)

4/9/08
Dr. D.R. Thakur
(Member)

4/9/08
Dr. M. S. Pathania
(Member)

4.9.08
Dr. M. Bhargava
(Member)

4-9-08
Dr. H. R. Sharma
(Member)
Dean's Nominee

Dr. R.K. Sharma
Head of the Department

08/09/08
Dr. Pradeep K. Sharma
(Dean)
Postgraduate Studies

ACKNOWLEDGEMENT

With limitless humility, I would like to praise and thank God, the supreme and the merciful, who blessed me with all the favorable circumstances to go through this gigantic task and for bestowing me with such affectionate grand father and parents whose constant moral encouragement has always been a source of inspiration to me to pursue for excellence.

Indeed the words at my command are not enough to convey my depth of feelings of gratitude to Dr K.D. Sharma, Senior Scientist, Department of Agricultural Economics, CSK HPKV Palampur, the chairman of my advisory committee for his excellent and praise worthy guidance, keen interest, adroit admonition, persistent encouragement, sympathetic help, elegant criticism and parental affection through out the entire course of investigation and in the completion of this manuscript. I shall ever be indebted to him for developing in me the desire to work hard through his valuable suggestions, the quest to delve into the facts and appreciable humanitarian behaviour which evoked in the bestir to achieve the destination successfully resulting in this manuscript. To him, I owe a lot more than I can express.

This memorable occasion also provides me an opportunity to express my gratitude to Dr. D.R. Thakur Dr. M. S. Pathania, Dr M. Bharghav (Dept of Mathematics and Statistics) and Dr. H.R. Sharma (Dean's Nominee) , members of my advisory committee who provided valuable comments, guidance, suggestions and kindly help at different stages of study.

I empathetically express my thanks to Dr R. K. Sharma, Professor and Head (Department of Agricultural Economics) , Dr Virender Kumar, Dr A. S. Saini, Dr. H. Lal and other faculty members for providing me unconditional helping hand whenever needed at various stages of this investigation and my studies. I also express thanks to all the office staff of Department of Agricultural Economics for their ever willing help in various forms during the course of my studies in the University.

I also express my sincere thanks to Dr. P.K. Sharma, Dean, Post Graduate Studies, CSK HPKV Palampur and University authorities for providing me necessary facilities to complete this study.

I felt indebted to my seniors especially Dr Vinod, Atul, Shyamlee, Chandan, Nikhil, Shilpa, Shivali, Sonal, Sruchi, Renu and Madhu for their cooperation, timely help and moral support during my stay at Palampur.

Time stops moving, when I think of acknowledging the nice company and unwavering help of my friends especially Manoj, Kishor, Rohit, Vijay, Naveen, Wagendra Kumari, Sarina, Shiksha and Neeti and my dearest juniors Jyoti, Vishal, Davinder, Anju and Anshul who kept me in exalted state even during the moments of despondency and were always with me with supporting hands.

I also owe sincere gratitude to Sh Kapoor Chand and his family, Chandan bhaiya, Deepu, Anku, Nishant, Ashwini bhaiya and all farming families of the study area, for their benevolent hospitality and help during my period of data collection.

I shall remain life long indebted and can never forget the constant inspiration, love and affection of my maternal uncle (Mama) Dr Humnath Bhandari, Baburam uncle, aunts Sabi and Laxmi and my dearest brother Kanchan and Bikash, Jiju Krishna, Kashi and Manish, sister Bindu, Usha, Radhika, Meenu, Pratiksha and Suraksha . I can never forget to mention the name of my nephew Kirbin, Sidant and Ashish, my niece Sristhi, Ashika and Nivu and my cousins Arapna, Anupa, Apeksha and Avi whose childish innocent deeds always inspired me during the movement of loneliness.

I express my heartfelt sense of gratefulness and indebtness to Manoj and his family for their spectrum of help and great hospitality during my two years of stay over here. Acknowledgements are inherently endless and incomplete and I apologise to many friendly and helpful people whom I could not enlist here due to paucity of space.

A word of appreciation is also spared for Sh. Ajay Walia for his painstaking efforts in typing this manuscript.

I owe the responsibility for all errors and omissions.

Place: Palampur
Dated: 21 July, 2008

(Rachana Devkota)

CONTENTS

LIST OF TABLES

LIST OF FIGURES

Introduction

Chapter I

INTRODUCTION

1.1 Background

Vegetables are excellent sources of roughage, proteins, vitamins, carbohydrates and minerals required for maintaining perfect health and curing nutritional disorders. Hence, vegetables provide variety, constitute essential part of the balanced diet and make the meals more appetizing and nutritious. The demand for vegetablesis continuously increasing at a faster rate due to increasing population pressure, increasing awareness of nutritional value of vegetables and as a result of the increasing per capita income over time. However, the consumption of vegetables in India, with a large vegetarian population, is surprisingly low, only 135 g per capita per day compared to 285 g as recommended by the Indian Council of Medical Research (ICMR) for a balanced diet (Kainth, 1996). All these factors have placed vegetable farming in a distinct advantageous position and it plays an important role in developing countries in economic and social spheres for enhancing income and nutritional status of the people. There has been significant increase in the prices of vegetables making vegetable farming a very attractive and beneficial enterprise for farmers and traders. Moreover, in hilly areas having short cropping seasons particularly in temperate regions, vegetables being short duration crops get well fitted in the cropping system. Vegetable cultivation on small holdings in the hills with small terraced fields, being labour intensive, offers better employment opportunities to the

unemployed population. The vegetable cultivation because of better quality, have a much higher export potential not only to neighbouring states in the country but have recently found way to the African/South Eastern countries as compared to field crops and thus help to generate a valuable foreign exchange (Arya, 2001). India is second largest producer of vegetables in the world next to China with its total production of 82.7 million tonnes from an area of 6 million hectares (George and Singh, 2002). However, the production is not enough to meet the essential requirements of vegetables to feed current population of more than one billion (Singh, 2002).Thus, there is enormous scope to increase the production and productivity of vegetables in the country and Himachal Pradesh is no exception.

The most urgent issue and the need in India today is the massive investment in vegetable sector to create massive employment opportunities for its increasing population and to compete successfully in the world market. It is noted that agricultural production has now become a big business but agricultural marketing is even bigger. As development takes place and the country or people advance, marketing becomes more important, bigger, complex and advanced than production. In advanced countries, for instance USA, it takes more men, money and investment to market the farm products than to produce them. Thus, agricultural marketing which is responsible for getting the agricultural produce in the final form to consumers from producers, costs more than producing the same. Similarly, advances in agricultural marketing and establishment of modern markets can provide massive employment opportunities to people. Moreover,

improvements in marketing facilities to ensure remunerative prices to farmers have become a pre-requisite for increasing agricultural production. As a matter of fact, Indian farmers in general and hill farmers in particular, are many times behind the farmers of advanced countries as our farmers are not much market oriented and market conscious.

1.2 Importance of Agricultural Marketing

It has been rightly said that marketing is born and grows as society moves from a home handicraft economy of self sufficiency into a socio-economic system which involves a division of labour, specialization, factory industrialization, mass production and urbanization of population. Marketing has developed in an evolutionary rather than a revolutionary fashion (Mamoria and Joshi, 1982).

With the gradual development of commercialized agriculture, marketing of farm products has assumed greater importance in recent years. For the farmer, disposal of his produce has become even more important than the adoption of modern practices for increasing physical output from agriculture. This is so because it is the value of output that matters most rather than more physical output. Therefore, unless the marketing efficiency improves, there are no incentives to increase the production. Only better returns, stable prices and attractive terms of trade would induce the cultivators to produce more and market an increasing proportion of their produce. Therefore, marketing is of outmost importance and demands special attention in the case of perishable commodities like vegetables, which are being produced mainly for market. The farmers who are

able to market their produce in the right form, at the right time and place for the right price emerge successful while the rest compromise their due share to middlemen or traders. This shows that market reforms need to be associated with any policy for agricultural development. However, in the past, the marketing of agricultural commodities remained neglected and it occupied a fairly low priority in agricultural development policies of the country. Lately, after signing of WTO agreement in 1995, it has been recognized that the nation cannot afford to have a rapid pace of growth without reforming the agricultural marketing sector in all parts of the country. There is ample evidence to show that agricultural production has also increased significantly in those areas where there is well-developed, efficient and assured marketing and procurement system prevalent.

1.3 Rationale of the Study

There is no denying the fact that marketing of vegetables has remained one of the major concerns in hilly regions and Himachal Pradesh is no exception. Himachal Pradesh is endowed with versatile agro-climatic conditions that favour the production of almost all types of vegetables, both of temperate and sub-tropical nature. There is remarkable increase in the production of vegetable crops in Himachal Pradesh. The production of vegetables that was about 2.80 lakh tonnes in 1985-86 increased to 8.35 lakh tonnes in 2004-05. Among various districts of Himachal Pradesh, Kangra is agriculturally the most predominant district in terms of cultivated area, irrigated area and number of cultivators. It has vast potential for commercialization of agriculture through vegetable farming that is highly remunerative and best suited to hills and to the

labour abundant small sized land holdings in this district. The vegetable commodities produced in hills have high demand in the markets of neighboring plains due to better quality and off-season supply. But being fragile and perishable in nature, vegetable commodities need quick and efficient marketing system and supply chain management. However, the present marketing system continues to be inefficient offering no incentives to producers which further acts as a hindrance in the transformation of subsistence agriculture to commercialization in this district.

Realizing this fact, the Government of Himachal Pradesh has already promulgated Model Agricultural & Horticultural Produce Marketing Development Act (known as APMC Act 2005) in November, 2005 to reform the marketing system in the state. The marketing information system is being strengthened with networking of state markets through Nationwide 'AGMARKNET'. The innovative concepts like private/farmers' markets, contract farming and development of special economic zones (SEZs) have added new dimensions in vegetable marketing. In this way, the contemporary marketing system is undergoing a significant metamorphosis in the state. Keeping these developments in view, the present study has been planned to examine various aspects of marketing vegetable commodities along with critical assessment of emerging issues, problems and constraints in marketing with pertinent suggestions to improve marketing system for the benefit of farmers.

1.4 Objectives

The specific objectives of the study are:

1. To study the marketable/marketed surplus, marketing practices, pattern of disposal, structure of marketing cost and price spread of vegetable commodities in Kangra district.
2. To examine the structure and behaviour of market prices in Kangra (principal) market yard, its co-integration with sub-market yards, to study the status of market regulation and identify operational and infrastructural bottlenecks so as to suggest measures for improving marketing system for vegetable commodities.

1.5 Organization of the Study

The entire study has been systematically presented and organized in six chapters. Chapter-I (Introduction) elaborates the concept, rationale and objectives of the study. This is followed by chapter-II which contemplates the critical review of the work done in India and within the state related to the present topic of investigation. The systematic methodology adopted for the selection of the sample, collection and analysis of data has been described in chapter-III. The results of the study categorised under different sections/ sub sections have been documented in chapter-IV. Chapter-V is devoted to elaborate discussion on various issues with logical conclusions and inferences based on the results of the study. Finally, the findings and policy options that emerged from this study have been summarized in chapter-VI. The illustrations, tables and figures have been extensively used to elucidate the results while additional information has been given under different appendices for more clarification and understanding of the interested readers.

Review of Literature

Chapter II

REVIEW OF LITERATURE

A scientific enquiry is based upon the systematic investigation and validation of the facts. A critical insight into the past knowledge base pertaining to the related field of investigation is of paramount importance not only to develop a sound methodology but also for pursuing chronological changes and the information gaps thereof. Therefore, this chapter is devoted to critically review the past studies on the pattern, practices and efficiency of marketing conducted in India and abroad. The relevant studies have been reviewed under the following broad headings:

2.1 Pattern and practices of marketing of farm commodities

2.2 Price-spreads and marketing efficiency

2.3 Problems and constraints in marketing.

2.1 Pattern and Practices of Marketing of Farm Commodities

Kumar (1991) conducted a study on marketing of vegetable commodities in Solan district of Himachal Pradesh and observed that marketable surplus of all vegetables was more than 95 per cent of the total production. The marketed surplus was found to be 85 per cent in case of tomato and capsicum while it was 92 per cent in case of beans and pea.

Singh and Singh (1992) conducted a study on patterns and factors affecting marketed surplus in Punjab. They revealed that the proportion of marketed surplus was directly related to the size of the farm. It was also found

that the large holdings contributed more to the total marketed surplus in proportion to their share in the state. Thus, the large farmers benefitted the most from new technology.

Lal (1993) analysed the economics of marketing of agricultural produce in Himachal Pradesh and found that in summer vegetables like tomato, brinjal, okra and cucumber, the marketed surplus was found to be 88 per cent of the total production whereas it was 93 to 95 per cent in case of winter vegetables like cauliflower, pea and radish. He further revealed that volume of production and per cent irrigated area had a positive effect on the marketed surplus of vegetable crops in the state.

Chand (1996) observed that the agricultural diversification through vegetable crops had huge potential for employment and income generation in Western Himalayan Region (Himachal Pradesh). The vegetable cultivation, due to its labour intensive nature, was more beneficial for the marginal and sub-marginal holdings, where family labour availability per unit of land was higher as compared to larger size holdings. He also found that it was not the farm size but infrastructure like access to motorable road, market and irrigation which determined the extent, access and profitability of diversification through high paying crops like pea.

Marothia *et al.* (1996) conducted a study on vegetable marketing in Chhattisgarh region of Madhya Pradesh by using simple random sampling technique and reported that the per cent area under vegetables decreased as size of holding increased in the study area. They also revealed that small vegetable growers usually preferred to sale their vegetables directly to the

consumers. Medium and large farmers sold their produce to retailers through commission agents. They further identified the two marketing channels. These were; channel-I (producer–seller –commission agents-retailer- consumer) and channel-II (producer-seller –consumer).The marketing through channel-II was found to be most efficient in comparison to channel-I.

Mehta and Chauhan (1996) studied the marketed surplus of vegetables in Himachal Pradesh and revealed that marketed surplus of vegetable commodities was very high (80-98 per cent) in all the regions due to their commercial cultivation. According to them, vegetable crops played a significant role in the livelihood earnings of mountain farmers in all the study regions.

Thakur *et al.* (1996) conducted a study on marketable and marketed surplus of vegetables in hills of H.P. and observed that vegetables were primarily grown for sale in market with marketable and marketed surplus ranging from 96 to 97 per cent and 93 to 94 per cent of the total production of different vegetable crops. They also indicated that the main factors associated positively with marketed surplus of vegetables, which can help in increasing the marketed surplus of those crops turned out to be total production, price of the crop and education of the farmers.

Lal *et al.* (1997) conducted a study in Kangra and Mandi district of Himachal Pradesh to estimate marketable and marketed surplus of principal vegetable crops such as tomato, pea, cauliflower, etc., for small and large farms. They reported that both production and marketed surplus showed a positive relationship with size of holding. They further reported that growers sold 83 to 97 per cent of total vegetable produce.

Thakur (1997) reported that the hills have vast potential of agricultural production and marketed surplus of vegetables due to which income of the people could be increased manifold. He found that even a small farmer could get income of Rs 1 to 3 lakh per hectare per annum. He also found that the most important factors affecting marketed surplus were volume of production and losses. He pointed out that farmers did not get the technical inputs and know-how at their doorsteps when needed. Hence, to increase farm production, marketed surplus and income, the agricultural experts and scientists should go to farmer s'fields. He concluded that development of market infrastructure should be given priority to ensure remunerative prices to hill farmers.

Shiyani et *al.* (1998) studied the marketing of vegetable commodities in South Saurashtra zone of Gujarat by using the two stage stratified random sampling technique. They reported that the overall marketed surplus was greater than 90 per cent of total vegetable production. The commission charges, transportation cost, storage and spoilage cost turned out to be the most important components among all the items of marketing costs. The producer's share in consumer's rupee ranged from 56.87 per cent in tomato to 62.38 per cent in cabbage. The marketing efficiency was found to be satisfactory for all the vegetable commodities studied.

Singh (2002) conducted a study on production and marketing of vegetablesin Mandi district of Himachal Pradesh and reported that marketable surplus was highest in case of brinjal (95 per cent of total production) followed by cauliflower (93.95 per cent) in the study area. Marketed surplus was found to be

positively correlated with the total production of vegetables. About 99 per cent variation in marketed surplus of tomato was explained by four factors like size of family, area under crop, total production and average price. They also reported that marketed margin of wholesaler was observed to be high (17 per cent) for tomato and marketing margin of retailer was the highest (19.03 per cent) in case of cauliflower.

Singh *et al.* (2002) studied the potato marketing pattern in Agra district of western Uttar Pradesh and revealed that the marketed surplus of potato was as high as 87.96 per cent of total output, which varied from 82.48 per cent on small farm size group to 91.82 per cent on large farm size group. It was also observed that across the farm size group, per quintal net price received at all places and time was the highest on large farm size group followed by medium and small farm size groups, respectively in decreasing order. Again across the farm size group, the cost of marketing of potato at all places and time was the highest in case of large farm size group with a magnitude of Rs. 96.05/q while it was the lowest in case of small farm size group with a magnitude of Rs. 54.86/q. The storage charge, transportation charge and cost of gunny bags were the important cost items in total cost of marketing on all categories of farms.

Elenchezhian and Kombairaju (2003) analysed the price-spread and marketing efficiency of major vegetable commodities in Madurai city of Tamil Nadu by using proportional allocation method. They revealed that after harvest, the vegetables were graded and packed by family labour and hired labour, if necessary. They also reported that vegetables were transported through buses

run by state transport corporation connecting villages with farmer's market. Expenditure incurred on labour, packing materials constituted the cost of grading and packaging. Transport fare was only for farmers since vegetable was transported free of cost. Marketing cost included transport (only for farmer), grading and packaging and miscellaneous cost.

Chauhan (2004) studied the infrastructural development and constraints in vegetable marketing in Himachal Pradesh. He reported that 96 to 98 per cent vegetable growers resorted to hand grading and packing of vegetables in the absence of machine facilities. Except tomato, all the vegetables were packed in gunny bags and bamboo baskets. About 84 per cent growers did not store vegetables on their farms due to lack of storage facilities. He recommended that farmer accident insurance scheme, farmer gift scheme and modern inputs delivery system through market committees/yards should be initiated to enhance overall efficiency and to encourage producers for selling their produce through the established regulated markets.

2.2 Price-Spreads and Marketing Efficiency

Nagraj and Chandrakanth (1992) studied the market performance of fruit and vegetables and observed that in case of beans, cabbage, brinjal and tomato, the main market channel was producer- commission agent-retailer-consumer. The share of producer was found to be around 66 per cent while that of commission agent and retailer was 5 per cent and 28 per cent, respectively. The marketing costs of producer, commission agent/ retailer were found to be 9.1 and 7 per cent, respectively. The study further revealed that vegetable growers

were forced to sell the vegetables because of their immediate cash requirement. They suggested that producer can only be benefitted by efficiently regulating the market and establishment of a network of infrastructure facilities ranging from scientific storage to transportation and processing.

Lal (1993) studied the marketing problems of agricultural produce in Himachal Pradesh by using multistage random sampling technique and reported that in case of all the vegetables, commission agents-cum-wholesalers played a dominant role, followed by village traders. He also reported that the portion of marketed surplus of vegetables handled by commission agents-cum-wholesaler was higher on large farms as compared to small farms because large farms had more access to send their produce to nearby markets.

Autkar *et al.* (1994) conducted a study on cost and price-spread of marketing of vegetable grown in Akola district and reported that transportation, commission charges and weighing charges were the main items which were responsible for high marketing cost of vegetables in the Akola district. They further reported that producers share was highest in brinjal and it was lowest in tomato. The study showed that cost and margins of intermediaries accounted large proportion of profit from the price paid by the consumers. They emphasized that vegetable grower co-operative society should be established in order to overcome the defects in the existing system of marketing.

Agarwal and Saini (1995) investigated the institutions, agencies and channels involved in the marketing of *Brassica* crops and assessed the price-spread in different marketing channels. Two villages (Mahapura and Bhankrota)

in the command area of *Krishi Upaj Mandi Samiti*, Jaipur, Rajasthan were selected for the study. The study indicated that farmers mostly adopted channel II (producer-commission agent-mashakhores-retailer-consumer). Estimation of price-spread indicated a low share of farmers in this channel (52 to 54 per cent) due to high marketing costs and margins charged by intermediaries.

Saini and Bhati (1995) studied the constraints of ginger marketing in Himachal Pradesh and identified four marketing channels in the study area. These were: channel-I (producer- primary wholesaler- secondary wholesaler-big secondary wholesaler- retailer- consumer). Channel-II (producer- village trader-primary wholesaler-secondary wholesaler- retailer- consumer), channel-III (producer-village trader-forwarding agent-secondary wholesaler-retailer-consumer), and channel-IV (producer-consumer). They also revealed that out of total marketed surplus of Ginger, 60 per cent was routed through channel-I followed by Channel-II (20 per cent) and channel-III (19 per cent). However, only 1 per cent of total marketed ginger was routed through channel-IV in spite of its highest efficiency.

Shyamsunder and Achoth (1996) examined the price-spread in marketing of onion in Kokar district. They reported that the producer got the highest net price per quintal in channel-II (producer- wholesaler – retailer – consumer) and lowest in channel-I (producer – village level trader – wholesaler-retailer- consumer). Thus, channel-II was found best as compared to all other channels. So, it would be seen that producer who sold onion to wholesaler got the highest net price per quintal and maximized their earnings. Hence, they

recommended that department like Horticulture and Marketing should educate the farmer not only in efficient production of onion but also in efficient marketing so as to enable them to realize a higher profit. Co-operative marketing society must be encouraged in the study area to improve the bargaining power of onion producers and also enable them to come out of the clutches of middlemen.

Chauhan *et al.* (1999) studied the marketing of vegetables in Utter Pradesh and identified three channels in study area. They were channel-I (producer-consumer), channel-II (producer-commission agent/ forwarding agent-retailer-consumer) and channel-III (producer-commission agent- retailer-consumer). They found that producer's share in consumer's rupee in channel- III was lowest (60 to 63 per cent). In channel-II, the producer's share in the consumer's rupee varied from 85 to 88 per cent for different vegetables. The highest producer's share in consumer's rupee was noted in channel I (91 to 94 per cent) in all vegetables. They further emphasized that in order to improve the vegetable marketing, the farmers should be encouraged to form producer's marketing co-operatives and thereby promoting group marketing which would not only reduce the marketing cost but also increase the producer's share in the consumer's rupee and also avoid inconvenience by the vegetable growers in bringing their produce to the markets.

Singh and Vashist (1999) analyzed the production and marketing system of vegetables in Lambagaon block of district Kangra (H.P.) and identified that producer- consumer marketing channel ensured higher profit and efficient marketing channel in the local markets. It was also found that the producer's share in terms of consumer's rupee was very low due to presence of large

number of market intermediaries. Most important constraints in the marketing of vegetables were lack of knowledge about marketing system, low vegetable prices and faulty weight excess deduction by traders etc.

Hussein *et al.* (2000) reported that the price-spread of potato i.e. producer's share in consumer's rupee in regulated market was higher. The producer's share in consumer's rupee in regulated market was 71.25 per cent and 62.72 per cent in unregulated market. The wholesaler's margin, cost of marketing and retailer's margin in regulated market were 5.54, 13.35 and 9.86 per cent, respectively and corresponding figures were 9.15, 16.34 and 11.79 per cent, respectively in unregulated markets. The marketing efficiency index in regulated market was 2.48 and 1.08 in unregulated markets. The major marketing problems faced by farmers were higher in unregulated market than in regulated market. It may be concluded from the finding that regulated market was able to get higher producer's share in consumer's rupee and marketing efficiency due to all the facilities available in regulated market.

Shelke and Kalyankar (2000) studied the price-spread in marketing of selected vegetables in New Modha market, Parbhani by using the secondary data. They reported that during the peak period of arrivals of these vegetables, the wholesale and retail prices were much lower. There was much wide difference between wholesale and retail prices. They further reported that retailer's share ranged between 12 to 41 per cent while the producer's net share ranged between 42 to 57 per cent. The retailers received major share of the consumer's rupee.

Singh (2002) conducted a study on production and marketing of vegetables in Mandi district of Himachal Pradesh and reported that producer- wholesaler- retailer- consumer was found to be the most important marketing channel, through which 90.82 per cent of tomato, 64 per cent of pea, 72.82 per cent of cauliflower, 83.94 per cent of frenchbean, 84.42 per cent of lady finger and 83.95 per cent of brinjal were marketed.

Elenchezhian and Kombairaju (2003) compared and analyzed the marketing efficiency of farmer market with central vegetable market. They took two marketing channels for the study i.e. marketing channel I (farmers - consumer) and marketing channel II (producer- commission agent- wholesaler cum retailer- retailer-consumer). They reported that the farmer's share in consumer's rupee was 86 per cent for tomato, about 95 per cent for brinjal, lady finger and small onion in channel I whereas, this share was lowest for tomato (27 per cent) followed by brinjal (50 per cent), small onion (55 per cent) and lady finger (57 per cent) in channel II. They also revealed that marketing efficiency index was highest in channel I with 18.3 for brinjal while 16.24 for lady finger, 16.02 for small onion and 6.99 for tomato as compared to the marketing efficiency index of 2.01, 2.33 2.44 and 1.37 per cent, respectively for these four vegetables in channel-II.

Sharma *et al.* (2004) studied the vegetable markets in Himachal Pradesh and they revealed that there was one regulated market for fruits and vegetables in Kangra and the nearby vegetable growers sold their produce in the market. It was observed that most of the farmers (59 out of 100) sold their produce through the marketing channels viz., produces- commission agents-

retailers- consumers. Only 5 per cent of sellers sold their produce directly to the consumers and this channel was found to more efficient as compared to other channels.

Singh *et al.* (2004) focused on the temporal behaviour of wholesale prices and arrivals of pea and tomato in Shimla, Chandigarh and Delhi markets. They also analyzed the operational efficiency of the marketing system and revealed that producer's share in the consumer's rupee for tomato ranged from 32.4 to 37.3 per cent while for pea this range was 61 to 66 per cent for different marketing channels. The study also observed that the selected markets were strongly integrated with the intermarket correlation coefficient ranging from 0.75 (in case of tomato) to as high as 0.95 (in case of pea), Delhi market was found to be the most suitable for the selected vegetables although it also showed a larger variation in prices.

Gajipara et *al.* (2006) studied price behavior of major vegetables in Gujarat state and confined their studies to the major vegetables (onion, brinjal, potato, chilies, tomato and cluster bean). Considering their share in total area of Gujarat state under vegetables, they had concluded that there was seasonality in arrivals and prices of all the major vegetables produced in the state which indicates the need for storage facilities. It was also found that there was a lot of scope of intermarket transfer of major vegetables in Gujarat.

2.3 Problems and Constraints in Marketing

Nagraj and Chanderkanth (1992) conducted a study on fruit and vegetable marketing in India and revealed that a large majority of the growers were forced to sell the vegetables at low prices because of immediate cash

requirements. About 90 per cent of the farmers reported that the intermediaries did not accept the producer's graded vegetables at higher prices. The other problems felt by the producers were lack of storage facilities, undue delay in getting payment from the traders, high rate of commission, improper weighment, wide fluctuation in prices and high unloading charges at the market. Besides, the commission agents and retailers complained about heavy congestion in market yards.

Thakur *et al.* (1994) studied the economics of off season vegetable production and marketing in Solan district of Himachal Pradesh by using random sampling technique and stated that vegetable production was highly profitable in the hilly areas and should be used to increase the income of small and marginal farmers, significantly. They suggested that there is a need for an integrated approach to tackle the production and marketing problems faced by farmers.

Gurung *et al.* (1996) conducted a study on production and marketing constraints in fresh fruits and vegetables in the Western hills of Nepal and found that market development was rudimentary and the area lacked physical and institutional infrastructure to support fruit and vegetable marketing. The major problems were with respect to market places, stalls, transport networks, price and market information, telecommunication facilities and credit services. It was concluded that government policies were needed to target these issues so that the agricultural sector could develop in the study area.

Mishra (1996) studied the marketing of agricultural and horticultural produce in North-Eastern region of India and revealed that emerging market structure reflected the growing power of traders to buy goods at cheaper rates from the rural producers and sell them at higher prices in rural/urban areas.

Similarly, due to lack of proper transportation and processing facilities, farmers were not able to dispose of the produce at right time to obtain remunerative prices. There were no linkages between the main wholesale markets with the rural markets of the states. There was also inadequate market network in North Eastern region.

Bhardwaj and Kaul (1999) studied the marketing of fruits and vegetables in India and reported that marketing of fruits and vegetables required more care and timely disposal because of their perishable nature. They also revealed that the returns from these products mainly dependent upon the efficiency of marketing system i.e. picking, grading, packaging and transportation. Lastly, they emphasized that marketing innovations could play important role in case of fruits and vegetables and creation of farmer's market (*Apni Mandi*) would promote the production level and reduce the marketing margins. Provision of market finance and market intelligence could bring a boom to this sector of agriculture.

Mishra *et al.* (1999) studied the production and marketing of chilies in Azamgarh district of Uttar Pradesh. They stated that non-availability of quality seed, poor extension services, non-availability of transportation, cold storage facility and high marketing cost due to dependence on commission agents were the major constraints in production of chillies.

Patel *et al.* (1999) conducted a study on marketing of cabbage and cauliflower grown in Banaskarth district of North Gujarat by using three stage sampling technique. They revealed that most of the vegetable commodities

routed in the market from producer to consumer through wholesalers cum commission agents and retailers. Total marketing costs were Rs.113.67 and Rs.116.98/quintal for cabbage and cauliflower, respectively. They further reported that commission charge was the major cost component of the total marketing costs. On an average, cabbage grower received 55.24 per cent and cauliflower grower received 50.80 per cent share in consumer's rupee. Marketing efficiency index was 1.23 and 1.03 for cabbage and cauliflower, respectively. Lastly, they concluded that lack of storage facilities, delay in payment, high cold storage charges, monopoly of few middlemen and need of timely disposal of these perishable products etc., were the major problems faced by the cabbage and cauliflower grower.

Prakash (1999) reviewed the existing marketing system in Kanpur and reported that rural periodic markets required infrastructural facilities for improving their efficiency. He also reported that existing road facilities were highly inadequate, out dated and inefficient, causing considerable delays and transit losses. Perishable commodities required suitable, specialized and fast transport. He suggested the need for heavy investment in order to meet the increasing storage requirement for agricultural produce. There was also a need for technological up gradation for cost effective building refrigeration, machinery and improvement in the method for scientific preservation of perishables. There was a need to review the existing packing system for different agricultural commodities and intensive R and D effort to develop a cheap and eco-friendly packing system.

Prasad *et al.* (1999) studied the marketing efficiency of vegetables by using stratified random sampling technique and reported that the perishable nature of vegetables, lack of proper storage facilities and disorganized marketing system in the study area resulted into lion's share of retailer's margin and higher proportion of marketing cost. They further noticed that the overall marketed surplus was more than 85 per cent of total vegetable production. Among different items of expenditure, the maximum share was noticed for spoilage cost. This was attributed mainly to the perishable nature of the vegetables and lack of adequate storage facilities. They emphasized the need for increasing the availability of storage facilities and the necessary infrastructural facilities and processing units at village level.

Vasudev and Chowdry (1999) studied the marketing of tomato in Andhra Pradesh by using simple random sampling technique. They reported that price had a positive impact on area under tomato. One of the major problem faced by the farmers was lack of grading facilities in markets. They further reported that absence of market information was another important problem faced by the farmers. The packaging material used by the farmers was found to be unsatisfactory. Market infrastructure such as cold storage, grading, amenities in the market yard may be provided to improve the marketing efficiency.

Lal *et al.* (2000) studied constraints and opportunity of vegetable marketing in Himachal Pradesh. They reported that marketing system for vegetables was not efficient and free from many blemishes that might discourage the farmers to increase their marketed surplus. They observed that producer's

share in the consumer's rupee was low due to exorbitant margins taken by the middlemen especially retailers and avoidable quantity losses at the market level due to poor storage and market clearance. They recommended that regulated markets should be properly monitored and the Agricultural Produce Market Act should be strongly enforced and implemented to check malpractices in marketing of vegetables.

Verma and Rajput (2000) conducted a study on marketing of potato in Indore district of Madhya Pradesh by using multistage random sampling technique. They reported that price of potato was low during post harvest period as compared to the pre-harvest period. They further reported that the major reason which compelled the farmers to sell their produce was the low retention power due to non-storability and immediate cash requirements.

Bunga (2001) analyzed the market structure for vegetables in East Nusa Tenggara, Indonesia. The relationship among channel members, the price of vegetables, the marketing margins, and marketing efficiency were examined. It was concluded that all market participants run their business efficiently. However, transportation was still a major constraint to vegetable marketing.

Balappa and Hugar (2002) examined the trends in prices and their variation in six principal vegetable markets of Northern Karnataka in the case of onion and potato. They revealed that the wide and frequent fluctuations in wholesale prices, wide variation in arrivals, perishable nature of the produce etc., affected the returns to the onion and potato growers. They also emphasized that price should be stabilized by introducing a fairly high degree of competition

among the wholesale functionaries and traders, introducing close tender system of sale, establishment of vegetable marketing cooperatives and fixation of minimum and maximum prices for the vegetables.

Basu (2002) examined the efficiency of potato market in West Bangal by using two stage stratified random sampling technique and reported that farmers in the village where the availability of cold storage facilities were satisfactory, were getting higher prices for potato as compared to the non availability of cold storage facilities. He further reported that the pre-dominance of non-institutional credit influenced the price formation, especially the traders-money lenders offered lower prices to the farmers. He also indicated that there was a large distress sale, which compelled the farmers to accept the lower prices as this sale was associated with the repayments of outstanding loans obtained from trader – money lender to finance the cultivation of potato. On the other hand, the formal credit enhanced scope of the sellers to remain longer in the market in post- harvest period.

Chattopadhyay (2002) examined the problems and prospects of marketing of potato in west Bengal. He reported two types of problems faced by potato growers in West Bangal. These were storage and marketing problems. He further reported that the interstate and intrastate variation in cold storage capacity were very large. It was also observed that the licensing procedure was very cumbersome which indicated inefficiency in the system. There was hardly any improvement in post harvest management of potato in the state.

Chauhan and Mehta (2002) studied the problems and constraints in vegetable marketing in Himachal Pradesh and concluded that unremunerative prices for vegetables particularly during peak season remained the foremost problem of producers. Lack of storage facilities was the important constraints reported by 94 per cent growers in vegetable farming. The other important problems perceived by vegetable growers were road blockage due to landslides, costly packing material, costly grading, lack of pucca roads, inadequate skilled labor for grading and scarcity of packing material, non availability of modern inputs etc.

Data (2002) examined the problems of infrastructure in West Bengal and found that all the wholesale agricultural markets in Sunderbans region lacked the minimum required infrastructural support for agri- transaction process. He also revealed that the villages also lacked the basic minimum infrastructure requirement for farming. He further reported that all these contributed to make the marketing system inefficient and the worst suffers were the farmers. It was suggested that the situation could be improved with the introduction of regulated markets.

Kumar and Arora (2003) reported that the major problems in marketing of vegetables were; high cost of packing material, high deduction by traders in the form of commission and problems of transportation means in the area. They suggested that, to give boost to the vegetable development in the area, proper input delivery system, infrastructural facilities and marketing arrangements for vegetables should be strengthened by the planners and policy makers.

Kumar *et al.* (2004) examined the market infrastructure of Himachal Pradesh and reported that the market infrastructure in the state was poor as the density of markets, road length and other facilities were low. They also revealed that the telecommunication facilities in the state were better which helped the farmers in getting market information and market intelligence for better prices.

Lal and Sharma (2004) examined economics of production and marketing of off-season garden pea in Lahaul valley of Himachal Pradesh and reported that the improvement in the marketing system had not kept pace with production. In the absence of organized marketing, the producers were not getting even one third or one fourth of the price paid by the consumers. It was mainly due to the substantial margins pocketed by the middlemen especially the private traders and retailers who had the monopoly in marketing due to low competition in remote area constrained with short working season and the typical geographical barriers. They emphasized the need to establish the regulated market yard/sub yards in Lahaul valley.

Shandil and Singh (2004) studied the fruit and vegetable regulated markets of Solan, in Solan district and Bhunter in Kullu district. From their studies , they concluded that Solan market was more efficient and competitive than Bhunter market as there were more sale alternatives, more marketing agents and large quantum of produce. The imperfection in market structure was due to dependence of producers on commission agents for credit, non- clearance of payments by some small commission agents and incapability of handling of produce in the peak season by small commission agents. In the absence of

proper scientific grading, the grading done at farmers and traders level was not uniform and had an individual bias. They emphasized that there was a need for produce quality certification agency. The institutional short term credit and crop insurance were also needed to selected farmers.

Sharma and Thakur (2004) examined the status of market infrastructure in Himachal Pradesh and revealed that the size and structure of these markets had not undergone major change over the years and some of the market yards received low arrivals due to inherent inefficiencies in handling and disposal of produce. They suggested the need to upgrade the principal markets by modernizing their operations to create desirable horizontal and vertical integration at various levels. According to them, the marketing regulation and administration also needed fresh look to act as promoters in marketing rather than regulators. The market committees should lay focus on orderly marketing by creating desirable amenities and infrastructure and awareness about grading, packing and quality control.

Sharma *et al.* (2004) examined the marketing channels and problems faced by vegetable cultivators of Kangra and Nagrota development blocks of Kangra district of Himachal Pradesh. They revealed that marketing problems included the existence of regulated market at a distant place, transportation problems, high cost of marketing and unremunerative prices. About 98 per cent of the respondentsreported that remunerative prices for their produce were not available whereas, 55 per cent reported high cost of marketing of farm produce and 44 per cent of farmers reported that the markets were not strictly regulated.

Verma (2004) studied the marketing of fruits and vegetables in Himachal Pradesh and reported that much of the vegetable production was made available to the marketing functionaries in relatively small lots from a large number of relatively unspecialized individual farmers. Lack of good transport system, proper storage facilities at the market places, malpractices in buying and selling were the main causes of inefficiency of vegetables marketing system in the study area. In addition, multiplicity of charges on producer in the process of selling his produce, long chain of middleman, non availability of sufficient market information also affects operational efficiency of the agricultural market of the study area.

The foregoing review of studies conducted in India and abroad in general and Himachal Pradesh in particular contemplates different dimensions of vegetable marketing. The critical insight into the literature cited above clearly shows the resounding importance of marketing in diversifying farming system. There is ample evidence to show that contemporary marketing system is not free from many blemishes and bottlenecks choking the flow of desirable benefits to farming community. Therefore, marketing reforms and improvements shall remain the major focus of researchers, planners and policy makers in India which is so indispensable for agricultural development and for deriving benefits from globalization.

In this endeavour, the study has been undertaken in Kangra district of Himachal Pradesh. It has been found that marketing system in the district is beset with imperfections hindering the pace of diversification through vegetable crops. Therefore, there is a need to study the pattern, practices, marketing efficiency and pertinent problems so as to suggest strategies and policy options for improving marketing system.

Materials and Methods

Chapter III

MATERIALS AND METHODS

A sound and systematic methodology is a pre-requisite for a scientific enquiry. In fact, precision, reliability, validity and acceptability of the scientific findings/facts depend solely on the methodology adopted for investigation of a phenomenon. The selection and application of appropriate methodology bears more relevance in socio-economic studies based upon sample surveys. The selection of representative sample at the first instance and thereafter derivation of the plausible estimates invariably depend upon the methodology adopted. Therefore, this chapter has been devoted to describe the methodological aspects of the present investigation.

The methodology used in this study has been described under the following four sections:

3.1 Selection of the study area

3.2 Sampling plan

3.3 Data collection

3.4 Analytical tools and models

3.1 Selection of the Study Area

The present study has been planned to be undertaken in Kangra district of Himachal Pradesh. This district is the largest district in Himachal Pradesh in terms of cultivated land, irrigated area as well as number of cultivators. Of late, there has been more inclination of the farming community

towards diversification of agriculture through vegetable cultivation. Therefore, this district has been purposely selected for the study. Two blocks namely, Kangra and Nagrota Bagwan were selected purposively due to higher area and production of vegetables in these blocks. The blocks selected for the study have been depicted through Figure 3.1.

3.2 Sampling Plan

Two stage random sampling design was employed to select sample village and vegetable producers. For this purpose, complete list of all the inhabited villages in Kangra and Nagrota block was compiled with the help of developmental and revenue officials of these blocks. There are 304 and 311 villages in Kangra and Nagrota blocks out of which total number of vegetables growing villages are 270 and 260, respectively (Table3.1). The list of main vegetable growing villages has been shown in Appendix VI. The sampling plan has been depicted through Figure 3.2.

Table 3.1: List of total number of villages and vegetable growing villages in study area

Blocks	Total number of villages	Number of vegetable growing villages
Kangra	304	270
Nagrota	311	260

3.2.1 Selection of villages

In the first stage of sampling, six main vegetable growing villages, three from each block were selected randomly from the comprehensive list procured from the revenue offices of Kangra and Nagrota blocks.

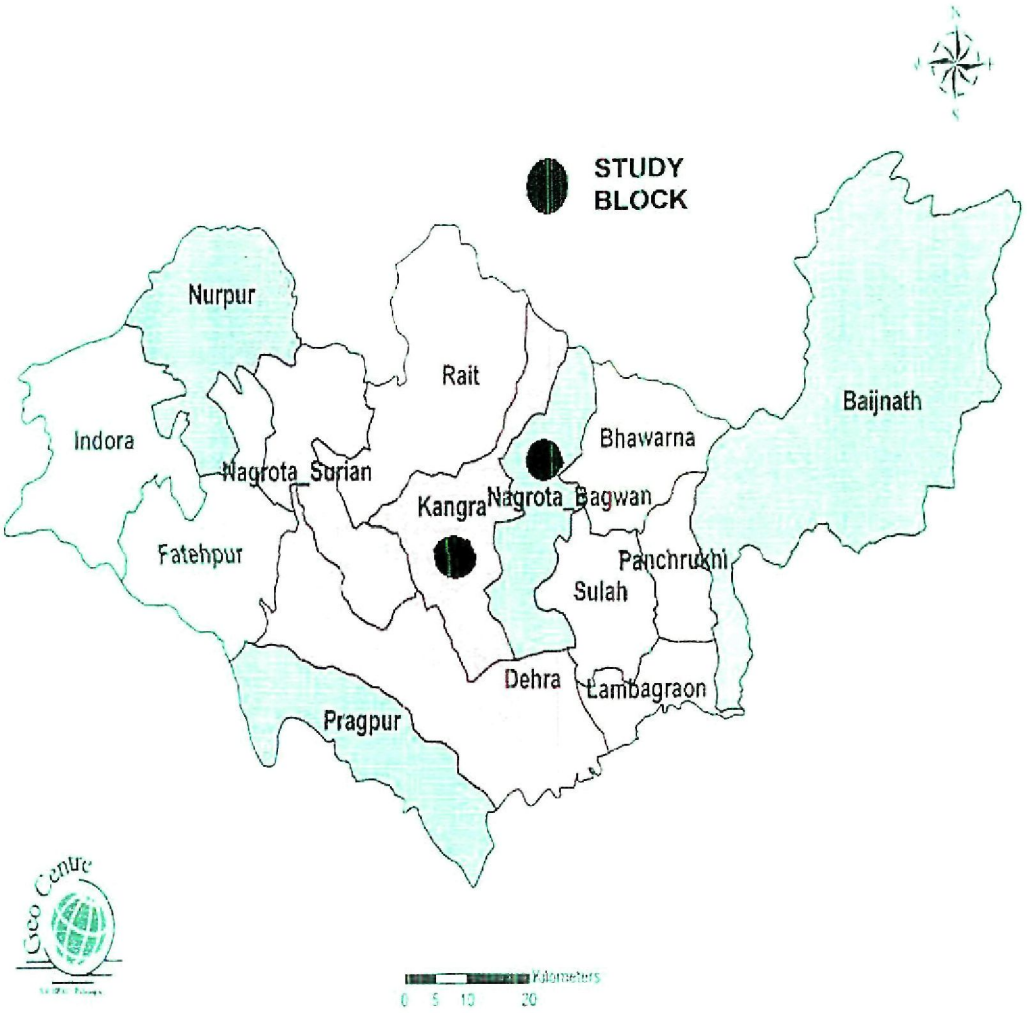
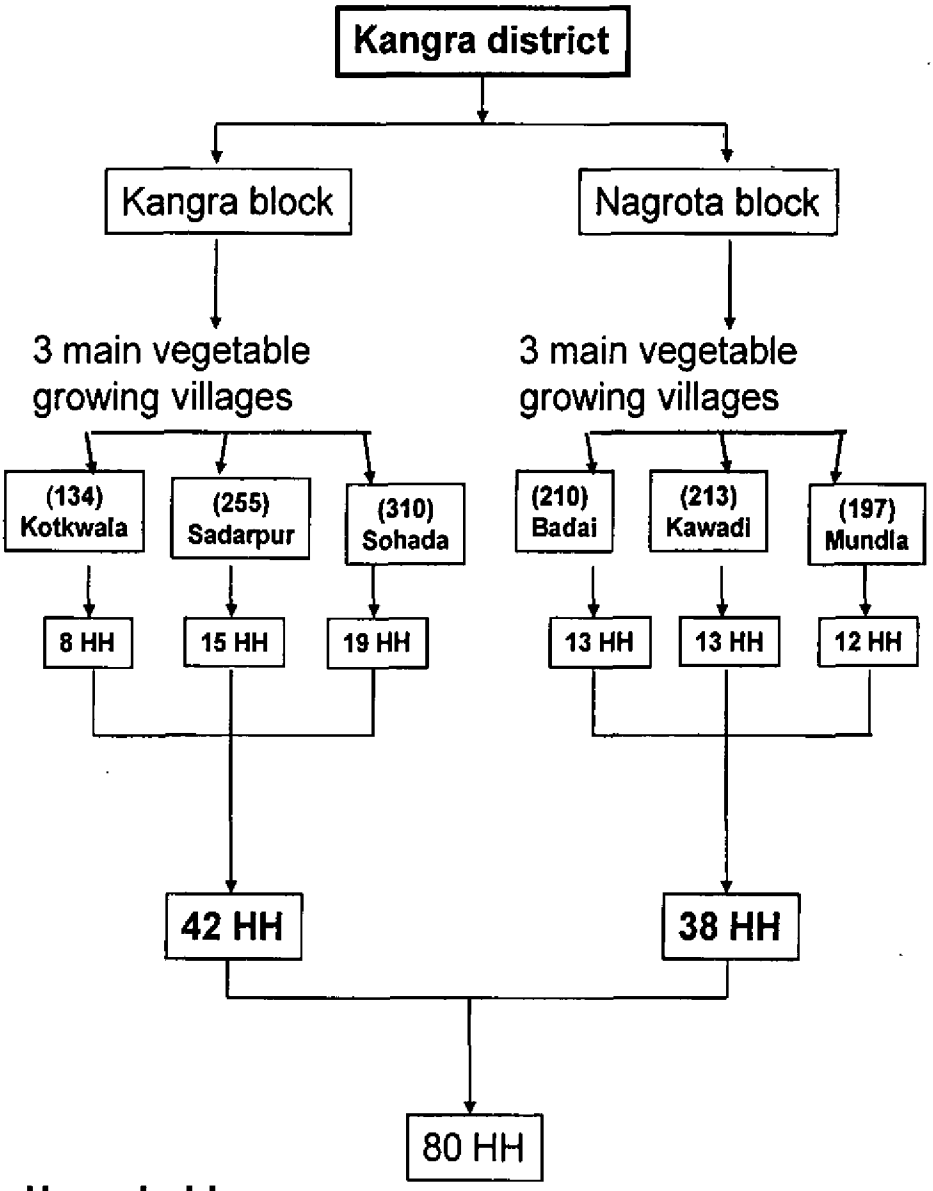


Figure 3.1: Map of Kangra district showing study blocks



HH: Household

Fig. 3.2 Sampling Plan

3.2.2 Selection of vegetable growers

In the second and final stage of sampling, a complete list of vegetable growers in selected villages was compiled along with their land holdings. Thereafter, 80 farmers were selected randomly from the six sampled villages through proportional allocation method. The formula used for the selection of farmers from the sampled villages is as follows:

$$ni = \frac{N_i}{N} X\, n \qquad i = 1, 2, 3, \ldots\ldots 6$$

Where,

ni = number of farmers to be sampled in i^{th} village

N_i = Total number of farmers in i^{th} village

N = Total number of farmers in all the selected villages

n = Total sample size to be chosen

The selected farmers were further grouped into two categories *viz.*, small and large by using cube root cumulative frequency method on the basis of their total land holdings. In this way, 42 farmers from Kangra (34 small and 8 large) and 38 from Nagrota (29 small and 9 large) blocks were selected. In all, 80 farmers (63 small and 17 large) constituted the ultimate sample for the study. The sample distribution of farmers has been shown in Table 3.2.

3.2.3 Selection of the markets and traders

Two markets, namely, Nagrota (sub-market) and Kangra (principal market) located in the study area were purposely selected to collect information relating to markets and marketing. There were 65 functionaries (33 commission agents, 21 weighmen and 12 hamals) in Kangra market. In Nagrota, there were 28 functionaries that comprised 9 commission agents, 9 weighmen and one processor.

Table 3.2: Selected villages and distribution of households (No.)

S. No.	Name of block	Name of villages	Total no. of vegetable growers	Number of selected farmers		
				Small	Large	Total
1	Kangra	Kotkwala	134	8	-	8
		Sadarpur	255	9	6	15
		Sohada	310	17	2	19
	Subtotal		699	34	8	42
2	Nagrota	Badai	210	13	-	13
		Kawadi	213	11	2	13
		Mundla	197	5	7	12
	Subtotal		620	29	9	38
3	Total (1+2)		1319	63	17	80

To study the behaviour and performance of market functionaries and other related aspects of vegetables, 20 market intermediaries of different types (commission agents, retailers, local traders, pre-harvest contractor, etc.) were selected randomly from each market. The distribution of sample traders has been shown in Table 3.3.

Table 3.3: Market-wise distribution of different traders selected for the study (No.)

Sr. No.	Market functionaries	Market		Total
		Kangra	Nagrota	
1.	Pre-harvest contractors	2	-	2
2.	Local traders	2	3	5
3.	Wholesales/Commission agents	3	3	6
4.	Retailers	3	4	7
	Total traders	**10**	**10**	**20**

Hypotheses to be tested

Different hypotheses based on objectives of the study were set before the data collection. These hypotheses were tested after analysing the data. Pre-defined hypotheses are given below:

- The marketable and marketed surplus varies in accordance with the level of farm production.
- The marketing practices followed are in accordance with the standards laid down in the market regulation act.
- The farmers adopt most efficient channel for marketing their vegetable commodities.
- The structure and composition of marketing costs and prices are in consonance with the services rendered by different functionaries.
- There is co integration between the submarket (Nagrota) and Principal market (Kangra) for transmission of price signals.
- The market infrastructure is sufficient enough to expedite orderly marketing.

3.3 Data Collection

The study is based upon both primary and secondary data gathered during the course of investigation.

3.3.1 Survey schedule

Three survey schedules were prepared for the collection of detailed primary data from the sampled respondents. The first survey schedule was developed to extract the detailed information from the producers (Appendix-I).

The second schedule was designed for collecting information from different traders of selected markets (Appendix-II) and the third one was developed to collect the required information about the study markets (Appendix-III). The survey schedules were pre-tested in the nearby areas of sampled villages and market to examine the relevance of structured questions on different aspects of marketing of vegetables. The schedules were modified and finalized for main survey.

3.3.2 Plan of survey

The present study has been planned into three phases as follows:

1. Phase I – Sampling and survey tools
2. Phase II – Data collection
3. Phase III – Tabulation and analysis

1. Phase - I: Sampling and survey tools

This was the first phase, before initiating survey for the study. During this phase, three different survey schedules were prepared to collect data from producer, traders and markets relating to different aspects of vegetable marketing during October, 2007-08. There after, pre-testing of these questionnaires was conducted in the study area during November, 2007-08. After some modification, these schedules were finalized during the month of December, 2007-08.

2. Phase - II: Data collection

After finalization of schedules, data collection from producers, traders and markets was carried out by using the survey schedules. Primary data from producers on different aspects of vegetable marketing were collected during the

month of January 2008- ''. The primary data from traders related to marketing pattern and practices of vegetables from Kangra and Nagrota markets were collected simultaneously. This data collection was completed by mid February, 2008- ' . Secondary data related to price and arrivals of different vegetables in Kangra and Nagrota markets were collected from Market Committee Office of Kangra market during the month of February and March, 2007 . Further, information related to market infrastructure and facilities was also collected from market officials.

3. Phase – III: Tabulation and data analysis

The primary and secondary data were tabulated for further analysis. For this, different analytical tools like tabular and statistical techniques were used. Different statistical tests were applied to test the hypotheses to meet the required objectives of study.

3.3.3 Primary data collection

The primary data for present study have been collected through personal interview method by using the well-designed and pre-tested survey schedules from selected farmers and traders in the study area during the agricultural year 2007-08. The primary data included the information on different aspects which are as follows:

(i) **Socio-economic features**: Age, family size/structure, sex-ratio, education, occupation, size of holding and land utilization pattern.

(ii) **Marketing aspects:** Marketing pattern and practices followed by sampled growers and traders.

- Disposal pattern of vegetables through different functionaries
- Marketing costs borne by the functionaries

(iii) Problems/constraints faced by sampled growers

In addition, primary data on following aspects of marketing were also collected from officials of selected markets.

- Size, type and structure of market
- Infrastructural facilities
- Structure and function of market committees
- Marketing problems.

Further, different information gathered from traders was as follows:-

- Marketing costs and margins of traders in the marketing of different vegetables
- Pattern of purchase and disposal of vegetable commodities
- Problems faced by the traders in the marketing of vegetable commodities

3.3.4 Secondary data collection

Secondary data on area, production, monthly prices and arrivals of different vegetable commodities in the study markets were collected from the Market Committee Office at Kangra. In addition, various published/unpublished sources and official websites of agricultural marketing (www.agmarket.nic.in) have been used for the collection of secondary data.

3.4 Analytical Framework

To meet out the objectives of the present study, both tabular and functional/statistical approaches were employed for analysis and interpretation of results.

3.4.1 Tabular method

The primary data collected on survey schedules were tabulated to workout averages, ratios, percentages and indices. Tabular technique was employed to study the family structure, demographic features, pattern of disposal of different vegetables, etc.

Marketable surplus

The marketable surplus is the residual left with the producer after meeting his requirements for family consumption, payment to labour in kind, disposal of vegetables as a gift to neighbours and relatives. This is worked out as follows:

$$MS_i = TP_i - (HC_i + KP_i + G_i); \qquad i = 1, 2, \ldots\ldots 10$$

where,

MS_i = Marketable surplus of i^{th} vegetables (q)

TP_i = Total production of i^{th} vegetable (q)

HC_i = Home consumption of i^{th} vegetables (q)

KP_i = Kind payments of i^{th} vegetables (q)

G_i = Disposal of i^{th} vegetables as gift (q)

Marketed surplus

Marketed surplus is that quantity of the produce which the producer actually sells in the market, irrespective of his requirements for family consumption, other payments and losses due to transportation, etc. This has been estimated as follows:

$$Mt_i = MS_i - LM_i$$

Mt_i = Marketed surplus i.e. actual quantity of i^{th} vegetable sold in the market (q)

LM_i = Losses of i^{th} vegetables during transportation (q)

Marketing channels

Marketing channels are defined as the chain of intermediaries through whom the various commodities pass from producers to consumers. Various marketing channels patronized by the growers for the marketing of vegetables in the study area were examined by personal survey of different intermediaries involved in the marketing process.

Marketing costs

a) At grower's level

This includes the costs incurred on different operations performed by the growers after harvesting/picking the vegetables. These are namely assembling, cleaning, grading, packaging, transportation from point of assembling to the point of selling, loading, unloading and commission paid to the intermediaries, etc.

b) At market level

The costs incurred by different intermediaries on different marketing operations done by them like packaging, loading, unloading, transportation, commission paid to other intermediaries (if any) and other costs including auction, market fee, etc.

Price-spread

Price-spread is the difference between the price paid by the consumer and the price received by the producer for an equivalent quantity/quality of the farm product. The price-spreads for different marketing channels of vegetables were worked out by estimating the marketing costs involved in moving the product from the place of production to the place of consumption and aggregate margins of various functionaries involved in the marketing process.

Marketing margins of middlemen

It is the difference between the total payments (purchase price plus costs incurred in marketing) and receipts (sale price) of the middlemen. Marketing margins were estimated by employing the following formula:

$$Am = Pm - (P_b + M_c)$$

where,

Am = Absolute margin of the middlemen

Pm = Selling price of the middlemen

P_b = Buying price or purchase price of the middlemen

M_c = Costs incurred by the middlemen

Total cost of marketing

The total cost incurred on marketing either in cash or in kind by the producer/seller and by various intermediaries involved in the sale and purchase of the commodity till the commodity reaches the ultimate consumer, was computed by using the following formula:

$$TC = PC + \sum_{i=1}^{n} MC$$

where,

TC = Total cost of marketing

PC = Costs incurred by the producers in the marketing of produce

MC_i = Costs incurred by the intermediaries

Producer's price

This is the net price received by the farmer at the time of first sale. The price received by the producer for the sale of vegetable commodities is computed as follows:

$$P_p = P_s - P_c$$

where,

P_p = Net price received by the producer

P_s = Producer's selling price

P_c = Cost incurred by the producer in the marketing of produce

Producer's share in consumer's rupee

Producer's share in consumer's rupee is the price received by the farmers. This means how much producer is getting from the price paid for his produce by the consumer and expressed as the percentage of the retail price or consumer's purchase price. This is computed by using following formula:

$$P_s = \frac{P_p}{P_c} \times 100$$

where,

P_s = Producer's share in consumer's rupee

P_p = Producer's price for the vegetable produce

P_c = Price paid by consumer or sale price of retailer

Marketing efficiency index

Marketing efficiency indicates the movements of goods from producer to consumer at the lowest possible cost, consistent with the provision of services desired by the consumer. It is the ratio of value of output to marketing inputs. An increase in this ratio represents the improved efficiency and a decrease denotes reduced efficiency. Marketing efficiency index of different marketing channels has been worked out by using Shephard's formula given below (Chahal *et al.*, 2004.):

$$ME = \frac{V}{I} - 1$$

where,

ME = Marketing efficiency

V = Value of the goods sold (consumer's price) in Rs. per quintal

I = Total marketing cost and marketing margin in Rs. per quintal

3.4.2 Statistical/functional analysis

Different statistical techniques have been used to achieve the planned objectives of the study. These are as follows:

Multiple linear regression model

To meet out the requirements of first objective, i.e. factor influencing marketed surplus of different vegetable commodities, multiple regression model was used. Based on the goodness of fit (R^2), the linear regression model of the following form was used:

$$Y_i = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6D_1 + U_i$$

where,

Y_i = Marketed surplus of i^{th} crop (q)

b_0 = Intercept

b_i = Regression coefficients (i = 1,2,3,.....6)

x_1 = Volume of production (q)

x_2 = Price received (Rs/q)

x_3 = Losses (q)

x_4 = Family size (No.)

x_5 = Distance of farm from the regulated markets (Kms)

D_i = Dummy variables for education, value '1' for matriculation and above, '0' otherwise

U_i = Random term

and significance of regression coefficient was tested by employing student 't' test as follows:

$$t = \frac{b_i}{SE(b_i)}$$

where,

$SE(b_i)$ = Standard error of regression coefficient

Time series analysis

To meet the second objective, trend and seasonal indices were computed for arrivals and prices of major vegetables. The decomposition of the time series data was done by assuming a multiplication model (Croxton *et al.* 1973) of the following form:

Y_t = T x S x C x I

where,

Y_t = Monthly wholesale prices (Rs/q) or arrivals (q)

T = Trend equation

S = Seasonal indices

C = Cyclical behaviour

I = Irregular component

The cyclical component was not visible for short periods while irregular component was non-controllable. Therefore, the final model was

$Y_t = T \times S$

To measure the trend in arrivals and prices, following equation was estimated:

$T = a + bt$

where,

a = Intercept showing value of trend when t = 0

b = Regression coefficient showing changes in arrivals/prices per unit time't'

Student's t-test

The significance of the different regression coefficient obtained from trend equation was tested by employing student's t-test as follows:

$$t = \frac{b}{SE(b)}$$

where,

SE(b) = Standard error of regression coefficient

The monthly seasonal indices in prices and arrivals were worked out by using the following formula (Fielder and Osagie, 1985).

$$S_t = \frac{Y_t}{\bar{y}_i - (6 - j)b}$$

$$\bar{S}t = \frac{\sum S_t}{7}$$

where,

S_t = Monthly index for j^{th} month in a year

$\bar{S}_t$ = Seasonal index for j^{th} month during the period of 7 years

$\bar{y}_t$ = Average of i^{th} year (i = 1, 2, ... 7)

y_t = Price (Rs/q) or arrivals (quintals) in j^{th} month in a year

(j = months 1, 2, ... 12)

b = Trend coefficient

Besides trends, coefficient of variation (C.V.) in prices and arrivals in different markets were estimated as

$$\text{C.V. (\%)} = \frac{\text{S.D.}}{\bar{Y}} \times 100$$

where,

S.D. = Standard deviation

$\bar{Y}$ = Mean value

Degree of market competition

Degree of market competition among different traders for the sale of vegetable commodities in the study markets have been estimated by using the Herfindhal Index (HI). Degree of market competitiveness is inversely

proportional to Herfindhal index. Low value of Herfindhal index shows higher degree of competition and vice versa. The following formula of Herfindhal index was used:

$$HI = \sum P_i^2$$

Where,

$$P_i = \frac{A_i}{\sum A_i}$$

HI = Herfindhal index

Pi = Proportion of arrivals handled by i^{th} trader in the market

A_i = Quantity of arrival handled by i^{th} trader in the market.

$\sum Ai$ = Total arrival of vegetable commodities in main market (*Sabji Mandi*)

Market co-integration test

Market integration may be a situation in which arbitrage causes prices in different markets to move together. Prices in one market vary with the actions of buyers and sellers in other markets. Here, in order to test the co-integration between two markets, principal market 'Kangra' and sub-market 'Nagrota', bivariate price correlation as well as co-integration tests developed by Engle-Granger (1987) have been used.

The most common methodology used in the past for testing market co-integration involves estimation of bivariate correlation coefficient between price changes in different markets (Ghosh, '2000). Using this traditional approach, we observed the degree of association between two study markets with respect to

wholesale prices. This can be visualised through zero-order correlation matrix of prices in these markets. The approach conveys that, with random price behaviour expected of a non-integrated market, the bivariate correlation coefficient of price movements will tend to be zero. Conversely, in a perfectly integrated market, correlation coefficient of price movements is expected to be unity. The simple correlation coefficient for the prices of different vegetables in selected markets can be estimated by employing the following formula (Acharya and Agarwal, 1994):

$$r = \frac{\sum_i (P_{1i} - \bar{P}_1)(P_{2i} - \bar{P}_2)}{\sqrt{\left[\sum_i (P_{1i} - \bar{P}_1)^2 \sum_i (P_{2i} - \bar{P}_2)^2\right]}}$$

where,

r = Simple correlation coefficient

P_{1i} = Price of the commodity in the first market at i^{th} point of time

P_{2i}= Price of the commodity in the second market at i^{th} point of time

$\bar{P}_1$ = Mean of prices in the first market

$\bar{P}_2$ = Mean of prices in the second market

and significance of correlation was tested by analyzing student 't' test as follows:

$$t = \frac{r}{\sqrt{(1-r^2)}}\sqrt{n-2}$$

with n-2 degree of freedom.

The studies based on bivariate correlation coefficient were found to have methodological flaws. The most serious one seems to have occurred due to their failure to recognize the possibility of spurious integration in the presence of common exogenous trends (e.g. general inflation), common periodicity (e.g. agricultural seasonality) or auto correlated and heteroscedastic residuals in the regression with non-stationary price data. Thus, a newly developed method in the theory of time series co- integration was applied to test the market integration. This test is known as Engle and Granger co-integration test. Co-integration test starts with the theory that for a long-run equilibrium relationship to exist between two variables, it is necessary that they should have the same inter-temporal characteristics. Thus, the first step involves testing for stationary of the variables. The stationary nature of the series was examined by using the unit root test. The most widely used unit root test is Phillips-Perron (PP) test.

Phillips-Perron test was carried out by subjecting the residual from the regression to a prescribed test procedure.

$$P_{it} = a + bP_{jt} + i_t$$

where,

P_{it} and P_{jt} = Prices of the i^{th} and j^{th} markets, respectively

i_t = Residuals

a = Constant term

b = Regression coefficient

Here, the regression was computed with the constant term. This procedure was based on two statistics (LIMDEP, Version 8.0).

$$Z_p = T(\hat{P}-1) - 1/2\left(\frac{T^2V^2}{S^2}\right)(a-c)$$

$$Z_t = \sqrt{\frac{Co}{a}\left(\frac{\hat{P}-1}{V}\right)} - 1/2\,(a - Co\frac{Tu}{\sqrt{a5^2}}$$

$$S^2 = \frac{\sum_{t=1}^{T} e_t^{\,2}}{T-K}$$

V^2 = Estimated asymptotic variance of $\hat{P}$

C_j = $1/T \sum_{S=j+1}^{T} e_t\ e_{t-s},\qquad j = 0, \ldots\ldots 1$

L = j^{th} *auto-correlation of residuals*

Co = $\{[\,(T-K)\,/\,T\,]\,S^2\}$

a = $Co + 2\sum_{j=1}^{L}(1 - j/L+1)\,C_j$

The test statistics were referred to the Dicky-Fuller tables. LINDEP uses linear interpretation in a few critical values from the tables. For each statistics, the internal values are for significance level of 0.1, 0.5 and 0.10.

The Engle-Granger (1987) co-integration test is based on residues, i.e.

e_t = $P_{it} - P_{it}^{*}$

where,

P_{it}^{*} = Estimate price of i^{th} market based on the price of j^{th} market

For testing the co-integration, we have used the following equation:

$$\Delta e_t = \mu + \eta\, e_{t-1} + \sum_{k=1}^{p} \theta\, \Delta e_t - k + e_t$$

To test the co-integration, we have set a null hypothesis of no co-integration against an alternative hypothesis of co-integration i.e.

$H_0 : \quad \eta = 0$

$H_1 : \quad \eta < 0$

Now, if two variables i.e. x and y are cointegrated in first order i.e. I (i) and also co-integrated in the long run, we can apply an error correction model (ECM) for x and y as :

$$\Delta NP_t = \alpha + \beta \Delta KP_t + \delta e_{t-1} + u_t$$

where,

ΔNP and ΔKP = First difference of the variables (NP and KP, respectively)

NP and KP = Prices of commodities in Nagrota and Kangra markets, respectively

e_{t-1} = Error, occurs one period lag

u_t = Disturbance term

In this model, the hypothesis of strong form test of market integration can be preformed by testing the restriction $\alpha = 0$ and $\beta = 1$ and any lagged term must have zero coefficient. On the other hand, if $\alpha \neq 0$ and $\beta = 1$, we have the weak form test for market integration (Buongiomo and Usivuori, 1992; Zanias, 1993). For this, we test $\alpha = 0$ and $\beta=1$.

The speed of adjustment of prices has been calculated for different commodities between two study markets by considering value of δ in the error correction model.

Problems faced by vegetable growers

The producers are facing numerous marketing problems. Thus, to analyze whether they are similar or dissimilar between different categories of farmers, Chi-square test was performed employing the following formula:

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

Where,

O_i = Observed frequency of problems faced by i^{th} category of vegetable growers,

E_i = Expected frequency related to each of problem faced by i^{th} category.

Limitations of the study

The present investigation has been carried out systematically using scientific methodology. Every care was taken to select the representative sample. The accuracy of the data was ensured through cross-checks in the survey schedules. However, few limitations as pertinent in every socio-economic survey may not be over ruled though these limitations would hardly limit the relevance and fidelity of the results derived. Some of the limitations in this study are as under:

1. This study is based upon the sample observation collected from 80 households of the selected villages and 20 traders of the selected markets. This is done keeping in view the limited time and resources constraint at the disposal of a researcher. However, random selection was done to obtain representative sample for the study.

2. During the period of survey in winter aberrant weather and hostile climate posed some problems in survey and collection of data from different villages of the study area. So, it took more time than expected for the collection of data.

3. As no farm records were maintained by the sampled farmers, the data were, therefore, collected by survey method based on their memory power and past experience. Though, due care was taken by cross checking the information, the possibility of few slips from the memory of the respondents could not, however, be ruled out.

4. Most of the traders in the study markets did not cooperate to the extent desirable as they were afraid of divulging their trade secrets. However, after convincing, they revealed useful information.

5. The study is more applicable to Kangra and Nagrota blocks. However, the findings can be generalized for the other hilly areas having similar features and agro-climatic conditions.

Results

4.1.1 Historical background and location

Himachal Pradesh is bound between 30°22' to 33°12' North latitude and 75°47' to 79°94' East longitude. To the east, it forms India's border with Tibet, to the North, lies state of Jammu and Kashmir, Uttar Pradesh in the South East, Haryana in South and Punjab in the West. The entire territory of Himachal is mountainous with altitude varying from 350 to 7000 m above the mean sea level. Himachal is a small hilly state, geographically located in the North Western part of the country and occupies an area of 55,673 sq kilometers. There is general increase in elevation from West to East and from South to North. It has 12 districts out of which Kangra is one of the largest districts in terms of population.

Kangra became a district of British India in 1846, when it was ceded to British India at the conclusion of the First Anglo-Sikh War. The British district included the present day districts of Kangra, Hamirpur, Kullu and Lahul & Spiti.

After Independence in 1947, Punjab province was partitioned between India and Pakistan, and the western portion, including Kangra, became the Indian state of Punjab. Lahaul and Spiti became a separate district in 1960, and Kullu in 1962. In 1966, Kangra and Una districts were added to Himachal Pradesh, which became a union territory of India, an Indian state in 1971. Hamirpur district was separated from Kangra in 1972. At present the Kangra district comprises of 8 sub-divisions, 12 tehsils and 4 sub-tehsils. Furthermore, the district has 15 developmental blocks, 760 panchayats and 3619 inhabited villages.

Kangra district, one of the most picturesque valley of lower Himalayas, lies along the southern escapement of the Shivalik Western Himalayan range and is throughout broken into massive confusion of hills and valleys. The valley, sheltered by the sublime Dhauladhar range, is green and luxuriant. Total geographical area of the district is 578 thousand hectares accounting for 12.72 per cent of the total geographical area of the state. The district lies between 75°35'34" to 71°4'46" North longitudes and 31°45' to 32°28' East latitudes and is bounded on West by Una district, on North-east by Lahul & Spiti and Chamba districts, on East by Kullu and Mandi districts while on South it touches Hamirpur district. The elevation of district ranges between 500 meters to 5500 meters above mean sea level. Beas is the principal river which receives almost the entire drainage of the district. Dharamshala, the headquarter of the district is the second rainiest place of the country after Cheerapunji (Mijoram) and is full of Buddhist air as well as ancient Hindu Temples like Brajeshwari, Baijnath, Jawalamukhi and Chamunda Devi.

4.1.2 Climate and soil

The climate of the district has wide diversity due to topographical variation according to the elevation of the different areas. The district lies in three agro climatic zones *viz.*, low hills (< 650 meters msl), mid hills sub-humid (650-1500 meters msl) and high hills temperate wet (> 1500 meters msl). Generally, the climate exhibits four broad seasons, *viz.*, summer, rainy, autumn and winter. The period from March to June is hot summer, rainy season generally extends from July to September while autumn season extends from October to November

and the winter is spread over December to February. The temperature during winter months in the lower valley area drastically falls to freezing range while the places lying at higher altitudes receive snow. The district harbours the picturesque snow clad Dhauladhar range running across almost entire North-Eastern boundary of the district.

4.1.3 Demographic features

Population

The total population of the district as per 2001 census is 13,39,030 which is spread in tiny hamlets/villages numbering 3,868. The district has a healthy sex ratio 1,025 females per 1000 males which is much higher than the state (970). The district is densely populated with a density of population 233 per sq. km as compared to 109 at the state level. Out of the total population, 94.6 per cent lives in the rural areas. Scheduled caste population constitutes 20.9 per cent of total population and the scheduled tribe population is 1597 only.

The demographic features and changes thereof over last three consecutive decades in Kangra district vis-à-vis Himachal Pradesh have been depicted in Table 4.1. The table shows that Kangra remains at top ranking in terms of population accounting for 22.03 per cent of the total population of the state. The decadal growth rate observed a decrease as the growth rate of population was 20.56 per cent in 1971-1981 which came down to 14.01 per cent in 1991-2001.

Table 4.1: Demographic features of Kangra District vis-à-vis Himachal Pradesh

Districts/ State	Year	Population (No)					Literacy %		
		Persons	% to State	Dec. Growth	Density / Sq Km	Sex Ratio	Male	Female	Total
Kangra	1981	965848	22.78	20.56	168	1058	56.70	39.79	48.01
	1991	1174072	22 71	18 50	205	959	80 12	61 39	70.57
	2001	1338536	22.03	14.01	233	1027	88.19	73.57	80.68
H. P.	1981	4237569	100 00	22 46	76	988	52 36	31.39	41.94
	1991	5170877	100 00	20.79	93	984	75.36	52.13	63 86
	2001	6077248	100.00	17 39	109	970	86 02	68.08	77.13

Source: Census of HP, 1981, 1991 & 2001

On literacy front, Himachal Pradesh as well as Kangra district achieved remarkable progress which is clear from the overall literacy rare. The overall literacy rate was 80.68 per cent that increased by 10 percentage points over 1991 in Kangra district. According to 2001 census, Kangra is ranked second in terms of literacy after Hamirpur. The literacy was found to be higher for males (88.19 per cent) than the females (73.57 per cent) for Kangra. This clearly shows that female education needs more attention.

Distribution of workers

The distribution of workers and non-workers is presented in Table 4.2. The occupational pattern reveals the predominance of agricultural sector. It can be seen from the table that around 64 per cent of the working population was dependent upon agriculture in this district. The cultivators accounted for 57 per cent, while agricultural labourers accounted for around 7 per cent of the work force. There has been marginal decrease in the proportion of workers dependent upon agriculture since 1981 which clearly shows inability of other secondary and tertiary sectors to absorb work force from agricultural sector.

Table 4.2: Dependence on agriculture

(Per cent)

DISTRICTS	Year	Cultivators	Agricultural labourer	Workers dependent upon agriculture	Other workers	Total workers
Kangra	1981	60.04	5.87	65.91	34.09	248393
	1991	56.27	6.58	62.85	37.15	300274
	2001	56.98	6.66	63.64	36.36	589442
H P	1981	69.44	2.93	72.36	27.64	1436284
	1991	65.19	3.52	68.71	31.29	1729089
	2001	65.55	3.10	68.65	31.35	2991448

Source: Statistical Outline of Himachal Pradesh (various issues)

Kangra district also has the largest number of cultivators (3.4 lakh) accounting for 17 per cent of the total cultivators (19.6 lakh) in the state. This clearly shows that agricultural development needs to be accorded top priority in this district as the livelihoods of more than 70 per cent of the work force depended on this sector. The total numbers of workers dependent on agriculture is continuously increasing putting more pressure on agriculture.

4.1.4 Agriculture scenario

Land holdings

Being a land based avocation, size of holding plays a major role in agriculture development and well being of cultivators. The changes in land holdings in Kangra district vis-à-vis state as a whole as depicted through Table 4.3 shows the predominance of marginal and small farmers. In this district around 74 per cent of the holdings were marginal (< 1 ha) and 14 per cent small

collectively accounting for 88 per cent of the total holdings in comparison to 83 per cent at state level. This clearly shows that pressure on land is much higher in Kangra. The number of holdings in Kangra increased from 1,05,721 in 1980-81 to 2,24,759 in 1995-96 showing 36 per cent increase in number of holdings as against only 4 per cent increase in area during this period. Consequently, the average size of holding in the district was only 0.93 hectare as against 1.13 hectare for the state as a whole (Table 4.4). This clearly shows that in terms of average size, all the holdings have virtually become marginal and small.

Table 4.3: Changes in land holdings, 1980-81 to 1995-96

(Per Cent)

Census Year	Marginal (<1 Ha)		Small (1-2 Ha)		Medium (2-4 Ha)		Large (>4 Ha)		Total	
	No.	area	No.	area	No.	area	No.	area	No.	Area
Kangra										
1980-81	66.68	18.52	17.40	18.65	9.99	21.11	5.93	41.71	165721	219226
1985-86	71.07	25.69	15.82	20.16	8.56	21.66	4.55	32.50	190196	210081
1990-91	73.90	26.06	14.55	21.13	7.75	22.51	3.80	30.30	216006	207975
1995-96	73.63	28.06	14.85	21.89	7.86	22.07	3.66	27.98	224759	209505
H.P.										
1980-81	55.30	14.92	22.03	20.43	15.16	27.08	7.51	37 57	637081	980425
1985-86	61.55	20.46	20.63	22.71	12 24	25.97	5.58	30.86	752882	980240
1990-91	63.82	21.26	19.96	23.29	11.26	25.51	4.96	29.94	833793	1009766
1995-96	62.85	23.05	19.61	24.07	10.74	25.54	6.80	27.34	884492	999099

Last columns show total number and area in hectares.
Source: Statistical Outline of Himachal Pradesh (various issues)

Table 4.4: Changes in average size of holdings, 1980-81 to 1995-96

(Hectares)

District	Year	Marginal (<1 Ha)	Small (1-2 Ha)	Medium (2-4 Ha)	Large (>4 Ha)	Overall
Kangra	1980-81	0.37	1.42	2.80	9.32	1.32
	1985-86	0.40	1.41	2.79	7.89	1.10
	1990-91	0.34	1.40	2.80	7.69	0.96
	1995-96	0.36	1.37	2.62	7.13	0.93
H. P.	1980-81	0.42	1.43	2.75	7.70	1.54
	1985-86	0.43	1.43	2.76	7.20	1.30
	1990-91	0.40	1.41	2.74	7.31	1.21
	1995-96	0.41	1.39	2.69	4.54	1.13

Note: Medium includes semi-medium holdings also.
Source: Statistical Outline of Himachal Pradesh (various issues)

Land utilization pattern

Land utilization pattern in Kangra district has remained almost same with minor changes over the years (Table 4.5). During 2004-05, maximum geographical area (56 per cent) reported was under forest and pastures followed by the land for non-agricultural uses (13 per cent). Around 20 per cent of the geographical area in the district was cultivated. It is also observed that there was increase in the fallow land and area put to non-agricultural uses. The diversion of agricultural land to non-agricultural uses is on the rise posing a major challenge to agriculture. The construction of roads in hinterlands, new buildings, creation of other infrastructural facilities and expansion of urban fringes is taking a heavy debit charge on prime agricultural lands that need proper and prudent planning to

spare prime lands to agriculture for our future generations. Ironically, the prices of land (for real estate investment) are rising alarmingly luring the farmers either to sell their cultivable land or to convert it for non-agricultural uses to earn through rentals or business avocations.

Table 4.5: Changing in the land utilization pattern in Kangra district and Himachal Pradesh

(Per cent)

Year	Forest land	Barren land	Non-agri. uses	Cultur able waste	Pasture	Misc Trees/ groves	Current fallow	Other fallow	Net Sown area
Kangra									
1990-91	40 08	6.37	13.59	8.80	8.13	0.80	1.38	0.07	20.78
1995-96	39.43	0.00	14.33	7.02	17.06	0.37	1.62	0.75	19.41
2000-01	40 28	2.52	13.36	4.72	15.76	1.26	1.63	0.05	20.42
2004-05	40.09	2.63	13.48	4.90	15.42	1.35	1.73	0.12	20.28
H P									
1990-91	30.85	5.46	5.74	3.72	33.72	1.43	1.32	0.46	17.30
1995-96	31.10	4.07	5.66	3.64	35.44	1.35	1.55	0.76	16.43
2000-01	24.05	17.75	6.90	2.74	33.63	1.25	1.18	0.30	12.20
2004-05	24.23	14.78	10.08	2.80	33.03	1.52	1.30	0.32	11.94

Source: Statistical Outline of Himachal Pradesh (various issues)

Irrigation

Soil type and climate are the main factors responsible for faster development of agriculture of any area, but the pace of development can be accelerated through better irrigation facilities because the pattern of precipitation is not uniform. Source-wise net irrigated area of the district and state as a whole has been presented in Table 4.6.

Table 4.6: Source of Irrigation and area under different sources of irrigation in Kangra district and Himachal Pradesh

(Hectares)

Districts /state	Year	Canal	Wells & Tube wells	Kuhls	Others	Total irrigated area	Percentage of net irrigated area
Kangra	1997-98	-	2056 (6.39)	30138 (93.61)	-	32194 (100.00)	28.6
	2002-03	-	2756 (8.22)	29767 (88.78)	1005.00 (3.00)	(100.00)	28.7
H.P.	1997-98	3398 (3.30)	8548 (8.33)	83968 (81.83)	3431 (3.34)	102617 (100.00)	13.9
	2002-03	3510 (3.43)	13814 (13.51)	81735 (79.93)	3204 (3.13)	102263 (100.00)	18.8

Source: Statistical Outline of Himachal Pradesh (various issues)

The Kuhls are the main source of irrigation in district and state. The other sources of irrigation are wells and tube wells and canals (only for state). The table reveals that 88.78 per cent of the total irrigated area in the district is under Kuhls irrigation as against 79.93 per cent in the state. The proportion of net irrigated area to net sown area is higher in Kangra (28.70 per cent) as compared to the state as whole (18.80 per cent). Thus, this district holds the key for increasing agricultural production in the state as higher proportion of area is under irrigation in the district.

Cropping pattern

The spatial distribution of different crops in Kangra district (Table 4.7) revealed that farming in this district is cereal dominated. The cereal crops accounted for about 88 per cent of total cropped area in Kangra as against 80

per cent at the state level. Among cereal crops, wheat accounted for 42.5 per cent of the total cropped area while maize commands about 27 per cent of the cropped area. The area under paddy is about 17 per cent. The area under pulses has decreased from 2.03 per cent in 1994-95 to less than 2 per cent in 2002-03. However, the area under foodgrains has slightly increased (90 per cent) while at the state level there is slight decrease from 87.57 per cent in 1994-95 to 85.67 per cent in 2002-03. Similarly, the area under vegetables has slightly increased from 1.02 per cent in 1994-95 to 1.11 per cent in 2002-2003 in the district and there is more proportionate increase in area under vegetables in the state from 2.87 per cent in 1994-95 to 3.63 per cent in 2002-03. This clearly shows slow progress of diversification in this district in comparison to the state as a whole. Agriculture in larger parts of this district has remained subsistence in spite of better irrigation resources, plain topography, higher literacy, better infrastructure and market avenues.

Table 4.7: Changes in Cropping Pattern in Kangra district and Himachal Pradesh

(Per cent)

Year	Maize	Rice	Wheat	Barley	Pulses	Food-grains	Vege-tables	Cropped area ('000' ha)
Kangra								
1994-95	26.33	16.79	42.38	1.39	2.03	89.07	1.02	214.48
2000-01	26.61	17.64	41.94	1.24	1.96	89.70	1.25	217.25
2002-03	27.17	17.20	42.50	1.19	1.90	90.17	1.11	215.96
H.P.								
1994-95	31.87	8.55	38.73	2.72	3.77	87.57	2.87	967.99
2000-01	31.46	8.65	38.27	2.71	3.28	85.98	3.38	947.54
2002-03	30 80	8.80	38.03	2.50	3.19	85.67	3.63	945.21

Source: Statistical Outline of Himachal Pradesh (various issues)

Average yield of different vegetable commodities

The average yields of major vegetables in Kangra district and Himachal Pradesh have been presented in the Table 4.8. It is evident from the table that tomato has a higher yield (286q/ha) followed by cabbage (277q/ha), radish, turnip and carrot (245q/ha) in the district whereas at the state level the yield of tomato was quite high (326.58 q/ha) followed by cabbage (315.26 q/ha) and cauliflower (207.99 q/ha). In most of the vegetables, the average yield in the district was relatively lower as compared to the state (except beans, radish, turnip and carrot and brinjal). The yield of pea, cauliflower and cucurbits has decreased from 97.60 q/ha to 93.43 q/ha, 178.57 to 152.50 q/ha and 335.68 q/ha to 204.25 q/ha from 1997-98 to 2005-06, respectively in the district. At state level, there is increase in yield of pea from 97.78 q/ha to 108.29q/ha while there was decrease in the yield of cauliflower and cucurbits from 297.03 q/ha to 234.66 q/ha and 319.45 q/ha to 210.59 q/ha during the period 1997-98 to 2005-06, respectively. The average yield of beans (166.67 q/ha), radish, turnip and carrot (245.24 q/ha) and brinjal (203.85 q/ha) was fairly higher in the district as compared to state.

Table 4.8: Changes in yields of major vegetable crops in Kangra district and Himachal Pradesh, 1975-78 to 2005-06 (q/ha)

Year	Pea	Tomato	Beans	Cabbage	Cauli Flower	Radish Turnip & Carrot	Lady Finger	Cucurbits	Brinjal
Kangra									
1997-98	97.60	255.45	97.78	261.82	178.57	172.00	86.47	335.68	186.67
2000-01	92.42	310.00	96.67	252.94	176.36	174.44	86.94	255.00	177.14
2005-06	93.43	286.17	166.67	277.30	152.50	245.24	110.13	204.25	203.85
H.P.									
1997-98	97.78	308.60	100.00	277.03	179.23	174.78	83.33	319.45	180.00
2000-01	95.74	346.45	98.20	287.53	181.64	175.49	81.69	249.92	175.50
2005-06	108.29	326.98	104.61	315.26	234.66	207.99	113.77	210.59	184.81

Source: Statistical Outline of Himachal Pradesh (various issues)

4.1.5 Agricultural marketing scenario in Kangra district

An effective agricultural marketing system guarantees the farmers better prices for their farm products. There are 1037 agricultural cooperatives societies working in the district. But all the cooperative societies are not involved in marketing. There are 5 Agricultural Regulated Markets and 5 tehsil level marketing societies in the district. Beside this, one milk- chilling center has been set up. The road network is well spread in the district connecting various markets of district as well as adjoining markets with in and outside the state. The salient features of these markets are shown in Table 4.9.

Table 4.9: Salient features of selected vegetable markets

Particulars	Kangra	Nagrota Bagwan	Jassur	Palampur	Baijnath
Year of establishment	30-7-1980	25-9-1982	15-7-1984	21-7-1983	21-8-1989
Total market area (sq. M)	7200	1720	6650	-	3940
Trading area open for future expansion (sq. M)	840	250	2000	-	1260
Market service area (sq. Km)	16	12	20	-	10
No. of panchayats	68	49	47	43	49
No. of inhabited villages	112	65	135	125	60
Traders	65	20	40	50	-
Commission agents	33	9	29	15	6
No. of cold storage	-	-	-	-	-

males which is same as in Kangra block. The density of population was much higher i. e. 309 persons per sq kilometer showing that the block is densely populated. The literacy rate was 68.59 per cent. The literacy rate was found higher in males (79.74 per cent) as compared to females (57.25 per cent).

The soils of Kangra and Nagrota Bagwan blocks are fertile and cultivable. The climate is humid due to heavy rains during summer and winter months. There is a network of six perennial streams across the area. These streams have been exploited to feed 80 irrigation channels. Major crops of the blocks are wheat, paddy, maize, potato and oilseed. In recent years, vegetable cultivation has become popular in the irrigated areas of these blocks.

Land utilization pattern in study block

Table 4.11 shows the detailed land utilization pattern of study block along with Kangra district. This table reveals that the total irrigated area is more in Kangra (11.47 per cent) and Nagrota block (17.33 per cent) as compared to district (6.16 per cent). However, the area not available for the cultivation is about 14 per cent in Kangra and 12 per cent in Nagrota Bagwan as against about 23 per cent at district level. The area under the culturable waste is somewhat similar in Kangra (13.18 per cent), Nagrota (15.88 per cent) and in Kangra district (14.30 per cent) as well. The proportion of cultivated area is more in Kangra (24.27 per cent) and Nagrota block (27.29 per cent) in comparison to the district (21.59 per cent). Moreover, the net irrigated area is fairly high in Kangra block (47.28 per cent) and Nagrota Bagwan (63.48 per cent) as against 28.53 per cent at district level. Thus, there is great potential for vegetable cultivation in these two selected blocks.

Table 4.11: Land utilization pattern in study blocks, 2007

(Ha)

Block	Total geo. area	Forests	Total irrigated area	Area not available for cultivation	Culturable waste	Total cultivated area	Net irrigated area to net sown area (%)
Kangra	33918 (100.00)	16310 (48.09)	3892 (11.47)	4907 (14.47)	4470 (13 18)	8231 (24.27)	47.28
Nagrota Bagwan	25997 (100.00)	11636 (45.76)	4504 (17.33)	3138 (12.07)	4128 (15.88)	7095 (27.29)	63.48
Kangra district	574630 (100.00)	233470 (41.63)	35390 (6.16)	134957 (23.41)	82167 (14.30)	124036 (21.59)	28.53

Figures in parentheses are percentage of respective total geographical area.
Source: District Statistical Office, District Kangra at Dharamshala (H.P.)

Infrastructural facilities

There is general consensus among the planners and the policy makers that development of agriculture is not possible without creating supporting infrastructure like transportation and communication and developing institutions like banks, co operative societies, etc. Keeping this in view, the comparative scenario of infrastructural facilities and institutions across study block along with the district has been presented in Table 4.12.

Table 4.12: Proportion of village with infrastructure facilities available in Kangra and Nagrota Bagwan blocks vis-à-vis Kangra district, 2007

Block	Road density (Km/ 000 Sq Km)	Villages electrified (per cent)	Fair price shop (No./1000 of population)	Per cent villages within 5 Km radius			
				Transportation facilities	Commercial bank	Cooperative society	Postal facilities
Kangra	104.95	95.39	5.12	54.93	50.98	75.32	61.51
Nagrota Bagwan	143.48	90.67	6.94	57.87	39.87	63.02	64.63
Kangra district	110.61	93.12	7.27	55.29	47.44	44.50	67.86

Source: District Statistical Office, District Kangra at Dharamshala (H.P.)

The road density per thousand square kilometers of geographical area is about 105 kilometers in Kangra block and 143 kilometers in Nagrota Bagwan whereas it is about 111 kilometers at district level. Transportation facilities are available for 54.93 per cent of villages in Kangra block, 57.87 per cent in Nagrota Bagwan and 55.29 per cent in Kangra district. About 95 and 91 per cent village are electrified in Kangra and Nagrota blocks, respectively as against 93 per cent at district level. About 51 and 40 per cent villages of Kangra and Nagrota have commercial bank facilities at less than 5 kilometers range as against about 48 per cent at district level. However, more proportion of village has cooperative society located within a radius of 5 kilometer in Kangra block (75.32 per cent) and Nagrota Bagwan (63.02 per cent) as compared to the district (44.5 per cent).

There are about 62 and 65 per cent villages having postal facilities within a distance of 5 kilometer in Kangra and Nagrota Bagwan block respectively as against 67.86 per cent villages in Kangra district. The number of fair price shops per thousand of population is 5.12 in Kangra block, 6.94 in Nagrota Bagwan and 7.24 in Kangra district. This clearly shows that Kangra and Nagrota blocks are equally equipped with respect to infrastructure. Thus, there is a scope of commercialization of vegetable commodities in the study area.

4.2 Socio-Economic Profile of Sample Growers

The socio-economic features of farmers affect the organization and management of farms as well as the production and marketing supply to a large extent. Thus, it is imperative to study the existing socio-economic status of the sample households. An attempt has been made to throw light on the socio-economic features of the sample households in the study area.

4.2.1 Family structure and size

The family structure and size are important indicators determining the social and economic well being of the families living in the area under consideration. Thus, a detailed study on family size and structure on sample households on different categories of farms has been carried out and results are displayed in Table 4.13. The average family size in the study area was found to be 6.43 persons comprising of 54.12 per cent males and 45.88 per cent females. Further, family comprised of about 72 per cent adults (above 15 years) and 28 per cent children (below 15 years). The average size of family was relatively more on large farms (7.94 persons/farm) as compared to small farms (6.02 persons/farm). This table also reveals that most of the families had nuclear family structure (68.75 per cent) where parents were living with their unmarried children. This was fairly high in case of small farms (76.19 per cent) as compared to large farms (41.18 per cent).

4.2.2 Age wise distribution

Since farming is a labour intensive avocation, therefore, age composition of family members available for farming determines the well being of farm households. The family members in the age group of 15-60 years are assumed to be workers in agriculture, while the rest are considered as dependents.

The age-wise distribution of family members on different categories of farms has been presented in Table 4.14. It reveals that about 28 per cent of the total population was below 15 years. The proportion of female children was found more on both the small as well as large farms. The average working population in

Table 4.13: Average family size and structure of sample households on different categories of farms

(Persons/farm)

Particulars	Small	Large	Overall
Family size (no.)			
Males			
a) Adults	2.44	3.12	2.59
b)Children	0.78	1.29	0.89
Sub total	3.22	4.41	3.48
Females			
a) Adults	1.94	2.35	2.03
b)Children	0.86	1.18	0.93
Sub total	2.79	3.53	2.95
Overall			
a) Adults	4.38	5.47	4.61
b)Children	1.63	2.47	1.81
Total	6.02	7.94	6.43
Family structure			
Nuclear	48 (76.19)	7 (41.18)	55 (68.75)
Joint	15 (23.81)	10 (58.82)	25 (31.25)
Total	63 (100.00)	17 (100.00)	80 (100.00)

Note: Children below 15 years of age
Figures in parentheses show percentage of total households.

Table 4.14: Age-wise distribution of family members on different categories of farms

(Per cent)

Age group	Small			Large			Overall		
(years)	Male	Female	Total	Male	Female	Total	Male	Female	Total
0-5	1.53	3.82	2.65	5.64	1.55	3.69	2.63	3.24	2.92
5 - 10	8.67	9.84	9.23	8.45	10.94	9.63	8.61	10.12	9.34
10 - 15	14.80	15.85	15.30	16.90	18.75	17.78	15.36	16.60	15.95
15 - 25	18.37	16.39	17.41	9.86	9.38	9.63	16.10	14.57	15.37
25 - 40	23.47	22.95	23.22	25.35	25.00	25.19	23.97	23.48	23.74
40 - 60	20.92	21.86	21.37	19.72	17.19	18.52	20.60	20.65	20.62
Above 60	12.24	9.29	10.82	14.08	17.19	15.56	12.73	11.34	12.06
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	(196.00)	(183.00)	(379.00)	(71.00)	(64.00)	(135.00)	(267.00)	(247.00)	(514.00)
Sex-ratio		**933.67**		**901.41**			**925.09**		

Figures in parentheses show total population.

the age group of 15-60 years constituted about 60 per cent whereas, it was slightly lower on large farms (53 per cent) as compared to small farms (62 per cent). The overall sex ratio was 925 per thousand male population where it was slightly higher on small farms (934) as compared to large ones (901).

4.2.3 Educational status of family

Educational status of family members plays a catalytic role in the scientific management of farms, adoption of recommended technologies and efficient marketing of farm products. It further helps in enhancing skill and general standard of awareness in the family.

Table 4.15: Educational status of family members on different categories of farm

(Per cent)

Educational status	Small			Large			Overall		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Illiterate	2 75	6.63	4.60	5.97	10.53	8.06	3.61	7.62	5.51
Primary	20.33	36.75	28.16	26.87	49.12	37.10	22.09	39.91	30.51
Middle	33.52	34.34	33.91	20.90	29.82	25.00	30.12	33.18	31.57
Metric	18 13	13.25	15.80	25.37	8.77	17.74	20.08	12.11	16 31
Higher secondary	23.08	8.43	16.09	16.42	1.75	9.68	21.29	6 73	14 41
Graduate	1.65	0.60	1.15	4.48	-	2.42	2.41	0.45	1.48
Post graduate	0.55	-	0.29	-	-	-	0.40	-	0 21
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	(181)	(165)	(346)	(64)	(56)	(120)	(245)	(221)	(466)
Literacy rate	97.25	93.37	95.40	94.03	89.47	91.94	96.39	92.38	94.49

Figures in parentheses show the total population.

Table 4.15 reveals that overall literacy rate in the study area was about 94 per cent. The male literacy rate was higher (96.39 per cent) as compared to females (92.38 per cent). The literacy rate was slightly higher on small farms (95 per cent) in comparison to large farms (92 per cent). Maximum number of both male and female family members were educated up to primary and middle standards (about 62 per cent) and a very few were graduates (1.48 per cent) and post graduates (less than 1 per cent).

4.2.4 Land holdings and utilization

Agriculture by and large is a land-based avocation and, as such, land resources are the basic requirement for farming. The size of holding that a farm household owns shows the basic strength of the farming family and its utilization reveals how efficiently this natural source is used by the farmers. The detailed break-up of land into cultivated, uncultivated, irrigated and unirrigated land in the study area is presented in Table 4.16.

Table 4.16: Land inventory and utilization pattern on different categories of farm households

(Ha)

Particulars	Small			Large			Overall		
	IR	UR	Total	IR	UR	Total	IR	UR	Total
Cultivated owned land	0.41	0.01	0.42	1.01	0.11	1.12	0.54	0.03	0.57
Leased in land	0.02	-	0.02	-	-	-	0.02	-	0.02
Leased out land	-	-	-	0.09	-	0.09	0.02	-	0.02
Total holding	0.43	0.01	0.44	0.92	0.11	1.03	0.54	0.03	0.57
Cultivated land	0.43	-	0.43	0.92	-	0.92	0.54	-	0.54
Uncultivated land	-	0.01	0.01		0.11	0.11		0.03	0.03
Average land Holding			**0.44**			**1.03**			**0.57**

A close examination of Table 4.16 reveals that about 94.74 per cent of the total land was cultivated and entire cultivated area was found to be irrigated. Contrary to this, the entire uncultivated area was found to be unirrigated. A negligible proportion of the holding was leased in (3.51 per cent) and leased out

(3.51 per cent). Mostly, small farmers leased in the land for cultivation whereas large farms were found to lease out their lands. The size of holding was 0.57 hectare on an average farm, whereas, average land holding was fairly high in case of large farms (1.03 ha/farm) as compared to small farms (0.44 ha/farm).

4.2.5 Cropping pattern

Cropping pattern of a particular area broadly indicates the proportion of area under different crops at a particular period of time which shows the relative importance of the crops. The area under different vegetable crops in the study area has been displayed in Tables 4.17 and 4.18.

Table 4.17: Area under summer vegetables and distribution of growers

(Per cent)

Vegetables	Small		Large		Overall	
	Area	Growers	Area	Growers	Area	Growers
Tomato	0.41	1.59	1.01	5.88	0.58	2.50
Brinjal	26.80	100.00	36.36	100.00	29.58	100.00
Frenchbean	1.65	14.29	2.02	17.65	1.76	15.00
Lady finger	46.19	100.00	37.88	100.00	43.78	100.00
Bottle gourd	24.95	96.83	22.73	88.24	24.30	95.00
Overall summer vegetables	100.00	100.00	100.00	100.00	100.00	100.00
	(0.15)	(63.00)	(0.23)	(17.00)	(0.17)	(80.00)

Figures in parentheses show total area and vegetable growers in respective categories.

It can be seen from the table that lady finger, brinjal and bottle gourd were the important summer vegetable commodities grown by almost all the farmers and accounted for about 44 per cent, 30 per cent and 24 per cent of the

total area under summer vegetables, respectively. Tomato and frenchbean were given less preference by most of the farmers. Only about 0.58 per cent and 1.76 per cent area were allocated for these two crops, respectively. We can also conclude that area under summer vegetables was higher on large farms (0.23 ha/farm) as compared to small farms (0.15 ha/farm).

Table 4.18: Area under winter vegetables and distribution of growers

(Per cent)

Vegetables	Small		Large		Overall	
	Area	Growers	Area	Growers	Area	Growers
Radish1	8.37	100.00	6.59	100.00	7.72	100.00
Radish2	9.13	100.00	7.25	100.00	8.44	100.00
Radish3	1.25	12.70	2.42	29.41	1.69	16.25
Pea	1.65	6.35	3.30	11.76	2.25	7.50
Cauliflower 1	33.08	100.00	38.02	100.00	34.89	100.00
Cauliflower 2	29.28	93.65	31.65	82.35	30.14	91.25
Cauliflower 3	0.25	1.59	1.32	5.88	0.65	2.50
Cabbage 1	16.86	96.83	7.69	82.35	13.50	93.75
Cabbage 2	0.13	1.59	1.76	5.88	0.72	2.50
Overall winter vegetables	100.00 (0.25)	100.00 (63.00)	100.00 (0.54)	100.00 (17.00)	100.00 (0.31)	100.00 (80.00)

Figures in parentheses show total area (ha per farm) and total vegetable growers (no.) in respective categories.

Table 4.18 shows area under winter vegetable crops. It was found that radish 1 (normal season), radish 2 (mid season), cauliflower 1 (normal season), cauliflower 2 (mid season) and cabbage 1 (normal season) were the important crops grown by the most of the growers in the study area. Most of the farmers

were growing radish 1 and radish 2 under 7.72 per cent and 8.44 per cent of total area under winter vegetables. All vegetable producers were found to grow cauliflower 1 (normal season) and cauliflower 2 (mid season) vegetable that commanded 34.89 per cent and 30.14 per cent of total area under winter vegetable crops. Cabbage 1 (normal season) was grown under 13.50 per cent of the total area. Radish 3 (late season), pea, cauliflower 3 (late season) and cabbage 2 (mid season) were grown by few growers. Potato was grown only for home consumption in the study area. On an average, area under winter vegetables was 0.54 ha on large farms as compared to 0.25 ha on small farms.

4.3 Marketable and Marketed Surplus of Vegetable Commodities

The marketable and marketed surpluses in agriculture are of crucial importance for overall development of farm sector. From the marketing point of view, the marketable surplus is more important as the arrangements for marketing and the expansion of the markets in the notified area have to be matched with surplus quantity available for sale. The study of marketable surplus is of paramount importance for highly perishable vegetable commodities that are grown mainly for sale. Any snag or bottleneck in marketing system would cause substantial harm to the interests of producers. Keeping this in view, the pattern of farm production, marketable and marketed surplus of vegetable commodities produced in the study area were examined and the factors affecting the marketed surplus were also analysed.

4.3.1 Marketable and marketed surplus: summer vegetables

The marketable and marketed surplus of summer vegetable commodities have been analyzed and presented in Table 4.19. Amongst summer vegetables, per farm production was maximum in case of lady finger (15.51q/farm) and lowest in case of tomato (0.14q/farm) on the overall farm situation. The table further reveals that the total production of all the summer vegetables except frenchbean was higher on large as compared to small farms. The total home consumption on overall farms varied from 2 to 6 per cent. The per cent share of consumption level to total production was lowest (2 per cent) in brinjal, lady finger and bottle gourd and highest (about 5 per cent) in case of frenchbean. The table further shows that the proportion of total production kept for home consumption decreased with the increase in the quantum of production thereby indicating that the large farmers disposed off greater proportion of their total production as compared to small farmers. The produce used as gift was found to be almost similar for all the summer vegetable commodities that ranged from 1-2 per cent except in case of tomato (3.64 per cent). Similarly, the share of kind payment to labour was also found in the range of 1-2 per cent for all summer vegetables on overall farm size.

The marketable surplus came out to be more than 90 per cent of total production for all summer vegetable commodities in average farm category. However, it was about 90 per cent for tomato, 95 per cent for brinjal, 93 per cent for frenchbean, 95 per cent for lady finger and 94 per cent for bottle gourd on average farm category. Moreover, the marketed surplus was more than 85 per

Table 4.19: Marketable and marketed surplus of summer vegetables on different categories of farms

(Per cent)

Vegetables		Total production (q/farm)	Utilizations			Marketable surplus	Losses	Marketed surplus
			Home consumption	Gifts	Kind payment			
Tomato	Small	0 10	5 00	3 33	1 67	90 00	5 43	84 57
	Large	0 29	3 84	4 00	2 00	90 16	6 40	83 76
	Total	0 14	4 47	3 64	1 82	90 07	5 87	84 20
Brinjal	Small	11 08	2 35	1 52	1 72	94 41	4 75	89 66
	Large	22 35	1 57	1 23	1 14	96 06	4 92	91 14
	Overall	13 48	2 07	1 42	1 52	94 99	4 81	90 18
French-bean	Small	0 26	4 93	1 22	0 94	92 91	3 64	89 27
	Large	0 26	6 02	1 65	0 80	91 53	4 82	86 71
	Overall	0 26	5 16	1 32	0 91	92 61	3 89	88 72
Lady finger	Small	14 86	2 15	1 33	1 46	95 06	2 16	92 90
	Large	17 94	2 10	1 23	1 42	95 25	2 25	93 00
	Overall	15 51	2 14	1 31	1 45	95 10	2 19	92 91
Bottle gourd	Small	9 98	2 43	1 67	1 76	94 14	2 14	92 00
	Large	13 71	1 90	1 50	1 54	95 06	1 84	93 22
	Overall	10 78	2 28	1 62	1 71	94 39	2 06	92 33
All summer vegetables	Small	36 28	2 32	1 48	1 62	94 58	2 97	91 61
	Large	54 56	1 86	1 32	1 33	95 49	3 28	92 21
	Overall	40 16	2 18	1 44	1 54	94 84	3 06	91 78

cent of total production of all summer vegetables in case of small farm category whereas it was came out to be more than 87 per cent of total production for all summer vegetables except tomato (84.57 per cent) on large farm category. The losses of produce due to different marketing functions were maximum in case of tomato (5.87 per cent) and minimum in case of bottle gourd (2.06) and lady finger (2.19 per cent) on an average farm category. Similar pattern was found in case of small and large farm category as well. Marketed surplus was fairly high in lady finger (92.92 per cent) and low in tomato (84.20 per cent) among different summer vegetables.

4.3.2 Marketable and marketed surplus: winter vegetables

The per farm production and marketed surplus of winter vegetable commodities have been analyzed and presented in Table 4.20. In case of winter vegetables cauliflower 1 (normal season) has highest production of 15.81 quintal followed by 11 quintal per farm in cauliflower 2 (mid season) and 10.39 quintal per farm in cabbage 1 (normal season) on average farm category. Total production of all the winter vegetables was higher on large farms as compared to small farms. The retention for home consumption varied from 1 to 5 per cent. The per cent share of consumption level to total production was lowest (2.12 per cent) in cauliflower 1 (normal season) and highest (about 5 per cent) in case of radish 1 (normal season).

The table further reveals that the proportion of total production kept for home consumption decreased with the increase in the quantum of production. Thus, large farms sold greater proportion of their total production as compared to small farms. The produce used as gift was found to be relatively high in case of

Table 4.20: Marketable and marketed surplus of winter vegetables on different categories of farms

(Per cent)

Vegetables		Total production (q/farm)	Utilizations			Marketable surplus	Losses	Marketed surplus
			Home consumption	Gifts	Kind payment			
Radish1	Small	5 86	4 85	2 69	3 17	89 29	0 71	88 58
	Large	8 35	4 16	2 46	2 79	90 59	0 78	89 81
	Overall	6 39	4 66	2 63	3 06	89 65	0 73	88 92
Radish 2	Small	5 06	4 68	2 30	3 48	89 54	2 03	87 51
	Large	6 88	4 06	2 44	3 18	90 32	2 28	88 04
	Overall	5 45	4 51	2 34	3 40	89 75	2 10	87 65
Radish 3	Small	0 52	4 29	1 75	2 08	91 88	3 67	88 21
	Large	1 35	3 38	1 36	1 82	93 44	4 18	89 26
	Overall	0 70	3 91	1 59	1 98	92 52	3 88	88 64
Pea	Small	0 39	3 27	0 41	0 10	96 22	0 02	96 20
	Large	1 76	2 07	0 18	0 03	97 72	0 17	97 55
	Overall	0 68	2 61	0 28	0 06	97 05	0 11	96 94
Cauliflower 1	Small	12 14	2 49	1 73	1 66	94 12	2 50	91 62
	Large	29 41	1 56	1 09	1 12	96 23	2 70	93 53
	Overall	15 81	2 12	1 48	1 45	94 95	2 58	92 37
Cauliflower 2	Small	8 68	2 59	2 03	1 68	93 70	2 77	90 93
	Large	19 59	1 99	1 49	1 28	95 24	2 87	92 37
	Overall	11 00	2 36	1 83	1 53	94 28	2 80	91 48
Cauliflower 3	Small	0 08	3 69	1 28	1 16	93 87	4 36	89 51
	Large	0 71	2 30	0 83	0 98	95 89	5 18	90 71
	Overall	0 21	2 71	0 96	1 03	95 30	4 94	90 36
Cabbage 1	Small	10 03	2 49	1 79	1 99	93 73	2 48	91 23
	Large	10 12	3 13	1 88	1 68	93 31	2 67	90 64
	Overall	10 05	2 63	1 81	1 93	93 63	2 53	91 10
Cabbage 2	Small	0 06	3 65	1 73	1 98	92 64	3 21	89 43
	Large	1 59	2 85	0 62	1 34	95 20	4 07	91 13
	Overall	0 39	2 95	0 76	1 42	94 87	3 96	90 91
All winter vegetables	Small	42 84	3 12	1 99	2 16	92 73	2 25	90 48
	Large	79 76	2 42	1 52	1 58	94 48	2 52	91 96
	Overall	50 68	2 89	1 83	1 96	93 32	2 34	90 98

radish 1 (2.63 per cent). Similarly, the share of kind payment to labour was found to be high in case of radish 2 (3.40 per cent). Almost similar pattern was found for both small and large farms categories. Marketable surplus was found to be more than 90 per cent of total production for all winter vegetables on average farm size. The marketable surplus came out to be relatively high in case of pea (96.94 per cent) and low in radish 3 (87.65 per cent). The farm level losses were maximum in case of cauliflower 3 (4.94 per cent) and minimum in case of pea (0.11 per cent) and radish 1 (0.73 per cent) on average farm category.

4.3.3 Factors affecting marketed surplus

Increase in the marketed surplus of vegetable commodities bears a great significance to bring increased economic prosperity and enhanced purchasing power to farmers. The importance of marketed surplus becomes even greater in view of the compulsion of small cultivators who resort to distress sale to meet urgent cash requirements. Hence, a study of factors which govern the marketed surplus is important to provide empirical evidence in this regard. In the present analysis, total production, family size, prevailing price, and losses were considered to be important factors influencing the marketed surplus of vegetable crops. The result of multiple regression analysis, displayed in Table 4.21, reveals that total production turned out to be the most significant factor. The marketed surplus was found to be positively related to the quantity of production, prices and education of the head of the family. Whereas, size of family, losses and distance of market from farm showed inverse relationship with marketed surplus.

Table 4.21: Estimated regression equations of marketed surplus of summer and winter vegetable commodities

S No	Vegetables	Intercept	Total production	Size of family	losses	Distance of market	Prices	Education	R^2
Summer vegetables									
1	Brinjal	-0 06*	0 96*	-0 08*	-0 42*	-0 01	0 0003	0 06	0 998
		(0 30)	(0 01)	(0 02)	(0 09)	(0 02)	(0 0004)	(0 11)	
2	French-bean	-1 61	0 89*	-0 03	-0 09	-0 004	0 002	0 16	0 988
		(1 14)	(0 11)	(0 02)	(0 41)	(0 011)	(0 001)	(0 14)	
3	Lady finger	-0 17	0 97*	-0 03	-0 66	-0 03	0 12	0 0004	0 996
		(0 41)	(0 01)	(0 02)	(0 34)	(0.02)	(0 09)	(0 0006)	
4	Bottle gourd	-1 48*	0 96*	-0 05*	-0 13	-0 01	0 002	0 05	0 998
		(0 43)	(0 01)	(0 012)	(0 18)	(0 01)	(0 001)	(0 06)	
	Winter vegetables								
5	Radish 1	-1 30	0 93*	-0 06*	-0 15	-0 001	0 004	0 003	0 988
		(0 35)	(0 02)	(0 01)	(0 24)	(0 01)	(0 001)	(0 07)	
7	Pea	-1 84*	0 96*	-0 03	-2 29	-0 02	0 002	0 07	0 999
		(0 06)	(0 05)	(0 06)	(1 33)	(0 063)	(0 001)	(0 174)	
8	Cauliflower1	-3 34	0 94*	-0 09**	-0 003	-0 02	0 005	0 351	0 993
		(3 78)	(0 01)	(0 05)	(0 103)	(0 04)	(0 01)	(0 27)	
9	Cabbage 1	-0 64*	0 95*	-0 001	-0 011	-0 001	0 0003	0 006	0 999
		(0 15)	(0 01)	(0 01)	(0 15)	(0 003)	(0 0003)	(0 03)	

** Significant at 1 per cent level*
*** Significant at 5 per cent level*
Figures in parentheses show standard errors

The close examination of results indicated that in case of brinjal, the regression coefficients associated with production, size of family and farm losses were statistically significant that these variables had a significant impact on the marketed surplus Total production was positively correlated with marketed surplus and thereby every quintal increase in total production would increase marketed surplus by 0.96 quintals However, size of family and losses showed

negative relationship to marketed surplus of brinjal as the regression coefficient of size of family indicated that one member increase in family would reduce the marketed surplus by 0.08 quintals keeping all other factors constant at their arithmetic mean levels. Similarly, regression coefficient of losses indicated that 1 per cent losses would reduce the marketed surplus by 0.462 quintal keeping all other factors constant at their arithmetic mean level. Other explanatory variables like distance of regulated market, price and education were found statistically non significant suggesting that there was no effect of these variables on marketed surplus of brinjal.

In case of frenchbean, regression coefficient of total production was found to be significant and positively related to marketed surplus and suggest that every quintal increase in total production would increase marketed surplus by 0.89 quintal. However, size of family, farm losses, distance of market price and education were found to be statistically non significant showing less impact on marketed surplus of frenchbean. In case of lady finger, among different explanatory variables, only total production was found to be statistically significant and indicates that with one quintal increase in total production, there would be increase of 0.97 quintals in marketed surplus of lady finger. Other explanatory variables included in the equation were non-significant. In case of bottle gourd, the regression coefficient of total production was found to be positive and statistically significant. The marketed surplus would increase by 0.96 quintals with every quintal increase in production.

In case of radish 1(normal season), total production and size of family showed significant relation with marketed surplus. With every quintal increase in total production, marketed surplus would increase by 0.93 quintals. However, size of family showed negative relation with marketed surplus that would reduce the marketed surplus by 0.06 quintals with one unit increase in family size. In

pea, the regression coefficient of total production was found to be positive and statistically significant and suggested that every quintal increase in total production would increase the marketed surplus of pea by 0.96 quintals. However, other factors included in the study were found to be non-significant showing less influence of these variables in the marketed surplus of pea.

In case of cauliflower 1(normal season), regression coefficient of total production and size of family have significant values while other factors included in study were found non-significant. Total production was positively correlated with marketed surplus and with every quintal increase in production, there would be increase in marketed surplus of cauliflower 1(normal season) by 0.94 quintals. However, size of family was negatively related with the marketed surplus and with every person increase in family size would reduce marketed surplus by 0.09 quintal. In case of cabbage 1(normal season), total production was found to be significant and positively related to marketed surplus and suggest that one quintal increase in total production would increase the marketed surplus of cabbage 1 by 0.95 quintals.

The regression equation fitted for different vegetable commodities revealed high values of $R^{2,}$ this implies that the variables included in the model explained high variation in the marketed surplus (dependent variable). The values of R^2 in different equation were, by and large above 90 per cents, showing high explanatory power of the linear regression model applied.

4.4 Marketing Practices

The marketing of vegetable commodities is a complex process and is comprised of various practices carried out by different functionaries involved in marketing process. It includes all the functions and processes involved in the

movement of vegetable commodities from the producers to the ultimate consumers. Any single activity performed in carrying a product from the point of its production to the consumer is known as marketing function/practice. These marketing practices are indispensable, helping in creation of one or combination of time, place, form and possession utilities. In fact, the nature and type of functions performed also reveal the advancement achieved in marketing of agricultural commodities. It is also true that these functions add to the cost but at the same time also enhance the value of the produce in the value chain benefiting both the producers and consumers. Keeping this in view, the marketing functions performed in the disposal of vegetable commodities in the study area have been elaborated in this section.

Assembling

Assembling of the produce at one place was the foremost marketing practice performed by the vegetable growers in the study area. The mode and place of assembling patronised in the study area has been displayed in Table 4.22. Generally, the harvested produce was assembled in field by 38.75 per cent producers and at farm place by 61.25 per cent producers in overall situation. However, mostly small farmers (65.08 per cent) assembled their produce at residential place while majority of large farmers (52.94 per cent) preferred to assemble their harvested produce in the fields due to bulk output that might take more time to carry the produce to home place. Majority of the producers assembled their produce manually with the help of their family members.

Table 4.22: Place of assembling

Place	Farmers (per cent)		
	Small	Large	Overall
At field	34.92	52.94	38.75
At farms home	-	-	-
In home place	65.08	47.06	61.25

Cleaning

Assembling was followed by the cleaning operation. Generally, producers performed cleaning operation to make these attractive and give fresh look. In case of tomato, about 74 per cent producers performed cleaning operation by dipping into water (Table 4.23). For brinjal, about 64 per cent producers performed cleaning operation whereas in case of frenchbean and bottle gourd about 20 and 43 per cent producers washed their produce with water. However, cleaning operation was not performed in case of lady finger. It was also noticed that small farmers gave more emphasis for cleaning operations as compared to large farmers.

Among different winter vegetables, cleaning operation was performed in case of radish, cauliflower and cabbage. In case of radish, farmers did not remove the foliage and only washing was done to remove soil from roots. However, in case of pea, nobody performed washing operation. In case of cauliflower and cabbage, about 75 and 68 per cent producers followed cleaning operation, respectively. In case of cauliflower, producers kept inner green leaves in order to protect the curd of cauliflower from damages and to give it fresh look.

Table 4.23: Proportion of farmers following washing and cleaning of vegetable commodities

(Per cent)

Vegetables	Small	Large	Overall
Summer vegetables			
Tomato	74.60	70.58	73.75
Brinjal	68.25	47.06	63.75
Frenchbean	19.05	23.53	20.00
Lady finger	-	-	-
Bottle gourd	44.44	35.29	42.50
Winter vegetables			
Radish	100.00	100.00	100.00
Pea	-	-	
Potato	100.00	100.00	100.00
Cauliflower	76.19	70.38	75.00
Cabbage	68.25	58.82	67.50

They also kept some portion of stalk in case of cauliflower and cabbage to handle them easily. Washing with water, in a way, also promoted pre-cooling operation indirectly. There were no special pre-cooling efforts and producers were not aware of this operation to maintain freshness of vegetable commodities

Grading and sorting

Grading is one of the most important market functions from the market point of view as it helps to fetch higher prices of produce. However, grading operation, as such, was not common in almost all vegetable commodities in the study area. Instead of grading, sorting of different vegetables was carried out by

the producer. A detailed study on mode and characteristics considered during sorting operation for different vegetable commodities have been displayed in Table 4.24.

Table 4.24: Major characters for grading/sorting of different vegetables

Vegetables	Characters considered
Summer vegetables	
Tomato	Size, colour, ripeness
Brinjal	Size, shape, insect/disease infection
Frenchbean	Length, maturity
Lady finger	Size, maturity
Bottle gourd	Maturity, smoothness
Winter vegetables	
Radish	Length, shape, maturity
Pea	Maturity, disease/insect infections, pod size
Cauliflower	Curd colour, compactness, mould growth
Cabbage	Compactness of head

Generally, sorting was done manually in almost all vegetable commodities. In case of tomato, size, colour and ripeness was considered while sorting the produce. Size, shape and insect/disease infections were the major characters considered for sorting of brinjal. In case of frenchbean, length and maturity of the produce were considered while size and maturity were considered for sorting lady finger. Maturity and smoothness of the produce were considered to be the major characters for sorting in case of bottle gourd.

Among different winter vegetables, length, shape and maturity were the major traits for sorting of radish whereas maturity, disease/insect infections and pod size were the major characters considered for sorting pea. Similarly, curd colour, compactness and mould growth in curd were considered for cauliflower. Moreover, compactness of head was the main character for sorting of cabbage. During sorting operation, diseased and damaged produce were seperated and used for home consumption, gift to relatives and neighbours and sometimes used as kind payment to labours.

Storage

Scientific storage facilities in the study area were not available. All farmers sold their produce after harvesting. In case of sale to commission agents or direct to consumers, they harvested their produce on previous day and stored in farm house. In the sale to retailer's shop or to local trader, they harvested their produce on the same day and there was no need of storage.

Packaging

Packaging is one of the important and necessary functions performed in the marketing process of vegetable commodities. This is done just after sorting. The mode and type of material used for packaging of produce play an important role in determining the marketing cost (Table 4.25). Packaging was done manually for all summer and winter vegetable commodities. Generally, bamboo baskets, plastic crates and gunny bags were used as packaging material for most of the commodities. Bamboo baskets and plastic crates were reused and durability of these were of 6 months and 2 to 3 years, respectively. In

Table 4.25: Packaging of different vegetable commodities

Vegetables	Material used	Capacity(kg)	Cost of packaging material (Rs/unit)	Extent of recycling (years)
Summer vegetables				
Tomato	Bamboo basket	40	40-50	½
	Plastic crate	40	200	2-3
Brinjal	Bamboo basket	30	40-50	½
	Plastic crate	30	200	2-3
	Gunny bag	30 -100	3	-
Frenchbean	Bamboo basket	25	40-50	½
	Plastic crate	25	200	2-3
	Gunny bag	30 -100	3	-
Lady finger	Bamboo basket	25	40-50	½
	Plastic crate	25	200	2-3
	Gunny bag	30 -100	3	-
Bottle gourd	Bamboo basket	40	40-50	½
	Plastic crate	40	200	2-3
	Gunny bag	30 -100	3	-
Winter vegetables				
Radish	Make a bundle and tie with jute rope	40	-	-
Pea	Bamboo basket	25	40-50	½
	Plastic crate	25	200	2-3
	Gunny bag	30-100	3	-
Cauliflower	Bamboo basket	40	40-50	½
	Plastic crate	40	200	2-3
	Gunny bag	30 -100	3	-
Cabbage	Bamboo basket	40	40-50	½
	Plastic crate	40	200	2-3
	Gunny bag	30 -100	3	-

case of tomato, wooden baskets and plastic crates of 40 kg capacity were used as packaging materials. Bamboo baskets, plastic crates and gunny bags were used by most of producers for the packaging of brinjal, frenchbean, lady finger and bottle gourd. The capacity was 40 kg in case of bottle gourd, 30 kg for brinjal and 25 kg for both frenchbean and lady finger. The size of gunny bag varied from 30 kg to 100 kg.

In case of radish, producers made a bundle of about 40 kg with the help of jute rope to facilitate transportation. Bamboo baskets, plastic crates and gunny bags were used for packing of pea, cauliflower and cabbage and the capacity was of 25 kg for pea and 40 kg for both cauliflower and cabbage. Generally, most of the producers used bamboo baskets and plastic crates for local market and gunny bags for distant markets. The cost of bamboo basket and plastic crates varied from Rs. 40 to 50 and Rs. 200 per unit, respectively. The cost of gunny bag varied according to their capacity and average costs came out to be Rs. 3 per unit.

Transportation

Quick and efficient transportation is the main step towards good marketing systems. Vegetable commodities being highly perishable in nature require quick disposal to avoid spoilage and loss in quality which need efficient network of transportation. The means of transportation adopted by producers for marketing of different vegetable commodities in the study area have been displayed in Table 4.26. Generally, all the producers transported their produce from field to home place manually. However, they used different means of transportation to carry their produce up to the market for sale. The producers

who sold their produce directly to the retailer's shop carried their produce on head loads adopted mostly by small farmers (9.52 per cent). However, wheel cart was used as mode of transportation by small farmers (17.46 per cent). Generally, producers selling their produce directly to the consumers by door to door sale method used this mode of transportation. Jeep was the most common mean of transportation used by 53.75 per cent of producers to carry their produce to main market. About 62 and 24 per cent small and large farmers used this means of transportation to carry their produce to Sabji Mandi in early morning. Tampoo and truck were also used by 18.75 and 6.25 per cent producers to carry their produce to main markets. Tampoo and trucks were more common among large farm category. Generally, large farmers hired truck or tampoo for transportation. The cost of transportation was found lower for truck and tampoo as compared to Jeep and the cost also varied with distance travelled.

Table 4.26: Means of transportation for different vegetable commodities

Means of transportation	Farmers (per cent)			Cost of transportation (Rs/q)		
	Small	Large	Overall	0-5 km	5-20 km	>20 km
Manual	9.52	-	7.50	As per distance	-	-
Wheel cart	17.46	-	13.75	100/day	-	-
Jeep	61.90	23.53	53.75	10.00	25.00	35.00
Tampoo	7.94	58.82	18.75	7.00	18.00	25.00
Truck	3.18	17.65	6.25	5.00	15.00	20.00

Loading / unloading

The producers themselves loaded their produce from their fields/ farm houses in the study area. However, in the Sabji Mandi, the workers of the commission agents helped them to unload their produce. The extra charge for loading/ unloading was not charged.

Sale Method

After unloading the produce, producers/ sellers kept their lots in queues in front of commission agent's shop for sale. Most of them had personal contact with commission agents. Government has made a rule to determine the price through open auction in the market. However, this system was not followed in the market and prices were fixed by the commission agents based on the quantum of arrivals, previous day prices, price trends in main wholesale markets (mainly Delhi), quality of produce and number of bidders. The commission agents generally fix the price of produce little above or below average price of previous day. Then, buyers judge the quality and prices of produce at the stalls of different commission agents before buying the produce and settle the deal where they got quality produce in less price. However, most of the buyers had personal contacts with commission agents and they prefer to buy from their stalls. The auctioning time was in morning hours from 5.30 a.m. in summer and 6.30 a.m. in winter. The payment to the producer/seller was made by the commission agent immediately after the sale while payment was made after one week to agents/traders bringing produce from distant markets.

Weighing system

After the agreement between the buyer and commission agents, the produce is weighed. Each commission agent has weighing machine kept in front of their shop and weighing was done by the weighmen attached to commission agents. Moreover, weighing was done in all vegetable commodities except in case of vegetables packed in standard boxes or crates.

Time spent in market by producers

Producers who sold their produce through commission agents in Sabji Mandi, spent at least four hours from 4 a.m. to 8 a.m. while producers who sold their produce directly to consumers through door to door sale method in local market spent about seven hours from 7 a.m. to 2 p.m. Producers (farmer/trader) who sold their produce directly to the consumers in the main market through their own stalls, spent whole day. However, producers who sold their produce to pre-harvest contractors and local traders could save their time in marketing.

Market information system

Without reliable and timely information, the marketing system can not achieve efficiency. Government of Himachal Pradesh has already promulgated model Agricultural and Horticultural Produce Marketing Development Act (known as APMC Act 2005) in November, 2005 to reform the marketing system in the state. In addition there is a website www.agmarknet.nic.in where all the information related to marketing such as arrivals and prices of all commodities in different markets of country was provided. Similarly, the Market Committees also disseminate price and arrival information through the medium of radio and

newspapers. Different sources of information used by producers in the study area are presented in Table 4.27. About 44 per cent producers got information on prices directly from Sabji Mandi whereas about 26 per cent producers got information in the interval of 2 to 3 days. Most of the large producers (58.82 per cent) used the market as the source of price information as compared to small producers (39.68 per cent). Similarly, producers got price information through local market (18.75 per cent), neighbours (7.50 per cent) and news papers (3.75 per cent). These three above mentioned sources of information were more common in small producers while large producers got information from main market and local market. However, information related to quantity of arrival in study markets were difficult to get by producers. There was not any fixed trend in arrivals. Thus, there was too much variation in the price of produce as the price mainly depends on arrivals in the market.

Table 4.27: Sources of price information used by sampled producers

(Per cent)

Sources	Size of farms						Total	
	Small		Large		Overall			
	Daily	2-3 days interval	Daily	2-3 days interval	Daily	2-3 days interval	No.	Per cent
Main market (Sabji Mandi)	39.68	26.98	58.82	23.53	43.75	26.25	56	70.00
Local market	19.06	-	17.65	-	18.75	-	15	18.75
Neighbours	9.52	-	-	-	7.50	-	6	7.50
Newspaper	4.76	-	-	-	3.75	-	3	3.75
Total (No.)	46	17	13	4	59	21	80	100.00

Arrival and disposal of produce in study markets

The season of supply of different vegetable commodities produced in the study area has been displayed in Figure 4.1. The local producers from Kangra and Nagrota brought vegetable commodities for sale in principal market Kangra and sub-market Nagrota. The arrival was also from Solan, Kullu, Mandi and Una during off season. The substantial arrival also came from Punjab and Delhi during main season. The disposal of commodities was mainly in local markets within the district.

Table 4.28: Arrivals and disposal of vegetable commodities in Kangra and Nagrota markets

Pattern of arrival			Pattern of disposal	
Local area	Within H. P.	Outside state	Local markets	Other districts of H. P. and outside state
Different villages of Kangra and Nagrota Blocks	Solan, Kullu, Mandi, Una	Punjab (Hoshiarpur), Haryana, Delhi	Kangra, Nagrota, Dehra, Jwalaji, Ranital, Nad aun, Dharamshala, Paprola, Palampur, Baijnath, Jogindranagar	-

Market functionaries

The role played by market functionaries in the marketing system is quite indispensable as they perform important marketing functions. They also help in expanding the markets for farm products and add value to the products. But sometimes long chain of functionaries may also add to marketing cost reducing producer's share. The main market functionaries include producers,

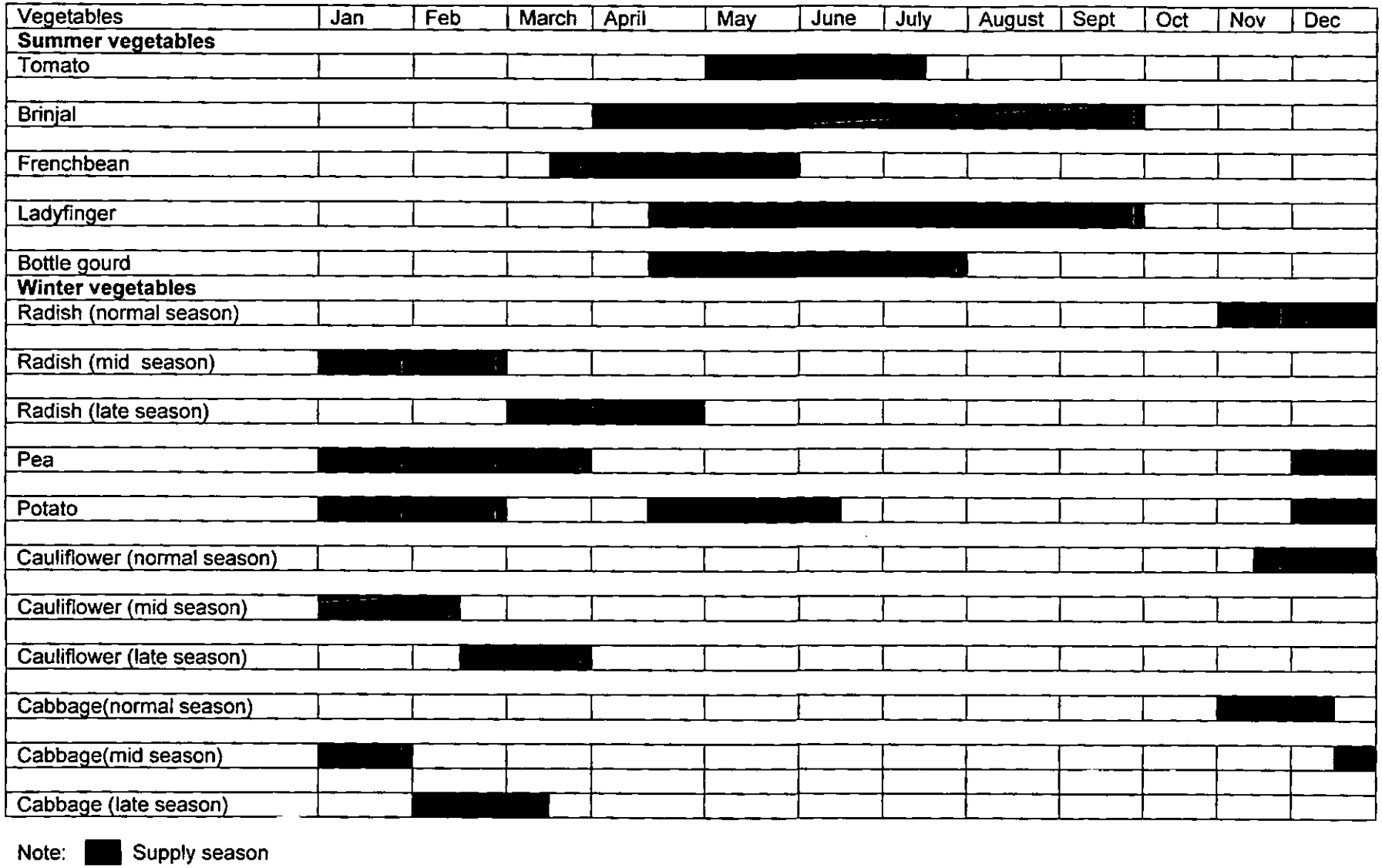


Fig 4.1: Supply season of summer and winter vegetable commodities in Kangra district.

pre-harvest contractors, local traders, commission agents, retailers and consumers. The role played by each of them along with marketing practices have been shown in Table 4.29 in detail.

Table 4.29: Marketing practices performed by different functionaries

Functionaries	Sale to Pre-harvest contractor	Sale to local trader	Sale to commission agents	Sale to retailers/ others	Sale to retailer's shop	Sale to consumer
Producers	-	Assembling cleaning and sorting	Assembling, cleaning, sorting, packaging, transportation and loading/ unloading	-	Assembling, cleaning, sorting, packaging, transportation and loading/ unloading	Assembling, cleaning, sorting, packaging, transportation loading/ unloading and retailing.
Pre-harvest contractor	-	-	-	-	Assembling, cleaning, sorting, packaging, transportation and loading/ unloading	Assembling, cleaning, sorting, packaging, transportation, loading/ unloading and retailing
Local traders	-	-	-	-	Packaging, transportation and loading/ unloading	Assembling, cleaning, sorting, packaging, transportation loading/ unloading and retailing.
Commission agents	-	-	-	Auctioning and weighing	-	-
Retailers	-	-	-	-	-	Packaging, transportation storage, loading/ unloading and retailing.

Producers

Producers are the foremost and basic functionary in marketing process. They perform one or more marketing functions which mainly depend or

the selling method. In the study area, producers did not perform any marketing function if they sold their produce directly to pre-harvest contractors. When sale was to local trader, they performed only assembling, cleaning and sorting operations while in the sale to commission agents and retailers, they performed assembling, cleaning, sorting, packaging, transportation and loading/unloading operations. Producers performed all the marketing functions when they sold produce directly to the consumers in the study area.

Pre-harvest contractors

This functionary brought produce directly from the farmers before harvesting. They made contracts with the farmers and then performed all marketing functions required to sell the produce.

Local traders

Local traders are small traders operating in same village or few surrounding villages. In the study area, local traders were residing in the same village or were producers themselves. They purchased produce from the producers on their farm land. They further sold either to the consumer in the market or to the retailer's shop.

Commission agents

Commission agents are those who are operating in the wholesale markets and act as representative of either a seller or a buyer. In the study area, they were the most predominant functionaries. As the produce arrived in the market, they arranged for weighing and selling in the market yard. They charged about 5-7 per cent commission from both producers and traders for selling or

buying produce in the market. However, government has fixed 6 per cent commission to be charged from traders/ retailers not from producers. This practices needs to checked for the benefit of producers.

Retailers

Retailers are the most important functionary in the marketing system. In the study area, there were two types of retailers. One who brought produce directly from Sabji Mandi and other who got produce in their own shop through producers, pre-harvest contractors and local traders. In former case, they performed packaging, transportation, loading/ unloading, storage and retailing functions while in latter cases, they performed only storage and retailing functions for the marketing of vegetable commodities.

4.5 Marketing Mechanism of Vegetable Commodities

4.5.1 Marketing channels for vegetable crops

Marketing channels are the routes through which agricultural produce move from producers to consumers. This entire process involves various functionaries who facilitate these movements in the whole marketing system. Marketing channels play a vital role in disposal of the produce of the farmers. The type of channel selected for sale greatly affects the absolute as well as proportionate share of the producers in the consumer's rupee. Therefore, the study of these channels is quite important to evaluate the market conduct, structure and performance so as to advocate possible ways of improvement in the existing system. Keeping this in view, the marketing channels patronized by the sample vegetable growers in the study area have been examined. There

were seven different marketing channels patronized for marketing of vegetable commodities in the study area. These channels have been defined in Figures 4.2 and 4.3 as well as in Table 4.30.

Table 4.30: Marketing channels in the study area

Channels	Functionaries in the channel
Channel-I	Producer → Pre-harvest contractor (PHC) → Retailer → Consumer
Channel-Ii	Producer → Pre-harvest contractor (PHC) → Consumer
Channel-III	Producer → Local trader → Retailer → Consumer
Channel-IV	Producer → Local trader → Consumer
Channel-V	Producer → Commission Agent (CA) → Retailer → Consumer
Channel-VI	Producer → Retailer → Consumer
Channel-VII	Producer → Consumer

The nature and salient characteristics of these channels are discussed here under:-

Channel-I

This channel consisted of producers, pre-harvest contractors, retailers and consumers. Here, pre-harvest contractors fixed up the prices of the produce before harvesting with the producers and then performed all the marketing functions from harvesting to transportation until produce was sold to the commission agents/wholesalers or to retailers. There was no marketing cost at producer's level in this channel as pre-harvest contractor himself harvested/transported the produce from the field itself. Producer who had more land and most of the family members were engaged in other non-farm activities

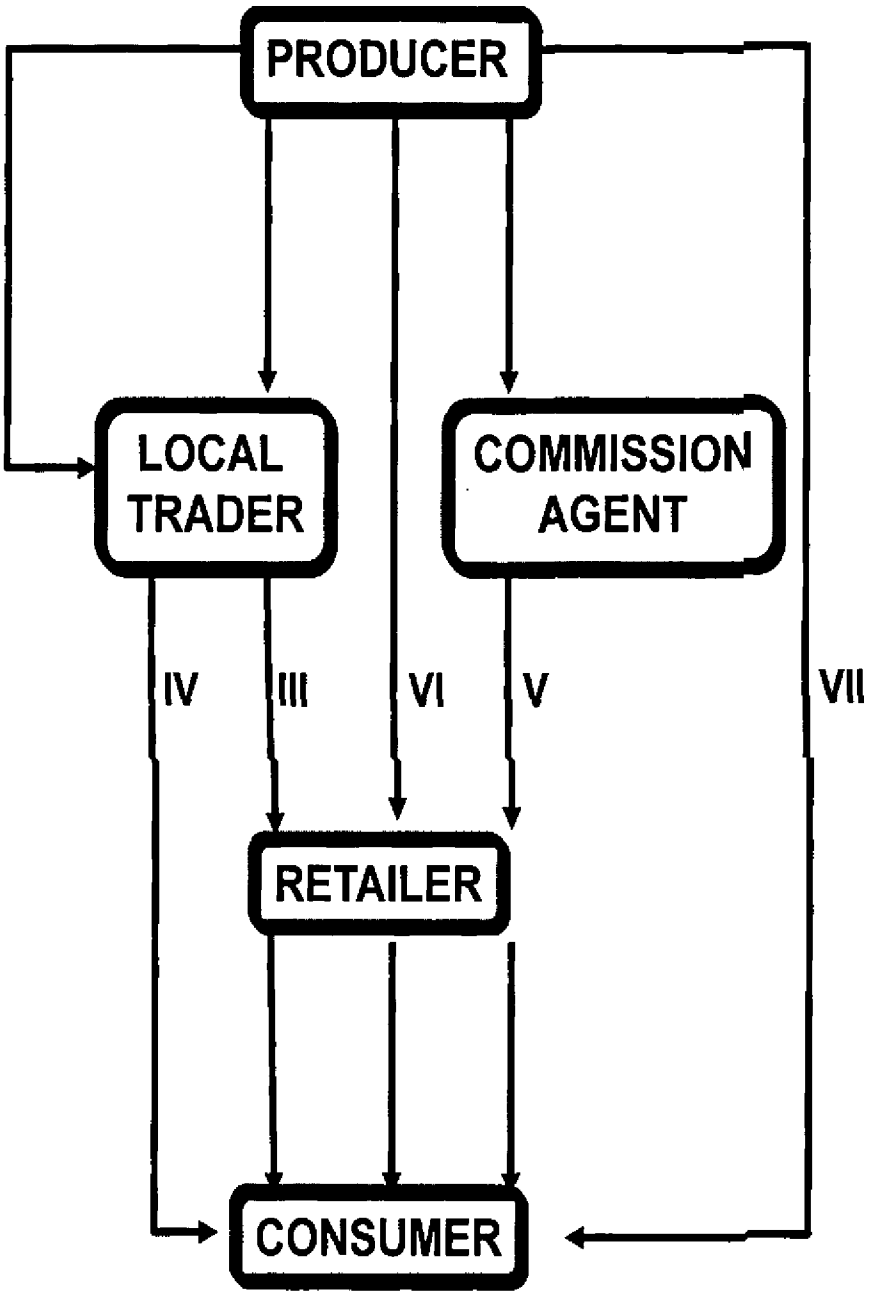


Fig 4.2: Marketing channels for summer vegetables

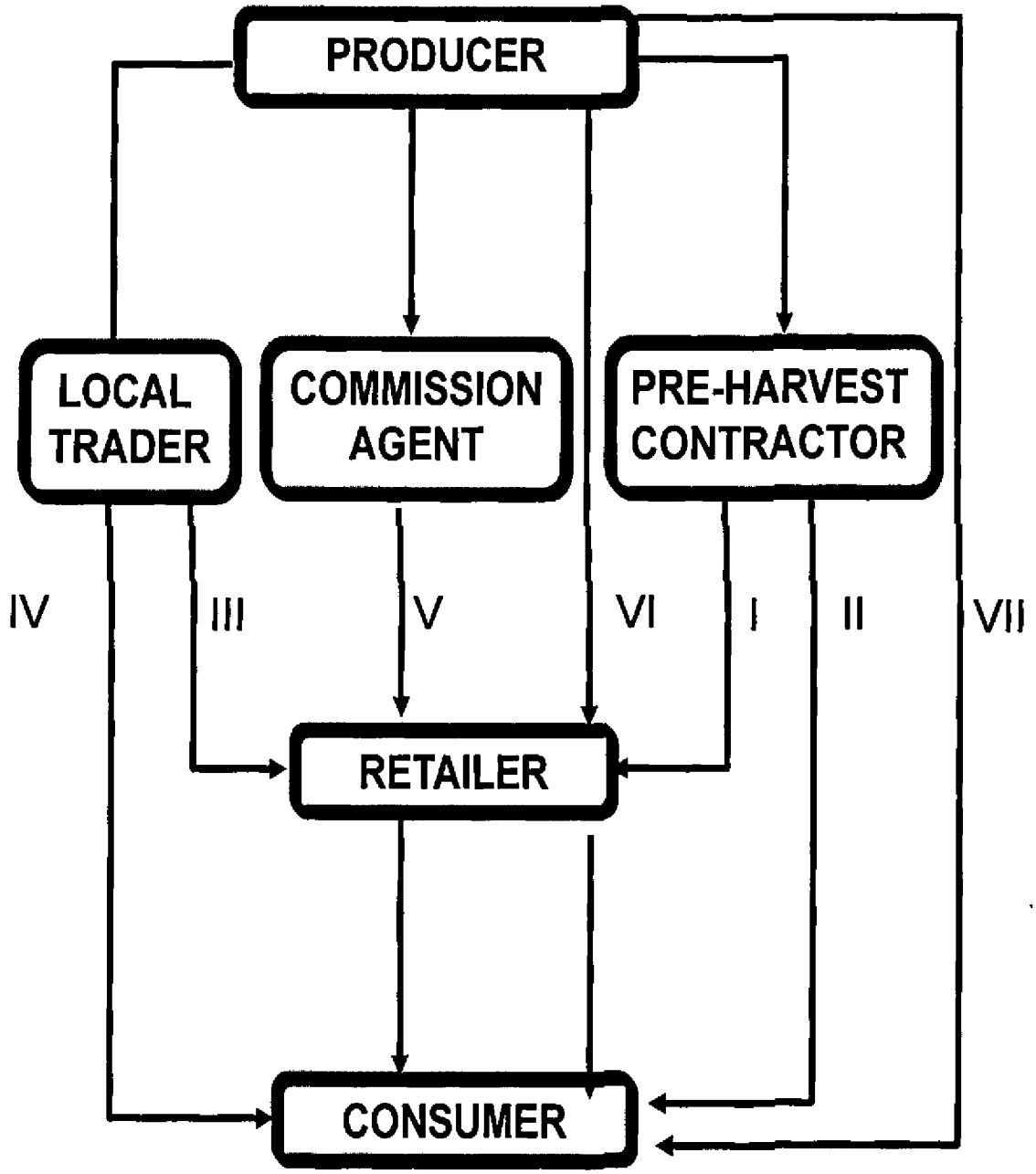


Fig. 4.3: Marketing channels for winter vegetables

rather than agriculture, sold their produce to pre-harvest contractor. This was common in case of winter vegetables. About 4.35 per cent of the produce was sold through this channel. This channel was more common in large farm category as compared to small farms.

Channel-II

The functionaries involved in this channel were; producers, pre-harvest contractors and consumers. In this case, pre-harvest contractors fixed the price of produce in advance with producers and performed all the functions as in channel-I with additional function of retailing. In this channel also, pre-harvest contractor has to bear all the marketing costs from harvesting to retailing. This channel was followed by few (0.49 per cent) producers selling only 2.49 per cent of the total produce of winter vegetable commodities. However, this channel was not common in summer vegetable commodities.

Channel-III

This channel involved the producers, local traders, retailers, and consumers. Producers patronizing this channel were those who were not able to carry their produce themselves to the local market due to small lot or lack of time to perform various marketing functions. In this system, producers were not performing any marketing functions except assembling and cleaning operation. Local traders were responsible for further transportation and sale of the produce. The local traders usually collected the produce from respective producers from their field/ farm house for further sale to the retailers in the local or main markets. This channel was followed by 11.60 and 9.98 per cent of summer and winter

vegetable producers and marketed 12.35 and 11.27 per cent of total marketed surplus of summer and winter vegetable commodities, respectively through this channel. This channel was more common on large farms as compared to small farms.

Channel-IV

Major functionaries involved in this channel were; producers, local traders and consumers. Generally, local trader collected the produce from producer's field/farm house and directly sold it to the consumers in local markets. Only assembling and cleaning operations were performed by producers. All other marketing activities were performed by local trader for the sale of commodities. This channel was followed by 14.40 per cent and 15.68 per cent of summer and winter vegetable producers, respectively and accounted for 11.70 per cent and 11.67 per cent of total marketed surplus of summer and winter vegetable commodities, respectively. This system was more popular among small farms.

Channel-V

This was the most predominant channel in the study area. This channel consisted of producers, commission agents, retailers and consumers. Producers were found to carry their produce directly to the Sabji Mandi of Kangra and/or Nagrota markets in early morning. The price of produce was determined by commission agents and buyers through arbitration. For this, commission agents charged at the rate of 5 to 7 per cent of the sale price from producers as well as traders. Thereafter, retailers further sold these commodities to ultimate consumers.

Generally, the producers having bulk produce carried their produce in Sabji Mandi. About 30.40 per cent and 32.86 per cent of summer and winter vegetable producers marketed about 39.69 per cent and 33.34 per cent of total marketed surplus of summer and winter vegetable commodities through this channel, respectively.

Channel-VI

The major functionaries involved in this channel were; producers, retailers and consumers. Producers sold their produce directly to the retailer's shop by carrying their produce on head loads or on wheel cart. In this system, retailers got the produce at cheaper rates from producers as compared to Sabji Mandi.

Producers who had less production patronised this channel. It can be seen from the table that about 29.60 per cent and 28.95 per cent of producers of summer and winter vegetable commodities followed this channel. Moreover, 25.12 per cent and 24.16 per cent of total marketed surplus of summer and winter vegetable commodities was marketed through this channel. This channel was more common on small farm category.

Channel-VII

This channel comprised of producers and consumers only. Producers directly sold their produce to ultimate consumers. Some producers took their produce on wheel cart and sold through door to door sale method whereas some producers also acted as retailer and sold their produce either in local market or in main markets to consumers. This type of sale was followed by 14.00 per cent

and 13.14 per cent of the total producers who marketed 11.14 per cent and 13.20 per cent of the total marketed surplus of summer and winter vegetables commodities through this method. This system was found to be more common on large farms for summer and small farms for winter vegetables commodities in the study area.

Marketing channels for summer vegetables

Table 4.31 further shows the distribution of producers adopting different channels along with proportion of different summer vegetable commodities sold through these channels. It can be seen from the table that channel-I (involving pre-harvest contractor and retailer) and channel-II (involving pre-harvest contractor) were not followed in disposal of summer vegetable commodities in the study area.

In case of tomato, only two channels i.e. channel-VI (involving retailers) and channel-VII (involving producer act as retailer) were found for the disposal of it in the study area. About 50 per cent producers patronizing each of these two channels sold 55.93 per cent and 44.07 per cent of produce through these two channels, respectively. For the disposal of brinjal, 32.50 per cent of producers sold 46.65 per cent of produce through channel-V involving commission agent and retailer. The next major route of sale was channel-VI involving retailers through which 30.00 per cent producers sold 18.75 per cent produce. For marketing of frenchbean, channel-III (involving local trader and retailer) was more popular with 46.15 per cent of growers who sold 52.35 per cent produce through this channel. However, in case of large farms, channel-III and channel-VII were adopted for the sale of frenchbean.

Table 4.31: Marketing channels for summer vegetable commodities

Vegetables		Marketing channels										Total	
		III		IV		V		VI		VII			
		Per cent Producer	Per cent Sale	Per cent Producer	Per cent Sale	Per cent Producer	Per cent Sale	Per cent Producer	Per cent Sale	Per cent Producer	Per cent Sale	Producer (No.)	Sale (q)
Tomato	Small	-	-	-	-	-	-	-	-	100.00	100.00	1.00	2.60
	Large	-	-	-	-	-	-	100.00	100.00	-	-	1.00	3.30
	Overall	-	-	-	-	-	-	50.00	55.93	50.00	44.07	2.00	5.90
Brinjal	Small	7.94	11.03	17.46	10.58	31.75	48.85	31.75	23.72	11.10	5.82	63.00	710.05
	Large	17.65	23.41	5.88	3.95	35.29	42.00	23.53	8.26	17.65	22.38	17.00	336.45
	Overall	10.00	15.01	15.00	8.45	32.50	46.65	30.00	18.75	12.50	11.14	80.00	1046.50
Frenchbean	Small	40.00	52.92	10.00	10.70	10.00	11.12	-	-	40.00	25.26	10.00	16.63
	Large	66.67	49.55	-	-	-	-	-	-	33.33	50.45	3.00	3.33
	Overall	46.15	52.35	7.69	8.92	7.69	9.27	-	-	38.47	29.46	13.00	19.96
Lady finger	Small	7.94	5.70	17.46	19.15	31.75	32.97	31.75	32.12	11.10	10.06	63.00	863.90
	Large	17.65	19.85	5.88	1.49	35.29	46.95	23.53	18.43	17.65	13.28	17.00	288.60
	Overall	10.00	9.24	15.00	14.72	32.50	36.47	30.00	28.69	12.50	10.88	80.00	1152.50
Bottle gourd	Small	6.56	8.81	18.03	15.94	29.51	37.32	34.43	29.84	11.47	8.09	61.00	613.55
	Large	20.00	23.03	-	-	33.33	33.59	26.67	25.00	20.00	18.38	15.00	218.80
	Overall	9.21	12.55	14.47	11.75	30.26	36.34	32.89	28.57	13.17	10.80	76.00	832.35
All Summer vegetables	Small	9.14	8.63	17.26	15.41	29.95	39.08	30.96	28.50	12.69	8.38	197.00	22067.3
	Large	20.75	22.12	3.77	2.07	32.08	41.19	24.53	16.34	18.87	18.28	53.00	850.48
	Total	11.60	12.35	14.40	11.70	30.40	39.69	29.60	25.12	14.00	11.14	250.00	3057.21

In case of lady finger, channel-V and VI involving commission agent and retailer or retailer alone, respectively were most popular with 32.50 and 30 per cent of growers selling 36.47 and 28.69 per cent of produce through these two channels, respectively. Channel-III, IV and VII were adopted by 10.00, 15.00 and 12.50 per cent producers selling 9.24, 14.72 and 10.88 per cent of produce through these three channels, respectively. In case of bottle gourd, channel-V (involving commission agent and retailer) and channel-VI (involving retailer) were mostly adopted by 30.26 per cent and 32.89 per cent producers selling 36.34 and 28.57 per cent of produce through these two channels, respectively.

Marketing channels for winter vegetables

Table 4.32 reveals the distribution of the producers and proportion of marketed surplus of winter vegetables routed through different channels in the study area. In case of radish 1 (normal season), channel-V (involving commission agents and retailers) and channel-VI (involving retailers) were more common with 32.50 and 30 per cent of producers selling 33.55 and 24.70 per cent of produce through these two channels, respectively. Channel-III involving local trader and retailer was found to be less common as 10 per cent producers sold 13.13 per cent of produce through this channel. In case of radish 2 (mid season), channel-V and VI were more popular with 32.50 and 30.00 per cent producers selling about 32 and 28 per cent of produce through these channels, respectively. Channel-III was adopted by 10 per cent of producers selling 9.92 per cent produce through this channel. For marketing of radish 3 (late season), channel-V involving commission agent and retailer was most common with 38.46

Table 4.32: Marketing channels for winter vegetable commodities (Per cent)

Vegetables		Marketing channels							
		I		II		III		IV	
		Per cent producer	Per cent Sale	Per cent producer	Per cent Sale	Per cent producer	Per cent Sale	Per cent producer	Per cent Sale
Radish 1	Small	-	-	-	-	7.94	11.42	17.46	16.18
	Large	-	-	-	-	17.65	17.96	5.88	3.33
	Overall	-	-	-	-	10.00	13.13	15.00	12.81
Radish 2	Small	-	-	-	-	7.94	5.43	17.46	17.81
	Large	-	-	-	-	17.65	21.41	5.88	3.25
	Overall	-	-	-	-	10 00	9.92	15.00	13.72
Radish 3	Small	-	-	-	-	12.50	9.13	25.00	19.77
	Large	-	-	-	-	20.00	16.96	20.00	12.28
	Overall	-	-	-	-	15.38	12.21	23.08	16.82
Pea	Small	-	-	-	-	-	-	50.00	90.24
	Large	-	-	-	-	-	-	-	-
	Overall	-	-	-	-	-	-	33.33	43.61
Cauliflower 1	Small	1.59	5.96	-	-	7.94	9.97	17.46	13.41
	Large	5.88	15.08	5.88	10.03	17.65	18.59	-	-
	Overall	2 50	9.37	1.25	3 76	10.00	13.20	13.75	8.39
Cauliflower 2	Small	-	-	-	-	8.47	8.42	18.64	20.43
	Large	7.14	15.48	7.14	15.48	14.29	19.37	-	-
	Overall	1.37	6.14	1.37	6.14	9.59	12.76	15.07	12.33
Cauliflower 3	Small	-	-	-	-	-	-	100.00	100.00
	Large	-	-	-	-	-	-	-	-
	Overall	-	-	-	-	-	-	50.00	32.48
Cabbage 1	Small	-	-	-	-	8.20	5.79	18.03	14.72
	Large	-	-	-	-	21.43	14.80	-	-
	Overall	-	-	-	-	10.67	7.57	14.67	11.82
Cabbage 2	Small	-	-	-	-	-	-	-	-
	Large	-	-	-	-	-	-	-	-
	Overall	-	-	-	-	-	-	-	-
All winter vegetables	Small	0 31	1.83	-	-	8.05	8.23	18.55	16.84
	Large	2.77	9.56	2.77	7.64	17.05	17.55	2.41	0.58
	Overall	0.73	4 35	0.49	2.49	9.98	11.27	15.68	11.67

Contd../-

Vegetables		Marketing channels						Total	
		V		VI		VII			
		Per cent producer	Per cent Sale	Per cent producer	Per cent Sale	Per cent producer	Per cent Sale	Producer (No)	Sale (q)
Radish 1	Small	31 75	32 13	31 75	27 84	11 11	12 43	63 00	363 50
	Large	35 29	37 54	23 53	15 87	17 65	25 31	17 00	129 20
	Overall	32 50	33 55	30 00	24 70	12 50	15 81	80 00	492 70
Radish 2	Small	31 75	29 59	31 75	32 84	11 11	14 32	63 00	283 50
	Large	35 29	38 03	23 53	15 81	17 65	21 50	17 00	110 70
	Overall	32 50	31 96	30 00	28 06	12 50	16 34	80 00	394 20
Radish 3	Small	25 00	17 87	-	-	37 50	53 23	8 00	26 30
	Large	60 00	70 76	-	-	-	-	5 00	17 10
	Overall	38 46	38 71	-	-	23 08	32 26	13 00	43 40
Pea	Small	25 00	4 74	-	-	25 00	5 02	4 00	27 40
	Large	50 00	50 00	-	-	50 00	50 00	2 00	29 30
	Overall	33 34	28 13	-	-	33 33	28 26	6 00	56.70
Cauliflower 1	Small	30 16	36 26	31 75	25 16	11 11	9 24	63 00	827 80
	Large	29 41	27 76	23 53	11 34	17 65	17 20	17 00	495 40
	Overall	30 00	33 08	30 00	19 99	12 50	12 22	80 00	1323 20
Cauliflower 2	Small	28 81	28 07	33 90	32 19	10 17	10 89	59 00	488 40
	Large	35 71	27 41	21 43	8 56	14 29	13 70	14 00	321 10
	Overall	30 14	27 81	31 51	22 82	10 96	12 01	73 00	809 50
Cauliflower 3	Small	-	-	-	-	-	-	1 00	5 10
	Large	100 00	100 00	-	-	-	-	1 00	10 60
	Overall	50 00	67 52	-	-	-	-	2 00	15 70
Cabbage 1	Small	27 87	35 59	32 79	34 82	13 11	9 08	61 00	663 85
	Large	28 57	33 42	28 57	31 45	21 43	20 33	14 00	162 80
	Overall	28 00	35 16	32 00	34 16	14 67	11 30	75 00	826 65
Cabbage 2	Small	100 00	100 00	-	-	-	-	1 00	3 10
	Large	100 00	100 00	-	-	-	-	1 00	24 40
	Overall	100 00	100 00	-	-	-	-	2 00	27 50
All winter vegetables	Small	30 10	32 87	30 96	29 41	12 03	10 83	323 00	2688 95
	Large	36 36	32 85	21 59	13 29	17 05	18 15	88 00	1300 00
	Overall	31 03	32 86	28 95	24 16	13 14	13 20	411 00	3989 55

per cent producers who sold about 38.71 per cent of their total produce through this channel. Channel-III involving local trader and retailer was adopted by 15.38 per cent producers to sell about 12 per cent of late season radish.

Pea was mostly marketed through channel-IV (involving local trader and retailer) followed by channel-V (involving commission agent and retailer) and channel-VII (direct sale to consumer). Each of these channels was patronized by 33.33 per cent of producers and accounted for 43.61, 28.13 and 28.26 per cent of the marketed surplus.

Cauliflower 1 (normal season) and cauliflower 2 (mid season) exhibited broader marketing pattern as these were marketed through almost all the channels prevailing in the study area. In case of cauliflower 1 (normal season), channel-V (involving commission agent and retailer) and channel-VI (involving retailer) were equally common with 30 per cent producers accounting for 33.08 and 19.99 per cent of produce, respectively. Channel-I (involving pre-harvest contractor and retailer) and channel-II (involving pre-harvest contractor acting as retailer) were least common for sale of cauliflower. Each of these channels was patronized by 2.50 and 1.25 per cent of producers and accounted for 9.37 and 3.76 per cent of the marketed surplus.

In case of cauliflower 2 (mid season), channel-V (involving commission agent and retailer) and channel-VI (involving retailer) were adopted by 30.41 and 31.51 per cent of producers to sell about 28 and 23 per cent of the marketed surplus through these two channels, respectively. In case of cauliflower 3 (late season), there were only two channels i.e. channel-IV (involving local trader and retailer) and channel-V (involving commission agent and retailer). Each of these two channels was patronized by 50 per cent producers to sell about 32.48 and 67.52 per cent of produce, respectively.

In case of cabbage 1 (normal season), channel-V (involving commission agent and retailer) and channel-VI (involving retailers) were more common with 28 and 32 per cent of producers selling about 35 and 34 per cent of produce through these two channels, respectively. Channel-III (involving local trader and retailer) was adopted by 10.67 per cent of producers selling about 8 per cent of produce through this channel. Cabbage 2 (mid season) was marketed through channel-V only (involving commission agent and retailers).

4. 5 Marketing Costs and Price-Spreads

Marketing cost of producer

The study of marketing cost is important both from the producer's and consumer's point of view. The efficient marketing system is one that is beneficial to both producers and consumers by channelizing the goods and services from its place of production to ultimate consumer at minimum possible cost. Producer is the first and foremost entity in agricultural marketing framework. Therefore, the cost of marketing which starts at the producer's level, sets the benchmark condition for the efficiency of entire supply chain. Therefore, negligency on the part of producer in performing marketing operations would lead to increase in cost.

Table 4.33 reveals the structure and composition of marketing cost per quintal of produce incurred by producers for marketing of summer vegetable commodities in the study area. Tomato was marketed through two channels i.e. channel-VI and channel-VII and the cost was higher (Rs. 101/q) in channel-VII as compared to channel-VI (Rs.52.01/q). For the sale of brinjal, the marketing cost

Table 4.33: Marketing cost incurred by producer for summer vegetable commodities (Rs/q)

	Marketing channels	Assembling charges	Cleaning	Packaging	Transportation to road head/market	Loading/unloading	Storage and losses	Market fee	Total
Tomato	VI	11.56	7.00	12.45	16.00	5.00	-	-	52.01
	VII	13.00	7.00	12.00	25.00	5.00	35.00	4.00	101.00
Brinjal	III	11.50	7.63	-	-	-	-	-	19.13
	IV	11.50	7.75	-	-	-	-	-	19.25
	V	11.96	7.62	10.31	24.42	7.24	-	-	61.55
	VI	12.20	7.33	10.74	15.00	4.00	-	-	49.27
	VII	11.20	6.25	10.30	25.00	4.00	9.10	4.00	69.85
Frenchbean	III	15.10	10.00	-	-	-	-	-	25.10
	IV	15.12	10.00	-	-	-	-	-	25.12
	V	15.57	11.00	11.50	25.00	7.00	-	-	70.07
	VII	15.40	6.25	12.40	30.00	5.00	17.20	4.00	90.25
Lady finger	III	14.60	-	-	-	-	-	-	14.60
	IV	14.50	-	-	-	-	-	-	14.50
	V	14.20	-	11.85	40.00	7.00	-	-	73.05
	VI	14.60	-	12.00	17.00	4.00	-	-	47.60
	VII	14.80	-	12.30	40.00	4.00	14.20	4.00	89.30
Bottle gourd	III	13.86	6.23	-	-	-	-	-	20.09
	IV	13.25	6.25	-	-	-	-	-	19.50
	V	13.97	6.87	11.01	25.10	7.00	-	-	63.95
	VI	13.70	6.25	10.38	17.00	4.00	-	-	51.33
	VII	13.60	6.25	10.30	27.00	4.00	9.56	4.00	74.71

at producer's level ranged from Rs.19.13/q to Rs.69.85/q. It was maximum (Rs. 69.85/q) when produce was sold directly to the consumer (channel-VII) due to the higher transportation cost (Rs.25/q) and storage and losses (Rs.9.10/q). However, the marketing cost was minimum (Rs.19.13/q) when produce was sold directly to local trader from his field/home (channel-III). This was due to the fact that producers need not to bear packaging, transportation and loading/unloading cost for the sale of brinjal. In case of frenchbean, the maximum marketing cost (Rs.90.25/q) was found in channel-VII when producer sold his produce directly to the consumer. The cost was minimum (Rs.25.10/q) when produce was directly sold to the local trader in his field/home (channel-III). For the sale of lady finger, the marketing cost varied from Rs.14.50/q when sold to local trader (channel-IV) to Rs.89.30/q when directly sold to the consumer (channel-VII). During marketing of bottle gourd, marketing cost incurred by producer was high (Rs.74.71/q) when he sold his produce directly to the consumer (channel-VII).

The marketing cost incurred by producer for the sale of winter vegetable commodities has been displayed in Table 4.34. A close examination of this table reveals that marketing cost incurred by producer varied from Rs.28.78/q to Rs.78.43/q for the sale of radish 1 (normal season). Likewise, the marketing cost of radish 2 (mid season) was maximum (Rs. 79.21/q) in direct sale to consumer while it was low (Rs. 28.98/q) when sold directly to local trader. In case of radish 3 (late season), the marketing cost ranged from Rs.28.79/q to Rs.80.97/q. In case of pea, the cost at producer's level was higher (Rs. 71.20/q) in channel-VII as compared to channel-IV (Rs.13/q). Similarly, the

Table 4.34: Marketing cost incurred by producer for winter vegetable commodities (Rs/q)

	Marketing channels	Assembling charges	Cleaning	Packaging	Transportation	Loading /unloading	Storage and losses	Market fee	Total
Radish 1	III	18.78	10.00	-	-	-	-	-	28.78
	IV	19.00	10.00	-	-	-	-	-	29.00
	V	18.00	11.12	10.23	24.42	7.00	-	-	70.77
	VI	17.50	10.00	10.38	19.00	4.00	-	-	60.88
	VII	19.00	10.00	10.20	25.00	4.00	6.23	4.00	78.43
Radish 2	III	19.00	10.00	-	-	-	-	-	29.00
	IV	18.78	10.20	-	-	-	-	-	28.98
	V	19.00	12.00	10.23	24.42	7.00	-	-	70.25
	VI	17.00	10.00	10.38	19.00	4.00	-	-	60.38
	VII	18.80	10.00	10.20	25.00	4.00	7.21	4.00	79.21
Radish 3	III	18.79	10.00	-	-	-	-	-	28.79
	IV	18.56	10.32	-	-	-	-	-	28.88
	V	18.00	10.00	9.80	20.00	7.00	5.45	-	54.50
	VII	19.33	10.00	10.33	25.00	4.00	8.30	4 00	80.97
Pea	IV	13.00	-	-	-	-	-	-	13.00
	V	13.00	-	9.50	25.00	7.00	-	-	150.50
	VII	10.00	-	10.20	30.00	7.00	10.00	4.00	71.20
Cauliflower 1	III	8.75	6.25	-	-	-	-	-	15.00
	IV	9.00	6.40	-	-	-	-	-	15.40
	V	8.97	6.25	10.29	25 00	7.00	-	-	57.51
	VI	9.20	6.30	10.38	15 00	4.00	-	-	44.88
	VII	9.37	6.25	10.20	25.00	4.00	20.24	4.00	79.06
Cauliflower 2	III	9.10	6.30	-	-	-	-	-	15.40
	IV	9.32	6.26	-	-	-	-	-	15.58
	V	9 20	6.23	3.27	25.00	7.00	-	-	50.70
	VI	9.40	6.25	10.30	15.00	4.00	-	-	44.95
	VII	9.42	6.45	10.13	25.00	4.00	19.86	4.00	78.86
Cauliflower 3	IV	9.13	6.30	-	-	-	-	-	15.43
	V	9.14	6.18	10.57	25.00	7.00	-	-	57.89
Cabbage 1	IV	9.00	6.50	-	-	-	-	-	15.50
	V	8.90	6.25	10.32	25.00	7.00	-	-	5.47
	VI	9.25	6.25	10.38	25.00	4.00	-	-	54.88
	VII	9.37	6.35	10.20	25.00	4.00	8.90	4.00	67.82
Cabbage 2	IV	8.91	6.25		-	-	-	-	15.16
	V	9.10	6.32	10.50	25 00	7.00	-	-	57.92

marketing cost of cauliflower 1 (normal season) was fairly high in channel-VII (Rs.79.06/q) than in channel-III (Rs.15/q). In case of cauliflower 2 (mid season), marketing cost varied from Rs.15.40/q (channel-III) to Rs.78.86/q (channel-VII) while it ranged from Rs.15.43/q (channel-IV) to Rs.111.89/q (channel-V) for the marketing of cauliflower 3 (late season). In case of cabbage 1 (normal season), the marketing cost incurred by producer ranged from Rs.15.50 to Rs.67.82/q. It was maximum (Rs. 67.82/q) when producer sold his produce directly to the consumer (channel-VII) and minimum (Rs. 15.50/q) in sale through channel-IV. The marketing cost of cabbage 2 (mid season) incurred at producer's level ranged from Rs.15.16 to Rs. 96.92/q. The cost was relatively high (Rs. 96.92/q) in direct sale method (channel-VII).

Marketing cost of pre-harvest contractor

A detailed study of marketing cost incurred by pre-harvest contractors in the sale of different commodities has been depicted in Table 4.35. The marketing cost of cauliflower 1 (normal season) incurred by pre-harvest contractor ranged from Rs.51.62/q to Rs.70.37/q. The cost was maximum (Rs.70.37/q) when he bought produce from producer's field and sold directly to consumer (channel-II). The cost was minimum (Rs.51.62/q) when he sold his produce directly to retailer (channel-I). In case of cauliflower 2 (mid season), the marketing cost incurred by pre-harvest contractor ranged from Rs.49.35/q to Rs.73.67/q. The cost was maximum (Rs. 73.67/q) again in channel-II as compared to channel-I (Rs. 49.35/q).

Table 4.35 : Marketing cost of pre harvest contractor (Rs/q)

	Cauliflower 1		Cauliflower 2	
Channel	I	II	I	II
Assembling charges	9.37	9.12	9.42	9.42
Cleaning	6.25	6.25	6.45	6.45
Packaging	12.00	11.00	10.98	12.00
Transportation	17.00	19.00	16.00	20.00
Loading/unloading	7.00	7.00	6.50	6.80
Storage and losses	-	14.00	-	15.00
Market fee	-	4.00	-	4.00
Total	51.62	70.37	49.35	73.67

Marketing cost of local trader

Table 4.36 reveals the structure and composition of marketing cost incurred by local traders in marketing of summer vegetable commodities. For the sale of summer vegetables, local trader was involved only in two channels i.e. channel-III and IV in the study area. In case of brinjal, the cost incurred by local trader was relatively high (Rs. 47.19/q) when he sold his produce directly to the consumer (channel-IV). This cost was high as the local trader has to bear storage losses cost along with market fee. In case of frenchbean, lady finger and bottle gourd, the cost incurred by local trader ranged from Rs.36.42/q to Rs.57.67/q, Rs.40.40/q to Rs.54.66/q and Rs.37.03/q to Rs.44.06/q, respectively.

Marketing cost incurred by local traders for the marketing of different winter vegetable commodities depicted in Table 4.36 reveals that marketing cost was relatively high when local trader sold his produce directly to the consumer (channel-IV) in case of radish 1 (Rs. 32.37/q), radish 2 (Rs. 31.94/q), and radish 3 (Rs. 39.44/q). The cost was found to be low when local trader sold his produce

Table 4.36 : Marketing cost of local trader for different vegetable commodities (Rs/q)

Vegetables	Marketing channels	Packaging cost	Transportation	Loading/ unloading	Storage and losses	Market fee	Total
Summer vegetables							
Brinjal	III	12.65	17.00	6.25	-	-	35.90
	IV	12.65	14.28	6.25	11.16	2.85	47.19
Frenchbean	III	12.64	17.00	6.78	-	-	36.42
	IV	13.67	18.00	8.00	14.00	4.00	57 67
Lady finger	III	12.53	21.00	6.87	-	-	40.40
	IV	12.78	17.00	6.87	15.21	2.80	54.66
Bottle gourd	III	10.78	20.00	6.25	-	-	37.03
	IV	10.78	14.35	6.25	9.88	2.80	44.06
Winter vegetables							
Radish 1	III	3.40	15.00	6.25	-	-	24.65
	IV	4.30	14.10	6.25	5.74	1.98	32.37
Radish 2	III	4.00	13.80	5.40	-	-	23.20
	IV	4.52	13.98	6.10	5.32	2.02	31.94
Radish 3	III	5.00	15.00	6.24	-	-	26.24
	IV	5.76	14.36	6.24	10.23	2.85	39.44
Pea	IV	12.43	16.00	6.25	12.00	2.85	49.53
Cauliflower 1	III	11.98	25.00	6.28	-	-	43.26
	IV	11.98	18.00	6.28	15.00	4.00	55.26
Cauliflower 2	III	12.20	25.00	6.35	-	-	43.55
	IV	12.20	17.00	6.35	16.00	2.80	54.35
Cauliflower 3	IV	11.34	18 00	6.25	16.00	2.85	54.44
Cabbage 1	IV	12.20	14.27	6.25	10.67	2.88	46.27
Cabbage 2	IV	12.50	14.28	6.87	10.80	2.90	47.35

directly to the retailer (channel-III). In pea, marketing cost incurred by local trader was found to be Rs. 49.53/q in channel-IV in which transportation (Rs.16.00/q) and packaging (Rs. 12.43/q) were the main components.

The marketing cost was relatively high in channel-IV in case of cauliflower 1 (Rs.55.26/q) and cauliflower 2 (Rs.54.35/q). The cost was found to be low when local trader sold his produce directly to retailer (channel-III) in case of cauliflower 1 (Rs.43.26/q) and cauliflower 2 (Rs 43.55/q). The cost was found to be Rs.54.44/q in case of cauliflower 3. Transportation (Rs.18.00/q) and storage losses (Rs.16 /q) accounted for major share in total cost incurred by local trader for the marketing of cauliflower 3. The marketing cost incurred by local trader was found to be Rs.46.27/q and Rs.47.35/q for marketing of cabbage 1 and cabbage 2, respectively.

Marketing cost of commission agent

Table 4.37 reveals that the main components of marketing cost incurred by commission agent were state tax (at the rate of 1 per cent), storage and losses and others (maintenance charges). It can be seen from the table that total cost incurred by commission agent for brinjal was Rs.12.83/q out of which state tax was Rs.5.83/q and storage was Rs.4/q. The total marketing cost of commission agents was almost similar for frenchbean (Rs. 19.89/q) and lady finger (Rs.19.90/q) while it was Rs.15.13/q for bottle gourd.

Among winter vegetable commodities, the marketing cost incurred by commission agents was found to be relatively high in case of pea (Rs.26.66/q). The main components of total cost incurred by commission agents were; state

Table 4.37: Marketing cost of commission agent (Rs/q)

Vegetables	State tax	Storage	Others	Total cost
Summer vegetables				
Brinjal	5.83	4.00	3.00	12.83
Frenchbean	10.34	5.25	4.30	19.89
Lady finger	9.40	6.00	4.50	19.90
Bottle gourd	5.83	5.00	4.30	15.13
Winter vegetables				
Radish 1	3.76	3.34	4.21	11.31
Radish 2	4.32	4.10	4.21	12.63
Radish 3	4.56	4.10	4.21	12.87
Pea	15.04	7.50	4.12	26.66
Cauliflower 1	6.11	3.56	4.12	13.79
Caulliflower 2	6.58	4.08	4.12	14.78
Cauliflower 3	8.25	5.00	4.12	17.37
Cabbage 1	5.72	6.10	4.12	15.94
Cabbage 2	6.85	6.00	4.12	16.97

tax and storage charges out of which state tax has more share varying from about Rs 4/q to Rs.15.04/q in all winter vegetable commodities. Total cost of marketing incurred by commission agents was Rs.11.31/q for radish1 (normal season), Rs.12.63/q for radish2 (mid season) and Rs.12.87/q for radish 3 (late season). Total cost was Rs.26.66/q for pea, Rs.13.79/q for cauliflower 1 (normal season), Rs.14.78 for cauliflower 2 (mid season), and Rs.17.37/q for cauliflower 3 (late season). The cost of marketing was Rs.15.94/q for cabbage 1 (normal season) and Rs.16.97/q for cabbage2 (mid season).

Marketing cost incurred by retailer

The marketing cost incurred by retailer in marketing different commodities has been shown in Table 4.38. In case of tomato, marketing cost incurred by retailer was found to be Rs.39/q which includes only storage and losses (Rs.35/q) and market fee (Rs.4). The marketing cost of brinjal ranged from Rs.14.99/q to Rs.47.30/q. The cost was maximum (Rs.47.30/q) in channel-V due to higher transportation (Rs.14.28/q) and packaging cost (Rs.12.65/q). In case of frenchbean, the cost incurred by retailers was found to be Rs.20.55/q in channel-III, while it was Rs.51.32/q when retailers purchased produce from the Mandi (channel-V). For the sale of lady finger and bottle gourd, the cost was maximum in channel-V (Rs.53.20/q and Rs. 44.90/q). The cost was relatively low when local trader or producer directly sold their produce in retailer's shop.

The marketing costs incurred by retailers for winter vegetable commodities shown in Table 4.38, reveals that marketing cost incurred by retailers was relatively high when they purchased produce from the Mandi in case of radish 1 (Rs.41.56/q), radish 2 (Rs.40.17/q), radish 3 (Rs.39.06/q), pea (Rs.50.85/q), cauliflower 1 (Rs.54.55/q), cauliflower 2 (Rs.55.50/q), cauliflower 3 (Rs.54.83/q), cabbage 1 (Rs.44.61/q) and cabbage 2 (Rs.47.43/q). The cost incurred by retailers was almost similar when they got produce directly in their shop from pre-harvest contractor, local trader and producer for all the winter vegetable commodities.

4.5.3 Price-spread analysis

The economic efficiency of the marketing system is generally measured in terms of the price-spread in agricultural commodities. The study of price-spread includes the break up of price paid by the ultimate consumers into different market functionaries and the producers.

Table 4.38 : Marketing cost incurred by retailer for different vegetable commodities (Rs/q)

Vegetables	Channels	Packaging cost	Transportation	Loading/ unloading	Storage and losses	Market fee	Total
Summer vegetables							
Tomato	VI	-	-	-	35 00	4 00	39 00
Brinjal	III	-	-	-	13 07	2 85	15 92
	V	12 65	14 28	6 25	11 27	2 85	47 30
	VI	-	-	-	10 99	4 00	14 99
Frenchbean	III	-	-	-	17 65	2 90	20 55
	V	12 64	15 00	6 78	14 00	2 90	51 32
Lady finger	III	-	-	-	17 00	3 40	20 40
	V	12 53	16 00	6 87	15 00	2 80	53 20
	VI	-	-	-	15 46	3 50	18 96
Bottle gourd	III	-	-	-	11 55	2 80	14 35
	V	10 78	14 35	6 25	10 72	2 80	44 90
	VI	-	-	-	11 20	4 00	15 20
Winter vegetables							
Radish 1	III	-	-	-	7 08	2 78	9 86
	V	6 56	14 63	6 25	11 27	2 85	41 56
	VI	-	-	-	7 13	4 00	11 13
Radish 2	III	-	-	-	11 21	3 00	14 21
	V	6 89	13 54	6 00	10 89	2 85	40 17
	VI	-	-	-	9 78	3 00	12 78
Radish 3	III	-	-	-	8 37	2 85	11 22
	V	6 74	14 36	6 24	8 87	2 85	39 06
Pea	V	8 45	17 00	5 90	15 50	4 00	50 85
Cauliflower 1	I	-	-	-	-	-	-
	III	-	-	-	18 00	2 79	20 79
	V	11 98	17 00	6 28	16 50	2 79	54 55
	VI	-	-	-	20 20	4 00	24 20
Cauliflower 2	I	-	-	-			
	III	-	-	-	18 21	4 00	22 21
	V	12 00	17 00	7 00	16 50	3 00	55 50
	VI	-	-	-	21 71	4 00	25 71
Cauliflower 3	V	11 10	14 28	6 30	20 85	2 30	54 83
Cabbage 1	V	11 45	14 27	6 23	10 10	2 56	44 61
	VI	-	-	-	10 00	3 00	13 00
Cabbage 2	V	13 10	14 28	6 20	10 95	2 90	47 43

Price-spread: summer vegetable commodities

The break-up of price paid by the consumer into different market functionaries and net price received by the producer in sale of summer vegetable commodities through different channels has been depicted in Tables 4.39 to 4.43.

A close examination of Table 4.39 reveals that in case of tomato, the per cent share of producer in consumer's rupee was maximum in channel-VII (89.90 per cent) when producer himself acted as retailer in the sale of produce to consumers. However, the price received by the producer was lower (69.80 per cent) in the sale of tomato through channel-VI involving producer and retailer in the supply chain. The share of producer in total marketing cost was fairly high in channel-VII (10.10 per cent) and low in channel-VI (5.20 per cent). The margin of retailer in channel-VI was about 21 per cent. Table 4.40 shows that in brinjal per cent share of producers was maximum in direct sale through channel-VII (90.02 per cent) followed by channel-VI (77.25 per cent) while it was low in channel-V (70.95 per cent). The share of total marketing cost incurred at producer's level was maximum in channel-VII (9.97 per cent) in direct sale to consumers. Among different functionaries, the margin realized by local trader was maximum (18.26 per cent) in sale through channel-IV followed by retailer in sale through channel-VI (13.57 per cent).

Table 4.39: Price-spread in marketing of tomato (per cent share)

S. No.	Particulars	Marketing channels	
		VI	VII
1	Producer's net price	69.80	89.90
1.1	Marketing cost incurred by producer		
	Assembling charges	1.15	1.30
	Cleaning	0.70	0.70
	Packaging	1.25	1.20
	Transportation	1.60	2.50
	Loading/unloading	0.50	0.50
	Storage and losses	-	3.50
	Market fee/commission	-	0.40
	Sub-total	5.20	10.10
2	Retailer's price	75.00	
2.1	Marketing cost incurred by retailer		
	Loading/unloading	-	-
	Storage and losses	3.50	-
	Market fee	0.40	-
	Sub-total	3.90	-
	Margin of retailer	21.10	-
3	Consumer's price	100.00	100.00
		(1000.00)	(1000.00)

Figures in parentheses indicate the prices in rupees per quintal.

Table 4.40: Price-spread in marketing of brinjal (per cent share)

S. No.	Particulars	Marketing channels				
		III	IV	V	VI	VII
1	Producer's net price	72.27	72.25	70.95	77.25	90.02
1.1	Marketing cost incurred by producer					
	Assembling charges	1.64	1.64	1.63	1.74	1.60
	Cleaning	1.09	1.11	1.04	1.05	0.89
	Packaging	-	-	1.40	1.53	1.48
	Transportation	-	-	3.32	2.14	3.57
	Loading/unloading	-	-	0.99	0.58	0.57
	Storage and losses	-	-	-	-	1.30
	Market fee	-	-	-	-	0.57
	Sub-total	2.73	2.75	8.38	7.04	9.98
2	Local trader's price	75.00	75.00	-	-	-
2.1	Marketing cost of local trader					
	Packaging cost	1.81	1.81	-	-	-
	Transportation	2.43	2.04	-	-	-
	Loading/unloading	0.89	0.89	-	-	-
	Storage and losses	-	1.59	-	-	-
	Market fee	-	0.41	-	-	-
	Sub-total	5.13	6.74	-	-	-
	Margin of local trader	7.01	18.26	-	-	-
3	Price paid by C.A.	-	-	79.32	-	-
3.1	Marketing cost of C.A.					
	State tax	-	-	0.79	-	-
	Storage and losses	-	-	0.54	-	-
	Others	-	-	0.41	-	-
	Sub-total	-	-	1.74	-	-
	Margin of C.A.	-	-	8.32	-	-
4	Retailer's price	87.14	-	84.37	84.29	-
4.1	Marketing cost of retailer					
	Packaging cost	-	-	1.72	-	-
	Transportation	-	-	*1.94*	-	-
	Loading/unloading	-	-	0.85	-	-
	Storage and losses	1.87	-	1.53	1.57	-
	Market fee	0.41	-	0.39	0.57	-
	Sub-total	2.28	-	6.43	2.14	-
	Margin of retailer	10.58	-	4.18	13.57	-
5	Consumer's price	100.00	100.00	100.00	100.00	100.00
		(700.00)	(700.00)	(735.00)	(700.00)	(700.00)

C.A.: Commission agent
Figures in parentheses indicate the prices in rupees per quintal.

The price-spread analysis of frenchbean presented in Table 4.41 reveals that the producer received maximum share in consumer's rupee in channel-VII (93.06 per cent) in direct sale to consumer in local market. The producer's share was relatively low in channel-V (73.03 per cent) in the sale through commission agent and retailers. Among different functionaries, the proportion of margin taken by local traders was fairly high in channel-IV (18.64 per cent) followed by retailers in channel-III (11.88 per cent). Table 4.42 displays the price-spread for marketing of lady finger in the study area. In lady finger too, the per cent share of producer was fairly high in direct sale in channel-VII (92.56 per cent) and low in channel-V (70.48 per cent). The share of marketing cost incurred at producer's level was also maximum in sale through channel-VII (7.44 per cent). The margin taken by local trader in channel-IV (20.45 per cent) was maximum among different functionaries in the sale of lady finger. Table 4.43 also reveals that in bottle gourd, the per cent share of producer in consumer's rupee was maximum in direct sale in channel-VII (90.66 per cent). The minimum share was found in channel-V (63.69 per cent) involving commission agents and retailers. The share in marketing cost incurred by producer was fairly high in channel-VII (9.34 per cent) and minimum in channel-IV (2.44 per cent). Among different functionaries, the margin taken by local trader was maximum in channel-IV (26.99 per cent).

Table 4.41: Price-spread in marketing of frenchbean (per cent share)

S. No.	Particulars	Marketing channels			
		III	IV	V	VII
1	Producer's net price	74.99	74.99	73.03	93.06
1.1	Marketing cost incurred by producer				
	Assembling charges	1.16	1.16	1.18	1.18
	Cleaning	0.77	0.77	0.83	0.48
	Packaging	-	-	0.87	0.95
	Transportation	-	-	1.89	2.31
	Loading/unloading	-	-	0.53	0.38
	Storage and losses	-	-	-	1.32
	Market fee	-	-	-	0.32
	Sub-total	1.93	1.93	5.30	6.94
2	Local trader's price	76.92	76.92	-	-
2.1	Marketing cost of local trader				
	Packaging cost	0.97	1.05	-	-
	Transportation	1.31	1.38	-	-
	Loading/unloading	0.53	0.62	-	-
	Storage and losses	-	1.08	-	-
	Market fee	-	0.31	-	-
	Sub-total	2.81	4.44	-	-
	Margin of local trader	6.81	18.64	-	-
3	Price paid by C.A.	-	-	78.33	
3.1	Marketing cost of C.A.				
	State tax	-	-	0.78	-
	Storage and losses	-	-	0.40	-
	Others	-	-	0.33	-
	Sub-total	-	-	1.51	-
	Margin of C.A.	-	-	8.49	-
4	Retailer's price	86.54	-	88.33	-
4.1	Marketing cost of retailer				
	Packaging cost	-	-	0.96	-
	Transportation	-	-	1.14	-
	Loading/unloading	-	-	0.51	-
	Storage and losses	1.36	-	1.06	-
	Market fee	0.22	-	0.22	-
	Sub-total	1.58	-	3.89	-
	Margin of retailer	11.88	-	7.78	-
5	Consumer's price	100.00 (1300.00)	100.00 (1300.00)	100.00 (1320.00)	100.00 (1300.00)

C.A.: Commission agent

Figures in parentheses indicate the prices in rupees per quintal.

Table 4.42: Price-spread in marketing of lady finger (per cent share)

S. No.	Particulars	Marketing channels				
		III	IV	V	VI	VII
1	Producer's net price	73.78	73.79	70.48	79.36	92.56
1.1	Marketing cost incurred by producer					
	Assembling charges	1.22	1.21	1.15	1.22	1.23
	Cleaning	-	-	-	-	-
	Packaging	-	-	0.96	1.00	1.03
	Transportation	-	-	3.25	1.42	3.33
	Loading/unloading	-	-	0.57	0.33	0.33
	Storage and losses	-	-	-	-	1.18
	Market fee	-	-	-	-	0.34
	Sub-total	1.22	1.21	5.93	3.97	7.44
2	Local trader's price	75.00	75.00			
2.1	Marketing cost of local trader					
	Packaging cost	1.04	1.07	-	-	-
	Transportation	1.75	1.42	-	-	-
	Loading/unloading	0.58	0.58	-	-	-
	Storage and losses	-	1.27	-	-	-
	Market fee	-	0.23	-	-	-
	Sub-total	3.37	4.57	-	-	-
	Margin of local trader	9.13	20.45	-	-	-
3	Price paid by C.A.	-	-	76.42	-	-
3.1	Marketing cost of C.A.					
	State tax	-	-	0.76	-	-
	Storage and losses	-	-	0.49	-	-
	Others	-	-	0.37	-	-
	Sub-total	-	-	1.62	-	-
	Margin of C.A.	-	-	8.14	-	-
4	Retailer's price	87.50	-	86.18	83.33	-
4.1	Marketing cost of retailer					
	Packaging cost	-	-	1.02	-	-
	Transportation	-	-	1.30	-	-
	Loading/unloading	-	-	0.56	-	-
	Storage and losses	1.42	-	1.22	1.29	-
	Market fee	0.28	-	0.23	0.29	-
	Sub-total	1.70	-	4.33	1.58	-
	Margin of retailer	10.80		9.50	15.09	
5	Consumer's price	100.00 (1200.00)	100.00 (1200.00)	100.00 (1230.00)	100.00 (1200.00)	100.00 (1200.00)

C.A.: Commission agent
Figures in parentheses indicate the prices in rupees per quintal.

Table 4.43: Price-spread in marketing of bottle gourd (per cent share)

S. No.	Particulars	Marketing channels				
		III	IV	V	VI	VII
1	Producer's net price	64.61	65.06	63.69	71.08	90.66
1.1	Marketing cost incurred by producer					
	Assembling charges	1.73	1.66	1.71	1.71	1.70
	Cleaning	0.78	0.78	0.84	0.78	0.78
	Packaging	-	-	1.35	1.30	1.28
	Transportation	-	-	3.08	2.13	3.38
	Loading/unloading	-	-	0.86	0.50	0.50
	Storage and losses	-	-	-	-	1.20
	Market fee/commission	-	-	-	-	0.50
	Sub-total	2.51	2.44	7.84	6.42	9.34
2	Local trader's price	67.13	67.5	-	-	-
2.1	Marketing cost of local trader					
	Packaging cost	1.35	1.35	-	-	-
	Transportation	2.50	1.79	-	-	-
	Loading/unloading	0.78	0.78	-	-	-
	Storage and losses	-	1.24	-	-	-
	Market fee	-	0.35	-	-	-
	Sub-total	4.63	5.51	-	-	-
	Margin of local trader	8.25	26.99	-	-	-
3	Price paid by C.A.	-	-	71.53	-	-
3.1	Marketing cost of C.A.					
	State tax	-	-	0.72	-	-
	Storage and losses	-	-	0.61	-	-
	Others	-	-	0.53	-	-
	Sub-total	-	-	1.86	-	-
	Margin of C.A.	-	-	7.22	-	-
4	Retailer's price	80.00	-	76.09	77.50	-
4.1	Marketing cost of retailer					
	Packaging cost	-	-	1.32	-	-
	Transportation	-	-	1.76	-	-
	Loading/unloading	-	-	0.77	-	-
	Storage and losses	1.44	-	1.32	1.40	-
	Market fee	0.35	-	0.34	0.50	-
	Sub-total	1.79	-	5.51	1.90	-
	Margin of retailer	18.21	-	13.88	20.60	-
5	Consumer's price	100.00 (800.00)	100.00 (800.00)	100.00 (815.00)	100.00 (800.00)	100.00 (800.00)

C.A.: Commission agent
Figures in parentheses indicate the prices in rupees per quintal.

Price-spread: winter vegetable commodities

Tables 4.44 to 4.52 present detailed analysis of price-spread in marketing of winter vegetable commodities in the study area. Table 4.44 and 4.45 reveals that in radish 1 (normal season) and radish 2 (mid season), the per cent share of producers in consumer's rupee was maximum in direct sale in channel-VII (84.31 per cent and 86.80 per cent, respectively). However, producer's share was low in channel-IV for radish 1 (54.20 per cent) and radish 2 (60.17 per cent). The share of marketing cost incurred at producer's level was fairly high in channel-VII (15.69 per cent and 13.20 per cent, respectively for each commodity) in direct sale method mainly because of higher transportation cost from farm to market as the producer himself acted as a retailer. The margin taken by local trader was maximum in channel-IV (33.53 per cent and 29.68 per cent, respectively) for each commodity.

Table 4.46 shows the detailed analysis of price-spread in marketing of radish 3 (late season). As observed in other commodities, the per cent share of producer was also higher in channel-VII (87.54 per cent) in direct sale. The minimum producer's share was realized in channel-V (57.57 per cent) in sale through commission agents and retailers. The per cent share of margin taken by local trader was fairly high in channel-IV (30.09 per cent). The price-spread in marketing of pea given in Table 4. 47 reveals that producers retained maximum share in consumer's rupee in direct sale i.e. channel-VII (96.27 per cent). The channel-V (72.45 per cent) was least profitable channel for sale of pea involving commission agent and retailer in the study area. The commission agents who

Table 4.44: Price-spread in marketing of radish 1 (per cent share)

S. No.	Particulars	Marketing channels				
		III	IV	V	VI	VII
1	Producer's net price	54.24	54.20	58.13	63.82	84.31
1.1	Marketing cost incurred by producer					
	Assembling charges	3.76	3.80	3.43	3.50	3.80
	Cleaning	2.00	2.00	2.12	2.00	2.00
	Packaging	-	-	1.95	2.08	2.04
	Transportation	-	-	4.65	3.80	5.00
	Loading/unloading	-	-	1.33	0.80	0.80
	Storage and losses	-	-	-	-	1.25
	Market fee	-	-	-	-	0.80
	Sub-total	5.76	5.80	13.48	12.18	15.69
2	Local trader's price	60.00	60.00	-	-	-
2.1	Marketing cost of local trader					
	Packaging cost	0.68	0.86	-	-	-
	Transportation	3.00	2.82	-	-	-
	Loading/unloading	1.25	1.25	-	-	-
	Storage and losses	-	1.15	-	-	-
	Market fee	-	0.39	-	-	-
	Sub-total	4.93	6.47	-	-	-
	Margin of local trader	14.07	33.53	-	-	-
3	Price paid by C.A.	-	-	71.62	-	-
3.1	Marketing cost of C.A.					
	State tax	-	-	0.72	-	-
	Storage and losses	-	-	0.64	-	-
	Others	-	-	0.80	-	-
	Sub-total	-	-	2.16	-	-
	Margin of C.A.	-	-	6.99	-	-
4	Retailer's price	79	-	80.76	76.00	-
4.1	Marketing cost of retailer					
	Packaging cost	-	-	1.25	-	-
	Transportation	-	-	2.79	-	-
	Loading/unloading	-	-	1.19	-	-
	Storage and losses	1.41	-	2.15	1.43	-
	Market fee	0.56	-	0.54	0.80	-
	Sub-total	1.97	-	7.92	2.23	-
	Margin of retailer	19.03	-	11.32	21.77	-
5	Consumer's price	100.00 (800.00)	100.00 (800.00)	100.00 (815.00)	100.00 (800.00)	100.00 (800.00)

C.A.: Commission agent
Figures in parentheses indicate the prices in rupees per quintal.

Table 4.45: Price-spread in marketing of radish 2 (per cent share)

S. No.	Particulars	Marketing channels				
		III	IV	V	VI	VII
1	Producer's net price	60.17	60.17	58.44	66.60	86.80
1.1	Marketing cost incurred by producer					
	Assembling charges	3.16	3.13	3.09	2.83	3.13
	Cleaning	1.66	1.70	1.95	1.67	1.67
	Packaging	-	-	1.66	1.73	1.70
	Transportation	-	-	3.97	3.17	4.17
	Loading/unloading	-	-	1.14	0.67	0.67
	Storage and losses	-	-	-	-	1.20
	Market fee	-	-	-	-	0.66
	Sub-total	4.82	4.83	11.81	10.07	13.20
2	Local trader's price	65.00	65.00	-	-	-
2.1	Marketing cost of local trader					
	Packaging cost	0.67	0.75	-	-	-
	Transportation	2.30	2.33	-	-	-
	Loading/unloading	0.90	1.02	-	-	-
	Storage and losses	-	0.88	-	-	-
	Market fee	-	0.34	-	-	-
	Sub-total	3.87	5.32	-	-	-
	Margin of local trader	9.47	29.68	-	-	-
3	Price paid by C.A.	-	-	70.24	-	-
3.1	Marketing cost of C.A.					
	State tax	-	-	0.70	-	-
	Storage and losses	-	-	0.67	-	-
	Others	-	-	0.68	-	-
	Sub-total	-	-	2.05	-	-
	Margin of C.A.	-	-	7.05	-	-
4	Retailer's price	78.33	-	79.35	76.67	-
4.1	Marketing cost of retailer					
	Packaging cost	-	-	1.12	-	-
	Transportation	-	-	2.20	-	-
	Loading/unloading	-	-	0.98	-	-
	Storage and losses	1.87	-	1.77	1.63	-
	Market fee	0.50	-	0.46	0.50	-
	Sub-total	2.37	-	6.53	2.13	-
	Margin of retailer	19.30	-	14.12	21.20	-
5	Consumer's price	100.00 (600.00)	100.00 (600.00)	100.00 (615.00)	100.00 (600.00)	100.00 (600 00)

C.A.: Commission agent
Figures in parentheses indicate the prices in rupees per quintal.

Table 4.46: Price-spread in marketing of radish 3 (per cent share)

S. No.	Particulars	Marketing channels			
		III	IV	V	VII
1	Producer's net price	57.88	59.40	57.57	87.54
1.1	Marketing cost incurred by producer				
	Assembling charges	2.89	2.86	2.69	2.97
	Cleaning	1.54	1.58	1.49	1.54
	Packaging	-	-	1.46	1.59
	Transportation	-	-	2.99	3.85
	Loading/unloading	-	-	1.04	0.62
	Storage and losses	-	-	0.82	1.28
	Market fee/commission	-	-	-	0.61
	Sub-total	4.43	4.44	10.49	12.46
2	Local trader's price	62.31	63.85	-	-
2.1	Marketing cost of local trader				
	Packaging cost	0.77	0.89	-	-
	Transportation	2.31	2.21	-	-
	Loading/unloading	0.96	0.96	-	-
	Storage and losses	-	1.57	-	-
	Market fee	-	0.44	-	-
	Sub-total	4.04	6.07	-	-
	Margin of local trader	12.12	30.09	-	-
3	Price paid by C.A.	-	-	68.06	-
3.1	Marketing cost of C.A.				
	State tax	-	-	0.68	-
	Storage and losses	-	-	0.61	-
	Others	-	-	0.63	-
	Sub-total	-	-	1.92	-
	Margin of C.A.	-	-	6.74	-
4	Retailer's price	78.46	-	76.72	-
4.1	Marketing cost of retailer				
	Packaging cost	-	-	1.01	-
	Transportation	-	-	2.14	-
	Loading/unloading	-	-	0.93	-
	Storage and losses	1.29	-	1.32	-
	Market fee	0.44	-	0.43	-
	Sub-total	1.73	-	5.83	-
	Margin of retailer	19.80	-	17.45	-
5	Consumer's price	100.00 (650.00)	100.00 (650.00)	100.00 (670.00)	100.00 (650.00)

C.A.: Commission agent
Figures in parentheses indicate the prices in rupees per quintal.

Table 4.47: Price-spread in marketing of pea (per cent share)

S. No.	Particulars	Marketing channels		
		IV	V	VII
1	Producer's net price	76.37	72.45	96.27
1.1	Marketing cost incurred by producer			
	Assembling charges	0.67	0.65	0.52
	Cleaning	-	-	
	Packaging	-	0.48	0.54
	Transportation	-	1.25	1.57
	Loading/unloading	-	0.35	0.37
	Storage and losses	-	-	0.52
	Market fee	-	-	0.21
	Sub-total	0.67	2.73	3.73
2	Local trader's price	77.04	-	-
2.1	Marketing cost of local trader			
	Packaging cost	0.64	-	-
	Transportation	0.82	-	-
	Loading/unloading	0.32	-	-
	Storage and losses	0.62	-	-
	Market fee	0.15	-	-
	Sub-total	2.55	-	-
	Margin of local trader	20.41	-	-
3	Price paid by C.A.	-	75.20	-
3.1	Marketing cost of C.A.			
	State tax	-	0.75	-
	Storage and losses	-	0.38	-
	Others	-	0.21	-
	Sub-total	-	1.34	-
	Margin of C.A.	-	8.27	-
4	Retailer's price	-	84.80	-
4.1	Marketing cost of retailer			
	Packaging cost	-	0.42	-
	Transportation	-	0.85	-
	Loading/unloading	-	0.30	-
	Storage and losses	-	0.78	-
	Market fee	-	0.20	-
	Sub-total	-	2.55	-
	Margin of retailer	-	12.66	-
5	Consumer's price	100.00 (1947.00)	100.00 (2000.00)	100.00 (1906.00)

C.A.: Commission agent
Figures in parentheses indicate the prices in rupees per quintal.

were involved in channel-V took away substantial margin (8.27 per cent) with very little efforts. The net margin of local trader was 20.41 per cent in channel-IV and the retailers reaped 12.66 per cent margin in channel-V. A close perusal of Table 4.48 reveals that in cauliflower 1 (normal season), the per cent share of producer in consumer's rupee was highest in direct sale in channel-VII (90.70 per cent) in which producer himself acted as a retailer in sale in the market. The share of marketing cost incurred by producers was found to be fairly high in this channel (9.30 per cent). There was no marketing cost at producer's level in sale through channel-I and channel-II involving pre-harvest contractor and retailer. However, the margin taken by the pre-harvest contractor was maximum (27.02 per cent) in channel-II followed by local trader (25.85 per cent) in channel-IV.

The price-spread in marketing of cauliflower 2 (mid season) is displayed in Table 4.49. The maximum (91.48 per cent) share of producer in consumer's rupee was found in direct sale (channel-VII). The producer's share was minimum in channel-V (63.04 per cent) involving commission agent and retailers. The share of marketing cost incurred at producer's level was maximum in channel-VII (8.52 per cent) followed by channel-VI (5.28 per cent). Among different functionaries, the margin taken by local trader was maximum in channel-IV (27.96 per cent) when local trader also acted as a retailer. Table 4.50 further shows that in marketing of cauliflower 3 (late season), producer received a relatively higher share in sale through channel-IV (71.33 per cent) involving local trader as compared to channel-V (69.44 per cent) involving commission agent and retailer. The total cost of marketing incurred at producer's level was relatively

Table 4.48: Price-spread in marketing of Cauliflower 1 (per cent share)

S. No.	Particulars	Marketing channels						
		I	II	III	IV	V	VI	VII
1	Producer's net price	64.12	64.70	65.28	65.84	64.44	71.19	90.70
1.1	Marketing cost incurred by producer							
	Assembling charges	-	-	1.03	1.06	1.04	1.08	1.10
	Cleaning	-	-	0.74	0.75	0.73	0.74	0.74
	Packaging	-	-	-	-	1.20	1.22	1.20
	Transportation	-	-	-	-	2.91	1.76	2.94
	Loading/unloading	-	-	-	-	0.82	0.48	0.47
	Storage and losses	-	-	-	-	-		2.38
	Market fee/commission	-	-	-	-	-		0.47
	Sub-total	-	-	1.77	1.81	6.70	5.28	9.30
2	Price paid by PHC	64.12	64.70	-	-	-	-	-
2.1	Marketing cost incurred by PHC							
	Assembling charges	1.10	1.07	-	-	-	-	-
	Cleaning	0.74	0.74	-	-	-	-	-
	Packaging	1.41	1.29	-	-	-	-	-
	Transportation	2.00	2.24	-	-	-	-	-
	Loading/unloading	0.82	0.82	-	-	-	-	-
	Storage and losses	-	1.65	-	-	-	-	-
	Market fee/commission	-	0.47	-	-	-	-	-
	Sub-total	6.07	8.28	-	-	-	-	-
	Margin of PHC	10.99	27.02	-	-	-	-	-
3	Local trader's price	-	-	67.06	67.65	-	-	-
3.1	Marketing cost of local trader					-		
	Packaging cost	-	-	1.41	1.41	-	-	-
	Transportation	-	-	2.94	2.12	-	-	-

Contd../-

S. No.	Particulars	Marketing channels						
		I	II	III	IV	V	VI	VII
	Loading/unloading	-	-	0.74	0.74	-	-	-
	Storage and losses	-	-		1.76	-	-	-
	Market fee	-	-		0.47	-	-	-
	Sub-total	-	-	5.09	6.50	-	-	-
	Margin of local trader	-	-	8.44	25.85	-	-	-
4	Price paid by C.A.	-	-		-	71.13	-	-
4.1	Marketing cost of C.A.							
	State tax	-	-	-	-	0.71	-	-
	Storage and losses	-	-	-	-	0.41	-	-
	Others	-	-	-	-	0.48	-	-
	Sub-total		-	-	-	1.60	-	-
	Margin of C.A.		-	-	-	7.47		-
5	Retailer's price	81.18	-	80.59	-	80.21	76.47	-
5.1	Marketing cost of retailer							
	Packaging cost	-	-	-	-	1.39	-	-
	Transportation	-	-	-	-	1.98	-	-
	Loading/unloading		-		-	0.73	-	-
	Storage and losses	3.09	-	2.12	-	1.92	2.38	-
	Market fee	0.47	-	0.33	-	0.33	0.47	-
	Sub-total	3.56	-	2.45	-	6.35	2.85	-
	Margin of retailer	15.26	-	16.97	-	13.44	20.68	-
6	Consumer's price	100.00	100.00	100.00	100.00	100.00	100.00	100.00
		(850.00)	(850.00)	(850.00)	(850.00)	(859.00)	(850.00)	(850.00)

C.A. : Commission agent
PHC : Pre-harvest contractor
Figures in parentheses indicate the prices in rupees per quintal.

Table 4.49: Price-spread in marketing of Cauliflower 2 (per cent share)

S. No.	Particulars	Marketing channels						
		I	II	III	IV	V	VI	VII
1	Producer's net price	65.79	65.96	63.64	64.68	63.04	72.63	91.48
1.1	Marketing cost incurred by producer							
	Assembling charges	-	-	0.96	0.98	0.96	0.99	1.02
	Cleaning	-	-	0.66	0.66	0.65	0.66	0.70
	Packaging	-	-	-	-	0.34	1.08	1.09
	Transportation	-	-	-	-	2.60	1.58	2.70
	Loading/unloading	-	-	-	-	0.73	0.42	0.43
	Storage and losses	-	-	-	-	-		2.15
	Market fee/commission	-	-	-	-	-		0.43
	Sub-total	-	-	1.62	1.64	5.28	4.73	8.52
2	Price paid by PHC	65.79	65.96	-	-	-	-	-
2.1	Marketing cost incurred by PHC							
	Assembling charges	0.99	0.99	-	-	-	-	-
	Cleaning	0.68	0.68	-	-	-	-	-
	Packaging	1.16	1.26	-	-	-	-	-
	Transportation	1.68	2.09	-	-	-	-	-
	Loading/unloading	0.68	0.71	-	-	-	-	-
	Storage and losses	-	1.57	-	-	-	-	-
	Market fee/commission	-	0.42	-	-	-	-	-
	Sub-total	5.19	7.72	-	-	-	-	-
	Margin of PHC	9.54	26.32	-	-	-	-	-
3	Local trader's price	-	-	65.26	66.32	-	-	-
3.1	Marketing cost of local trader							
	Packaging cost	-	-	1.28	1.28	-	-	-
	Transportation	-	-	2.63	1.79	-	-	-

Contd../-

S. No.	Particulars	Marketing channels						
		I	II	III	IV	V	VI	VII
	Loading/unloading	-	-	0.67	0.67	-	-	-
	Storage and losses	-	-	-	1.69	-	-	-
	Market fee	-	-	-	0.29	-	-	-
	Sub-total	-	-	4.58	5.72	-	-	-
	Margin of local trader	-	-	9.10	27.96	-	-	-
4	Price paid by C.A.	-	-	-	-	68.33	-	-
4.1	Marketing cost of C.A.							
	State tax	-	-	-	-	0.68	-	-
	Storage and losses	-	-	-	-	0.42	-	-
	Others	-	-	-	-	0.43	-	-
	Sub-total	-	-	-	-	1.53	-	-
	Margin of C.A.		-	-	-	7.19	-	-
5	Retailer's price	80.53	-	78.95	-	77.05	77.37	-
5.1	Marketing cost of retailer							
	Packaging cost	-	-	-	-	1.25	-	-
	Transportation	-	-	-	-	1.77	-	-
	Loading/unloading	-	-	-	-	0.73	-	-
	Storage and losses	3.13	-	1.92	-	1.71	2.29	-
	Market fee	0.42	-	0.42	-	0.31	0.42	-
	Sub-total	3.55	-	2.34	-	5.77	2.71	-
	Margin of retailer	15.93	-	18.72	-	17.19	19.93	-
6	Consumer's price	100.00 (950.00)	100.00 (955.00)	100.00 (950.00)	100.00 (950.00)	100.00 (963.00)	100.00 (950.00)	100.00 (925.00)

C.A. : Commission agent
PHC : Pre-harvest contractor
Figures in parentheses indicate the prices in rupees per quintal.

Table 4.50: Price-spread in marketing of cauliflower 3 (per cent share)

S. No.	Particulars	Marketing channels	
		IV	V
1	Producer's net price	71.33	69.42
1.1	Marketing cost incurred by producer		
	Assembling charges	0.83	0.81
	Cleaning	0.57	0.54
	Packaging	-	0.93
	Transportation	-	2.20
	Loading/unloading	-	0.62
	Storage and losses	-	-
	Market fee	-	-
	Sub-total	1.40	5.10
2	Local trader's price	72.73	-
2.1	Marketing cost of local trader		
	Packaging cost	1.03	-
	Transportation	1.64	-
	Loading/unloading	0.57	-
	Storage and losses	1.45	-
	Market fee	0.26	-
	Sub-total	4.95	-
	Margin of local trader	22.32	-
3	Price paid by C.A.	-	79.30
3.1	Marketing cost of C.A.		
	State tax	-	0.73
	Storage and losses	-	0.44
	Others	-	0.36
	Sub-total	-	1.53
	Margin of C.A.	-	7.99
4	Retailer's price	-	84.05
4.1	Marketing cost of retailer		
	Packaging cost	-	0.98
	Transportation	-	1.26
	Loading/unloading	-	0.56
	Storage and losses	-	1.84
	Market fee	-	0.20
	Sub-total	-	4.84
	Margin of retailer	-	11.12
5	Consumer's price	100.00 (1100.00)	100.00 (1135.00)

C.A.: Commission agent
Figures in parentheses indicate the prices in rupees per quintal.

higher in channel-V (5.10 per cent) as compared to channel-IV (1.40 per cent). Among different functionaries, the margin of local trader was maximum in channel-IV (22.32 per cent).

The price-spread in marketing of cabbage 1 (normal season) displayed in Table 4.51 shows the maximum share of producer (90.96 per cent) in direct sale (channel-VII) and minimum in channel-IV (66.61 per cent). The share of marketing cost incurred at producer's level was relatively higher in channel-VII (9.04 per cent) followed by channel-V (7.52 per cent). Among different market functionaries, the margin taken by local trader was quite high (25.16 per cent) in channel-IV. Table 4.52 contemplates the detailed analysis of price-spread in marketing of cabbage 2 (mid season) in the study area. The producer's share was relatively higher in channel-IV (69.98 per cent) involving local traders as compared to channel-V (67.04 per cent) involving commission agent and retailer. The share of marketing cost incurred at producer's level was more in channel-V (7.02 per cent) as compared to channel-IV (1.89 per cent). Among different functionaries, the margin of local trader was maximum (22.21 per cent) in channel-IV.

4.6 Structure and Behaviour of Price of Vegetables

The analysis of past trends in market arrivals and prices for agricultural commodities is useful in understanding the present scenario and to forecast the future. The quantification of these aspects in different commodities has become imperative from market reforms and policy point of view, to make prices stable for the benefits of producers, processors and consumers. Keeping this in view, the structure and behaviour of arrivals and prices of major vegetable commodities in selected markets (Kangra and Nagrota) of Kangra district have been examined.

Table 4.51: Price-spread in marketing of cabbage 1 (per cent share)

S. No.	Particulars	Marketing channels			
		IV	V	VI	VII
1	Producer's net price	66.61	67.25	75.35	90.96
1.1	Marketing cost incurred by producer				
	Assembling charges	1.20	1.16	1.24	1.25
	Cleaning	0.87	0.82	0.83	0.85
	Packaging	-	1.35	1.38	1.36
	Transportation	-	3.27	3.33	3.33
	Loading/unloading	-	0.92	0.54	0.53
	Storage and losses	-	-	-	1.19
	Market fee/commission	-	-	-	0.53
	Sub-total	2.07	7.52	7.32	9.04
2	Local trader's price	68.67	-	-	-
2.1	Marketing cost of local trader				
	Packaging cost	1.63	-	-	-
	Transportation	1.90	-	-	-
	Loading/unloading	0.83	-	-	-
	Storage and losses	1.42	-	-	-
	Market fee	0.38	-	-	-
	Sub-total	6.16	-	-	-
	Margin of local trader	25.16	-	-	-
3	Price paid by C.A.	-	74.77	-	-
3.1	Marketing cost of C.A.				
	State tax	-	0.75	-	-
	Storage and losses	-	0.80	-	-
	Others	-	0.54	-	-
	Sub-total	-	2.09	-	-
	Margin of C.A.	-	7.82	-	-
4	Retailer's price	-	84.68	82.67	-
4.1	Marketing cost of retailer				
	Packaging cost	-	1.50	-	-
	Transportation	-	1.87	-	-
	Loading/unloading	-	0.81	-	-
	Storage and losses	-	1.32	1.33	-
	Market fee	-	0.33	0.40	-
	Sub-total	-	5.83	1.73	-
	Margin of retailer	-	9.49	15.60	-
5	Consumer's price	100.00 (750.00)	100.00 (765.00)	100.00 (750.00)	100.00 (750.00)

C.A.: Commission agent
Figures in parentheses indicate the prices in rupees per quintal.

Table 4.52: Price-spread in marketing of cabbage 2 (per cent share)

S. No.	Particulars	Marketing channels	
		IV	V
1	Producer's net price	69.98	67.04
1.1	Marketing cost incurred by producer		
	Assembling charges	1.11	1.10
	Cleaning	0.78	0.77
	Packaging	-	1.27
	Transportation	-	3.03
	Loading/unloading	-	0.85
	Storage and losses	-	-
	Market fee/commission	-	-
	Sub-total	1.89	7.02
2	Local trader's price	71.88	-
2.1	Marketing cost of local trader		
	Packaging cost	1.56	-
	Transportation	1.79	-
	Loading/unloading	0.86	-
	Storage and losses	1.35	-
	Market fee	0.36	-
	Sub-total	5.92	-
	Margin of local trader	22.21	-
3	Price paid by C.A.	-	74.06
3.1	Marketing cost of C.A.		
	State tax	-	0.83
	Storage and losses	-	0.73
	Others	-	0.50
	Sub-total	-	2.06
	Margin of C.A.	-	7.40
4	Retailer's price	-	83.52
4.1	Marketing cost of retailer		
	Packaging cost	-	1.59
	Transportation	-	1.73
	Loading/unloading	-	0.75
	Storage and losses	-	1.33
	Market fee	-	0.35
	Sub-total	-	5.75
	Margin of retailer	-	10.73
5	Consumer's price	100.00 (800.00)	100.00 (825.00)

C.A.: Commission agent
Figures in parentheses indicate the prices in rupees per quintal.

4.6.1 Variability in arrivals and prices of major vegetable commodities

The analysis of variability in arrivals and prices indicates the extent to which marketing system is managing the arrivals in the market. The extent of variability in monthly arrivals and average wholesale prices of summer and winter vegetable commodities in the selected markets has been analysed for the period 2000-01 to 2006-07.

Table 4.53 shows the extent of variability in arrivals and wholesale prices for major summer vegetable commodities. The coefficient of variation in prices of tomato was found to be fairly high (42.65 per cent) in Kangra market as compared to Nagrota market (38.04 per cent). However, the variability in arrivals of tomato was found to be much higher in Nagrota market (65.89 per cent) as compared to Kangra market (37.36 per cent). Similarly in brinjal, the coefficient of variation of monthly prices was higher in Kangra market (35.51 per cent) while variation in arrivals was as high as 75.88 per cent in Nagrota market in comparison to 55.27 per cent in Kangra market. In case of frenchbean, the coefficient of variation in prices was found to be 30.34 per cent in Kangra and 29.01 per cent in Nagrota market. The coefficient of variation in arrivals of frenchbean was also very high in Kangra (83.06 per cent) and Nagrota markets (50.21 per cent). The coefficient of variation in both the prices and arrivals of lady finger was found to be 54.26 per cent and 88.20 per cent in Nagrota market. In case of bottle gourd, the coefficient of variation in prices was found to be 62.22 per cent in Kangra market and 78.45 per cent in Nagrota market. The variability in arrivals of bottle gourd was found to be as high as 81.61 per cent in Kangra and 72.61 per cent in Nagrota market.

Table 4.53: Mean and coefficient of variation of monthly wholesale prices and arrivals of different vegetables in Kangra and Nagrota markets, 2000-01 to 2006-07

(Arrival q, Price Rs/q)

Vegetables		Kangra market		Nagrota market	
		Mean	C. V. (per cent)	Mean	C. V (per cent)
Summer vegetables					
Tomato	Prices	721.73	42.65	797.92	38.04
	Arrivals	527.4	37.36	248.12	65.89
Brinjal	Prices	477.98	35.51	500.60	28.61
	Arrivals	208.00	55.27	97.15	75.88
French-bean	Prices				
	Arrivals	84.80	83.06	31.39	50.21
Lady finger	Prices	1138.69	46.52	1083.93	54.26
	Arrivals	152.99	65.14	96.31	88.20
Bottle gourd	Prices	626.49	62.22	798.87	78.45
	Arrivals	244.96	81.61	119.79	72.61
Winter vegetables					
Radish	Prices	310.71	44.37	417.26	30.19
	Arrivals	275.57	67.24	115.96	53.83
Pea	Prices	1557.14	44.63	1491.67	38 79
	Arrivals	140.25	63.15	75.32	63.79
Potato	Prices	475.60	33.30	496.07	32.16
	Arrivals	328.87	27.56	140.13	26.98
Cauliflower	Prices	735.12	46.90	741.37	39.38
	Arrivals	564.90	73.11	172.81	61.85
Cabbage	Prices	361.31	46.37	500.30	38.30
	Arrivals	592.80	58.83	184.85	56.66

The detailed analysis of variability in arrivals and prices of major winter vegetable commodities have been displayed in Table 4.53. A perusal of this table shows that variability in prices of radish was relatively higher in Kangra market (44.37 per cent) in comparison to Nagrota market (30.19 per cent). Likewise, the variability in arrivals of radish was also higher in Kangra (67.24 per cent) as compared to 53.83 per cent in Nagrota market. In case of pea, the price variability was to the tune of 44.63 per cent in Kangra and 38.79 per cent in Nagrota. However, the lowest variation in arrivals of pea was found among all other vegetable commodities in both the markets. In case of cauliflower, the variability in both prices (46.90 per cent) and arrivals (73.11 per cent) was higher in Kangra market as compared to Nagrota. Similar pattern was visible in arrivals and prices of cabbage.

4.6.2 Trends in arrivals and prices

Trend analysis shows the magnitude and direction of changes in market behaviour. The trends for arrivals and prices for major vegetable commodities have been worked out on the basis of average monthly arrival and prices for the period 2000-01 to 2006-07 and the results are displayed in Tables 4.54 and 4.55.

Trends in arrivals and prices for summer vegetable commodities have been displayed in Table 4.54. In case of tomato, the regression equation for both arrivals and prices showed positive trends in both Kangra and Nagrota markets. During the past 7 years, the arrivals increased by about 0.36 and 0.83 quintals per month whereas, during the same period, the prices of tomato showed significant increase of about Rs. 6.44 and Rs. 6.38/q per month in Kangra and

Table 4.54: Trends in monthly arrivals and prices of summer vegetable commodities in Kangra and Nagrota markets

(Arrivals, q, Price Rs/q)

Vegetables		Kangra market				Nagrota market			
		Intercept (a)	Regression coefficient (b)	R^2	F-value	Intercept (a)	Regression coefficient (b)	R^2	F-value
Tomato	Arrivals	512.21	0.36	0.01	0.16	212.64	0.83	0.02	1.29
			(0.90)				(0.73)		
	Prices	447.98	6.44*	0.26*	28.43	526.76	6.38*	0.26*	29.25
			(1.21)				(1.18)		
Brinjal	Arrivals	210.51	-0.06	0.0002	0.013	101.74	-0.11	0.001	0.10
			(0.52)				(0.33)		
	Prices	265.69	4.99*	0.51*	85.02	479.65	3.22	0.01	0.50
			(0.54)				(4.54)		
Frenchbean	Arrivals	112.11	-0.64**	0.05	4.22	31.08	0.01	0.0001	0.01
			(0.31)				(0.71)		
	Prices	736.72	9.36*	0.43*	63.09	748.11	8.57*	0.42*	58.21
			(1.18)				(1.12)		
Lady finger	Arrivals	149.58	0.08	0.0004	0.03	86.09	0.22	0.004	0.33
			(0.45)				(0.38)		
	Prices	761.88	8.87*	0.16*	16.17	774.53	7.28*	0.09*	8.23
			(2.21)				(2.54)		
Bottle gourd	Arrivals	289.27	-1.04	0.02	1.35	105.78	0.33	0.01	0.71
			(0.90)				(0.39)		
	Prices	384.16	5.70*	0.13*	11.8	605.49	4.55	0.03	2.66
			(1.66)				(2.79)		

** significant at 1 per cent level.*
*** significant at 5 per cent level*

Table 4.55: Trends in monthly arrivals and prices of winter vegetable commodities in Kangra and Nagrota markets

(Arrivals, q, Price Rs/q)

Vegetables		Kangra market				Nagrota market			
		Intercept (a)	Regression coefficient (b)	R^2	F-value	Intercept (a)	Regression coefficient (b)	R^2	F-value
Radish	Arrivals	97.61	4.19*	0.30*	35.19	47.88	1.60*	0.39*	52.84
			(0.71)				(0.22)		
	Prices	168.35	3.35*	0.35*	43.59	378.66	0.91	0.03	2.6
			(0.51)				(0.56)		
Pea	Arrivals	147.10	-0.16	0.002	0.16	64.68	0.25	0.02	1.35
			(0.40)				(0.22)		
	Prices	1146.90	9.65*	0.11*	10.49	1143	8.20*	0.12*	11.14
			(2.98)				(2.46)		
Potato	Arrivals	344.22	-0.36	0.01	0.77	134.36	0.14	0.01	0.63
			(0.41)				(0.17)		
	Prices	292.18	4.32*	0.44*	63.5	291.15	4.82*	0.54*	97.63
			(0.54)				(0.49)		
Cauliflower	Arrivals	455.61	2.57	0.02	1.91	87.43	2.01*	0.21*	21.83
			(1.86)				(0.43)		
	Prices	555.56	4.23*	0.09*	7.94	544.99	4.62*	0.15*	14.37
			(1.50)				(1.22)		
Cabbage	Arrivals	428.33	3.89*	0.07**	6.20	72.60	2.64*	0.38*	49.91
			(1.56)				(0.37)		
		166.76	4.56*	0.42*	59.62	433.46	1.57**	0.04	3.42
			(0.59)				(0.85)		

** significant at 1 per cent level.*
*** significant at 5 per cent level*

Nagrota markets, respectively. However, the value of R^2 was quite low showing low explanatory power of the fitted equation because of seasonality in arrivals and prices. In case of brinjal, the trend equations revealed decrease in monthly arrivals by 0.06 quintals and 0.11 quintals per month over the years in Kangra and Nagrota markets, respectively. Contrary to this, the price showed continuous increase of Rs.4.99/q and Rs. 3.22/q per month over the years in Kangra and Nagrota markets, respectively. In case of frenchbean, the trend equations revealed significant decrease in arrivals in Kangra market by 0.64 quintals per month. However, the arrivals in Nagrota market showed increasing trend by about 0.01q/month. There was significant increase in the price of frenchbean to the extent of Rs 9.36/q and Rs 8.57/q per month in Kangra and Nagrota markets, respectively.

The arrivals of lady finger showed non-significant increase in both the study markets. However, significant increase was noticed in prices of lady finger that increased by Rs 8.87/q and Rs 7.28/q per month during the past seven years in both Kangra and Nagrota markets, respectively. It is also noticed that trend equations for arrivals and prices in these markets explained only 10 per cent variations in prices. This weak trend could be attributed to seasonality affecting arrivals and prices of most of the vegetables. The trend equation for bottle gourd indicated that arrivals decreased by 1.04 q/month in Kangra market. Whereas, arrivals increased by 0.33 q/month in Nagrota market. Contrary to this, the price of bottle gourd showed significant increase to the tune of Rs 5.70 and Rs 4.55/q per month in both Kangra and Nagrota markets, respectively.

Trends in arrivals in prices for winter vegetable commodities have been depicted in Table 4.55. Among different winter vegetables, the arrival of radish increased significantly by 4.19 q/month in Kangra and 1.60 q/month in Nagrota market. The price of radish also increased by Rs.3.35/q per month in

Kangra and Rs.0.91/q per month in Nagrota over the years. The trend equation also explained reasonable variation in arrivals and prices as revealed through significant values of R^2. The arrivals of pea decrease by about 0.16 quintal per month in Kangra market while the same increase by 0.25 quintal per month in Nagrota, though these trends were non-significant. However, there was significant increase in prices of pea in both the markets. The prices of pea increased by Rs 9.65/q and Rs 8.20/q per month in both Kangra and Nagrota markets, respectively. There was non-significant decrease (0.36 q/month) in the arrivals of potato in Kangra market. The arrival of potato in Nagrota market showed some increase trend (0.14 q/month) though non-significant. But, the prices of potato witnessed significant increase over the years by Rs 4.32 (Kangra) and Rs 4.82 (Nagrota) per quintal per month during the period 2000-01 to 2007-08. Significant increase was also noticed in the arrivals of cauliflower in both the study markets. The arrival of cauliflower showed increase of 2.57q/month in Kangra and 2.01q/month in Nagrota market. Like other vegetable commodities, there was significant increase in prices of cauliflower to the tune of Rs 4.23/q and Rs 4.62/q per month over past 7 years in Kangra and Nagrota markets, respectively. There was significant increase in arrivals of cabbage to the extent of 3.89 and 2.64 quintals per month in Kangra and Nagrota markets, respectively. Similarly, the prices of cabbage recorded significant increase of Rs 4.56 in Kangra and Rs 1.57/q per month in Nagrota over the period under consideration.

4.6.3 Relationship between arrivals and prices

The relationship between the prices and arrivals of major vegetable commodities in the study area was studied and the results are displayed in Table 4.56.

Table 4.56 : Effect of arrivals on prices of vegetable commodities in Kangra and Nagrota markets (Rs./q)

Vegetables	Kangra market				Nagrota market			
	Intercept (a)	Regression coefficient (b)	R^2	F- value	Intercept (a)	Regression coefficient (b)	R^2	F- value
Summer vegetables								
Tomato	972.71	-0.48*	0.09*	8.39	924.24	-0.51*	0.08*	6.67
		(0.16)				(0.20)		
Brinjal	514.16	-0.17	0.01	1.18	531.06	-0.31	0.03	2.19
		(0.16)				(0.21)		
Frenchbean	1307.90	-2.04*	0.18*	17.40	1303.76	-6.09*	0.09*	7.86
		(0.49)				(2.17)		
Lady finger	1405.39	-1.74*	0.11*	9.88	1416.79	-3.46*	0.25*	27.22
		(0.55)				(0.66)		
Bottle gourd	900.61	-1.12*	0.33*	39.62	1252.24	-3.78*	0.28*	31.24
		(0.18)				(0.68)		
Winter vegetables								
Radish	306.24	0.02	0.001	0.04	443.77	-0.23	0.01	1.07
		(0.08)				(0.22)		
Pea	2016.39	-3.27*	0.17*	17.29	1895.31	-5.36*	0.20*	20.25
		(0.79)				(1.19)		
Potato	665.21	-0.58*	0.11*	10.01	507.86	-0.08	0.001	0.03
		(0.18)				(0.47)		
Cauliflower	964.15	-0.41*	0.24*	25.31	886.17	-0.84*	0.09*	8.52
		(0.08)				(0.29)		
Cabbage	414.93	-0.09**	0.04	3.01	554.76	-0.29	0.03	2.18
		(0.05)				(0.20)		

** Significant at 1 per cent level.*
*** Significant at 5 per cent level.*

The regression coefficient of tomato indicates that, on an average, there was significant decrease in prices to the tune of Rs 0.48/q in Kangra and Rs 0.51/q in Nagrota market with the increase in arrivals of tomato. This shows the typical inverse relationship between arrivals and prices of tomato. The regression coefficient for brinjal was negative but non significant in both the markets showing there was less effect of arrivals on prices. In case of frenchbean, there was significant decrease in prices by Rs 2.04/q in Kangra and Rs 6.09/q in Nagrota with the increase in arrivals of frenchbean. For lady finger, the regression coefficient was negative and statistically significant indicating there was a decrease in prices worth Rs 1.74/q in Kangra and Rs 3.46/q in Nagrota market with increase in arrivals of lady finger. In case of bottle gourd, there was significant decrease in prices to the extent of Rs 1.12/q in Kangra and Rs 3.78/q in Nagrota with increase in arrivals.

Among different winter vegetable commodities, radish showed non-significant effect of arrivals on prices in both the study market. There was decrease in prices of pea with increase in arrivals in both Kangra (Rs 3.27/q) and Nagrota (5.36/q) markets. In case of potato, the prices showed significant decrease worth Rs 0.58/q in Kangra with increase in arrivals while there was non-significant relationship between arrivals and prices of potato in Nagrota market. For cauliflower, there was a negative significant value of regression coefficient indicating inverse relationship between prices and arrivals of cauliflower in both the markets. The prices of cauliflower decreased by Rs 0.41 in Kangra and 0.84 in Nagrota with one quintal increase in arrivals. In case of

cabbage, there was less effect of arrivals on prices in both the markets. The value of R^2 was found low in all the vegetable commodities clearly showing that seasonality and random factors might have more impact on prices.

4.6.4 Seasonal behaviour of prices and arrivals

The seasonal behaviour of arrivals and prices for different vegetable commodities in principal market Kangra and sub market Nagrota has been studied and the results are displayed in Table 4.57 and 4.58.

Seasonal behaviour of monthly wholesale prices and arrivals of different summer vegetable commodities for Kangra and Nagrota markets have been presented in Table 4.56. In case of tomato, arrival indices were highest in the month of May in both Kangra (149.53 per cent) and Nagrota markets (226.79 per cent). The lowest arrival was noticed in the month of November and October with 71.51 and 74.69 per cent indices for Kangra and 52.99 and 57.16 per cent for Nagrota markets. In case of prices, indices were fairly high in the months of August (155.92 per cent) and September (136.71 per cent) for Kangra market while for Nagrota, the price indices were quite high during the months of October (125.63 per cent) and September (123.29 per cent). The lowest price was found during the month of May with price indices of about 61 per cent for Kangra and about 73 per cent for Nagrota markets. For brinjal, the highest arrival indices were in the month of May in Kangra (148.09 per cent) and Nagrota (196.85 per cent) markets as this was the main supply month of brinjal in study markets. The price indices were maximum in April (119.16 per cent) and minimium in June (81.52 per cent) in Kangra market while it was highest in the month of September

Table 4.57 : Seasonal indices of arrivals and prices of summer vegetable commodities in Kangra and Nagrota markets (2000 - 01 through 2006 - 07)

(Per cent)

Vegetables			Month											
			April	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Tomato	Kangra	Arrivals	124.51	149.53	140.94	136.75	81.84	92.17	74.69	71.51	80.92	75.25	87.22	84.67
		Prices	85.18	60.84	74.94	75.31	155.92	136.71	130.40	136.29	102.86	82.78	84.96	73.81
	Nagrota	Arrivals	106.92	226.79	195.69	122.22	68.20	71.19	57.16	52.99	61.28	74.58	91.42	71.55
		Prices	82.93	73.37	73.87	86.96	97.89	123.29	125.63	119.81	119.43	111.32	107.64	77.85
Brinjal	Kangra	Arrivals	131.24	148.09	140.17	72.68	79.53	89.28	85.31	89.85	82.50	104.95	96.73	79.66
		Prices	119.16	90.95	81.52	98.49	100.99	107.86	113.60	109.66	95.20	89.04	82.33	111.21
	Nagrota	Arrivals	193.72	196.85	188.92	133.14	113.48	66.95	42.93	38.89	42.80	41.82	37.59	102.93
		Prices	112.22	94.36	82.04	93.31	109.40	120.11	116.40	98.48	86.34	85.52	84.14	117.67
French-bean	Kangra	Arrivals	157.77	217.45	132.94	118.97	68.56	98.35	57.66	97.99	39.24	39.49	71.75	99.84
		Prices	96.00	76.00	74.00	80.00	88.00	97.00	115.00	117.00	121.00	117.00	120.00	97.00
	Nagrota	Arrivals	141.07	159.42	136.21	124.04	127.19	93.07	93.06	68.44	70.09	71.24	61.63	54.53
		Prices	98.00	94.00	71.00	81.00	87.00	98.00	109.00	115.00	120.00	112.00	98.00	116.00
Lady Finger	Kangra	Arrivals	102.27	108.52	130.43	184.54	115.63	98.48	89.92	89.34	63.37	60.22	54.49	102.79
		Prices	141.08	76.42	59.22	43.24	45.23	61.37	92.85	122.55	108.11	166.74	143.13	140.07
	Nagrota	Arrivals	174.17	187.69	230.34	177.16	131.50	62.22	54.42	39.72	32.49	20.58	12.30	77.41
		Prices	117.75	80.21	49.12	60.25	53.86	67.18	64.89	76.29	101.35	191.55	188.75	148.79
Bottle Gourd	Kangra	Arrivals	157.83	211.52	190.86	163.31	141.12	78.38	68.79	57.56	24.86	34.03	17.86	53.87
		Prices	61.36	38.58	52.62	77.20	75.70	69.99	74.00	87.53	96.06	205.07	185.79	176.11
	Nagrota	Arrivals	176.92	204.24	194.26	149.16	125.70	94.07	76.50	55.98	49.19	25.21	15.55	33.23
		Prices	74.46	54.30	53.70	69.92	62.00	61.61	51.97	49.44	77.98	222.42	227.29	194.90

(120.11 per cent) and lowest in the month of June (82.04 per cent) in Nagrota market. Generally, high price indices were associated with low arrivals of produce. The seasonal index for arrivals of frenchbean was highest in the month of May in both Kangra (217.45 per cent) and Nagrota (159.42 per cent) markets showing the peak supply season of frenchbean in the study area. The price indices of frenchbean were found to be maximum in December in Kangra (121.00 per cent) as well as in Nagrota (120.00 per cent) markets while it was minimum in June in both Kangra (74.00 per cent) and Nagrota (71.00 per cent) markets. In case of lady finger, the arrival indices were maximum in July (184.54 per cent) in Kangra and June (230.34 per cent) in Nagrota markets that happens to be the main supply month of lady finger in the study area. As far as price is concerned, it was found that producer could get maximum prices in the month of January in both Kangra (166.74 per cent) and Nagrota (191.55 per cent) markets while there were very low prices in July (43.24 per cent) in Kangra and in June (49.12 per cent) in Nagrota markets. The highest arrival of bottle gourd was found in the month of May in both Kangra (211.52 per cent) and Nagrota (204.24 per cent) markets as this month was peak supply month of bottle gourd in the study area. It was lowest in February in Kangra (17.86 per cent) as well as in Nagrota (15.55 per cent) markets showing lean supply season for bottle gourd. Similarly, the highest price index was observed in January (205.07 per cent) for Kangra and in February (227.29 per cent) for Nagrota markets.

Table 4.58 reveals that the highest arrival index for radish was observed during the month of December (149.72 per cent) in Kangra and during November (143.77 per cent) in Nagrota market showing its peak supply season in market. The seasonal price index for radish was maximum in September in

Table 4.58 : Seasonal indices of arrivals and prices of winter vegetable commodities in Kangra and Nagrota markets (2000 - 01 through 2006 - 07)

(Per cent)

Vegetables	Markets		Month											
			April	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Radish	Kangra	Arrivals	84.34	90.95	72.93	42.36	72.89	85.76	119.26	118.41	149.72	138.34	111.14	113.91
		Prices	101.62	109.50	118.09	142.02	133.35	144.96	99.43	77.24	77.80	59.67	65.05	71.28
	Nagrota	Arrivals	146.64	113.16	62.91	46.91	66.03	55.83	118.81	143.77	123.79	131.39	120.75	69.98
		Prices	124.77	123.46	107.65	105.76	116.88	126.51	126.30	85.80	81.63	67.03	66.79	67.42
Pea	Kangra	Arrivals	183.95	154.19	62.73	34.28	37.74	65.15	42.65	80.84	156.00	166.61	114.04	101.83
		Prices	88.96	110.60	137.69	121.57	123.27	160.11	134.06	109.85	57.08	49.82	47.72	59.26
	Nagrota	Arrivals	150.09	106.71	89.36	82.58	29.06	58.67	39.30	51.94	132.39	167.07	148.42	144.39
		Prices	80.96	79.82	93.52	138.27	144.34	149.47	144.60	102.95	86.83	61.62	58.11	59.51
Potato	Kangra	Arrivals	119.34	106.33	105.21	89.92	98.16	105.05	84.81	100.45	103.84	96.59	91.03	99.26
		Prices	98.26	97.90	102.98	103.05	110.41	122.51	124.47	110.07	77.60	83.70	83.80	85.25
	Nagrota	Arrivals	113.86	130.75	112.80	103.00	87.91	81.75	90.27	91.13	103.74	98.50	94.43	91.87
		Prices	114.84	103.15	92.40	100.31	113.55	120.87	120.48	111.44	88.72	77.69	73.95	82.59
Cauliflower	Kangra	Arrivals	87.62	55.12	48.15	43.71	45.49	43.04	79.72	93.85	225.87	193.65	152.08	131.69
		Prices	81.27	85.44	120.57	134.82	149.27	160.70	138.06	75.29	84.65	69.00	44.17	56.76
	Nagrota	Arrivals	78.91	75.63	52.97	57.72	57.83	65.46	90.25	120.21	139.34	184.72	162.75	114.22
		Prices	79.21	94.31	76.79	144.25	155.26	139.15	123.16	114.76	86.73	67.38	52.76	66.25
Cabbage	Kangra	Arrivals	107.36	92.77	74.74	72.24	56.78	59.84	78.91	78.03	101.21	222.77	140.66	114.71
		Prices	89.53	110.14	103.39	124.20	109.36	120.37	101.34	119.08	90.52	80.79	78.23	73.04
	Nagrota	Arrivals	114.14	102.23	66.07	75.24	75.65	58.89	85.36	106.15	135.44	142.81	124.77	113.26
		Prices	68.66	86.46	85.81	112.83	158.49	140.15	121.66	115.27	96.48	81.34	69.88	62.96

Kangra (144.96 per cent) as well as for Nagrota (126.51 per cent). In case of pea, the highest arrival index was in the month of April in both Kangra (183.95 per cent) and Nagrota (150.09 per cent) markets while it was quite low in July (34.28 per cent) in Kangra and in August (29.06 per cent) in Nagrota. The price index was maximum in the month of September in both Kangra (160.11 per cent) and Nagrota (149.47 per cent) markets and minimum in February in Kangra (47.72 per cent) as well as in Nagrota (58.11 per cent) markets. In case of potato, the seasonal index of arrivals was found to be maximum in April (119.34 per cent) in Kangra and in May in Nagrota (130.75 per cent) that coincided with main supply season in these markets. The price index of potato was highest in October (124.47 per cent) in Kangra and in September (120.87 per cent) in Nagrota. The minimum price index was observed during January (83.70 per cent) in Kangra and February (73.95 per cent) in Nagrota markets. Similarly, in case of cauliflower, the maximum index for arrivals was observed in December (225.87 per cent) in Kangra and in January (184.72 per cent) in Nagrota while these were quite low during September (43.04 per cent) and in June (52.97 per cent) in Kangra and Nagrota market, respectively. The seasonal price index for cauliflower was maximum in September (160.70 per cent) for Kangra and in August (155.26 per cent) for Nagrota market. It was minimum during February in both Kangra (44.17 per cent) and Nagrota (52.76 per cent) markets. For cabbage, the seasonal index of arrivals was highest in January in Kangra (222.77 per cent) as well as in Nagrota (142.81 per cent) markets. The arrival index was minimum in August (56.78 per cent) for Kangra and in September

(58.89 per cent) for Nagrota market. The seasonal price index was maximum in July (124.20 per cent) in Kangra and in August (158.49 per cent) in Nagrota market and low in March (73.04 per cent) in Kangra and Nagrota (62.96 per cent).

4.7 Marketing Efficiency

Marketing efficiency shows the extent to which different marketing agencies are able to move the vegetablesfrom producer to the consumer at the minimum cost with maximum services to producers and consumers in the supply chain. The efficiency also varies in accordance with the structure and composition of price-spreads, degree of market competition and market integration.

4.7.1 Operational efficiency

Operational efficiency shows the extent to which marketing functions are performed with minimum cost. The extent and magnitude of marketing costs and margins of middlemen influence share of producers in final price paid by consumers as well as overall marketing efficiency of the system. The aggregate marketing costs, margins and producer's share thereof in marketing of vegetables through different channels have been shown in Table 4.59.

In tomato, the producer's share was maximum in channel-VII (89.90 per cent) followed by channel-VI (69.80 per cent). Marketing margins and costs were maximum in channel VI (21.10 per cent) and in channel-VII (10.10 per cent), respectively. In case of brinjal, producer's share was highest in channel

Table 4.59 : Cost, margins and producer's share in marketing of summer vegetable commodities in Kangra district

S No	Vegetables	Marketing Channels	Producer's share		Marketing cost		Margin		Consumer's price	
			Rs/q	Per cent	Rs/q	Per cent	Rs/q	Per cent	Rs/q	Per cent
1	Tomato	VI	697 99	69 80	91 01	9 10	211 00	21 10	1000 00	100 00
		VII	899 00	89 90	101 00	10 10	-	-	1000 00	100 00
2	Brinjal	III	505 88	72 27	70 95	10 13	123 18	17 60	700 00	100 00
		IV	505 75	72 25	66 44	9 49	127 81	18 26	700 00	100 00
		V	521 45	70 95	121 68	16 55	91 87	12 50	735 00	100 00
		VI	540 73	77 25	64 26	9 18	95 01	13 57	700 00	100 00
		VII	630 15	90 02	69 85	9 98	-	-	700 00	100 00
3	Frenchbean	III	974 90	74 99	82 07	6 32	243 03	18 69	1300 00	100 00
		IV	974 88	74 99	82 79	6 37	242 33	18 64	1300 00	100 00
		V	963 93	73 03	141 28	10 70	214 79	16 27	1320 00	100 00
		VII	1209 75	93 06	90 25	6 94	-	-	1300 00	100 00
4	Lady finger	III	885 40	73 78	75 40	6 28	239 20	19 92	1200 00	100 00
		IV	885 50	73 79	69 16	5 76	245 34	20 44	1200 00	100 00
		V	866 95	70 48	146 15	11 88	216 90	17 62	1230 00	100 00
		VI	952 40	79 36	66 56	5 55	181 04	15 09	1200 00	100 00
		VII	1110 70	92 56	89 30	7 44	-	-	1200 00	100 00
5	Bottle gourd	III	516 91	64 61	71 47	8 93	211 62	26 46	800 00	100 00
		IV	520 50	65 06	63 56	7 95	215 94	26 99	800 00	100 00
		V	519 05	63 69	123 98	15 21	171 97	21 10	815 00	100 00
		VI	568 68	71 08	66 52	8 32	164 80	20 60	800 00	100 00
		VII	725 29	90 66	74 71	9 34	-	-	800 00	100 00

VII (90 02 per cent) followed by channel-VI (77.25 per cent). Aggregate margins of all the functionaries were maximum in channel-IV (18.26 per cent) followed by channel-III (17.60 per cent). Marketing cost incurred was more in channel-V (16.55 per cent) followed by channel-III (10.13 per cent). In frenchbean, producer's share was maximum in channel-VII (93.06 per cent) followed by channels-III and IV (74.99 per cent). The marketing margins were maximum in channel-III and IV (about 19 per cent) while marketing cost was found high in channel-V (10.70 per cent). In case of lady finger maximum share of producer was found in channel-VII (92.56 per cent) while high marketing costs and margins were in channel-V (11.88 per cent) and channel-IV (20.44 per cent), respectively. In marketing of bottle guard the highest producer's share was realized in channel-VII (90.66 per cent) followed by channel-VI (71.08 per cent). Marketing margins taken by middlemen were maximum in channel-IV (26.99 per cent) and channel-III (26.46 per cent) while the marketing costs were maximum in channel-V (15.21 per cent).

Table 4.60 reveals the composition of costs, margins and producer's share in marketing of winter vegetable commodities in the study area. In case of radish 1 (normal season), producer share was maximum in channel-VII (84.31 per cent) followed by channel-VI (63.82 per cent). The marketing margins and costs of all the functionaries were maximum in channel-IV (33.53 per cent) and channel-V (23.55 per cent). In the sale of radish 2 (mid season), maximum share of producer was obtained in channel-VII (86.80 per cent) while the margins and costs were more in channel-IV (29.68 per cent) and channel-V (20.39 per cent),

Table 4.60 : Cost, margins and producer's share in marketing of winter vegetable commodities in Kangra district

S. No.	Vegetables	Channels	Producer's share		Marketing cost		Margin		Consumer's price	
			Rs/q	Per cent	Rs/q	Per cent	Rs/q	Per cent	Rs/q	Per cent
1	Radish 1	III	271.22	54.24	63.29	12.66	165.49	33.10	500.00	100.00
		IV	271.00	54.20	61.37	12.27	167.63	33.53	500.00	100.00
		V	305.23	58.13	123.64	23.55	96.13	18.32	525.00	100.00
		VI	319.13	63.82	72.01	14.41	108.87	21.77	500.00	100.00
		VII	421.57	84.31	78.43	15.69	-	-	500.00	100.00
2	Radish 2	III	361.00	60.17	66.41	11.06	172.59	28.77	600.00	100.00
		IV	361.02	60.17	60.92	10.15	178.06	29.68	600.00	100.00
		V	359.35	58.44	125.45	20.39	130.26	21.17	615.00	100.00
		VI	399.63	66.60	73.16	12.19	127.22	21.21	600.00	100.00
		VII	520.79	86.80	79.21	13.20			600.00	100.00
3	Radish 3	III	376.21	57.88	66.25	10.19	207.54	31.93	650.00	100.00
		IV	386.12	59.40	68.32	10.51	195.56	30.09	650.00	100.00
		V	385.75	57.57	122.18	18.24	162.07	24.19	670.00	100.00
		VII	569.03	87.54	80.97	12.46		0.00	650.00	100.00
4	Pea	IV	1487.00	76.37	62.53	3.22	397.47	20.41	1947.00	100.00
		V	1449.50	72.45	132.01	6.62	418.49	20.93	2000.00	100.00
		VII	1834.80	96.26	71.20	3.74	-	0.00	1906.00	100.00
5	Cauliflower 1	I	545.00	64.12	81.92	9.64	223.08	26.24	850.00	100.00
		II	550.00	64.70	70.37	8.28	229.63	27.02	850.00	100.00
		III	555.00	65.28	79.05	9.31	215.95	25.41	850.00	100.00
		IV	559.60	65.84	70.66	8.31	219.74	25.85	850.00	100.00
		V	553.49	64.44	125.85	14.65	179.66	20.91	859.00	100.00
		VI	605.13	71.19	69.07	8.13	175.80	20.68	850.00	100.00
		VII	770.94	90.70	79.06	9.30		0.00	850.00	100.00

Contd../-

S. No.	Vegetables	Channels	Producer's share		Marketing cost		Margin		Consumer's price	
			Rs/q	Per cent	Rs/q	Per cent	Rs/q	Per cent	Rs/q	Per cent
6	Cauliflower 2	I	625.00	65.79	83.08	8.75	241.92	25.48	950.00	100.00
		II	630.00	65.96	73.67	7.71	251.33	26.33	955.00	100.00
		III	604.60	63.64	81.16	8.54	264.24	27.82	950.00	100.00
		IV	614.42	64.68	69.93	7.36	265.65	27.96	950.00	100.00
		V	607.30	63.04	120.98	12.58	234.73	24.38	963.00	100.00
		VI	690.05	72.63	70.66	7.44	189.29	19.93	950.00	100.00
		VII	846.15	91.48	78.86	8.52		0.00	925.00	100.00
7	Cauliflower 3	IV	784.57	71.33	69.87	6.35	245.56	22.32	1100.00	100.00
		V	788.11	69.42	130.09	11.46	216.80	19.12	1135.00	100.00
8	Cabbage 1	IV	499.50	66.61	61.77	8.24	188.73	25.15	750.00	100.00
		V	514.53	67.25	118.02	15.43	132.45	17.32	765.00	100.00
		VI	565.13	75.35	67.88	9.05	117.00	15.60	750.00	100.00
		VII	682.18	90.96	67.82	9.04		0.00	750.00	100.00
9	Cabbage 2	IV	559.84	69.98	62.51	7.81	177.65	22.21	800.00	100.00
		V	553.08	67.04	122.32	14.83	149.60	18.13	825.00	100.00

respectively. In marketing of radish 3 (late season), the producers share was fairly high in channel-VII (87.54 per cent) followed by channel-IV (59.40 per cent). The high marketing costs and margins were visualised in channel-V (18.24 per cent) and channel-IV (30.09 per cent). The producers share in sale of pea was maximum in channel-VII (96.26 per cent) while both collective margins and total marketing costs were high in channel-V viz.6.60 per cent and 20.93 per cent, respectively.

For the sale of cauliflower 1 (normal season), the share of producers in consumers rupee was maximum in channel-VII (90.70 per cent) followed by channel-VI (71.19 per cent). The producers share was almost similar in all other channels. Margins and costs were maximum in channel-II (27.02 per cent) and channel-V (14.65 per cent). The maximum share was realized by producer in channel-VII (91.48 per cent) in marketing of cauliflower 2 (mid season) while, the marketing margins of all the functionaries were maximum in channel-IV (27.96 per cent) followed by channel-III (27.82 per cent). Total marketing cost incurred was highest in channel-V (12.58 per cent). During the sale of cauliflower 3 (late season), maximum share of producer was realized in channel-IV (71.33 per cent) while collective margins and total costs were found to be fairly high in channel-IV (22.32 per cent) and channel-V (11.46 per cent). In case of cabbage 1 (normal season), producers share was found to be maximum in channel-VII (90.96 per cent) followed by Channel-VI (73.35 per cent). Marketing margins were quite high in channel-IV (25.15 per cent) followed by channel-V (17.32 per cent) while total marketing cost incurred was maximum in channel-V (15.43 per cent). Similarly in case of cabbage 2 (mid season), producer's share was found to be relatively

higher in the sale through channel-IV (69.98 per cent) while margins and marketing costs were maximum in channel-IV (22.21 per cent) and channel-V (14.83 per cent), respectively.

Table 4.61 shows efficiency indices of different marketing channels. In case of tomato, channel-VII was found to be more efficient as compared to channel-VI as marketing efficiency index was quite high in channel-VII (8.90). Similarly, in case of brinjal, frenchbean, lady finger and bottle gourd, the efficiency indices were higher in channel-VII. Channel-VI was next best channel for summer vegetable commodities with indices ranging from 2.31 for tomato, 2.46 for bottle gourd, 3.40 for brinjal and 3.85 for lady finger.

Table 4.61 : Marketing efficiency of summer vegetables

S. No.	Vegetables	Marketing Channels	V	I	MEI
1	Tomato	VI	1000.00	302.01	2.31
		VII	1000.00	101.00	8.90
2	Brinjal	III	700.00	194.13	2.61
		IV	700.00	194.25	2.60
		V	735.00	213.55	2.44
		VI	700.00	159.27	3.40
		VII	700.00	69.85	9.02
3	Frenchbean	III	1300.00	325.10	3.00
		IV	1300.00	325.12	3.00
		V	1320.00	356.07	2.71
		VII	1300.00	90.25	13.40
4	Lady finger	III	1200.00	314.60	2.81
		IV	1200.00	314.50	2.82
		V	1230.00	363.05	2.39
		VI	1200.00	247.60	3.85
		VII	1200.00	89.30	12.44
5	Bottle gourd	III	800.00	283.09	1.83
		IV	800.00	279.50	1.86
		V	815.00	295.95	1.75
		VI	800.00	231.33	2.46
		VII	800.00	74.71	9.71

V= Consumer's price (Rs/q)
I= Total marketing cost and marketing margin (Rs/q)
MEI= Marketing Efficiency Index

Table 4.62 represents the channel wise efficiency of winter vegetable commodities. In case of radish 1 (normal season) and radish 2 (mid season), the most efficient channel was VII with indices of 5.38 and 6.57, respectively followed by channel-VI with efficiency indices of 1.76 and 1.99, respectively. Channel-VII (7.03) was also found to be most efficient for the sale of radish 3 (late season) followed by channel-IV (1.46) and III (1.37). In case of pea, channel-VII (25.77) was most efficient system of sale. Channel-VII (9.75) and VI (2.47) were found to be more efficient for the sale of cauliflower 1 (normal season). Similarly, channel-VII (10.73) was also most efficient system in sale of cauliflower 2 (mid season). However, channel-IV (2.49) was efficient in sale of cauliflower 3 (late season). Channel-VII (10.06) and VI (3.06) were found to be efficient for selling of cabbage I (normal season) whereas channel-IV (2.33) was better system for the sale of cabbage 2 (mid season) in the study area.

The analysis clearly reveals that the marketing efficiency decreased with the increase in number of middlemen for most of the vegetables commodities More or less similar pattern was observed in case of all summer and winter vegetable commodities. The direct sale to consumer was obviously the best method of sale followed by sale to retailer's shop.

4.7.2 Degree of market competition

Degree of competitiveness among different traders for purchase and sale of different commodities in the markets greatly influence the welfare of both producers and consumers. Higher degree of market competition is desirable to increase the efficiency of the marketing system. The degree of competitiveness

Table 4.62: Marketing efficiency of winter vegetables

S No	Vegetables	Marketing Channels	V	I	MEI
1	Radish 1	III	500 00	228 78	1 19
		IV	500 00	229 00	1 18
		V	525 00	219 77	1 39
		VI	500 00	180 88	1 76
		VII	500 00	78 43	5 38
2	Radish 2	III	600 00	239 00	1 51
		IV	600 00	238 98	1 51
		V	615 00	255 71	1 41
		VI	600 00	200 38	1 99
		VII	600 00	79 21	6 57
3	Radish 3	III	650 00	273 79	1 37
		IV	650 00	263 88	1 46
		V	670 00	284 25	1 36
		VII	650 00	80 97	7 03
4	Pea	IV	1947 00	460 00	3 23
		V	2000 00	550 50	2 63
		VII	1906 00	71 20	25 77
5	Cauliflower 1	I	850 00	305 00	1 79
		II	850 00	300 00	1 83
		III	850 00	295 00	1 88
		IV	850 00	290 40	1 93
		V	859 00	305 51	1 81
		VI	850 00	244 87	2 47
		VII	850 00	79 06	9 75
6	Cauliflower 2	I	950 00	325 00	1 92
		II	955 00	325 00	1 94
		III	950 00	345 40	1 75
		IV	950 00	335 58	1 83
		V	963 00	355 71	1 71
		VI	950 00	259 95	2 65
		VII	925 00	78 86	10 73
7	Cauliflower 3	IV	1100 00	315 43	2 49
		V	1135 00	346 89	2 27
8	Cabbage 1	IV	750 00	250 50	1 99
		V	765 00	250 47	2 05
		VI	750 00	184 88	3 06
		VII	750 00	67 82	10 06
9	Cabbage 2	IV	800 00	240 16	2 33
		V	825 00	271 92	2 03

V= Consumer's price (Rs/q)
I= Total marketing cost and marketing margin (Rs/q)
MEI= Marketing Efficiency Index

among different traders in the study markets has been examined by using the Herfindhal index. Higher the value of Herfindhal index lesser will be the degree of competitiveness and vice versa. Table 4.63 reveals that the degree of competition among different traders was found to be 0.11 for tomato, cauliflower and cabbage while it was 0.12 for lady finger in Kangra market indicating higher degree of competition as compared to Nagrota market when this index ranged from 0.26 to 0.27.

Table 4.63 Degree of market competition in study markets

(Herfindhal Index)

Commodities	Kangra market	Nagrota market
Tomato	0.11	0.26
Lady finger	0.12	0.27
Cauliflower	0.11	0.26
cabbage	0.11	0.26
Total	0.11	0.26

4. 7.3 Pricing efficiency and market co-integration

One of the main causes of structural deficiencies in marketing system is poor market integration, the difficulty with which information and trade flows among spatially separated markets. Integrated markets are those where prices are determined interdependently. This means that the price changed in one would be fully transmitted to the other markets. Markets that are not integrated result into improper transfer of price signals from one market to other market. Realizing this fact, an attempt has made to determine whether or not Kangra, the

principal market and Nagrota, the sub market are co-integrated to each other. Two approaches have been used to test the degree and magnitude of integration. The first is the traditional correlation coefficient that reveals the degree of integration and the second one is the modern co-integration test measuring both the extent and magnitude of market integration.

Traditional approach: correlation coefficient

Table 4.64 reveals the bivariate correlation coefficient among the monthly price series for the selected commodities over the period 2000-01 to 2006-07 in Kangra (principal market) and Nagrota (sub-market). It can be seen from the table that the correlation coefficient of market prices between Kangra and Nagrota markets for summer and winter vegetable commodities were found to be positive and significant indicated integration between two markets to transfer the price signals. Among summer vegetable commodities, the correlation was maximum for brinjal (0.89) while this value was minimum in case of lady finger (0.37). Among winter vegetable commodities, the markets were fairly integrated for potato (0.85), pea (0.82) and cauliflower (0.71). The degree of integration was, however, low in case of cabbage (0.56).

Modern approach: market co-integration test

This test is based upon Engle-Granger co-integration approach (Engle and Granger, 1987). Testing for co-integration among the markets is a relatively recent development in the time series literature designed to avoid the presence of the spurious correlation encountered in non-stationary time series data. There may be non-linear relation as the series sometimes may be non-stationary. As

Table 4.64 : Correlation between Kangra and Nagrota markets for monthly wholesale prices of summer and winter vegetable commodities

Vegetables	Correlation coefficient	t- value
Summer vegetables		
Tomato	0.67*	8.15
Brinjal	0.89*	18.07
Frenchbean	0.82*	13.11
Lady finger	0.37*	3.57
Bottle gourd	0.89*	17.53
Winter vegetables		
Radish	0.63*	7.28
Pea	0.82*	12.96
Potato	0.85*	14.86
Cauliflower	0.71*	9.26
Cabbage	0.56*	6.05

** significant at 1 per cent level*

the fidelity of correlation test depends upon the assumption of linearity, thus, it may depict erroneous integration when price series are non-stationary. Hence, to test the stationary nature of price series data of all vegetable commodities, 'Phillips-Perron' test was used and results are displayed in Table 4.65.

Table 4.65: Unit root test for monthly wholesale price of different vegetable commodities in Kangra and Nagrota markets

S. No.	Vegetables	Kangra market		Nagrota market	
		Phillips –Perron		Phillips –Perron	
		At level	At first difference	At level	At first difference
	Summer vegetables				
1	Tomato	-5.11*	-	-15.89*	-
2	Brinjal	-1.80	-21.59*	-0.88	-11.78*
3	Frenchbean	-2.27	-17.61*	-4.19*	-
4	Lady finger	-2.35	-25.97*	-2.38	-16.80*
5	Bottle gourd	-3.12**	-	-3.11**	-
	Winter vegetables				
6	Radish	-2.74	-21.06*	-5.04*	-
7	Pea	-2.48	-19.66*	-1.76	-12.14*
8	Potato	-2.30	-18.41*	-2.88	-20.15*
9	Cauliflower	-3.60*	-	-3.04**	-
10	Cabbage	-0.92	-32.64*	-1.33	-17.32*

** Significant at 1 per cent level*
*** Significant at 5 per cent level*

When the price series data were used without any differencing i.e. at level, the "Phillips-Perron' test gave non-significant estimates for brinjal (-1.80), frenchbean (-2.27), pea (-2.48), potato (-2.30) and cabbage (-0.92) in Kangra market. In Nagrota market, the test gave non-significant results for brinjal (-0.88), lady finger (-2.38), pea (-1.76), potato (-2.88) and cabbage (-1.33). As per this test, non-significant values indicated that the series for those crops were non-stationary. However, there were some significant values at level for tomato (-5.11), bottle-gourd (-3.12) and cauliflower (-3.60) in Kangra market and tomato (-15.89), frenchbean (-4.19), bottle gourd (-3.11), radish (-5.04) and cauliflower (-3.04) in Nagrota market. The significant values for these commodities at level

indicated that the price series were stationary and order of integration was 0 i.e. I (0) for which we can apply simple zero order correlation to depict the extent of integration. Further, the 'Phillips-Perron test' at the first difference of the price series data of these commodities confirms the non-stationary nature of time series. The non-significant values at first difference would confirm the non-stationary nature of price series. Table 4.65 shows that Phillips-Perron estimate at first difference confirmed the non-stationary nature of price series.

The set of data for brinjal, frenchbean, lady finger, radish, pea, potato and cabbage in Kangra market and brinjal, lady finger, pea, potato and cabbage in Nagrota market have order of integration of one i.e. I(1). Thus, these commodities qualified for the application of Engle-Granger co-integration test. Table 4.66 reveals that the test statistics obtained for two study markets were greater than the critical values at 1 per cent level of significance for brinjal(-4.79), Pea (-6.52), potato (-4.07), and cabbage (-3.73), whereas this was found to be non significant in case of lady finger (1.49). Thus, the null hypotheses of no co-integration between these two study markets was rejected for brinjal, pea, potato and cabbage and accepted for lady finger. This established that a long run equilibrium relationship existed between these two study markets for determination of prices for brinjal, pea, potato and cabbage. Whereas, there was poor co-integration between these two study markets for price determination of lady finger.

Table 4.66: Co-integration (tau) tests for wholesale prices of different vegetable commodities in between Kangra and Nagrota markets

S. No.	Vegetables	Z (TAU) value
	Summer vegetables	
1	Brinjal	-4.79*
2	Lady finger	1.49
	Winter vegetables	
3	Pea	-6.52*
4	Potato	-4.07*
5	Cabbage	-3.73*

Critical value of Z (TAU) at 1 per cent level is -3.51.

It has now to be tested weather the prices are in short run equilibrium as well. For this the Error Correction Model (ECM) was applied to the above tested data sets of summer and winter vegetables and the results are furnished in Table 4.67. The coefficients of error term were negative and statistically significant for selected vegetable commodities in the study markets. This implies that there were short run fluctuations in the prices of two markets with the long run equilibrium and the error would be corrected in the long run adjustments.

The order of co-integration is of different type i.e. strong, moderate and week form of co-integration. Here, the hypothesis of strong form test of market integration was performed by testing the restriction $\alpha = 0$ and $\beta = 1$. The result of this test for selected vegetable commodities has been displayed in Table 4.68. The test value of $\alpha = 0$ was found to be statistically non significant whereas $\beta = 1$ was found to be statistically significant for selected vegetables. This implies that the moderate form of market co-integration existed between Kangra and Nagrota markets.

Table 4.67: Error Correction Model (ECM) for monthly wholesale prices of different vegetable commodities in Nagrota in relation to Kangra market.

S. No.	Vegetables	Equation
	Summer vegetables	
1	Brinjal	$\Delta NP = 1.1837 + 0.647\ \Delta KP - 0.7495\ e_{it-1}$ (0.17) (12 21) (-6.64)
2	Lady finger	$\Delta NP = 1\ 0835 + 0.735\ \Delta KP - 0\ 65619\ e_{it-1}$ (0.03) (8.97) (-6.002)
	Winter vegetables	
3	Pea	$\Delta NP = 1\ 8320 + 0.3334\ \Delta KP - 0.6391\ e_{it-1}$ (0.06) (6.04) (-7.78)
4	Potato	$\Delta NP = -3.3023 + 0.13559\ \Delta KP - 0.33599\ e_{it-1}$ (0.29) (3.53) (-3.647)
5	Cabbage	$\Delta NP = 1.1142 + 0.6332\ \Delta KP - 0.32896\ e_{it-1}$ (0 09) (5.905) (-3.99)

Δ indicates change; NP and KP indicate Nagrota and Kangra prices, respectively.

Table 4.68 : Testing for strong form of integration ($\beta = 1$, $\alpha = 0$) of Nagrota sub market with Kangra principal market

Dependent variable (Nagrota wholesale price)	Independent variable (Kangra wholesale price)	t- value for $\beta = 1$	t- value for $\alpha = 0$
Summer vegetables			
Brinjal	Brinjal	6.66*	0.17
Lady finger	Lady finger	3 23*	0.03
Winter vegetables			
Pea	Pea	12.07*	0.06
Potato	Potato	22 56*	0.29
Cabbage	Cabbage	3.42*	0.09

**significant at 1 per cent level*

Table 4.69 further shows the speed of price adjustment of Nagrota with respect to changes in Kangra market. The speed of adjustment of Nagrota with respect to Kangra ranged from 32.90 per cent to 89.63 per cent. The highest speed of price adjustment was observed for brinjal (74.95 per cent) and pea (68.91 per cent). However, the lowest speed for price adjustment was found for cabbage (32.90 per cent) and potato (33.60 per cent). This implies that if any price divergence of Nagrota market with Kangra appears from the long run equilibrium it will be adjusted towards the equilibrium value by the speed given convergence.

Table 4.69: Speed of adjustment on wholesale prices of different vegetable commodities in Nagrota with respect to wholesale prices in Kangra markets

S. No.	Vegetables	Speed of Adjustment (δ)
	Summer vegetables	
1	Brinjal	74.95 *
2	Lady finger	56.65 *
	Winter vegetables	
3	Pea	68.91 *
4	Potato	33.60 *
5	Cabbage	32.90 *

** significant at 1 per cent level*

4.8 Existing Infrastructure Facilities, Regulatory Mechanism, Problems and Constraints

4.8.1 Infrastructure facilities available in the study markets

The infrastructural facilities available in Kangra principal market and Nagrota sub market are displayed in Table 4.70. A perusal of table reveals that there was availability of adequate water supply, electricity, drinking water, toilets, canteen and farmers rest house in both the study markets. However, staff quarters, agricultural input shops and grading lab were available only in Kangra market. Similarly, farmer's shed was only available in Nagrota market. There was availability of open auction platform in both the markets. However, grading and cold storage facilities were not available to farmers in any of the study markets. The mechanical weighing, grading and packaging facilities were not available in these markets. The daily price information was not displayed for use of the farmers. The advanced mechanism for electronic auctioning board and internet facilities were not available in any of the study markets. In Kangra market, there was more congestion especially during auctioning due to lack of sufficient yard space. Therefore, the facilities/amenities in thee two markets need to be thoroughly developed/improved and modernized for the benefits of farmers and traders.

4.8.2 Market regulation in the study area

The vegetable commodities produced in hills have high demand in the markets of neighboring plains due to their better quality and off-season supply. But being fragile and perishable in nature, these commodities need efficient

Table 4.70: Marketing infrastructure facilities available in study markets

Infrastructures	Kangra market	Nagrota market
Total market yard area(sq. M)	7200	1720
Facility construction	3600	940
Administrative block	160	40
Internal road, parking and circulation	1000	150
Trading area	1600	340
Open auction for future expansion	840	250
Market service area (sq km)	16	12
Adequate and drinking water supply	Yes	Yes
Electricity availability	Yes	Yes
Toilets, canteen	Yes	Yes
Farmer shed	No	Yes
Grading lab	Yes	No
Farmers rest house	Yes	No
Open auction platform	Yes	No
Staff quarters and agricultural input shops	Yes	No
Disputes redressal system (arbitrators)	Yes	Yes

marketing system. However, the present marketing system was not ideal from the view point of operational and structural deficiencies. Realizing this fact, the Government has already promulgated Model Agricultural & Horticultural Produce Marketing Development Act (known as APMC Act 2005) in November, 2005 to reform the marketing system in the state. The main contrasting features of Old and New APMC Acts are given in Table 4.71. In New APMC Act, there is a provision for contract farming, public-private participation in development and operation of agricultural markets, rules for market fee, establishment of market extension cell and establishment of Market Quality and Standard Bureau for quality and grading of produce. These above mentioned provisions were not in the Old APMC Act. In spite of all these new provisions in APMC Act (2005), the study markets were still functioning as per the Old APMC Act. Thus, the Market Committees of the study market should strictly enforce these market regulations/rules to increase the efficiency of the vegetable marketing system in the study area.

Problems and constraints in vegetable production and marketing

Marketing is an integral part of economic development programme. In fact, production and marketing systems are practically so interwined that both should go hand in hand. Efficient production ensures lower per unit cost of output making it possible for more number of consumers to buy it while on the other hand, efficient marketing systems turn this possibility into reality benefiting both the producer and consumer. Contrary to this, the inefficiency in marketing system chocks the flow of these benefits to producers and consumers. There are various

Table 4.71: Market regulation

Particulars	Old APMC Act (1969)	New APMC Act (2005)
Establishment of markets (Mandi) by farmers, consumers and private institutions	For notified market areas, one main market and one or more than one sub market By the permission of State Govt , Market Board can declare main or sub market in any building area or places	Organization and regulation of Main market and one or more than one sub market by Market Committees in each market area Establishment and regulation of market by farmers, consumers and others private institutions
Direct purchase from producers	No provision	Person willing to purchase the produce directly from the producers or to provide any marketing facilities like grading, packaging, etc can apply for the license
Provision for contract farming	No provision	Nobody will be allowed to do contract farming unless he makes agreements with producers No need to bring produce in market Contract farming agency can directly purchase agricultural produce from the producers
Public-private partnership in functioning of agricultural market	No provision	Encouraging the Public-private relationship • For establishing, regulating and management of market • For production, marketing, storage and extension and dissemination of market information for notified agricultural produce
Market fee	Not to be charged more than one time in notified area	Not to be charged second time in any market of state, if paid market fee in any market of state producing a receipt for proof
Licensing process	License is necessary for buying and selling, storing of produce etc , in one or more than one markets	Person willing to perform different marketing functions has to be registered by market secretary or he has to apply for renewing his license
Special task of Market Board		
Establishment of market extension cell	No provision	State Mandi board will encourage new techniques and extension activities There is a provision for collecting and disseminating the data for agricultural production and marketing
Establishment of market quality and Standard Bureau for quality and grading of produce	No provision	There is a provision that Mandi Board will establish a Standard Bureau for quality and quantity of agricultural produce

problems and constraints that render the present marketing system for agricultural commodities imperfect and inefficient. Therefore, the insight into these problems is essential in order to suggest appropriate policy action to further motivate the growers to expand area under vegetable cultivation. Keeping this in view, an attempt has been made to analyse the problems faced by the sample vegetable growers in the study area and results are displayed in Table 4.72.

No standard grading practices were followed in the study area. Most of vegetable growers (69 per cent) reported that there was lack of grading standards and manual grading was also costly and time consuming (31 per cent) as well. Grading also did not enhance value as about 97 per cent of farmers reported that they did not get premium prices for graded vegetable commodities. Therefore, the grading of vegetables was not done by majority of the growers.

For carrying vegetable crops from farmers to the market, different packaging materials like wooden baskets, plastic crates, gunny bags, etc., were used. About 20 per cent farmers reported the shortage of packaging material in study area. The growers reported that packaging material was costly (71 per cent) and not of good quality (21 per cent).

The growers also reported some transportation bottlenecks thwarting marketing operation. There was lack of all weather link roads in some villages. The high cost of transportation was reported by as many as 81 per cent of farmers. About 55 per cent growers also reported lack of quick and timely transportation for carrying perishable vegetable commodities to the market. The intensity of these problems was particularly higher on small farms as compared to large farms.

Table 4.72 : Marketing problems faced by vegetable growers under different categories of farms

(Per cent)

S No	Problems	Size of farms		
		Small	Large	Overall
1	Grading			
	Manual grading is time consuming	69 84	67 32	69 31
	Manual grading is costly	31 75	30 47	31 47
	Lack of standard grades	68 25	72 33	69 12
	No price for graded vegetables	96 83	95 32	96 51
	Calculated value of Chi square			0 06
2	Packaging			
	Packaging material not available in time	20 63	18 22	20 12
	Packaging material is costly	71 43	67 47	70 59
	Packaging material not of good quality	22 22	18 23	21 37
	Calculated value of Chi square			0 07
3	Transportation			
	Link roads	12 70	10 23	12 17
	Transportation facility	11 11	8 45	10 55
	High transportation charges	82 54	86 32	83 34
	Quick and timely transportation not available	58 73	53 33	57 58
	Calculated value of Chi square			1 00
4	*Market/market yard*			
	Well established market in area	7 94	8 25	8 00
	Market at distant place	7 94	8 10	7 97
	Regulated market	79 37	82 12	79 95
	Sanitary condition	22 22	19 24	21 59
	Space problem	20 63	19 37	20 37
	Boarding facility availability	79 37	72 54	77 91
	Lodging	76 19	70 45	74 97
	Parking of vehicles	58 73	75 27	62 24
	Calculated value of Chi square			1 98
5	Management cost of marketing			
	Costly	92 06	89 23	91 46
	Marketing is time consuming	93 65	91 71	93 24
	Remunerative price not available	95 24	96 43	95 49
	Production and marketing extension availability	82 54	76 51	81 26
	Critical input availability	11 11	8 21	10 49
	Crop insurance scheme	100 00	100 00	100 00
	Support price	100 00	100 00	100 00
	Cooperative nature of traders	12 70	9 37	11 99
	Market competitiveness(Fair)	98 41	99 32	98 61
	Prompt payment by traders	7 94	5 53	7 43
	Implementation of market regulation	88 89	85 35	88 14
	Market supervision	85 71	84 32	85 42
	Timely information of prices	88 89	90 21	89 17
	Outright procurement system	98 41	95 21	97 73
	Calculated value of Chi square			0 80
6	Malpractices			
	Faulty weighment	6 35	6 74	6 43
	Faulty grading	78 23	75 69	78 12
	Deductions practices	13 00	18 00	14 00
	Auction practices improper	22 00	18 00	21 00
	Higher market charges	96 83	88 24	95 00
	Calculated value of Chi square			0 40

The producers reported the need for collection centers/sub yards at suitable and nearby places in the producing area. About 80 per cent producers reported that there was lack of enforcing strict regulations in the markets. They further pointed out that there was lack of sanitation, sufficient space, boarding, lodging and parking facilities in the existing market yards of study area. Most of the farmers (85 per cent) opined lack of storage facilities in the markets.

The problems regarding market management aspects were also reported by the farmers. High cost of marketing was revealed by 91 per cent of farmers. About 93 per cent farmers thought that marketing was becoming a time consuming job. The prices for most of the vegetable commodities were less remunerative as reported by 95 per cent of the farmers. Non-availability of production and market extension services was reported by majority of the growers (81 per cent). All farmers, in the study area reported that there was lack of crop insurance scheme and support prices for vegetable commodities. Some of the producers also pointed non cooperative nature of commission agents. Lack of strict enforcement of market regulation and supervision of market was reported by 54 per cent and 85 per cent farmers, respectively. There was no reliable information about arrivals and prevailing prices in concerning markets as reported by 89 per cent of vegetable producers. About 98 per cent growers reported no provision for outright procurement system in the study area.

The producers also brought into limelight the malpractices prevalent in the existing marketing system. The faulty weighment of produce by traders and unnecessary deductions were reported by few growers. However, majority of the growers (79 per cent) reported charging of commission and market fees above the prescribed rates in the Act. Some of the producers also reported double charging of commission from both producers and buyers/traders.

Calculated values of Chi-square between small and large producers for all these problems were found to be non significant at 1 per cent level of significance indicating that both the small and large farmers faced these problems in same severity.

Discussion

Chapter V

DISCUSSION

In this chapter, the results emerging out of the present investigation have been further described in logical and conclusive manner. In consonance with the objectives, the discussion and interpretation of the results have been planned under following sections:

5.1 Socio economic profile

5.2 Marketable and marketed surplus

5.3 Marketing pattern and practices

5.4 Marketing cost and price-spread

5.5 Structure and behavior of market prices

5.6 Marketing efficiency, problems and pertinent suggestions.

5.1 Socio- Economic Profile

The family has been regarded as the basic social organization where the family members strive to achieve collective well being while moving on the successive path of progress from one generation to another. The average size of family in the study area varied from 6 to 8 members. The family size increased with increase in farm size. Mehta *et al.* (1996) also revealed direct relationship between size of family and farm. More than 60 per cent of the family members were in the working age group of 15-60 years. The proportion of working population was found higher on small farms as compared to large farms. Most of

the small families had nuclear structure, however, this tendency may not be compatible with the development of agriculture as it was resulting into fragmentation and sub- division of holdings.

Education inculcates modern wisdom and, as such, is expected to enhance the decision making capacity of farmers. There has been marked improvement in the literacy level in the study area though the literacy level of males was found higher than females in all farms categories. The females were still found way behind the males in education status though literacy gap was narrowing down. Maximum number of females were educated up to primary and middle standards. It needs to be emphasized that low education standards and gender bias may not be conducive to bring desired transformation in the agricultural sector as agriculture in the study area was more female dominated avocation. Singh and Bhati (1996) also reported conspicuous literary gaps between males and females in hills.

Land is the critical resource for agricultural development and is most limited resource in hills due to undulating topography and ever increasing population pressure. This fact was vividly proved by looking at small size of holdings in the study area (0.57 ha). The population pressure and increasing tendency towards nuclear family structure were found to be the major causes of proliferation of small holdings. It was quite pleasing to note that major proportion of cultivated land was irrigated in the study area that favoured the cultivation of vegetable crops on commercial scale. As a result, the farm diversification was quite high and vegetable crops were predominantly grown in both summer and winter seasons.

In summer season, lady finger, bottle gourd and brinjal were the major vegetable crops grown by almost all the farmers while radish, cauliflower and cabbage were the important winter vegetable crops. The irrigated villages in Kangra and Nagrota Bagwan blocks were found conducive to grow these crops. However, tomato and potato were grown on limited scale due to more disease and pests infestation in these crops. Moreover, most of the farmers did not prefer to grow frenchbean and pea due to more labour intensive nature especially harvesting. However, both of these crops fetched higher prices throughout the year in the study area. The area under summer and winter vegetable commodities has been shown in Figures. 5.1 and 5.2. Similarly, most of the small farmers allocated more proportion of total area under vegetable crops as compared to large farmers. It is interesting to note that the cropping intensity was also higher on small farms as compared to large farms. Vashist and Pathania (1999) also confirmed the inverse relationship between cropping intensity and farm size in hills.

5.2 Marketable and Marketed Surplus

The prosperity of the farmers does not depend solely on the increase in production but more on the quantum of farm surpluses which can be spared for off - farm disposal and sale in the market to earn cash income. On overall account, marketed surplus of selected summer and winter vegetable commodities ranged from 89 to 93 per cent of total farm production (Figures 5.3 and 5.4). The highest surplus was visible in case of lady finger (92.92 per cent) among summer vegetables and in case of pea (96.94 per cent) among

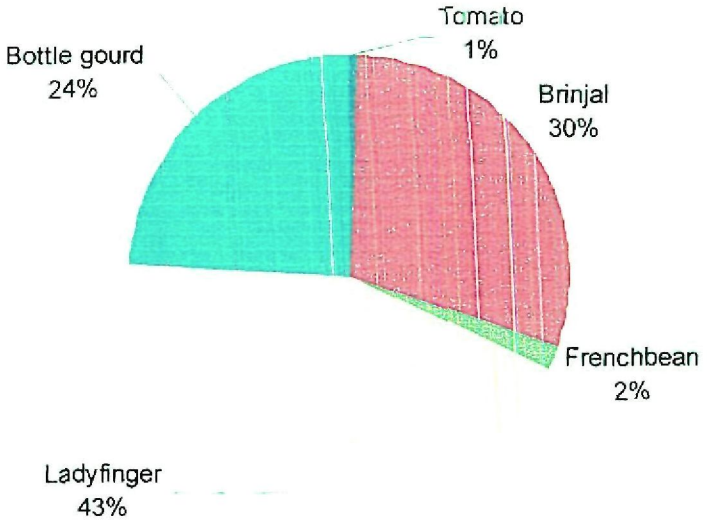


Fig 5.1: Area under summer vegetable crops grown by overall farmers

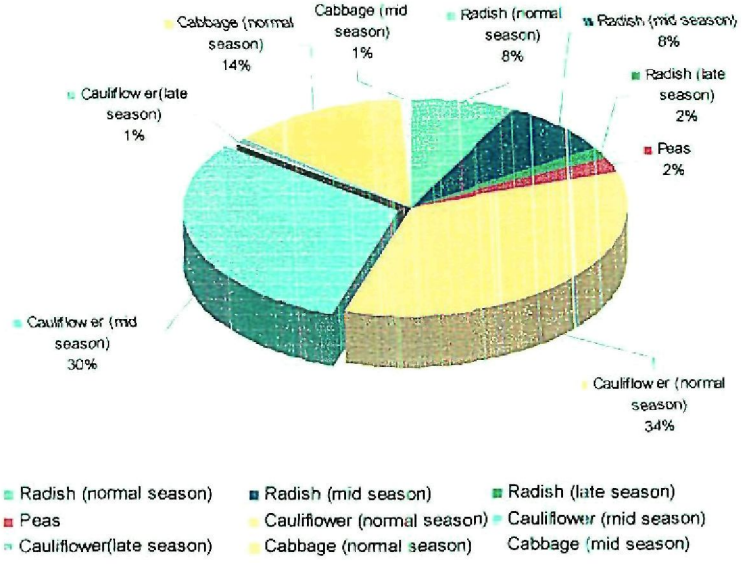


Fig 5.2: Area under winter vegetable crops grown by overall farmers

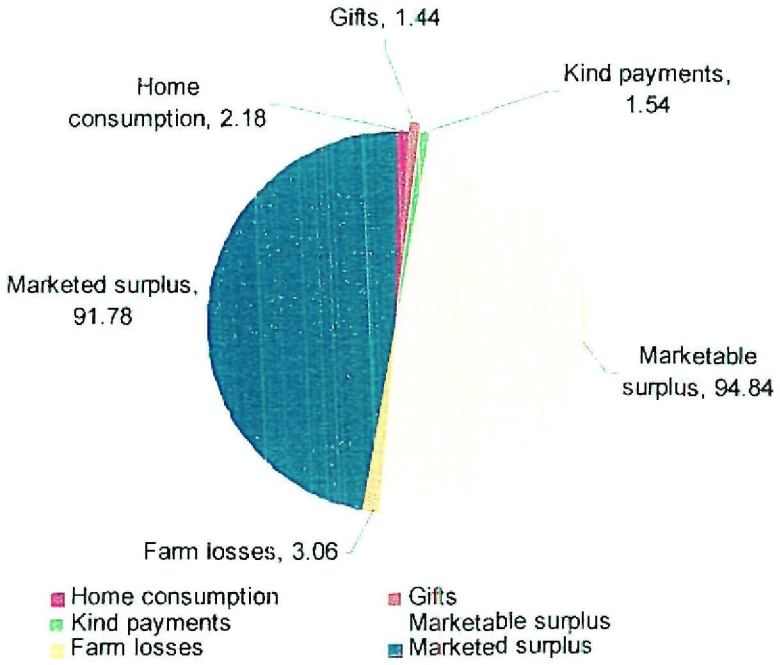


Fig 5.3: Marketable and marketed surplus of summer vegetable commodities (per cent to total production)

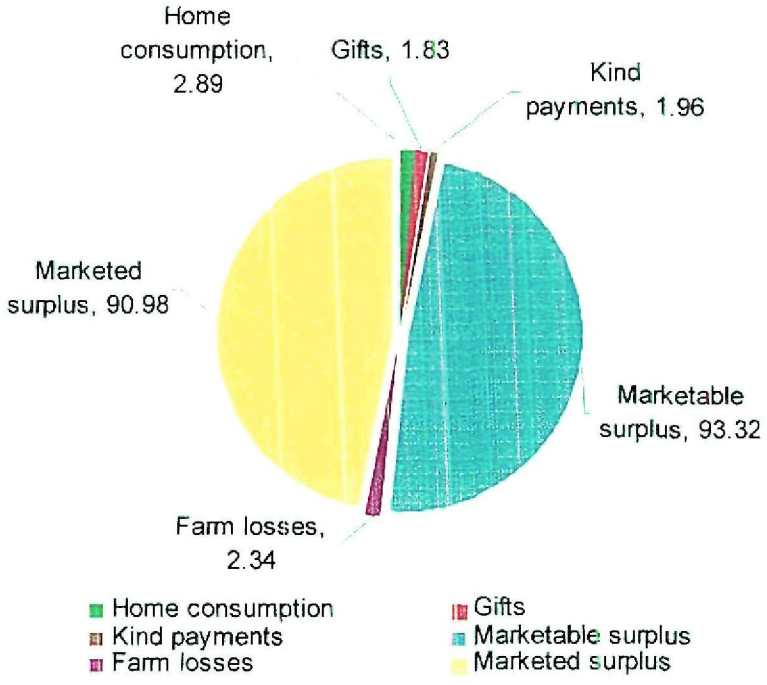


Fig 5.4: Marketable and marketed surplus of winter vegetable commodities (per cent to total production)

winter vegetable commodities in the study area. As pea fetched high prices as compared to other winter vegetables, farmers did not prefer to use this commodity for kind payment to labourers and as a gift to relatives. The vegetable commodities were mainly grown for commercial purpose in the study area. Thakur (1997) and Verma (2004) also supported these results. The quantity retained for home consumption, gifts and kind payment in each commodity ranged from 5 to 9 per cent. The high marketable/marketed surpluses in vegetable commodities were due to bulk production, perishable nature of vegetables and lack of storage facilities in the study area. The farm losses were very low (2 to 5 per cent) as a result of which the difference in marketable and marketed surplus was very less.

The linear regression model revealed that the most significant factor that governed the size of marketed surplus was total farm production of vegetable commodities. Thakur *et al.* (1996) also emphasized the positive correlation between total production and marketed surplus of vegetable commodities. In some cases like brinjal, bottle gourd, radish, cauliflower and cabbage, family size was also significant factor showing inverse relation between family size and marketed surplus. The literacy rate did not show any significant effect on marketed surplus. The model explained 98 per cent variation in the marketed surplus. This clearly shows that the model was best fit and can be applied to estimate the marketed surplus with high precision. This is also in confirmation with the first hypothesis of the study that marketable and marketed surplus vary in accordance with the level of production.

5.3 Marketing Pattern and Practices

5.3.1 Marketing practices

Marketing practices are helpful in creation of one or combination of time, place, form and possession utilities of commodities/products. Modes of marketing practices also reveal the extent of advancement achieved in marketing of agricultural commodities. The practices followed in the study area are described in this section.

At farm level, marketing started with assembling operation. Mostly, the small farmers assembled their produce in home/residential place. Majority of large farmers assembled produce in the fields to save time and labour in carrying the produce to home place. Generally, the produce was assembled manually with the help of family members as farmers did not hire labour for assembling. Rajesh (1991) also revealed that owners of the produce assembled their commodities at farm level themselves.

Assembling was followed by cleaning of vegetable commodities. It was observed that cleaning of the produce was done by washing the produce with water. Pre-cooling water dipping was practiced in tomato, brinjal, bottle gourd, radish, cauliflower and cabbage. In case of lady finger and pea, cleaning operation included removing plant leaves/twigs from the fruits and no washing was done. The small producers gave more emphasis on cleaning operations as compared to large producers which may be due to less bulk and more labour availability. On the contrary, large producers could not afford more time for cleaning unless it required to remove the soil, dust and dirt from certain commodities especially radish and other root crops.

Along with cleaning, sorting operation was carried out simultaneously. Standard grading practices were not followed by vegetable producers and they were not aware of standard grades as well. Generally, diseased and damaged produce was sorted out from the lot and kept for home consumption. The sorting was done manually using family labour. During sorting operation, size, colour and ripeness were considered for tomato. Whereas, size, shape and insect/disease infection were the major attributes considered for sorting of brinjal. In case of frenchbean, length and maturity of the produce were considered while size and maturity were considered for sorting in case of lady finger. Maturity and smoothness of the produce was considered to be the major characters for bottle gourd. Length, shape and maturity were the major traits for sorting of radish whereas maturity, disease/insect infection and pod size were considered while sorting of pea in the study area. Similarly, curd colour, compactness and mould growth in curd were considered while sorting cauliflower. The compactness of head was the major character for sorting of cabbage. It was also reported that there was no premium price for graded produce in the study markets and, thus, producers gave less emphasis on grading of vegetable commodities. All the producers have to sell their produce immediately after harvesting as there were no storage facilities in the study area. The farm level storage operation was non existent. Lal (1993) and Sanjay (1994) also confirmed lack of scientific storage at farm level compelling the vegetable growers to sell perishable commodities immediately after harvest.

Vegetable commodities need delicate handling and care especially during carrying the produce to the markets. As such, the type, size and mode of packaging depend upon the type of produce, mode of transportation and distance to the market. The packaging of produce was done just after grading/ sorting. To facilitate transportation, the produce was packed in bamboo baskets, plastic crates and gunny bags. Tomatoes were mostly put into bamboo baskets and plastic crates for the transportation of produce to local as well as main markets as they were delicate in nature. Whereas, all other summer and winter vegetable commodities were carried in baskets, plastic crates and gunny bags to local as well as main markets as they were less delicate as compared to tomato. Bamboo baskets and plastic crates were re-used after selling of the produce and durability of these two packaging material were of 6 months and 2 to 3 years, respectively. The capacity of most of the packaging materials was of 40 kg in case of bottle gourd, tomato, cauliflower and cabbage whereas, it was of 30 kg for brinjal and 25 kg for frenchbean, lady finger and pea. The size of gunny bag varied from 30 kg to 100 kg and their uses depended upon the quantity of produce for sale.

Most of vegetable growing villages in Kangra and Nagrota were well connected with motorable roads which enabled the producers/farmers to transport the produce in jeeps and tampoo outrightly from the villages. However, there were some villages where all weather link roads were not there. Jeep was found to be the commonly used mode of transportation. Most of small farmers (54 per cent) used jeep to carry their produce up to main market. Jeep was found to be most convenient mode of transportation for those having small quantities

and group of small farmers collectively hired this mode of transportation. Large farmers hired tampoo (19 per cent) and truck (6 per cent) to dispose of their produce in main market because they had large quantity of produce to transport. The producers who directly sold their produce to consumers through door to door sale method used wheel cart (14 per cent) as a mean of transportation. Few small growers (8 per cent) also carried produce on head loads up to nearby retailer's shop for sale. It was observed that the farmers had set in rapports and contacts with commission agents in the markets. The farmers carried their produce to the same commission agents for expediting sale process in the morning hours.

In the study markets, the initial auction price of vegetable commodities was determined by the group of commission agents and they charged double commission both from producer/sellers and buyers/retailers for the sale of commodities. Regarding weighing system, there was mannual weighing system for which producers did not pay extra charges. However, this practice was too much time consuming. There was no mechanical grading and storage facilities in the market yard. Generally, vegetable commodities were graded on visual basis on shape, size, colour and fresh look of the produce.

All the market transactions took place in early morning hours everyday. For this, farmers have to come early in the morning before the transaction process starts. The farmers felt difficultly to come early in the morning and many of them stuff their produce in the yard in the evening for auctioning in the next day morning. However, farmers also reported the possibilities of pilferage and losing the freshness of produce overnight.

The mode of payment to the farmers was cash and payment was made after completion of the auctioning procedure while it was made within a weak to distant sellers from other markets. The sale proceeds were not recorded on the prescribed forms as envisaged in the market regulation act. No sample respondent was aware of such procedures and did not possess any such receipt with them. Regarding the market information, most of the large producers got information on prices from principal market daily (44 per cent) while small farmers also got information from local markets (18.75 per cent) and neighbours (7.50 per cent).

The value of Herfindhal Index showed that the degree of competitiveness among different traders was fairly high in Kangra market (0.11) as compared to Nagrota market (0.26). This might be due to the fact that there were 30 commission agents dealing in sale of vegetable commodities in Kangra market. On the contrary, only 5 traders/commission agents were found in Nagrota market. The pattern of arrival and disposal of different vegetable commodities in study markets revealed that the most of the arrival was from nearby villages, Solan, Kullu, Mandi and Una during peak season and supplies also came from Punjab and Delhi. The commodities were disposed of only in local markets within the district. There was no disposal of produce outside the district or state. This clearly shows that local production/supply was still not sufficient in these markets to dispatch for sale to other markets outside the state.

The above discussion also reveals that marketing practices followed are not in accordance with the standards laid down in the market regulation act. The practices like open auction, grading, market charges and recording sale proceeds lacked transparency. Therefore, second hypothesis of orderly marketing is strongly rejected.

5.3.2 Marketing channels

Based upon the study, seven channels were identified for the marketing of vegetable commodities. Among these channels most of the farmers sold their produce through commission agents (channel-V) in principal market (*Sabji Mandi*) and, thus, was identified as a major channel for disposal of summer and winter vegetable commodities. Kumar and Arora (1999), Sharma *et al.* (2004) also reported that commission agents were the main buyers of the bulk of vegetable commodities in the country. Channel-VI (involving producer, retailer and consumer) was also popular in the study area followed by channel-III (involving local trader and retailer), channel-IV (local trader acting as retailer) and channel-VII (direct sale to consumer). However, channel-I (involving pre-harvest contractor and retailer) and channel-II (involving pre-harvest contractor) were not patronised for summer vegetables. Channel-III (involving local trader and retailer) and channel-IV (involving local trader only) were preferred by small farmers as they had small quantity of produce and did not prefer to go to market for sale of their produce. Further, channel-VII (producer acting as the retailer himself) was also patronized on a limited scale as this took more time for the sale of vegetable commodities in spite of its high efficiency. It was interesting to note that few producers were also acting as retailers in the nearby local markets carrying their produce to the towns for sale to the consumers.

5.4 Structure of Marketing Cost and Price-Spread

5.4.1 Marketing cost

Marketing cost is one of the most importantscomponent of price-spread that determines the extent of marketing efficiency. An ideal marketing system is one that conducts business with minimum possible cost ensuring fair returns to farmers and maximum market utilities and satisfaction to consumers. Therefore, marketing cost is important both from the producer's and consumer's point of view.

The cost incurred by the producers was maximum when the producers sold vegetable commodities directly to consumers (channel-VII). The high cost was due to high transportation cost, storage losses and cost of packaging while selling in small lots to consumers. Autkar *et al.* (1994) and Shiyani *et al.* (1998) also reported that transportation, storage losses and packaging cost were the main components of marketing cost at producers' level. However, the cost incurred by producers was low when producers sold their produce to local trader from their field/ farm house (channel-III and IV). In this case, producers did not bear transportation and packaging, storage losses costs. In case of winter vegetable commodities too, producers did not bear any cost when they sold their produce to pre-harvest contractor (channel-I and II) as pre-harvest contractor performed all the post harvest marketing operations.

The main components of marketing cost incurred by pre-harvest contractor were assembling, cleaning, packaging and transportation when they directly sold their produce to retailers (channel-I) while there was additional cost

on storage losses in direct sale to consumers (channel-II). Thus, the marketing cost incurred by pre-harvest contractor was relatively higher in channel-II.

At local trader's level, packaging and transportation were the main components of marketing cost incurred for the sale of commodities to retailers (channel-III) as well as directly to the consumers (channel-IV). The additional cost on account of storage losses increased the marketing cost in channel-IV as compared to channel-III.

The marketing cost incurred by the commission agent was fairly low as they had to bear expenses on account of payment of state tax and maintenance of their offices. Patil and Mahajan (1993) also reported that among different functionaries, commission agents incurred lesser cost in marketing of tomato in Bombay.

At the retailer's level, the main components of marketing costs were transportation, packaging and storage losses when they purchased the produce from main markets (channel-V). However, storage losses and packaging were the main components of marketing cost at retailer's level when they purchased produce directly from producers, pre-harvest contractors or from local traders in their own shop.

5.4.2 Price-spread analysis

The foremost objective of ideal marketing system is to ensure remunerative prices to producers, and at the same time to provide commodities to consumers at reasonable and affordable prices. The producer's share in

consumer's rupee was found to be maximum and ranged from 84.31 per cent to 95.72 per cent in channel-VII (direct sale to consumer) as there was no intermediary involved in this channel. Similar results were reported by Marothia *et al.* (1996), Chauhan *et al.* (1999), Singh and Vashist (1999) and Radha and Eshwara (2001).

Producer's share in consumer's rupee was found to be maximum in frenchbean (93.06 per cent) followed by lady finger (93 per cent) among summer vegetable commodities while it was found maximum in pea (96.27 per cent) and cauliflower (91 per cent) among winter vegetable commodities. The study further indicates that total marketing costs and margins in price-spread for all summer and winter vegetable commodities ranged from 27 to 43 per cent in channel-V which was higher than all other channels adopted for sale. This might be due to the fact that there were more intermediaries involved in this channel. In the sale through channel-V, producer received about 70 per cent share in lady finger, 72 per cent in pea and 63 per cent in cauliflower. Chauhan *et al.* (1999) also stated that the producer's share was low in the channel involving commission agent and retailer. The total marketing cost in channel-V ranging from Rs.121.68/q in brinjal to Rs.146.15/q in lady finger for summer vegetables and Rs.118.02/q in cabbage (normal season) to Rs.132.01/q in pea for winter vegetable commodities. The higher cost was due to the more cost of transportation, packaging and storage losses in this channel. The collective margins realized by different intermediaries were high in channel-IV (producer- local trader- consumer) ranging from Rs.127.8/q in brinjal to Rs.245.34/q in lady finger among summer vegetables

while it was Rs.167.63/q for radish and Rs. 397.47/q for pea among winter vegetable commodities. The collective margin was also quite high (Rs 418.49/q) in pea in channel-V. Thus, the study of marketing channels, structure of marketing costs and price-spreads proves that farmers of the study area did not patronise the most efficient channel for the sale of vegetable commodities. The share of producers in consumer's rupee varied greatly across different channels. The margins taken by different intermediaries also varied across different channels. Therefore, our hypotheses that all channels are equally efficient and that farmers follow most efficient system of sale for vegetable commodities are strongly rejected.

5.5 Structure and Behaviour of Market Prices

The instability in prices of agricultural commodities affects the level of income of the farmers significantly. Thus, the vegetable growers need to pay attention to seasonal variation and long term price behaviour to develop market intelligence.

The data on average monthly wholesale prices in the study markets (Kangra and Nagrota) showed higher variations (30 to 78 per cent) for summer vegetables as compared to winter vegetable commodities (33 to 47 per cent). This was attributed to high fluctuation in arrivals (37 to 88 per cent) in these markets. Among summer vegetable commodities, there was more variation in prices of bottle gourd (82.61 per cent) in Kangra and that of lady finger (88.2 per cent) in Nagrota markets. The fluctuation in arrival was also very high for these commodities (37 to 88 per cent) attributing to wider variations in prices. Among

winter vegetables, cauliflower showed more variation for prices in Kangra (46.9 per cent) and in Nagrota (39.38 per cent) markets due to high variability in arrivals ranging from 62 to 73 per cent in the study markets. However, there was less variation in the prices of potato (about 33 per cent) in both the study markets that was also accompanied by low variability in arrivals (28 per cent). The low variation in arrivals of potato might be due to the fact that production of potato was more stable due to growing two crops (summer and autumn).

The trend analysis revealed that among summer vegetable commodities, the arrival of frenchbean decreased in Kangra market over the period. This is in consonance to earlier discussion that farmers of the study area showed less preference for the cultivation of frenchbean. There was increase in arrivals of other summer vegetable commodities in both the markets though the increase was non-significant. Among winter vegetable commodities, farmers gave major emphasis on the cultivation of radish, cauliflower and cabbage. Thus, the arrivals of radish, cauliflower and cabbage recorded significant increase in both the study markets. The prices of all vegetable commodities showed significant increase in Kangra market while in Nagrota, the prices of tomato, frenchbean, lady finger, pea, potato, cauliflower and cabbage showed significant increase in prices. The increase in prices was caused mainly by increase in prices of vegetable commodities in major wholesale markets in the country. Mundinamani *et al.* (1999) also supported this finding and revealed that high demand for vegetable commodities led to increase in the prices in major wholesale markets. However, low value of R^2 for trend equations depicted weak

trends and strong effect of seasonality in arrivals and prices of vegetable commodities. Jha (2007) also reported weak trends in prices and arrival of pea in different markets of Himachal Pradesh. The study further confirmed the inverse relationship between the prices and arrivals of summer and winter vegetable commodities in the study markets. The high arrivals were, in general, associated with fall in prices and vice versa.

Seasonal variation in the prices and arrivals was found to be the prominent phenomena in both the markets. The seasonal indices revealed that prices of tomato declined from March onwards and were lowest during the month of May and June. This period was associated with maximum arrivals of tomato in both the study markets. From the month of August in Kangra and July in Nagrota markets, the prices started rising and were maximum during the months of August to October. During this period, there was less supply of tomato. In case of brinjal, the price indices were high in the months of September and October (lean season) due to low arrivals in both Kangra and Nagrota markets. The lowest price indices were visible during the month of May to June (peak season).

The seasonal indices of prices of frenchbean were found to be high during the months of October to January when arrival was quite low. The price indices were minimum during April to July. This period was associated with high arrivals of frenchbean in these markets. The prices of lady finger were maximum during the months of December to April in both the study markets. This can be attributed to less off-season supply of lady finger in comparison to demand. Contrary to this, the prices were low during peak supply season of lady finger

(May to August). In case of bottle gourd, the prices were fairly high in the months of January to March (lean season) while prices were minimum during peak season (April to August). The seasonal indices in arrival and prices of summer vegetable commodities have been depicted through Figures 5.5 to 5.9.

Among winter vegetable commodities, the prices of radish were maximum during April to October and low in the months of January to March. The seasonal indices of wholesale prices of pea were higher during the months of June to November that favoured the off-season pea produced in mid and high hills. The prices of pea were low in the months of January to March that happens to be the peak season supply of pea from plains. In this way, the peak arrival period was associated with low seasonal prices and vise-versa.

In case of potato, the maximum prices were observed in the months of August to November when arrival was low in both the study markets. Contrary to this, the prices were low during the months of December to March. However, the price of potato remained higher for most of the time in both the study markets. This might be due to the fact that potato is more durable vegetable commodity as compared to other commodities and it can be stored during peak season and supplied during lean season. The seasonal indices of prices of cauliflower were maximum during July to November for Kangra and June to October for Nagrota markets. Low prices of cauliflower were recorded in the months of January to March. During this period, there was heavy arrival of cauliflower in both the markets not only from adjoining producing areas but also from plain areas of Punjab.

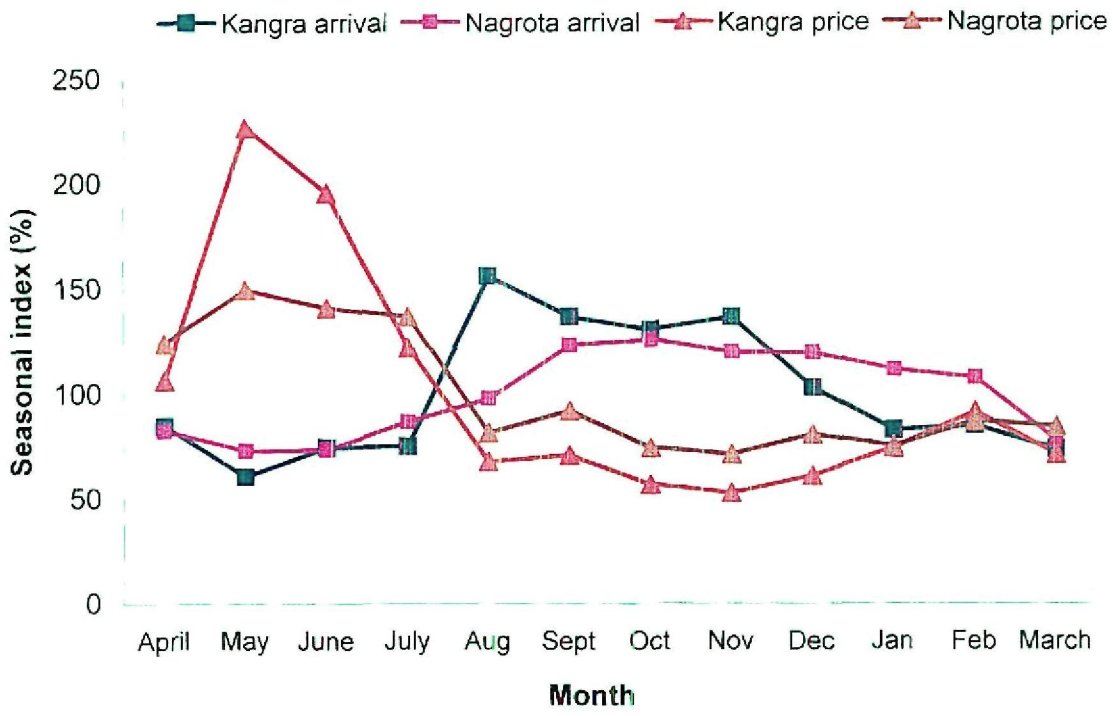


Fig 5.5: Seasonal indices of arrivals and prices of tomato in Kangra and Nagrota markets

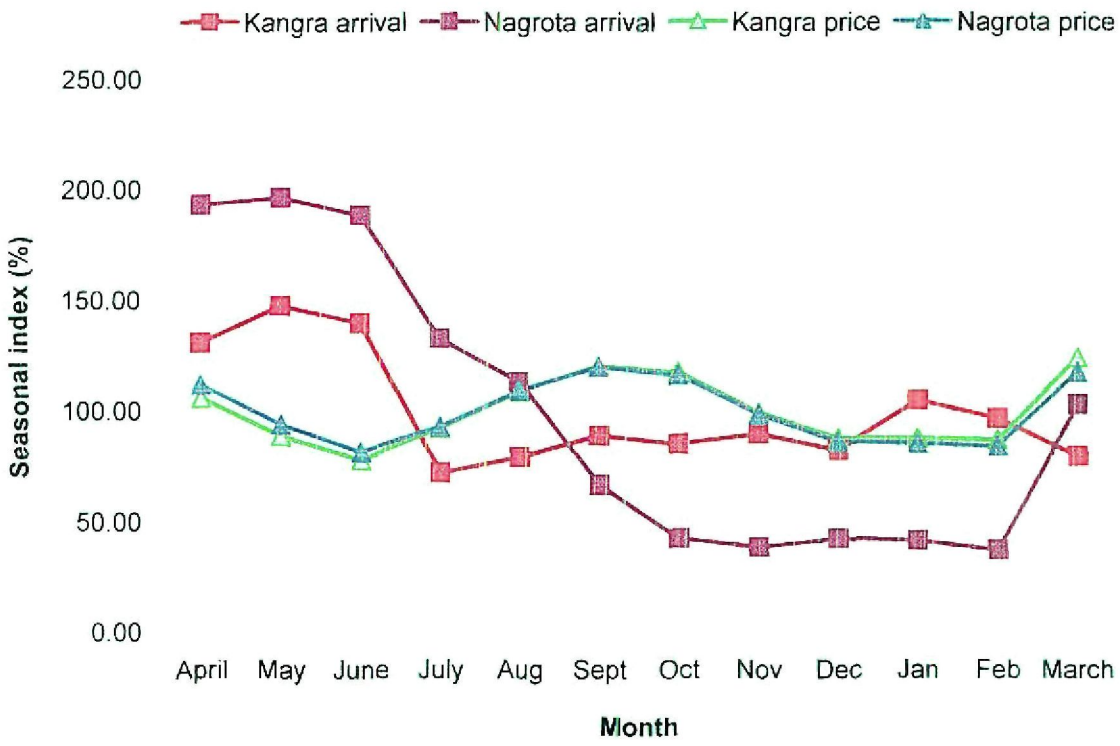


Fig 5.6: Seasonal indices of arrivals and prices of brinjal in Kangra and Nagrota markets

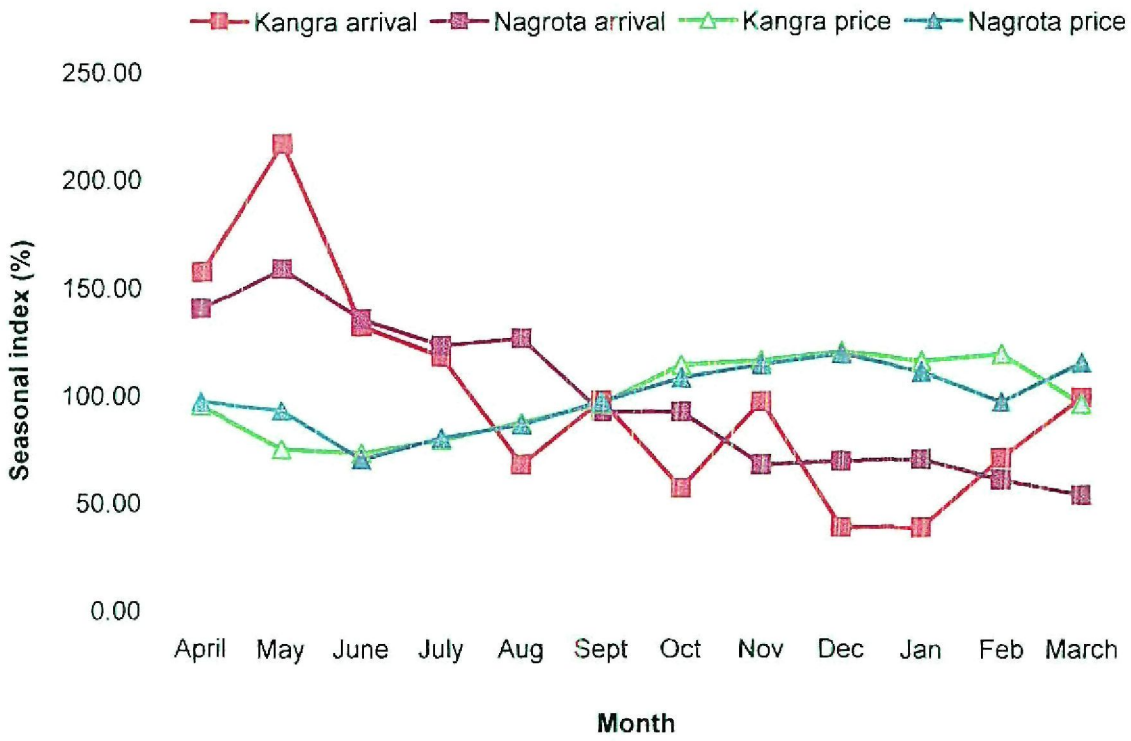


Fig 5.7: Seasonal indices of arrivals and prices of frenchbean in Kangra and Nagrota markets

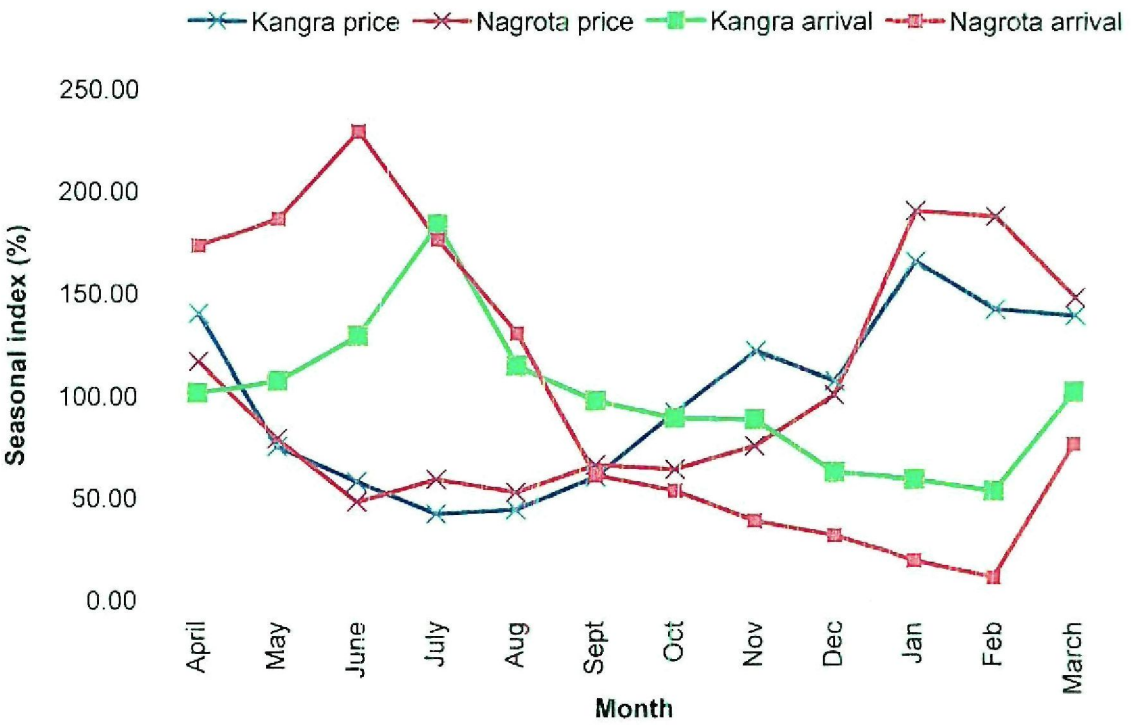


Fig 5.8: Seasonal indices of arrivals and prices of lady finger in Kangra and Nagrota markets

In case of cabbage also, the prices were maximum in the months of July to November in Kangra and from May to November in Nagrota market. However, the prices were low during peak supply season in the months of January to April in both the study markets. This clearly shows that local producers were getting low prices in peak season when bulk of the cauliflower and cabbage was sold out. The seasonal indices of arrivals and prices of winter vegetable commodities are displayed in Figures 5.10 to 5.14.

To sum up, seasonality in arrivals and prices was found to be most striking feature of vegetable commodities in the study area. The heavy arrival was associated with low prices and vice versa. The local producers were getting low prices when bulk of the marketed surplus was sold in Kangra and Nagrota markets. There were also heavy arrivals from other markets outside the state during peak seasons. The inverse arrivals and prices relationship in almost all the commodities clearly contemplates the need for prudent supply chain management, creating storage infrastructures and promoting value addition through processing in order to iron out wider swings in arrivals and prices.

5.6 Marketing Efficiency, Problems and Pertinent Suggestions

5.6.1 Marketing efficiency

Marketing efficiency shows the level of efficiency with which the different marketing agencies are able to move the vegetable from producer to the consumer at the minimum cost with maximum services to producers and consumers in the supply chain. Two types of marketing efficiencies are reported in the literature. The operational efficiency varies in accordance with the structure

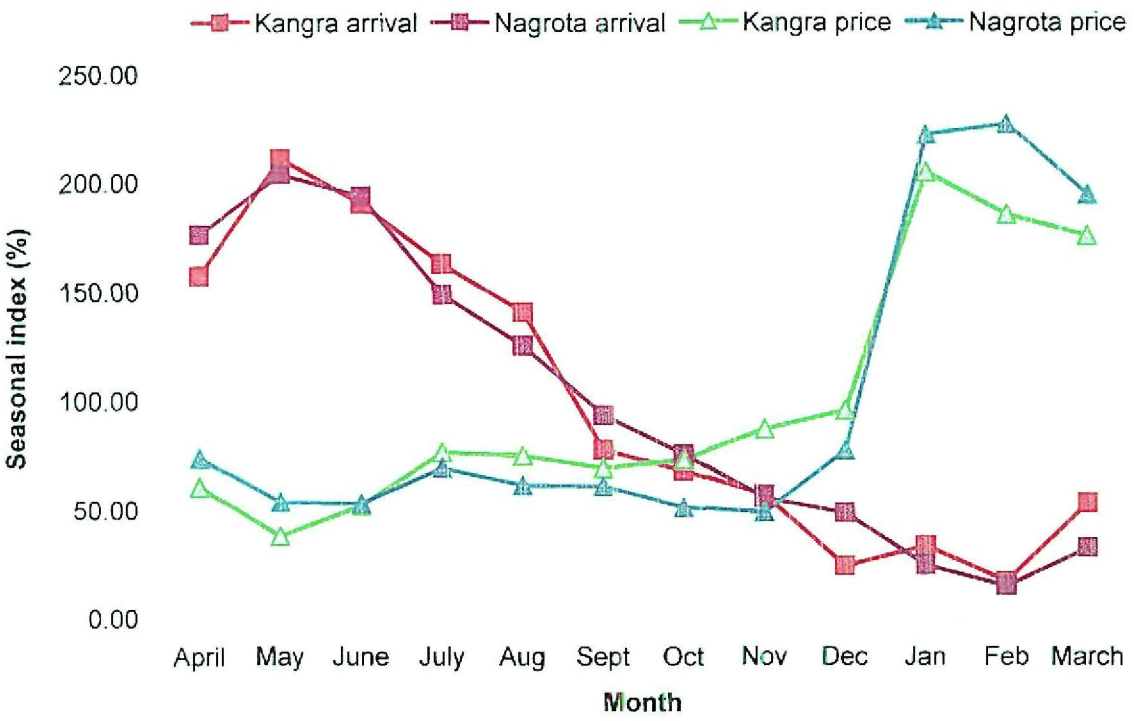


Fig 5.9: Seasonal indices of arrivals and prices of bottle gourd in Kangra and Nagrota markets

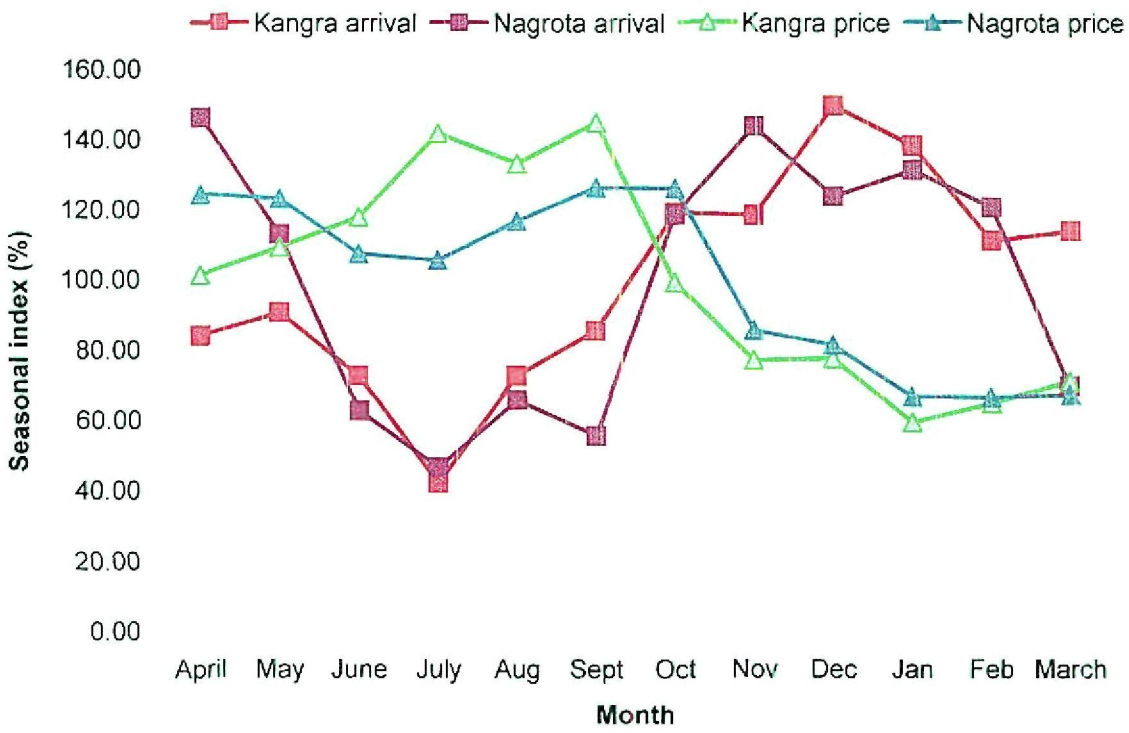


Fig 5.10: Seasonal indices of arrivals and prices of radish in Kangra and Nagrota markets

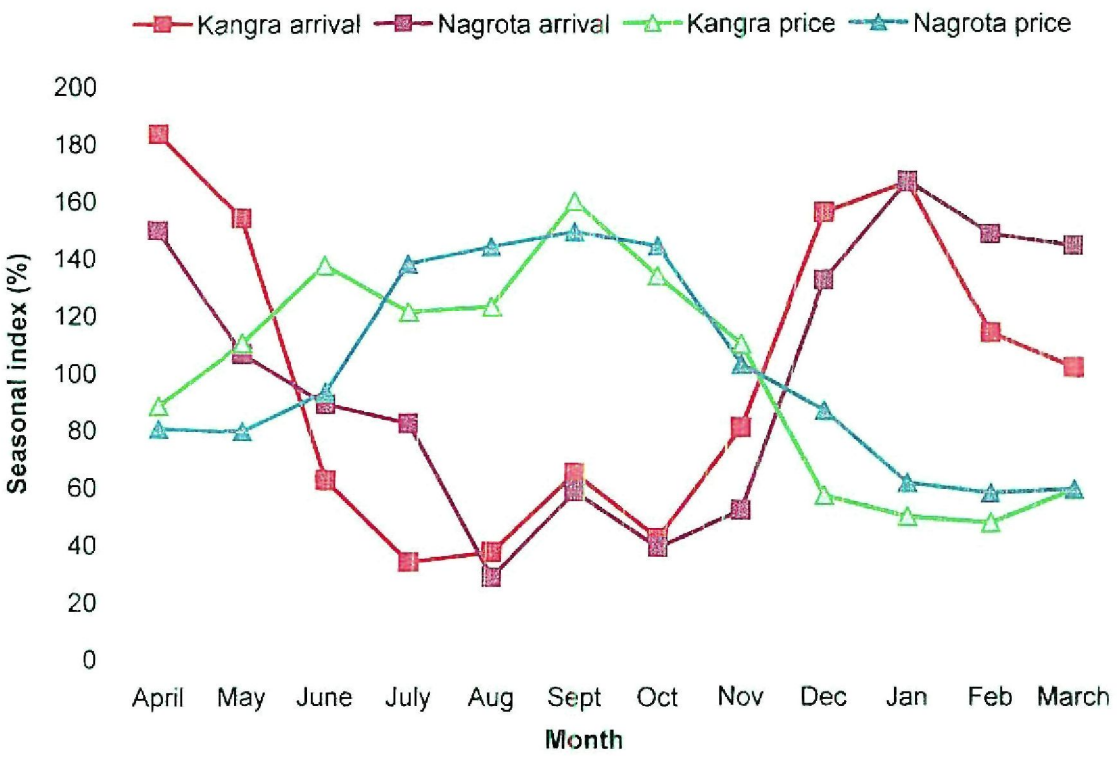


Fig 5.11: Seasonal indices of arrivals and prices of pea in Kangra and Nagrota markets

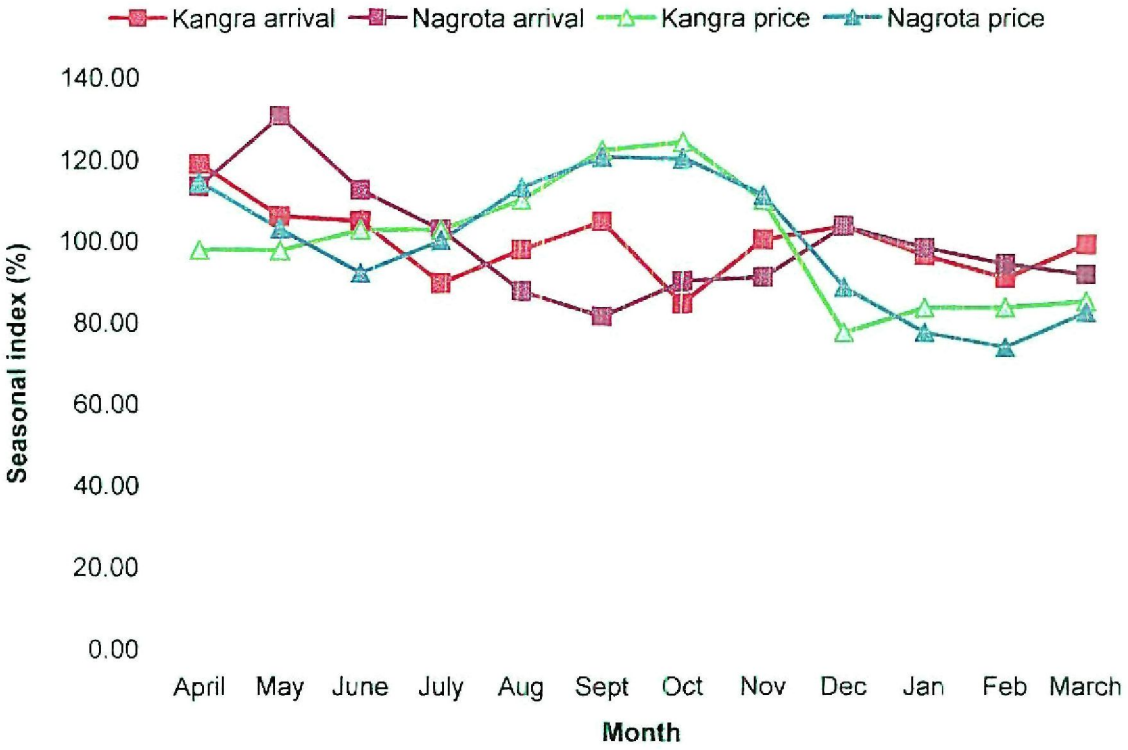


Fig 5.12: Seasonal indices of arrivals and prices of potato in Kangra and Nagrota markets

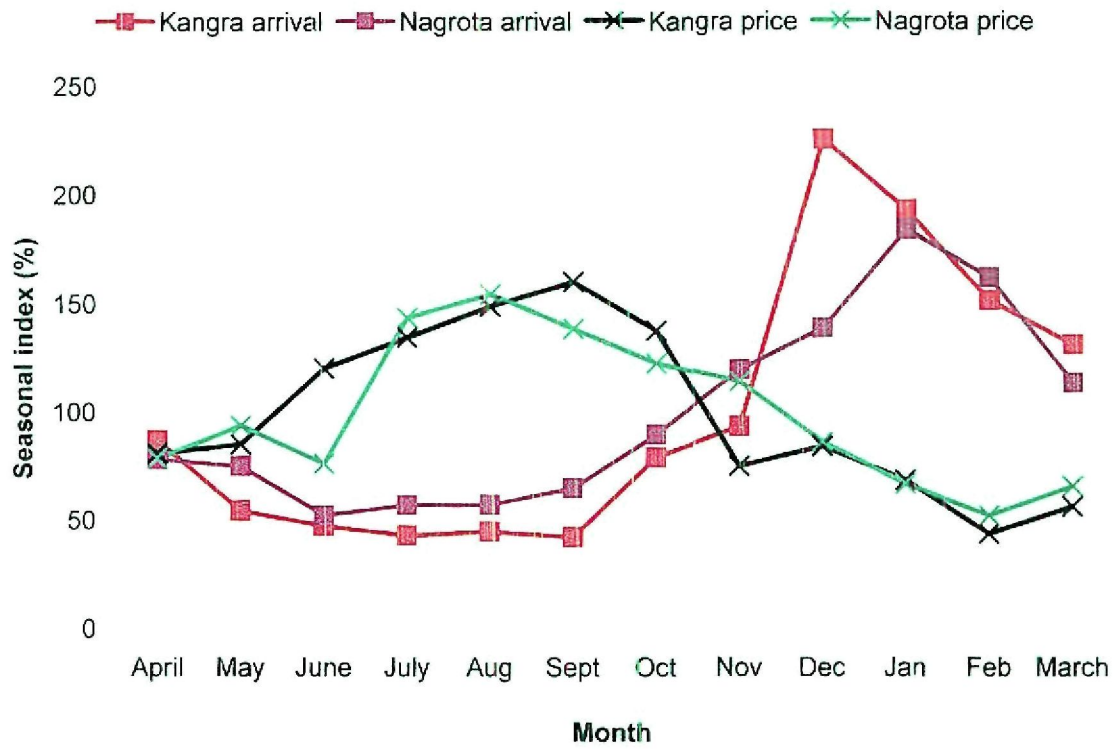


Fig 5.13: Seasonal indices of arrivals and prices of cauliflower in Kangra and Nagrota markets

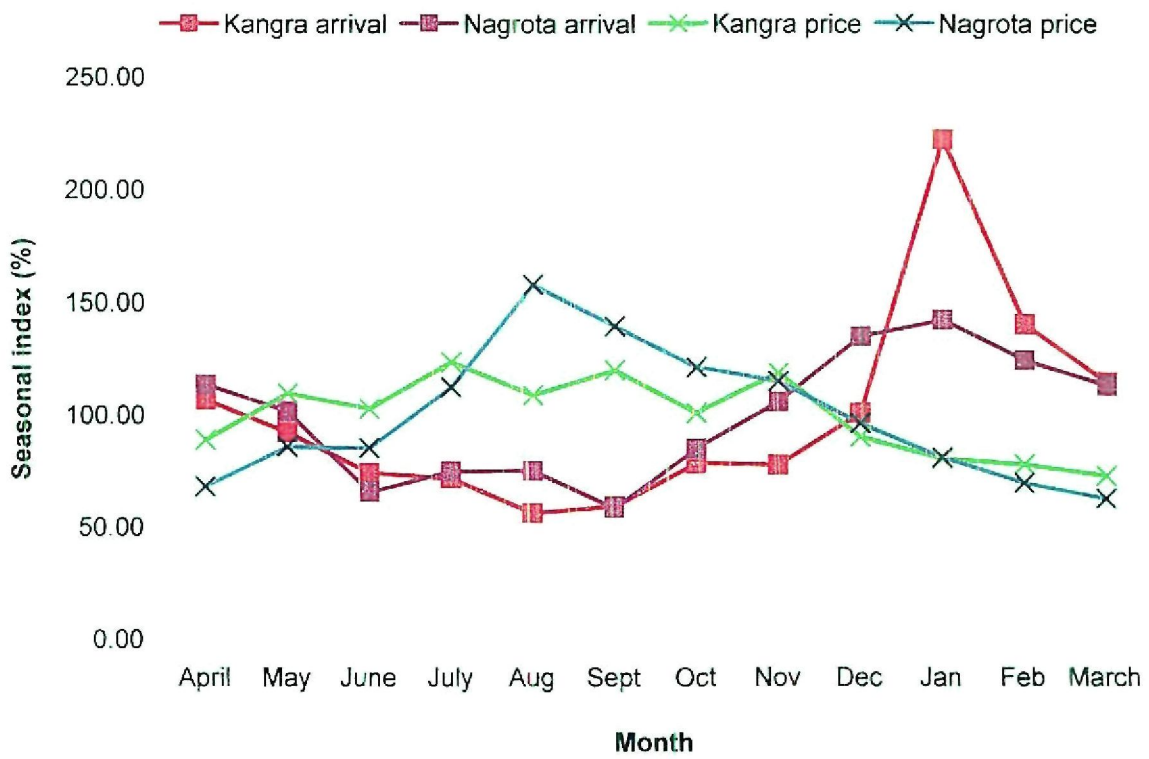


Fig 5.14: Seasonal indices of arrivals and prices of cabbage Kangra and Nagrota markets

and composition of marketing costs, margins and overall price-spreads. The pricing efficiency on the other hand, depends upon the extent to which the markets are integrated over time and space for transmission of excess supplies and passing price signals from one market to other markets. Such type of analysis helps the producers in the selection of appropriate channels, markets or time of sale to get remunerative prices. The efficiency indices were derived from the price-spreads of different channels. Higher the ratio, higher is the marketing efficiency and vice- versa. Marketing efficiency indices was very high ranging from 5.38 to 25.77 for channel V-II in direct sale for all commodities. This might be due to the fact that there was no involvement of middlemen in this channel. This was found to be 12.44 for lady finger, 9.71 for bottle gourd, 25.77 for pea, 9.75 for cauliflower (normal) and 10.06 for cabbage (normal). The next efficient system of sale was channel-VI (Producer- retailer-consumer) as in this channel producer directly sold the produce to retailers and there was less involvement of middlemen. The marketing efficiency index value for channel-VI ranged from 1.99 (cabbage) to 3.40 (brinjal). But these channels had limitations and did not permit sufficient clearance in peak supply seasons. Thus, these two channels (VI and VII) need to be promoted through adequate market reforms in the new APMC Act. The marketing efficiency index shows that channel-V (producer-commission agent-retailer-consumer) was least efficient system for the marketing of all vegetable commodities. This might be due to the more involvement of middlemen thereby increasing the cost and margins and lowering producer's share in this channel. However, due to more market clearance in peak seasons, this channel was patronized by majority of the producers.

5.6.2 Market integration and co-integration (pricing efficiency)

The recent market reforms have renewed the interest in the working of agricultural markets in the country. However, the success of the reform process in promoting equity and efficiency is constrained by the numerous structural deficiencies in primary markets. One of the main consequences of these structural deficiencies is poor market integration, the difficulty with which information and trade flows among spatially separated markets. Market integration may be defined as a situation in which arbitrage causes prices in different markets to move together. More specifically, two markets are said to be integrated if prices are determined interdependently. This implies that price changes in one market would be fully transmitted to the other markets. Markets that are not integrated may choke the flow of true price signals to other markets.

It was found that Kangra and Nagrota markets were fairly integrated in terms of transmission of price signals. This was depicted through positive and significant correlation coefficient of monthly wholesale prices of summer and winter vegetable commodities between these two markets. This value was found to be fairly high for brinjal (0.89), frenchbean (0.82), bottle gourd (0.89), pea (0.82), potato (0.85) and cauliflower (0.71) due to the similar movements in prices in these two markets. In case of lady finger, the correlation coefficient was very low (0.37) as there was more variation in the prices of lady finger between these two markets especially during lean season.

The time series data on prices tested by 'Phillips – Perron' test showed non-stationary characters for brinjal, frenchbean, ladyfinger, radish, pea and potato in the study markets. Simple correlation might reveal inaccurate results due to non-stationarity of data series. Therefore, 'Engle-Granger co-integration

test' was applied. This test showed that two study markets were significantly co-integrated for the determination of wholesale prices of brinjal, pea, potato and cabbage in the long-run. The significant values of tau test revealed that these markets were co-integrated in long-run and the variations or fluctuations that exist in the short run might be reconciled during long-run adjustments. However, there was no co-integration between these two markets for the price determination of lady finger. This might be due to the fact that during off-season, both markets act independently of each other for supplies of early crop grown in poly houses or under controlled conditions.

The application of Error Correction Model confirmed the existence of long-run relationship between two markets for adjustment of prices of brinjal, pea, potato and cabbage. This further showed that the short-run fluctuation in the prices of these commodities would be adjusted in long run. There was moderate form of integration between two markets for the determination of prices of different selected commodities.

Similarly, the speed of price adjustments of Nagrota (sub market) with Kangra (main market) showed maximum value for brinjal (74.95 per cent) and pea (68.91 per cent) and this value was minimum for cabbage (32.90 per cent). This value implies that if any divergence appears from the long-run equilibrium, it will be adjusted towards equilibrium value to the extent of 74.95 per cent in brinjal, 68.91 per cent in pea and 32.90 per cent in cabbage. The extent of adjustment was low between two markets for cabbage as during lean season, this commodity would become scarce and specialized and Nagrota and Kangra markets acted independently for price determination.

Above discussion lends support to our fifth hypothesis of the study that sub-market was co-integrated with principal market for brinjal, pea and potato. But it may not be true for all vegetable commodities like lady finger and cabbage. Thus, there was moderate form of co-integration between the two study markets for vegetable commodities.

5.6.3 Problems and Pertinent Suggestions

In Himachal Pradesh, vegetable cultivation has been found to be highly remunerative as compared to other field crops. However, there are numerous problems and constraints faced by vegetable growers in marketing of vegetable commodities. In Kangra (study area), majority of the growers faced lack of remunerative prices for their produce due to bulk arrivals from plains in addition to local supply during peak seasons. Similarly, lack of premium prices for graded produce was another major problem faced by most of the farmers. There was no storage facility and farmers have to sell their produce immediately after harvesting, sometimes creating market gluts and low prices. Thus, proper storage facilities should be created in the study area. Further high transportation charges were the main problems faced by 84 per cent farmers in the study area. Regarding the status of existing infrastructure in market yards, there was lack of standard grading, packaging, storage houses and mechanized weighing system in the markets. Lack of reliable market information, malpractices/undue charges contrary to established rules were reported by majority of the farmers (80 per cent) in study area. Similar problems were also pointed out by Thakur (1994) and Sharma *et al.* (2004). Problems of lack of market information and ineffective market regulation were also pointed out by Kumar and Arora (2003).

Similarly, lack of marketing co-operative societies and no co-ordination among vegetable growers were reported by 83 per cent producers in the study area. Thus, the hypothesis that the market regulatory mechanism and infrastructure are sufficient enough to expedite orderly marketing was strongly rejected. This calls for bringing substantial structural and organizational changes in the existing marketing system for the benefits of farmers. The modern infrastructural facilities in the market like mechanical weighing/grading, information kiosks/electronic display boards, computer/internet accessibility in the market to farmers and other amenities need to be created. The innovative provisions envisaged in APMC Act 2005 like promotion of farmers'/private Mandies, contract farming, setting of market extension cell and Standard Grading Bureau in the principal market (Kangra) may be implemented to bring about overall transformation in vegetable production and marketing in Kangra district.

Summary

Chapter VI

SUMMARY

6.1 Introduction

In the developing country like India, marketing of vegetable commodities has become important, bigger, complex and more advanced than the production for better performance and diversification of agriculture. The farmers who are able to market their produce in right form at right time and place for the right price emerge successful while the rest compromise their due share to middlemen or traders. This shows that market reforms be associated with any policy for agricultural development in the country. However, in the past, the marketing of agricultural commodities remained neglected and it occupied a fairly low place in agricultural development policies of the country. Lately, particularly after signing of WTO agreement in 1995, it has been recognized that the nation cannot afford to have a rapid pace of growth without reforming the agricultural marketing sector in all parts of the country. There is no denying the fact that marketing of vegetable commodities has remained one of the major area of concern in hilly regions and Himachal Pradesh is no exception.

Himachal Pradesh is endowed with versatile agro-climatic conditions that favour the production of almost all types of vegetables, both of temperate and sub-tropical nature. Among various districts of Himachal Pradesh, Kangra is agriculturally the most predominant district in terms of cultivated area, irrigated area and number of cultivators. It has vast potential for diversification and commercialization of agriculture through vegetable crops that are highly

remunerative and best suited to hills and to the labour abundant small sized land holdings in this district. Being perishable in nature, vegetable commodities need efficient marketing system and supply chain management. However, the present marketing system in the district continues to be inefficient offering no incentives to producers which further acts as a hindrance in the transformation of subsistence agriculture to commercialization. Keeping this in view, the present study has been conducted to examine various aspects of marketing vegetable commodities along with critical assessment of emerging issues, problems and constraints in marketing with pertinent suggestions to improve marketing system for the benefit of farmers.

6.2 Specific Objectives of the Study

The specific objectives of this study are;

- To study the marketable/marketed surplus, marketing practices, pattern of disposal, structure of marketing cost and price-spread of vegetable commodities in Kangra district.
- To examine the structure and behaviour of market prices in Kangra (principal) market yard, its co-integration with sub-market yards, to examine the status of market regulation and infrastructural development and to suggest measure to improve marketing system for vegetable commodities.

6.3 Methodology

The present study was carried out in Kangra district of Himachal Pradesh. Two blocks namely, Kangra and Nagrota Bagwan were selected purposively due to higher area and production of vegetables in these two blocks.

Two-stage random sampling design was used to select sample villages and vegetable producers. In the first stage of sampling, 6 villages (3 from each block) were randomly selected. In the second stage, a sample of 80 farmers was selected randomly from selected villages of two blocks through proportional allocation method. All the farmers were arranged in ascending order on the basis of their total land holdings. With the help of cube root cumulative frequency method, farmers were classified into two categories viz; small (less than 0.8 ha) and large (equal to or greater than 0.8 ha). Besides this, two markets namely, Nagrota (submarket) and Kangra (principal market) were purposely selected to collect market related information for which a sample of 20 market intermediaries (10 from each market) was selected randomly .Both primary and secondary data were collected to meet out the objectives of the study. Primary data were collected through survey schedules and secondary data were taken from the market committees of the respective markets, internet/websites and published/unpublished reports. The study pertains to the year 2007-08. Tabular and statistical techniques were used to achieve the planned objectives of the study. The statistical techniques include multiple linear regression models, time series analysis, trends and monthly seasonal indices, correlation coefficient, Engle-Granger co-integration test, chi-square test, etc.

6.4 Main Findings

1. Land utilization pattern in Kangra district revealed that about 20 per cent of the geographical area was cultivated as against 11.94 per cent at the state level. In Kangra district, around 74 per cent of the holdings

were marginal (<1 ha) and 14 per cent small collectively accounting for 88 per cent of the holdings in comparison to 83 per cent at state level. There was 36 per cent increase in number of holdings from 1980-81 to 1995- 96 as against 4 per cent increase at state level during this period. Consequently, the average size of holding in the district was only 0.93 hectares as against 1.13 hectares for the state as a whole.

2. There has been marginal decrease in the proportion of workers dependant upon agriculture from about 66 per cent in 1981 to about 64 per cent in 2001 in the district in comparison to decrease from 72 to 69 per cent in the state during the same period. The cultivators accounted for about 57 per cent while agricultural labourers accounted for about 7 per cent of the total work force of the district in 2001.
3. The cropping pattern of Kangra district revealed that farming in the district was cereal dominated. The cereal crops accounted for 88 per cent of total cropped area in Kangra as against 80 per cent at the state level during 2002-03. The proportion of net irrigated area to net sown area was higher in Kangra (28.70 per cent) as compared to the state (18.80 per cent) as a whole. Therefore, there was great scope for increasing agricultural production in the district.
4. The area under vegetables in Kangra district has increased from 2,330 ha in 1997-98 to 6,038 ha in 2005-06. The production recorded increase from 38,745 tonnes to 1,00,737 tonnes during the same period. The proportion of area under vegetable crops in total cropped

area in this district increased from 1.02 per cent in 1997-98 to 1.11 per cent in 2005-06. This clearly shows that area under vegetable crops was still quite low in this district in comparison to 3.73 per cent at the state level.

5. The socio–economic survey of vegetable growers in Kangra district revealed average family size of 6 to 8 members and most of the families were having nuclear structure. There was also direct relationship between size of farms and family. About 60 per cent of family members comprised the working population in the age groups of 15-60 years.
6. The overall sex-ratio in the study area was found to be 926 females per thousand males. This ratio was slightly higher on small farms (934) as compared to large farms (901). The overall literacy rate on sampled farms was quite high (94.49 per cent). The literacy rate was higher for males (96.39 per cent) as compared to females (92.38 per cent).
7. The average size of holding of average sampled farm was 0.57 hectare out of which major proportion (94.74 per cent) of area was under irrigation. The average land holding of small farm was 0.4 ha and that of large farm was 1.03 ha.
8. During summer season, lady finger, brinjal and bottle gourd were the major vegetable crops grown by majority of the farmers collectively accounting for about 98 per cent of the total area under summer vegetable crops. Among winter vegetable crops, cauliflower (normal

and mid season), radish (normal and mid season) and cabbage (normal season) were the important crops accounting for about 62, 17 and 17 per cent of the total area under winter vegetable crops, respectively.

9. Since most of the vegetable crops were grown for commercial purpose, therefore, the marketed surplus of both summer and winter vegetable commodities was quite high (89 t0 93 per cent). The per farm production was estimated at about 36 quintals for summer and 43 quintals for winter on small farm and 51 quintals for summer and 80 quintals for winter season on large farm category. In general, the quantity of winter vegetable commodities marketed was higher as compared to summer season vegetables on both the farm categories. The quantity retained for home consumption varied from 5 to 9 per cent of the total production while farm losses came out to be 2 to 5 per cent.
10. The factor analysis shows that marketed surplus was directly related to total production of summer as well as winter vegetable commodities. The size of family was also found to have inverse relationship with marketed surplus. The losses were found to decrease the marketed surplus of brinjal significantly.
11. The prevailing marketing practices and functions were not so specialized at farmer's level. Instead of grading, most of the farmers were sorting out the diseased, bruised, damaged and over ripened

produce along with washing/ cleaning operations. In packaging, bamboo baskets and plastic crates were recycled and used as a packaging material for local sale. In certain commodities, gunny bags were also used for sale in main markets (Kangra and Nagrota).

12. Most of the small producers (54 per cent) used jeep to carry their produce up to main markets while tampoo and truck were used as the means of transportation by large producers. Wheel cart was used by around 14 per cent producers for door to door (direct) sale. The cost of transportation was relatively high for jeep (Rs.10/q) as compared to tampoo (Rs.7/q) and truck (Rs.5/q) up to 5 km distance.
13. The auctioning prices of vegetable commodities were determined by group of commission agents mainly on the basis of quantum of market arrivals, previous day prices and general prices behaviour in wholesale markets outside the state. It was surprising to note that commission agents charged double commission from producers/sellers and retailers/buyers for acting as a mediator.
14. Generally, payment to the local producers was made immediately after auctioning was over while it was made within a week to distant sellers (from other markets). The sale proceeds were not recorded on the prescribed forms as envisaged in the Act as no producers had any such sale document.
15. There were no mechanical weighing, grading and storage facilities available in the study markets (Kangra and Nagrota). The producers received market information (prices) mainly from commission agents in the main markets, local markets, and from neighbours.

16. The vegetable growers patronized seven marketing channels for sale of their produce: producer- pre-harvest contractor – retailer- consumer; producer – pre-harvest contractor- consumer; producer – local trader – retailer – consumer; producer – commission agent – retailer– consumer, producer – retailer – consumer; and producer – consumer.
17. Out of these seven channels, channel-V (involving commission agents and retailers) was popular with 30 per cent of producers. About 40 per cent summer and 33 per cent of winter vegetable commodities were sold through this channel. Another competing channel preferred mainly by small farmers was channel-VI in which producer sold their produce directly in retailer's shop, through which 25 per cent of summer and 26 per cent of winter vegetable commodities were sold.
18. Marketing cost in all vegetable commodities incurred by producer was maximum in channel-VII when they sold their produce directly to consumers. The cost varied from Rs 67.82/q for cabbage (normal season) to Rs 101/ q for tomato. The cost incurred by pre-harvest contractor was high in channel-II (pre-harvest contractor acting as retailer) while for local traders, it was high in channel-IV (producer – local trader – consumer). The marketing cost incurred by retailer was maximum in channel-V (involving commission agents and retailers).
19. The overall marketing cost was maximum when produce was routed through channel-V (involving commission agents and retailers). The total marketing cost varied from Rs 118.02/q in cabbage (normal

season) to Rs 146.15/q in lady finger. The marketing cost was more due to high transportation cost and substantial commission/margin taken by the traders.

20. The producer's share in consumer's rupee was found to be quite high in channel-VII (direct sale to consumer) for all vegetable commodities. The producer's share ranged from 90 to 93 per cent for summer and 84 to 96 per cent for winter vegetable commodities. Thus, this channel was found to be more efficient channel in the study area. However, this channel was patronized on a limited scale as it was more time consuming, having narrow coverage and more risk.
21. The average monthly wholesale prices during the period 2000-01 to 2006-07 showed wide fluctuations with a coefficient of variation ranging from 30 to 62 per cent in Kangra and 29 to 78 per cent in Nagrota market for summer vegetable commodities. It was comparatively low for winter vegetable commodities as the coefficient of variation was found in the range of 33 to 47 per cent in Kangra market and 30 to 39 per cent in Nagrota market. The high variations in prices of summer vegetable commodities could be attributed to high fluctuations in arrivals (37 to 88 per cent) of these commodities.
22. The trends in arrivals during the period 2000-01 to 2006-07 showed significant decrease in case of frenchbean (0.64 q/month) in Kangra while other summer vegetable commodities showed non significant changes for arrivals in both the study markets during the same period.

On the contrary, the average monthly prices of all summer vegetable commodities showed significant increase in Kangra market. The prices increased significantly in case of tomato, frenchbean and lady finger in Nagrota market. Among winter vegetable commodities, the arrivals of radish and cabbage showed significant increase in both the study markets while cauliflower showed significant increase only in Nagrota market. There was significant increase in prices of all winter vegetable commodities in both Kangra and Nagrota markets except in case of radish in Nagrota market. The prices of frenchbean showed maximum increase in Kangra (Rs 9.36/q/month) and Nagrota (Rs 8.57/q/month) market among summer vegetable commodities. In case of winter vegetable commodities, the whole sale prices showed maximum increase to the tune of Rs.8.20/q/month in Nagrota and Rs 9.65/q/month in Kangra market. However, low value of R^2 signifies week trends due to high seasonal variation in prices.

23. There was inverse relationship between prices and arrivals as high arrivals were associated with fall in the prices of most of the vegetable commodities. There was significant decrease in prices to the extent of Rs 2.04 in Kangra and Rs 6.09 in Nagrota with one quintal increase in arrivals of frenchbean. Similarly, the price of pea significantly decreased by Rs 3.27 in Kangra and Rs 5.36 in Nagrota market with additional arrival of one quintal of produce in these markets.

24. The arrivals and prices of vegetable commodities showed high degree of seasonal variations in both the study markets. In case of summer vegetable commodities, peak arrival period was from May to June. During this period, the seasonal indices of prices were at the lowest level for most of the summer vegetable commodities. The price of lady finger was found to be maximum during lean season from the month of November to April in Kangra and from December to March in Nagrota markets while the lowest prices were recorded during months of June to August in both the markets. Similarly, in case of winter vegetable commodities, the peak arrival was from December to January that was also associated with low seasonal price indices. The prices of cauliflower were found to be high during June to October in both Kangra and Nagrota markets. The prices of cauliflower ruled very low in the months of January to April in both the markets due to peak supply during this period from local producers as well as from neighbouring states like Punjab.

25. The market integration between Kangra and Nagrota markets showed positive and significant correlation for summer (0.37 to 0.89) and winter (0.56 to 0.85) vegetable commodities indicating that market signals did get transmitted from one market to another. The high degree of market integration was visible in case of brinjal (0.89) and bottle gourd (0.89) among summer vegetable commodities. Among winter vegetable commodities, the degree of market integration was relatively high in case of potato (0.85). However, the time series data tested for

stationary nature by 'Phillips-Perron' test showed non stationary characters for brinjal, radish, pea, potato and cabbage in Kangra and for brinjal, lady finger, pea, potato and cabbage in Nagrota market.

26. The Engle- Granger co-integration test further revealed that Nagrota market was significantly co-integrated with Kangra market for the determination of wholesale prices of brinjal, pea, potato and cabbage in long term. The Error Correction Model further proved that there were short run fluctuations in prices of these commodities in the two markets. However, in the long run, Nagrota (sub market) followed Kangra (principal market) in adjusting the prices of different vegetable commodities.

27. However, the results indicated moderate form of co-integration between Nagrota and Kangra markets for price determination. The speed of price adjustment of Nagrota with Kangra was found maximum for brinjal (75 per cent) followed by pea (70 per cent). However, the extent of price adjustment was low for cabbage (33 per cent).

28. The pertinent marketing problems pinpointed by the farmers were; high market charges, gluts in peak seasons due to bulk arrivals from plains leading to low prices, lack of storage facilities, no premium for graded/ quality produce, lack of reliable market information and above all indifferent attitude of commission agents toward farmers. The problems highlighted by the traders were lack of parking facilities, paucity of sufficient yard space, lack of market infrastructure/amenities, and absence of mechanical devices for efficient market operations.

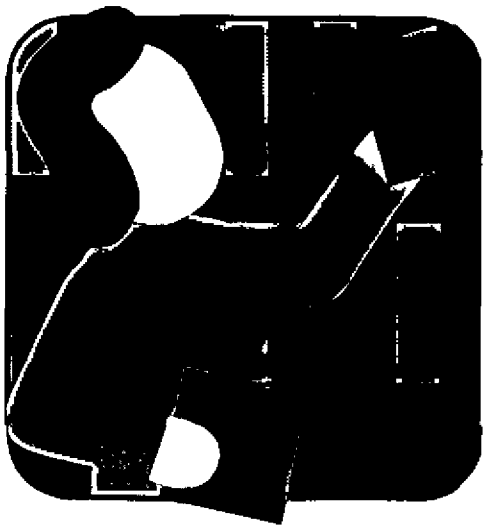
29. Most of the farmers sold their vegetable commodities during main season due to which there was glut in the markets and they did not get remunerative prices for their produce. Thus, the growing season of different vegetable commodities should be altered in such a way that they can supply these commodities over a period to increase their profits. Further, farmers should explore new market avenues like contract farming or linkage with agro processing industries so as to reduce the number of intermediaries and instability in prices.

6.5 Suggestions and Recommendations

1. It was found that farmers generally grow conventional vegetable commodities without any consideration of the trends in the market prices. Frenchbean in summer and pea in winter season fetched high prices in both the markets. Therefore, the farmers should change their conventional cropping pattern by putting more area under profitable crops like frenchbean, lady finger and pea.
2. The farmers should be educated to alter the supply seasons of certain vegetable commodities to avoid peak seasons gluts by adjusting sowing/harvesting time. The protected cultivation of vegetable commodities in early or late seasons could prove to be a bonanza to farmers to reap the benefits of lean season high prices.
3. The higher marketing efficiency and better returns to producers through direct retailing is a clear indicator for developing farmer's markets in the region. This will also increase competition in vegetable marketing for the benefit of both producers and consumers.

4. The farmers should be encouraged to form their own marketing co-operative societies in order to reap the benefit of scale economies (low cost of handling, transportation, packaging and storage) and better bargaining and collective strength.
5. There is need to explore new market outlets within and outside the state as well as export to other countries particularly lady finger, frenchbean and potato having good quality and production potential in this district. In this context, organic farming should be promoted to improve quality for exports.
6. The malpractices like arbitrary auction, double charging of commission and arbitrary deduction for moisture etc., should be checked. The recording of sale proceeds on prescribed forms should be strictly enforced so that the producers get a transparent and fair deal.
7. The latest and updated local, state and national level market information should be made available to producers by Market Committees and Marketing Board through Large Display Boards for developing marketing intelligence among the farmers. This will also increase the co-integration among different markets of the region.
8. More funds should be earmarked for improving infrastructures and modern facilities and amenities. The village level collection/procurement centres should be established in potential areas.

9. Emphasis should be given to make New APMC Act 2005 fully operational in the markets. The innovative provisions envisaged in APMC Act 2005 like promotion of farmers'/private Mandies, contract farming, setting of market extension cell and Standard Grading Bureau in the principal market (Kangra) may be implemented to bring overall transformation in vegetable production and marketing in Kangra district



Literature Cited

LITERATURE CITED

Acharya, S.S. and Agarwal, N.L. 2004. Agricultural marketing in India, Oxford and IBH Publications, pp. 493

Agarwal, N.L. 1998. Marketing cost, margins and price spread for major agricultural commodities of Rajasthan. Indian Journal of Agricultural Marketing 12 (3) : 122-132.

Agarwal, N.L. and Saini, T.C. 1995. Vegetable marketing : a case study of Jaipur market (Rajasthan). Indian Journal of Agricultural Marketing 9(1): 36-43.

Anonymous. 2003. Crop annual season report. Directorate of Land Records, Shimla, Himachal Pradesh.

Anonymous. 2007. http//.www.agmarknet.nic.in

Arya, P.S. 2001. Off-Season Vegetable growing in Hills. A.P.H. Publishing Corporation, pp. 413.

Autkar, V.N., Vyawahare, C.A. and Rakhonde, B.M. 1994. Vegetable marketing in unorganized sector: a case study of Akola district. Indian Journal of Agricultural Marketing (Conf spl.) : 114

Balappa, S.R. and Hugar, L.B. 2002. Trends and variations in arrivals and prices of vegetables in Northern Karnataka. Indian Journal of Agricultural Marketing 16 (2): 10-17.

Basu, J.P. 2002. Is potato market efficient: An analysis of village survey data for Hooghly district, West Bengal. Indian Journal of Agricultural Marketing 16(3): 147-158.

Basu, J.P. and Soumyananda, D. 2003. Market integration: an application of error correction model to potato market in Hooghly district, West Bengal. Indian Journal of Agricultural Economics 58(4): 742-751.

Bhardwaj, S.R., and Kaul, S. 1999. Marketing of fruits and vegetables in India. Indian Journal of Agricultural Marketing (Conf. Spl.) 13(2): 45.

Bhupal, D.S. 2000. Changing pattern of agriculture marketing. Indian Journal of Agricultural Marketing (conf. Spl.): 8-17.

Bunga, M. 2001. An analysis of marketing efficiency of agricultural product: case study of East Nusa Tenggara. Tropenlandwirt, Beiheft 73: 73-83.

Buongiomo J. and Usivuori, J. 1992. The law of one price in the trade of forest products: co-integration tests for U.S. exports of pulp and paper. Forest Science 38 (3): 539-553.

Chahal, S.S., Singla, R. and Kataria, P. 2004. Marketing efficiency and price behaviour of green peas in Punjab. Indian Journal of Agricultural Marketing 18(1): 115-128.

Chand, Ramesh. 1996. Diversification through high value crops in Western Himalayan Region: Evidence from Himachal Pradesh. Indian Journal of Agricultural Economics 51(4): 652-663.

Chattopadhyay, S.K. 2002. Problems and prospects of marketing of potato in West Bengal. Indian Journal of Agricultural Marketing (conf.spl.) 16(3): 161.

Chauhan, R.S., Singh, J.M. and Thakur, D.R. 1999. Marketing of vegetable in Utter Pradesh. Indian Journal of Agricultural Marketing (conf. spl.) 13(2): 56-57.

Chauhan, S.K. 2004. Infrastructural development and constraints in vegetable marketing: a study of regulated markets in Himachal Pradesh. Indian Journal of Agricultural Marketing (conf. Spl.) 18(3): 273.

Chauhan, S.K. and Mehta, P. (2002). Problems and constraints in vegetable marketing: a case study of Himachal Pradesh. The Bihar Journal of Agricultural Marketing 10 (1): 25-30.

Croxton, F.E., Cowden, D.J. and Sidney, K. 1973. Applied General Statistics, Prince Hall International Inc. pp: 322-333.

Data, T.K. 2002. Problems of infrastructure in the agrimarkets and villages of Sunderbans in West Bengal. Indian Journal of Agricultural Marketing 16(3): 137-146.

Dhanasekaran, K. 2002. Divergence or convergence between prices received and prices paid by agricultural sector in India: a statistical exposition using co-integration and causality models. Asian Economic Review 44(3): 452-460.

Dhondyal, S.P. 1985. Farm Management: An Economic Analysis, Friends Publications, Meerut.

Elenchezhian, T. and Kombairaju, S. 2003. Comparing the marketing efficiency of farmer market with central vegetable market. Indian Journal of Agricultural Marketing 17(1): 45-51.

Engle, R.F. and Granger, C.W.J. 1987. Co-integration and error correction: representation, estimation, and testing. Econometrica 55 (2): 251-276.

Fielder, Lonnie, L. and Osagie, Emmanual, I. 1985. Analysis, forecasts and seasonal patterns of monthly prices and quantities, Lousiana farm products. DAE, Research Report No. 642. PP: 73

Gajipara, H.M., Khunt, K.A. and Vekariya, S.B. 2006. Price behaviour of major vegetables in Gujarat state. Indian Journal of Agricultural Marketing 20 (1): 28-37.

George, S. and Singh, A. 2002. Vegetables for health and nutrition security. Yojana 46(April): 36-40.

Ghosh, M. 2000. Co-integration tests and spatial integration of rice markets in India. American Journal of Agricultural Economics 55 (4):616-625.

Greene, W. H. 2002. Phillips-Perron test for a unit root. LIMDEP Version 8.0: Econometric Modeling Guide, Econometric Software, INC. pp: 1:E3-9:11.

Gurung, H. B., Subedi, P. P., Gurung, T. B., Acharya, U., and Gurung, H. P.1996. Production and marketing constraints to fresh fruits and vegetables in the western hills of Nepal: a rapid marketing appraisal. Occasional Paper Lumle Agricultural Centre 96 (4): 35.

Hussein, N., Singh, D.S. and Gupta, N.K. 2000. Impact of regulation of markets on price spread of potato: a case study in U.P. Indian Journal of Agricultural Marketing 14(2): 42.

Jha, C. 2007. Economic sustainability and market potential of garden pea in Himachal Pradesh. M.Sc. Thesis (unpublished). Submitted to Himachal Pradesh Krishi Vishvavidyalaya, Palampur.

Kainth, G.S. 1996. Indian export potential of Indian Agriculture, Regency Publication. New Delhi Pp: 165-172.

Kaur, P and Kaur, A. 2003. Progress and performance of regulated markets in Punjab. Indian Journal of Agricultural Marketing 17(1): 34-40.

Kirve N.V., Navdkar, D.S., Shette , V.R. and Dorge, J.T. 2002. Production and marketing of frenchbean. Indian Journal of Agricultural Marketing 16(2): 59-63.

Kumar, A. and Arora, V.P.S. 1999. Post harvest management of vegetables in U.P. hills. Indian Journal of Agricultural Marketing 13(2): 6-14.

Kumar, A.I. and Arora, V.P.S. 2003. An analysis of marketed surplus and marketing cost of vegetables in Uttaranchal Indian Journal of Agricultural Marketing 17 (1): 63-74.

Kumar, A.K., Atteri, R.B. and Kumar, P. 2004. Marketing infrastructure in Himachal Pradesh and integration of the Indian apple markets Indian Journal of Agricultural Marketing (Conf. Spl.) 18 (3): 243-252.

Kumar, R. 1991. Marketing of vegetables in Solan district of Himchal Pradesh. M.Sc. Thesis (unpublished). Submitted to Himachal Pradesh Krishi Vishvavidyalaya, Palampur.

Kumar, S. 1994. Marketing of vegetables in Kullu valley of Himachal Pradesh. M.Sc. Thesis (unpublished. Submitted to Himachal Pradesh Krishi Vishvavidyalaya, Palampur.

Lal, H. 1993. Economic analysis of marketing problems of agricultural produce in Himachal Pradesh. P.hD. Thesis. Submitted to Himachal Pradesh Krishi Vishvavidyalaya, Palampur.

Lal, H. and Sharma, K. D. 2004. Economics of production and marketing of off-season garden peas in Lahaul valley of Himachal Pradesh. Indian Journal of Agricultural Marketing (Conf. Spl.) 18 (3): 277-278.

Lal, H., Sharma, K. D. and Thakur, D.S.2000. Vegetable marketing in Himachal Pradesh: constraints and opportunities. The Bihar Journal of Agricultural Marketing 8 (4): 416-415.

Lal. H., Thakur. D.S. and Sharma, K. D. 1997. Determinants of marketed supply of vegetables from Himachal Pradesh. Agricultural Marketing 39(4): 35-38.

Mamoria, C.B. and Joshi, R.L. 1982. Principal and practices of marketing in India. Kitab Mahal15, pp: 993.

Marothia, D.K, Gupta, S.P. and Chandrakar, M. R. 1996. Vegetables marketing a case study of two markets in Chattisgarh region of Madhya Pradesh. The Bihar journal of agriculture marketing 4(1): 44-50.

Mehta, Prakash and Chauhan, S.K. 1996. Marketed surplus of vegetables in Himachal Pradesh. The Bihar Journal of Agricultural Marketing 4(4): 361-368.

Mishra, J.P. 1996. Glimpses of marketing of agricultural and horticultural produce in North-Eastern region of India. The Bihar Journal of Agricultural Marketing 4 (1): 6-13.

Mishra, J.P., Vishwakarma, R.S. and Rawat, S.K. 1999. Production and marketing of chillies. The Bihar Journal of Agricultural Marketing 7(1): 36-43.

Mundinamani, S.M., Ranganatha Sastry, K.N. and Basavaraja, M. 1999. Trends and seasonality in market arrivals and prices of groundnut in Karnataka. Indian Journal of Agricultural Marketing 13(1): 53-59.

Nagraj, N. and Chandrakanth. 1992. Market performance of perishables – case of vegetables and fruits. Agricultural marketing 35(2): 34-40.

Narayanagowda, K., Samashekara, C., and Prassad , R., Shivanna, J. and Neelkantan, B. 1991. Adoption and non adoption of recommended practices among rainfed potato growers in Hanan district. Mysore Journal of Agricultural Sciences 25: 100-104.

Patel, D.A., Patel, A.J., and Antani, K.L. 1999. Marketing of cabbage and cauliflower growing Banaskantha district of North Gujarat. Indian Journal of Agricultural Marketing (conf. spl.): 34-35.

Patil, H.N. and Mahajan, R.S. 1993. Price spread in marketing of tomato in Bombay. Agricultural Marketing 36(2): 16-20.

Prakash, Brahm. 1999. Constrains and strategies for the transformation of agricultural marketing to meet emerging challenges of the future. Indian Journal of Agricultural Marketing (Conf. spl.) 13(2): 144-145.

Prasad, Y.E., Jahan, A. and Choudary, M.N.K. 1999. Marketing of vegetable : a case study of Chirala market. Indian Journal of Agricultural Marketing (conf. spl.) 13(2): 40-41.

Radha, Y. and Y., Eswara, Prasad. 2001. Economics of production and marketing of vegetable in Karimnagar district, Andhra Pradesh. Journal of Agricultural Marketing 15(1): 55-61.

Saini, A.S., and Bhati, S.K. 1995. Constraints of ginger marketing in Himachal Pradesh. The Bihar Journal of Agricultural Marketing 3(2): 117-127.

Shandil, K. and Singh, R. 2004. Marketing of vegetables in Himachal Pradesh: a study of market structure and marketing efficiency. Indian Journal of Agricultural Marketing (conf. Spl.) 18 (3): 278-279.

Sharma, A., Kumar, A. and Sharma, S.K. 2004. Marketing channels, production problems and constraints in vegetable cultivation: a case study in Himachal Pradesh. The Bihar Journal of Agricultural Marketing 12(1): 47-51.

Sharma, K.D. and Thakur, D.R. 2004. Market infrastructure for increasing agricultural production and prosperity of hill farmers in Himachal Pradesh. Indian Journal of agricultural Marketing (conf. Spl.)18 (3): 227.

Shelke, R.C. and Kalyankar, S.P. 2000. Price spread in marketing of selected vegetables in new Mondha Market, Porbhani. Indian Journal of Agricultural Marketing 14(1): 54-59.

Shiyani, R.L, Kuchhadiya, D.B. and Patel, N.V. 1998.Marketing of vegetable in South Saurashtra zone of Gujrat. Indian journal of agricultural marketing 12(1): 156.

Shyamsunder, M.S. and Achoth, L. 1996. Price spread in marketing of irrigated onion in chickballpur taluk of Kokar district. Indian Journal of Agricultural Marketing 10(1): 52-57.

Singh, A.J. and Singh, I. 1992. An analysis study of pattern and factors affecting marketed surplus in Punjab: a size wise analysis. Indian Journal of Agricultural Marketing 6(1): 12-20.

Singh, D.V. and Bhati, J.P.1996. Pattern of energy consumption in farming household of Himachal Pradesh. Agricultural Situation in India 53(7): 629-634.

Singh, K. and Vashist, G.D. 1999. An analysis of production and marketing system of vegetables in Lambagaon block of district Kangra (H.P.). The Bihar Journal of Agricultural Marketing 7(4): 376-389.

Singh, R.S. and Shrivastava, P. 2004. Production, consumption and economics of vegetables in selected districts of Himachal Pradesh. Indian Journal of Agricultural Marketing (conf. Spl.) 18 (3): 279-280.

Singh, S. 2002. Production and marketing of vegetables in Mandi district of Himachal Pradesh. M. Sc Thesis (unpublished). Submitted to Himachal Pradesh Krishi Vishvavidyalaya, Palampur.

Singh, V., Shrivastava, P. and Kumar, A. 2002. Potato marketing pattern in Agra district of Western Uttar Pradesh: a temporal and spatial analysis. Indian Journal of Agricultural Marketing 16 (1): 27-35.

Singh, Y. Chakrabarty, Prasher, R.S. and Negi Y.S. 2004. Marketing of off-season vegetables in Himachal Pradesh: a spatio-temporal analysis for peas and tomato. Indian Journal of Agricultural Marketing (conf. Spl.) 18 (3): 276.

Thakur, D.S. 1994. High stakes for banks in off-season vegetable production and marketing. The Bihar Journal of Agricultural Marketing 2(1): 89-95.

Thakur, D.S. 1997. Advances in agricultural marketing, marketed surplus and possibilities of increasing marketed surplus and income of farmers in hills.The Bihar Journal of Agricultural Marketing 5(2): 141-151.

Thakur, D.S, and Saini, A.S. 1996. Marketable and marketed surplus of vegetables in hills. Indian journal of agriculture marketing 10(3): 88-92.

Thakur, D.S., Sanjay and Saini, A.S. 1996. Marketable and marketed surplus of vegetables in hills. Indian Journal of Agricultural Marketing 10(3): 87-92.

Thakur, D.S., Sanjay, Thakur, D.R. and Sharma, K.D. 1994. Economics of off season vegetable production and marketing in hills. Indian Journal of Agricultural Marketing 8(1): 72-82.

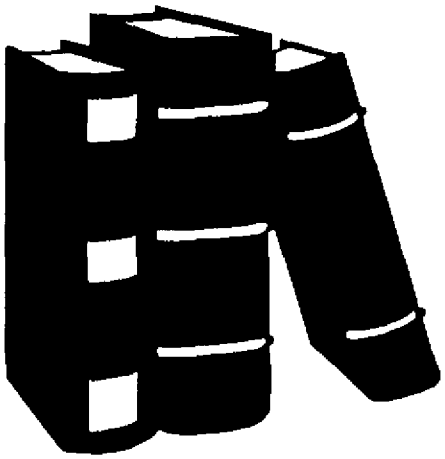
Vashist, G.D. and Pathania, M.S. 1999. Inequalities in income and expenditure in Kangra district of Himachal Pradesh. ICCSSR seminar on poverty and income distribution in North-Western states of India, organized by Department of Agricultural Economics, Himachal Pradesh Krishi Vishvavidyalaya Palampur, May: 28-29, 1999.

Vasudev, N. and Chowdry, K.R. 1999. Marketing of tomato in Andhara Pradesh Indian Journal of Agricultural Marketing (conf. spl.) 13(2): 53.

Verma, A.R. and Rajput, A.M.2000. Costs, returns and marketing of potato in Indore district of Madhya Pradesh. Indian Journal of Agricultural Marketing 14(1): 23-31.

Verma, L.R. 2004. Marketing of fruits and vegetables in Himachal Pradesh: strategies for sustainable development. Indian Journal of Agricultural Marketing (Conf. Spl.) 18 (3): 202-226.

Zanias, G.P. 1993. Testing for integration in European community agricultural products markets. Journal of Agricultural Economics 44(3): 418-427.



Appendices

APPENDIX –I Farmer's survey schedule

1. General Information :-

Name of the Farmer: _____

P.O:- _____ Village: _____

Tehsil: - _____ Block: _____

Distance of the farm from (in km):-

a. Kacha road: - b. Metalled road: - c. Bank branch:-

d. Post office: - e. ADO/VEO office: - f. local market:-

g. Co-operative store: - h. Tehsil office:- i. regulated market:-

Date of interview :-_____

Signature of interviewer :- _____

Checked by Major Advisor :- _____

2. Demographic Features of Family

S. No.	Age (yrs.)	Education I/P/M/HS/G/NS	Occupation			
			Main	Income	Subsidiary	Income
1						
2						
3						
4						
5						
6						
7						
8						

I-Illiterate, P- Primary, M- Middle, HS- Higher Secondary, G- Graduate, NS- Non School

N.B. - Family Structure:- Joint /Nuclear

3. Land inventory:-

S. No.	Particulars	Area (canals)			Source of Irrigation	Rent Paid/received	Land Revenue
		IR	UR	Total			
1.	Owned Land						
2.	Leased in						
3.	Leased out						
4.	Total Holding(1+2-3)						
5.	Land utilization						
	i. Cultivated land						
	ii. Fallow land						
	iii. Pastures/forests						
	iv. Any other						
	Total						

IR: irrigated area; UR: un irrigated area ;

4. Marketable and marketed surplus of different vegetable commodities.

CROP	Time/date		Total Production (q)	Home Consumption (q)	Gifts (q)	Kind payments (q)	Marketable surplus (q)	Losses (q)		Quantity marketed (q)
	Sowing	Harvesting/Supply						At farm	During transit	
Summer vegetables										
Tomato										
Brinjal										
Frenchbean										
Lady finger										
Bottle gourd										
Winter vegetables										
Radish*										
Pea										
Potato*										
Cauliflower*										
cabbage										

* Note down Early and late sown crops separately.

5. Disposal of vegetable commodities through different channels / agencies

Name of the vegetables	Pre harvest contractor			Local trader			Cooperative society			C.A./ WS			Retailer			Consumer		
	Name of Place/ Market	Quantity sold (q)	Price (Rs./q)	Name of Place/ Market	Quantity sold (q)	Price (Rs./q)	Name of Place/ Market	Quantity sold (q)	Price (Rs./q)	Name of Place/ Market	Quantity sold (q)	Price (Rs./q)	Name of Place/ Market	Quantity sold (q)	Price (Rs./q)	Name of Place/ Market	Quantity sold (q)	Price (Rs./q)
Summer vegetables																		
Tomato																		
Brinjal																		
Frenchbean																		
Lady finger																		
Bottle gourd																		
Winter vegetables																		
Radish																		
Pea																		
Potato																		
Cauliflower																		
Cabbage																		

6. Marketing cost incurred by Vegetable growers:

Name of the vegetables	Marketing agency formed	Grower's expense on (channel-wise)												Price received by the growers
		Assembling charges up to farm house/store	Cleaning	Pre-cooling	Grading (labour charges)	Packaging Material	Packaging Labour	Wastage during farm storage	Transportation to road head /market	Loading/unloading	commission	Market fee	Other charges if any	
Summer vegetables														
Tomato														
Brinjal														
Frenchbean														
Lady finger														
Bottle gourd														
Winter vegetables														
Radish														
Pea														
Potato														
Cauliflower														
cabbage														

7. Marketing practices followed by vegetable growers:

SN	Name of the vegetables	Cleaning (Y/N)		Pre-cooling		Grading (Yes/No) if yes						Packaging						Storage (yes/ no)				Transportation			Selling time				Av. time spent for market/ hrs
						Characteristics considered			Mode			Mode		Packaging material			Capacity (kg)	Duration	Type of storage		Looses (%)	To farm house	To road head	To market	Same day		Next date		
		m	p	m	p	s	l	m	ml	mh	st	ml	mh	g	bx	b			i	c					mg	e	mg	e	
Summer vegetables																													
1	Tomato																												
2	Brinjal																												
3	Frenchbean																												
4	Lady finger																												
5	Bottle gourd																												
Winter vegetables																													
6	Radish																												
7	Pea																												
8	Potato																												
9	Cauliflower																												
10	cabbage																												

md- mode, p-place, s-size, l-length, m-moisture, ml-manual, mh-machine, st- sorting table
agency, g-gunny bag, bx- box, b-basket, lc-local, c-cold storage, mg-morning, e- evening.

7. Marketing practices followed by vegetable growers: Contd.....

	Name of vegetables	Weighing						Auctioning						payment			Price information			Arrival information			others (specify)		
		mode	Deduction practiced for					Open auction	Close tender	Decided by trader	No. of bidders for a lot	Price (Rs/lot)		Mode		Period(days	T	s	F	T	s	F	T	s	F
			Pm	ml	dm	N. wt	G. wt					S	E	c	c h										
	Summer vegetables																								
	Tomato																								
2	Brinjal																								
3	Frenchbean																								
4	Lady finger																								
5	Bottle gourd																								
	Winter vegetables																								
6	Radish																								
7	Pea																								
8	Potato																								
9	Cauliflower																								
10	cabbage																								

Pm- packaging material, ml-moisture loss, dm- damaged, N. wt- net wt in qt, G. wt-gross wt in qt, S- starting, E- ending, c-cash, ch- checque, Ti-type of information, s-sources, F-frequency in a season.

8. Problems faced by farmers in selling of vegetable commodities:-

problems	Dimension of problems	Response		Suggestions
		Yes	No	
Relating to market				
Well established market in the area				
Market at distant place				
Regulated market				
Market facilities a. Boarding b. Lodging c. Parking of animals d. Parking of vehicles				

Taking produce to market a. Costly b. Time consuming				
Remunerative price				
Management cost of marketing a. High b. Medium c. Low				
Institutional:				
Production and marketing extension available				
Availability of critical inputs at sale centre/shops				
Crop insurance scheme				
Support price				
Relating to traders				
Cooperative nature of traders				
Market competitiveness a. Fair b. Low				
Prompt payment by traders				
Open auction				
Malpractices				
1. Faulty weighment				
2. Faulty grading/ standardization				
3. Deductions for moisture and purity				
4. Auction practices improper				
5. Higher market charges				
Relating to transportation				
Link roads in the producing area				
Availability of means of transportation				
High transportation cost				
Miscellaneous				
Proper implementation of market regulation				
Proper market supervision by the market officials				
Timely information regarding prices of vegetables in different markets.				
Outright procurement system in the village				
Any other				

APPENDIX II: Trader's survey schedule

I. Introduction:

1. Name of the market _____
2. Name and address of the Firm/trader(s) _____
3. Year of entry in business _____
4. Type of business: WS/LT/Itinerant/ Retailer/Producer_____
5. Commodities dealt: Vegetables
6. Date of interview:_____
7. Signature of the advisor:_____

II Marketing Costs and Margins of Traders in the Marketing vegetables

From Producers/ local market/ wholesale market/from outside state/retail market

Vegetables	Procurement /purchases						Marketing cost (Rs/q)										
	No. of producer	No. of traders	Market /place from where procured.	Total quantity purchased during the year	Auction/ Purchase price (Rs./q)		Packaging		Loading	Transportation charges	Unloading	Storage cost (if any)	Grading/cleaning	Losses in transit & storage	Octroi/State Tax	Other charges	Total cost
					Mn	Mx	Mat	C									
Summer vegetables																	
Tomato																	
Brinjal																	
Frenchbean																	
Lady finger																	
Bottle gourd																	
Winter vegetables																	
Radish																	
Pea																	
Potato																	
Cauliflower																	
Cabbage																	

LT: local trader, RT: retailer, CA: commission agent, Mat: material, C: cost, Mn: minimum, Mx: maximum

III. Average daily volume of business

	Quantity	Value	Remarks
Peak season			
Mid season			
Mild season			

IV. Pattern of disposal

Vegetables	Pattern of disposal						Price received	
	H.P.			Other states			min	max
	LT	CA	RT	Markets	CA	RT		
Summer vegetables								
Tomato								
Brinjal								
Frenchbean								
Lady finger								
Bottle gourd								
Winter vegetables								
Radish								
Pea								
Potato								
Cauliflower								
Cabbage								

LT: Local traders; CA: Commission agents; RT: retailers.

V. Facilities provided to producer by trader in the markets

Particulars	Yes/No Suggestion
Boarding/ lodging	
Packaging	
Transportation facility	
Cold Storage Prompt payment	
Credit and banking	
Internet,	
e-marketing	
Insurance	
Daily information from main market	

VI. Problems Faced by Traders in the Marketing of vegetable commodities

Problems	Yes/No	Suggestion
Relating to labour		
Labour scarcity		
High wage rate		
Deficiency of skilled labour in the season.		
Relating to grading		
Lack of grade specification		
Grading very costly and difficult task		
Non-availability of mechanical grading facilities		
No provision for improved methods of Grading and standardization		
Relating to Packing		
Lack of packing material		
Costly packing material		
Packing material not of good quality		
Relating to transportation		
Lack of link road to the main market		
Quick transportation facilities are not available for distant markets.		
Limited and non availability of vehicles at the right time		
Relating to APMC		
Non-corporative officials		
Formalities in getting license		
Interference in the business by market committee		
Too much information required		
Less fund for market development		

APPENDIX III: Market survey schedule

I. **Introduction :-**

1. Name of market : _____
2. Year of establishment: _____
3. Location of market Village/Town/City _____
4. Distance (Km) of market from :
   a. National highway _____
   b. Nearest City _____
   c. Other competing market (s) _____
5. Coverage of market (in the producing area):
6. Radius in Km_____
7. No. of Villages _____
8. No. of producers coming to the market/annum_____
9. Date of Interview: _____
10. Signature of the major advisor_____

II. **Size, Type and Nature of the Market**

1. Size of market _____ No. of traders _____
2. Functionary Commodities dealt
   a. Commission Agents _____ _____
   b. Wholesalers _____ _____
   c. Retailers _____ _____
   d. Processors _____ _____
   e. Other (Specify): _____ _____

III. **Infra-structural facilities available**

Facilities	Yes/No	No./ Size/ Capacity	Functional/ non functional
Market Yard			
Shops			
Auction Platform			
Weighing machine			
Grading/Packing Sheds			
Storage/godown			
Cold storage/Warehouses			
Boarding/Lodging(beds)			
Drinking water taps			
Electrification			
Telephone (STD/ISD)			
Sanitary staff			
Public utility			
Other Modern facilities (If any)			
Mechanical Grading			
Mechanical weighing			

APPENDIX IV

Monthly wholesale prices of summer vegetables in Kangra and Nagrota markets, 2000-2001 to 2006-07 (Rs./q)

		Tomato		Brinjal		French bean		Lady finger		Bottle gourd	
		Kangra	Nagrota	Kangra	Nagrota	Kangra	Nagrota	Kangra	Nagrota	Kangra	Nagrota
2000	April	450	475	350	400	800	800	1150	1150	250	550
	May	400	350	300	350	750	750	700	650	200	350
	June	350	350	300	350	750	600	700	550	200	300
	July	350	500	400	300	700	600	400	600	250	400
	Aug	1000	500	300	400	700	700	350	450	325	450
	Sep	950	800	300	400	800	900	450	475	350	452.5
	Oct	900	750	350	400	1000	950	700	550	350	350
	Nov	850	750	400	325	900	950	1400	750	400	300
	Dec	600	900	350	300	1250	1000	900	550	400	500
	Jan	500	900	300	300	1250	750	1800	1900	900	1250
	Feb	550	850	300	350	1300	800	1200	1900	1200	1600
	Mar	400	500	400	350	800	800	1400	1600	1000	1400
2001	April	400	450	400	475	800	900	1400	750	300	450
	May	325	400	350	350	800	850	600	750	200	350
	June	350	375	300	300	600	600	600	450	200	300
	July	300	500	350	400	600	800	300	700	300	400
	Aug	900	625	300	425	650	800	300	525	350	450
	Sep	500	800	300	475	800	950	400	525	350	425
	Oct	800	800	350	450	1000	1100	700	500	350	350
	Nov	800	825	450	425	1000	1100	1400	550	400	300
	Dec	600	950	350	350	1000	1150	1000	900	400	900
	Jan	450	850	400	350	1000	800	1600	2250	1200	1025
	Feb	350	900	325	350	900	850	1200	2250	1000	1500
	Mar	400	550	350	450	750	1200	1300	1500	1000	1500
2002	April	550	550	500	525	800	1000	1400	1200	350	475
	May	350	400	400	525	800	1050	700	800	200	400
	June	350	400	275	400	650	700	600	500	200	400
	July	400	550	275	400	800	900	350	700	400	475
	Aug	1100	675	350	450	1000	900	450	575	450	500
	Sep	850	900	300	550	1000	1050	600	550	300	500
	Oct	900	1000	450	550	1400	1000	800	600	350	300
	Nov	1000	900	500	500	1400	1150	1200	600	500	300
	Dec	650	925	450	425	1400	1200	1000	950	500	800
	Jan	500	950	400	425	1200	1150	1700	2000	1400	2100
	Feb	550	900	300	325	1000	900	1700	2000	1200	2100
	Mar	400	600	450	500	900	1100	1500	1500	1200	1650
2003	April	450	550	600	550	1000	1000	1600	1250	400	550
	May	350	425	400	500	850	1150	850	850	200	400
	June	400	400	400	400	750	800	750	500	300	525

		Tomato		Brinjal		French bean		Lady finger		Bottle gourd	
		Kangra	Nagrota	Kangra	Nagrota	Kangra	Nagrota	Kangra	Nagrota	Kangra	Nagrota
	July	425	600	450	400	1000	1000	450	700	450	525
	Aug	1150	675	400	475	1000	1000	500	600	500	550
	Sep	900	900	450	575	1100	1100	800	600	400	400
	Oct	850	1000	500	575	1500	1300	1400	550	500	400
	Nov	1100	925	600	500	1500	1300	1300	800	600	375
	Dec	700	950	450	400	1500	1400	1100	1000	500	500
	Jan	600	1000	400	450	1400	2250	1900	2100	1400	2600
	Feb	700	900	350	375	1400	1000	1800	2100	1300	2400
	Mar	400	650	500	650	1000	1200	1600	1500	1250	1950
2004	April	550	600	600	550	1000	1100	1600	1300	400	550
	May	350	450	450	500	850	1200	800	900	300	500
	June	450	400	350	400	700	900	750	600	300	500
	July	450	500	350	450	1000	950	500	300	500	550
	Aug	1250	700	500	550	1100	1000	600	600	550	450
	Sep	950	900	600	600	1100	1100	800	650	400	400
	Oct	900	1000	600	550	1500	1400	1400	750	550	400
	Nov	1150	1000	550	500	1500	1400	1300	850	700	350
	Dec	800	1100	500	500	1500	1500	1200	1000	650	375
	Jan	650	1000	400	400	1500	1200	2050	2400	1750	2750
	Feb	800	900	400	425	1100	1000	1900	2200	1250	2250
	Mar	450	600	600	700	1000	1300	1800	1600	1300	1600
2005	April	900	950	600	625	1400	1100	1850	1500	375	600
	May	650	700	425	450	900	950	1050	1000	200	400
	June	400	450	350	475	1000	800	550	500	200	400
	July	750	800	900	800	1050	900	875	800	200	700
	Aug	950	1050	750	775	1200	1100	700	600	450	400
	Sep	1050	1125	1050	800	1250	1200	1200	1200	550	500
	Oct	1000	1050	950	900	1500	1400	1450	800	600	500
	Nov	1100	1150	500	625	1550	1450	1600	850	600	450
2006	April	800	850	600	600	1500	1300	1400	1400	500	750
	May	500	1500	450	450	850	1000	1050	900	325	500
	June	1450	2100	600	425	1150	900	525	450	500	500
	July	1150	1500	500	500	1150	1000	600	600	650	750
	Aug	1250	1250	850	750	1300	1200	750	650	700	550
	Sep	1750	1400	800	825	1200	1200	800	1200	750	650
	Oct	1150	1400	700	700	1400	1300	1200	1250	600	550
	Nov	850	1100	575	600	1600	1650	1400	1500	750	650
	Dec	1250	900	550	575	1550	1600	1900	2000	1150	650
2007	Jan	1050	750	550	550	1350	1250	1900	1700	1100	975
	Feb	900	775	700	650	2050	2000	2150	2000	1100	1077.5
	Mar	1050	650	1000	1000	2100	2100	1900	1800	1200	1250

APPENDIX V

Monthly wholesale prices of winter vegetables in Kangra and Nagrota markets, 2000-2001 to 2006-07 (Rs./q)

		Radish		Peas		Potato		Cauliflower		Cabbage	
		Kangra	Nagrota	Kangra	Nagrota	Kangra	Nagrota	Kangra	Nagrota	Kangra	Nagrota
2000	April	225	450	1000	1100	300	350	550	500	225	250
	May	200	450	1700	750	300	350	550	475	225	350
	June	200	450	1700	1000	325	125	1000	300	300	250
	July	300	275	1600	1600	300	300	1200	900	300	500
	Aug	325	400	1500	1700	375	375	1200	800	225	800
	Sep	350	400	1800	1700	375	300	1100	700	300	600
	Oct	225	500	1800	1550	400	325	900	650	250	500
	Nov	150	250	1400	1000	350	300	400	600	300	500
	Dec	175	250	800	1050	300	300	400	400	225	350
	Jan	150	250	750	800	325	300	500	375	200	250
	Feb	150	250	600	750	300	300	250	250	150	250
	Mar	200	200	600	750	300	250	300	400	150	225
2001	April	225	450	1000	950	400	400	400	500	225	300
	May	200	550	1500	800	400	400	400	600	225	300
	June	200	425	1800	1100	400	500	600	400	150	225
	July	300	300	1400	1700	400	400	600	950	300	500
	Aug	300	500	1300	1900	400	450	800	900	225	875
	Sep	300	550	1800	1900	500	550	1000	700	300	700
	Oct	225	300	1500	2050	475	400	800	700	275	650
	Nov	150	375	1500	1200	400	350	300	725	300	650
	Dec	175	375	750	1100	300	250	300	500	225	450
	Jan	150	250	600	850	375	300	400	475	225	300
	Feb	150	250	500	850	400	325	200	375	150	250
	Mar	200	325	600	800	400	375	300	375	175	250
2002	April	225	500	1200	1000	450	550	550	550	250	300
	May	275	550	1800	1200	450	450	550	650	300	350
	June	300	425	2150	1200	550	400	800	400	275	300
	July	350	350	1600	2200	500	450	1000	1100	350	550
	Aug	300	500	1700	2100	500	500	800	1100	350	900
	Sep	300	500	2050	2100	550	550	1000	950	400	800
	Oct	275	600	1700	1900	600	650	1000	800	300	725
	Nov	225	350	1500	1300	450	600	350	800	300	500
	Dec	225	350	700	1300	325	450	350	750	225	450
	Jan	150	250	700	900	500	300	400	550	175	350
	Feb	150	225	650	800	500	300	300	400	225	300
	Mar	150	250	700	800	425	400	350	450	275	275
2003	April	300	600	1300	1100	350	600	650	500	225	350
	May	375	650	1800	1400	350	450	600	675	300	350
	June	400	450	2150	1300	375	450	800	450	300	450
	July	425	400	1700	2250	400	450	1000	1150	400	650
	Aug	350	500	2300	2300	400	550	900	1250	350	1000

		Radish		Peas		Potato		Cauliflower		Cabbage	
		Kangra	Nagrota	Kangra	Nagrota	Kangra	Nagrota	Kangra	Nagrota	Kangra	Nagrota
	Sep	350	600	2600	2100	475	625	1100	1100	400	900
	Oct	225	650	1950	2100	475	575	900	900	350	750
	Nov	225	300	1600	1400	400	550	500	900	450	600
	Dec	175	300	800	1400	300	525	400	600	225	450
	Jan	150	300	600	1000	300	350	600	450	225	400
	Feb	200	300	650	800	275	300	350	400	250	400
	Mar	200	275	900	800	275	400	400	500	250	300
2004	April	300	600	1600	1300	400	550	650	625	350	400
	May	350	600	2150	1600	400	500	700	700	350	350
	June	350	450	2500	1500	425	450	900	500	300	400
	July	500	400	2150	2100	450	500	1050	1200	500	600
	Aug	425	500	2150	2300	500	550	1300	1400	400	700
	Sep	500	550	2500	2250	550	650	1200	1200	400	800
	Oct	300	650	2150	2100	550	700	1000	1100	400	700
	Nov	175	350	1700	1700	450	500	600	1100	450	600
	Dec	225	350	800	1500	300	450	600	800	300	500
	Jan	150	300	800	1000	300	400	400	600	225	475
	Feb	250	350	750	900	300	325	400	525	300	350
	Mar	200	325	1000	800	400	500	400	625	300	350
2005	April	400	600	1500	1300	550	600	625	650	325	325
	May	450	400	900	950	600	575	950	1000	950	900
	June	525	400	1900	1780	600	625	900	1000	950	1000
	July	350	700	2250	2100	550	550	950	900	550	600
	Aug	450	400	2150	2300	650	650	1200	1200	750	650
	Sep	750	500	2600	2600	650	625	1600	1450	750	675
	Oct	450	500	2500	2450	650	675	1150	1100	500	500
	Nov	450	450	2350	2370	875	850	900	1000	550	525
	Dec	450	400	1300	1500	625	600	2000	800	600	575
	Jan	275	300	950	950	525	575	550	500	650	625
	Feb	300	300	1050	1000	550	575	350	350	750	575
	Mar	400	325	1550	1200	600	600	575	550	375	400
2006	April	350	400	1850	1400	625	650	550	575	350	425
	May	400	350	1400	1500	600	625	550	650	400	450
	June	550	500	2250	1800	600	625	1000	1000	350	475
	July	750	700	2400	2200	750	750	900	1000	500	500
	Aug	700	600	2250	2250	800	775	1400	1350	450	500
	Sep	650	600	4500	3000	975	900	1150	1200	400	400
	Oct	500	500	3300	3100	1050	950	1300	1225	400	400
	Nov	400	450	2000	2100	900	900	1050	900	650	625
	Dec	350	375	1200	1300	500	600	800	775	650	625
2007	Jan	350	325	1200	1000	525	570	750	600	550	525
	Feb	300	300	1300	1100	600	550	500	525	450	400
	Mar	300	300	1600	1300	600	500	750	675	450	450

APPENDIX VI

List of vegetable growing villages in study blocks

S. No.	Kangra block	Nagrota Bagwan block
1.	Kotakwala	Badai
2.	Balla	Kawadi
3.	Nandher	Sadarpur
4.	Sohada	Samloti
5.	Zamanabad	Kachhrehr
6.	Kachhyari	Thanpuri
7.	Kholi	Nagrota
8.	Mundla	Hatwas khas
9.	Birta	Malan
10.	Paig	Baroh Road
11.	Sunehar	Mumta
12.	Gagal khas	Kandi
13.	Icchi khas	Baldhar
14.	Ansoli	53 Miles
15.	Mehalu	Sukhadh
16.	Mataur	Pathiar
17.	Abdullapur	Rajol
18.	Tiara dhagiyari	Lily
19.	Daihriyan	
20.	Nandrul	
21.	Shamirpur	
22.	Khas kachhiari	
23.	Natehr	

CURRICULUM VITAE OF MS. RACHANA DEVKOTA

Ms. Rachana Devkota d/o Sh. Bhimsen Devkota was born on 16th June 1982 in Bharatpur Municipality, Ward No. 7, Chitwan District in Nepal. She completed her Graduation Degree from Institution of Agriculture and Animal Sciences, Rampur, Chitwan, securing 75.6 per cent marks. She was sponsored as a ICAR nominee to pursue her Post Graduation Degree (Agricultural Economics) from CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur. she secured 81.60 per cent marks in her M.Sc. programme. She has a plan to pursue higher studied (Ph. D.) from reputed foreign institute and start her career as a planner and agricultural expert to serve the farming community of her native country. The academic record of Ms. Rachana Devkota clearly tells her brilliant career which is given below:

Educational Qualification

Degree	Institution/ University	Year of Passing	Subjects	Score and Division
M.Sc. (Agricultural Economics)	CSKHPKV. Palampur Himachal Pradesh	2008	Major field: - Ag. Economics Minor field:- Statistics	Appearing (81.60 %) ICAR nominees and awarded with ICAR scholarship for 2 years
B.Sc. (Agriculture)	Tribhuvan University, Nepal (Institute of Agriculture and Animal Sciences, Rampur, Chitwan)	2005	Major: Ag. Economics Minor: all agriculture related subjects	75.6 % Awarded with Winrock International Scholarship and National scholarship for 4 years

(Ms Rachana Devkota)