Report of

The Research Study on

Estimation of Marketing Efficiency of Horticultural Commodities under Different Supply Chains in India

Submitted to

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Executive Summary

The study on "Estimation of Marketing Efficiency of Horticultural Commodities under Different Supply Chains in India" was conducted in 7 states viz Andhra Pradesh, Karnataka, Tamil Nadu, West Bengal, Manipur, Rajasthan and Punjab and Innovtive Models in Horticulture Marketing in India study by NCAP. The main objective of the study are to estimate marketing cost, market margin, price spread and producer share in consumer rupee and suggest suitable strategies for improvement of marketing efficiency of different horticultural commodities. The executive summary of these states is furnished below.

The study was taken up in Ranga Reddy, Medak and Hyderabad districts of Andhra Pradesh. The crops included were Potato, Tomato, Baby corn, Roses and Grapes. A sample of 90 farmers each for all the selected crops except for grape was selected. The data pertaining to grapes could not be collected from more than 50 farmers due to limitation of availability of required sample size and thus the total sample size was 410 farmers.

In terms of supply chains, in the case of potato, the preferred channel was producer-wholesaler-retailer-consumer (PWRC).The preferred supply chain for tomatoes on the other hand was producer-middleman-wholesaler-retailers-consumer (PMWRC). The supply chains for baby corn were producer-middlemen-retailer-consumer (PMRC).Producers of roses preferred producer-wholesaler-retailer-consumer (PWRC) supply chain, and subsequently roses and grapes followed a similar pattern, with producer-middleman-wholesaler-retailers-consumer (PMWRC) supply chain. With respect to marketing costs, the farmer-producer of potato was seen to incur the highest marketing cost compared to that of producers of the other crops studied. In addition, it was evident that the market cost incurred by the retailers was lower than that of the wholesalers and commission agents. In terms of price spread it was evident in the marketing of all the crops that marketing margins at wholesalers and retailers level and also the market cost was relatively high at the intermediary level. The data supports the argument that the intermediaries play a crucial role in realizing better margins to all the crops compared to that of growers. In the case of the share of different agencies during marketing of fruits and vegetables the highest share was accrued by retailer followed by wholesalers. In terms of marketing efficiency, it was clear that in the supply chain model of producer-retailer-consumer (PRC) efficiency was 90% followed by the producer-wholesaler-retailer-consumer (PWRC) and in the producer-middleman-wholesaler-consumer

(PMWC) it was 75%. The information indicated that the more intermediaries there in the supply chain systems, the lower was the market efficiency. The chief constraints for farmers were malpractices in auction and faulty weighing; wholesalers cited inadequate storage facilities and retailers referred to exploitative middlemen and inadequate marketing facilities. Other complaints by farmers included high market fees. Thus it could be concluded that the marketing cost, marketing margin, transport cost, labor wages and the length of the market channel had negative influence on the marketing efficiency.

Bangalore urban and rural districts, which form the most important horticultural belt of Karnataka state, have purposively been selected as the study area. Data on month wise procurement of different fruits and vegetables by SAFAL, Bangalore was taken as the primary focus for crop selection. Banana (Robusta) and tomato formed the ones that are dealt with throughout the year hence were selected as the crops for this study. Total sample size worked out to 130 and above for each crop.

Marketing of horticultural crops includes a number of marketing channels involving the traditional as well as modern marketing networks. In Karnataka several models of marketing networks involving backward and forward linkages have emerged in marketing of horticultural crops. This study analyzed the performance of some of these marketing networks on the basis of their performance and marketing efficiency. The study specifically evaluated three modern systems Viz., SAFAL, Namdharis and HOPCOMs in comparison to the traditional marketing networks for banana and tomato crops in the state.

Several channels of marketing could be identified in banana (Robusta) marketing in Karnataka. Field sale is the most common, followed by self marketing by the producer at the nearby wholesale market. Sale at the HOPCOMs society is also popular, while the sale to the newly established corporate house, SAFAL is the latest.

It could be seen from the analyses that producers share in consumers rupee has the largest in the co-operative channel (62.3%) followed by the traditional wholesale network (51%). Despite all the hype, the SAFAL network fetches the farmer only 50 percent of the consumers' rupee.

Total marketing costs incurred in Banana sale was in the range of Rs.2.77 to Rs. 5.1 /kg, with SAFAL outlet sales taking the largest chunk. Total margins of the different market intermediaries were in the range of Rs. 2.65/kg in the co-operative channel to Rs. 4.82/kg in the traditional channels. Marketing efficiency measured in terms of modified Acharya's formula was the highest

for the co-operative channel at 1.65 followed by the 1.05 in the traditional wholesale channel while SAFAL registered an efficiency of 0.99, which is better than the field sale channel. Price spread ranged from Rs 4.90 in the cooperative channel to Rs 8.80 in SAFAL outlet route.

Yelaki banana is most popularly grown in and around Ramnagar region of Mandya district, Karnataka. This has received a boost from the extension of co-operative marketing network of HOPCOMs at the district.It could be seen from the analyses that producers share in consumers rupee was the largest in the co-operative channel (70%) in comparison to the 46 .5% in the traditional wholesale network. Total marketing costs incurred in Banana sale was in the range of Rs.2.76 to Rs. 4.95 /kg, with co-operative network and wholesale market network. Total margins of the different market intermediaries were in the range of Rs. 5.42/kg in the co-operative channel to Rs. 16.39/kg in the traditional channels. Price spread ranged from Rs 4.90 in the cooperative channel to Rs 8.80 in SAFAL outlet route.The marketing network of tomato included the traditional marketing channel of sale through Kolar wholesale market, sale through SAFAL and its outlets, HOPCOMs and their outlets and contract cultivation for Namdhari seeds private limited.

Net farm price varied from Rs. 4.05 /kg in the Namdhari fresh channel to Rs. 5.93/kg in the channel 3, i.e., the distant market sale. While the procedure adopted by the SAFAL network is similar to that for Banana, the Namdhari fresh offers farm gate procurement. Producers share in consumers rupee in case of tomato among the six channels studied was the highest in the co-operative network involving HOPCOMs at 435 followed by distant market channel and SAFAL. The lowest was for the producers dealing with Namdhari. Total marketing costs incurred in tomato marketing ranged from Rs. 2.45/kg in Namdhari sale to Rs. 6.28/kg in Kolar marketing. Total margins of the different market intermediaries were in the range of Rs. 2.55/kg in the co-operative channel to Rs. 9.00/Kg in the namdhari market network

Marketing efficiency measured in terms of modified Acharya's formula was the highest for the co-operative channel at 0.75 followed by the 0.73 in the traditional distant market channel. Price spread ranged from Rs 7.15 in the cooperative channel to Rs 11.45 in Namdhari.

In Tamil Nadu data was collected from farmers and market intermediaries for the four selected vegetables viz brinjal, potato, tapioca and gherkin. The data were based on respondent recall and as per existing practices and pertain to the year 2009-10. For each of the four vegetables covered under the present study samples of 120 farmers were selected, and hence the total sample size is 630.

Lessons from the study of the vegetables, brinjal, potato, tapioca and gherkins indicate that marketing issues were larger than mere reduction in the number of middlemen or promoting adhoc measures. Number of tapioca processing industries in Salem District are said to be declining in number due to gradual reduction in area under tapioca cultivation in surrounding districts. Similarly, gherkins processors have been facing major problems since the economic slow down in the west which is the major importing countries. On the contrary, brinjal and potato farmers have been reaping greater benefits in recent year due to escalating vegetable prices. Similar increases in market prices have been observed for commonly consumed vegetables.

Results presented in the study indicated that in the most common marketing channels for the studied vegetables the marketing cost was a reasonable 15 per cent of the consumer price and marketing margins of the intermediaries constituted again a reasonable 10 per cent. Producers get about 75 per cent of the consumer rupee. However, problems arise to the producers mostly because of the wider price fluctuations due to production cycles. While production and marketing costs for the farmers remain fixed, abnormal down trends in prices inflicts heavy damages in terms of income loss for them. Market intermediaries only suffer loss of turnover with their margins and fees fixed.

Study has been conducted in three coastal districts of West Bengal, viz, South 24 Parganas, North 24 Parganas and East Midnapore. Three vegetables, brinjal, bhindi (ladies finger) and tomato have been selected. Among flowers and fruits, marigold and guava respectively have been selected. The sample size number of farmers interviewed are 272 and number of middlemen interviewed are 113, and hence the total sample size is 385.

Brinjal and bhindi are marketed through same marketing channels, in the study area. Marketing channels for tomato are frequently changing depending on season and local supply. Tomato is marketed through more number of marketing channels and also passes through more long channels as compared to other vegetables under study (brinjal and bhindi). Dominating marketing channels for guava is shorter in length because it has to reach to final consumer as quick as possible after harvesting to fetch better prices. Guava looses its flavour, vigor glossiness, freshness and taste very quickly. Marigold is also highly perishable and requires quick disposal after harvesting. It has to reach to final consumer in quickest possible time, preferably within a day to realize better prices. Majority of marigold and guava are marketed

through wholesale marketing, at Mullick Ghat Ful Bazar, and Machna Ful Patty of Kolkata, respectively.

Marketing cost for brinjal incurred by farmers has been calculated to be Rs. 80/q, and the same was Rs. 70/q for bhindi, Rs. 90/q for tomato, Rs. 105/ 1000 no. of guava and Rs. 110/100 no. of garlands. Total marketing margin has been calculated to be Rs. 990/q for brinjal and the same was Rs. 778/q for bhindi, Rs. 894/q for tomato, Rs. 1138/1000 no. of guava and Rs. 4458/100 unit (*kuri*) of garlands. For brinjal the price spread (Consumers' price – producers' price) has been calculated to be Rs. 955/q, and the same is Rs. 850/q for bhindi, Rs. 1055/q for tomato, Rs. 985/1000 no for guava, and Rs. 2800/100 unit (*kuri*) for marigold marketing. In case of brinjal the producers' share in the consumers' price was estimated to be 44 percent and the same was 37 percent under bhindi, 26 percent under tomato, 45 percent under guava and 60 percent under marigold. The marketing efficiency has been estimated as 0.79 for brinjal, 0.58 for guava and 1.51 for marigold marketing.

The study was taken up in Bishnupur, Imphal-West, Ukhrul, Thoubal, Churachandpur and Senapati districts of Manipur and Aizawl district of Mizoram state. The crops included were Tomato, Cabbage, Passion fruit and Anthurium. Data were collected from 480 farmers and 155 middlemen (wholesaler, retailers and traders) and hence the total sample size was 635.

It was observed that the maximum quantity of tomato in the sample area was marketed through retailers. As tomato is highly perishable, losses consumed highest share in the total marketing cost. Most of the farmers in hilly region of Manipur market their cabbage through village traders, while those in the plain regions market their produce through wholesalers. The passion fruit growers of Churachandpur district market their produce through the Passion Beekeeping Development Association of Churachandpur district, Manipur. About one third of the total cut flowers of anthurium produced in the Mizoram have been sold outside the state through Bangalore based exporter, ZOPAR Export Ltd. and the remaining consumed in the state. Transportation cost consumed the highest share in the marketing cost of these produces.

Marketing cost and marketing margin vary considerably from channel to channel and were related directly to the length of the channel, *i.e.*, longer the channel, more were the marketing cost and marketing margin. The price paid by the consumer increased with the increase in the length of the marketing channel or with the increased in the numbers of intermediaries involved between the producer and the ultimate consumers. As the length of channel increases the price

spread also increases and vice-versa. The marketing efficiency increased with the decrease in marketing margin and open market price and with the increase in volume of the produce handled and length of market channel.

The major constraints of marketing horticultural crops include lack of market to absorb the production, low price for the products, large number of middlemen in marketing system, lack of marketing institutions to safeguard the farmers' interest and rights over their marketing (e.g. cooperatives), lack of coordination among producers to increase their bargaining power, poor product handling and packaging, imperfect pricing system and lack of transparency in market information system.

Present study was conducted in Jaipur and Sriganganagar districts of Rajasthan. Sriganganagar district was selected for study of kinnow and carrot crop while, Jaipur district was selected for aonla and tomato crop. These districts were selected based on significant area under selected fruits and vegetables crop. Sample size was kept uniform for all fruits and vegetable crops. For each crop 120 farmers were selected. Beside this, information was also collected from 30 wholesalers/ traders/ contractors and 30 retailers for each fruit and vegetables crop studied.

There were three important marketing channels through which kinnow produce were sold by farmers in Sriganganagar district. The marketing channel- I was most famous as about 71 percent produce was sold through it. In channel-II farmers directly brought produce in the mandi and sold it through commission agents either in local or distant markets in same or other states. In channel III producers sell the produce after grading and processing. The produce was either processed by farmers himself at his processing plant or on payment basis at grading plants situated around Ganganagar city. Total marketing cost of about Rs 807 was observed in channel-I when sold to distant markets in south particularly Bangalore city. The cost was shared by contractors (65.30%), commission agents (3.72 %) and retailers (30.98%). The maximum cost of marketing was shared by contractors as he arranges labour for fruits harvesting, packing and pays the cost of packing material and transportation cost. Total marketing cost had 29.49 and 15.67 percent share in consumer price in channel I and II, respectively. There were three important marketing channels through which aonla produce were sold by farmers in Jaipur district. The marketing channel-I was the major one as about 87 percent produce was sold through it. In channel-II, farmers directly brought produce in the mandi and sold it through commission agents. The marketing cost in channel II was lower than channel I as produce was

directly brought by farmers in the mandi and sold through retailers to consumers after paying taxes of market and fee of commission agents.

There were two important marketing channels through which carrot produce were sold by farmers in Ganganagar district. The marketing channel-I was the largest one as about 85 percent produce was sold through it. Traders from adjoining states like Punjab, Haryana and other parts of Rajasthan were participating in the auction which takes place on the banks of Ganga canal. The total marketing cost was lower in channel II compared to I because produce was not taken to distant places and number of intermediaries were also fewer .There were two important marketing channels through which tomato produce were sold by farmers in Jaipur district. Produce procured in channel I was sold in different markets of Rajasthan, viz. Jaipur, Sikar, Ganganagar, Hanumangarh, Sardarshahar, Churu and various cities in Punjab and Haryana etc, while in Channel II produce is directly procured by retailers and sold in Chomu or Jaipur city. The total marketing cost was lower in channel II compared to I because produce was not taken to distant places and number of intermediaries were also fewer.

Strategies to enhance marketing efficiency of fruits and vegetables vary according to nature of produce and kind of marketing facilities in a particular region. Discussions were held with farmers, contractors, wholesalers, processors and retailers to get the idea about improvement in marketing system so that efficiency of the whole marketing system is improved and farmers get adequate returns from this enterprise to remain in horticulture crops farming. Regarding fruits both kinnow and aonla are important fruit crops of Rajasthan. More than 50 percent produce of both fruits are transported outside state for further processing or for direct consumption. There is not a single fruit processing industry for kinnow in the production region.

In Punjab, five important vegetables were studied in the study. These are potato, tomato, green peas, brinjal and okra. Jalandhar district was selected for potato, Kapurthala for tomato, Hoshiarpur for green peas, and Jalandhar for brinjal and okra based on area under these crops. The convenience sampling technique was used for selection of different types of respondents in the study. For each vegetable, the sample consisted of 120 farmers except 93 farmers for brinjal. Further, for each vegetable, 30 wholesalers, 30 retailers and 30 farmers from Apni Mandi were selected. Thus, the total sample consisted of 573 farmers, 150 wholesalers, 150 retailers and 150 farmers from Apni Mandi. For the present study, the total number of all types of respondents was 1023.

The study brought out that the net price received by the producer was about Rs 554/q which in percentage terms was about 46 per cent of the consumer's purchase price in supply chain I in Kapurthala market. The expenses borne by the wholesaler and retailer were Rs 68 and Rs 84/ q. These respective expenses were about 6 and 7 per cent of the consumer's purchase price. The margin of the wholesaler and retailer was 11 per cent and 26 per cent of the purchase price of consumer. The producer's net price received was Rs 579/q in supply chain II. This was about 48 per cent of the consumer's purchase price. The expenses and margins of the retailer were about 12 per cent and 36 per cent of the consumer's price. The retailer's margins were comparatively less in supply chain I as compared to supply chain II. For sale of tomato in supply chain III (Apni Mandi), the net price received by the producer was Rs 1024/q which was 93 per cent of the consumer's purchase price. The marketing efficiency in supply chain III was 13.42 as against 1.01 in supply chain II and 0.92 in supply chain I. The marketing efficiency in supply chain III was high on account of the fact that no middleman was involved and produce was directly sold to consumers. As compared to supply chain I, the marketing efficiency of tomato was marginally high in supply chain II due to less number of the intermediaries in the latter.

In case of potato, market margins and costs were the major explanatory variables significantly affecting the marketing efficiency. It infers that with one percent increase in marketing margin and cost, the resultant marketing efficiency declined by 0.61 and 0.37 percent respectively. In case of tomato, the coefficients of marketing margins and costs were significantly and negatively related with the marketing efficiency. The coefficient indicated that one percent increase in these variables resulted into fall in the marketing efficiency by 0.69 percent and 0.38 percent respectively. In case of green peas, market margins and costs were the major explanatory variables significantly affecting the marketing efficiency. It infers that with one percent increase in these variables the resultant marketing efficiency declined by 0.45 and 0.44 percent respectively. In case of brinjal, the various explanatory variables included in the model were significantly affecting the marketing efficiency. The coefficients of market margins and costs were significantly negatively related with the dependent variable. It can be inferred that with one percent increase in these variables, the marketing efficiency declined by 0.57 percent and 0.32 percent respectively. In case of okra, the various explanatory variables included in the model were significantly affecting the marketing efficiency. The coefficients of market margins and costs were significantly negatively related with the dependent variable. It can be inferred that

with one percent increase in these variables, the marketing efficiency declined by 0.54 percent and 0.37 percent respectively.

Estimation of Marketing Efficiency of Horticultural Commodities under Different Supply Chains in India

India with diverse soil and climate comprising several agro-ecological regions provides ample opportunity to grow a variety of horticulture crops. These crops form a significant part of total agricultural produce in the country comprising of fruits, vegetables, root and tuber crops, flowers, ornamental plants, medicinal and aromatic plants, spices, condiments, plantation crops and mushrooms.

Horticulture development had not been a priority until recent years. In the period 1948-80, the main focus of the country was on cereals. During 1980-92 there was consolidation of institutional support and a planned process for the development of horticulture then started. It was later in the post-1993 period that a focused attention was given to horticulture development through an enhancement of plan allocation and knowledge based technology.

National Horticulture Mission has been launched in April 2005 as a centrally sponsored scheme to promote holistic growth of the horticulture sector through an area based regionally differentiated strategies. The foreign trade policy in 2004-09 emphasized the need to boost agricultural exports, growth and promotion of exports of horticultural products. The sector is growing at an average growth rate of 3.6 per cent over the last decade.

India produces around 111.8 MTs of vegetables and 57.73 MTs of fruits (2006-07) which accounts for nearly 1.90 per cent and 10.90 per cent of country's share in the world production of vegetables and fruits, respectively. India is the second largest producer of fruits and vegetables in the world next only to Brazil and China. The country's annual requirement is 74.40 MTs fruits and 175.2 MTs vegetables. However, per capita consumption of fruits and vegetables in India is only around 46 kg and 130 g against a minimum of about 92kg and 300g respectively recommended by ICMR and National Institute of Nutrition, Hyderabad. With the present level of population, the annual requirement of fruits and vegetables will be of the order of more than production level. Horticultural sector contributes 28% of AgGDP and 54% of Agricultural Exports in India (2007-08). India plans to increase the production of horticultural crops to 300 million tones by 2012 (Government of India, 2001) from the current level of 202.68 million tones (NHB, 2008).

Based on 11th Five year plan approach paper, accelerated agricultural growth will require diversification into horticulture and floriculture which in turn imply structural changes in the relation between agriculture and non-agriculture. Diversification requires effective marketing linkages, supported by modern marketing practices including introduction of grading, post-harvest management, cold chains etc.

The agricultural market in India is dominated by rural primary markets that meet local demand; secondary markets that serve more distant needs; and wholesalers who gather system parallel to the existing system was sought to be put in place. This will be outside the produce from different sources for retail in the country. The objective of the regulated markets established by the government was to regulate trade practices, increase marketing efficiency by reducing marketing charges, eliminate intermediaries and protect the interests of the producer seller. Though regulated markets helped to reduce multiple charges to the producer-seller, the system failed to check trade malpractices, making such markets highly restrictive, inefficient and dominated by traders.

To overcome the defects of regulated markets and to increase productivity, a direct marketing purview of the Agricultural Produce Marketing Committee (APMC) and will hence ensure transparency, efficiency, quality control and fair play. Direct marketing by farmers was experimented with via *Apni Mandis* in Punjab and Haryana. A modified concept was introduced in *Rythu Bazars* (AP) and *Uzahvar Santhaigal* (TN). In the meantime, private players such as Cargill India, Mahindra, ITC-e Choupal, Bharti etc., have emerged with sophisticated supply chain management systems and vertical co-ordination.

Past trend in development of horticulture has been satisfying and this trend has been marked as "Golden Revolution" with India emerging as the second largest producer of fruits and vegetables and occupying first position in several horticultural crops. Production and export of flowers have increased manifold and the country has a major stake in global trade of spices and cashew nuts. Export of medicinal plants, fruits and vegetables have also exhibited rising trend. Even though India is leading in the productivity of some horticultural crops like grapes, cassava, ginger, turmeric, still there is a scope to increase the productivity in other horticultural crops in comparison to other countries. Challenges ahead are numerous with a targeted production of 300 mill tons at the end of XI Plan from the current level of 185.5 million tons in the environment of dwindling land and water resources . However, today, as a result of synergy between focused

research, technological and policy initiatives and high efficiency inputs, horticulture in India, has become a sustainable and viable venture especially for the small and marginal farmers.

The most important determinants to establish the required linkages are in the area of agricultural marketing and processing. Since high value agriculture is based on perishable commodities, large investments are required in modern methods of grading, post-harvest management and development of cold chains. Such investment in turn requires that new players, including large corporate players, be able to enter existing markets and set up new marketing channels. The NHM therefore incentivizes the on-going marketing reforms based on amending existing Agricultural Product Marketing Committee (APMC) Acts to allow this. This process has started in earnest, with many business houses investing in the area and with most States having already made APMC amendments. However, this must be taken to its logical conclusion. Many States that have made APMC amendments are yet to frame the necessary rules. This uncertainty needs to be removed as soon as possible. Most States have also endorsed, and many have encouraged, Contract Farming. This needs to be backed by ensuring effective mechanisms for contract registration and dispute resolution, along with adequate information and support so that small farmers are able to enter into collective contracts.

Several studies such as Bansal (1994), Bhatia (1994), Sudha and Gajanana (2001) were done on traditional areas / conventional crops. Studies such as V.T. Raju and Rao (1993), Ganesh (2004) were mainly focused on traditional marketing channels. Limited scientific studies on the emerging / newer institutional marketing models are available. Chengappa (2001). Apart from these newer crops are coming in this sector and their marketing problems are un-explored. Further, few studies are available on many horticultural commodities across several states at a given point of time.

This study was carried out with the following specific objectives:

1. to ***estimate*** the marketing cost and marketing margin of different functionaries for selected horticultural commodities under various supply chains,
2. to ***analyze*** the price spread, marketing efficiency and farmer's share in consumer rupee in various supply chains,
3. to ***identify*** the constraints perceived by various stakeholders; and study the factors influencing the marketing cost, market margin and marketing efficiency, and
4. to ***suggest*** suitable strategies to enhance the marketing efficiency for horticultural commodities

The study has been conducted in 7 states viz Andhra Pradesh, Karnataka, Tamil Nadu, West Bengal, Manipur, Rajasthan and Punjab. The study estimated marketing costs, marketing channels, market margins, price spread, and producer share in consumer rupee for vegetables, fruits and flowers under different supply chains. Both the traditional and modern supply chain were studied. The data has been collected from farmers, wholesaler and retailers personally through structured questionnaires. Analytical tools such as logistic regression model, Acharyas modified formula and Delphi models have been used to estimate marketing efficiency in the study.

The results of the studies conducted in the 7 states and Innovative models in Horticulture marketing in India are furnished in subsequent chapters.

Innovative Models in Horticulture Marketing in India

M.B. Dastagiri, B. Ganesh Kumar[1]

Abstract : India produces around 111.8 MT of vegetables and 57.73 MTs of fruits (2006-07). Horticultural sector contributes 28% of AgGDP and 54% of Agricultural Exports in India (2007-08). Horticulture development is currently constrained by poor marketing arrangements. The gap between prices received by the farmers and those paid by urban consumers is large, reflecting inefficient marketing arrangements. Studies indicate that the share of producers varies from 33 to 75 per cent case of fruit and vegetables.

India opened up post 1990, a number of innovative liberalized markets in the WTO regime to eliminate middlemen and increase distributional efficiency. It is necessary to study and understand their success and operations of these marketing institutions. The main objective of the paper is to study functions, mandate and trace innovative models, strategies and policy principles practicing by different innovative marketing institutions in horticulture marketing in India. The recent changes in functions of agricultural marketing institutions, public and private retail markets were documented and analyzed their marketing models, strategies and policy principles in improving the marketing efficiency of fruits and vegetables. The features of different systems operating for marketing of fruits and vegetables were studied through a survey conducted with the officials of Department of Marketing, Hyderabad

India opened up post-1990, a number of new innovative public liberalized markets in the WTO regime. The main functions of farmers markets are empowering the farmers to participate effectively in the open market to get a remunerative price for their produce, and increase by enhancing the distributional efficiency of the marketing system. The economic reforms lead to the emergence a number of new private retail markets. Organized retailing in Fresh Fruits and Vegetables (FFV) is gaining a lot of momentum in India with huge investment by leading Indian corporations.

The features of different systems operating for marketing of fruits and vegetables were shown that the marketing models of private agencies, particularly Reliance fresh and subhiksha were more efficient than that of Rythu bazaar, due to their low cost on marketing, transport, and incidental charges.

Therefore, there is an immediate need to replicate such models in a much larger scale to cover not only the cities but also the interior villages in the country. The study suggests that it is necessary to amend outdated laws restricting the establishment of markets to allow cooperatives and private entrepreneurs to set up modern markets. Both public and private retail markets have to adopt the new marketing models to enhance the distributional efficiency of the marketing system.

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1. Introduction

India produces around 111.8 MTs of vegetables and 57.73 MTs of fruits (2006-07) which accounts for nearly 1.90 per cent and 10.90 per cent of country's share in the world production of vegetables and fruits, respectively. The country's annual requirement is 74.40 MTs fruits & 175.2 MTs vegetables. Horticultural sector contributes 28% of AgGDP and 54% of Agricultural Exports in India (2007-08). India plans to increase the production of horticultural crops to 300 million tones by 2012 (Government of India, 2001) from the current level of 202.68 million tones (NHB, 2008). In the post-1993 period that a focused attention was given to horticulture development through an enhancement of plan allocation and knowledge based technology. National Horticulture Mission has been launched in April 2005 as a centrally sponsored scheme to promote holistic growth of the horticulture sector through an area based regionally differentiated strategies. The foreign trade policy in 2004-09 emphasized the need to boost agricultural exports, growth and promotion of exports of horticultural products. Based on 11th Five year plan approach paper, accelerated agricultural growth will require diversification into horticulture and floriculture...

Most of the agricultural commodity markets in India generally operate under the normal forces of demand and supply. The buying and selling of agricultural produce takes place in the market yards where numbers of market functionaries are involved. Government of India(2001) reported that as per survey conducted recently, the farmer is getting only one rupee out of every Rs 3.50 paid by the consumer, the retailers is getting Rs 0.75, the wholesaler is getting Rs 0.50 and rest of the amount Rs 1.25 is going to commission agents and traders.

Anantia (2008) quotes according to Lal Bhuria, Minister of State for Agriculture, the share of producer in consumer's price depend upon the types of marketing channels followed in sales transactions by the farmers. Studies indicate that the share of producers varies from 56 to 83 per cent in food grains and 79 to 95 per cent in pulses, 65-96 per cent in oilseeds and 33 to 75 per cent in case of fruit and vegetables. He said in order to provide the remunerative prices to the farmers, there is a need to eliminate the chain of middlemen etc., by introducing innovative marketing channels like direct marketing, contract farming, etc. and removal of controls on movement and storage of agricultural produce across the country which will facilitate functioning of common Indian market.

Horticulture development is currently constrained by poor marketing arrangements. The gap between prices received by the farmers and those paid by urban consumers is large, reflecting inefficient marketing arrangements. Horticultural produce is typically collected from farmers by market agents, who sell it in organized markets established under the Agricultural Produce Marketing Acts. Unfortunately, these markets are controlled by a few traders and operate on a highly nontransparent basis. Facilities for grading and handling are poor, and methods of price discovery in the markets are not transparent. Wastage is high owing to poor logistics and the absence of cold chains. The net result is much lower realization of income by the farmer. Jairath (2008) highlights that in India, many producers – growers face barriers to effective participation in markets for disposal of fruits and vegetables.

It is necessary to amend outdated laws restricting the establishment of markets to allow cooperatives and private entrepreneurs to set up modern innovative markets with grading facilities, cold storage, and transparent auction procedures.

World Development Report (World Bank, 2000-01) points out the markets are central to the lives of poor people. India opened up post 1990, a number of innovative liberalized markets in the WTO regime to eliminate middlemen and facilitate direct contact between producer and consumers. It is necessary to study and understand these markets functions, performance and success.

The main objective of the paper is to study functions, mandate and trace innovative models, strategies and policy principles practicing by different innovative marketing institutions in horticulture marketing in India. The specific objectives of the study are:

1. To study the different innovative marketing institutions, their functions, and mandates in horticulture marketing in India.
2. To trace marketing models, strategies and policy principles practicing by different marketing institutions in horticulture marketing in India
3. To suggest suitable strategies or policies to guide for effective marketing of fruits and vegetables of horticulture sector in India.

2. Data and methodology

Information on objectives, mandates, and functions of the marketing institutions which deal fruits and vegetables in the country were collected from the respective institutions, websites and published secondary sources. Similarly, the status, growth and future plans of public and private retail markets in the horticulture were collected from websites and secondary sources. The focus was on change in functions, mandate, models, strategies and principles of marketing institutions over the years particularly pre and post market reforms. The study used Delphi survey method to validate the results obtained through secondary data from concerned officials of institutions.

This is basically a quick, diagnostic study. The different marketing institutions, their functions, and mandates are reviewed and put in matrix format. The status, growth and future plans, marketing models and strategies of public and private retailing markets in fruits and vegetables are analyzed along with case study. The recent changes in functions of fruits and vegetable marketing institutions, public and private retail markets were documented. Finally, suggestions are made to address marketing problems of fruits and vegetables in India.

3. Results and Discussion

3.1. New innovative public marketing models

It has been realized that the marketing channel for fruits and vegetables which are highly perishable should be as short as possible. Perishable horticulture produce should move quickly from farmers to consumers. If farmers directly sell their produce to the consumers, it will not only save losses but also increase farmer's share in the price paid by the consumers. Therefore, direct marketing by the farmers is being encouraged as an alternative channel.

India opened up post-1990, a number of new innovative public liberalized markets for fruits and vegetables in the WTO regime and their key functions and objectives were given in the Table 1. The main functions of farmers markets are empowering the farmers to participate effectively in the open market to get a remunerative price for their produce, to avoid the exploitation of both the farmers and the consumers by the middlemen and increase by enhancing the distributional efficiency of the marketing system. It will eliminate middlemen, links producers and consumers directly, reduce price spread, and enhance producer shares in consumer rupee. Forward and

Futures markets have been identified as important tools of price stabilization and risk management. Commodity exchanges for futures trading narrows the marketing, storage and processing margins, there by benefiting both growers and consumers. E-trading based on buying and selling of electronic warehouse receipts and with the latest price information has also become a widespread practice.

Table 1. New liberalized public agricultural marketing institutions in India during WTO regime

No	Public Agricultural Marketing Institutions	Status/ key function/mandate/status
1	**Safal Market**	- NDDB started a fruits and vegetable unit of SAFAL at delhi was one of the first fruit and vegetable retail chain - NDDB has set up an alternate system of whole sale markets in Banglore as a pilot project. - This market is a move to introduce a transparent and efficient platform for sale and purchase fruits and vegetables by connecting growers through Grower's associations
2	**Mother Dairy Booths**	- Mother dairy, basically handling milk in Delhi. But it was asked to handle retail vegetable marketing. - Mother dairy management has opened retail outlets in the city for providing vegetables to the consumers at reasonable prices.
3	**Cooperative Marketing Society**	- The need for cooperative marketing arose due to many defects in the private and open marketing system - A cooperative marketing society can eliminate some or all of the intermediaries

		- This will make commodities cheaper and ensure good quality - Few successful cooperative marketing societies for fruits and vegetables. eg. Maha-grape- cooperative federation marketing, Maharashtra, Cooperative marketing pomegranate, Co-operatives marketing banana in Jalgaon district, Vegetables co-operatives in Thane District, Milk co-operatives in Maharashtra, HOPCOMS,Bangalore and Gujarat and Co-operative4cotton marketing society.
4	**Hardaspar Vegetable Market**	- Hadaspar vegetable market is a model market for direct marketing of vegetables in Pune city. - This is one of the ideal markets in the country for marketing of vegetables - The market has modern weighing machines
5	**Shetkari Bazar**	- Shetkari bazaars were established in the Maharashtra state for marketing of fruits and vegetables - It will eliminate middlemen, links producers and consumers directly, reduce price spread, and enhance producer share's in consumer rupee - Thus these markets increase the farm income, well being of the farmers and bring stability in prices of horticultural crops.
6	**Krushak Bazaar**	- Established in the state of Orissa in 2000-01 - The purpose is to empower farmer-producer to compete effectively in the open market to get a remunerative price and ensure products at affordable prices to the consumer

7	**Raythu Bazaar in Andhra Pradesh**	- First started in Andhra Pradesh in the direction of empowering the farmers to participate effectively in the open market to get a remunerative price for their produce. - To avoid the exploitation of both the farmers and the consumers by the middlemen by creating a positive atmosphere of direct interface between them. - - As of now, there are 96 Raythu Bazaars operating well and spread over different regions and districts of the state.
8	**Apni Mandi**	- First started in Punjab in the direction of ensuring direct contact of the producer-farmers and consumers and there by enhancing the distributional efficiency of the marketing system. This system does away with the middlemen. - The price spread is considerable low. These are working satisfactorily in the case of fruits and vegetables. - -These 'Apni Mandis' are similar to the Saturday markets of United Kingdom and United States of America.
9	**Farmers markets**	- -Farmers markets initiated in Tamil Nadu in Nov 1999 to eliminate middlemen and traders from the marketing of vegetables in the farmers markets, and to establish direct contacts between farmers and consumers. - - By Nov, 2000, 95 such markets had been established in most of the states towns and cities and over 75, 5000 farmers had been issued cards

		authorizing them to sell their product in the markets.
10	**Contract Farming/Contract Marketing**	- Essentially is an agreement between farmer – producers and the agribusiness firms to produce certain pre-agrred quantity and quality of the produce a particular price and time - This is an important initiative for reducing transaction costs by establishing farmer –processer linkages. - Successful contract farming includes Organic dyes-Marigold farmers and extraction units in Coimbatore, Pepsi Company and farmers of Punjab and Rajasthan for tomato growing,
11	**Forward and Future Markets**	- Forward and Futures markets have been identified as important tools of price stabilization and risk management. - Extension of forward and futures markets to all major agro commodities has, therefore, assumed great importance. - -Commodity futures markets in the country are regulated through Forward Contracts (Regulation) Act, 1952.
12	**Commodity Exchanges**	- Commodity exchanges for futures trading narrows the marketing, storage and processing margins, there by benefiting both growers and consumers. - NAFED started National Multi-Commodity Exchange of India Ltd. on 26th November, 2002, for cash crops, food grains, plantations, spices, oilseeds, metals and bullion among others.

		- National Commodity and Derivate Exchange of India Ltd. Was established in Dec, 2003 at Mumbai with a similar purpose
13	**E-trading**	- Trading based on buying and selling of electronic warehouse receipts and providing the latest price information - - The services can be accessed by internet, telephone (by interactive response), from mandi administration as well.
14	**Food retail super markets**	- -Food retail markets in India during 1990s and early 2000 opened up the availability of food products dramatically. They key functions are - Higher standards - Lower prices

3.2. New Liberalized Innovative Private Retail Marketing models

The concept of organised retail has been existing in India since early 80s with the existence of players like Mother Dairy and Safal but it's only in past one year that the fever of retail in FFV has caught up really fast. Organized retailing in Fresh Fruits and Vegetables (FFV) is gaining a lot of momentum in India with huge investment by leading Indian corporations. Modern formats of supermarkets such as Reliance Fresh, Choupal Fresh, Food World, etc. promoted by different companies are emerging very rapidly in small and large towns around the country. Two of the major players in the supermarket sector in the country are Reliance Industries and Bharti- Walmart tie up. Other key players include ITC, Food World., Spencer, Godrej, Pantaloon (Big Baazar and Food Baazar), Subhiksha and Aditya Birla Group (Abid Hussain, 2009).

The economic reforms lead to the emergence a number of new private retail markets, dealing with fruits and vegetables, agricultural commodities and non-agricultural consumables. Traditional markets were seen making way for new formats such as departmental stores, hypermarkets, supermarkets and specialty stores. Most of them were started with foreign collaboration or in line with western retail markets. Before 1991, Nilgiris and Trinethra were the only retail chains existing in the country. However, other retail groups like Margin free, Spencers, Subhiksha, Reliance retail, Food Bazaar and many others were added to the list in the post-reforms era. The list of these new generation retail chains along with their functions, area of operation, ownership, formats etc are presented in Table 2. Most of these operators have highly ambitious plans of extending their operations to more areas by increasing the number of outlets and scale of operation in the coming years.

Table 2 : Growth of India's Chain food New Liberalized Marketing Institutions

Private Retailer markets	Year entered	Ownership	Formats	Outlets/plans	Locations
Nilgiri's	1971	Local (part ownership by Actis, U.K.	supermarkets, convenience stores	40; plans for 500 stores by 2010	Major cities in South India
Trinethra/ Fabmill	1986	Local (Aditya Birla Group)	supermarkets, convenience stores,	170	Major cities in A.P.,Tamilnadu, Karnataka and Kerala
MarginFree	1994	Local Cooperative (Consumer Protection and Guidance Society)	Discount stores, Supermarkets	350	Major cities in Kerala, Tamilnadu, and Karnataka
Spencers	1996	Local (RPG Group)	Hypermarkets, supermarkets, convenience stores	97; plans to add 50 hypermarkets by 2008	Major cities in South India
Subhiksha	1997	Local (Subhoksha Trading Services Pvt. Ltd)	Discount stores	520; plans for 1200 stores all over the country by 2007/08	Major cities in Tamilnadu, A.P, Pondichery and Delhi region
Foodworld	1999	Local (Subsidiary of Dairy Farm	Supermarkets	55; plans to expand in South	Banglore, Hyderabad

		International		India	
Trumart	2001	Local (Pyramid Retail)	supermarkets, convenience stores	29; plans for 90 stores by end of 2007	Maharashtra and Gujarat, Banglore, Chennai, Hyderabad,
Food Bazaar	2002	Local (Future Group)	Hypermarkets, supermarkets,	90; Plans for 250 store by 2010	National (major metros and large cities)
Metro Cash & Carry	2003	Foreign (Metro AG, Germany)	Wholesale"Cash & Carry"	3; plans to add 15-18 new outlets by 2009	Banglore, Hyderabad,Mumbai, Kolkata, Chennai
My Dollar Store	2004	Local (Franchisee of My Dollar Store of the US)	convenience stores	50; plans for 400 stores by 2007	Nationwaide
Shoprite	2004	Local (Subsidiary of Shoprite (PTY0 Ltd;South Africa)	Hypermarket	1; plans to add 2-3 new outlets by 2007	Mumbai
Star India Bazaar	2004	Local (Trent; division of Tata Group)	Hypermarket	3; plans to add 23	Nationwide
Reliance Retail	2006	Local (Reliance Industries Ltd.)	Hypermarkets, supermarkets, convenience stores	230; plans for 3,000 stores, 2500 super markets and 500 hypermarkets by	Nationwide

				2010	
Spinach	2006	Local (Wadhwan Retail)	Super markets	89; plans to add 1500 stores in 90 cities by 2010	Nationwide
Max Hypermarkets	2007	Local –foreign joint venture (Spar International, Neth.)	Hypermarkets	Plans to develop 7 stores by 2009	Nationwide
Bharti1	2007	Local (Bharti Enterprises)	Hypermarkets, Supermarkets	Plans to invest $2.5 billion by 2014	Nationwide
Bhart Walmart	2007	Local –foreign joint venture (Wal-mart, USA)	Wholesale "cash & carry)	Plans for 15 stores by 2014	Nationwide
Birla "More"	2007	Local –Birla	Super markets	1000 stores $2 billion by 2010	Nationwide

1 Retail Partner of walmart

Source: USDA, Foreign Agriculture Service, 2006; updated from various reports

3.3 Features of different models for marketing of fruits and vegetables: A case study in Hyderabad, A.P.

The features of different systems operating for marketing of fruits and vegetables were studied through a survey conducted with the officials of Department of Marketing, Hyderabad and discussion held with management of government controlled Rythu bazzar, Hyderabad. Other models being followed in marketing of fruits and vegetables were also studied, these included Reliance Fresh and Subhiksha. The features of these marketing models have been presented in Table 3.

The Table 3 compares the public markets (Ryathu bazaars) in operation in Andhra Pradesh with the new generation private retail markets like Reliance fresh and Subhiksha. It was found that in private retail markets the produce was mostly procured directly from the farmers at the farm gate. The farmers get higher share as the size of the channel was reduced and the associated costs like transportation, margins of the market intermediaries and other incidental costs. The middle men were completely eliminated which resulted in greater efficiency of these retail markets in comparison to the public models where intermediaries still indirectly exist and eat away a major chunk of the margins. It was also found that grading and sorting of the produce were appropriately done in private retail markets which helped the consumers in easy purchase of the commodities. However, it is mentioned that the public markets were operating at a no-profit no-loss basis while the private companies derive certain amount of profit from the operation. The study concludes that the marketing models of private agencies, particularly Reliance Fresh and Subhiksha were more efficient than that of Rythu bazaar, due to their low cost on marketing, transport, and incidental charges.

Table 3. Marketing functions models of fruits and vegetables under different supply chains.

Sl No.	Items	Rythu bazaars	Reliance	Subhiksha
1	Marketing model	Government acts as facilitator bet Farmer and consumer	Directly purchase from farmer.	Directly purchase from farmer.
2	Farmers share in consumer rupee	Farmers get good share compare to retail markets because of prices are fixed higher than local retail shops but less than reliance and subhisha markets	Farmers get higher share than rythubazars because of marketing model as it saves transport cost, marketing cost and other incidental charges	Farmers get higher share than rythubazars because of marketing model as it saves transport cost, marketing cost and other incidental charges
3.	Role of middlemen	Partially and indirectly existing	Complete elimination of middlemen	Complete elimination of middlemen
4.	Consumer status	Below Poverty Line people, Middle Class, village middle class	High income group, Software professional, metro people	High income group, Software professional, metro people
5.	Organization	Government	Private	Private
6.	Goal	No profit/loss	Commercial/profit	Commercial/profit
7.	Consumer	No grading	Grading	Grading

	choice of grading			
8.	Prices	Prices low	Low/high	More or less similar to reliance
9.	Marketing channel	Farmer – government-consumer	Company - farmer	Company- farmer
10	Participants	Farmers, unemployed women, self help group, unemployed youth Government Agencies: Civil Supplies corporation, OILFED, MARKFED, Girijana Cooperative societies	Company	Company

4. Conclusions and Policy Implications

In India, organized retailing in Fresh Fruits and Vegetables (FFV) is gaining a lot of impetus with huge investment by leading Indian corporations. India opened up post – 1990, a number of new liberalized public markets for fruits and vegetables in the WTO regime. The main functions of farmers markets are empowering the farmers to participate effectively in the open market to get a remunerative price for their produce, to avoid the exploitation of both the farmers and the consumers by the middlemen and increase by enhancing the distributional efficiency of the marketing system. It will eliminate middlemen, links producers and consumers directly, reduce price spread, and enhance producer shares in consumer rupee. Forward and Futures markets have been identified as important tools of price stabilization and risk management. Commodity exchanges for futures trading narrows the marketing, storage and processing margins, there by benefiting both growers and consumers. E-Trading based on buying and selling of electronic warehouse receipts and providing the latest price information. The economic reforms also lead to the emergence a number of new private retail markets, in new formats such as departmental stores, hypermarkets, supermarkets and specialty stores. Their number and scale of operations have been under going a phenomenal growth in the past few years.

The study concludes that the marketing model adopted by private markets particularly reliance and Subhiksha is more efficient than government markets like Rythu bazaar because the marketing agency directly go to farmers field and collect fruits and vegetable resulting in reduced marketing cost, transport cost and other incidental charges.

Therefore, there is an immediate need to replicate such models in a much larger scale to cover not only the cities but also the interior villages in the country. The study suggests that it is necessary to amend outdated laws restricting the establishment of markets to allow cooperatives and private entrepreneurs to set up modern markets. Both public and private retail markets have to adopt the new marketing models to enhance the distributional efficiency of the marketing system.

5) References

Abid Hussain (2009). "Fresh Fruits and Vegetables/FFV: Constraints and Opportunities"at **http://www.scribd.com/doc/18678642/FFV-Marketing dated 17th August 2009.**

Anantia (2008). **" What is India's share in global vegetable & fruits market?" at http://www.managementparadise.com/forums/archive/index.php/t-25024.html dated 18-09-2009**

Economic Survey (2007-08), Ministry of Finance, Government of India, New Delhi.

Government of India (2001), *Report of the Working Group on Horticulture Development for Tenth Five Year Plan (Main Report)* Planning commission, New Delhi

Jaitath M.S. (2008) "Enhancing Farmers' Linkage to Markets" Indian Journal of Agricultural Economics, Vol 63. No.3. pp355-356.

National Horticulture Board (2008), National Horticulture Board Data base (http://nhb.gov.in

World Bank (2001), *"World Development Report"*, Washington, D.C.

ACHRYA NG RANGA AGRICULTURAL UNIVERSITY
COLLEGE OF AGRICULTURE, RAJENDRANAGAR

FINAL REPORT

ON

'Estimating Marketing Efficiency of Horticultural Commodities under Different Supply Chains in India'

WITH SPECIAL REFERENCE

To

Andhra Pradesh

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1. INTRODUCTION

1.1 Background

The agriculture marketing system of perishables in the country plays a distinct and dominant role by virtue of the nature of perish ability that warrants due importance to vegetables, flowers and fruits. Marketing of these very perishable commodities is very important both in terms of price realization to the farmer - producer and prices within the reach of consumers. The vegetable grower always looks for a better price and while consumers prefer a normal price which should be within their reach, the short lived nature of perishable commodities in the market always causes a tussle between producers and consumers and in the process, the middleman play a crucial role to take price behaviour to their advantage and this brings profits to them. The marketing efficiency reflects the share of consumer rupee by the farmer (producer) to a greater extent possible especially in the case of horticultural commodities which are perishable in their nature. The price escalation both at the producer level and consumer level is common phenomenon as it depends upon the number of players involved in marketing of the produce to make it available with the consumers in most appropriate way. The farmers on one side look for highly remunerative price for the produce and in the process there is every possibility of over exploitation. The marketing system where the exploitation is taking place needs to be thoroughly understood to check the practices by the middleman/commission agents or any actors present between producer and consumer. To make the marketing system more efficient, especially for horticultural commodities, a thorough investigation is required. Keeping this in view, the present study was under taken for the identified perishable commodities. The commodities identified for the study were **Potato, Tomato, Baby Corn, Rose and Grapes.**

1.2 Policy Research Questions

The questions that need to be answered in the study are mainly related to the perishable commodities movement pattern through several intermediate players and their profiteering pattern. The efforts of the grower to sustain in the marketing system, the price realizations aspects for the produced perishable commodity in the competitive market need to be documented. Price spread of the selected perishable crops and ways to integrate the price level

between producers and consumers for marketing efficiency pattern of each commodity and possibilities for the increasing the marketing efficiency of the selected commodities.

1.3 Objectives of the Study.

- To ***estimate*** the marketing cost and marketing margin of different functionaries for selected horticultural commodities under various supply chains.
- To ***analyze*** the price spread, marketing efficiency and farmer's share in consumer rupee in various supply chains
- To ***identify*** the constraints perceived by various stakeholders; and study the factors influencing the marketing cost / margin / efficiency
- To ***suggest*** suitable strategies to enhance the marketing efficiency for horticultural commodities

2. DATA AND METHODOLOGY

2.1 Study Area.

The present study was taken up in Ranga Reddy, Medak and Hyderabad districts of Andhra Pradesh. In view of highest volume of production of the selected five crops in these districts and due to large scale marketing activity taking place in relation to these crops in Hyderabad district and as they are endowed with relatively highest areas under respective vegetable crops, these districts were very much preferred for the present study. The market infrastructure is relatively larger in terms of presence of number of Rhytu bazaars, Supermarkets and accordingly corporate market centres and the volume of transactions are relatively very high in Hyderabad district and hence selected for the present study. The crops included for the present study were **Potato, Tomato, Baby corn, Roses and Grapes.**

2.2 Data on Items

The data on market cost, market margin, and price spread for each selected perishables were collected. Data related to constraints perceived by the farmers, retailers and wholesalers were elicited with the help of specially designed schedules for the purpose of Garret rank analysis, Market efficiency for each selected crops was analyzed using appropriate formula.

2.3 Sample Size

A sample of 90 farmers each for all the selected crops except for grape were selected and included for the present study. The data pertaining to grapes could not be collected from more than 50 farmers due to limitation of availability of required sample size and thus the total sample size was 410 farmers. The details of data collected from different Districts, Mandals and Villages are presented in Table No.1 along with Crop wise details of selection of Intermediaries.

Table 1: Crop wise details pertaining to sample design

S.No	Name of the Crop	Village	Mandal	District	Sample size	Total Sample size
1	Potato	Kupppanagar	Jarasangam	Medak	47	90
		Ranjole	Zaheerabad		43	
2	Tomato	Chenvalli	Cheval	Ranga reddy	55	90
		Peddapur	Sadha shivapet	Medak	18	
		Shapur	Moinabad	Ranga reddy	17	
3	Baby Corn	Narsampalli	Wargal	Medak	40	90
		Begum pet	Dowltabad		50	
4	Rose	Shapur	Moinabad	Ranga reddy	69	90
		Peddamangalarum			21	
5	Grape	Papireddy guda	Imbrahimpatnam	Ranga reddy	10	50
		Akkanpally	Maheshawaram		10	
		Ghatpally	Medchal		10	
		Raviral gate	Shameerpet		5	
		Gowraram	Mulugu		5	
		Shadnagar	Shadnagar	Mehaboobnagar	10	

For the present study, the sample of Intermediaries i.e., Wholesalers, Retailers and Middlemen were taken as 30 each for each crop, thus comprising the sample intermediaries to 30 for each crop and 450 as a whole. (Table2)

Table 2: Crop wise Details of Intermediaries Sample Design

Crop	Wholesalers	Retailers	Middlemen
Potato	30	30	30
Tomato	30	30	30
Baby Corn	30	30	30
Rose	30	30	30
Grape	30	30	30

2.4 Sampling Methods

For the present study Multistage Random technique was used.

Selection of crops

Arbitrarily, it was decided to select one crop from Fruits (Grapes), Vegetables (Tomato), Flowers (Roses), Tuber Crop (Potato) and Coming up Vegetables (Baby corn) in the markets.

Selection of District

Three districts of Andhra Pradesh, i.e., Rangareddy, Hyderabad and Medak were chosen as the volume of production in these three districts was relatively high.

Selection of Respondent

a. Farmer/ producers

The required sample size of farmer (ie. 90 each for Potato, Tomato, Baby corn & Rose and 50 for Grapes) was selected as per the sample decided from the selected mandals and villages taking the volume of production into consideration. The farmers were identified randomly.

b. Selection of Intermediaries

For each selected crops for both secondary and primary data collection attempt has been made to collect the data from wholesalers, Retailers & Commission agents operating in the marketing system.

2.5 Statistical Techniques

Different techniques were used for different objectives.

Tabular analysis	:	Market margin, Market cost, Price spread, Marketing efficiency
Graphical	:	Pie charts for Market costs, Price spread
Flow chart for market channels	:	For all the identified Vegetables,
Functional Logistic model	:	Factors affecting marketing efficiency
Garrett's Ranking Technique	:	Constraints of the farmers and other market Intermediaries

Marketing Efficiency

Acharya's Modified Marketing Efficiency

MME = FP/ (MC+MM)

Where,

MME is modified measure of marketing efficiency

FP is price received by farmers

MC is marketing cost

MM is marketing margin

Price Spread

It is the difference between the two prices, i.e., the price paid by the consumer and the price received by the producer.

For e.g. P1-P2,

Where,

P1 is price at one level or stage in the market

P2 is price at another level

Average Gross Margin method

$$MT = \Sigma [(Si-Pi)/qi]$$

Where,

MT is the total marketing margin

Si is the sale value of a product from the ith firm

Pi is the purchase value paid by the ith firm

Qi is quantity of the product paid by the ith firm

Producer Share in Consumer Rupee

$$PS = (PF/PR)*100$$

Where,

Pf is price received by the farmer

Pr is retail price (consumer price)

Marketing Margin of Middleman

$$Ami = Pri – (Ppi+Cmi)$$

Where,

Pri is the total value of receipts per unit (sale price)

Ppi is the purchase value of good per unit (purchase price)

Cmi is the cost incurred on marketing per unit

Factors affecting Marketing Efficiency

$$y = f(x1 \ldots xn)$$

Where,

y = Marketing efficiency (%)

X1 = Marketing cost (Rs.)

X2 = Marketing margin (Rs.)

X3 = Transport cost (Rs.)

X4 = Open market price (Rs.)

X5 = Lab our wages (Rs.)

X6 = Controlling middlemen (put ‘1’, if middlemen are controlled and ‘0’ if

Not)

X7 = Volume of produce handled (kg)

X8 = Presence of cold storage facilities (put '1', if present and '0' if not present)

X9 = Length of the market channel (No. of market intermediaries)

X10 = Length of the market channel (No. of market intermediaries)

X11 = Nature of produce (put '1', if semi-perishable and '0' if perishable)

Constraints perceived by the farmers / wholesalers / retailers

Garrett's Ranking Technique

$$\text{Percent position} = \frac{100\,(Rij - 0.50)}{Nij}$$

Where,

Rij is the rank given by ith item by jth individual

Nj is the number of items ranked by the jth individual

(Note: The percent position of each rank is converted into scores by referring tables given by Garrett and Woodworth (1969). Then for each factor, the scores of individual respondents are added together and divided by the number of respondents for whom scores are added. The mean scores for all the factors are ranked by arranging in descending order).

3. RESULTS AND DISCUSSION.

3.1 Status of the Vegetables Production in Andhra Pradesh

Andhra Pradesh comprises seven agro – climatic zones and endowed with rich natural resources of soil, water and vegetation. The agricultural production system in the state is multi cropped situation with diversified systems of both agricultural and horticultural crops separately and together. The state has 2, 03,574 hectares under vegetable area with a production around 34, 32,193 tones (2009-10).

Vegetables, besides providing nutritional security are also a major source of income especially for small and marginal farmers. The vegetable crops apart from higher productivity and high value produce, provides more food per unit time and area can improve the economic condition of the grower as compared to cereal crops. Hence, they are becoming a potential commodity to provide economic security to the resource poor and marginal farmers in the state. Newly developed short duration varieties of vegetable crops in the recent years not only fit in the perennial cropping systems but also in the rice based cropping intensity, can be increased many fold. The scope for horizontal expansion of area may be limited for want of suitable land in the state consequent to shifting of cultivated land to real estate and industrial growth and the only option available is to increase the vertical expansion to increase the productivity adopting newer production technologies. The productivity of vegetables in the state was 12.35 Mt. / Ha which quite low as compared to the national average productivity of 15.0 MT/Ha.

There is significant gap in the national average productivity of different vegetable crops as compared to the world average productivity as well as the potential productivity for the respective vegetable crops Table 3. Then there is vast scope to improve this productivity of their crops at national level and more particularly in Andhra Pradesh. This critical gap between potential yield and national average can be minimized by strong extension services, training and demonstration. To enhance the vegetable production in the state, our target should be to achieve 25Mt/ha. Productivity by 2020, which is presently around 12.35 Mt/ha. Improvement of the productivity can be achieved through replacement of varieties/ hybrids and adoption of improved production/ protection technologies. The low production of vegetable crops in the region could

be attributed to a number of biotic, abiotic stresses, irrigation, vagaries of weather conditions and socio – economic factors.

Table 3: Vegetable Productivity Scenario (2004-05).

Name of the Crop	India Average(T/ha)	State Average (T/ha)	World Average (T/ha)	Potential Productivity T/ha)	Maximum Productivity Achieved (T/ha)
Tomato	14.02	21.80	26.69	60 – 80	70 .45 (USA)
Brinjal	16.08	12.50	17.48	40 -50	34.70 (Japan)
Chili	9.18	6.35	14.40	30- 40	44.50 (Spain)
Okra	9.59	11.70	6.47	15 -20	17.78 (Jordan)
Bean	9.14	5.70	8.35	18-20	20.00 (Ludhiana)
Melon	20.48	15.20	20.95	30-40	45.83(Cyprus)
Cucurbits	9.72	8.30	12.97	25-30	41.33 (Israel)
Cucumber	6.67	7.50	16.98	40-50	67.67(Korea)
Watermelon	12.75	10.25	27.13	30-40	40.96(Spain)
Cabbage	21.43	9.1	25.10	30-40	42.59(Japan)
Cauliflower	17.14	4.5	18.36	35-40	45.25(New Zealand)
Onion	10.38	4.2	17.53	40-50	60.33(Korea)
Garlic	4.17	2.1	12.37	15-20	23.23(Egypt)

Source: Indian Horticulture database 2005

However, in the state to maximum open pollinated old and interior varieties with the application of farmers own package and practices and their traditional vision are followed. In the recent past (since 2004), continued efforts have been made by vegetable production. Still the area under hybrid vegetable is very limited.

The state however, has tremendous potential for production of vegetables. The high altitude zone area in the state has favourable weather conditions. In the agency areas even cool season vegetables crops can be grown after the harvest of rice during winter season from January to April every year.

Table 4: Vegetable Area and Production trends in Andhra Pradesh

Year	Area(000Ha)	Production (000tons)
2005-06	266	4373
2006-07	251	4210
2007-08	299	4942
2008-09	325	5267
2009-10	204	3422

Source: Sakshi Telugu News Paper

The Vegetable Scenario in Andhra Pradesh over the period is not encouraging as the trend of both area and production has declined between the period 2005-06 and 2009-10. (Table4). However the Andhra Pradesh Govt. is continuously providing encouragement to Vegetable growers to improve the vegetable production in the form subsidy on seeds which has been increased from 50 to 75 percent. The main reason attributable for the declining trend in vegetables area and production was mainly due to non availability of seeds as per demand and unfavourable climatic factors.

3.2. Economics of Vegetables:

The most important factor impacting the Horticulture sector in growth is the low and declining productivity. But the potential yield possible for all fruits and vegetables is higher than the existing yields. The major constraints are non – availability of quality seeds (Hybrid breeds in all Vegetables), inadequate irrigation facilities, lack of knowledge on nutritient requirement of these crops, Poor pest / disease management, absence of credit availability in time from nationalized banks, high cost of production, huge post- harvest losses, lack of road network, absence of sufficient numbers of cold storage units, poor- market network and high transportation cost. A great deal is to be done in the field of research, investment to improve the infrastructure conditions and reduce the post – harvest – losses in the sector do that the per-unit productivity and per - capita availability of Vegetables could be increased. The general constraints faced by this sector are timely delivery, grading, packing, production of quality product, poor market infrastructure, agro processing plants, credit facilities, proper pricing, uniform grading and standardization of weights and measures, poor post harvest handling low productivity.

Supply chain

The supply chain has a weak point i.e., it is a multi layered marketing channel lacking required infrastructure. The efficient supply chain requires strengthening all the levels of infrastructure such as input delivery, credit, irrigation, procurement, reducing post-harvest loses, creation of cold store chains, starting of processing units and marketing techniques, improving storage plants and marketing information.

The infra structure to improve efficiency and the linkages of the supply chain is very poor, which is affecting the growth potential of the horticulture sector. Timely availability of inputs, development of organized input market infrastructure for its storage and distribution will add to the productivity of horticultural crops. The development of cold chain network will help in reducing the post –harvest losses of fruits and vegetables. Improved post harvest management means an overall improvement in the per unit productivity. Investment is required to build the cold storage chain for the refrigerant truckers which procure the produce from the orchard gate, the pre-cooling chambers, cold area for porting and grading the produce, refrigerated trucks for

transferring the produce to the market distribution. This development of chains requires huge investment in technology, infra structure and maintenance. Due to deficiency in the supply chain the price received by the grower is only about one fourth to half (1/4 to ½) of the retail price the consumer pays.

The economics of the selected crops (Table10) indicated that all the farmers involved in the production of the crops were realizing the desired returns both on absolute basis and on rupee basis. But the major problem the farmers have been facing in all the crops was their perish ability and lack of sufficient infrastructure to retain the storage quality till such time it reaches the ultimate consumers at least till the produce moves out from the farmer**- producer level.**

Table 5: Cost of Cultivation of selected crops (2008-09)

Name of the Crop (1)	**Cost of cultivation per Hectare (2)**	**Yield per Hectare(Q) (3)**	**Price per Quintal (Rs.) (4)**	**Gross returns per Hectare (5)**	**Net Returns per Hectare (6)**	**B:C ratio(6/2) (7)**
Potato	74886	350 bags per hectare (1 bag =60 kgs)	700	245000	170114	2.27
Tomato	29408.33	83.33	1000.00	83333.33	53925.00	1.83
Rose	152492	6448 flowers per day	30 flowers cost is Rs.5/-	350000	197507.9	1.29
Baby corn	51256.	80	1200	96000	44744	0.87
Grape	89175	125	2000	250000	160825	1.80

3.3 Marketing of Vegetables

The marketing of vegetables in Andhra Pradesh has taken a good turn with the introduction of Rythu bazars which was mainly aimed to help the vegetable growers to derive maximum benefits. This public investment influenced private investment in marketing of vegetable crops with the entering of corporate bodies. The fresh and perishable commodity producers especially farmers are receiving due price for their valuable produce because of good competition prevailing in the perishable market scenario. Various costs that are incurred in the marketing of vegetables and fruits are transport, loading/unloading, market fee and commission. Large variation may be observed in the cost shares of different commodities. This was mainly due to high cost of transport borne by the producer farmer located at far-off places from the markets. For locally produced commodities also transport cost dominated. The variations in the share of other costs such as commission, loading / unloading, market fees etc. for different commodities were not high because there were standard norms for charging such cost in the existing marketing system.

Retailers share in total marketing cost of horticultural products may be dominated by commission of middle men followed by transport cost. Retailers do not have to pay any commission to the wholesalers for commodities marketed as they buy directly from the cultivators in certain cases which were very isolated case.

Traditionally, farmers depend heavily on middlemen particularly in the marketing of fruits and vegetables. There has been great concern in recent years about the efficiency of marketing of horticultural produce. It is feared that the low efficiency in the marketing channels accompanied with poor marketing infrastructure would not only lead to high and fluctuating consumer prices, but also only a little fraction of the consumer rupee reaching the grower. It may also leads to deterioration in quality, frequent mismatch between demand and supply over a period of time resulting to high fluctuating of prices. Therefore, these types of studies address the issues such as present marketing practices, the seasonal phenomenon, the physical market infrastructure, existing market channels and the price spread of these fruits, vegetables and flowers.

For improving the marketing of these horticultural products, some major recommendations have to be considered. Firstly, it is important to bring more markets under regulation and put them under supervision of market committees. Secondly it is important to promote, and even to enforce the rules or laws, the practice of open auction in the markets. Thirdly it is essential to

bring more number of buyers and sellers to the wholesale markets so as to encourage a healthy competition in perfect market conditions and better price realization to the growers/ cultivators.

Besides the above measures, improvements in market infrastructure such as storage facilities, cold storage, better mechanical loading and unloading facilities, better weighing facilities, proper stalls, good road links etc. would also be helpful to improve marketing efficiency. Finally the market information system by making available the latest and extensive market information to all market players through the use of internet facilities, on line marketing facilities, and other means of communication system need to be paid due attention.

3.4. Innovative Models

Innovative marketing system in case of several crops was different and also from crop to crop and functionaries to functionaries.

Potato

The innovative marketing system with regard to potato was mainly taking place from producer to the wholesalers then to the consumers through Self Help Groups (SHGs). The farmers mainly depend on wholesalers to sell the produce, as they found it more profitable. The consumer's interest was taken care by SHGs in all the Rythu Bazars of the Grater Hyderabad city markets in Potato crop.

Tomato

Tomato produce market was done by the farmers themselves by playing the role of Retailers which helped them in realizing better price to their Produce.

Baby Corn

Baby corn sales were mainly marketed by few Wholesalers cum Pre Harvest Contractors cum Processors as this is a new Vegetable crop in the marketing system. It reaches consumer directly from farmer through wholesalers only and the corporate bodies also play crucial role in this new vegetable crop marketing.

Rose

This highly valuable elegant flowers market was mainly done through involvement of commission agents. The farmer makes use of the services of commission agents every day to make roses reach into consumer hands. The Commission agents sell the produce only on the basis of Commission alone but not on any basis. However, the farmers expressed that the present system is not to the advantage of the farmers as the market risk is very high.

Grape

Grapes are highly commercial and seasonal crop in Greater Hyderabad city. It was sold by the farmers on innovative manner by selling the grapes through mobile vans. These mobile vans have no boundaries. They move the produce throughout the state which helps them in realization of the satisfactory price despite incurring the sizeable amount on transportation.

Developing supply chains is a new strategy and it is very different from the existing fragmented traditional markets. There may be several challenges whenever a new system is to be implemented. Certain aspects suitable for marketing of horticulture produce have to be considered as furnished below.

- Policy environment
- Developing linkages with growers
- Coordination with growers
- Procurement
- Post-harvest management

The modern value chains are to be developed by the retail sector. Some concrete investments have to be made. The government should encourage the establishment of such chains and some of these efforts needed are

- Providing a conductive environment for private sector investment.
- Setting standards for products to maintain quality.
- Post-harvest management, skilled manpower and infrastructure.
- Development of linkages between small and marginal farmers on one side and the retail sector on the other side.

All the above efforts to initiate the retail revolution are likely to have far reaching implications for the stakeholders including growers, wholesalers and traders in the traditional market. It may also benefit the small retailers. Of course the extent of impact will depend on the share of organized retail and the involvement of small and marginal farmers who are involved in the production of these selected horticultural crops.

Above all the most important aspect which should be given first and fore most thinking is price stabilization. At present the policy in general deals with a few important commercial crop products namely tomatos and potatoes. This should be extended to other fruits, vegetables and commercial flower crops. This policy naturally supports the grower to fetch a better price for his produce in the market and also benefits the consumer on the other side.

3.5 Market Intermediaries and their Functions

There exist many different shares of the players in the consumer rupee. The grower's share is higher if the produce is marketed through co-operative society compared to the private trade. There is generally no intermediary involved at the primary level of marketing and hence the growers themselves market the produce at the wholesale market. With regard to other selected commodities like grapes, market functionaries like village merchants, village contractors etc, may be involved as intermediaries.

Familiarity on the part of growers because it has been important criterion in determining the agency of sale i.e. the commission agent and two thirds of growers supply to the commission agent on the basis of familiarity. The selected non-regulated producers like tomatos and grapes are not weighed at all during transactions. They may need on the basis of truck loads by grower-suppliers as well as pre-harvest-contractors. However, at the retail level, their produce is weighed and sold by the retailers. These tomatoes and grapes are sold basket wise or box wise.

The main function of the commission agent is to mediate between the seller and buyer and some of them do the functions of assembler and wholesaler.

Although, sale on credit basis may result in higher profit margin for commission agents and or traders which points to the economic inefficiency of the market. Some times at the wholesale

market, the wholesaler and traders of other areas or States followed by retailers are also involved as intermediaries. Some typical ways of marketing are furnished below.

Up to wholesaling

i) Grower ----------> Commission agent

ii) Grower ---------- > Village merchant/Pre-harvest contractor---------- > Commission agent

After wholesaling

i) Commission agent ------ > wholesaler/Re-wholesale ----- - >-retailer/hawkers----------> Consumer.

ii) Commission agent ----- > Retailers------ > Consumers.

iii) Commission agents ---------> Hawkers-----> Consumers

3.6 Supply Chains

The data related to number of farmers adapted by different supply chains for different crops was presented in Table 6 along with relevant flow charts showing the path of the produce connected to consumer from producer.

Table 6: Crop wise sample farmers preferred market channels in the existing supply chain system

Particulars	Supply Chain	Potato	Tomato	Baby corn	Rose	Grape
Channel 1	P-M-R-C	0	0	44	0	0
Channel 2	P-M-W-R-C	9	43	0	30	28
Channel 3	P-R-C	38	11	11	20	13
Channel 4	P-RELIANCE	0	10	0	0	0
Channel 5	P-W-R-C	43	26	35	40	9

Potato

The potato growers mainly preferred the supply chains from Producer to wholesaler, Retailer, consumer chain. Only less percentage of sample farmers preferred producer, middleman, wholesaler, retailer and consumer chain. The interesting channel of potato identified was producer, retailer and consumer. Where, retailers play a usual role in marketing of potato produce and help the farmers to realize a better price for the produce in the supply chain.

Tomato

The highly perishable crop reaching the consumer through multi channel supply chain followed by producer, wholesaler, retailer and consumer channel.

Baby corn

The maize product is produced by small group of farmers in isolated places in and around Greater Hyderabad city. Middlemen supply chain system is playing influential role to the farmers.

Rose

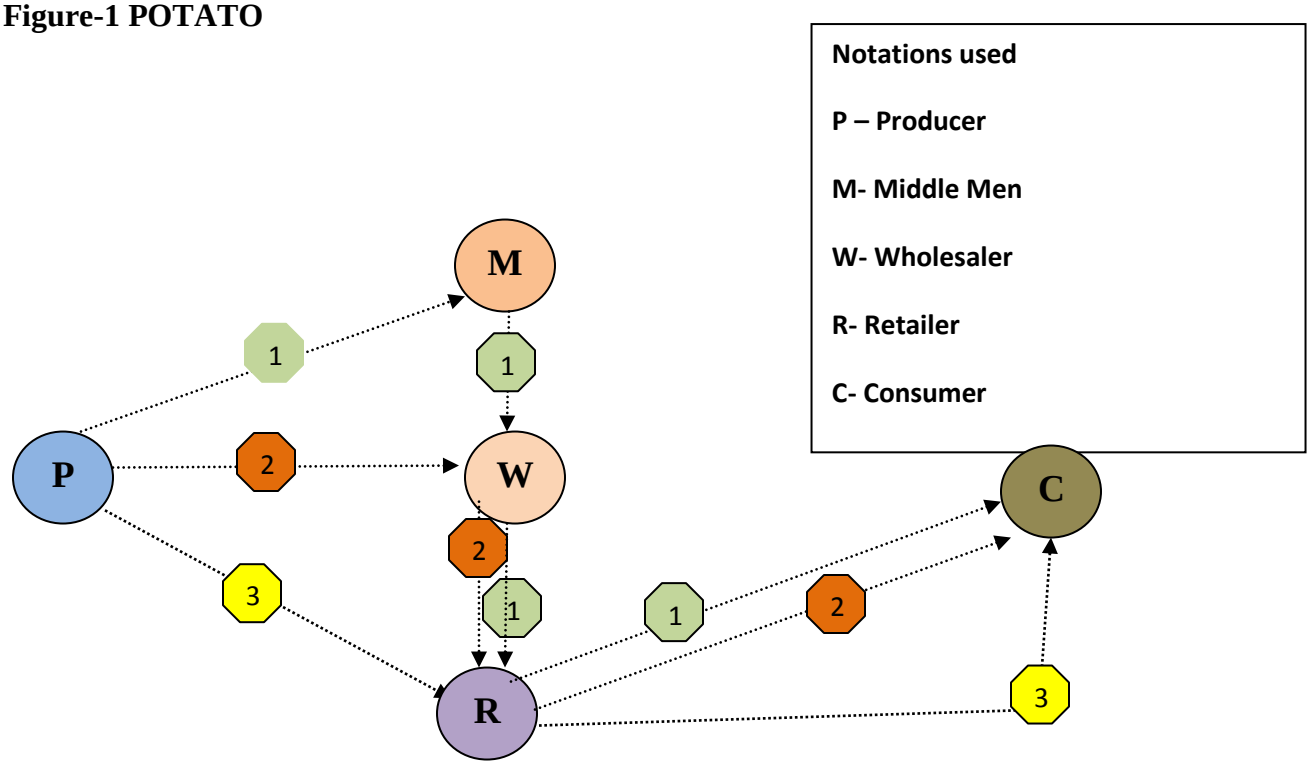
The elegant flower is reaching consumer through the multi channel supply chains and also with involvement of retailers between producers and consumers.

Grape

The grapes which is a highly commercial crop reaching the consumer through multi channel supply chain model and with little role of retailers between producers and consumers in making grapes reach from producers and consumers.

Supply chain Network depicting selected crops produce movement from farmer - Producer to ultimate consumer

Figure-1 POTATO



Channel -1

P → M → W → R → C

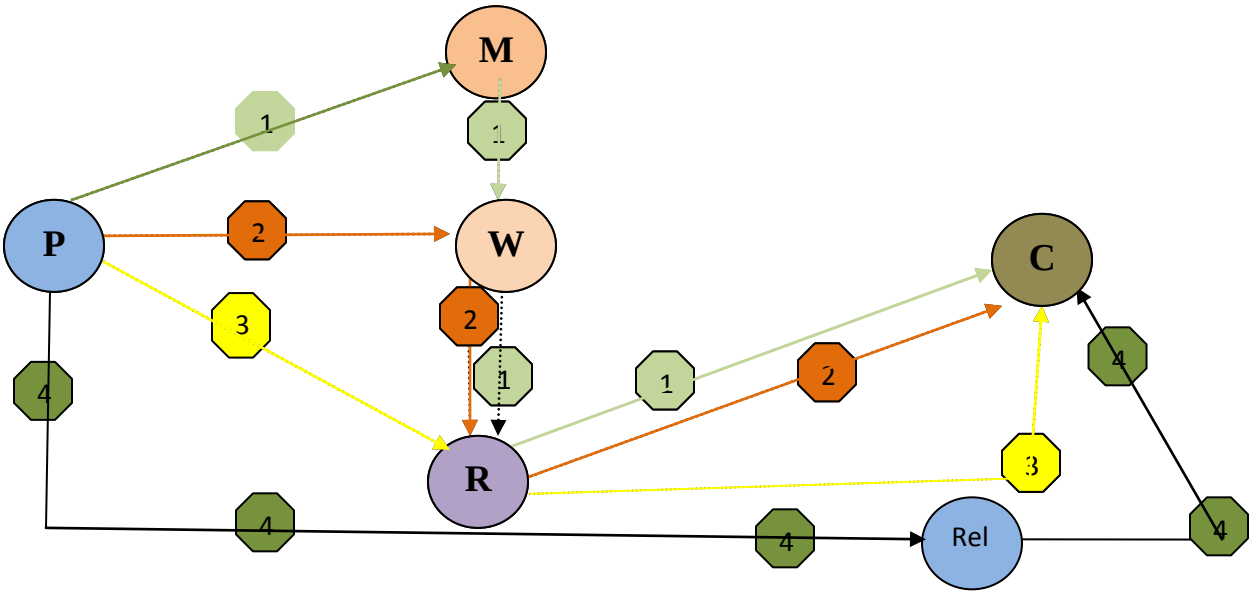
Channel -2

P → W → R → C

Channel -3

P → R → C

Figure- 2 TOMATO



Channel -1

P → M → W → R → C

Channel -2

P → W → R → C

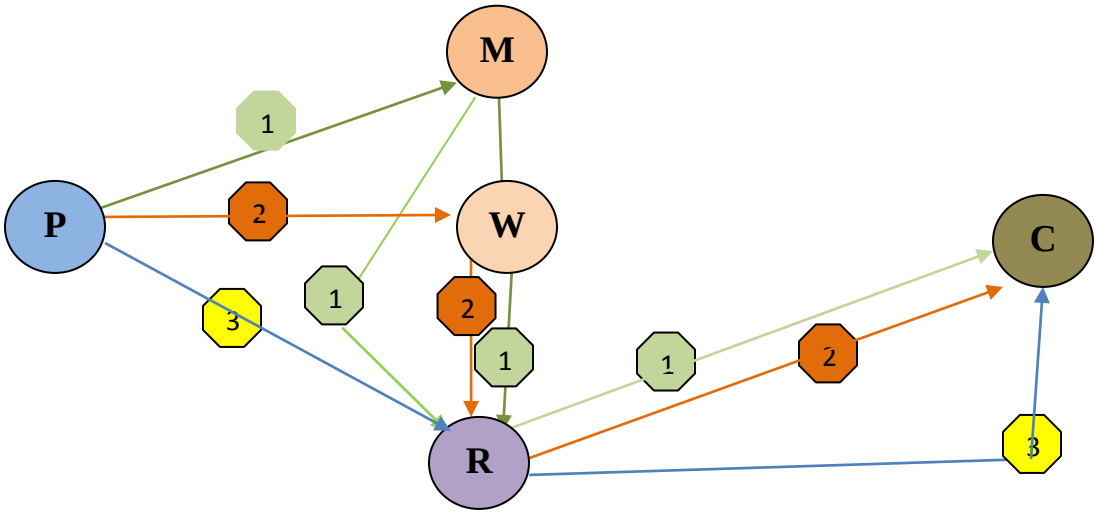
Channel -3

P → R → C

Channel -4

P → Reliance → C

Figure-3 BABY CORN



Channel -1

P → M → R → C →

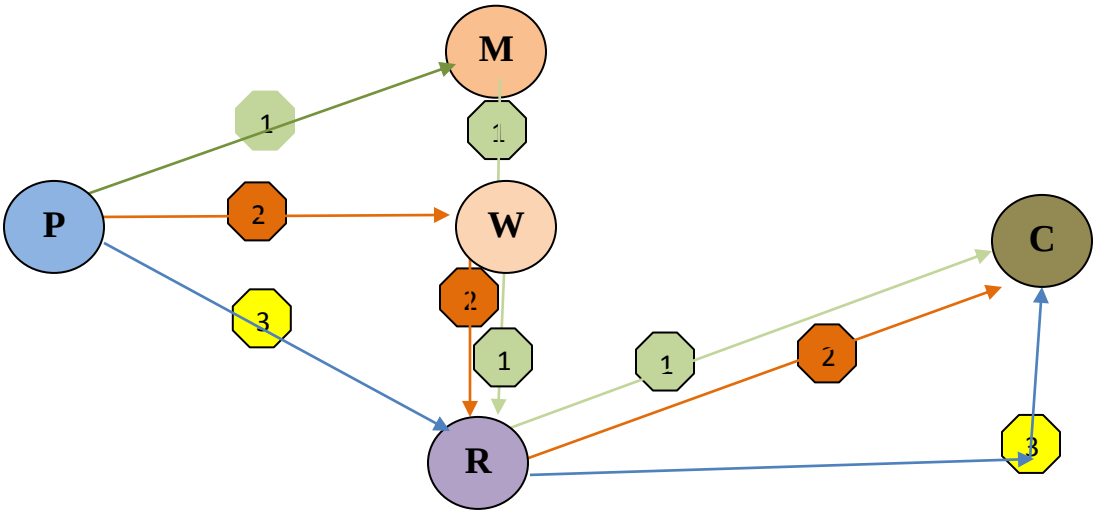
Channel -2

P → W → R → C

Channel -3

P → R → C

Figure-4 ROSE



Channel -1

P → M → W → R → C

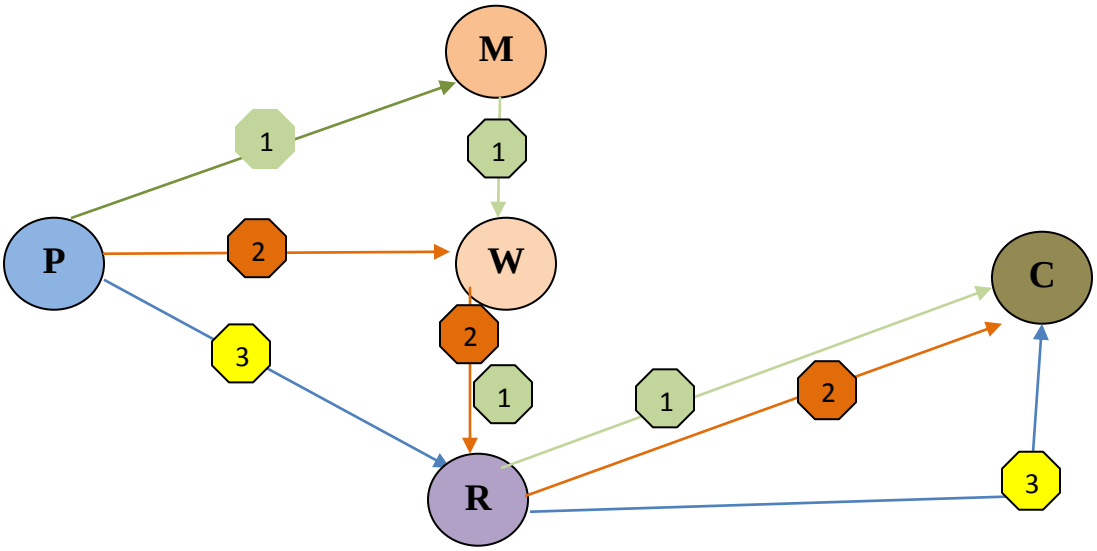
Channel -2

P → W → R → C

Channel -3

P → R → C

Figure-5 GRAPE



Channel -1

P → M → W → R → C

Channel -2

P → W → R → C

Channel -3

P → R → C

3.7. Produce quantities crop wise handled under different supply chains

The channel wise quantities dealt under different supply chain systems are presented in the Table 7.

Table 7: Quantities handled in different supply chains in kgs per day

Marketing channel	Potato	Tomato	Baby Corn	Rose	Grape
P-M-R-C	0	0	11442	0	0
P-M-W-R-C	24520	56,433	0	375	85214
P-R-C	19657	71956.8	16889	421	94846
P-RELIANCE	0	74957.1	0	0	0
P-W-R-C	15072	64685.7	12774	575	44000

Potato

Multi channel system has handled highest volume of produce (24520 kgs/day)) followed by producer – retailer - consumer channel (19657 kgs/day) and this channel were preferred very much in the supply chain system by the producer farmer.

Tomato

The interesting phenomenon in handling of tomato from producer to consumer was almost took place in all the supply chains including intervention of corporate bodies like Reliance, Spencer's etc...

Baby Corn

Baby corn produce was mainly marketed in large quantities through producer –retailer - consumer supply chain followed by multi channel supply chains.

Roses

The highly elegant and highly perishable flower product has to be handled with most care. The Rose produce reaches the consumer through producer - retailer - consumer (421 kgs) channel while the other supply chain channel was producer – wholesaler- retailer- consumer (575 kgs.)

Grape

Grape Produce in larger quantities reaching the consumer through producer – retailer-consumer supply chain. The main reason for this, the retailer playing the role of wholesalers and making the produce reach the consumer though retailer earns little profit.

3.8. Marketing Cost and Margins.

Marketing cost means the entire expenditure met by the supply chain players to move the product from different levels and ultimately to respective consumers. The marketing cost items generally will be packing, storage, transport and commissions to be charged and incurred by the intermediaries. The selected crops market cost scenario has been presented in table-8 and discussed crop wise.

Table 8. Crop wise Marketing cost and Marketing Margins

Name of the Crop	Potato			Tomato			Baby Corn			Rose			Grape		
Item	Unit	Cost	% Consumer Price	Unit	Cost	% Consumer Price	Unit	Cost	% Consumer Price	Unit	Cost	% Consumer Price	Unit	Cost	% Consumer Price
Farm gate price at village	1Q	660	48.35	1Q	1465	49.64	1Q	670	30.66	1 bag (1bag consist of 40-50 mini bags. each mini bag consist of 30 - 40	547	38.77	1Q	2100	75.32
+sorting	1Q	0	0	1Q	0	0	1Q	0	0		0	0	1Q	0	0
+packing	1Q	94.28	6.91	1Q	134	4.54	1Q	110	5.03		50	3.54	1Q	65	2.33
+transport	1Q	28	2.05	1Q	27.68	0.94	1Q	35	1.6		10	0.71	1Q	45	1.61
+others	1Q	28	2.05	1Q	114	3.86	1Q	30	1.37		20	1.42	1Q	20	0.72
Total marketing cost	1Q	150.3	11.01	1Q	275.7	9.34	1Q	175	8		80	5.67	1Q	130	4.66
Farmer's Selling Price to Local	1Q	720	52.75	1Q	1565	53.03	1Q	925	42.33		600	42.52	1Q	2150	77.12

Assembly Trader at Rural Market										flowers					
+sorting	1Q	0	0	1Q	0	0	1Q	0	0		0	0	1Q	0	0
+packing	1Q	95	6.96	1Q	130	4.41	1Q	110	5.03		45	3.19	1Q	65	2.33
+storage	1Q	0	0	1Q	0	0	1Q	0	0		0	0	1Q	0	0
+transport	1Q	30	2.2	1Q	0	0	1Q	30	1.37		20	1.42	1Q	20	0.72
Total marketing cost	1Q	125	9.16	1Q	130	4.41	1Q	140	6.4		65	4.61	1Q	85	3.05
Marketing margin	1Q	25.28	1.85	1Q	145.7	4.93	1Q	35	1.6		15	1.06	1Q	45	1.61
Assembly traders price to wholesaler	1Q	838	61.39	1Q	1620	54.9	1Q	1120	51.26		861	61.02	1Q	2242	80.42
+sorting	1Q	0	0	1Q	0	0	1Q	0	0		10	0.71	1Q	10	0.36
+packing	1Q	0	0	1Q	0	0	1Q	0	0		0	0	1Q	0	0
+storage	1Q	20	1.47	1Q	25	0.85	1Q	25	1.14		10	0.71	1Q	25	0.9
+transport	1Q	25	1.83	1Q	28	0.95	1Q	25	1.14		18	1.28	1Q	25	0.9
Market fee	1Q	5	0.37	1Q	10	0.34	1Q	5	0.23		5	0.35	1Q	5	0.18

Total marketing cost	1Q	50	3.67	1Q	63	2.14	1Q	55	2.51		33	2.34	1Q	55	1.98
Marketing margin	1Q	75	5.49	1Q	67	2.27	1Q	85	3.89		32	2.27	1Q	30	1.07
Wholesalers price to retailers	1Q	970	71.06	1Q	1745	59.13	1Q	1450	66.36		1120	79.38	1Q	2352	84.36
+transport	1Q	20	1.47	1Q	25	0	1Q	20	0.92		16	1.13	1Q	20	0.72
+packing	1Q	15	1.1	1Q	10	0.34	1Q	10	0.46		0	0	1Q	0	0
Total marketing cost	1Q	35	2.57	1Q	35	0.34	1Q	30	1.38		16	1.13	1Q	20	0.72
Marketing margin	1Q	15	1.1	1Q	28	1.8	1Q	25	1.13		17	1.21	1Q	35	1.26
Retailers price to consumer	1Q	1365	100	1Q	2951	100	1Q	2185			1411	100	1Q	2788	100

Potato

The Potato crop data indicated that the farmer from the farm gate also incurred marketing cost on packing, transport and others with 11.01% to make the produce reach to local assembler / trader in rural markets. The marketing cost indicated as 9.16% of the consumer rupee while it was 3.67% at wholesaler's level and ultimately by the time reaching from retailers to consumer it was only 2.57%. The interesting and striking feature was that the farmer producer of potato crop was incurring highest marketing cost in the consumer rupee compared to that of other players in the market. Furthermore, the data indicated that the market cost incurred by the retailers was lowest relatively compared to wholesalers, commission agents. This was mainly due to the reason that due to fast moving of product and its volatile price situation, the retailers prefer to sell out the product with minimum storage time hence the marketing cost was low and marketing margin was also found to be relatively low.

Tomato

The marketing cost scenario in tomato crop indicated that the marketing cost of the tomato producers in consumer rupee was high with farmer producer in the order followed by village merchants (4.41%), wholesalers (2.14%) and retailers (0.34%) This data indicates that the farmers were again major bearers of market cost in consumer rupee compared to other players in the supply chain system.

Baby corn

The baby corn is a peculiar coming up market product and very much gaining importance in the market due to its special preference at high end hotels. The market cost borne by the farmer producer (8%) in the producer rupee followed by other players in the market. The market cost borne by the farmer producer in consumer rupee was highest among all the supply chain players.

ROSE

The roses are important elegant commodity produced in Rangareddy district in isolated pockets of the villages. The villages exclusively produce rose flowers and farmers are very much habituated to produce this crop which was main income source. The roses marketing cost in consumer price was high at farmer's level with 5.67% and with assembling trader it was (4.61%)

followed by wholesalers (2.34%) and retailers (1.42%). The striking feature of the data suggests that the producer – farmer incurring more percentage of marketing cost compared to other players in the supply chain system. However marketing margin in the case of roses indicated that the market margins have increased from 1.06% of consumer rupee from local Assembly traders to rural markets (2.27%) and wholesalers (1.21%). The data indicated that the realistic of market price at farmers level was only 38.77% of consumer rupee in the case of Roses which was mainly due to the fact that volatile prices of the commodity and perishable nature of the flower decides circumstantial demand for the product.

Grapes

Grapes is an important crop earlier time in Greater Hyderabad city due to its valuable position among the fruits. Hyderabad grapes are very famous in early 50s and 60s. Now the area under grapes has come down drastically due to the fact i.e., lack of sufficient market to this important fruit crop and also due to its insufficient export importance in Hyderabad city. However Grape exports have come in to the business both with the forward and backward linkages. The market cost and margin of the grapes suggest that the producers mainly borne the marketing cost with greater share of the consumer rupee than other players in the supply chain system and the trend was in descending order starting from village level merchants to retailers. Interestingly, it was noticed that the players in the supply chain system were playing dual roles as wholesalers and retailers to make the product reach from producer to consumers with the help of mini trucks and they make reach the product from Hyderabad city to far places in Andhra Pradesh due to the fact of market potential in Hyderabad city and far places in Andhra Pradesh.

The market margins data has also indicated that the realization of margins was very low with low percentage of consumer price.

3.9. Market Margin

The efficiency of marketing system reflects the marketing cost and marketing margins between different intermediates. Less is .market cost and more is the margins the market is said to be efficient. The data related to marketing margins and costs are presented in table 9.

Table 9: Marketing cost and Marketing Margin of Selected Fruits & Vegetables

(Rs/q)	Potato		Tomato		Baby Corn		Rose		Grape	
Item	Cost	% Consumer Price	Cost	% Consumer Price	Cost	% Consumer Price	Cost	% Consumer Price	Cost	% Consumer Price
Farm gate price	660	48.35	1465	49.64	670	30.66	547	38.77	2100	75.32
Marketing cost										
Producer	150.28	11.01	276	9.35	175	8.01	80	5.67	130	4.66
Wholesaler	125	9.16	130	4.41	140	6.41	65	4.61	85	3.05
Retailers	50	3.66	63	2.13	55	2.52	32	2.27	55	1.97
Total marketing cost	325.3	23.83	469	15.89	370	16.93	177	12.55	270	9.68
Marketing margin										
Assembler/Trader	25.28	1.85	145.7	4.94	35	1.6	15	1.06	45	1.61
Wholesaler	75	5.49	67	2.27	85	3.89	32	2.27	30	1.08
Retailer	15	1.1	28	0.95	25	1.14	17	1.21	35	1.26
Total marketing margin	115.3	8.44	241	8.16	145	6.63	64	4.54	110	3.95
Consumer price	1365	100	2951	100	2185	100	1411	100	2788	100

Potato

In the case of potato the marketing cost was 23.83% with a major share borne by the producer farmer with 11.01% followed by the wholesaler with 9.16%. The marketing margin in potato crop indicated that the wholesaler was gaining more percentage of benefit with marketing margin of 5.49 % in the total marketing margin of 8.44%.

Tomato

The total marketing cost in the tomato crop supply chain system was 15.89% and the lion share was borne by the producer himself with 9.35% per Qtl. The market margins comes to 8.16% of which assembler or trader take the more share with the margin of 4.94% i.e., more than 60% it accounts.

Baby corn

The Baby corn was less marketed with less number of participation of intermediaries in number. The product reaches through supply chain to the consumer with 16.93% of market cost of consumer price while the market margins in the consumer rupee were 6.63% of which wholesaler major share was 60%.

Rose

In the case of Roses, the marketing cost was 12.55% with a major share borne by producer (5.67%) as the produce was sold in the market in mini packets consisting 30-35 flowers in physical number with a major share borne by producer. The share of wholesaler was 4.61% followed by retailers (2.27%). The total market margin in consumer Rupee was 4.54% since the chance to make margins in this perishable elegant commodity looks like to be very low. Out of this the major share is gained by wholesaler i.e., 2.27%. The consumer rupee was shared by traders (1.06%) and retailers (1.21%) for their active functioning in the supply chain system..

Grape

Grapes are grown in isolated pockets in and around Hyderabad city with less number of participation of intermediaries. The marketing cost indicated as 9.6% of consumer Rupee. The

marketing margin realization was very low in the grape crop to the intermediaries because of its high perishable in nature.

3.10 Price Spread

The data related to price received by the farmer/ producer and price paid by the consumer has been worked out under different supply chain system for the sample farmers for all the selected crops. The information related to market cost and market margins under different supply chains to different intermediaries incurring cost and making margins was presented crop wise.(10A-10E).

Potato

The price spread collected for the potato crop under different supply chains system indicated (Table 10A) that the marketing margins at wholesalers and retailers level and also the market cost was relatively high at the intermediary level. The data supports the arguments that the intermediaries play a crucial role in realizing better margins for them compared to that of potato growers.

Table 10A: Price Spread of Potato (per Kg.)

Particulars	**Potato**				
	P-M-R-C	**P-M-W-R-C**	**P-R-C**	**P-RELIANCE**	**P-W-R-C**
Price received by the farmer	**0**	**6.25**	**6.6**	**0**	**6.3**
Cost incurred		1.23	1.45		1.8
Margin	0	1.25	2	0	2.1
Wholesaler's purchase price	**0**	**7.5**			**8.4**
Cost incurred	0	0	0	0	0
Margin	0	1.5	8.6	0	1.8
Retailer's purchase price	**0**	**9**	**8.6**		**10.2**
Cost incurred	0	2	1.85	0	1.5
Margin	0	4.27	4.9	0	3.7
Price paid by the consumer	**0**	**13.27**	**13.5**		**13.9**

Tomato

The data related to tomato crop indicated (Table 10B) that the margins were relatively high at intermediary levels and the price realization by the producers was not that high in consumer rupee in any of the supply chain.

Table 10B: Price Spread of Tomato (per kg.)

Particulars	**Tomato**				
	P-M-R-C	**P-M-W-R-C**	**P-R-C**	**P-RELIANCE**	**P-W-R-C**
Price received by the farmer	**0**	**14.53**	**14.7**	**14.8**	**15.5**
Cost incurred	0	1.5	1.5	2.4	1.5
Margin	0	5.37	3.53	7.7	1
Wholesaler's purchase price	**0**	**19.9**	**0**	**0**	**16.5**
Cost incurred	0	0	0	0	0
Margin	0	3.55	18.2	0	3.3
Retailer's purchase price	**0**	**23.45**	**18.2**	**0**	**19.8**
Cost incurred	0	0	0	0	0
Margin	0	5.2	6.6	22.5	4.7
Price paid by the consumer	**0**	**28.65**	**24.8**	**22.5**	**24.5**

Baby corn

The price spread of baby corn indicated (Table 10 C) that the price spread was relatively very favorable to wholesalers and retailers when compared to baby corn producers. The farmers were very limited in number and in the pockets of isolated villages of Medak district where the middlemen dominate the price structure. The wholesalers and retailers are encashing more market margins in this new upcoming crop.

Table 10 C: Price Spread of Baby Corn (Per kg.)

Particulars	**Baby Corn**				
	P-M-R-C	**P-M-W-R-C**	**P-R-C**	**P-RELIANCE**	**P-W-R-C**
Price received by the farmer	**4.5**	**0**	**6**	**0**	**4.95**
Cost incurred	0	0	1.5	0	1.8
Margin	11.3	0	9.65	0	5.7
Wholesaler's purchase price	**15.8**	**0**	**0**	**0**	**10.65**
Cost incurred	0	0	0	0	0
Margin	3.1	0	0	0	4.89
Retailer's purchase price	**18.9**	**0**	**15.7**	**0**	**15.54**
Cost incurred	0	0	0	0	0
Margin	3.48	0	8.85	0	4.89
Price paid by the consumer	**22.38**	**0**	**24.5**	**0**	**21.25**

Rose

The Price Spread data of Roses indicated that the wholesaler and retailer were realizing margins almost in equal amounts because of its high perishable nature (Table 10D).

Table .10 D: Price Spread of Rose(per big bag which consist of 45 mini bags with 30 to 35 flowers each)

Particulars	**Rose**				
	P-M-R-C	**P-M-W-R-C**	**P-R-C**	**P-RELIANCE**	**P-W-R-C**
Price received by the farmer	0	5.47	6.56	0	5.47
Cost incurred	0	0.5	1.5	0	0.5
Margin	0	3.2	0	0	3.2
Wholesaler's purchase price	0	8.67	0	0	8.67
Cost incurred	0	0	0	0	0
Margin	0	4.06	4.17	0	4.06
Retailer's purchase price	0	12.73	10.7	0	12.73
Cost incurred	0	0	0	0	0
Margin	0	3.02	3.57	0	3.02
Price paid by the consumer	0	15.75	14.3	0	15.75

Grape

Grape area in Greater Hyderabad city has declined in a most drastic way and also the due to the fact that the farmers involved in producing this commercial crop lack sufficient encouragement on several fronts. The data indicated (Table 10E) that the price margins were high in retailers with 4.5 Rs/kg. And the margin was high when compared to other players.

Table 10 E: Price Spread of Grapes (per kg.)

Particulars	**Grape**				
	P-M-R-C	**P-M-W-R-C**	**P-R-C**	**P-RELIANCE**	**P-W-R-C**
Price received by the farmer	**0**	**19.3**	**22.1**	**0**	**19.7**
Cost incurred	0	1.5	1.8	0	1.5
Margin	0	1.7	3.4	0	1.3
Wholesaler's purchase price	**0**	**21**	**0**	**0**	**21**
Cost incurred	0	0	0	0	0
Margin	0	3	0	0	3
Retailer's purchase price	**0**	**24**	**25.5**	**0**	**24**
Cost incurred	0	0	0	0	0
Margin	0	11	4.5	0	11
Price paid by the consumer	**0**	**35**	**30**	**0**	**35**

3.11. Share of different agencies in Consumer Rupee.

Each intermediary agency will have its due share while moving the produce from producer to the consumer. Every intermediary will have certain share in consumer rupee for their function and roll. Accordingly the data has been analyzed and estimated the percentage of share taken by the each agency for their function to make the produce move from producer to consumer. The data on different agencies share crop wise presented in Table 11.

Table 11: Share of different agencies during marketing of selected crops (%)

Sl No.	Particulars		Potato	Tomato	Baby corn	Rose	Grape
	Agency	Function	Share in final price				
I	Retailers	Retailing	71.06	59.13	66.4	79.4	84.4
II	Wholesalers	Breaking bulk	61.39	54.9	51.26	61	80.4
III	Commission agent	Market/making	52.75	53.03	42.33	42.5	77.1
IV	Trader	Packing/transportation/making	48.35	49.64	30.66	38.8	75.3
V	Commission agent	Market/making	0	0	0	22.5	0
VI	Large farmer	Consolidation	54.96	49.03	0	40.4	65.8
VII	Small farmer	Production	40.35	38.85	25.08	33.8	56.7
	Consumer price		328.9	304.58	215.73	318	440

The striking feature of the data was that in all the selected crops the share of retailers was high for all the crops followed by wholesalers and traders and lastly farmers. This is quite logical and true as in the order of descending in the supply chain system. The share of retailers was found to be high followed by other agencies in the supply chain system. The farmers share in consumer rupee was low in all the crops because of several explainable and unexplainable reasons such as poor bargaining power , low capacity of product retention, illiteracy, good market outlets and due encouragement in the form of price support and suitable storage facilities for the perishable commodities

3.12 Marketing Efficiency

The Acharya's formula was used to testify market efficiency under different supply chains system.

Potato

The market efficiency in the case of channel Producer-Retailer-Consumer was 90% followed by the Producer-Wholesaler-Retailer-Consumer and in this channel Producer-middleman-wholesaler-consumer it is 75%. The information indicates (Table 12A) that more intermediaries in supply chain systems market efficiency decrease and vise-versa.

Table 12 A: Measurement of Marketing Efficiency of Potato

S.No.	Particulars	Unit	Channel 1 P-M-R-C	Channel 2 P-M-W-R-C	Channel 3 P-R-C	Channel 4 P-RELIANCE- C	Channel 5 P-W-R-C
1	Retailer's sale price (RP)	Rs/q	0	1138	1014	0	1150
2	Total marketing costs (MC)	Rs/q	0	124	97	0	95
3	Total margins of intermediaries (MM)	Rs/q	0	705	660	0	732
4	Price received by farmer (FP)	Rs/q	0	622	680	0	660
5	Value added by the marketing system (1-4)	Rs/q	0	516	334	0	490
Index of Marketing Efficiency							
	Acharya's method (MME) [4 / (2+3)]	Ratio	0	0.75	0.9	0	0.8

Tomato

In case of Tomato crop, the participation of corporate body between producer and consumer as in intermediary in marketing system has indicated high market efficiency with more than 100% followed by multi channel supply system.(Table 12B).

Table 12 B: Measurement of Marketing Efficiency of Tomato

S.No.	Particulars	Unit	Tomato				
			Channel 1 P-M-R-C	Channel 2 P-M-W-R-C	Channel 3 P-R-C	Channel 4 P-RELIANCE –C	Channel 5 P-W-R-C
1	Retailer's sale price (RP)	Rs/q	0	2810	1780	2550	1720
2	Total marketing costs (MC)	Rs/q	0	550	312	317	544
3	Total margins of intermediaries (MM)	Rs/q	0	1360	1760	1070	1740
4	Price received by farmer (FP)	Rs/q	0	1450	1460	1480	1470
5	Value added by the marketing system (1-4)	Rs/q	0	1360	320	1070	250
Index of Marketing Efficiency							
	Acharya's method (MME) [4 / (2+3)]	Ratio	0	0.76	0.7	1.07	0.64

Baby corn

The marketing efficiency of baby corn data indicated very poor performance with only up to 25 to 30 percent in all the existing supply chain system .The main reason behind this is probably new crop and due to lack of sufficient market awareness to farmers to realize better market price and hence low market efficiency was noticed.(Table 12C)

Table 12C : Measurement of Marketing Efficiency of Baby Corn

S.No.	Particulars	Unit	Baby Corn				
			Channel 1 P-M-R-C	Channel 2 P-M-W-R-C	Channel 3 P-R-C	Channel 4 P-RELIANCE –C	Channel 5 P-W-R-C
1	Retailer's sale price (RP)	Rs/q	2238	0	2450	0	2125
2	Total marketing costs (MC)	Rs/q	310	0	312	0	570
3	Total margins of intermediaries (MM)	Rs/q	1515	0	1717	0	1740
4	Price received by farmer (FP)	Rs/q	450	0	600	0	495
5	Value added by the marketing system (1-4)	Rs/q	1788	0	1850	0	1630
Index of Marketing Efficiency							
	Acharya's method (MME) [4 / (2+3)]	Ratio	0.25	0	0.3	0	0.21

Rose

The market efficiency of roses indicated as 54% under channel producer-retailer-consumer with a 40% in the producer-wholesaler-retailer-consumer channel the very delegate nature and perish ability of flowers the farmers may have to sell the produce at the price offered by the middlemen and commission agents and hence The market efficiency was ranged between 35 to 54 percent.(Table 12D).

Table 12 D: Measurement of Marketing Efficiency of Rose

S.No.	Particulars	Unit	Rose				
			Channel 1 P-M-R-C	Channel 2 P-M-W-R-C	Channel 3 P-R-C	Channel 4 P-RELIANCE-C	Channel 5 P-W-R-C
1	Retailer's sale price (RP)	Rs/q	0	1575	1430	0	1575
2	Total marketing costs (MC)	Rs/q	0	441	357	0	341
3	Total margins of intermediaries (MM)	Rs/q	0	1110	857	0	1010
4	Price received by farmer (FP)	Rs/q	0	547	656	0	547
5	Value added by the marketing system (1-4)	Rs/q	0	1028	774	0	1028
Index of Marketing Efficiency							
	Acharya's method (MME) [4 / (2+3)]	Ratio	0	0.35	0.54	0	0.4

Grapes:

The grapes are most liked commercial fruits for its table purpose has indicated high marketing efficiency in all the supply chain systems. The marketing efficiency indicated 100% and above in all the existing supply chain systems because of the systemized and defined supply chains to this valuable crop.(Table 12E)

Table 12E: Measurement of Marketing Efficiency of Grape

S.No.	Particulars	Unit	Grape				
			Channel 1 P-M-R-C	Channel 2 P-M-W-R-C	Channel 3 P-R-C	Channel 4 P-RELIANCE-C	Channel 5 P-W-R-C
1	Retailer's sale price (RP)	Rs/q	0	3500	3000	0	3500
2	Total marketing costs (MC)	Rs/q	0	320	212	0	540
3	Total margins of intermediaries (MM)	Rs/q	0	1360	1750	0	1450
4	Price received by farmer (FP)	Rs/q	0	1930	2210	0	1970
5	Value added by the marketing system (1-4)	Rs/q	0	1570	790	0	1530
Index of Marketing Efficiency							
	Acharya's method (MME) [4 / (2+3)]	Ratio	0	1.15	1.13	0	0.99

3.13 Constraints Perceived by Various Stakeholders

The information pertaining to farmers, wholesalers, retailers perception towards logically identified constraints were analyzed for their normal and Garret ranking and presented crop wise (Tables 13A to 13E).

Potato

Both Garrets and normal rankings were analyzed for several constraints and found (Table 13A) that the Garret ranking came first for the constraint *Malpractices in auction*, while the normal ranking indicated *Faulty weighment.* In the perception of farmers, normal ranking indicated second position in case of constraint *related to facilities to farmers to stay in the market* and the rank for the same constraint stood in second position with respect to wholesalers. Wholesalers perceived highest Garret rank related to *storage facilities lacking.* Retailers perceived that *Non availability of marketing credit* is major constraint for the potato crop as per the Garret ranking. The second constraint in the order perceived by the farmer as per the Garratt Ranking forcible sales to pre –harvest contractors when there is lack of sufficient market while the normal ranking indicated per the same constraint as 12^{th} position by the retailer.

Table 13A: Constraints perceived by the farmers, wholesalers and retailers in marketing of Potato

Constraints	Farmer		Wholesalers		Retailers	
	Normal Ranking	Garret Ranking	Normal Ranking	Garret Ranking	Normal Ranking	Garret Ranking
Forced to sell to pre-harvest contractor due to absence of market	3	8	1	3	12	2
Non-availability of marketing credit	12	10	3	7	6	1
Faulty weighment	1	11	4	11	2	5
Very high commission rates	4	7	5	9	3	7
Commission charged more than once	5	9	6	10	4	9
Malpractices in auction	11	1	12	8	5	8
Presence of exploitative middlemen	7	5	9	12	1	12
High Market Fee	8	4	10	6	9	4
Practice of bribing at the market	9	2	8	5	7	6
Inadequate facilities at the market	10	3	11	2	11	10
No storage facility	6	6	7	1	10	3
No facilities for personnel stay at the market	2	12	2	4	8	11

Tomato

Tomato is one of the very high perishable crop and was subjected to farmers perception to rank them as per garrets ranking. The farmer's perception indicated (Table13.B) those Malpractices in auction system was main constraint followed by high market fees. The wholesaler's perceived lack of sufficient storage facility as first Garret rank while retailers ranked the constraint related to presence of exploitative middlemen as first Garret Rank.

Table 13. B. Constraints perceived by the farmers, wholesalers and retailers in marketing of Tomato

Constraints	Farmer		Wholesalers		Retailers	
	Normal Ranking	Garret Ranking	Normal Ranking	Garret Ranking	Normal Ranking	Garret Ranking
Forced to sell to pre-harvest contractor due to absence of market	1	11	5	3	2	12
Non-availability of marketing credit	3	10	9	7	1	6
Faulty weighment	4	8	7	11	5	2
Very high commission rates	6	7	11	9	7	3
Commission charged more than once	5	9	8	10	9	4
Malpractices in auction	12	1	6	8	8	5
Presence of exploitative middlemen	9	5	4	12	12	1
High Market Fee	10	2	2	6	4	9
Practice of bribing at the market	8	3	12	5	6	7
Inadiquate facilities at the market	11	4	10	2	10	11
No storage facility	7	6	1	1	3	10
No facilities for personnel stay at the market	2	12	3	4	11	8

Baby Corn

The farmers when subjected to perception of constraints have indicated (Table 13 C) the same opinion of other crop producer farmers as malpractices in auction was the main constraint as per the Garret rank. The wholesaler's perceived that the non availability of marketing credits was the major constraint of the supply chain management system. The retailers felt that the lack of storage facilities for the produce was the major constraint and ranked it as first as per Garret rank and Normal rank. This was logical though the perceptions were differently felt by the players in the supply chain system.

Table 13. C. Constraints perceived by the farmers, wholesalers and retailers in marketing of *Baby Corn*

Constraints	Farmer		Wholesalers		Retailers	
	Normal Ranking	Garret Ranking	Normal Ranking	Garret Ranking	Normal Ranking	Garret Ranking
Forced to sell to pre-harvest contractor due to absence of market	4	8	1	2	3	5
Non-availability of marketing credit	2	10	3	1	7	9
Faulty weighment	1	11	4	5	11	7
Very high commission rates	5	7	5	7	9	11
Commission charged more than once	6	9	6	9	10	8
Malpractices in auction	12	1	12	8	8	6
Presence of exploitative middlemen	8	6	9	12	12	4
High Market Fee	9	4	10	4	6	2
Practice of bribing at the market	10	2	8	6	5	12
Inadequate facilities at the market	11	3	11	10	2	10
No storage facility	7	5	7	3	1	1
No facilities for personnel stay at the market	3	12	2	11	4	3

Roses

Roses are another important volatile oriented market commodity. The rose farmers when subjected to study their perception towards constraints to rank them as per Garret rank indicated (Table 13 D) that malpractices in auction system was main constraint as the ranked it No.1. Interestingly the wholesalers were perceived the same constraints i.e. malpractices in auction system as major constraint. The retailers perceived that the presence of exploitative middlemen in the supply chain system as a major constraint and ranked it as one as per the Garret ranking. The results concluded here were quite nearer to the actual situation observed in the supply chain system in the marketing of rose flowers.

Table 13. D. Constraints perceived by the farmers, wholesalers and retailers in marketing of Rose

Constraints	Farmer		Wholesalers		Retailers	
	Normal Ranking	Garret Ranking	Normal Ranking	Garret Ranking	Normal Ranking	Garret Ranking
Forced to sell to pre-harvest contractor due to absence of market	1	11	3	8	4	12
Non-availability of marketing credit	3	7	7	10	2	6
Faulty weighment	4	8	11	11	1	2
Very high commission rates	5	9	9	7	5	3
Commission charged more than once	6	10	10	9	6	4
Malpractices in auction	12	1	8	1	12	5
Presence of exploitative middlemen	9	6	12	5	8	1
High Market Fee	10	3	6	4	9	9
Practice of bribing at the market	8	5	5	2	10	7
Inadiquate facilities at the market	11	2	2	3	11	11
No storage facility	7	4	1	6	7	10
No facilities for personnel stay at the market	2	12	4	12	3	8

Grapes

The perception of grape farmers towards constraints when analyzed indicated (Table 13. E) that the presence of exploitative middlemen was the main constraint and ranked it as No.1. In the opinion of wholesaler's perception it was faulty weighment ranked first while that of retailers indicated that the malpractices prevailing in the auction system.

Table 13 E: Constraints perceived by the farmers, wholesalers and retailers in marketing of Grape

Constraints	Farmer		Wholesalers		Retailers	
	Normal Ranking	Garret Ranking	Normal Ranking	Garret Ranking	Normal Ranking	Garret Ranking
Forced to sell to pre-harvest contractor due to absence of market	3	12	11	3	1	8
Non-availability of marketing credit	7	6	10	12	3	10
Faulty weighment	11	2	8	1	4	11
Very high commission rates	9	3	7	4	6	7
Commission charged more than once	10	4	9	5	5	9
Malpractices in auction	8	5	1	11	12	1
Presence of exploitative middlemen	12	1	5	7	9	5
High Market Fee	6	9	2	8	10	4
Practice of bribing at the market	5	7	3	9	8	2
Inadequate facilities at the market	2	11	4	10	11	3
No storage facility	1	10	6	6	7	6
No facilities for personnel stay at the market	4	8	12	2	2	12

The Garret rank results have indicated a consistency in perception of constraints perceived by the farmers in the case of Potato, Tomato and Baby corn. Malpractices in auction system as a constraint was ranked first as per Garrets in all the three crops. The results were quite true and very much acceptable fact in supply chain system.

3.14. Factors affecting marketing cost, margin and efficiency

The marketing efficiency of Agricultural commodities will be influenced by several parameters under several circumstances. The marketing efficiency is one where the producer receives higher percentage of consumer rupee. More the producer shares in consumer rupee more is the efficient marketing system. Accordingly, it was decided to include certain parameters to study the influence of these parameters on marketing efficiency. The data related to factors affecting marketing efficiency are presented crop wise in Table-14.

The data indicated that the marketing margin coefficients of Potato (-0.2385), Tomato (-0.1041), Baby corn (-0.1136), Roses (-0.1185) & Grapes (-0.0189) indicated negative coefficients and all are found to be significant at one percent level of Probability. Thus the data indicated that as the marketing margin is increasing, the marketing efficiency is found to be decreased.The marketing cost information with respect to Potato (-0.1467), Tomato (-0.0676), and grapes (-0.0043) indicated negative relationship which indicates that more is the marketing cost less is the marketing efficiency. The other results related to labor wages and middlemen controlling has indicated a negative relationship which also indicates that these factors were also influencing the market efficiency drastically.

The results were quite logical as the variables identified have a direct relationship that influences marketing efficiency very well. Further, the data also indicated that more is the length of market channel less is the market efficiency and with respect to tomato and grape crops the data indicated a significant results.

Table 14 : Factors affecting marketing cost, margin and efficiency

Marketing Efficiency = f (x1 ---------- xn)

Factors	Potato		Tomato		Baby Corn		Rose		Grape	
	Coefficient	't' value	Coefficient	't' value	Coefficient	't' value	Coefficient	't' value	Coefficient	't' value
Marketing cost x1	-0.1467	3.581***	-0.0676	6.2538***	0.0005	6.553***	0.0136	1.455	-0.0043	13.566***
Marketing margin x2	-0.2385	38.189***	-0.1041	25.5595***	-0.1136	14.049***	-0.1185	21.126***	-0.0189	1.459
Transport cost x3	0.0005	0.467	0.0031	1.9694**	0.0006	65.535	-0.0833	3.172***	-0.0084	1.757*
Open market prices x4	0.1218	27.089***	0.0543	16.9106***	0.0831	8.907***	0.0893	22.901***	-0.0011	0.165
Labour wages x5	-0.0002	0.488	0.0006	1.3272	0.0003	0.427	-0.0001	0.228	-0.0006	0.552
Controlling middlemen x6	-0.0019	0.531	-0.0112	2.1357**	-0.0027	0.328	-0.0001	0.037	0.0183	1.134
Volume of the produce handled x7	0.0008	0.042	0.0001	0.8528	0.0001	0.071	0.0001	0.856	1.70E-07	0.536
Presence of cold storage facilities x8	0.0004	0.061	-0.0034	0.4722	0.0041	0.333	-0.0049	0.726	0.0337	1.997**
Length of the market channel (No. of market intermediaries) x9	-0.011	0.721	-0.0414	3.5456***	0.0496	1.361	-0.0148	1.417	-0.0409	1.706*
Existence of competition in selling x10	0.0037	0.262	0.013	0.8527	0.0099	0.421	0.005	0.328	-0.0722	1.893*
Nature of produce (perishable/semi-perishable) x11	0.0021	0.155	-0.0016	0.1079	-0.0207	0.871	0.0004	0.027	0.07185	1.875*

(*) Significant at 10% lead of probability

(**) Significant at 5% lead of probability

(***) Significant at 1% lead of probability

3.15 Suggestions to increase marketing Efficiency

The study has examined the marketing of selected fruits and vegetables; in light of wide spread concern about poor marketing efficiency and low share of farmers in the consumer rupee. The objective of the present study was to improve the marketing and efficiency of these selected products i.e. Potato, Tomato, Baby corn, Roses and Grapes.

These selected crops are known for their perish ability, seasonality in plain and has exhibited substantially in these crops. The study finds that the extent of contract between farmers and commission agents was low and needs considerable improvement. It has also showed that the practice of open auction in the market was very low and so much potential for gain in market efficiency has not been realized.

Then the present study revealed that the share of the farmer in the consumer price works out to only 48 per cent for vegetables and 37 per cent for fruits. Further, this explicit cost makes out to only very measurable percentage of the price difference between the farmer and the consumer, and the profit margin works out between to 80 to 90 percent of price difference. Thus it was the relatively poor efficiency of the marketing system despite the presence of marketing cooperatives, regular markets and Rhytu bazaar, Super markets in the supply chain system of marketing.

Therefore, the measure required to improve this efficiency should include adaption of open auction measures to increase the number of buyers and sellers in the market, improvements in market infrastructure as well as cold storages, Godowns (storage facilities), loading and unloading facilities, mechanically weighing facilities, and improved transparency through supervision and making availability of up-to date market information through electronic media, intranet etc.

4. CONCLUSIONS AND POLICY IMPLICATIONS

4.1 Conclusions

The various factors affecting the marketing of vegetables and fruits in Andhra Pradesh can thus be enumerated and analyzed with specific reference to Potato, Tomato, Baby Corn, Roses and Grapes.

The need for market intermediaries was seen to vary with the produce. It has been noted that while producers of potatoes, baby corn and roses prefer to rely on market intermediaries like wholesalers and commission agents, tomatoes and grapes were frequently sold efficiently and profitably by the producers themselves. This was probably due to the fact that baby corn and roses were sold in niche markets that were elitist and not accessible to the growers/producers for direct retail and in the case of potatoes the bulk handling and storage required was probably better handled by the middlemen who have access to transport and mass storage infrastructure. Sometimes there was more than one intermediary, as wholesalers often buy from commission agents and then forward the produce to the hawkers and retailers.

An interesting phenomenon of Corporate Farming was emerging with some farmers/ growers selling directly to the representatives of Corporate like Reliance.

In terms of supply chains, in the case of potato, the preferred channel was producer-wholesaler-retailer-consumer (PWRC) and less often, producer-retailer-consumer (PRC); very few opted for the long route of producer-middlemen-wholesaler-retailers-consumer (PMWRC). The preferred supply chain for tomatoes on the other hand was producer-middleman-wholesaler-retailers-consumer (PMWRC), followed by producer-wholesaler-retailer-consumer (PWRC), producer-retailer-consumer (PRC) and Reliance. The supply chains for baby corn were producer-middlemen-retailer-consumer (PMRC) followed by producer-wholesaler-retailer-consumer (PWRC), and producer-retailer-consumer (PRC). Producers of roses preferred producer-wholesaler-retailer-consumer (PWRC) supply chain, and subsequently roses and grapes followed a similar pattern, with producer-middleman-wholesaler-retailers-consumer (PMWRC) supply chain being the dominant form followed by producer-retailer-consumer (PRC). Thus the middlemen continue to

play an important role, although producers were also trying to reduce their involvement so as to improve profits.

Thus, most of the potato crops were marketed through PMWRC and PRC; tomatoes through PRC, Reliance and PWRC; baby corn and roses through PRC and PWRC, and grapes through PMWRC and PRC.

In the context of marketing costs, the farmer producer of potato was seen to incur the highest marketing cost compared to that of other producers of the crops studied. In addition, it was evident that the market cost incurred by the retailers was lower than that of the wholesalers and commission agents. This was mainly due to the reason that due to fast moving of product and its volatile price situation, the retailers prefer to sell out the product with minimum storage time hence the marketing cost was low and marketing margin was also found to be relatively low.

The marketing cost of the tomato producers in consumer rupee was high with farmer producer in the order followed by village merchants, wholesalers, and retailers, indicating that the farmers were again the major bearers of market cost in consumer rupee compared to other players in the supply chain system.

Baby corn has a niche market and is a new product which has special preference at high end hotels. The market cost borne by the farmer producer (8%) in the producer rupee followed by other players in the market. The market cost borne by the farmer producer in consumer rupee was highest among all the supply chain players.

The marketing cost of roses in consumer price was high at farmer's level with 5.67% and with lower for assembling traders followed by wholesalers and retailers. The striking feature of the data suggests that the producer – farmer incurred a higher percentage of marketing cost compared to other players in the supply chain system.

The market cost and margin of grapes suggest that the producers mainly borne the marketing cost in greater of the consumer rupee and other players in the supply chain system incurred in descending order starting from village level merchants to retailers.

It is thus evident that the producer has to bear the brunt of producing and marketing costs of these crops thus reducing their profit margins considerably.

In terms of price spread it was evident in the marketing of all the crops that marketing margins at wholesalers and retailers level and also the market cost was relatively high at the intermediary level. The data supports the arguments that the intermediaries play a crucial role in realizing better margins to all the crops compared to that of growers. Price spread was relatively very favorable to wholesalers and retailers when compared to producers. Particularly in the case of baby corn the farmers were very limited in number in the pockets of isolated villages of Medak district where the middlemen dominate the price structure. The area under grapes has declined drastically and the farmers involved in producing this commercial crop suffer due to the lack of profitability and encouragement.

In the case of the share of different agencies during marketing of fruits and vegetables the highest share while marketing of the crops studied was shared by retailer followed by wholesalers In terms of market efficiency, it was clear that in the supply chain model of producer-retailer-consumer (PRC) efficiency was 90% followed by the producer-wholesaler-retailer-consumer (PWRC) and in the producer-middleman-wholesaler-consumer (PMWC) it was 75%. The information indicates that the more intermediaries there were in the supply chain systems, the lower is the market efficiency. For example, in the case of tomato , the participation of corporate body (Reliance) between producer and consumer in the intermediary marketing system has indicated high efficiency up to 100%. The marketing efficiency of baby corn was very poor due to the fact that it is a new crop and farmers lack market awareness about it. Roses, due to their perishable nature also show a low market efficiency of 50% as the farmers were compelled to sell the produce at the price offered by the middleman and commission agent.

In the case of grapes, however, due to the fact that this was a very popular fruit, marketing efficiency was very high in all the supply chain systems.

In terms of constraints perceived by various stakeholders, the chief constraints for farmers were malpractices in auction and faulty weighing; wholesalers cited inadequate storage facilities and retailers referred to exploitative middlemen and inadequate marketing facilities. Other complaints by farmers included high market fees,

Thus it can be concluded that the marketing cost, marketing margin, transport cost, labor wages and the length of the market channel has negative influence on the marketing

efficiency. The data has also indicated that open market price has positive influence on the market efficiency.

4.2 Policy Implications

The creation of sound infrastructure of research on horticultural crops has helped to increase production. The increased role of research in the recent years also helped to maintain a sustainable horticulture. However, innovation in institutional support is required. For example, production under the contract system of farming ensures a confirmed income to growers along with no or less risk in product marketing. Further, there may be chance of exporting the produce to other countries and as a result a share of such profits can be given to the grower.

The identification of Agri -export zones would help in addressing problems of marketing of produce in the wake of changing global policy environment.

Development of certain critical management inputs particularly that of supply chain management collaborating with other stake holders along with efficient vertical and horizontal integration is very much needed. Therefore it is to be prioritized with regard to horticultural products.

Therefore, further development research on issues like genetic engineering, biotechnology, integrated and stainable production systems, Post-harvest handling storage, marketing and consumer education is also as a important as a policy. These technological and associate institutional changes identified as above naturally become thrust areas for future development of horticultural sector. Further, it improves the chance of exporting quality horticulture products. All these efforts in due course of time not only helps in the overall growth of economy , but also creates employment opportunities and helps in the upliftment of small and marginal farmers.

Thus the government should create a positive environment that will ensure a mutually beneficial relationship between farmers and organized sector. Along with investment in infrastructure, development of extension activities and linkages with farmers is also an important area where government can play an influential role.

The horticulture products are considered as high value products by virtue of their freshness, export earnings and multinational importance. Therefore both to increase the income of poor rural and urban families, as well as contribute to improving their livelihoods (including nutrition and health), it is essential to address the need to promote value added products is horticultural crops. It must include.

i. Strategic positioning and priority setting in research and development on high value horticultural crops.

ii. Research in markets, institutions and policies required for value added products in the context of complex and dynamic relationship between the components.

iii. Post-harvest management and small scale processing units in rural areas.

iv. Market-chain development, involving various forms and levels of linkages (rural-urban linkage, Private - Public sector linkage and formal - informal markets linkage.)

v. Identification of policy measures and other mechanism to facilitate increased income generation from fruits, vegetables and flowers.

vi. Key elements of cropping systems information, processes and tools that provides insights on business models that reduces poverty.

vii. Identification of nutrition and health opportunities of selected high value crops and how to exploit those opportunities most effectively.

Annexure

Table 1: Latest scenario of Selected Crops

S.No (1)	Name of the Crop (2)	2007-08 Area (Ha.) (3)	Proposed Area to be Covered during 2008-09 (4)	Estimate for 2008-09 (Ha.) (5)	Productivity Mt/Ha. (6)	Estimated Production Metric tons 2008-09 (7)
1	Potato	6637	0	6637	20	132740
2	Tomato	74108	0	74108	19	1408052
3	Baby Corn	-	-	-	-	-
4	Rose	849	40	889	3.	2667
5	Grape	2764	200	2964	21	62244

Table 2: Highest Districts Area, Production & Productivity of Potato Crop (2008-09)

S.no	District	Area (Ha)	Production(Mt)	Productivity Mt/ha)
1	Medak	4402	88040	20.09
2	Chittor	1500	30020	20.01
3	Visakhapatnam	210	4940	23.52

Table 3: Highest Districts Area, Production & Productivity of Tomato Crop (2008-09)

S.No	District	Area (Ha)	Production(Mts)	Productivity (mt/ha)
1	Adilabad	10860	206378	19.035
2	Kurnool	9500	180785	19.03
3	Medak	5940	112765	18.98
4	Mehboob Nagar	4855	92264	19.39
5	Rangareddy	4562	86982	19.66

Table 4: Highest Districts Area, Production & Productivity of Rose Crop.(2008-09)

S.No	District	Area (Ha)	Production (Mt/ha)	Productivity (Mt/ha)
1	East Godavari	179	519	2.89
2	Ranga Reddy	132	423	3.20
3	Vijayanagaram	83	240	2.89

Table 5: Highest Districts Area, Production & Productivity of Grape Crop (2008-09)

S.No	District	Area (Ha)	Production(Mt)	Productivity (Mt/ha)
1	RangaReddy	2100	44205	21.05
2	Medak	400	6426	16.06
3	Mehboob Nagar	160	3045	19.03

6) Reference

Annual reports of Horticultural mission of Andhrapradesh from 2005 to 2008

Seasonal and crop reports – (2007-08) Published by Directorate of Economics and statistics

Annual reports of Horticultural university (2007-08)

India stat.com

Garratt (1969) Statistics in psychology education .

Aphorticulte.com

Annual report of Maize research center for the year 2007-08 Prepared by Maize Research station.

Annual report of Kothapet Fruit Market for the year 2008-09.

Estimating Marketing Efficiency
Of
selected horticultural commodities along different supply chains.

Final Report

Chapter: KARNATAKA

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Section 1.

(i) Synthesis on status of marketing of horticultural crops in India.

Horticulture, comprising a number of fruits, vegetables, flowers, spices, medicinal and aromatic crops has emerged as a key sector in the Indian economy in the last few years, contributing to over 28 percent to the agricultural GDP. Though, its relative contribution has been declining over the years, this sector has been identified as a potential export earner over the years. The increasing budgetary allocation by the Government of India to this sector from a mere Rs. 38 crores during the IV plan period (1975-80) to over Rs 4 500 crores in the X plan highlights the growing significance of this sector.

The sector's performance in terms of increased production and productivity, expanding export earnings are suggestive of growth, while other micro level indicators such as the unit value realization of different commodities in export earnings, proportionate share of producer in consumers' rupee for highly perishable commodities do not indicate changing trend. This is especially so with regard to the linking of producers to markets, with the persisting domination of market intermediaries like the pre harvest contractors and commission agents in the trade of perishables like horticultural crops. In contrast, the changing institutional and infrastructural support through the public and or private investment into R&D and marketing have shown success in some pockets. In the anticipation of huge inflow of FDI into agricultural wholesale/retail marketing in the near future and its associated objective of linking farmers to markets, it is of significance to review different models and partnerships that have been in operation involving horticultural crops. Hence this study attempts to compare three models, one each for fruits, vegetables and flowers, with an objective to evaluate the partnership patterns, success factors, lessons learnt and arrives at future perspectives.

i) Status of Marketing of horticultural crops

Horticultural crops being highly seasonal, perishable are also capital and labour intensive and need care in handling and transportation. Their bulkiness makes the handling and transportation a difficult task, leading to huge post harvest a loss which is estimated at

around Rs. 23,000 crore or nearly 35 percent of the total annual production **(**CII, Mckinsey, 1997**)**. Their seasonal production pattern results in frequent market gluts and associated price risk, thereby forcing the farmers into distress sale to pre harvest contractors and commission agents. A typical marketing channel of horticultural crop thus involves a number of intermediaries like the pre harvest contractor, commission agent, wholesaler, retailer operating between the producer and the final consumer. Each of these market intermediaries performs a specific market function of assembling or distribution that involves a cost to then, there by claiming a share in the market margin. Though, it is said that an efficient market provides for the distribution of market margins in proportion to the task performed by each market intermediary it is seldom so. The price spread along the marketing channel is directly proportional to the number of market intermediaries involved along the channel (Gupta and Rathode, 1998).

In a market function, the physical movement of the produce is along the chain, while the monetary and information flow is in the reverse direction. It is the access to information that empowers a market intermediary to bargain or take away a larger share in the marketing margin (Crawford, 1997).

Most of the fruits being bulky and highly seasonal are sold through the Pre-Harvest Contractor (PHC) at the field much before they come to harvest. Very often, the PHC takes most of the production risks due to pests and diseases and also the cost of maintenance, while he makes his margin through bulking (Sudha and Froukje, 2006). Vegetables, barring cabbage and cauliflower, are mainly sold through the commission agents at the market, who intern transports the produce to the distant markets and makes his margin, traditional flowers are self marketed at the wholesale auction centres (Subrahmanyam, 1989**)**.

Absence of efforts at percolating market information has been a major constraining factor in the efficient functioning of the market. In a typical market operation, each one of the market intermediary contributes by way of either a transfer function or an assembly function. In this process, each one tries to optimize their risk and maximize their margin. The distribution of market margin depends purely on the access to information and the strategy that is being adopted in forwarding the trade. The primary focus therefore is to

increase the accessibility to information by all the market intermediaries so as to enable a level playing ground for them. Such an increased access to market information is expected to bring about the market regulation automatically there by reducing the monopoly power of any single market intermediary. Therefore, the main effort so far in the market regulation activity has been to create marketing infrastructure, such that it enhances the access to market information, besides the enactment of market regulation acts and market interventions whenever required.

ii) Market regulation, status and constraints

Though agricultural marketing is inclusive of horticultural commodities, they differ from the agricultural commodities by way of being highly perishable, seasonal and bulky. This group of commodities was recognized as the major contributors of farm income much later than the other crop groups. Hence, they have been included into the standard marketing system much later than their counter parts. Development of horticulture marketing attracted attention of policy makers during the 3rd Five Year Plan.

Most agricultural commodity markets generally operate under the normal forces of demand and supply. However, with a view to protecting farmers' interest and to encourage them to increase production, the Government also fixes minimum support/statutory prices for some crops and makes arrangements for their purchase on state account whenever their price falls below the support level. The role of Government normally is limited to protecting the interests of producers and consumers, only in respect of wage goods, mass consumption goods and essential goods. The role of Government is promoting organized marketing of agricultural commodities in the country through a network of regulated markets. To achieve an efficient system of buying and selling of agricultural commodities, most of the state Governments and Union Territories have enacted legislations (APMC Act) to provide for regulation of agricultural produce markets. The basic objective of setting up of network of physical markets has been to ensure reasonable gain to the farmers by creating environment in markets for fair play of supply and demand forces, regulate market practices and attain transparency in transactions.

While by the end of 1950, there were 286 regulated markets in the country, today the number stands at 7521 (31.3.2005). The Central Government advised all the State Governments to enact Marketing Legislation to promote competitive and transparent transactional methods to protect the interests of the farmers. Barring a few, most of the States and Union Territories embarked upon a massive programmer of regulation of markets after enacting the legislation. Most of these regulated markets are wholesale markets. There are in all 7293 wholesale markets in the country. Besides, the country has 27294 rural periodical markets, about 15% of which function under the ambit of regulation. The advent of regulated markets has helped in mitigating the market handicaps of producers/sellers at the wholesale assembling level. But, the rural periodic markets in general, and the tribal markets in particular, remained out of its developmental ambit.

The purpose of regulation of agricultural markets was to protect farmers from the exploitation of intermediaries and traders and also to ensure better prices and timely payment for his produce. Over a period of time these markets have, however, acquired the status of restrictive and monopolistic markets, providing no help in direct and free marketing, organized retailing, and smooth raw material supplies to agro – processing, competitive trading, information exchange and adoption of innovative marketing systems and technologies. Farmer cannot sell his produce directly in bulk except on retail basis to the consumers. Farmers have to bring their produce to the Market yard. Exporters, processors and retail chain operators can not get desired quality and quantity of produce for their business due to restrictions on direct marketing. The processor can not buy the produce at the processing plant or at the warehouse. The produce is required to be transported from the farm to the market yard and then only it can be purchased and taken to the plant. There is thus an enormous increase in the cost of marketing and the farmer end up getting a low price for his produce.

Under the APMC Act, only State Governments are permitted to set up markets. Monopolistic practices and modalities of the State-controlled markets have prevented private investment in the sector. The licensing of traders in the regulated markets has led to the monopoly of the licensed traders acting as a major entry barrier for a new

entrepreneur. The traders, commission agents and other functionaries organize themselves into associations, which generally do not allow easy entry of new persons, stifling the very spirit of competitive functioning.

Agriculture sector needs well functioning markets to drive growth, employment and economic prosperity in rural areas of the country. In order to provide dynamism and efficiency into the marketing system, large investments are required for the development of post harvest and cold chain infrastructure nearer to the farmers' field. Projection of production and marketable surplus of various farm products was recently assessed by an Task Force set up by the Ministry of Agriculture which estimated that an investment of Rs.12,230 crore in next 10^{th} Plan would be necessary for infrastructure development for agricultural marketing. A major portion of this investment is expected from the private sector, for which an appropriate regulatory and policy environment is necessary. Alongside, enabling policies need to be put in place to encourage procurement of agricultural commodities directly from farmers' field and to establish effective linkage between the farm production and the retail chain and food processing industries. Towards this end, the Inter-Ministerial Task Force on Agricultural Marketing Reforms constituted by this Ministry in its report of 28.06.2002 has made the following important recommendations:

i. Promotion of competitive agricultural markets in private and cooperative sectors, direct marketing and contract farming programmes by amending the State Agricultural Produce Marketing Regulation Acts and to provide central assistance for the development of marketing infrastructure subject to such deregulation and reforms;

ii. Progressive dismantling of controls and regulations under the Essential Commodities Act to remove all restrictions on production, supply, storage and movement of, and trade and commerce in respect of all agricultural commodities;

iii. Substantial step up in flow of institutional credit to farmers for marketing of crops (pledge financing) to enhance their holding capacity to obtain remunerative price for their produce;

iv. Expand availability of warehousing services in rural areas by introducing negotiable warehousing receipt system for agricultural commodities; and

v. Allow futures trading in all agricultural commodities to improve price risk management and facilitate price discovery by amending the Forward Contracts (Regulation) Act, 1952;

The recommendations contained in these Reports were discussed with the State Governments at a National Conference on 27th September, 2002 and later by a Standing committee of State Ministers on 29th January, 2003. It was opined, that in view of the liberalization of trade and emergence of global markets, it was necessary to promote development of a competitive marketing infrastructure in the country and to bring about professionalism in the management of existing market yards and market fee structure. While promoting the alternative marketing structure, however, Government needs to put in place adequate safeguards to avoid any exploitation of farmers by the private trade and industries. For this, there was a need to formulate model legislation on agricultural marketing.

The Ministry of Agriculture accordingly formulated a model law on agricultural marketing in consultation with the States Governments. The draft model legislation provides for establishment of Private Markets/Yards, Direct Purchase Centres, Consumer/Farmers Markets for direct sale and promotion of Public Private Partnership in the management and development of agricultural markets in the country. It also provides for separate constitution for Special Markets for Commodities like Onions, Fruits, vegetables, Flowers etc. A separate Chapter has been included in the legislation to regulate and promote contract-farming arrangements in the country. It provides for prohibition of commission agency in any transaction of agricultural commodities with the producers. It redefines the role of present Agricultural Produce Market Committee to promote alternative marketing system, contract farming, and direct marketing and farmers/consumers markets. It also redefines the role of State Agricultural Marketing Boards to promote standardization, grading, quality certification, market led extension and training of farmers and market functionaries in marketing related areas. Provision has also been made in the Act for constitution of State Agricultural Produce Marketing Standards Bureau for promotion of Grading, Standardization and Quality Certification of agricultural produce. This would facilitate pledge financing, E-trading, direct purchasing,

export, forward/future trading and introduction of negotiable warehousing receipt system in respect of agricultural commodities.

iii) Contract Farming

Contract farming has been prevalent in various parts of the country for commercial crops like sugarcane, cotton, tea, coffee, etc. The concept has, however, gained importance in recent times in the wake of economic liberalization. The main feature of contract farming is that farmers grow selected crops under a buy back agreement with an agency engaged in trading or processing.

There are many success stories on contract farming such as potato, tomato, groundnut and chilli in Punjab, Safflower in Madhya Pradesh, oil palm in Andhra Pradesh, and seed production contracts for hybrids seed companies in Karnataka, cotton in Tamil Nadu and Maharashtra etc. which helped the growers in realization of better returns for their produce.

Model law on marketing has been formulated keeping these requirements in view. This law inter-alia provides for an institutional arrangement for registration of sponsoring companies, recording of Contract Farming Agreement, indemnity to farmers' land and lays down a time bound dispute resolution mechanism. The Model law has been discussed with the State Governments and the representatives of Trade and Industries at the National Conference of State Agriculture Ministers on 7th January, 2004 and again on 19th November, 2004 and a consensus has been arrived at to give a major thrust to this programme. Several State Governments have already initiated legal amendments to APMC Act. Haryana and Gujarat are among the first States to take steps in establishing an institutional set up for supporting contract farming in these States.

With a view to induce large investment in the development of marketing infrastructure as envisaged above, the Ministry has formulated a scheme for "Development/Strengthening of Agricultural Marketing Infrastructure, Grading and Standardization". Under this scheme investment subsidy is provided on the capital cost of general or commodity specific infrastructure for marketing of agricultural commodities and for strengthening

and modernization of existing agricultural markets, wholesale, rural and periodic or in tribal areas. The scheme is reform linked, to be implemented in those States/UTs that amend the APMC Act wherever required to allow setting up of agricultural markets in private and cooperative sectors. The States of Madhya Pradesh, Tamil Nadu, Kerala, Manipur, Himachal Pradesh, Andhra Pradesh, Punjab, Sikkim, Nagaland and Andaman & Nicobar Islands (U.T.) have notified for implementation of the Central Sector Scheme, being the reforming States. Under the scheme, back ended subsidy @ 25% of capital cost of the project is provided in all States and @ 33.3% of capital cost in case of NE States, hilly areas and SC/ST entrepreneurs. In respect of infrastructure projects of State Agencies, there is no upper ceiling on subsidy to be provided under the scheme. There is central allocation of Rs. 190.00 crore under the scheme 10^{th} Plan. An amount of Rs. 25 crore has been released under the scheme during 2004-05.

iv) Efforts at linking farmers to the markets

Linking farmers to markets and to processors has been a well recognized means of augmenting seasonal gluts and associated price crash, especially for perishables (Charles and Andrew, 2001; Subrahmanyam, 2000; Sudha and Gajanana, 2001). However, the linkage between producers and processors is rather weak under Indian conditions attributable to reasons like high cost of processing, inadequate supply of right quantity of raw material for processing, dual taxation policies etc besides inconsistent demand for the processed produce. Efforts have constantly been on to link farmers to the markets so that the marketing channels and the role played by different market intermediaries are minimized. These efforts include creation of alternate marketing channels which provide better pricing policies and reduce the margins, contract farming for assured buy back and hence assured price and supply chains for creating and sustaining value addition for some commodities (Dileep, et al, 2002)

The earliest attempt of contract production in horticultural crops could be traced way back to the early 70s, with the Indo Bulgarian production complex, involving cultivation of tomato. The Indo-Bulgarian project which was initiated during April 1974, aimed at linking production, processing with marketing based on the experience of the Agro-

Industrial complexes of Bulgaria. Two centers were identified, with one based at Karnataka and the other based in Bihar, involving a total financial commitment of Rs. 10.97 lakhs (ICAR, 1976). The project was planned with a three phase development plan, involving the objectives of introduction and expansion of the cultivation of some of the popular Bulgarian varieties in India. The Karnataka State Agro-Industries Corporation (KSAIC) was identified as the nodal point for processing tomatoes, which were to be delivered at the factory by the growers themselves.

Initiated during the Kharif season in 1976, the scheme could not make much head way due to the failure by the farmers to supply their produce to the processing industry. However, during Rabi season the same year, farmers were willing to supply the produce. Analysis of the reasons for this behavior highlighted that the market price was the main contributing factor for the farmers' disinterest for supplying to the processors. The significant feature of the model was the introduction of Bulgarian varieties for demonstration purposes, which did not get adapted to Indian conditions.

Among the others, contract cultivation of tomato under PepsiCo in Punjab (Singh, 2000; Dileep *et al*, 2001), contract production of hybrid seed production of vegetables (Sudha et *al*, 2006), contract production of cotton, gherkins etc., to name a few. In all these contract cultivation models, the linkage of farmer with the market is only partial as the farmer is not directly linked to the market. Further, the model does not include creation or strengthening the infrastructure or the objective of empowering the farmer to operate independently in a new market, there by making them unsustainable in the long run. Several others are in operation, of which, three successful ones, each representing fruits, vegetables and flowers has been considered for a discussion in this presentation.

Model 1

Export oriented production of grapes in Maharashtra: Initiated during the mid 90s, this model depicts spatial and vertical integration along the supply chain for grapes with the cooperative and public sector partnership between the farmers and the state government. The three tier structure of the model constitutes farmer groups or association at the base (village) level, district cooperative at the second and federation of

cooperatives at the state level. Each farmer needs to enroll as a member of the association closer to his production base with a nominal payment (in the range of Rs. 5000/farmer). All such associations then become a part of the district level cooperative, which in turn is grouped under the state level federation. State government has helped set up cold storage units at district level so as to enable all the members coming under its purview can assemble and store their produce at a nominal fee. The federation then helps in accessing distant domestic markets and the export markets so as to maximize returns. The model, thus empowers the farmer a better bargaining power by creating infrastructure to come out of the clutches of the distress sale to PHC, prolonging the marketing season, access to alternate and distant markets to reap the advantage of better and higher price. Through collective action farmers also have access to import better technical know-how for value addition on farm. This model also helped farmers plan the area under grape for different purposes, i.e., for exports, for raisin making or for distant domestic markets.

Model 2

Precision farming for vegetables in Tamil Nadu: A government initiative, this model is in operation in the Dharmapuri district of Tami Nadu state. The model involves a budget of over Rs. 7.2 crores, spread over a period of three years in Dharmapuri and Krishnagiri districts of Tamil nadu state covering an area of 400 ha. Crop diversification with vegetables is the primary focus of the project. Each one of the willing farmer needs to cultivate at least one hectare under this scheme. The model provides for fertigation system involving a cost of Rs. 75,000/ha along with cultivation expenses up to Rs. 40,000/ha. The beneficiary is required to incur only 10 percent of this expenditure as equity, besides the land and labour contribution towards cultivation. The farmer is expected to choose from a set of vegetables to be cultivated under fertigation conditions. The technical guidance for crop production is provided by periodic visits by an expert team. The team also advises and helps farmer market his produce by providing market information. Tomato, cabbage, cauliflower and chili were the vegetables included under this model. Farmers observed a 20 percent saving in cost due to the use of fertigation and a yield increase to the tune of over 25 to 60 percent in different crops.

Model 3

Integrated Cut flower production: Due to frequent fluctuations in the international tea prices, the farmers from Nilgiris, who are tea planters, have diversified into cut flower production in the recent times. Formed as a small farmer's consortium, the Nilgiris Integrated Floritech Co Ltd (NIFCO) pools the flower produce and markets it under a common brand. This initiative by small farmers and cut-flower growers is neither a mass movement nor a co-operative, but has a unique production model envisaged as being operative on a cluster basis. With a total project outlay of over Rs. 10 crore, the project promotes export-oriented floriculture cluster development zones in the 12 watershed areas of Nilgiris district. Each of these clusters would comprise a minimum of 40 units, taking the total number to 500 units in the 12 clusters. A small farmer willing to take part in the consortium could take 500 mts2 polyhouse on lease for three years from the company and choose to cultivate among the 12 exotic flowers identified. The consortium organizes to provide a tripartite agreement with the bank for the necessary financial assistance and also provides the farmer with the centralized facilities for packing, transport and export sales. As per the projected production plan, by 2005-06, the annual production from the 200-odd integrated units is expected to cross 300 lakh cut-flowers. The project implementation team envisages the integration of 500-plus units by 2007-08 and the production rising commensurately to touch a high of 825 lakh cut flowers.

v) Comparisons and contrasts between the three models

The three models presented above represent the changing pattern of commercial horticulture under Indian conditions that envisages an effective linkage of farmers to the market. A comparison of the three models on the objectives, partnership pattern, organizational structure, and other aspects provide an evaluation of the functional success.

As could be seen from the table, though the three models address different commodities and regions, have some common features. Infrastructure creation, either at individual farmer or regional level is the primary focus, followed closely by technical assistance. All the three models envisage empowering the farmers through improved quality produce,

there by enhancing their bargaining power at the market. While the first and the third models signify collective action as a means of better bargaining power, model 2, primary focuses on crop diversification and cost effective production of quality produce as a means for increased returns. While the models 2 and 3 lay emphasis on credit as one of the critical factors increased profitability, model 1 lays emphasis on prolonging the season of availability as a means to increasing bargaining power.

Table (i): Comparison of three models linking farmers to the market in India

Sl No	Particulars	Model 1	Model 2	Model 3
1	Initiated since	Early 90s	Early 2000	2003
2	Area covered	Covers all grape growing districts of Maharashtra	Dharmapuri district of TN covering 400 ha	Exclusively in the 12 Zones of Nilgiri district of TN
3	Commodities involved.	Single crop model, Grape	Multiple, Vegetables, tomato, cabbage, chilli and cauliflower	Multiple, covering 12 cut flowers grown under polyhouse conditions
4	Partnership pattern	Cooperative and public sector	Individual and Government	Individual, private sector
5	Pattern and extent of Financial assistance	Creating public good, No financial assistance	Creating individual infrastructure and financial assistance	Creating common pool infrastructure, market linked financial assistance to individuals.
6	Technical know-how	Provided if required	Provided on day-today basis	Provided
7	Market linkages	Indirect but	Indirect and limited.	Indirect. Undertakes

		complete, as final product is sold on one brand name.	Only provides the market information	responsibility of exports under one brand name
8	Benefit to the producer (enhanced yield and returns through)	Provides bargaining power, market access	Better quality produce so that farmer gets a higher price	Provides bargaining power, market access
9	Envisaged success	Proven success	Successful, but sustainability yet to be seen	Yet to realize the benefits
10	Limiting factor	Strengthening cooperative spirit at farmer level	Sustainable only till the model is in operation	Sustainability is yet to be seen

All the three models also try to eliminate a number of market intermediaries from the market chain and suggest self marketing as a better means for increasing profits. Model 1 lays stress on the last stage of the production process i.e., marketing, model 2 on the production process, while model 3 seems to hold an integrated approach

vi) Scope and future perspective

Based on the review of literature and the examination of the three models in operation under Indian conditions, it could be inferred that a lot of effort has been on for increasing the access to market information by all the market intermediaries, especially in case of perishables like horticultural crops. Efforts also have been made at linking farmers to the markets and contract cultivation has been one of the most popular models. There have been other efforts as well, as has been presented in the three models examined in this paper.

As has been seen, all the three models attempted at creating infrastructure and provide technical support for improving the performance of the producers, and at the same time try to create a collective barging power to the producers. However, the primary objective of creating a direct link between the farmer and the market is not totally been achieved. However, these models do indicate an effort in the direction of organizing farmers into self-help groups and provide the direction for a larger globally active organization.

However, the main effort at breaking the supremacy of the PHC or a commission agent in the wholesale market has been left untouched. Since it has been seen in a number of studies that the wholesaler/ commission agent takes away a disproportionately high margin, effort is needed at linking farmers to the market at this level.

Section 2: Estimating marketing efficiency of selected horticultural crops along different supply chains in KARNATAKA

1 INTRODUCTION

1.1 Background

Karnataka is the second most important states next to Maharashtra for the production of horticultural crops. The agro climatic suitability provides a unique position for the state to be a natural home for a large number of horticultural crops that can be grown all round the year. Out of a total of 121.86 lakh ha cultivable area, nearly 17.64 lakh ha is under horticultural crops accounting for 8 % of area contributing to over 136.66 lakh tones (2007-08) (6 % of total production) (Anonymous 2008). Around 2.46 lakh ha is under fruit crops and 2.99 lakh ha is under vegetables. Fruits contribute to 73.62 lakh tones while vegetables 6.23 lakh tones. The state leads in country's area and production of brinjal, tomato, mango and cut flowers.

Being the horticultural capital, Bangalore district is the hub of activity for various horticultural crop research and development. Estimates indicate that the state capital with a total population of over 80 lakhs consumes nearly one third of the states horticultural crop production. It is also a major hub for interstate transactions and movement of horticultural crop products to distant locations within and outside the country. The metropolis is also the home for the recent retail revolution in the country. Spensors, food world, reliance and more, SAFAL and Namdharis retail outlet chains have set up operations in the metros. Thus, besides production, horticultural crop marketing also is of significance both from their highly seasonal and perishable nature as well as employment generation perspective.

While the agricultural marketing system in the country is due for an over haul, given the changing global trade order, that specific to horticultural crops are no exception. However, the sheer commercial nature of these set of crops besets their marketing systems with contradictions. On one hand, perennial and seasonal produce like mango show persisting domination of Pre Harvest Contractors (PHC), others like grapes have

advanced systems of marketing that are international in operations ensuring quality product supply chains. Individual or group effort in organizing and integrating production with marketing has been the critical factor responsible for their success, institutional support through favorable policy cannot be over looked.

1.2 Policy research questions

In recognition of the growing significance of integrated marketing in highly perishable and seasonal horticultural crops, efforts have been on for a while to modernize agricultural/ horticultural marketing through government interventions and policy changes.

Notable among these are the constitution of various high powered marketing committees and marketing boards that analyzed the pitfalls in the existing system and proposed requisite changes. The primary objective of these initiatives has been to reorient the current marketing system, upgrade basic infrastructure to enable the marketing system to absorb the enhanced production. The main focus of these initiatives has been to reducing the length of the marketing network such that the producer is directly in contact with the ultimate consumer as also to ensure higher share of the consumer rupee to the producers.

Some of these efforts include,

(i) initiation of alternate marketing channels with reduced number of market intermediaries,

(ii) efforts at enhanced price stability and consistency, i.e., contract farming and

(iii) State interventions at market regulation and procurement as and when situation warrants.

Most of these initiatives have been successful in reducing the number of market intermediaries along the marketing chain and assisted in increasing the producers share in consumers rupee to a large extant.

However, with the changing global trade order initiated by the WTO and world trade reforms, the focus shifted towards assured quality of produce and efficient marketing system that is in line with the state-of the art infrastructure with international standards for weighment, auction and sale procedures.

This was assured by the gradual privatization of the marketing system and allowing corporate interventions to enter into the agricultural/ horticultural marketing arena. Since agriculture is state subject and the transformations could not be brought forth easily under the existing legislative, reforming the legislature became a necessity. Few of the state governments, including that of Karnataka, amended their marketing legislature to permit the entry of corporate houses into the area of agricultural marketing. The primary focus being reduced length of marketing channels; quality based pricing and fair deal for all.

Several models of corporate led marketing initiatives came forth, at different levels of marketing system, be it at the level of wholesaling or at retailing. The establishment of SAFAL by the National Dairy Development Board was one such initiative, which set up a state-of the art infrastructure costing over Rs.1600 crores at about 30 kms from Bangalore during the mid 90s. Among the other such initiatives are the reliance fresh, subhiksha, more and farm fresh etc,

Many of these initiatives have set up their own retail marketing chains besides the wholesale procurement centre, there by starting up a 'whole new supply chain' especially for handling fresh fruits and vegetables.

Among such supply chain initiatives are others as well, initiated by private seed companies, but with a different objective. Important among them is the initiative by the Ms. Namdhari seed company operating around Bangalore with an objective of helping farmers get better price through a form of contract production of selected vegetables.

Important features of all these initiatives are, (i) a backward linkage of contact farming or agreement with the farmers that ensures continuous supply; (ii) a forward linkage or supply chain that ensures quick and easy disposal of the produce and assured quality and (iii) quality based pricing.

Since most of these marketing practices and systems are in their initial stage of establishment, it is of interest to assess the feasibility and suitability of a few such models and compare them with the traditional ones.

2.3 Objectives of the Study

How successful have these initiatives been in achieving their objectives of backward linkage, quality supply of produce for satisfying the consumer needs along with improved marketing efficiency is the basic question that is being assessed?

Keeping this in view, this study is beset with the objectives of

(i) assessing different models of modern marketing of horticultural crops involving the corporate organizations and

(ii) Compare them with the traditional or other models and evaluate the same based on marketing efficiency and other parameters.

2. Data and Methodology

2.1 Study area

Bangalore urban and rural districts, which form the most important horticultural belt of Karnataka state, have purposively been selected as the study area. The objective of the study being an assessment of marketing efficiency along different marketing channels, various marketing arrangements that exist for horticultural crops formed the basis for the selection.

Besides the traditional marketing network involving PHC, commission agents and retailers, several alternate channels have sprung into action in metropolis like Bangalore. These include,

A state initiated producers' cooperative society, HOPCOMS

Karnataka Horticultural Marketing Society

SAFAL ; Reliance Fresh ;Namdhari Fresh ;More, to name a few.

In order to arrive at a comparison of different marketing arrangements for horticultural crops, this study attempted to compare the marketing operations and performance of the traditional marketing channel, Co-operative marketing system and the two most important corporate horticultural marketing networks, viz., SAFAL and Namdhari fresh.

2.2 Data on items

The marketing system of the corporations formed the starting point for this study. Therefore, the crops that figured in relative abundance in corporate marketing system were selected for this study.

Data on month wise procurement of different fruits and vegetables by SAFAL, Bangalore was taken as the primary focus for crop selection. Banana (Robusta) and tomato formed the ones that are dealt with throughout the year hence were selected as the crops for this study. The data on costs of marketing, price realized and proportion of produce sold through different marketing channels was obtained from the sample farmers for different crops. Similar information on the trade aspects and the cost and sale price, wastage and

other information were obtained from traders and other market intermediaries. Effort was made to obtain time series data on price and arrival of the selected commodities into different marketing networks for arriving at appropriate price for estimating the costs, margins and efficiency.

2.3 Sample size

Data on marketing of banana and tomato were collected from different stakeholders along the marketing chain. These included the producers, the wholesalers, retailers, co-operative societies, corporate houses and consumers as the total sample for this study. Total sample size worked out to **130 and above** for each crop and the split up of sample for different stakeholders is presented crop wise.

2.4 Sampling methods

Two corporate houses dealing in fruit and vegetable sales have been selected purposively for this study. Producers who supplied to the corporate houses were randomly selected from the list of villages provided by the corporate houses. Effort was made to select an equal number of producers who were not suppliers to the corporate house from the same villages for comparison. A total of around 30 wholesalers and other market intermediaries were selected from different markets for the selected fruit and vegetables.

Table 1: The total sample for the crops selected

Sl No	Stakeholder	Crop & Region					
		Banana				Tomato	
		Robusta	**No.**	**Yelaki**	**No**	**Tomato**	**No**
1	**Producers**	Kolar	25	Ramnagar	45	Kolar	20
		Chickballapur	20	Chickballapur	45	Srinivaspura	15
		Dodballapur	20			Chickballapur	25
		Theni	25			Bidadi	30
	Sub-total		**90**		**90**		**90**
2	**Wholesalers & Commission agents**	Bangalore (SAFAL), Market	7 8	HOPCOMS co-operative society, Bangalore	1	Kolar	10
		Binny market	5	HOPCOMS Ramnagar	1	Bidadi	5
		Theni	5			Theni	10
	Sub-total		**25**		**2**		**25**
3	**Retailers**	Bangalore market	10	Bangalore market	8	Kolar	7
		SAFAL outlets	6	Ramnagar	6	Bangalore	8
		Binny market	8	Binny market	5	SAFAL outlets	6
		Theni	6	HOPCOMS outlets	4	Namdhari Outlets	9
	Sub-total		**30**		**23**		**30**
4	Consumers	Bangalore	10	Ramnagar	10	Kolar	10
		Theni	10	Bangalore	10	Bangalore	10
	Sub-total		**20**		**20**		**20**
	Crop total		**165**		**135**		**165**
	Grand Total	**465**					

2.5 Statistical techniques

The study uses simple statistical tools such as tabular analysis, percentages for estimating the marketing costs and margins of different market intermediaries along different marketing channels.

The study utilizes Acharya's method of estimating the marketing efficiency as given below.

Acharya's Modified Marketing Efficiency

$$MME = FP/(MC+MM)$$

Where, MME is modified measure of marketing efficiency

FP is price received by farmers

MC is marketing cost

MM is marketing margin

Constraints perceived by the farmers / wholesalers / retailers

Garrett method of ranking has been adopted for arriving at the important constraining factors in marketing of the horticultural crops.

Garrett's Ranking Technique

$$\text{Percent position} = \frac{100\ (Rij - 0.50)}{Nij}$$

Where, Rij is the rank given by ith item by jth individual

Nj is the number of items ranked by the jth individual

3. Results and Discussion

3.1 Status of the fruits and vegetables production

The horticultural crops gained around 101 lakh thousand hectares in the last one decade and half. Nearly 67 percent of this increase comes from fruits and vegetables (Sudha, 2009). Tomato among vegetables and banana among fruits has shown significant growth in area and production during the period from 1992 to 2007-08. One of the important reasons for this increased focus towards horticultural crops is their definite profitability over other crop groups.

Increasing income and standard of living, greater awareness towards nutritional security also contribute towards the increasing consumption of horticultural crops. Availability of high yielding varieties and other technical support also has led to the growing acreage under this group of crops.

With the increased area and production of horticultural crops, the marketable surplus also increases. If there is no sufficient demand or appropriate marketing facility to absorb this increased production, or the failure of markets to transmit price would result in frequent market gluts and associated price crash. Tomato is one such vegetable that exhibits such high variability in prices across the regions and markets.

3.2 Marketing of Fruits & vegetables: Innovative models

Marketing of fruits and vegetables attracts special attention given their highly seasonal and perishable nature. Being bulky, harvesting and transporting them to the market is a very cumbersome process requiring special skills. Traditionally, traders or few larger scale growers themselves undertook this task by assessing the value of the harvest and making an agreement with the farmer for a pre fixed amount.

Marketing activity of fruits and vegetables was dominated by few traders with inadequate infrastructure as well as institutional and legislative support for regulated trade in these commodities. Absence of marketing infrastructure ensuring proper weighing and fair trade, trade in few hands led to the domination of pre harvest contractors. High post harvest losses to the tune of 35%, high price spread, lower share of producers in the consumers

rupee, frequent market gluts and associated price crash leading to distress sale were the most common features of horticultural crop marketing. Several innovative models with backward and forward linkages emerged in the recent past to help augment horticultural crop marketing.

3.3 Innovative models

This study attempts to evaluate the marketing practices and methods adopted under two distinct models involving corporate houses in fruits and vegetables. This section provides a description of the models adopted by these corporate houses.

3.3.1 SAFAL

The Safal Fruit and Vegetable Auction Market (SFVAM) were established near Bangalore in July 2004. The Department of Agriculture and Cooperation, Government of India, requested NDDB to suggest a system to modernize the procurement and marketing of the horticultural produce. NDDB has taken up a project in Bangalore as an alternate set up that will operate to the parallel system of marketing like Agriculture Produce Marketing Committee. An investment of Rs.1500 crores was made in to this project with the support of GOI**.**

A trading capacity of 1600 tons per day; transact about 300 tons; commercial cold storage facility with capacity of 10000 metric tons. Fruit ripening chambers – banana, 100 - Spacious and well designed shops available for the buyers for their use. Trained professionals in different areas of Backward and forward linkages are the specific features of this modern marketing network.

The operation model:

SAFAL encouraged farmers to form associations (FA) across different production regions such that they would ensure regular supply to SAFAL and get higher share in consumers rupee. The FA supports the farmers in backward and forward linkages with the support of Safal Market. 200 such associations have been initiated by SAFAL with appropriate field staff to over see the operations. On an average each of the Farmers Association transacts business of Rs.50-60 lakhs annually.

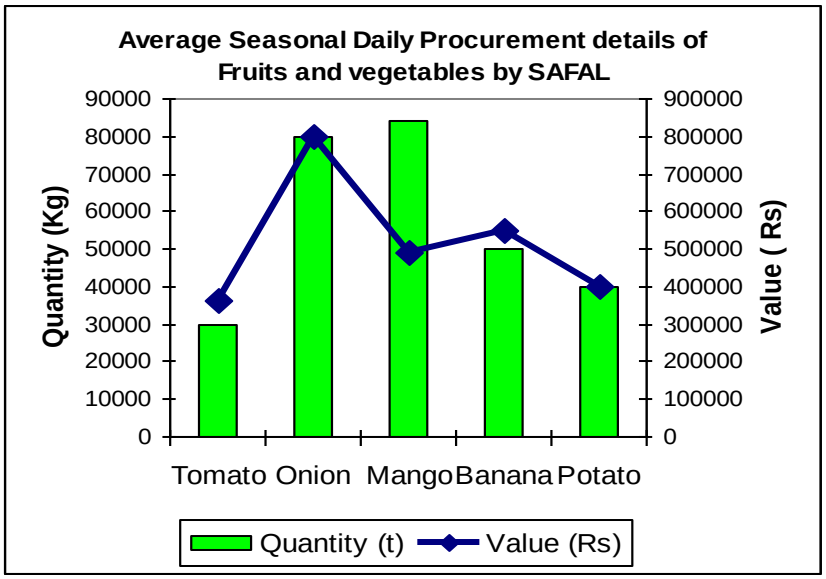
The farmers give their indent of supply to the FA indicating how much they will supply on the day. The SAFAL also send an indent to FA of its requirements based on the need of the buyers. The farmers themselves are encouraged to grade their produce and bring in to the FA. The produces are labeled as A or B/ market quality grade The Transport facilities are arranged to transport the produces from FA or from the farm itself, depend upon the quantity.

This market uses the Dutch auction system (with an auction clock on which prices are reduced) for fruit and vegetables and the English system (with the auction clock counting upwards) is used for onion, potato and garlic. With two auctions per day, the reference price for the morning auction is the wholesale price of the day before, while the afternoon auction uses the morning wholesale price of that day. The produce is procured from 200 farmer associations through local collection centres. The produce is transported to the auction hall, graded, shown in lots and sold the day after the farmers deliver it to the collection centre. Farmers receive payment based on a weighted average of the auction price the next day. Any produce that is not sold through the auction is sold in small outlets at the Safal premises.

Three types marketing systems:

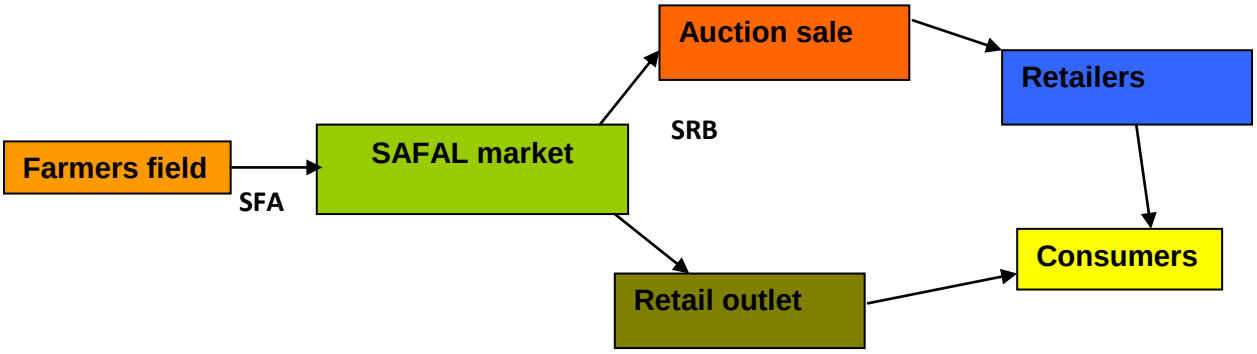
1. Electronic Auction Hall: The selling and buying take place at the press of a button. The retail and whole sale buyers participate in the auction and bid through the electronic button system.
2. Safal Daily Fresh outlets: There are 7 outlets in Bangalore city for the consumers to buy them directly from the shop.
3. Outstation Sale

Using a specially designed questionnaire the daily procurement of different fruits and vegetables at the SAFAL market has been collected and are analysed. Based on the volumes procured, seasonality and regularity of procurement, two crops namely banana and tomato have been identified for further analysis.



Since the organisation procures only through registered safal farmers associations (SFA), a list of all farmer associations was obtained and five for each crop viz., banana and tomato were identified for colleting producer level data. Each association includes 200 farmers as members. Kolar, Chickballapur, Dodballapur from Karnataka and then from Tamil Nadu were identified for banana sample growers, while Kolar and chickballapur for tomato. A sample of 25 farmers supplying to SAFAL were selected for each crop, an equal number of farmers not supplying to SAFAL were selected from the same village for comparison. As per the model of linkage suggested, wholesalers or registered safal buyers who took part in SAFAL auction were selected. Out of the seven SAFAL retail outlets that operated in Bangalore, 6 were selected for obtaining retailer level data, besides the regular market based retailers.

The procurement and sale model adopted by SAFAL is as follows

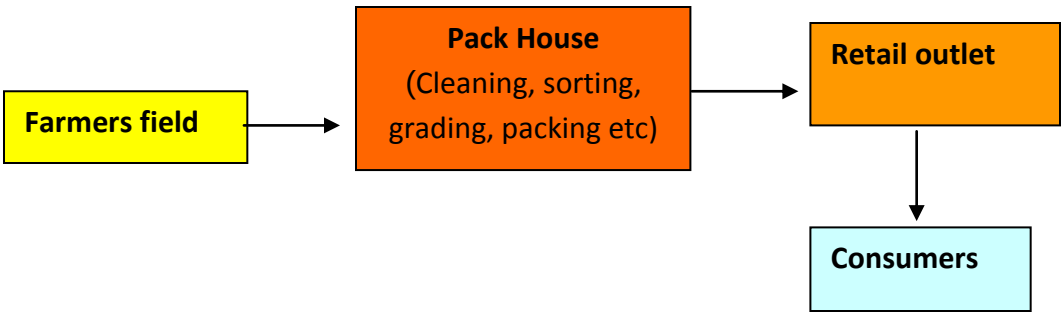


3.3.2 Namdhari Fresh:

Ms Namdhari seeds private limited is one of the popular seed companies that has been in operation since mid 90s. The company along with its research and development wing and experimental farm is located in Bidadi village close to Ramnagar near Bangalore. Company is into vegetable seeds business for long, started contract cultivation in 2001. Totally there are 1000 farmers involved in contract production for the company which includes the 58 farmers for tomato. Company's procurement target is 10ton as per production schedule. They give preference to small farmers. They provide direct seedlings to farmers for 1(or) 2 acre at free of cost. Actual cost for seeds I s Rs3000/acre but they charge only Rs 500/acre. They also provide inputs like fertilizers and chemicals and deduct the amount at the end of the procurement. Though the company officials said they pin their procurement price to SAFAL/ Kolar wholesale market, for tomato and offer Rs 1 less than the market price from the farmers. However, the farmers expressed that the get Rs 5/kg of tomato or corn irrespective of the season at the farm gate. Entire produce is graded as A, B & C grade based on size, appearance, firmness colour, tenderness, damage etc. They prefer only A grade Tomato. Yield per acre: 10-25t/acre, total cost of cultivation is around Rs 20000-25000/acre. The produce procured is transported to the company's warehouse, where it is cleaned and packed and transported to the 19 retail outlets (Namdhari fresh) located around Bangalore. They use more quantity of tomato for domestic purpose only. The retail outlets do not store produce for more than two days

and the unsold is returned back to the company for use elsewhere in the preparation of value added products. Thus the Namdhari fresh tries to minimize the wastage and losses at the retail level. While other products like corn and maize are procured to meet the international demand, tomato is taken up especially to help small scale farmers located in and around the factory premises.

Namdhari Fresh Marketing Network



3.3.3 Other traditional / non traditional marketing networks:

HOPCOMS: Horticultural Producers Cooperative Marketing Society (HOPCOMS) is a cooperative society set up in Karnataka to provide the producers an alternative marketing channel to safe guard against powerful market intermediaries such as the PHC and commission agents. HOPCOMS, set up in the 1970s has 230 outlets in the state of Karnataka and employs around 1800 people. Fruits and vegetables are only procured from the approximately 16,000 members of the cooperative. Facilities are provided for farmers to stay overnight and have their produce graded and sold early the next day. The daily price of HOPCOMS is established based on the daily retail market price, the farmer receives a 75% share of the final HOPCOMS retail price, but has slightly higher costs than those trading in the traditional markets as the cooperative members have higher transport costs and pay a (small) membership fee. One of the major constraints of this marketing system is a lack of appropriate infrastructure to handle large quantities. A total of around 805 tonnes is traded annually, which is a marginal proportion of the total quantity that is

traded at the wholesale market. HOPCOMS will thus only be able to provide an alternative to a relatively small proportion of farmers.

HOPCOMs also have initiated cooperative societies in the neighbouring districts within the state to help producers benefit from the sale through cooperatives. Such a facility also is expected to promote regional specialisation. One of the beneficiaries of this programme is banana (Yelaki) which has a production base in Ramnagar, Mandya and Mysore region of the state. Farmers bring their produce to the society and get a fair price based on quality. The produce is then transported to HOPCOMs main centre at Bangalore and is sold through its retail network.

3.4 Marketing channels

The movement of produce through different market intermediaries before it reaches the ultimate consumer is referred to as a marketing channel. The traditional marketing channels include the Pre harvest Contractor (PHC), the wholesaler/ commission agent, the retailers and other petty shop owners or pushcart vendors. The non-traditional or modern marketing channels include the contracting agencies of the corporate houses and their assembly centres, packhouses with sophisticated infrastructure for cleaning and packing the produce. Besides these, the modern marketing channels have retail marketing outlets of the corporate houses that directly sell the produce to the consumers. In view of the better ambience and clean surroundings, these retail outlets are able to provide greater consumer satisfaction and hence charge higher price or transfer greater proportion of transaction cost to the consumers. However, in view of the better quality, the consumer is willing to pay higher price to the commodities from these outlets. In order to provide a comparison of alternate marketing networks, this study has identified the following marketing channels for the crops selected.

Table 2: Marketing Channels identified for different crops

Sl No	Marketing channel	Proportion of produce disposed
	Banana (Robusta)	
1	P - Field sale (PHC or CA)– Retailer - Consumer	40%
2	P – Wholesaler – Retailer – Pushcart vendor - Consumer	35%
3	P (SFA) – SAFAL – SAFAL Buyer – Retailer - Consumer	10%
4	P (SFA)- SAFAL – SAFAL Retail Outlet - Consumer	
5	P - HOPCOMs - HOPCOMs Retail outlet - Consumer	10%

Sl No	Marketing channel	Proportion of produce disposed
	Banana (Yelaki)	
1	P – Wholesaler – Retailer – Pushcart vendor - Consumer	35%
2	P - HOPCOMs Society Ramnagar - HOPCOMs Retail outlet (Bangalore) - Consumer	60%

Sl No	Marketing channel	Proportion of produce disposed
	Tomato	
1	P – Wholesaler/ CA (Kolar) – Retailer – Consumer	35%
2	P – Chennai WS market – Retailer- Consumer	25%
3	P (SFA) - SAFAL – SAFAL buyer - Retailer - Consumer	15%
4	P (SFA)- SAFAL – SAFAL Retail Outlet - Consumer	
5	P - HOPCOMs - HOPCOMs Retail outlet - Consumer	5%
6	P – Namdhari fresh contract – Namdhari Retail outlet - Consumer	5%

3.5 Supply chains

Almost all the marketing channels described above present a supply chain that ensures the smooth flow of produce from the source of origin to its ultimate destination. In a typical supply chain, the movement of produce is from the producer to the consumer, while the market information and monetary benefits move in the opposite direction. Since both are not integrated and the one who holds access to market information is stronger than the other, there is an unequal power play leading to in equal distribution of benefits across different stakeholders along the supply chain. The effort is to equalize the power play such that each one of the marketing network stakeholder gets benefit proportional to the role played by him in the process of marketing.

In a modern supply chains operated either by a homogenous group or by a single corporate house, the effort is to minimize the number of stakeholders and or have as little a number of independent stakeholders as possible. This is amply visible from the list of marketing channels selected for analysis that all the alternate channels tend to have a component of 'supply chain' in terms of own retail network. In essence, more than the backward linkage for sourcing of the produce, having an assured means of disposal is a must in handling fresh fruits and vegetables with very low shelf life.

3.6 Price spread and marketing efficiency along the marketing channels.

This section presents the comparison of marketing costs, margins, price spread and marketing efficiency taking three cases along different marketing channels.

Case Studies

3.6.1 Banana CV Robusta:

Marketing of banana is unique as the produce is dealt in bunches. Traditionally, the un ripe banana bunches harvested, transported to the market get auctioned at the wholesale market. It is the wholesaler who ripens the banana in special ripening chambers prior to further marketing the same. However, the practice differs widely across banana growing regions. In Karnataka, it is the commission agent who undertakes field sale who takes the responsibility of ripening the bunch. In Jalgoan, the banana growers association undertakes the ripening as well as long distance transport of the produce (Gajanana etal, 2005).

Growers from Rajahmundry region of AP adopt a unique method of transporting the semi-ripe bunches to the wholesale market on bicycles (Sudha etal, 2006).

Several channels of marketing could be identified in banana (Robusta) marketing in Karnataka. Field sale is the most common, followed by self marketing by the producer at the nearby wholesale market. Sale at the HOPCOMs society is also popular, while the sale to the newly established corporate house, SAFAL is the latest. Table 3 presents detailed information on the marketing practices and procedures, costs, margins and measures of marketing efficiency for banana (Robusta). It should be noted that both SAFAL and HOPCOMs have their own retail marketing networks for product disposal, while the other is follow the traditional route.

Producers need to have membership in the Safal Farmers association (SFA) or hold a membership card for HOPCOMs, to be able to supply their produce to either of the two marketing networks. Similar to the wholesale market, producers face an auction at both markets. Market fee and a fixed percentage as commission are the other marketing costs incurred by the producers in supplying banana to these markets. Post auction, banana bunches change hands to SAFAL auction buyer or retailer at HOPCOMs and passes through the network to reach the ultimate consumers.

Each market intermediary incurs a cost and adds a margin while passing the produce to the nest market intermediary. These costs include the cost of handling, transport and repacking. It could be seen from the table 3, that cost to the producer is the least when he undertakes field sale, as he only needs to harvest the produce. Participation in any other market involves a cost towards transport and other associated costs. It is the highest in sale through the wholesale market channel, followed by that through SAFAL and HOPCOMs. Both in the field sales and wholesale channel, the produce changes hands to retailers and other intermediary like pushcart vendors before reaching the consumer. In case of SAFAL, the produce is auctioned to SAFAL registered buyers who in turn sell it to retailers either local or distant ones. Besides this channel, SAFAL also disposes at least about 25% of the produce through its own retail outlets, 7 of which are located in different parts of Bangalore. Similarly, HOMCOMs also sells through its own retail network within the city.

Producers share in Consumers Rupee:

It could be seen from the analyses that producers share in consumers rupee is the largest in the co-operative channel (62.3%) followed by the traditional wholesale network (51%). Despite all the hype, the SAFAL network fetches the farmer only 50 percent of the consumers' rupee.

Marketing Costs:

Total marketing costs incurred in Banana sale was in the range of Rs.2.77 to Rs. 5.1 /Kg, with SAFAL outlet sales taking the largest chunk. Total margins of the different market intermediaries were in the range of Rs. 2.65/Kg in the co-operative channel to Rs. 4.82/Kg in the traditional channels.

Marketing Efficiency & Price Spread:

Marketing efficiency measured in terms of modified Acharya's formula was the highest for the co-operative channel at 1.65 followed by the 1.05 in the traditional wholesale channel while SAFAL registered an efficiency of 0.99, which is better than the field sale channel. Price spread ranged from Rs 4.9 in the cooperative channel to 8.8 in SAFAL outlet route.

3.6.2 Banana CV Yelaki

Creation of a marketing infrastructure can encourage specialized production of horticultural crops in specific regions thereby enhancing the comparative advantage of its cultivation. Several such examples can be cited, some of them being specialized cultivation of Tella Chakkira Keli banana in Rajahmundry region of AP. Similarly, Yelaki banana is most popularly grown in and around Ramnagar region of Mandya district, Karnataka. This has received a boost from the extension of co-operative marketing network of HOPCOMs at the district.

With a view to highlight this point, this study also analyzed the marketing practices and channels involving Yelaki banana in Bangalore region. Typically, Yelaki banana is produced around Ramnagar, besides Chiballapur. The growers from all over Karnataka sell their produce, especially Yelaki banana in a wholesale market exclusively for fruits at Binny market in Bangalore. However, the growers from Ramnagar have the opportunity to sell their produce through the HOPOMs extension wing. The produce is transported by HOMCOMs to its main centre in Bangalore and the produce disposed off through its

network of retail outlets. Farmers get higher net price for yelaki banana in comparison to the Robusta type in both the channels studied. While the realization is Rs 11.16 /Kg in wholesale market, it is nearly Rs. 18.72 /kg for sale through HOPCOMS society at Ramnagara. These growers also benefit from lower costs as they need to harvest and the produce is picked from the farm gate by the society. The HOPCOMs society transports the produce to the main centre and distributes through its own retail outlets.

Producers share in Consumers Rupee:

It could be seen from the analyses that producers share in consumers rupee is the largest in the co-operative channel (70%) in comparison to the 46 .5% in the traditional wholesale network.

Marketing Costs:

Total marketing costs incurred in Banana sale was in the range of Rs.2.76 to Rs. 4.95 /Kg, with co-operative network and wholesale market network. Total margins of the different market intermediaries were in the range of Rs. 5.42/Kg in the co-operative channel to Rs. 16.39/Kg in the traditional channels.

Price spread ranged from Rs 4.9 in the cooperative channel to 8.8 in SAFAL outlet route.

3.6.3 Tomato

The marketing network of tomato included the traditional marketing channel of sale through Kolar wholesale market, sale through SAFAL and its outlets, HOPCOMs and their outlets and contract cultivation for Namdhari seeds private limited. The marketing costs, margins and price spread along these six channels are presented in Table 5.

Net farm price varied from Rs. 4.05 /kg in the namdhari fresh channel to Rs. 5.93/Kg in the channel 3, i.e., the distant market sale. While the procedure adopted by the SAFAL network is similar to that for Banana, the namdhari fresh offers farm gate procurement.

Producers share in Consumers Rupee:

Producers share in consumers rupee in case of tomato among the six channels studied was the highest in the co-operative network involving HOPCOMs at 435 followed by distant market channel and SAFAL. The lowest was for the producers dealing with Namdhari

Marketing Costs:

Total marketing costs incurred in tomato marketing ranged from Rs. 2.45/Kg in Namdhari sale to Rs. 6.28/Kg in Kolar marketing. Total margins of the different market intermediaries were in the range of Rs. 2.55/Kg in the co-operative channel to Rs. 9.00/Kg in the namdhari market network

Marketing Efficiency & Price Spread:

Marketing efficiency measured in terms of modified Acharya's formula was the highest for the co-operative channel at 0.75 followed by the 0.73 in the traditional distant market channel. Price spread ranged from Rs 7.15 in the cooperative channel to 11.45 in Namdhari.

3.7 Comparison of marketing arrangements and efficiency across different marketing networks

An attempt has been made in this section to compare and contrast the conceptual framework, operations, costs and margins under different marketing networks analyzed in this study. Reorganization of agricultural marketing has been the most felt need in the recent past both from the point of benefit to the producers and for meeting the changing global order. Flow of investments into agriculture in general and that for marketing in particular have been low, several policy changes have been brought forth in the last decade or so. Corporatization of agriculture has become the order of the day. Hence, a number of private seed companies or other corporate houses have started getting involved into agricultural marketing. The primary objective of these initiatives has been to modernize agricultural marketing as also provide the consumer an opportunity of picking quality produce under clean surroundings. Any attempt at assessing the impact of these changes should include parameters other than the shear marketing efficiency and price spread.

The parameters like marketing cost and margins are correlated to the number of marketing intermediaries involved in the marketing system. The traditional marketing system involves several market intermediaries each operating at different scale, there by increasing the costs of marketing. In contrast, an organized marketing system having well defined backward or forward linkages is much better equipped to handle the rising costs and thus have cost effective marketing system. Similarly, marketing efficiency as a parameter is a ratio of net price realized by the producer to the total of costs and margins in the marketing network.

An organized marketing network likes SAFAL or Namdharis involves higher establishment and operating costs due to their higher volume of operation. At the same time having set up their own marketing network, they have better control over the business operations and may be able to better perform in the long run. Also, the objective of quality based pricing and assured quality to the consumers are better addressed by such networks.

In terms of marketing efficiency or marketing costs, the corporate houses may not match up with either the traditional marketing network or the co-operatives, however, they are successful in enhancing the value of the produce, there by creating the concept of value based pricing, which is absent in the traditional system. Further, they could help producers and traders by enhancing the shelf life of the produce and spread the marketability of the produce. Being large scale operators they could create larger employment opportunities. It is reasonable that the co-operative system has emerged the most efficient with least price spread for all the selected crops. However, co-operative marketing system can cater only to around 20 % of the produce that reaches the market.

The other corporate venture, i.e., the Namdharis is helping farmers in the vicinity of their warehouse to get better realization at their farm gate. The value addition is the largest in this channel. By grading and sorting, they are catering to the needs of different section of consumers who have the affordability to pick better quality produce. Such value addition is not clearly demonstrated in other marketing channels. The fact that this value addition is not necessarily been distributed to the farmer is a matter of concern.

The SAFAL system of operations is conceptually unique and is futuristic. However, the network could not sustain the marketing practices as envisaged in the long run. Dissatisfied producers, traditional buyers blocking the operations and sheer lack of management appear to have blocked the progress of SAFAL. Much of the capacity lying unutilized or under utilized may soon led to huge over heads and reduced profit margins.

The traditional wholesalers' role in marketing and distribution cannot be over looked. The fact that the organized marketing as well as co-operative marketing is only price takers while his traditional wholesale market is still the price setter is indicative of the importance of this marketing network. There is however a need to regularize his operations and redistribute the market margins based on the activity performed.

3.8 Constraints in accessing different marketing channels

Effort was made to obtain the opinion of different stake holders on the problems and constraints faced by them under the different marketing arrangements. Each one of the sample member was posed different questions on their experience and were asked to rank the constraints in a descending order.

The respondents were widely divided on their opinion on the new marketing networks. Producers who have been involved with SAFAL marketing network expressed that there have been delays in payments from the market. Some of the SFA members from far off places were extremely unhappy with the processes and the delays. Lack of information on the price that is likely to prevail on the day of their participation was a major constraint for participation in the network. Majority of the producers were happy with the co-operative marketing network rather than the organized network. Since the cooperative market network cannot absorb all the produce, they are forced to depend on the wholesale markets.

The namdhari contract farmers were very happy with the system as the network provides them a technical guidance, advance towards meeting their farm input needs and also collect the produce from their farm gate. There was a sense of assured buyback even though the price was slightly on the lower side.

Table 3: Constraints and problems in horticultural crop marketing

Constraints	Rank	Score *
Producers		
Forced to sell to pre-harvest contractor due to absence of market		
Non-availability of marketing credit	**1**	**85.7**
Faulty weighment & Loss while grading		
Delay in payment (by organized networks)	**2**	**74.6**
Less price as compared to the traditional market prices (Chennai & Bangalore)	**3**	**65**
Malpractices in auction		
They fix minimum target to supply vegetables	**4**	**25**
Practice of bribing at the market		
Inadequate facilities at the market	**5**	**42.05**
No storage facility		
No facilities for personal stay at the market		
Any other (Specify)		
Wholesalers		
Organized marketing networks deprived them	**4**	**31.45**
Malpractices in auction	**2**	**45.67**
Faulty weighment	**5**	**27**
Practice of bribing or preferential treatment at the market	**1**	**65.08**
Inadequate facilities at the market	**3**	**35.43**
Retailers		
Organized marketing networks deprived them	**4**	**32**
Non-availability of marketing credit	**1**	**55.25**
Retail chains affect their business	**3**	**35**
Malpractices in auction	**2**	**45**
Inadequate facilities at the market	**5**	**45**

* Percentage of interviewed persons agrees with the score

4. Suggestions for improvement

Horticultural produce marketing in India is in the process of being modernized. The entry of corporate houses and other private and public sector organizations have initiated investment into this sector is indicative of the changing trend. While much has been changed and the process of creating infrastructure has begun, there is a lot of scope for improvement. The specific features that need special attention include,

Entry of corporate houses into the arena of horticultural marketing has helped in modernizing the marketing network of this set of crops. However, the process of price discovery and price percolation is yet to be standardized.

There is ample scope to improve the mechanism and access to 'market information service' at all levels irrespective of the type of channel in question.

5. Conclusions and policy implications

This study is an attempt to assess the economics of corporatization of horticultural marketing system in India, with special reference to Karnataka. The analysis based on a sample of over 400 stakeholders involved in marketing of three important horticultural crops Viz., Banana (Robusta and Yelaki) and tomato in and around Bangalore region, brought forth the following.

Marketing of horticultural crops includes a number of marketing channels involving the traditional as well as modern marketing networks. With a view to augment modernization process, state governments have amended their existing legislature to let corporate houses into the horticultural marketing arena. This has led to the creation of marketing infrastructure exclusively for horticultural crops. Several models of marketing networks involving backward and forward linkages have emerged in marketing of horticultural crops. This study analyzed the performance of some of these marketing networks on the basis of their performance and marketing efficiency. The study specifically evaluated three modern systems Viz., SAFAL, Namdharis and HOPCOMs in comparison to the traditional marketing networks for banana and tomato crops in Karnataka. The following are the conclusions and inferences that emerged out of this study.

- The option to open up horticultural marketing to corporate houses has resulted in creation of state-of the art infrastructure for facilitating horticultural crop marketing.

- The traditional and the modern marketing networks co-exist opening better alternatives for the producers and consumers.

- Modern marketing networks have been successful in creating the concept of quality based pricing, thereby enhancing the value of horticultural crop produce marketed along the supply chains.

- The corporate houses were comparable to the traditional marketing channels in terms of marketing costs and margins.

- In terms of marketing efficiency, corporate house based marketing networks were lower in comparison to the co-operative based networks.

- Modern marketing networks were better off in product disposal as they had their own 'supply chains' in operation.

- Irrespective of the type of marketing network, all the modern marketing systems were pinned with the traditional wholesale marketing system for price discovery.

- Better and alternate parameters other than marketing efficiency need to be evolved while measuring the effectiveness of corporatization of horti marketing.

- Creation of market infrastructure and elaborate network of institutional support could not address the issue of 'price risk' as effectively as a 'predetermined price contract' in gaining producer confidence.

Policy Implications

Effectiveness and implications of creation of marketing infrastructure versus measures that augment price risk need debate and further research.

Introduction and implementation of mechanism of price support need emphasis.

Policy and conceptual framework for regularizing the activities of exploitative middlemen along the horticultural crop based supply chains is needed.

Conceptualizing and mitigating risks in horticultural crop based production systems need critical view.

6) Annexures

	Banana					
Particulars	**Safal Market** -1-Apr-2009 to 31-Mar-2010					
	(in Rupees)					
	Inwards		**Outwards**		**Closing Balance**	
	Quantity	Value	Quantity	Value	Quantity	Value
Opening Balance					3376542	22352710
April	1124020	9224926.7	954206	9374536	3546356	23476878
May	1028318	9526604.6	929264	9878445	3645410	24132616
June	1076124	11541216	920172	10894110	3801363	25165021
July	952619.2	10167432	831919	10974245	3822063	25302056
August	949973.9	11211803	765898	10842934	3906139	25858639
September	980821.6	11442748	789300	10390600	3997660	26464512
October	1148886	13614850	1000474	12884663	4146072	27447000
November	862185.8	10340634	1028174	13653233	3980084	26348158
December	2171121	13199329	1020998	12826355	4130249	27342251
January	800041	8803816	948648	12029066	3981648	26358509
February	1046707	11165904	797054	9929150	4231301	28011214
March	2103466	21908852	972051	21849755	5362717	35501184
Grand Total	**14244285**	**142148116**	**10958158**	**1.46E+08**	**48551063**	**321408036**
Average price		9.98		13.28		

Tomato					
Safal Market *1-Apr-2009 to 31-Mar-2010*					
(in Rupees)					
Inwards		**Outwards**		**Closing Balance**	
Quantity	Value	Quantity	Value	Quantity	Value
				19743803	57488536.02
588059	1846218	36820	102926	20295042	58947547.7
526863	5657254	55080	361764	20766825	64025893.85
723723	7440152	43105	355896	21447443	71012831.28
735566	5306463	32350	184804	22150659	75979065.96
1007769	8939928	99682	2267456	23018746	83450793.23
1193466	7677778	29260	1007911	24182952	90820867.25
1413410	10507987	30280	155143	25566082	101010390
792036	8122242	25280	225246	26332838	108867033.3
618025	8095249	34700	379486	26916163	116597380.1
590513.4	4479003	35980	273143	27470696	120700552
409128	1709915	30380	114866	27849444	122551602
727744.7	2326412	31480	104118.1	28545709	125233301.9
9326303	**72108599**	**484397**	**5532759**	**294542600**	**1139197259**
	7.731745		11.42195		

Table 3: Banana Price Spread and marketing Efficiency

	Sl No	Field sale		Wholesale		SAFAL		SAFAL Outlet		HOPCOMS	
		Channel 1		Channel 2		Channel 3		Channel 4		Channel 5	
		Value Rs/Kg	% to Total	Value Rs/Kg	% to Total	Value Rs/Kg	% to Total	Value Rs/Kg	% to Total	Value Rs/Kg	% to Tota
Net Farmer price		6.91	47.65	7.41	51.10	8.7	49.71	8.7	49.71	8.1	62.31
	Cost	0.32	2.21	1.45	10.00	1.3	7.43	1.3	7.43	1	7.69
S	Price	7.23	49.86	8.86	61.10	10	57.14	10	57.14	9.1	70.00
	Cost	0.85	5.86	0.85	5.86	2	11.43	2.1	12.00	1.25	9.62
	Margin	1.92	13.24	2.29	15.79	1.5	8.57	1.4	8.00	2.65	20.38
tail	Price	10	68.97	12	82.76	13.5	77.14				
	Cost	0.4	2.76	1.6	11.03	1.8	10.29				
	Margin	1.6	11.03	0.9	6.21	2.2	12.57				
shcart	Price	12	82.76					13.5	77.14		
AFAL outlet	Cost	1.2	8.28					1.2	6.86		
	Margin	1.3	8.97					2.8	16.00		
nsumer	Price	14.5	100	14.5	100	17.5	100	17.5	100	13	100
	Cost	2.77		3.9		5.1		4.6		2.25	
	Margin	4.82		3.19		3.7		4.2		2.65	
	Efficiency	0.91		1.05		0.99		0.99		1.65	
ice spread		7.59		7.09		8.8		8.8		4.9	

Table 4: Banana marketing Efficiency & price Spread, Yelaki

		WS Binny		HOPCOMS society	
		Channel 1		Channel 2	
		Value Rs/Kg	% to Total	Value Rs/Kg	% to Total
Net Farmer price		**11.16**	46.50	**18.72**	69.59
	Cost	2	8.33	0.76	2.83
WS	**Price**	**13.16**	54.83	**19.48**	72.42
	Cost	0.85	3.54	2	7.43
	Margin	9.99	**41.63**	5.42	**20.15**
R	**Price**	**15.5**	64.58		
	Cost	0.85	3.54		
	Margin	2.25	9.38		
Pushcart	**Price**	**18.6**	77.50		
	Cost	1.25	5.21		
	Margin	4.15	17.29		
Consumer	**Price**	**24**	100.00	**26.9**	100.00
	Cost	4.95	20.63	2.76	10.26
	Margin	16.39	68.29	5.42	20.15
	Efficiency	0.52	0.52	**2.29**	**2.29**

Table 5: Tomato Price Spread and market Efficiency

		SAFAL		SAFAL outlet		MAS Market		HOPCOMs		APMC, Kolar	
		Channel 1		Channel 2		Channel 3		Channel 4		Channel 5	
		Rs/Kg	% to Total	Rs/Kg	% to Total	Rs/Kg	% to Total	Rs/Kg	% to Total	Rs/Kg	% to Total
Farmer Net price		5.73	40.93	5.73	40.93	5.93	42.35	5.35	42.79	4.62	33.01
	f cost	2.00	14.29	2	14.29	3.74	26.72	4.15	33.21	3.18	22.70
WS	Price	7.73	55.21	7.73	55.21	9.67	69.07	9.50	76.00	7.80	55.71
	cost	1.5	10.71	1.5	10.71	0.35	2.50	0.45	3.60	0.6	4.29
	margin	0.77	5.50	1.77	12.64	1.98	14.14	2.55	20.40	0.60	4.29
Retailer	price	10	71.43			12	85.71			9	64.29
	cost	1.2	8.57			0.85	6.07			1	7.14
	margin	0.8	5.71			1.15	8.21			1.5	10.71
Pushcart		12	85.71	11	78.57					11.5	82.14
SAFAL Outlet	cost	0.7	5.00	1.3	9.29					1.5	10.71
	margin	1.3	9.29	1.7	12.14					1	7.14
	Price	14	100.00	14	100.00	14	100.00	12.5	100.00	14	100.00
	Cost	5.40		4.80		4.94		4.60		6.28	
	margin	2.87		3.47		3.13		2.55		3.10	
	Efficiency	0.69		0.69		0.73		0.75		0.49	
Price Spread		8.27		8.27		8.07		7.15		9.38	

Table 5: Tomato Price Spread and market Efficiency

Statement of Expenditure of Network Project "Estimating Marketing Efficiency of Horticultural Commodities Different

Supply Chain in India". From 01.08.2009 to 30.06.2010.

Sl.No	Particulars	Opening Balance	Budget	Remittance Received	Payments Made	Refunds	Closing Balance
1	**Salaries/Hon/SRF**	-	-	-	1,71,600.00	0.00	-
2	**Travelling Allowance**	-	-	-	6,136.00	0.00	-
3	**Recurring Contingencies**				68,675.00		
4	**Receipts**	-	-	3,00,000.00	0.00	0.00	0.00
5	**Total**	-	-	**3,00,000.00**	**2,46,411.00**	**0.00**	**53,589.00**

6. References

Anonymous, 2008, Horticultural crop statistics of Karnataka State at a glance, Directorate of horticulture, lalbaugh, Karnataka

Acharya, S.S. and N.L.Agarwal , 2001, Agricultural marketing in India, New Delhi, oxford and IBH Publishing Co.

Crawford, I.M, 1997, Agricultural and food marketing management, FAO publication www.fao.org/docrep/004/W3240E/W3240E00.HTM

CII, Mckinsey Report, 1997. The Fruit and Vegetable Opportunity, In: Food and Agriculture Integrated Development (FAID) Action Report, pp.140-152

Gajanana, T.M.,D. Sreenivasa Murthy and Sudha M, 2002, Marketing practices and post harvest loss assessment of banana var. poovan in Tamil Nadu, Agricultural Economics Research Review, 15(1): 56-65.

Gupta, S. P. and N. S. Rathore, "Marketing of Vegetables in Raipur District of Chhattisgarh State: An Economic Analysis", Indian Journal of Agriculture Economics, July-Sept. 1998, Vol. 53, No.3, p. 393.

Indian Council of Agricultural Research (ICAR) 1976, Rural Agro-Industrial Complex for Karnataka. A joint effort of India and the Peoples Republic of Bulgaria Brochure released on the occasion of the visit of His Excellency the President of Bulgaria to inaugurate the Agro-industrial Complex, Indian Institute of Horticulture Research, Bangalore Pp1-20

Subrahmanyam, 1989, Economics of cultivation of horticultural crops in South India, Technical bulletin 7, Indian Institute of Horticulture Research, Bangalore-89

Sudha,M, T.M. Gajanana and D. Sreenivasamurthy, 2005, Post Harvest Handling and Marketing of Banana CV Tella Chakkara Keli in Rajahmundry region of Andhra Pradesh, Indian J of Agricultural Marketing, 19 (1): 25-37

Sudha, M., T.M. Gajanana, D. Sreenivasa Murthy and V. Dakshinamoorthy, 2002. Post harvest Loss Assessment of Pineapple in Kerala, Indian Journal of Agricultural Marketing,16(1):10-21

Sudha, M. and F. Kruijssen, 2006. Varietal differences in the supply chain of two mango varieties in South India. Paper presented at the "International symposium on tropical and sub-tropical fruits", 27-30 November 2006, Chiang Mai, Thailand

Estimating Marketing Efficiency of Vegetables under different supply chains in Tamil Nadu

1. INTRODUCTION

1.1 Background

Compared to field crops horticultural crops offer wider scope for income increase to farmers. They are also amenable for higher value addition. Greater employment opportunities coupled with higher remuneration is an incentive to go in for horticultural crops. However the flip side is that they are highly resource intensive, perishable and seasonal in nature. Storability is limited and need special arrangements like cold storage with higher levels of investments, normally not affordable by farmers. Yet, growing income levels of Indian population and increasing awareness of nutritional requirements have led to a gradual increase in the demand for horticultural crops.

Tamil Nadu is one of the prospering states with higher scopes for horticultural crops. While agriculture accounts for about 12%_of the State GDP that of Horticulture is estimated at 3.5%. The area under Horticulture at 8.24 lakh Ha accounts for 15.5% of the total cultivable area in the State, with an annual production of 99.47 lakh tonnes.

Production strengths of Tamil Nadu in Horticulture

Tamil Nadu accounts for nearly 6% of the area under fruits and 4% of the area under vegetables in the country. In terms of production, the state's share is nearly 10% in fruits and 6% in vegetables. Tamil Nadu is also a leading state in production of flowers. The estimated total production of horticultural crops is 10.95 Lakh ha during 2008-09. As the figures indicate there has been a slow but steady increase in the cultivation of different components of the horticultural crops compared to the base year as per realizations and estimates.

Table 1. Status of Horticultural Crops in Tamil Nadu

(Area: Lakh Ha., **Production:** Lakh MT., **Productivity:** MT/Ha.)

SI.	**Crops**	**2000-01 (Base year)**			**2006 07**			**2007-08 (provisional)**			**2008-09 (Estimated)**		
		Area	Pdn	Pdy	Area	Pdn	Pdy	Area	Pdn	Pdy	Area	Pdn	Pdy
1	Fruits	2.23	40.06	17.96	2.69	69.4	25.79	2.92	75.30	25.80	3.18	82.08	25.81
2	Vegetables	2.20	59.39	26.99	2.41	73.06	30.32	2.61	79.27	30.37	2.84	86.4	30.42
3	Plantation crops	2.20	7.73	3.51	2.33	7.92	3.4	2.53	8.6	3.41	2.76	9.37	3.43
4	Spices& condiments	1.68	6.62	3.94	1.55	8.02	5.17	1.68	8.7	5.18	1.83	9.48	5.19
5	Medicinal & Aromatic	0.01	0.02	0.02	0.05	0.08	1.6	0.05	0.09	1.8	0.06	0.11	1.83
6	Flowers	0.19	1.45	7.75	0.24	2.01	8.37	0.26	2.18	8.38	0.28	2.38	8.5
	TOTAL	8.51	115.27	13.55	9.27	160.49	17.31	10.05	174.14	17.33	10.95	190.0	17.35

Source - Tamil Nadu state horticultural department

Among varied horticultural crops grown, the state ranks first in the production of flowers and tapioca. The state accounts for about 59 percent of the total tapioca production in the country. Besides, the state ranks second in the production of mango and third in the production of Sapota. Fruits dominate both area and production

followed by vegetables and both groups exhibit higher growth rates. Banana, mango and sapota are the major fruits grown in the state.

Table 2 - Production strengths of Tamil Nadu

	Area	**Production**	**Share of All India**		**All India Rank**	
	(`000 Ha)	(`000 tonnes)	Area	Prodn	Area	Prodn
Total Fruit	228	4342	6%	10%	7	3
Mango	111	439	7%	4%	6	8
Banana	85	3544	18%	25%	1	2
Sapota	3	72	5%	12%	5	3
Vegetables	214	5445	4%	6%	10	5
Tapioca	102	3835	43%	59%	2	1
Onion	32	282	6%	5%	4	5
Tomato	27	258	6%	4%	7	10

Source - NHM Database

Vegetables

Bhendi, Tapioca, Tomato, Onion, Brinjal potato and Drumstick are some of the major vegetables grown in Tamil Nadu. These vegetables account for about 85% of the total vegetable area and production. While fruits are mainly grown in large areas where water and labor are relatively scarce, vegetables are generally grown in small areas manageable mostly with family resources. Vegetable growing areas are far more distributed in nature compared to fruits and are mostly concentrated around large urban centres. Besides there are some belts in the state more conducive for vegetables in terms of weather and water resources around which vegetable cultivation is more intensive. Specialised vegetable markets dominated by mandies and commission agents have evolved to become major market intermediaries in such areas. While cultivation of major vegetables is widely distributed across different districts, certain districts account for concentration of cultivation of specific vegetables as indicated in the table.

Table 3. Vegetables (Main Production areas)

Vegetable	Main production areas
Tapioca	Namakkal, Salem, Dharmapuri
Drumstick	Thoothukudi, Dindigul, Karur
Tomato	Coimbatore, Dharmapuri, Salem, Krishnagiri
Onion	Perambalur, Thiruchirapalli, Namakkal, Dindidul
Brinjal	Vellore, Kanchipuram, Theni, Coimbatore
Cabbage	Nilgiris, Krishnagiri, Dindigul
Potato	Nilgiris, Dindigul
Bhendi	Kancheepuram, Vellore, Dindigul

Horticultural Scenario in Tamil Nadu

Strengths

- The state is ideally suited for exports given the strategic location of airports and sea ports
- Prevalence of off-season cropping (e.g. mango, grapes, etc.) is unique to Tamil Nadu.
- Presence of leading institutions like Tamil Nadu Agricultural University (TNAU) and other Research Institutions.
- State Government policies facilitate growth of the sector (TANFLORA, AEZ's).

Weaknesses

- There is a lack of awareness on Hi-tech horticulture / quality consciousness among growers
- Lack of Adherance to phyto-sanitary standards hinders acceptance in foreign markets.
- The presence of small land holdings hampers adoption of best practices.
- Lack of price discovery mechanism often leads to wide fluctuation in market prices.
- There is low focus on post harvest management and facilities like cold storage, pre-cooling and waxing centers, processing units etc.
- The marketing channels are not well developed

Opportunities

- Large tracts of drylands / rainfed areas / wastelands can be utilized for promotion of horticulture.

- There is an opportunity to set up processing industries for horticultural crops on the back of improved post harvest practices
- There are export opportunities to the Far East which can be tapped (Tamarind, Chillies, Mango etc)
- There is an increasing demand in developed countries for Green foods / Organic foods.
- There is a growing trend in contract farming initiatives which needs to be encouraged through supportive policies.

Threats

- The dwindling water resources could pose a serious issue in the coming years
- Non-availability of work force for agriculture during season.

Existing and Potential Market Linkages

Horticultural crops being perishable in nature are subject to post harvest losses. Post harvest facilities from production linking to the market and consumption points help in the reduction of losses due to wastage. Agri Export Zones (AEZs) are promoted with the objective of promoting exports of agricultural produce from selected areas of productivity prominence, while food parks provide an opportunity of increasing processing capabilities in the state. The AEZs and the Food Parks are two important linkage points which helps in absorption of Fruits and Vegetables for further value addition.

1.2 Policy research questions

Emerging Supply Chain Alternatives

Horticultural crops being perishable in nature are subject to post harvest losses. Post harvest facilities from production linking to the market and consumption points help in the reduction of losses due to wastage. Recent efforts in the horticultural sector revolve around maximizing farmer's returns by ensuring a greater share of consumer's rupee and by avoiding post harvest losses. Creation of better infrastructural facilities in the form of cold storage and supply chain management, provision of market intelligence are some of the measures emphasized in developmental plans. Agri Export Zones (AEZs) are promoted with the objective of promoting exports of agricultural produce from selected areas of productivity prominence, while food parks provide an opportunity of increasing

processing capabilities in the state. The AEZs and the Food Parks are two important linkage points which helps in absorption of Fruits and Vegetables for further value addition.

Public private partnerships are being encouraged to invest in marketing infrastructure. Similarly corporate houses are entering horticultural produce marketing in a significant manner. Various state governments have been promoting direct sale of horticultural produce like vegetables and fruits by farmers to consumers through markets like farmers shandies. These steps are expected to reduce the number of middlemen involved in moving horticultural produce from farmers to consumers and in that process cut down the market margins going to them. It is also expected that these gains will be shared by both producers and consumers.

However, it is a moot question whether big corporate once they get themselves firmly established will pass on the benefits either to the consumer or the producer rather than appropriating it to themselves. Their success in penetrating the retail horticultural marketing is as yet uncertain as is the case with other market attempts like farmers shandies. There is need for examining the changes that are happening in the market place for horticultural products in the light of emerging alternative supply channels. To understand the effectiveness of these newer supply channels the present study is contemplated with the following objectives.

1.3 Objectives of the Study

- To ***estimate*** the marketing cost and marketing margin of different functionaries for vegetables Tapioca, Potato, Brinjal and Gerkins under various supply chains in Tamil Nadu
- To ***analyze*** the price spread, marketing efficiency and farmer's share in consumer rupee in various supply chains
- To ***identify*** the constraints perceived by various stakeholders; and study the factors influencing the marketing cost, market margin and marketing efficiency
- To ***suggest*** suitable strategies to enhance the marketing efficiency for horticultural commodities and

2. Data and Methodology

2.1 Study area

Most of the common vegetables are widely grown across regions of the state are consumed locally. Certain pockets, where the environments are conducive concentrate on few or more vegetable crops. Table below lists the predominant districts in which the vegetables selected for the present study are grown. The status of area and production of various vegetables and those selected for the study across different districts of the State are discussed in a subsequent section.

Table 4. Major growing Districts of selected vegetables

Vegetable	Main production areas
Brinjal	Salem, Coimbatore, Dindigul
Potato	Nilgiris, Dindigul
Tapioca	Namakkal, Salem, Dharmapuri
Gherkins	Dindigul, Madurai, Theni

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2.2 Data on items

Data was collected from farmers and market intermediaries for the four selected vegetables brinjal, potato, tapioca and gherkin. Separate interview schedules were used for collecting information from the sample respondents selected as per sampling methodology detailed in section 2.4. The data were based on respondent recall and as per existing practices and pertain to the year 2009-10. Details regarding harvesting and post harvesting operations along with their expenses, post harvest marketing expenses incurred by the farmers till their produce was sold by them to different intermediaries or directly to the consumers were also collected.

From the market intermediaries details of market expenditures incurred by them from the time they buy the produce from their sources and till they disposed of them to the next functionary or final consumers were collected. These details are relevant for calculating various market related indicators and parameters like marketing cost, marketing margin, price spread and marketing efficiency.

2.3 Sample size

Sample size in general is a function of population size. Wherever the population size is large, however, for practical reasons its size is limited. Considering the nature of cultivation it was agreed that for farmers survey a sample size of 120 would be adequate

and the same was adopted in the present study. For each of the four vegetables brinjal, potato, tapioca and gherkin covered under the present study a sample of 120 farmers were selected as detailed in the next section and interviewed. For market intermediaries different sample sizes were adopted depending on the number of such intermediaries involved in market operations in the selected locations. Details of the intermediaries and the sample size for each of them for the vegetables covered in this study are presented in the table.

Table 5. Farmers and market intermediaries sample sizes

Sample	**Brinjal**	**Potato**	**Tapioca**	**Gherkin**
Farmers	120	120	120	120
Wholesalers	15	15		
Retailers	30	30		
Commission Agents/processors	15/0	15/0	15/5	0/ 5
Farmers from Uzhavar shanti	30	30		

2.4 Statistical techniques

One of the main focus of the study was to estimate various indicators of the status of vegetable markets. These indicators help to assess the market margin, market cost, price spread and marketing efficiency. Besides, factors affecting marketing efficiency, constraints faced by the farmers and other market intermediaries are also to be assessed. Data collected through primary surveys of the farmers growing the selected vegetables and market intermediaries engaged in marketing of the vegetables were analysed for assessing the above indicators. Conventional descriptive analysis using tables and descriptive statistics were used for calculating the components of marketing costs and marketing efficiency.

Marketing Efficiency:

Markets and intermediaries undertake various functions in transferring the produce from the producer to the final consumer. The transferring process involves various costs in terms of assembling, grading, packing, loading, transport, fees and a component as margin to the intermediaries. Efficiency is a concept that invokes the notion of how these costs compare with the services offered. It is calculated using Shepherd Formula and Acharya's Modified Marketing Efficiency using the following definitions

Shepherd formula :

ME = (VA/MC)*100 where, ME = index of Marketing efficiency

VA = value addition by the marketing system and

MC = marketing costs including margins

Acharya's Modified Marketing Efficiency

MME = FP/(MC+MM)

Where, MME is modified measure of Marketing efficiency

FP is price received by farmers

MC is marketing cost

MM is marketing margin

Price Spread is calculated as the difference between the price paid by the consumer and the price received by the farmer, the **Average Gross Margin** as the sum of average of the margins received by specific intermediaries of a channel for a vegetable weighed by volumes handled by them ie.,**Producer Share in Consumer Rupee** is calculated as the percent consumers price received by the farmer and the **Marketing Margin of a Middleman** is calculated as the difference between the sale price received by him and the price at which he bought the produce, reduced by the extent of costs incurred by him all calculated per unit of the produce handled.

Factors affecting adoption of gherkin contract farming

In the present study, Probit model was applied to identify the factors influencing the farmers' participation in the gherkin contract farming. For gherkins the sample farmers are actual contract farmers with a sample of equal number of non gherkin farmers from whom data were collected mainly for determining the factors influencing adoption decision. The probit model is based on utility theory or rational choice perspective on behavior. Probit analysis can be used to estimate the effects of one or more independent variables on a dichotomous dependent variable. The qualitative dependent variable assumes only two values viz., 0 and 1. In this model, it is assumed that the factors influencing participation in contract farming depended on the variables such as age, farmsize, education of head of family, environment awareness, debt, net income and percentage of villagers growing gherkins in the village. The model used in this study is given below.

$I_i = \beta_0 + \beta_1 X1 + \beta_2 X2 + \beta_3 X3 + \beta_4 X4 + \beta_5 X5 + \beta_6 X6 + \beta_7 X7 + e$

Where,

I_i = Y =1, if the farmer participates in gherkin contract farming

= 0, if the farmer does not participate in gherkin contract farming

X1 - Age of the farmer (in years)

X2 - Farm size (ha)

X - Educational status of the farmer indicated by grades viz. Illiterate - 1; Below primary- 2;

Primary- 3; Upper primary- 4; Secondary College -5; High school- 6 and Others- 7

X4 -One for environment awareness and zero for environment awareness

X5 - Debt of household (in Rupees)

X6 - Net income from contract farming/non-contract farming (Rs /ha).

X7 - Per cent of farmers adopted gherkin contract farming in the village

β_1 to β_7- Co-efficients of independent variables

β_0 - Intercept

Constraints perceived by the farmers / wholesalers / retailers

Garrett's Ranking Technique:

Constraints in vegetable marketing were prioritized by using Garrett's ranking technique in the following manner using Garrett's Ranking Technique:

$$\text{Percent position} = \frac{100\,(Rij - 0.50)}{Nj}$$

Where, Rij is the rank given by ith item by jth individual

Nj is the number of items ranked by the jth individual

The percentage position of each rank was converted into scores using Garrett table. For each constraint, scores of individual respondents were added together and were divided by total number of respondents for whom scores were added. Thus, mean score for each constraint was ranked by arranging them in the descending order. In the same manner, opinion about the problems and prospects was obtained and then Garrett's ranking technique was used for prioritizing the constraints. An Excel macro was developed to automate the computations.

3. Results and Discussion

3.1 Marketing of vegetables

Several institutional interventions have been planned and promoted by the State and Central Governments to improve marketing of agricultural and horticultural crops. Majority of these measures are aimed to reduce the intermediaries, improve market infrastructure and facilities so that small and medium farmers could be benefited and that they receive a higher share of the consumer price. Promotion of cooperative marketing societies is one such institutional arrangement that has been promoted with various incentives. However its success depends on client patronage namely farmers participation. Wherever homogenous producer groups could be formed with continuity of cropping there is a possibility of cooperation to succeed.

By and large vegetables are grown in small areas compared to agricultural crops due to their resource use intensity, especially labour and capital. Perishability of the produce demands that delays in harvesting and disposal of the produce to the consumers is minimised. Most of the vegetables harvested are brought to nearby assembling centres, either wholesale markets in nearby towns or commission mandies where there is concentrated production of vegetables. In far flung areas assembling function is taken care by village traders in local shanties.

Most common market channel for vegetables observed involves the produce moving from producers to assemblers who are either village traders of commission mandies from whom wholesalers purchase the produce mostly through auctions. While village level trader assemblers usually buy and trade commission mandies undertake the functions of major assembly and forwarding to consuming centres for fixed commission charged that ranges from six to 15 per cent of the value of transactions. Wholesalers procuring from the man dies arrive from different consuming centres and bid in the auctions conducted at these mandies. Often farmers voice concerns about unbiasedness of the commission agents and do not rule out the possibility of collusion between them. Wholesalers distribute the produce to the final consumers through local retailers. Thus,

Producer→Trader/Commission agent→Wholesaler→Retailer→consumer

is the predominant channel through which major share of the vegetables produced are observed to be marketed. Specifically this holds true for those vegetables that reach the consumer without changes in its form. In this channel traders and commission mandies

undertake the assembling function, the wholesalers the twin functions of translocation and distribution and the retailers the final distribution function. Observations indicate that the risks of wastages and losses travel in the inverse direction

starting from the retailers, to wholesalers and minimally to the commission agents. However the absolute price risks are born by the producers and consumers at both ends of the channel. This channel is cut short when the produce is marketed locally or when farmers take advantage of institutional arrangements to market their produce. For instance, small proportions of farmers sell their produce directly to consumers through local markets or farmers markets or to local retailers. In such cases one gets the following channels

Producer→Institution→Wholesaler→Retailer→consumer

Producer →(through local shanties/farmers market)→consumer

Producer→Retailer→consumer

These were the major channels observed for the vegetables brinjal and potato covered in the present study. Nilgiris Cooperative Marketing Society (NCMS) was the major institution involved in the marketing of potato grown in Ooty which has mainly replaced the functions of the commission agents in potato marketing.

Additional intermediaries enter into the market depending on the specificity of the vegetable be it in the form of the need to be processed, stored, targeted for specific segments of the markets and or institutional interventions. In cases where produce is purchased by processing units the final produce is either distributed as manufactured product with better shelf life through general merchandise distribution channels or exported to long destinations both within and outside the country. In such vegetables depending on the nature of the crop the processing units source their raw materials either directly from the producer or through agents and/or commission agents. For instance, tapioca covered in this study and cultivated in large areas by farmers compared to other vegetables is procured directly by the processors employing agents. The final produce of the tapioca processing units are starch and sago that go mainly for industrial uses and are mainly sold through commission agents and/or SagoServe an industrial cooperative to wholesalers. Wherever farmers supply their produce to the commission agents some amount of informal contract farming in a loose sense is practised with the commission agents mostly providing the capital requirements of cultivation and some amount of input provision which are adjusted during the payment of the farmers for their produce.

Gherkins produce covered in the study is completely exported after minimal processing by processing and despatching units. The crop is cultivated entirely under contract farming and the processors undertake periodical supervision of the cultivation besides providing all the resources needed for cultivation. Complete accounting is done by the firms and farmers are paid for their produce after deducting for the expenses of the resources provided. Though contract farming is the rule, farmers are paid at prevailing at market prices and hence have to bear both production and marketing risks to a large extent till the produce reaches the processor.

3.2 Innovative models

Cooperative tapioca marketing (SagoServe) society:

In case of tapioca there has a success story of marketing cooperative institution in the form of SagoServe. It is to be noted that Sagoserve serves not the tapioca producers directly, but helps only the processors of starch and sago to market their final produce. Benefits to farmers are indirect in the sense that processing firms directly procure the raw tubers from farmers and market most of their final produce through Sagoserve and thereby some of the traditional middlemen are eliminated. It would be more advantageous to the farmers if they could have organised cooperative processing units of their own but none of the units operational in the area are cooperatively organised.

It is estimated that in India, tapioca is grown over an area of 3.5 million hectares with a production of over 60 lakh tonnes of tubers. Though Kerala ranks first in cultivation and production, the Tamilnadu stands first in respect of processing of tapioca into sago and starch throughout the country meeting about 85% of country's demand. -There are about 800 sago and starch industries in Small Scale sector scattered throughout the State. Erstwhile Salem District now divided into Salem and Namakkal districts has traditionally been the Land of Sago and Starch. The region offers good raw material, cheap labour and good sunshine for a longer period of the day throughout the year, helping manufacturers to produce more tapioca based products sago and starch.

SagoServe

Prior to the formation of the SagoServe an Industrial Co-operative Service Society the manufacturers of starch and sago in this district faced a lot of problems pertaining to credit and marketing of tapioca products. Merchants used to offer low prices for their goods and middlemen exploited this situation in the absence of organised marketing and

warehousing facilities. To get over these problems the sago/starch manufacturers formed "The Salem Starch and Sago Manufacturers' Service Industrial Co-operative Society Ltd.", Salem in 1981 under the Tamil Nadu Co-operative Societies Act 1961. This society, popularly known as "SagoServe" throughout the world, is functioning under the administrative control of Director of Industries and Commerce, Govt. of Tamil Nadu.

After the emergence of SagoServe, the bargaining power of manufacturers has substantially increased in the field of marketing and the menace of middlemen in this trade has been completely overcome. Due to sustained efforts of the society, sago/starch industry has now become the backbone of Salem District's Rural Economy, providing employment to more than 5 lakh persons both in field as well as factories.

INCENTIVES OFFERED BY THE GOVERNMENT:

(1) State participation in the share capital structure of the society.

(2) Exemption on payment of A.S.T.

(3) Reduction of VAT Rate from 4% to 2% sales routed through SagoServe.

(4) CST exemption for the goods sold to other State out of the stocks purchased from SAGO SERVE.

(5) Subsidy for modernization of Sago and Starch Manufacturing units

These incentives have played a vital role in strengthening SagoServe and helped the sago/starch industry thrive.

Working of SagoServe:

SagoServe members send their finished goods for sale to the society. On receipt of goods, the member is paid 60% of the value of the goods as advance and consignment is assigned a 'Lot Number'. Samples drawn from this consignment are put to 'Tender Sale' conducted daily except on Sundays and the days of State, National holidays. After paying a tender deposit of Rs.2,00,000/- or any amount as may be fixed from time to time the buyers are registered with the society and only then they can participate in the tenders. At present both industrial concerns as well as private traders have registered themselves as buyers at the SagoServe.

After verification of sample of starch and sago in the Tender hall the traders quote their rates in secret tender forms and the results are announced after tabulation around 2.30 P.M. The member-producer has the option of confirming the highest rate against his goods. Once he confirms the sale he is paid another additional advance calculated with reference to the sales rate after keeping Rs.40/- for Starch and Rs.SO/- for Sago per bag for recoverable expenses. The goods of the members, till the confirmation of the sale and those of the buyers, till they take delivery, are stored in the SagoServe godowns at a nominal godown rent.

Besides this tender system, SagoServe is executing the orders directly received from the consumers/end users against 100% payment from private merchants and Co-operative societies respectively on behalf of the members.

Farmers' Market

Farmers' markets have been established in Tamil Nadu with a view to improve the efficiency of marketing fruits and vegetables, and to increase the farmers' share in consumers' expenditure on purchase of fruits and vegetables. Started in the year 1999, about 100 farmers markets have been set up so far in different districts throughout Tamil Nadu under the organizational control of the respective district market committees. Farmers' markets are the new institutional arrangements that eliminate the middlemen in fruits and vegetables marketing by bringing producers and consumers of these commodities in direct contact with each other. The elimination of intermediaries helps farmers in getting good price and consumers in getting fresh vegetables and fruits at a reasonable price. Farmers' markets are not only outlets for locally produced fresh fruits and vegetables. They help establish connections between consumers and food producers, provide an additional income source for farmers, and in general, serve as a tool for community development.

There is wide support for the farmers' markets from consumers as they are benefited in many ways. In addition to low prices of vegetables sold in the market, the consumers are benefited by good quality and freshness of the vegetables besides getting a wide variety

of vegetables in a single place. Some of the consumers feel that it gives them a special experience to buy from the actual producers of the commodities which is a rare chance in the modern economy.

Farmers' market helps to avoid the exploitation by wholesale traders. The prices of vegetables sold in the farmers' markets are fixed above the wholesale price (at which the wholesalers buy vegetables from farmers) and below the retail prices (at which the consumers buy vegetables from vegetable retailers). Hence prices prevailing in the farmers' market are beneficial to both producers and consumers of vegetables.

Problems and constraints in Farmers' Market

- Most of the farmers reported the reduction in bus service to the market during the last five years which was the single major constraint faced by them in bringing vegetables to the market on time. Though some farmers resorted to their own arrangements to transport the vegetables many farmers stopped or reduced their sales in the farmers' market. The reduction in transport facilities to the market during the last five years was the major reason for the reduction in average annual arrival of vegetables in the farmers' markets.
- In large towns consumers report that allowing traders to buy vegetables from the market is a problem. This was a major problem faced by the consumers when the farmers' market was not properly regulated and monitored during the last five years. The retail vegetable sellers buy vegetables early in the morning which deprived the consumers of quality vegetables. However, farmers point to the fact that unless the traders are allowed to some extent, it is not possible for them to sell the entire stock in a single day. Further, the retail vegetable sellers who buy from the farmers' market also serve the consumers who are located far from the farmers' markets and

those who are not able to travel to the farmers' market. At present almost all the farmers markets depend on the state government for most of their financial and manpower requirements. The cost of managing the farmers' markets far exceeds the income even though there is scope for increasing the income from the markets thus making them financially self-supporting.

- Consumers in many of the small towns reported that non-availability of variety and hill vegetables is a major problem faced by them in supporting the farmers' markets.
- Farmers in about two thirds of the farmers' market felt the need for establishing mini-cold storage facility inside the premises of the market so as to store the unsold vegetables for a few days.
- Farmers and consumers in markets surveyed reported that wholesale vegetable market is already located close to the farmers' market which hinders the smooth functioning of the farmers' markets.

3.3 Suggestions by stakeholders for improvement

A) Location

- Locating the markets close to large residential areas in big cities and close to the bus stand in smaller towns.
- Relocate the vegetables market adjacent to farmers' market since it reduces both farmers and consumers to farmers' market.
- There is a scope to establish new markets in residential areas of medium sized towns and more markets in big cities after examining the scope.

B) Availability of vegetables and market timing

- Arrangements have to be made for vegetables during lean production periods.
- Fruits and flower stalls may be started within the farmers' market premises – Women self-help groups in the area may be encouraged to put up fruit and flower stalls.
- Increasing number of stalls, wherever possible
- Ensure availability of vegetables during lean season by providing extension support to farmers to grow vegetables throughout the year. Popularization of vegetable crops and varieties suitable for different agro-climatic and soil conditions during different seasons is essential.
- Consumers in farmers' markets located in most of the smaller towns reported the

non-availability of hill vegetables and lack of variety. Local self-help groups in these towns may be motivated to put up stalls to sell these vegetables in farmers' markets so as to increase the availability. Similarly, the self-help groups may be permitted to put up fruit stalls inside the farmers' market so as to facilitate the consumers to purchase fruits from farmers' market.

C) Infrastructure

- Feasibility of establishing mini cold storage facilities may be explored at least in big markets.
- Most of the farmers' markets have fairly good arrangements for disposal of vegetable wastes. This should be made more systematic and productive.

D) Administration and management of the market

- Allowing retail vegetable traders to buy vegetables in large quantities from the farmers' market is one of the contentious issues facing the farmers' market. While farmers strongly support the purchase by retailers, consumers report that they are deprived of important vegetables especially during lean seasons. A careful consideration of the problems faced by both the farmers and consumers leads us to the conclusion that the retail traders may be allowed to purchase from the farmers' market. However, considering the interests of the consumers buying from the farmers' market, it is necessary to regulate the entry of retail traders by issuing entry permit cards and they may be allowed on alternate days on rotation basis. During lean seasons for important vegetables such as tomato and onion, a strict vigil should be maintained to ration the purchase of these vegetables by the retail traders in bulk quantities.
- Morning and evening markets by introducing rotational system of card distribution to the farmers. The farmers who are selling in the morning during odd month shall be permitted for evening sales during even months and vice versa. This will the farmers' market accommodate more farmers and attract more consumers who are used to the habit of purchasing vegetables in the evening.
- Bulk consumers of vegetable such as college hostels, canteens, hospitals, jails, etc may be encouraged to purchase vegetables from the farmers' markets.

3.4 Market intermediaries and their functions

Delivery options to farmer producers

Direct selling to consumers: Direct selling to consumers is mainly through weekly shanties. Most of the producers who cultivate small areas under assorted vegetables prefer selling their produce through weekly shanties. They visit more than one local shanty a week, depending on harvest. Area limitations is due to many reasons, the more important being water availability, plant protection needs and labour availability. Selling to merchants (At the farm level, at shanties)

Selling to retailers: If the volume is high, some producers prefer selling wholesale to local retailers and assemblers in weekly shanties. Farm level sales to local retailers and merchants are done in some cases.

Selling to wholesalers: In areas where vegetable cultivation is intensive and concentrated, wholesale markets and commission mandies develop. Farmers dispose their produce mostly through auction in such centres. Running accounts are maintained with the commission agents and settlements are done on a continuing basis. Yet formal supply contracts are rare in commonly cultivated vegetables.

Contract supply: These exist mostly with reference to special crops like medicinal plants or when the production is on a large scale. In such cases the counter party is usually a corporate or established processor or exporter. Mostly contracts are informal and production risks are borne by the producers. Marginal market risk protection exists in some cases.

Delivery sources to the final consumers

Urban areas (with concentrated housing localities)

Wholesale cum retail markets: These are daily wholesale markets. While in bigger cities the receipts are from other assembly level whole sale markets in smaller towns the receipts are mainly from village level merchants and farmers. They serve as the feeder markets for other channels of distribution. There are also retail sales to some extent though the prices are not lesser than in farmers markets.

Farmers markets: With government sponsorship, these markets have gained a significant market share in urban centers in recent years. They can be considered the urban equivalents of weekly shanties of the rural areas. They do not differ functionally much from shanties except that they are provided with better infrastructure facilities. These and the wholesale markets offer choice for the consumers in terms of quality and price with many sellers compared to the retail channels.

Special vegetable and fruit retail stores: These are concentrated more in cities with higher population and better standards of living. They offer value for money and concentrate on branding and quality. Often, like corporate retails they enter into contracts with potential suppliers; both from big farmer producers and agents from other assembling markets. These are major sources of fruits supply to consumers compared to vegetables.

Corporate retail stores: These, like special purpose vegetable and fruit outlets, concentrate on branding and quality and source mainly from contract suppliers. Initially many corporate retails evinced keen interest in specialized dealing of fruits and vegetables. Many of them have diversified into general purpose retailing. They follow a top down approach to market penetration starting from big cities and moving down to

tier II and III cities. Of late there is said to be some stagnation in their branch expansions as they find it difficult to match the local shops in lower order cities.

General purpose retail stores: They are ubiquitous and are the most common suppliers of the immediate needs of the consumers. They offer convenience and nearness. Almost every retail store also offers some vegetables of daily use. Fruit supply though is insignificant compared to vegetables. They are the most common outlets for satisfying daily needs of urgently needed vegetable ingredients. Many of them establish customer relationships in the neighbourhood and sometimes provide vegetables and other items on loans. These stores procure the vegetables from nearby wholesale markets and sell by marking up the prices by 20 to 25 percent. These units have to take the risk of losses in case the vegetables are not disposed off in time and get spoiled. They can be considered the micro market makers for the vegetables.

Push cart vendors: Prices of vegetables supplied by these sources are usually costlier than from other sources. But they offer convenience of purchase at the doorstep and is useful to those who cannot travel to other supply sources. These vendors mostly concentrate on one or few vegetable(s) or fruit. They also concentrate on seasonally available vegetables. The rates at which they sell the produce is comparatively higher than those prevailing at retail stores by about 15 to 20 per cent. In many cases the traders rent the push carts and get small loans on discount basis to procure the produce in the early morning and settle the rents and loans by end of the day.

Head load/cycle vendors: They are similar to push cart vendors, operating with still lesser volumes. The persons involved are usually those who want to make a living out of it. Rates are similar to those of the cycle and push cart vendors.

Rural areas

Weekly shanties: These are the primary source of delivery of vegetables and fruits to consumers in the rural areas. Unlike in other delivery channels these are loose congregations of buyers and sellers coming together on a particular day of a week at a specific place. Locations are historical, decided mostly on population. Every hamlet has the option of participating in more than one such shanty around its perimeter and thereby offers scope for choice. Most of the delivery is direct from producer to consumers though the shanties also serve as assembly lines for wholesale markets. Famers sell either directly to consumers or to retail merchants who buy in bulk and deliver to consumers. These shanties can be considered as the model on which the uzhavar shanties of the State.

Local general purpose retail stores: These are similar to their urban counterparts albeit in a smaller scale.

Neighbourhood purchases (cash/barter): This cannot be considered as marketing proper. Yet there are some minor farm level direct sales to local consumers. Barter exchanges are common among neighbourhood farmer producers and consumers

3.5 Marketing channels

Urinal marketing channels

The Different channels in Brinjal marketing are

Ch1: Farmer→ Commission Mandi→ Wholesaler→ Retailer→ Consumer

Ch2: Farmer→ Commission Mandi→ Retailer→ Consumer

Ch3: Farmer→ Traders →Commission Mandi→ Corporate Retailer→ Consumer

Ch4: Farmer→ Retailer→ Consumer

Ch5: Farmer → Consumer

%The Niligiris Cooperative Marketing Society (NCMS) through which most of the Ooty produce is routed to wholesalers from different cities is located in Mettupalayam. The market channels for potato are

Ch1: Farmer→ NCMS→ Wholesaler→ Retailer→ Consumer

Ch2: Farmer→ Commission mandi→ Wholesaler→ Retailer→ Consumer

Ch3: Farmer→ Retailer→ Consumer

Ch4: Farmer→ Consumer

Tapioca

Unlike other vegetable crops tapioca produce goes for processing and industrial use almost entirely. The processing units procure the produce directly from producers or using their agents. Once processed the final produce is disposed off for industrial and commercial use through SagoServe and wholesalers in commercial channels. Very small quantities of the produce are sold for direct consumption be consumers. The marketing channels identified for tapioca are

Ch1: Farmer→ Processor→Sagoserve→ Wholesaler……

Ch2: Farmer→ Retailer→ Consumer

Ch3: Farmer→ Consumer

Gherkin

Gherkin is produced completely under contract forming with the processors undertaking to supply inputs and purchase the produce from the farmers. After minimal processing the entire produce is exported by the processors to international destinations and there are no domestic distribution channels.

Marketing cost

Table 6. Marketing Cost and per cent to consumer price for Brinjal and Potato (Rs/Q)

Brinjal			**Potato**		
Item	**Cost**	**%**	**Item**	**Cost**	**%**
Marketing cost			**Marketing cost**		
Producer	110	5.00	Producer	120	4.84
Wholesaler	125	5.68	Wholesaler	125	5.04
Retailers	160	7.27	Retailers	150	6.05
Total marketing cost	395	**17.95**	**Total marketing cost**	**395**	**15.93**
Marketing margin			**Marketing margin**		
Wholesaler	85	3.86	Wholesaler	115	4.63
Retailer	120	5.46	Retailer	160	6.45
Total marketing margin	205	**9.18**	**Total marketing margin**	**275**	**11.09**
Consumer price	2200	**100.00**	**Consumer price**	**2480**	**100.00**

Marketing costs were incurred by producers and market intermediaries that included packing, transport, weighing, market fees, loading and unloading etc. Besides, each

intermediary also received remuneration for the services rendered by them in the form of market margins. The market charges and margins for the producers and intermediaries for brinjal and potato that have similar marketing structure are presented in table 14. It is seen that in the major channel the marketing costs account for about 16-18 per cent and margins for the intermediaries for about 10 per cent. Thus the farmers receive about 70 to 75 per cent of the consumer price in normal circumstances.

The marketing costs for tapioca account for about 30 (refer table 20) rupees per quintal which includes mainly harvesting and transportation to the processing units and are usually paid by the processors and deducted from the money payable to the farmers. In case of the small quantity distributed for direct consumption by consumers an additional marketing cost of R.35 per quintal is incurred in terms of loading and unloading charges and market fees. When the processors sell their final produce through the SagoServe they get the following services and incur connected expenditures.

Tapioca marketing charges at Sagoserve

For the various services rendered to the members and the traders the society charges the following.

(1) Godown Service charges from the member-producers: @ 0.75% on Sale value with effect from 1-11-2006.

(2) **Service charges from the buyers:**

@ 0.38% on TNGST Sales turnover and eST Sales turnover.

(3) Interest:

(a) Members:

@ 12.25% on the advance (From 01-09-2008)

(b) Merchants:

@ 17% from 6th day onwards to so" day with effect from 1-1-2005.

(4) **Godown rent:**

(a) Members

(per bag/week

No. of bags contained in a lot	Up to **one year**	**Over one year and** upto **2 years**	**Above two years**
1 to 100 bags	1.25	1.50	2.00
101 bags and above	1.00	1.25	1.75

	(b) Merchants	16paiselbag/day (from 6th day t030th day) 26 paiselbag/day (from 31st day onwards)
(5)	**Insurance:**	
	Members	Re.1/bag
(5)	**Weighbridge charges:**	
	Members	40 paise/bag

3.6 Marketing cost in different channels

Tables 7 to 9 provide an account of the marketing costs associated with different channels of the selected vegetables brinjal, potato and tapioca respectively. Marketing costs represent averages of the sample data and are expressed per quintal of the produce. Costs have been worked out for the major channels including intermediaries undertaking the major functions of assembling, transportation and distribution. Most of the marketing expenses are borne by the producers, wholesalers, and retailers. Others like agents, commission agents and institutions like NCMS, SagoServe provide services which are directly charged to any of the above intermediaries. For instance, commission charges for mandies, unloading and market charges at such places are borne by the producers. Accordingly the market channels for calculation market cost purposed have been grouped under the major channels Producers→Wholesalers→Retailers→Consumers.

As can be seen from tables 15, 16 and 17 the market charges as a whole increased with more intermediaries. In channels where commission agents, wholesalers and retailers are involved producers received approximately 70 per cent of the consumer rupee in brinjal and potato. When the produce moved from producers to consumers through retailers without the services of wholesalers producer share in consumer improved to about 80-85 per cent. Finally when the produce moved directly to consumers from producers received highest share of about 90-95 per cent. Such computations of producer share in consumer rupee have not been feasible in gherkins since it is an exported vegetable.

Table 7. Marketing cost for Brinjal (Rs/qtl)

Particulars	P-W-R-C	P-R-C	P-C
Producers price	1600	1600	1800
Packing	20	15	25
Transport	50	60	110
Loading &unloading	15	15	15
Weighing	15	10	15
Market fee	10	15	15
SUB TOTAL	110	115	180
Wholesaler purchase price	1710		1980
Packing	25		
Transport	55		
Loading &unloading	20		
Weighing	20		
Market fee	5		
SUB TOTAL	125		
Retailer purchase price	1920	1715	
Packing	25	20	
Transport	70	65	
Loading &unloading	25	10	
Weighing	25	15	
Market fee	15	20	
SUB TOTAL	160	130	
Consumer purchase price	2200	2000	1980
Producer share in consumer rupee	72.70%	80.00%	90.90%

Table 8. Marketing cost for Potato (Rs/qtl)

Particulars	P-W-R-C	P-R-C	P-C
Producers price	1810	2000	2200
Packing	20	20	25
Transport	60	65	120
Loading &unloading	15	15	20
Weighing	10	10	15
Market fee	15	15	10
SUB TOTAL	120	125	190
Producers gross price	1930	2125	2390
Wholesaler purchase price	1930		
Packing	20		
Transport	65		
Loading &unloading	10		
Weighing	10		
Market fee	20		
SUB TOTAL	125		
Retailer purchase price	2170	2125	
Packing	15	20	
Transport	70	65	
Loading &unloading	25	10	
Weighing	25	15	
Market fee	15	20	
SUB TOTAL	150	130	
Consumer purchase price	2480	2340	2390
Producer share in consumer rupee	72.98%	85.47%	92.05%

Table 9. Marketing cost for tapioca (Rs./q)

Particulars	P-Pro-W	P-C
Producers price	890	1050
Packing	0	0
Transport	15	30
Loading &unloading	5	10
Weighing	10	0
Market fee	0	10
Sub total	30	50
Producers gross price	**920**	**1100**
Retailer purchase price	920	0
Packing	5	0
Transport	10	0
Loading &unloading	5	0
Weighing	15	0
Market fee	0	0
Sub total	**35**	0
Consumer purchase price	**1100**	**1100**
Producer share in consumer rupee	80.91%	95.45%

3.7 Price spread

Based on marketing costs computed in the foregoing tables price spreads for vegetables brinjal, potato and tapioca were calculated and the results are presented in tables 10, 11 and 12 respectively. As noted earlier the price spread was higher in lengthy channels involving commission agents, wholesalers, retailers (either private or corporate) and lesser in shorter channels. Though farmers markets and local shanties helped the producers to market directly to the consumers and realize shares upwards of 90 per cent of the consumer rupee their reach was limited. The channel that takes care of the largest quantum produce marketed rewards the producers with about 70 per cent of the consumer rupee. The producers share of consumers rupee for the selected vegetables in the most common channels are summarized in table 21.

Table 10. Price spread for Brinjal (Rs./q)

Particulars	P-W-R-C	P-R-C	P-C
Producer sale price	1600	1600	1800
Market cost	110	115	180
Producers gross price	1710	1715	1980
Wholesaler Purchase price	1710		
Marketing cost	125		
Market margin	85		
Retailer Purchase price	1920	1715	
Marketing cost	160	130	
Market margin	120	155	
Consumer purchase price	2200	2000	1980
Producer share in consumer rupee	72.70%	80.00%	90.90%

Table 11. Price spread for Potato (Rs./q)

Particulars	P-W-R-C	P-R-C	P-C
Producer sale price	1810	2000	2200
Market cost	120	125	190
Producers gross price	1930	2125	2390
Wholesaler Purchase price	1930		
Marketing cost	125		
Market margin	115		
Retailer Purchase price	2170	2125	
Marketing cost	150	130	
Market margin	160	85	
Consumer purchase price	2480	2340	2390
Producer share in consumer rupee	72.98%	85.47%	92.05%

Table 12. Price spread for tapioca (Rs./q)

Particulars	P-Pro-W	P-C
Producer sale price	890	1050
Market cost	30	500
Producers gross price	920	1100
Wholesaler Purchase price	0	0
Marketing cost	0	0
Market margin	0	0
Retailer Purchase price	920	0
Marketing cost	35	0
Market margin	145	0
Consumer purchase price	**1100**	**1100**
Producer share in consumer rupee	80.91%	95.45%

3.8 Producer share in consumer rupee

Table 13. Producer share in consumer rupee of selected vegetables

Vegetable	Particulars	P-W-R-C	P-R-C	P-C
Brinjal	Producer sale price	1600	1600	1800
	Consumer purchase price	2200	2000	1980
	Producer share in consumer rupee	72.70%	80.00%	90.90%
Potato	Producer sale price	1810	2000	2200
	Consumer purchase price	2480	2340	2390
	Producer share in consumer rupee	72.98%	85.47%	92.05%
Tapioca	Producer sale price		890	1050
	Consumer purchase price		1100	1100
	Producer share in consumer rupee		80.91%	95.45%

3.9 Marketing Efficiency

Marketing efficiency measures indicate how efficiently the produce is marketed in a given channel. The results of market efficiencies calculated conventionally as a ratio between value addition by the market system and consumers/retailers price, following Shepered's Method and Acharya's modified marketing efficiency methods are presented in subsequent tables.

Tables 14 and 15 present the marketing efficiency ratios of marketing channels of brinjal. As per Shepered ratio market efficiency improves from about 5.5 in the most common channel to 8.1 in case of producer, retailer and consumer channel to 11 when the produce is directly marketed to consumers. Similar results are observed based on Acharya's ratio where the ratio starts with 2.67, improving to 4 and finally to 10. Conventional method indicates the cost effectiveness of the channels and indicates strength with declining ratios. In case of brinjal the ratio was 1.24 for P-W-R-C channel which reduces to 1.16 in P-R-C channel and finally to one in case of direct marketing to consumer.

Table 14. Measurement of Marketing Efficiency of Brinjal (Rs./q)

S.No.	Particulars	P-W-R-C	P-R-C	P-C
1	Retailer's sale price (RP)	2200	2000	1980
2	Total marketing costs (MC)	395	245	180
3	Total margins of intermediaries (MM)	205	155	0
4	Price received by farmer (FP)	1600	1600	1800
5	Value added by the marketing system (1-4)	490	285	180

Table 15. Index of Marketing Efficiency of Brinjal

Conventional method (E) (5/2)	Ratio	1.24	1.16	1.00
Shephered's method (ME) (1/2)	Ratio	5.57	8.16	11.00
Acharya's method (MME)[4 / (2+3)]	Ratio	2.67	4.00	10.00

Tables 16 and 17 present the marketing efficiency ratios of marketing channels of potato. As per Shepered ratio market efficiency improves from about 6.3 in the most common channel to 9.2 in case of producer, retailer and consumer channel to 14.5 when the produce is directly marketed to consumers. Similar results are observed based on Acharya's ratio where the ratio starts with 2.7, improving to 6.3 and finally to 14.3.

Conventional method indicates that the ratio was 0.91 for P-W-R-C channel which reduces to 0.84 in P-R-C channel and finally to 0.15 in case of direct marketing to consumer.

Table 16. Measurement of Marketing Efficiency of Potato (Rs./q)

S.No.	Particulars	P-W-R-C	P-R-C	P-C
1	Retailer's sale price (RP)	2480	2340	2390
2	Total marketing costs (MC)	395	255	165
3	Total margins of intermediaries (MM)	275	85	0
4	Price received by farmer (FP)	1810	2125	2365
5	Value added by the marketing system (1-4)	360	215	25

Table 17. Index of Marketing Efficiency of Potato

Conventional method (E) (5/2)	0.91	0.84	0.15
Shephered's method (ME) (1/2)	6.28	9.18	14.48
Acharya's method (MME)[4 / (2+3)]	2.70	6.25	14.33

Tables 18 and 19 present the marketing efficiency ratios of the two marketing channels of tapioca for direct consumptions. As per Shepered ratio market efficiency improves from about 16.92 in the P-R-C channel to 22 when the produce is directly marketed to consumers. Similar results are observed based on Acharya's ratio where the ratio starts with 4.38 and improving to 22. Conventional method indicates that the ratio was 2.77 for P-R-C channel which reduces to one in P-C channel.

Table 18. Measurement of Marketing Efficiency of tapioca (Rs./q)

S.No.	Particulars	P-R-C	P-C
1	Retailer's sale price (RP)	1100	1100
2	Total marketing costs (MC)	65	50
3	Total margins of intermediaries (MM)	145	0
4	Price received by farmer (FP)	920	1050
5	Value added by the marketing system (1-4)	180	50

Table 19. Index of Marketing Efficiency of tapioca

Conventional method (E) (5/2)	2.77	1.00
Shephered's method (ME) (1/2)	16.92	22.00
Acharya's method (MME)[4 / (2+3)]	4.38	21.00

Constraints perceived by various stake holders

Qualitative questions were asked to assess the perception of the producers and market intermediaries about market constraints and analyzed using Garrett ranking method. The results are presented in tables 20 and 21 below.

Table 20.Constraints perceived by the farmers, wholesalers and retailers in marketing Brinjal

Constraints	Farmer	Wholesalers	Retailers
Forced to sell to pre-harvest contractor	7	8	11
Non-availability of marketing credit	8	9	6
Faulty weighment	5	7	5
Very high commission rates	9	10	7
Commission charged more than once	10	6	8
Malpractices in auction	4	5	4
Presence of exploitative middlemen	6	3	9
High market fee	11	11	10
Inadequate competition at the market	3	1	3
Inadequate facilities at the market	2	2	2
No storage facility	1	4	1
No facilities for personal stay at the market	12	12	12

Table 21. Constraints perceived by the farmers, wholesalers and retailers in marketing Potato

Constraints	Farmer	Wholesalers	Retailers
Forced to sell to pre-harvest contractor	6	7	12
Non-availability of marketing credit	9	8	6
Faulty weighment	3	9	5
Very high commission rates	8	11	8
Commission charged more than once	10	6	7
Malpractices in auction	4	5	4
Presence of exploitative middlemen	7	3	9
High market fee	11	10	10
Inadequate competition at the market	5	1	1
Inadequate facilities at the market	1	2	2
No storage facility	2	4	3
No facilities for personal stay at the market	12	12	11

3.10 Factors influencing participation in gherkin contract farming

Factors affecting marketing cost, margin and efficiency

Results of probit model

The factors determining the participation of farmers in the contract farming were analyzed using probit function. Independent variables specified were age, farmsize, education, environment, debt, net income and percentage of villagers growing gherkins. Data were analyzed using the Limdep 7.0 package and the results are presented in Table 22.The results of the Probit model indicated that age, farm size, net income and debt were significantly influencing the farmers' participation in contract farming. Age and farm size had negative coefficients. As the age of the farmers increased by one per cent, the probability of participation of farmers in contract farming decreased by 0.05 per cent. It indicated that aged farmers were less likely to participate in contract farming. Similarly when farm size of farmers is increased by one percent, the probability of participation is decreased by 0.30 per cent which indicated that marginal farmers were likely to participate in contract farming. The variables debt and net income were positive and significantly influencing the participation. If indebtedness of the farmer increased by one per cent, the probability of participation in contract farming increased by 0.01 per

cent. This indicated that as the debt of farmer increased participation in contract farming also would increase. If net income increased by one per cent the probability of participation in contract farming would increase by 0.01 per cent.

Table 22 Results of Probit Model

S.no.		Regression Coefficients	Probability
1	Constant	1.46	0.07
2	Age (in years) X_1	-0.05***	0.01
3	Farmsize (in ha) X_2	-0.30***	0.00
4.	Education (in level)X_3	0.089^{NS}	0.37
5.	Environment X_4	-0.03^{NS}	0.92
6.	Debt(in Rs.) X_5	0.01***	0.00
7.	Net income(in Rs.) X_6	0.01***	0.04
8.	% of villagers growing X_7	0.01	0.84

Note: *** - Significant at one percent and NS- Non-significant

4. Conclusions and policy implications

Marketing of vegetables in the state, as in other parts of the country, is highly unorganized. The losses in the marketing chain have been estimated in excess of 30 percent for fruits and vegetables. Moreover, because of several government restrictions, the agro-processing industry continues to be inefficient, resulting in considerable losses that adversely affect farmers and consumers. The institutional interventions in marketing by the governments in the form of cooperatives and regulated markets have made little impact except in few cases. Price interventions such as minimum support prices and government procurement in some commodities have not solved the complex web problems plaguing the marketing. There is a lot of scope for further revamping the marketing system.

Minimizing marketing costs, improving overall marketing efficiency, minimizing post-harvest losses, and ensuring remunerative price to farmers with minimal price risk are some of the areas which should receive priority in future. In the context of liberalization and globalization with marketing sector being increasingly freed up for foreign investments domestic farmers and market intermediaries with little market power need to be protected.

Vegetable marketing suffers from production uncertainties. Most of the production and marketing problems could be traced to the small scale nature of production. Compared to agricultural commodities vegetables require intensive applications of resources especially plant protection chemicals and fertilizers that small farmers could not afford. Besides vegetable crops are also labour intensive. Thus labour, water and capital all act as limiting factors in the scale of production. With their scale of operation compromised farmers could not ensure production in volumes and of uniform quality standards.

Production also critically depends on seasons and with limited scales of operation farmers could not plan their produce as per market conditions. Staggering production requires controlled production environments in the form of green and poly houses which the small producers cannot afford. Coupled with lack of market intelligence, these production cycles invariably lead to wider price fluctuations that further erode the income levels realized by the vegetable producers.

Controlling the number of middlemen in the hope that part of the margins cornered by the middlemen eliminated from the system could be shared between both the producers and consumers has been a major theme of marketing reform debates in India with little

tangible outcomes. Regulated markets, producer and product market cooperatives have been promoted over decades to achieve the objective of reducing the market channel length and these have not met with much success especially in the case of vegetables. Cooperation by nature requires a degree of homogeneity among those come under its umbrella. Vegetable producers lack that homogeneity in various ways; in terms of their resource endowments, scales of operation and more importantly in terms of consistency in their production process. Farmers invariably do not specialize in growing specific crops and diversify. There are several reasons other than those related to marketing and this diversity precludes their commitment to specific product cooperatives. This has been evidenced in case of potato marketing through NCMS and tapioca marketing through SagoServe. In both cases commission mandies whom these institutions were supposed to have substituted, are equally active and in the same locations.

While the scale of operation precludes farmers functioning as assemblers with facilities to store and process their produce, private corporate investments are perceived to be a viable option to create such facilities. Entry of corporate retails was expected to reduce the number of middlemen since they could integrate market functions through their own supply chain networks. It was also expected that they would promote contract farming with financial, technical and market support. Market awareness thus was expected to percolate to producer levels through these private operators helping the producers to improve the quality of the produce.

Experience in the state so far indicates that these hopes are yet to materialize. Though many corporate retails entered the market around 2005, with hopes of specializing in fresh fruits and vegetables, sourcing the produce from farmers, they have gradually began to diversify into general merchandise. To the extent they deal in vegetables they source them from commission agents. This has been necessitated by the fact that corporate sponsored contract farming to succeed needs a double coincidence of interests that is lacking in practice. Farmers expect all their produce with their quality differences be bought by the contractor. With their miniscule scales of operation they find it difficult to dispose of their substandard produce not procured by the contractor. Contractor on the other hand need bulk supply of produce as per their standards which individual producers will not be able to supply. Thus both the farmers and corporate have now turned to utilize the services of the commission agents and wholesalers. Corporate retails thus have now become one more category of retailers catering to specific segments of the market rather than replacing any of the existing players.

Contract farming, seems to have some success in vegetables that have concentrated buying by few firms that use them for value addition and are export. Gherkins in Tamil Nadu are an example where the private firms have played a major role in promoting the crop and technology by providing inputs and buying back the produce. Here again the system is not perfect to the extent of protecting the farmers from either production are price risks. Real competition in fixing prices is a question mark when there are few firms operating in a given crop.

Lessons from the study of the vegetables brinjal, potato, tapioca and gherkins indicate that marketing issues are larger than mere reduction in the number of middlemen or promoting adhoc measures. Number of tapioca processing industries in Salem District are said to be declining in number due to gradual reduction in area under tapioca cultivation in surrounding districts. Similarly, gherkins processors have been facing major problems since the economic decline in the west which are the major importing countries. On the contrary, brinjal and potato farmers have been reaping greater benefits in recent year due to escalating vegetable prices. Similar increases in market prices have been observed for commonly consumed vegetables.

Discussion with stakeholders and experts bring out the opinion that demand for vegetables has been tremendously increasing in the recent years due to the increasing purchasing power. On the other hand more and more people are moving out of agriculture since they feel it as an un remunerative occupation and scarcity pressures of labour and water are mounting leading to reduction or atleast no increase in production of vegetable crops. These observations indicate that market issues are dynamic and one has to be alive to emerging trends and there cannot be one solution fitting all contingencies. Private vegetable seed producers seem to have been alive to the emerging changes and have been trying to come out with varieties that would yield well over extended periods for the markets. This is especially so in brinjal a vegetable covered in the study. Similar is the case with gherkin where a single foreign company dominates the seed industry.

Results presented in the study indicate that in the most common marketing channels for the studied vegetables the marketing cost was a reasonable 15 per cent of the consumer price and marketing margins of the intermediaries constituted again a reasonable 10 per cent. Producers get about 75 per cent of the consumer rupee. However, problems arise to the producers mostly because of the wider price fluctuations due to production cycles. While production and marketing costs for the farmers remain fixed, abnormal down

trends in prices inflicts heavy damages in terms of income loss for them. Market intermediaries only suffer loss of turnover with their margins and fees fixed. With these observations some policy implications can be drawn as follows:

- Producer empowerment through consolidation and ramping up of scale of vegetable production is a prerequisite for market stabilization.
- Spreading the supply temporally is the most effective way for stabilizing prices and producer's income besides protecting consumer interests. This may have to happen through technology to extend production periods, production under controlled environments and improving storage facilities. These however, warrant a look at previous point.
- Corporate investments and retail may eventually rise to dominant positions; but as of now they are one more addition to the intermediary list, neither minimizing nor enlarging price and production risks
- Corporate sourcing may be encouraged to be tied up with cooperative institutions like NCMS, SagoSere wherever possible.
- Contract farming is a viable option to reduce middlemen provided efforts are made to match both producer and buyer expectations. They need to be put into an effective competitive market framework.
- Storage and processing infrastructure is to be necessarily ramped up as part of market stabilization efforts with local planning inputs and private partnership wherever necessary.

5) References

Action Plan for Tamil Nadu National Horticulture Mission Prepared by Rabo India Finance Pvt. Ltd for Ministry of Agriculture Government of India September 2005

Birari K.S., D.S. Navadkar and J.T. Dorge "Marketing Efficiency of Cole Vegetables in Western Maharashtra" Agricultural Marketing VOL.-XLVII, No.:3 pp23-28

Chennai, Martketing of Fruits and Vegetables in and Around Chennai, Research Study No.130, Agro Economic Research Centre, University of madras, 2002-03, Coimbatore -3 August, 2006

Farmers' Market in Tamil Nadu – An Assessment of Current Performance and Potentials for Future Expansion, Research report of the Department of Agricultural Economics Tamil Nadu Agricultural University

Gangwar L.S., Dinesh Singh and D.B. Singh "Estimation of Post-Harvest Losses in Kinnow Mandarin in Punjab Using a Modified Formula" *Agricultural Economics Research Review* July-December 2007 Vol. 20 pp 315-331

Kusum Jain, Umesh Kumar Sharma, R. S. Kadian, R. K. Malik and S.L. Bhella. 2008. Direct Marketing. Technical Bulletin (27), Directorate of Extension Education, CCS Haryana Agricultural University, Hisar, India.

Rengasamy S, J Devavaram, T Marirajan, N Ramavel, K Rajadurai, M Karunanidhi, N Rajendra Prasad and A Erskine "Farmers' markets in Tamil Nadu: increasing options for rural producers, improving access for urban consumers**"** *Environment and Urbanization* 2003; 15; 25

Season and Crop Report, Department of Economics and Statistics,Government of Tamil Nadu, 2005-06

Shamsher Singh and S.K. Chauhan "Marketing of Vegetables in Himachal Pradesh" Agricultural Marketing VOL.-XLVII, No.:3 pp5-10

Srinivas T., M.Anantharaman Cassava Marketing System in India, Technical Bulletin Series: 43 CTCRI (ICAR), Kerala, India, December, 2005

Sudhandhiran C, The Sago & Starch Industry Cluster Salem (Tamil Nadu), SME Diagnostic Study developed under the Cluster Development Agent Training Programme, Organised By Unido Cdp, New Delhi & (Edii), Ahmedabad 2001

Viswanadham N, Food and Retail Chains in India, ISAS Working Paper No. 15 – October 2006.

Estimating Marketing Efficiency of Major Horticultural Commodities in Coastal districts of West Bengal

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Estimating Marketing Efficiency of Major Horticultural Commodities under different supply chains in Coastal districts of West Bengal

1. INTRODUCTION

1.1. Background

The horticulture sector plays a significant role towards sustainable rural livelihoods in all farming systems including the marginal areas. The credibility of horticulture has been well established in improving productivity of land, generating employment, improving economic conditions of the farmers and entrepreneurs, enhancing exports and above all providing nutritional security to the people. 'West Bengal has a total geographical area of 8.88 million hectares. The population of the state is about 8.02 crores with a population density of 904 per sq. km. Around 30 percent of the state's income is derived from agriculture. Cropped area covers 5.47 million hectares with a cropping intensity of 174.4 percent. Only 35 percent of the 5.47 million hectares are irrigated'. West Bengal produces highest vegetables in India among all states. During 2007-08, the state produced more than 22 million tones of vegetables. Vegetables are grown quite extensively across all the districts but most extensively in and around the districts of Kolkata. In the coastal areas of Sundarbans of West Bengal, the land is mostly mono-cropped with rice during *kharif* season, and around 11percent of total gross cropped area is under vegetables cultivation. Out of which brinjal, bhindi and tomato occupy a major share in cropping pattern in this salt-affected soils. However, growing vegetables in these problematic soils are subjected to multifarious constraints (management as well as marketing), which pose as the major challenge to increase the area under vegetable crop in the area. Establishing and functioning of efficient marketing system may increase the area under vegetables and may ensure remunerative prices to the primary producers. Prevailing marketing systems of vegetables are not well organized. Therefore, present study was undertaken to analyse the prevailing marketing channels and the marketing efficiency therein Present study has been undertaken in three coastal districts of West Bengal, namely, South 24 Parganas, North 24 Parganas and East Midnapore.

West Bengal's coastal areas are situated in these three districts where growing vegetables are gaining popularities due to the readily available market in Kolkata. More than 2.45 million population of West Bengal is dependent on this costal area and 80 percent of which are engaged in agriculture and rest on fisheries. However, these livelihoods options under marginal

environment of coastal salinity are typically charcterised with multi-faceted problems such as low crop productivity and low returns. Growing suitable vegetables in these areas is a good option to improve the livelihood conditions of the farmers. These districts receive substantial rainfall during *kharif* season and suitable for growing a number of high-value vegetable crops despite being primarily rainfed. Functioning of efficient marketing system is essential to increase the area under vegetables and to ensure remunerative prices to the primary producers. Prevailing marketing systems of vegetables are not well organized and the producers' share in consumer rupee is substantially low. Therefore, systematic study is essential to analyse the prevailing marketing channels and the marketing efficiency. Agricultural marketing are now more liberated and private players have been allowed to participate actively and several innovations and alternative marketing systems are in place. This ongoing liberalization process and entry of private players to agricultural marketing have made the present study quite significant from the purview of strong opposition from within as well as opposition party in the state. The study endevoured to analyse the functioning of these innovations/organized retail marketing and whether there is any impact on marketing efficiency.

1.2. Policy research question

Whether or not the ongoing liberalization process in agricultural marketing system would improve the marketing efficiency

1. Corporatization through value addition has segmented the market and hence improved market efficiency.
2. Entry of corporate houses increases the farmers' share in consumer rupee and reduces their transaction cost.
3. Large farmers are taking more advantage in corporate market models.

1.3. Objectives of the study

1. To ***estimate*** the marketing cost and marketing margin of different functionaries for selected vegetables under various supply chains
2. To ***analyze*** the price spread, marketing efficiency and farmer's share in consumer rupee in various supply chains
3. To ***identify*** the constraints perceived by various stakeholders; and study the factors influencing the marketing cost, market margin and marketing efficiency
4. To ***suggest*** suitable strategies to enhance the marketing efficiency for vegetables in west Bengal

2. DATA AND METHODOLOGY

2.1. Study area

Present study was based on primary data collected from sample farmers through pre-structured and tested farm survey schedule. In some analysis relevant secondary data has also been used. In the study area marginal farmers are the most dominant (86 percent) category of farmers, followed by very few small farmers (12 percent). So, for data collection and analysis, no separate classification has been made for the farmers. Study has been conducted in three coastal districts of West Bengal, namely, South 24 Parganas, North 24 Parganas and East Midnapore**.**

2.2. Selection of crops

Based on the maximum area and production pattern in the study district, three vegetables, brinjal, bhindi (ladies finger) and tomato has been selected. Similarly, among flowers, marigold was most important and among fruits guava was most dominating crop in the study districts and therefore, were selected for the present study.

2.3. Sampling methods

Three districts of West Bengal, namely South 24 Parganas, North 24 Parganas and East Midnapore has been selected purposively complying with the objective of the study as 'Estimating Marketing Efficiency of Major Horticultural Commodities in Coastal districts of West Bengal' Based on the importance of crops in terms of maximum area and production pattern, 3 vegetables (brinjal, bhindi and tomato), one fruit crop (guava) and one flower (marigold) has been selected (**Table 1**). Since these vegetables are widely grown in these two districts across the blocks, therefore farmers have been selected randomly. However, commercially, growing of guava and marigold was concentrated in few blocks of these districts and therefore farmers were interviewed from the selected blocks only and purposive sampling method was followed to obtain adequate number of growers. Overall the data collection on production and marketing of these selected crops were obtained from the farmers distributed over 15 blocks of these three districts. These were, Bangaon, Baruipur, Bhangore, Budge budge, Canning I, II & III, Contai I, II & III, Kasipara, Magrahat II, Mathurapur II, Nonakhali, Ramnagar and Swarupnagar. To facilitate easy access for data collection, farmers were interviewed in various market places where they visited for selling their produce frequently. These were mainly rural or primary *haat*, wholesale market at block level or at wholesale market in Kolkata. Total sample size was 385 which includes farmers (272 no) and middlemen (113 no).

Out of the total farmers interviewed, 115 farmers were brinjal growers, followed by bhindi, (65 farmers) tomato (53 farmers), guava (56 farmers) and marigold (35 farmers). Beside, various wholesale markets in Kolkata, such as Nafar Babur Bazar, Math Pukur Bazar, Bantala Market (for vegetables), Mechua Fal Patty, Baruipur Kachari Bazaar (for guava) and Mullick Ghat Ful Bazaar (for marigold) have been surveyed in detail.

Table: 1. Sampling size and composition

Sl no	Commodity/Item	No of sample
1.	No of farmers interviewed	272
2.	No of middlemen interviewed	113
3.	Total Sample size	385
4.	Item-wise break-up	
(i)	Brinjal	115
(ii)	Bhindi	65
(iii)	Tomato	53
(iv)	Guava	56
(v)	Marigold	35

2.4. Units of Calculation

For computing cost, returns on operational holdings standard units have been followed for brinjal, bhindi and tomato cultivation such as Rs/q, Rs/ha or ha (hectare) etc. But marketing system for guava and marigold is strikingly different from the vegetables marketing. For example guava is most commonly sold in numbers and the fruits are traded in a group of 20 numbers by farmers and further it moves for one intermediary to the next intermediaries in term of number only. Finally, it reaches to consumer either as number or in weight basis. Thus, the estimation of marketing cost, marketing margins etc. has been made in terms of Rs./1000 no of fruit for guava. For marigold also the most common way of trading is though making of garlands (around 4 ft length) and selling in a bunch of 20 such garlands (=1 *kuri*) together. Therefore the

'unit' for marigold trading has been considered as per 100 no of garlands' or no of '*kuri*' of garlands. Purchasing and selling of guava and marigold are commonly done based on these units i.e. 20 nos of guava or 20 nos of garland as a bunch. In various secondary sources, the unit for guava and marigold are reported in terms of kg or in terms of number also.

2.5. Financial feasibility analysis for Guava

Guava is a plantation crop which starts bearing fruits after certain gestation period and continues throughout its economic life. Under present analysis the economic life has been considered to be a 10 years. After eight year of plantation guava fruiting decline steadily and beyond 10 years the plants become non-economic and requires replacement. For analysis financial viability, undiscounted measures, payback period and discounted measures such as Internal Rate of Return (IRR), Net Present Value (NPV) and Benefit Cost Ratio (BCR) has been computed following the standard methodology. For discounting, 14 percent rate has been applied which is the maximum interest charge by the bankers for any agricultural loan in the study area and this rate is sufficient to take care the time value of money and to cover the inflation or risk of investment during the economic life. The financial viability analysis has been computed with the assumption of constant prices i.e. input and output prices are expected to change in same magnitude. Other important assumption were,

i) First year of plantation is considered to be the planning period, only initial investment is made and no return is realized,
ii) Full benefit realized from 3rd year onwards and fruiting declines after eighth year of plantation and plants are required to be replaced.

2.6. Analytical Framework / Statistical technique

2.6.1. Factors affecting marketing efficiency

In view of analyzing various factors influencing the marketing efficiency of producers, Multiple Linear Regression Model has been employed. Marketing efficiency for individual farmers have been calculated as

$ME_i = NMM_i + MC_i$

Where ME_i = Marketing efficiency of i^{th} farmer

NMM_i = Net Marketing Margins of i^{th} farmer

MC_i = Marketing Cost incurred by i^{th} farmer

CP = Consumers price

This marketing efficiency is expected to be affected by various factors such as total marketing cost (incurred by different intermediaries during entire marketing channels), total marketing margins realized by different market intermediaries, prevailing open market prices, presence of controlling middlemen, quantity or volume handled, presence of cold storage service, length of marketing channel, perish ability and the season of production. The Multiple Line Regression is specified as below.

$$ME_i = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + e_i$$

Where,

a = Constant

b_1…….b_9 Various regression parameters to be estimated

X_1 Marketing cost (Rs/q) for brinjal, bhindi or tomato Rs/1000 guava or Rs/100 unit (or *kuri* where 1 *kuri* = 20 no) of garlands of marigold.

X_2 Marketing margins (units are same as mentioned in X_1)

X_3 Open market price (units are same as mentioned in X_1)

X_4 Presence of controlling middlemen, taken as a dummy variable, if present = 1, 0 otherwise

X_5 Volume handled (in q for brinjal, bhindi & tomato, in numbers for guava and in no. of garlands for marigold)

X_6 Presence of clod storage service (taken as dummy variable , if present=1,0 otherwise

X_7 Length of marketing channel (taken as no of middlemen or market functionaries present in the marketing channel)

X_8 Perish ability (taken as dummy variable 1= highly perishable, 0 otherwise)

X_9 Summer season (taken as dummy variable, it grown in summer season = 1, 0 otherwise)

The marketing channels are not permanent in nature and changes across the season. Production as well as marketing and thus marketing efficiency is also strikingly different for the commodities grown and marketed during different season. So, the dummy variable for summer season has been included in the regression model particularly for the vegetables (brinjal, bhindi and tomato).

To compute the regression estimate step-wise regression analysis has been employed with large number of independent variables and only relevant variable were retained in the estimated regression model. Some variables were important for marketing efficiency of vegetables marketing but the same were superfluous for functional analysis of other commodities, and those variables were excluded from the regression model to obtain the best-fit model.

2.7. Constraints analysis through Garrett Ranking

Constraints analysis was done through computing Garrett rank for the constraints faced by farmers as well middlemen. List of various constraints was prepared after details discussion with the farmers and middlemen. Then farmers or middlemen were asked to assign rank to these constraints during personal interview. Based on the rank assigned by farmers or middlemen, constraints have been prioritized through computing Garrett rank following standard procedure and with the help of Garrett table.

3. RESULTS AND DISCUSSION

3.1. Marketing of vegetables/fruits/flowers

Majority of the farmers in the study area belongs to the marginal farmers and they are producing the selected commodities in a small scale. However, these commodities are primarily grown for selling to the market rather for home consumption. So, the marketable surplus of these cash crops is usually much higher than the staple crops. Average marketable surplus has been estimated to be 90 percent fir brinjal and the same was 81 percent for bhindi, 92 percent for tomato, 95 percent for guava and 96 percent marigold. Almost entire produce of guava and marigold are produced to sell to the market. The marketable surplus has been estimated after deducting the quantity lose/damaged during harvesting or post-harvest handling.

3.2. Market intermediaries and their function

After harvesting of crops, the produce are brought in the market by farmers or the village level traders collect the produce and used to bring in the market. First interaction point between farmers and traders occurred at primary market or village level market. Various primary market or *'haat'* operates during specific time of the day or specific time in weekly or weekly basis. Farmers sell their produce to the traders called *'fariah'* who are usually the first middlemen functioning in the market (**Table 2**). They collect the produce from different farmers through direct bargaining from the farmers. However most commonly farmers used to bring their produce to the commission agent called *'arhatdar'* in the market and they arrange the auction for selling of the produce. After inspecting quality of produce traders (*fariah*) offer bidding price and based on the maximum bid the produce is sold. Commission agent charges for this function either through cash payment or keeping some quantity of produce which various from produce to produce and also market to market. It has been estimated, in terms of value the commission agent charges around 5-7 percent of the total value of the produce sold. Key intermediate functionaries in the marketing include farmers, village traders (*fariah*)/ middlemen – wholesaler – retailer and consumer. Primary grading and standardization is done by farmers and second time the grading, standardization is made by the traders before the produce goes to wholesale market. Functions of various intermediaries are summarized in table below.

Table 2. Major market intermediaries and their key functions

Intermediaries	Primary Function
Producer	Primary grading, standardization, bring produce to the market.
Middlemen (*fariah*)	Collection of produce from farmers, grading, packing. Purchase produce either directly from producer or through commission agent (*arahtdar*). Also takes produce to wholesale market.
Commission agent	Arrange interaction between farmers and traders for auction/selling of produce.
Wholesaler	Purchase produce from middlemen and sell the produce to retailer through some person employed by him
Retailer	Sells produce to consumer.
Contractor	Sometime wholesaler tie up with the contractor to bring the produce from far away/different market or sending the produce to faraway market depending on the demand for the produce in the market

3.3. Supply chain/ marketing channel

Marketing channels are the flow of produce from producer to final consumer. No marketing channels are permanent in nature. The agricultural commodities reach to final consumer in various channels depending on the season and price movement in the market. One marketing channel may be dominating in summer season and the same may

not be so important during winter season. For example, during summer tomato in Kolkata market used to come from Bangalore market whereas during winter season that supply chain become insignificant because during winter tomato is supplied by the local farmers in West Bengal. However, based on the detail discussion with the farmers, traders, wholesalers and contractor few important marketing channels for each selected crops have been identified and also approximate volume of transaction has been reported.

Brinjal and bhindi are marketed through same marketing channels, in the study area. Marketing channels for tomato are frequently changing depending on season and local supply. Tomato is marketed through more number of marketing channels and also passes through more long channels as compared to other vegetables under study (brinjal & bhindi).

- Producer – *Fariah* (Assembler) – Wholesaler – Retailer - Consumer….55 %
- Producer –*Fariah* (Assembler) –Retailer – Consumer ……20 %p
- Producer –Retailer – Consumer

- Producer – commission agents – supermarket - consumer
- Producer – *Fariah* (Assembler) – Wholesaler – Middleman – Retailer - Consumer

Major marketing Channel for tomato

- Producer - *Fariah* - Wholesale market - Commision agent- Retailer – Consumer ….10percent (during winter increases > 80 %)
- Bangalore market-Wholesale market - Commission agent – *Fariah* - Retailer – Consumer … 70 % (during summer only)
- Bangalore market -Wholesale market – Commission agent – Retailer – Consumer (around 5 percent)
- Producer – Consumer (less than 1 percent)

Dominating marketing channels for guava is shorter in length because it has to reach to final consumer as quick as possible after harvesting to fetch better prices. Guava looses its flavour, vigor glossiness, freshness and taste very quickly.

- Producer – *Fariah* –Wholesale fruit market (Kolkata) – Retailer– Consumer… 60%
- Producer – *Fariah* – Wholesale fruit market (Kolkata) – Commission agent - Retailer – Consumer …..25 %
- Producer – *Fariah* (Assembler) – Middleman - Distant market wholesaler (Orissa, Digha) – Retailer – Consumer
- Producer – Retailer – Consumer
- Producer – Commission agent – Distant market wholesaler - - Retailer – Consumer

Like guava, marigold is also highly perishable and requires quick disposal after harvesting. It has to reach to final consumer in quickest possible time, preferably within a day to realize better prices. However, some good quality of marigold flowers was being exported to distant markets like in Nepal, Bangladesh or in other states of India. Majority of marigold and guava are marketed through wholesale marketing, Mullick Ghat Ful Bazar, and Machna Ful Patty of Kolkata, respectively.

- Producer – *Fariah* – Wholesaler – Retailer - Consumer (30 %)
- Producer – *Fariah* – Wholesaler – Commission agent – Retailer – Consumer (30 %)
- Producer – *Fariah* – Wholsaler – Retailer – Consumer (20 %)
- Producer – Retailer – Consumer (less than 1 percent)
- Producer – *Fariah* – Wholeseller – Commission agent – Distant market wholesaler (Bihar, Orissa, Bangalore, Mumbai, Nepal, Bangladesh etc) – Retailer – Consumer

3.4. Marketing Cost

Marketing costs are incurred by the various functionaries in the market starting from farmers, middlemen, wholesalers and retailer. Marketing cost for farmers includes sorting, packing (mostly packed in gunny bags or in basket) transportation and others (eg. loading, unloading, bribing or paying fees for undisclosed reason). Marketing cost for brinjal incurred by farmers has been calculated to be Rs. 80/q, and the same was Rs. 70/q for bhindi, Rs. 90/q for tomato, Rs. 105/ 1000 no. of guava and Rs. 110/100 no. of garlands (**Table 3**).

Table 3. Estimation of marketing costs and marketing margin for selected commodities

Item	Brinjal	Bhindi	Tomato	Guava	Marigold
	Price/Cost (Rs/Q)	Price/Cost (Rs/Q)	Price/Cost (Rs/Q)	Price/Cost (Rs/1000 no)	Price/Cost (Rs/100 unit (*kuri**) of garlands)
Marketing cost					
Producer	80 (24)	70 (21)	90 (26)	105 (25)	110 (31)
Assembler/Trader	140 (42)	145 (44)	145 (42)	205 (49)	150 (42)
Wholesaler	80 (24)	80 (24)	80 (23)	70 (17)	70 (19)
Retailers	35 (10)	35 (11)	30 (9)	35 (8)	30 (8)
Total marketing cost	**335 (100)**	**330 (100)**	**345 (100)**	**415 (100)**	**360 (100)**
Marketing margin					
Producer	290 (29)	188 (24)	94 (11)	463 (41)	1908 (43)
Assembler/Trader	250 (25)	200 (26)	250 (28)	275 (24)	1000 (22)
Wholesaler	200 (20)	1510 (19)	250 (28)	150 (13)	750 (17)
Retailer	250 (25)	240 (31)	300 (34)	250 (22)	800 (18)
Total marketing margin	**990 (100)**	**778 (100)**	**894 (100)**	**1138 (100)**	**4458 (100)**

Note: Figures in parentheses indicates percent to respective total, 1 *kuri* = 20 no

Similarly, average marketing cost incurred by assembly traders or *fariah* has been calculated to be Rs. 140/q for brinjal, Rs. 145/q for bhindi, Rs. 145/ for tomato Rs. 205/1000 no. of guava and Rs. 150/100 no. of garland of marigold. Wholesale marketing cost includes cost of transportation mainly loading and unloading and the marketing cost is Rs. 80/q for brinjal, bhindi and tomato, and Rs. 70/100 no. of guava

and Rs. 70/100 nos. of garlands usually the middleman brings the produce in the market packed in large size basket or gunny bag and retailer used to purchase the commodities directly from them in multiple of 5 kg quality (called 'palla'). In case of transportation distant market the produce is sent in the large size package or in boxes. But these selected commodities all mostly traded within the local market state or nearby states only Orisa, Jharkhand, or Bihar). Retailer's cost of marketing cost has been calculated as Rs. 30-35/q for vegetables and Rs. 35/1000 no. of guava and Rs. 30/100 unit (*kuri*) of garlands. Usually retailer purchases these commodities from their nearest wholesale market or directly from the farmers or middlemen, thus the transportation cost is the only cost incurred by them. Total marketing cost included by all market intermediaries/ functionaries has been calculated to be Rs. 335/q for brinjal, Rs. 330/q for bhindi, Rs. 345/1000 no. of guava and Rs. 360/100 unit (*kuri*) of garlands. In terms of percent share to total marketing cost for brinjal has been estimated to be 18 percent of final consumers' price. Similarly, for bhindi the marketing cost was calculated to be 23 percent for guava 21 percent and for marigold 5 percent to the final consumer's price.

3.5. Marketing Margins

Marketing margins are the net profit by the market functionaries/ intermediaries and has been calculated by deducting the marketing cost incurred by particular intermediaries from actual price paid by him. For farmers the margin has been calculated by deducting the production cost plus marketing cost from the price received by him.

Total marketing margin has been calculated to be Rs. 990/q for brinjal marketing, and the same was Rs. 778/q for bhindi, Rs. 894/q for tomato, Rs. 1138/1000 no. of guava and Rs. 4458/100 unit (*kuri*) of garlands (**Table 4**). In regards to brinjal marketing 29 percent of the total marketing margin was received by the producer followed by Assembler (25 percent), retailer(25 percent) and wholesalers (20 percent). Under bhindi marketing 31 percent of the total marketing margin was received by the retailer followed by assembler (26 percent), producer (24 percent) and wholesaler (19 percent). Under tomato marketing major marketing margin was shared by retailer (34 percent), followed by wholesaler & assembler (28 percent) and least by the producer (11 percent), It was the general observation for vegetables marketing that as the open market prices rises intermediaries like wholesaler, retailer or assembler enjoyed larger marketing margins than as compared to the producer. In other words high open market prices increases the

margin for all intermediaries in a greater magnitude as compared to farmers' margins. This situation prevails under highly price volatile market situation; such was the case of tomato marketing during 2009. In case of guava marketing margins of producers was accounted for 41 percent of the total market margins, followed by assembler (24 percent), retailer (22 percent) and wholesaler (13 percent).

Table 4. Details of marketing cost and marketing margins across different market intermediaries/functionaries

Item/commodities	**Brinjal**	**Bhindi**	**Tomato**	**Guava**	**Marigold**
	Price/Cost (Rs/Q)	Price/Cost (Rs/Q)	Price/Cost (Rs/Q)	Price/Cost (Rs/1000 no)	Price/Cost (Rs/100 unit (*kuri*) of garlands)
Production cost	**530**	**342**	**316**	**432**	**2482**
Farmers					
+sorting	10	10	20	30	20
+packing	15	15	15	10	20
+transport	45	45	45	50	50
+others	10	10	10	15	20
Total marketing cost (incurred by farmers)	80	70	90	105	110
Producers' price	**900 (49)**	**600 (41)**	**500 (32)**	**1000 (50)**	**4500 (62)**
Producers' Net Price	820	530	410	895	4390
Farmers' margin	290	188	94	463	1908
Assembly traders (*Fariah* or middleman)					

+sorting	30	35	30	40	0
+packing	30	30	30	45	20
+storage	0	0	0	0	0
+transport	40	40	45	80	100
Market fee	40	40	40	40	30
Total marketing cost (incurred by assembly traders or *fariah*)	140	145	145	205	150
Marketing margin	250	200	250	275	1000
Assembly traders selling price to wholeseller	**1290 (70)**	**945 (65)**	**895 (58)**	**1480 (75)**	**5650 (77)**
Wholesalers					
+transport	80	80	80	100	70
+packing	0	0	0	0	0
Total marketing cost (incurred by wholesaler)	80	80	80	70	70
Marketing margin	200	150	250	150	750
Wholesaler price to retailer	**1570 (85)**	**1175 (81)**	**1225 (79)**	**1700 (86)**	**6470 (89)**
Retailer					
+transport	35	35	30	35	30
+marketing margin	250	240	300	250	800
Retailers price to	**1855 (100)**	**1450 (100)**	**1555 (100)**	**1985 (100)**	**7300 (100)**

consumer					
Total marketing cost (farmers - consumers)	**335 (18)**	**330 (23)**	**345 (22)**	**415 (21)**	**360 (5)**

Note: Figures in parentheses indicates percent to consumer's price (retail price), 1 *kuri* = 20 no.

Similarly for marigold marketing farmers' share in total marketing margin was 43 percent and the same was 22 percent for assembler, 18 percent for retailer and 17 percent for wholesaler. Farmers relatively receive higher marketing margins for guava and marigold and thus the area under these crops are gradually increasing over the period of time in the study area. However, it is to mention here that commodities with higher market margins are also embodied with higher marketing risk particularly during the market glut situation or when the supply increases from other places around the states or country.

3.6. Price spread

Price spread has been calculated as the difference between the absolute prices received by farmers and the price paid by the consumers for a particular commodity. Magnitude of price spread among various marketing channels of same commodities indicates the market efficiency. Higher the price spread less is the marketing efficiency. In the present study the price spread of the selected commodities has been estimated for the most dominating marketing channels only, thus the comparison among the price spread under different marketing channel was not possible. For brinjal the price spread (Consumers' price – producers' price) has been calculated to be Rs. 955/q, and the same is Rs. 850/q for bhindi, Rs. 1055/q for tomato, Rs. 985/1000 no for guava, and Rs. 2800/100 unit (*kuri*) for marigold marketing (**Table 5**).

Table 5. Estimation of price spread of selected commodities

Item	Brinjal	Bhindi	Tomato	Guava	Marigold
Producers' price (Rs)	900	600	500	1000	4500
Consumers' price (Rs)	1855	1450	1555	1985	7300
Price spread	955	850	26	985	2800

3.7. Producers' share in consumer rupee

Producers share in consumers' rupee is an important criterion to judge how efficiently the producers are being marketed in the marketing channel. Higher is the producer's share in the consumers' price implied higher is the market efficiency. Under the present study, in case of brinjal the producers' share in the consumers' price was estimated to be 44 percent and the same was 37 percent under bhindi, 26 percent under tomato, 45 percent under guava and 60 percent under marigold (**Table 6**). This indicates that producers are receiving better price while marketing marigold and receiving lowest price in case of tomato marketing. The reason being the length marketing channel under tomato is much larger than the other selected commodities. Also the open market prices become more volatile the better prices are shared by the intermediaries but not transferred to the producers in same magnitude.

Table 6. Estimation of producers' share in consumer rupee

Item	Brinjal	Bhindi	Tomato	Guava	Marigold
Producers' price (Rs)	900	600	500	1000	4500
Net producers' price (Rs)	820	530	410	895	4390
Consumers' price (Rs)	1855	1450	1555	1985	7300
Producers' price in consumers' rupee (percent)	44	37	1555	45	60

3.8. Marketing efficiency

Marketing efficiency of the selected commodities has been estimated by following Acharyas modified method as well as shepherd formula. Under Acharyas modified formula net price received by the farmers has been calculated by deducting transportation cost plus value of loss incurred by farmers (while transportation of commodities to the market) from the absolute price received by the farmers. Estimated marketing efficiency is an index and as the index value is high, more is the market efficiency. The marketing efficiency has been estimated as 0.79 under brinjal, 0.58 for guava and 1.51 for marigold marketing (**Table 7**). In terms of marketing efficiency the marigold marketing has been observed to be most efficient while the tomato marketing efficiency can be termed as poor. However this marketing efficiency is also various widely even within a day and the index value is an indicative, not an absolute way to judge the marketing efficiency. Similar result was obtained while calculating the marketing efficiency by employing shepherd's formula. The marketing efficiency index was calculated as 1.79 for brinjal, 158 for bhindi, 1.36 for tomato, 1.82 for guava and 2.51 for marigold (**Table 8**).

Table 7. Estimation of marketing efficiency* of major marketing channel

Particular/Commodities	Brinjal	Bhindi	Tomato	Guava	Marigold
Price received by farmers (FP)	900	600	500	1000	4500
Net Price received by farmers (NP)	820	530	410	895	4390
Marketing cost (MC)	335	330	345	415	360
Marketing Margin (MM)	700	590	800	675	2550
Marketing Efficiency (FP/(MC+MM)	0.79	0.58	0.36	0.82	1.51

*Acharya's modified method

Marketing efficiency has been estimated for most common marketing channel, P-M-W-R-C

Table 8. Estimation of marketing efficiency* of most important marketing channel

Particular/Commodities	Brinjal	Bhindi	Tomato	Guava	Marigold
Value of goods or consumer price (V)	1855	1450	1555	1985	7300
Total marketing cost (MC)	335	330	345	415	360
Marketing Margin (MM)	700	590	800	675	2550
Marketing Efficiency (V/(MC+MM)	1.79	1.58	1.36	1.82	2.51
*Shepherd formula					

3.9. Factors affecting marketing efficiency of vegetables marketing

Factors affecting the marketing efficiency have been estimated by employing linear multiple regression model where marketing as dependent variables (response function) and several relevant variable have been included in the model as independent variable. Since various factor affecting the marketing efficiency of brinjal, bhindi and tomato were quite similar, the functional analysis for these vegetable have been done after pooling all the data pertains to vegetables.

The R-square value of the regression model indicated that around 73 percent variation in marketing efficiency has been explained by the independent variables included in the model. Thus the model can be considered as a good fit (**Table 9**). Independent variables included in the model were marketing cost (Rs./q), marketing margins (Rs/q), open market price (Rs/q), presence of controlling middleman (as dummy variable), volume of produce handled (q), presence of cold storage service (as dummy variable), length of marketing channel (no of market functionaries involves) perish ability (as dummy variable), and as summer season (as dummy variable). Estimated regression co-efficient variable for independent variables, open market price and volume of produce handled were observed to be significant and positive. This implied that as the open market prices and volume of produce handled increases the marketing efficiency was also likely in

increase. While the variables such as marketing margins presence of controlling middlemen and length of marketing channels were observed to have significant negative contribution towards marketing efficiency. This implied that as the length of marketing channel increases marketing efficiency declines. Similarly presence of controlling middlemen reduces the marketing efficiency significantly. It was notable that presence of cold storage and perish ability nature of vegetables were observed to be non-significant variables indicating that presence of clod storage nor perish ability were effecting the marketing efficiency significantly. The reason might be that these vegetables are produced in a small scale and due to their high perish ability nature, these are quickly marketed and therefore farmers or traders were not dependent on presence of cold storage in the area. Since summer is relatively off-season for vegetable cultivation in West Bengal, and thus marketing and marketing efficiencies are assumed to be strikingly different from winter season, which is the main season for vegetable production. The beta co-efficient of the dummy variable for summer season was estimated to be negative and significant. The reason being during summer season the vegetables prices are usually very high and most of the marketing margins are enjoyed by the market intermediaries, therefore, the marketing efficiencies of farmers remains to be low even though the profitability of growing vegetables during summer season are more. Usually, during short supply of vegetables benefits of realisation of higher market prices are not equally percolated to the farmers, rather other market functionaries enjoy major margins. In contrast during winter season the farmers are affected by lower prices and the price-risk is passed on to the farmers rather than sharing the burden.

Table 9. Determinants of factors affecting marketing efficiency in marketing of vegetables in West Bengal

S no	Particulars	Co-efficient	Standard Error	't' value
1	Constant	0.767***	0.0240	3.1958
2	Marketing Cost	-0.0020	0.0015	-1.3407
3	Marketing Margins	0.0077**	0.0032	2.4059
4	Open market price	0.0069**	0.0035	1.9846
5	Presence of controlling middlemen	-0.0077*	0.0041	-1.8827
6	Volume handled	0.0038***	0.008	4.7150
7	Presence of cold storage service	-0.0142	0.0090	-1.5822
8	Length of marketing channel	-0.0066*	0.0039	-1.6987
9	Pershability	-0.0014	0.0090	-0.1537
10	Summer season	-0.0078**	0.0032	-2.4503
11	R square	0.729		
12	Adjusted R square	0.613		
13	No of observation (N)	138		

3.10. Factors affecting marketing efficiency of guava marketing

To analyse factors affecting marketing efficiency, multiple linear regression model was employed. The R square value was estimated to be 0.83 implying that 83 percent variation in marketing efficiency of guava marketing was explained by the independent variables included in the model and rest of the variation and the model can be considered as a good fit (**Table 10)**. Regression co-efficient for the variables, open market price was estimated to be positive and significant, implying that as the open market price increases

the marketing efficiency was also likely to enhance. Marketing cost and length of marketing channels were observed to be affecting marketing efficiency significantly with negative co-efficient indicating that as the marketing cost or length of marketing channel increases, the marketing efficiency is likely to decline. It was notable that total marketing efficiency of guava marketing was not significantly affected by the variables, marketing margins, and presence of controlling middlemen or volume handled by the producers. Price of guava depends on quality, colour and flavour and the volume of produce was not affecting the level of price receipt by the farmers.

Table 10. Determinants of factors affecting marketing efficiency in marketing of Guava in West Bengal

S no	Particulars	Co-efficient	Standard Error	't' value
1	Constant	0.295***	0.110	2.677
2	Marketing Cost	-0.002***	0.001	-2.010
3	Marketing Margins	-0.003	0.004	-0.751
4	Open market price	0.0055***	0.001	5.500
5	Presence of controlling middlemen	0.0012	0.053	-0.227
6	Volume handled	-0.0013	.001	-1.310
7	Length of marketing channel	-0.047***	0.016	-2.93
8	R square	0.827		
9	Adjusted R square	0.786		
10	No of observation (N)	56		

Note: All cost and returns are in Rs/1000 no of Guava

3.11. Factors affecting marketing efficiency of marigold marketing

As like the vegetables and guava marketing, functional analysis also has been employed to identify various factors affecting the marketing efficiency of marigold marketing in the study area. The estimated R square value indicated that around 80 percent of the variation in marketing efficiency has been explained by the explanatory variables included in the model and rest of the

variation is due to error factor (**Table 11)**. Considering the R square value the model can be termed as a good fit. The estimated regression parameters for variables, marketing margin and presence of controlling middlemen were estimated to be significant with negative sign, implying that these variables would affect the marketing efficiency adversely. As the marketing margins increased or more number of controlling middlemen exists, the marketing efficiency is likely to decline. The volume of handling of marigold was estimated to have positive and significant implication on marketing efficiency. This indicated that as the producer would handle more volume of marigold, their marketing efficiency also likely to improve. However, most of the producer in the study area are producing in a smaller quantity individually, thus the advantage of handling large volume is restricted. It was notable in the regression results that the variables marketing cost length of marketing channel were influencing the marketing efficiency positively but the estimated parameter was not statistically significant. Similarly, open market price of the marigold was having efficiency but the estimate was not statistically significant.

Table 11. Determinants of factors affecting marketing efficiency in marketing of Marigold in West Bengal

S no	Particulars	Co-efficient	Standard Error	't' value
1	Constant	1.022***	0.212	4.816
2	Marketing Cost	-0.0018	0.100	-0.216
3	Marketing Margins	-0.0018***	0.004	-4.174
4	Open market price	0.0014	0.251	0.553
5	Presence of controlling middlemen	-0.0055**	0.0014	3.92
6	Volume handled	0.0019*	0.113	2.316
7	Length of marketing channel	-0.112	0.044	-2.551
8	R square	0.801		
9	Adjusted R square	0.712		
10	No of observation (N)	35		

Note: All cost and returns are in Rs/100 units (kuri) of garlands, 1 kuri = 20 no of garlands.

4. CONSTRAINT ANALYSIS

Constraint analysis in marketing of produce by farmers as well as middlemen was analyzed through computing Garrett ranking of various constraints. Detail discussion was held with the farmers and list of important constraints was prepared. Individually, farmers were asked to rank these constraints. Based on this rank, finally, Garrett rank has been computed to priorities the constraints faced by the farmers. Same procedure has been followed for identification and prioritization of constraints in marketing of agricultural produce, faced by middleman also. In the result tables both rank i.e. rank based on percentage as well as computed following Garrett's formula, have been reported.

4.1. Constraints faced by the producer

The constraints analysis indicated that high cost of production (due to escalation of input cost) is the most important constraints faced by the farmers to enhance their production and in turn the marketable surplus of the produce (**Table 12**). Poor transportation facilities, occasional market glut situation during peak season, lack of remunerative price (very often) and intra-day price variation (price uncertainty) were the other most important constraints faced by the farmers in marketing of their produce. Due to the small scale of production, farmers lack any bargaining power of their produce and poor transportation facilities increases their marketing cost and reduces receipt of remunerative prices. Establishing better market linkages between farmers to market would likely to promote marketing farmers marketing margins substantially. In fact due to these constraints most of the production area are skewed to 5-6 km radius of the market yard only, even though the favourable conditions for growing these commodities prevails in other areas also. Marketing of guava and marigold is required very quick disposal due to their high perishable nature and therefore, productions of these crops are skewed only in few pockets where farmers and markets are better linked. Other important constraints encountered by the farmers are lack of knowledge of grading and sorting, presence of exploitative middlemen, delay in payment, scarcity of labour, difficulty in selling produce with relatively lower reality, lack of adequate cold storage facilities, lack of technical know-how and lack of crop insurance coverage and awareness about the crop insurance.

Table 12. Constraints perceived by the farmers in marketing of Fruits and Vegetables in West Bengal

Sl no	Constraints	Rank (based on maximum percent of respondents)	Garette Ranking
1	High cost of production due to high input cost	1	1
2	Scarcity of labourers	9	9
3	Poor transportation facilities	2	2
4	Delay in payment	10	8
5	Lack of remunerative price	3	4
6	Presence of exploitative middlemen	5	7
7	Market glut during peak season	4	3
8	Practice of bribing while transportation via train	14	14
9	Difficulty in selling of produce with relatively lower quality	8	10
10	Intra-day market price variation	6	5
11	Lack of knowledge of grading and sorting	7	6
12	Lack of technical know how	11	12
13	Lack of insurance	14	13
14	Lack of adequate cold storage facility	13	11

It was notable while discussion with the farmers that even with the existing high production risk (particularly under poor quality of soil & water environment), farmers were not realizing insurance as an important instrument for risk mitigation. The reason being either these crops are not covered under the insurance scheme or farmers feel that the paying of insurance premium is an added cost. There is a need to popularize crop

insurance scheme and also to bring more number of crops under this scheme to reduce the risk. Recently contract farming is gaining popularity among the farmers in some pockets for some particular crop (e.g. Potato). However, formal contract farming for the selected crops in the study area was almost nil.

4.2. Constraints faced by the middleman

Like farmers, also middlemen face primary constraints as poor transportation facilities. Village trader or first middlemen in marketing of these selected commodities plays very important role through collection of tiny marketable surplus from the small-scale producer and selling it to the wholesale market. Middlemen perceived risk of timely disposal was another important constraint in marketing of these produce (**Table 13)**. Various important constraints faced by these middlemen are post harvest losses during transportation, market glut during peak season, lack of basic facilities in the market yard, intra-day price variation, scarcity of labourers, delay in payment, high market fees and practice in bribing while transportation via train or road transport. Village trader or first middlemen are playing very important role particularly in view of the small-scale of production and tiny marketable surplus of the producer, because marketing of these small quantity by individual farmers may not be so remunerative. But very often farmers were not aware of open market price or middlemen offers low prices and the farmers are forced to sell their produce once the produce are harvested or brought in the market. Middlemen offers prices based on the volume of produce arrived in that local market/village market in a particular day but not on the basis of open market prices available in wholesale market, which results in often exploitation of farmers. Middlemen are also not sure about the selling price of the purchased commodities at wholesale market (because similar commodities are brought by other middlemen from other local markets also) and rely on speculative marketing and sometime bear the risk of low prices also.

Table 13. Constraints perceived by the middlemen in marketing of Fruits and Vegetables in West Bengal

Sl no	Constraints	Rank (based on maximum percent of respondents)	Garrett Ranking
1	Post harvest losses during transportation	4	3
2	Scarcity of labourers	6	7
3	Poor transportation facilities	1	1
4	Delay in payment	9	8
5	Risk of timely disposal of commodities	2	2
6	High market fees	10	9
7	Lack of basic facilities in the market yard	7	5
8	Market glut during peak season	3	4
9	Practice of bribing while transportation via train	8	10
10	Intra-day market price variation	5	6

5. SUGGESTION TO IMPROVE MARKETING EFFICIENCY

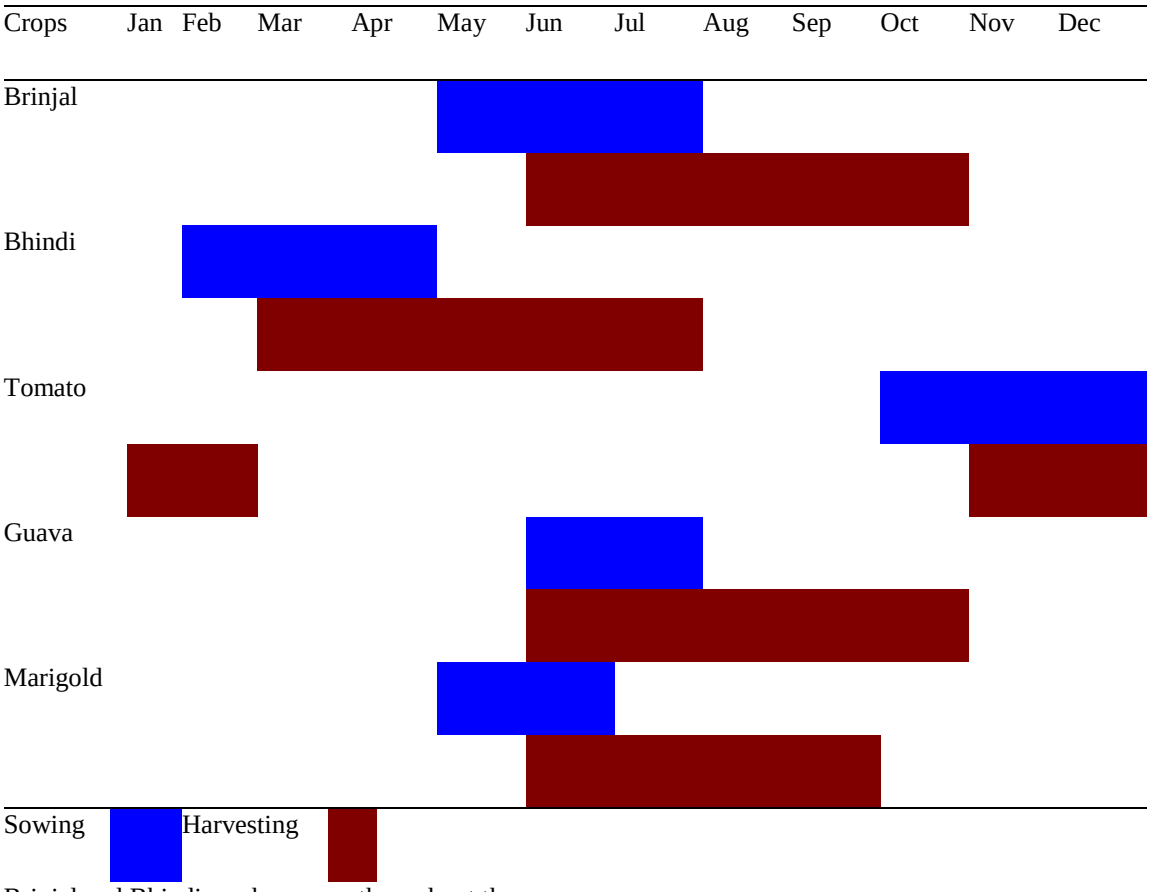
Marketing efficiency of marketing of selected commodities can be increased significantly with certain intervention such as 1) up-scaling of the volume of produce handled, either through increase in production or through formation of self-help groups or formation of grower's association so that farmers' marketing cost reduces. 2) Improving the market functioning system particularly transparency on commission charged, 3) Integration among various markets through better transportation facilities and approach road to reduce the transportation cost. 4) Regular timely inflow of information to farmers about the prevailing wholesale market prices of commodities. 5) Providing market intelligence support to the farmers particularly on the time to grow certain crops and making availability of suitable seed/variety for crops. 6) Basic

infrastructure in the market yard should be improved in a greater way so that interaction between large number of farmers and traders can be made freely. 7) Government regulation should be enforced for free and fair marketing practices and free entry of a number of organized retailers in the market. Implementation of Agricultural Produce and Marketing Act (APMC Act) would be one of the option for better, free and fair marketing practices provided organized retailers are allowed to purchase produce directly from farmers across the districts. 8) Appropriate price discovery of the produce in the market was the most important issue to facilitate improved marketing efficiency and providing farmers a better deal. Suitable institutional change may be made such as commissioning an arbitrator or personnel to ensure better prices to the farmers.

6. PRICE MOVEMENT AT WHOLESALE MARKET

Agricultural commodity prices vary widely across the season, months, weeks, days and even within a day across the hours. Quantity of arrival of selected produce is the most important factor for price determination in the wholesale market. The primary season of sowing and harvesting of the selected crops are presented in **Table 14**. To analyze the price movement of selected commodities details of arrivals (kg) and modal prices (Rs/q) were analyzed at fortnight interval at Baruipur market (Canning). This is the most important wholesale market in the study area and also the information on price and arrivals were available on daily basis. As expected the relationship between model prices and arrival quantity of selected commodities, were negative indicating larger the arrival less was the modal prices. Market arrival quantity of brinjal was hovering around 15-20 q/day during May to July, and after that market arrivals jumped to over 35-40 q/day (**Fig. 1**). In contrast the price movement was opposite to market arrival and comparatively low prices prevail during August to first fortnight of October.

Table 14. Sowing and harvesting period of selected crops in the study area



Brinjal and Bhindi can be grown throughout the year

Similar trend was observed for bhindi, market arrival was hovering around 20-25 q/day during second fortnight of May to second fortnight of July. Quantity of market arrival jumped during August to October and was hovering around 30-40 q/day. The price movement was just reverse of market arrival but the prices were more or less varying between Rs. 10-15/ kg (**Fig 2**).

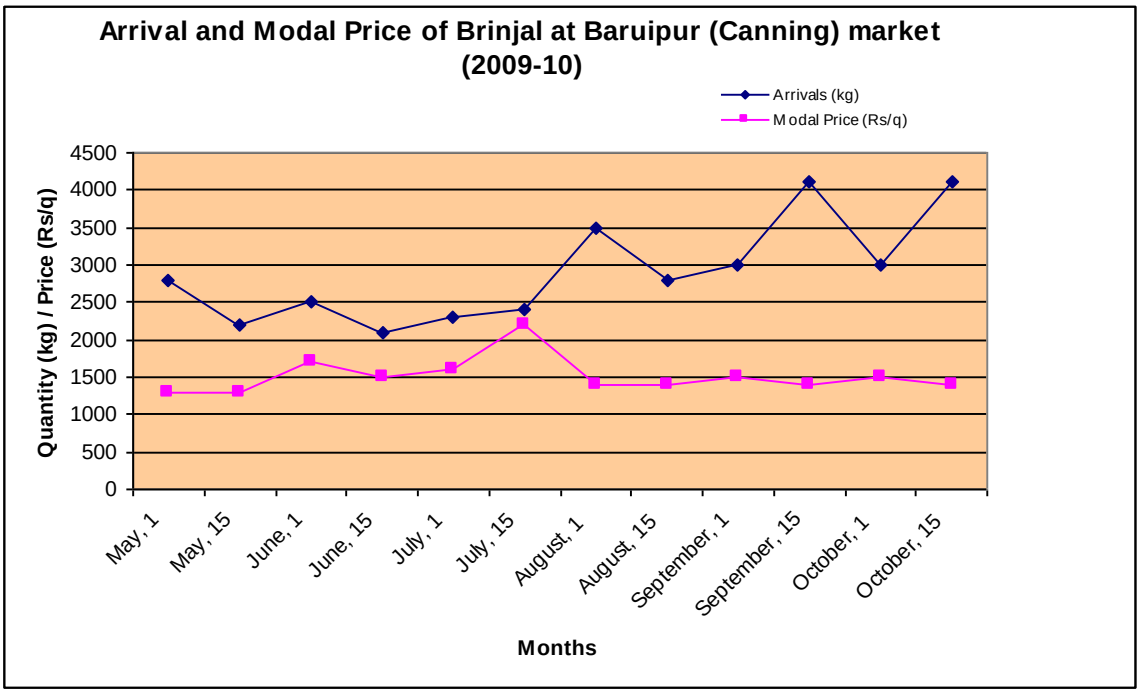


Figure 1: Arrival and modal price of brinjal at Baruipur (Canning) market during 2009-10

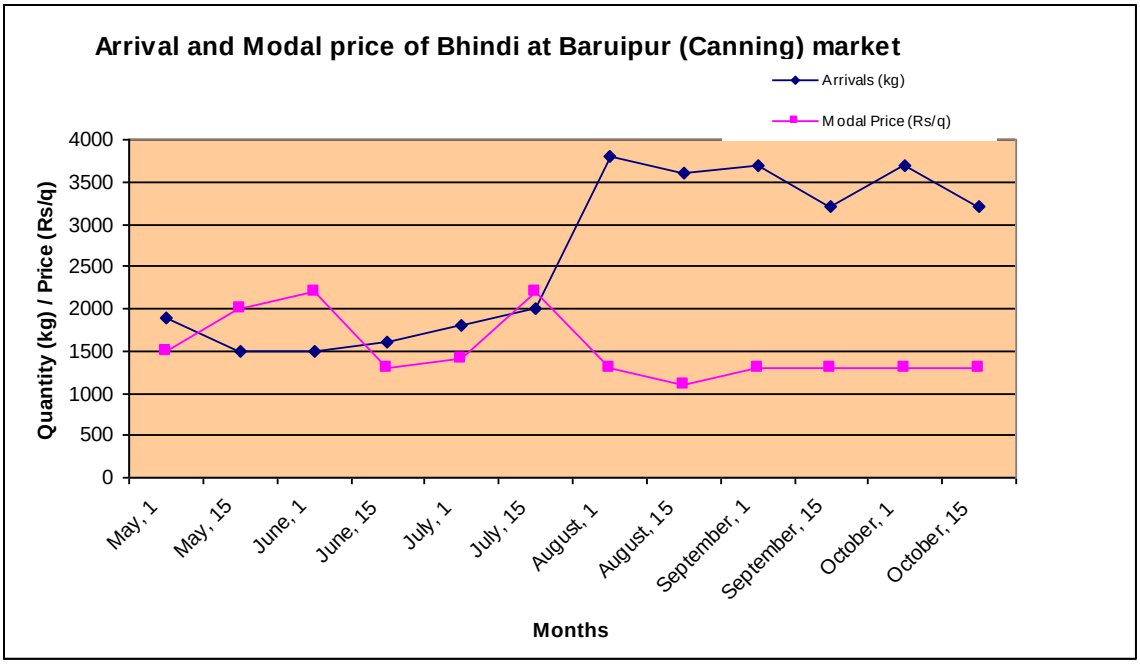


Figure 2: Arrival and modal price of bhindi at Baruipur (Canning) market during 2009-10

The reverse relationship between prices and arrival was more pronounce in case of tomato (**Fig. 3**). Higher prices were prevailing during June to November and after that prices goes down and become very low during second fortnight of December to the month of April. During the higher market price the tomato used to come form distant market such as Bangalore and during winter local production starts and price falls and sometime becomes absolutely non-profitable.

One common phenomenon was notable in case of arrival and model price movement of vegetables that price movement was not so erratic as compared to the movement in quantity of arrival. Possibly, the reason being, vegetable prices operate under some kind of cap at higher prices. Once production has started farmers are bound to bring their produce at market for sell and in case of glut situation price falls drastically and below the normal profit (it total cost equals to total return) farmers failed to sell his produce. During price rise, also vegetable cannot be sold beyond a maximum price (cap) or demand for that vegetable falls sharply because consumers switch over to other/alternative vegetables. Therefore, the price cannot go beyond certain level for marketing of large volume of commodities due to the natural supply-demand interaction. So, the price movement of vegetables across the year was less bouncing as compared to quantity of market arrival of vegetables.

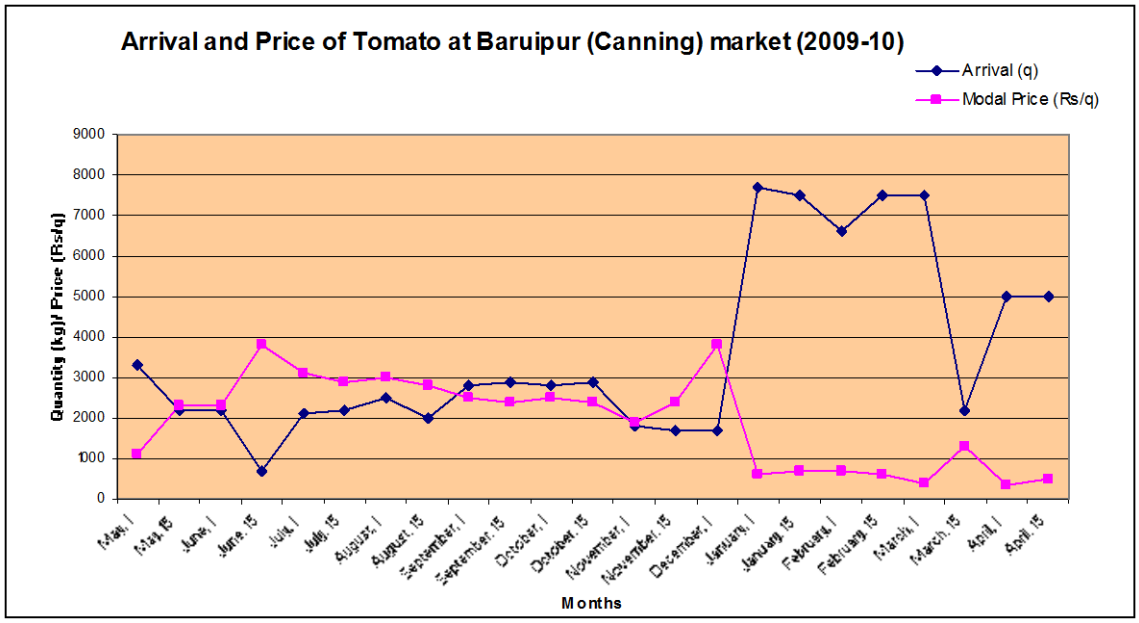


Figure 3: Arrival and modal price of tomato at Baruipur (Canning) market during 2009-10

In case of guava marketing price and arrival movement was just opposite. In contrast to vegetable marketing, the price movement was more erratic rather and movement in quantity of arrival. The average prices were very high (Rs. 40-45/kg) during May to first fortnight of July and then price falls sharply (Rs. 5-10/kg) during August to January (**Fig. 4**). Price begins rising again after February around. Prices of guava are more of supply driven and thus price movement was more bouncy as compared to the quantity of arrival in the market. When supply shrinks the price moved upward in a greater magnitude and vice versa. The supply of guava depends on the few pockets of pockets of production and due to the high perishes ability nature; arrival from distant market during short supply and export to distant market even in peak season is highly restricted. As a result the price movement becomes erratic and very often cause market glut situation. Provision of suitable post-harvest intervention would likely to streamline the prices in a better way.

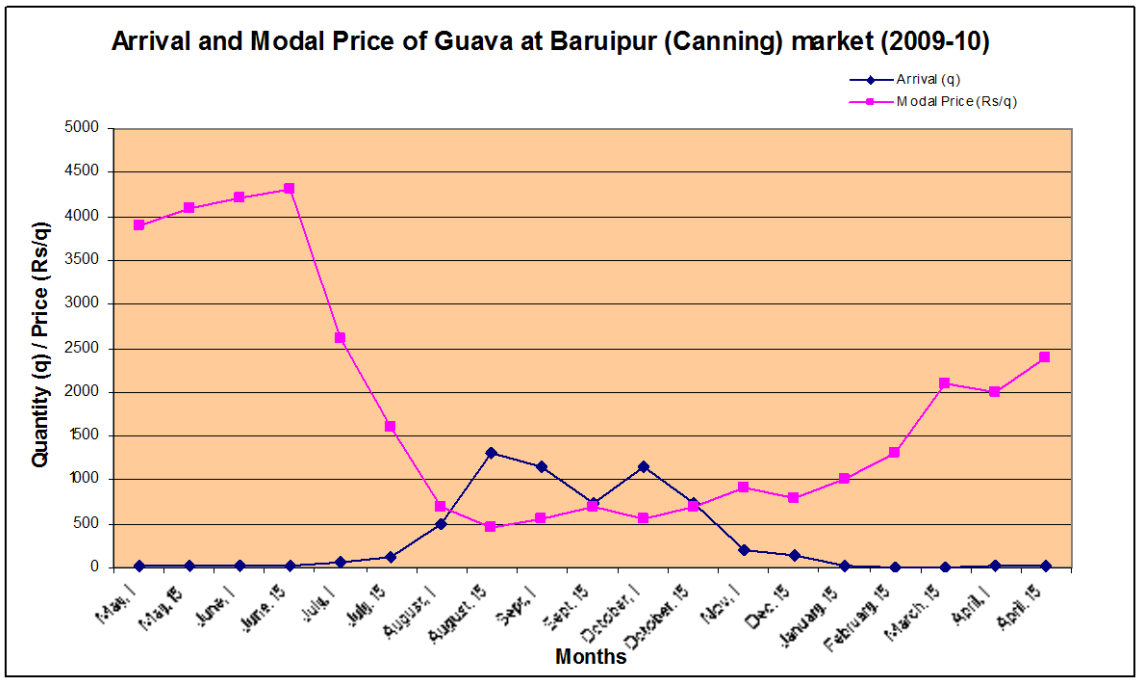


Figure 4: Arrival and modal price of guava at Baruipur (Canning) market during 2009-10

7. Alternative marketing channel/Organised retailer

Organised retail marketing by several corporate houses such as Reliance, Food Bazar (Future Group), 'Spencers' retail marketing (RPG Group) and Metro cash and Carry (wholesale business) are likely to change the agricultural marketing in India in general and in West Bengal in particular. These are the alternative marketing channels, some of which are acting as wholesale market (Metro cash and carry) and some are involved in retail marketing (spencers, food Bazaer, Reliance etc.). The functioning of these alternative marketing systems, such as how they procure the produce, from whom they procure, what is the mechanism of their price fixing, how the produce are sorted, graded and finally reaches to the consumer are important to know the future of agricultural marketing in the state, and also the probable implication of entry of such market players to the farmers and to the large no of traders/ middlemen/ retailers. In an attempt to understand the functioning of these retail-marketing systems detail discussion was held with the management officials involved with this retail chain management. However, the information available on this organized retail functioning was not adequate to perform detail and systematic analysis as has been done for traditional marketing system. Following are the collection of pieces of information generated from the discussion with the management personnel of the relevant retail marketers.

7.1. Functioning of Metro cash and carry (wholesale)

Based on the information available and personal visit following were the observation on functioning of Metro Cash & Carry, Kolkata (source: www.metro.co.in).

- The Metro Group was created in 1996 through the merger of leading trading companies. The corporate group is composed of high-performance, operationally independent companies and businesses.
- Just as the group profits from the strengths of the individual companies, each sales division receives support and reinforcement from the entire corporation's business potential. Furthermore, all members of the Metro Group profit from the important synergy effects that only a nationally and internationally successful major corporation can offer.
- Metro Group today, is the third largest trading and retailing group in the world. The company employs over 2,50,000 staff in 30 countries. In the year 2005

Metro Group had generated sales of over US$ 55.7 billion; 53 percent of total sales came from outside Germany.

- Metro Cash & Carry business model is based on a Business to Business (B2B) concept and focuses on meeting all the needs and requirements of business customers. It is a modern format of wholesale trading, catering only to business customers.
- "Cash & Carry" means that the customers pick the goods themselves, pay in cash and transport their goods with their own vehicles. The advantage as compared with conventional wholesale lies in the more competitive price, the scope of the food and nonfood assortment, the immediate availability of the merchandise and the customer-oriented working hours.
- Metro Cash & Carry started operations in India in 2003 with two Distribution Centres in Bangalore. With this Metro introduced the concept of Cash & Carry to India. These Centres offer the benefit of quality products at the best wholesale price to over 150,000 businesses in Bangalore.
- Metro offers assortment of over 18000 articles across food and non food at the best wholesale prices to business customers such as Hotels, Restaurants, Caterers, Food and Non-food Traders, Institutional buyers and professionals.
- Metro today is poised to extend its concept of Business to Business (B2B) Wholesale to other cities in the country

7.2. Key observation on functioning organized retailer

Information has been compiled based on discussion with management officials of Metro Cash & Carry, Food Bazaar (Future Group), Reliance retail and Spencer's retail market. Following are the major observations on status and functioning of the organized retail marketing in West Bengal-

- Fruits & vegetables marketed through the organized retail chain accounts for less than 0.5 percent or even less (roughly). Thus, less likely to have any impact on the traditional agricultural marketing so far, particularly for fresh fruits and vegetables.
- In case of retail marketing for staple commodities such as pulses and branded rice, edible oil etc are growing rapidly and roughly accounted for nearly 10 percent of the total volume of transaction. The retail-marketing share of the

processed and value added foods and staple foods are rapidly increasing. Increase in quantity of value added product through establishing more number of food processing unit are extremely essential to increase the marketing efficiency in the state. The organized retail marketing systems are ready for large scale investment in food processing and value addition in the state once the socio-political bottlenecks are sorted out.

- Currently fruits & vegetables are procured through various collection centers where farmers (or middlemen in disguise of farmers) used to bring their produce in every morning
- Primary grading and standardization are done by the farmers (or middlemen in disguise of farmers), who are already informed about the preferred quality, size and shape of the commodities.
- The 'price discovery' depends on the present day market price. Framers were assured of 'best' price (actually prevailing wholesale market prices) of their commodities on satisfaction of the quality of produce.
- Price determination may also be done based on the cost-price model or minimum base price model subject to availability of adequate information of cost of cultivation of crops. Organised retailers are ready to pay minimum remunerative price to the farmers based on the actual cost of cultivation as Government may fix. The minimum price of the commodities (through Market Intervention Scheme) may be prescribed and organized retail marketers are ready to accept the price to make the marketing a win-win-win situation for all i.e farmers-retailer-consumer.
- Profit margins retained for fruits & vegetables commodities depend on degree of perish ability. More is the perish ability more is the profit margin kept. For example, higher margins are kept for leafy vegetables rather than potato as the leafy vegetables is more perishable than potato.
    - Average margin kept for fruits & vegetables was around 20-25 percent implying that if the retailers are allowed to procure vegetables freely from farmers (or if they can procure) more margins can be transferred to the farmers.
    - For leafy vegetables margins are > 30percent
    - For staple food margins are around 10 percent

- Successful marketing model should offer
    - Best price
    - Insurance cover
    - Making availability of technical know how
- Major problem/bottleneck of the organized retail business is non-implementation of APMC Act uniformly across the states. Presently separate license was required for every district for procurement of fruits & vegetables. And also very often they find it difficult to procure commodities from open market freely. Free and fair access to these commodities would likely to make retailing business more competitive and efficient.
- The biggest problem is the price discovery or price determination of the fresh fruits and vegetables in the market. Usually they rely on the previous days prices are offered for procuring these commodities.
- Organised retail marketers accept only the certain quality produce. Once farmers or middlemen are aware of the quality they do not bring the inferior quality of produce. But rest of the production must be sold in other markets therefore; farmers have to visit multiple markets in same day – which is a constraint for them.
- Farmers himself cannot come to the collection centres everyday as they are producing very small quantity – therefore they need to depend on the middleman/*fariah* again.

7.3. Possible implications of organized retail agricultural marketing and few issue

Organized retail marketing channels are more efficient and also their post harvest handling is better than the traditional marketing system. The organized retailers are offering better quality of commodities almost at same price as other retailers are offering. Under the traditional marketing system, the traders often add (on dipped produce into) artificial colour or additives to the commodities to increase keeping quality and make it attractive, glossy to fetch higher retail price. But these additives are very often not safe for health. This calls for enforcement of stringent regulation in food safety and food quality, which is presently almost non-functional. Organised retailers are handling these produce in a better way through the cool-chain system and the quality of the produce are expected to be more safe and healthy. The expectation from corporate retailers is to

provide quality produce at competitive price and also to provide better prices to farmers. But these marketing channels are likely to have some implications on all levels of market functionaries, which need to be looked into carefully. These are-

- Organised retail marketers are sourcing the produce from various collection centers. Mostly traders/ middleman bring the produce at this collection centers. Farmers who are producing commodities at a small-scale hardly can take advantage to sell directly to these retailers. Therefore, middlemen on disguise of farmers sell the produce to the retailer and enjoy the margin as like in traditional marketing system. Unless the retailer marketers will be allowed to purchase directly form the farmers (presently not happening due to various interference) or farmers are made capable (more volume) of selling their produce to these organized retailer, the producers price on consumer rupee would not be improved significantly.
- In West Bengal almost all the producers are small-scale producer and fragmented. In one had the retail markets are becoming consolidated and the producers are becoming further fragmented, making the non-level playing situation. Thus as the investment in these organized retail chain would be increasing, they would have more control on agricultural trading and in other hand the small-scale producers would further loose their bargaining power or in other word the marginal producers would be excluded from the advantage of the organized retail marketing system.
- Entry of organized retailer in large scale would likely to displace large number of traders and retailers. Under West Bengal condition, large amount of unemployed persons are involved in this unorganized employment sector. Alternative employment opportunities must be created for this large number of displaced people to avoid social tension. In presence of these active middlemen and burgeoning retail investment in the agricultural commodity there would not be any real benefit to the producers' particularly.
- The biggest advantage of organized retail marketing (as argued) is likely to be elimination of large number of middlemen and reducing the marketing margins so to provide lower price to consumer and better price to farmers. However, the most important question is whether the benefit of elimination of middlemen would be passed on to the retailer would enjoy the producers or the benefit only.

To ensure the distribution of benefits, besides providing free and fair business environment to organized retailer also strong regulation needs to be enforced. Most importantly more number of agri-retailer has to be operative in the market so that market control should not be in the hands of only few organized retailers.

- Organised retailers procure the commodities of specific qualities after suitable sorting and grading but farmers produce same commodity in varying quality, therefore, they need to depend on other marketing channels to dispose their rest amount of produce. Also retailers would have special interest on purchasing in bulk quantity, favouring the large producers or from some other collectors (or middlemen).
- Corporate retail of agricultural marketing might be highly successful for large farmers, farmers with large investment capacity and endowed with adequate capital adequacy. But the marginal farmers are constrained with all types of resources including financial capital, thus unless their production capacity increases, they might be again by-passed.
- Organised retailer may offer predatory pricing to attract the consumer to eliminate the competitions or other small-scale retailers from the market. Once the market control is established the cost of predatory pricing may be passed on to the producers and they may offer below-cost pricing to the producer. For this there is again need of strong regulation from the government eliminate any exploitation.
- Organised retail marketing would be successful model with win-win-win situation for all (producer-retailer-consumer) of free and fair marketing system if promoted through implementation of APMC Act and with stringent regulation by the government. Investment capacity of the marginal farmers must be increased. Marginal farmers' access to financial resources and other inputs such as irrigation water, seed, fertilizer etc needs to be enhanced. Finally farmers or growers association must be formed to take advantage from the organized retail marketing and to reduce the functioning of middlemen.

8. CONCLUSION AND POLICY IMPLICATIONS

Following were the key observation and suggestion to improve the agricultural marketing system in West Bengal:

- In general it was observed that the farmers were absolutely unorganized but traders were 'relatively' organized. Farmers lack bargaining power,
- Lack any system for timely information flow on market prices to the farmers. Prices were determined by the traders/assembler at village market based on the volume of produce arrived in that particular market in that day. Traders are better informed with market prices rather than farmers,
- Large number of traders are operating without any formal license,
- Market places lack minimum basic facilities. Need large investment for construction of market infrastructure, like pucca building/structure for displaying commodities, sitting place etc. Every market places lack adequate space – becomes overcrowded and clumsy,
- Individually, the scale of production is small but at aggregate level volume of production is high because of large number of producer. Also a large no of traders (license or non-licensed) are in trading business i.e., large volume of produce were being handled by even larger no of traders making the scale of business a very small one,
- Whole system is operating under a vicious cycle like – large number of small producer - producing low marketable surplus – resulting low bargaining power and – low profit. Then these commodities passes to large number of small traders who are handling these produce in a small scale subjected to high degree of post harvest losses – ultimately resulting the whole marketing system a non-commercial venture,
- Due to small scale of production by farmers as well as small scale of operation by traders, both (farmers and traders) lack competitiveness (in terms of offering low prices to consumer),
- Because of this low volume of operation both farmers or traders tries to dispose off his entire produce in quickest possible time as either they cannot afford to store the produce (if storage facility is available) or mostly the storage facility is not available,

- In spite of large volume of production at aggregate level, the small scale of operation, vegetables (and other perishable commodities) trading a risky and uncertain business forcing the traders to keep high profit margin, which ultimately affects consumer badly. Therefore, inter-day and intra-day price variation is exorbitantly high,
- The volume of handling must be increased to make the business more commercialized, which is also likely to offer more stabilized price at the market and benefiting both consumers and producers, State government is required to provide better facilities, services and amenities in the market places. It seems all functions in the process of agricultural marketing is going on in a very traditional way without any change, improvement or any kind of initiatives since ages,

- To increase the marketing efficiency of the vegetables, it has been suggested to increase the volume of handling through organized retail chain to make the business more commercialized. This increased volume of trading also likely to offer more stabilized price at the market, benefiting both consumers and producers and attracting other farmer to diversify their cropping system, thereby increasing the area under vegetables.

In production side, the small-scale producers were observed to be reasonably efficient in production and the production systems were labor and input intensive, but their marketing efficiencies were poor. In West Bengal the agricultural marketing system is functioning in a very traditional way and most of the market places including the wholesale markets are devoid of adequate basic infrastructure. In general there was no certain system for price fixation. The prices are determined by the interaction between farmers and traders at the village market based on the volume or produce arrived at the market on a particular day on specific time. Therefore, appropriate price discovery is always a problem and due to this wide price instability persists, and the farmers are the worst sufferers for this uncertainty. Price discovery can be made efficiently if some kind of base price is fixed by the government regulatory authority based on the estimated cost of cultivation of crops as well as analyzing the trend in price and market arrivals for a particular commodity. In fact price fixing can be made based on available

database on average of production and movement of produce across several important markets.

Alternative marketing systems or organized retail marketers are ready for entry into the agriculture retail marketing in a big way but non-implementation of APMC Act in a free and fair manner was the main hurdle for their functioning in large scale. Marketing efficiencies of organized marketing channels are high but they prefer to procure in bulk quantity, which marginal farmers cannot offer individually. Organised retailer would depend on bulk suppliers; therefore presence of middlemen would be active even in the case of organized retail marketing. So far the entry of these retail chains were not affecting the traditional agr-retailing in a significant way because their trading volume was meager in terms of total volume of fruits and vegetables traded through other wholesale markets in the state. Therefore, relationship between corporate retailing and improvement in the farmers' share in consumer rupee was not well established. Large investment from corporate houses on value addition to the agricultural produces is still awaited in the state, which would probably be beneficial for both producers and consumers. It is inevitable under the ongoing economic liberalization process, that corporate houses would increase their market share and market control over the trading agricultural commodities in future, it is also certain that marketing efficiencies through these alternative marketing channels are likely to be improved in terms of creation of value addition and reduction in transaction cost, but the most important issue is, how to include the marginal farmers category (who are dominating class and producing tiny marketable surplus from fragmented land in west Bengal) into this corporate marketing channels suitably or directly. Market economy has one unique attribute to pull the growth for those who are in advantages position or who have better access to natural and financial capitals, but utterly excludes those who are in disadvantageous situation (like marginal farmers) or those who are not having adequate access to the resources/ inputs to produce larger quantity. The fact is that the marginal farmers operate under a host of difficult socio-economic condition in which they produce small quantity with high production efficiency but they are poor in marketing efficiency. On one hand corporate retailers are consolidating rapidly asking for bulk purchase of agri-commodities, and on other hand producers are becoming more and more fragmented and producing small quantity of marketable surplus, so farmers must be organised to increase their volume of trading to increase their bargaining power to take advantage of these marketing systems.

ANNEXURE

Table 14. Arrival and Modal price of Bhindi and Brinjal at Baruipur market (Canning) during 2009-10

Months	Bhindi		Brinjal	
	Arrivals (kg)	Modal Price (Rs/q)	Arrivals (kg)	Modal Price (Rs/q)
May, 1	1900	1500	2800	1300
May, 15	1500	2000	2200	1300
June, 1	1500	2200	2500	1700
June, 15	1600	1300	2100	1500
July, 1	1800	1400	2300	1600
July, 15	2000	2200	2400	2200
August, 1	3800	1300	3500	1400
August, 15	3600	1100	2800	1400
September, 1	3700	1300	3000	1500
September, 15	3200	1300	4100	1400
October, 1	3700	1300	3000	1500
October, 15	3200	1300	4100	1400

Source: http://agmarknet.nic.in/

Table 15. Arrival and Modal price of Tomato at Baruipur market (Canning) during 2009-10

Months	Arrival (q)	Modal Price (Rs/q)
May, 1	3300	1100
May, 15	2200	2300
June, 1	2200	2300
June, 15	700	3800
July, 1	2100	3100
July, 15	2200	2900
August, 1	2500	3000
August, 15	2000	2800
September, 1	2800	2500
September, 15	2900	2400
October, 1	2800	2500
October, 15	2900	2400
November, 1	1800	1900
November, 15	1700	2400
December, 1	1700	3800
January, 1	7700	600
January, 15	7500	700
February, 1	6600	700
February, 15	7500	600
March, 1	7500	400

March, 15	2200	1300
April, 1	5000	350
April, 15	5000	500

Source: http://agmarknet.nic.in/

Table 16. Arrival and Modal price of Guava at Baruipur market (Canning) during 2009-10

Months	Arrival (q)	Modal Price (Rs/q)
May, 1	22	3900
May, 15	25	4100
June, 1	20	4200
June, 15	15	4300
July, 1	60	2600
July, 15	125	1600
August, 1	500	700
August, 15	1300	450
Sept, 1	1150	550
Sept, 15	725	700
October, 1	1150	550
October, 15	725	700
Nov, 1	200	900
Dec, 15	135	800
January, 15	16	1000
February, 15	8	1300

March, 15	2	2100
April, 1	20	2000
April, 15	15	2400

Source: http://agmarknet.nic.in/

10) References

Acharya, S. S. and Agrawal, N. L. (2001). Agricultural Marketing in India, Oxford & IBH Publishing Company, New Delhi.

Agmarknet (2010 a), Directorate of Marketing & Inspection, Ministry of Agriculture, Govt. of India, http://agmarknet.nic.in/

Agmarknet (2010 b), Salient Features of the Model Act on Agricultural Marketing, Directorate of Marketing & Inspection, Ministry of Agriculture, Govt. of India, http://agmarknet.nic.in/

L.S. Gangwar, L. S, Singh, Dinesh and Singh, D.B. (2007) Estimation of Post-Harvest Losses in Kinnow Mandarin in Punjab Using a Modified Formula, Agricultural Economics Resaerch Review, Vol 20, July-December, pp. 315-331

Dhillon, Ashok, Khatkar, R.K. and Kumar, Arun (2005) Marketing Costs and Price Spread for Marigold Flower in Haryana, Agricultural Marketing, Vol.XLVIII, No:1, pp.9-12.

Govt. of West Bengal (2010), Department of Sundarban Affairs, Block profile, www. http://www.sadepartmentwb.org/Profile.htm

Govt. of West Bengal, (2010b), State Agricultural Marketing Board

Indian Horticulture Database 2008, Ministry of Agriculture, Govt. of India, www.nhb.gov.in

Metro Cash & Carry India, www.metro.co.in

Estimating Marketing Efficiency of Horticultural Commodities under Different Supply Chains in Manipur and Mizoram States, North-eastern Hill Region of India

1. Introduction

1.1 Background

With the technological development in the agricultural field, India has made rapid stride in horticulture too along with increased foodgrain production. The changing life style and food habit, the importance of vegetables and fruits in the human diet is being increasingly realized. They supply a myriad range of essential nutrients to the population of the country that is largely vegetarian. The use of flower is considered inevitable in many of the Indian cultural and religious practices. Today our country has emerged as the second largest producer of fruit and vegetables in the world. Owing to the varied agro-climatic zones, abundance of natural resources like sunlight and water, existence of large number of small and marginal farmers and technology available for their production, India has considerable potential to increase its production of horticultural crops. But the impact of new production technology cannot be sustained unless simultaneous efforts are made in the direction of effecting improvements in the marketing system as a whole. Unless the marketing efficiency improves, no incentives to increase production will attract the cultivator.

It has been noticed that the marketing facilities for horticultural crops are not that adequate as compared with other agricultural commodities. Being perishable in nature, they cannot be stored for a long period and it is also not possible to transport them to long distances under ordinary conditions. Hence, exploitation by the buyers and middlemen in these commodities still persist in spite of regulation of markets.

Agriculture is the mainstay of most of the people of Manipur and Mizoram states, north-eastern hill region of India. Agriculture and allied activities accounts for about 23.35 percent and 16.44 percent of the total Net State Domestic Product of the states respectively (Basic Statistics of NEH Region 2007). The existence of subtropical to temperate climatic conditions and also, fertile soils in this region offer good scope for the cultivation of various types of vegetables, fruits and flowers throughout the year. Over the past one decade, the production and marketing of horticultural crops in this

region has become increasingly important as physical infrastructure and experience in the production of these crops has improved continuously. The reason being the implementation of Technology Mission for the Development of Horticulture in NEH Region as a centrally sponsored scheme. In addition the consumers began to demand higher value horticultural crops in response to demand generated out of income increase and food habit change. Accordingly, the area and production of horticultural crops in this region increases many fold.

An increase of marketed surplus of horticultural crops calls for larger and improved market facilities. If market function efficiently farmers allocate their resources according to their comparative advantage and intensify their production. The prevailing marketing systems of horticultural crops are not well organized and the producers' share in consumer rupee is substantially low.

The recent development of horticultural sector in Manipur and Mizoram after the introduction of Technology Mission calls for a sound marketing system. Since high value crops such as vegetables, fruits and flower require a chain of marketing functions before reaching the ultimate consumer, the role of various marketing agencies assumes great importance. The farmers will get the remunerative prices for their surplus produce only when the effective and efficient marketing system is in place. However, in recent years many new supply chains involving large sized agri-retail companies, contract farming systems, producer groups, etc. are emerging, which are considered to be better marketing models giving higher prices to the producers and better market efficiency through the vertical integration of the market. Therefore, an in-depth study on the existing systems of marketing of horticultural crops particularly vegetables, fruits and flower in the region is required for diagnosing the supply chain models and finally, development of an efficient marketing model. The experience of the initiatives taken for the promotion of these crops through contract/ co-operative/ corporate farming and other marketing models will be helpful to identify the factors responsible for the success/ failure of the promotion of these crops in the region and to explore the possibilities of their strengthening or improving their viability and commercialization as well as replication in other areas.

1.2 Objectives of the study:

- To **estimate** the marketing cost and marketing margin of different functionaries for selected horticultural commodities under various supply chains.
- To **analyze** the price spread, marketing efficiency and farmer's share in consumer rupee in various supply chains.
- To **identify** the constraints perceived by various stakeholders; and study the factors influencing the marketing cost / margin / efficiency.
- To **suggest** suitable strategies to enhance the marketing efficiency for horticultural commodities.

2. Data and Methodology

2.1 Crops studied:

Sl.No.	Crop	State
1	Tomato	Manipur
2	Cabbage	Manipur
3	Passion fruit	Manipur
4	Anthurium	Mizoram

2.2 Sample size for each crop:

Crops	Farmers	Retailers	Wholesalers	Traders	Total
Tomato	120	30	10	0	160
Cabbage	120	30	11	30	191
Passion fruit	120	30	6	1	157
Anthurium	120	6	0	1	127

Tomato:

Village	District	Farmers
Kabowakching	Bishnupur	29
Kamong	Imphal-West	22
Keinou	Bishnupur	22
Hinabok	Bishnupur	26
Khoijuman	Bishnupur	21

Cabbage:

Village	District	Farmers
Boharam	Ukhrul	13
Lunghar	Ukhrul	48
Khoijuman	Bishnupur	23
Kwakshiphi	Bishnupur	16
Wabagai	Thoubal	20

Passion fruit:

Village	District	Farmers
Thenmual	Churachandpur	46
Khopuibung	Churachandpur	20
Valpakaot	Churachandpur	10
Saikot	Churachandpur	24
Purul Akutpa	Senapati	15
New Kameng	Senapati	5

Anthurium:

Village	District	Farmers
Durtlang	Aizawl	43
Chawlhhmun	Aizawl	23
Luangmual	Aizawl	12
Ramhlun	Aizawl	12
Zolhong	Aizawl	19
Kolasib	Aizawl	11

2.3 Methodology and Analytical techniques:

The following analytical tools were used to achieve the desired objectives

Marketing Efficiency:

Shepherd Formula

E = (O/I)*100

Where, E is index of Marketing efficiency

O is value added by the marketing system

I is 'cost + margin' of market intermediaries

Acharya's Modified Marketing Efficiency

MME = FP/(MC+MM)

Where, MME is modified measure of marketing efficiency

FP is price received by farmers

MC is marketing cost

MM is marketing margin

2.4 Price Spread

It is the difference between the two prices, i.e., the price paid by the consumer and the price received by the producer.

For e.g. P1-P2,

Where, P1 is price at one level or stage in the market

P2 is price at another level

2.5 Producer Share in Consumer Rupee

PS = (PF/PR)*100

Where, PF is price received by the farmer

PR is retail price (consumer price)

Cmi is the cost incurred on marketing per unit

2.6 Factors affecting Marketing Efficiency

y = f (x1,……..……xn)

Where,

y = Marketing efficiency (%)

x1 = Marketing cost (Rs.)

x2 = Marketing margin (Rs.)

x3 = Transport cost (Rs.)

x4 = Open market price (Rs.)

x5 = Labour wages (Rs.)

x6 = Controlling middlemen (put '1', if middlemen are controlled and '0' if not)

x7 = Volume of produce handled (kg)

x8 = Presence of cold storage facilities (put '1', if present and '0' if not present)

x9 = Length of the market channel (No. of market intermediaries)

x10 = Existence of competition in selling

x11 = Nature of produce (put '1', if semi-perishable and '0' if perishable)

Constraints perceived by the farmers / wholesalers / retailers

Garrett's Ranking Technique

$$\text{Percent position} = \frac{100\,(Rij - 0.50)}{Nij}$$

Where, Rij is the rank given by ith item by jth individual

Nj is the number of items ranked by the jth individual

(Note: The percent position of each rank is converted into scores by referring tables given by Garrett and Woodworth (1969). Then for each factor, the scores of individual respondents are added together and divided by the number of respondents for whom scores are added. The mean scores for all the factors are ranked by arranging in descending order).

3. Results and Discussion

3.1 TOMATO

The tomato farmers were classified into three categories, viz., (i) Small having up to 0.99 hectares of land holding; (ii) Medium having 1 – 1.49 hectares and (iii) Large having 1.5 hectares and above land holding. The information on size group-wise distribution of sample farmers is presented in Table 1. Of the total number of 120 sample farmers, 52.50 percent were in small group operating about 31.44 percent of the total area, while large group accounting for about only 16.67 percent of the total sample farmers shared about 33.67 percent area. Farmers in Medium group formed about 30.83 percent operating 34.89 percent of the total area. The average farm size was 0.56 hectares, 1.06 hectares and 1.89 hectares respectively in small, medium and large groups with an overall average of 0.93 hectares.

Table 1: Distribution of sample Tomato cultivators

Sl.	Category	Holding Size (ha.)	No. of cultivators	Total land holding (ha.)	Average land holding (ha.)
1	Small	0 - 0.99	63	35.25	0.56
			(52.50)	(31.44)	
2	Medium	1 - 1.49	37	39.13	1.06
			(30.83)	(34.89)	
3	Large	1.5 & above	20	37.75	1.89
			(16.67)	(33.67)	
4	Total		120	112.13	0.93
			(100)	(100)	

Figures in the parentheses indicate percentages to the total

The per hectare disposal pattern of tomato is shown in Table 2. The farmers marketed almost all the produce (94.81 percent) from the farm after using 0.22 percent for home consumption and 0.42 percent for payment in kind and as gift to relatives. It was observed that losses due to breakage and spoilage accounted for 4.54 percent of the total production.

Table 2: Per Hectare Disposal of Tomato (Quantity in quintals)

Sl. No.	Particular	Groups			
		Small	**Medium**	**Large**	**Overall**
I	Production	333.23	325.66	323.21	328.33
		(100)	(100)	(100)	(100)
II	Quantity consumed on farm				
	a) Home consumption	0.79	0.66	0.72	0.73
		(0.24)	(0.20)	(0.22)	(0.22)
	b) Payment in kind & as gift	1.55	1.14	1.52	1.39
		(0.47)	(0.35)	(0.47)	(0.42)
	c) Losses (due to breakage & spoilage)	13.98	14.61	17.42	14.91
		(4.19)	(4.49)	(5.39)	(4.54)
III	Marketed surplus	316.91	309.25	303.55	311.30
		(95.10)	(94.96)	(93.92)	(94.81)

Figures in the parentheses indicate percentages to the total production

Again, it was observed from the table that out of the total production 0.24 percent was consumed at home in small group, 0.20 percent in medium group and 0.22 percent in large group; 0.47 percent was used for payment in kind and as gift to relatives in small group, 0.35 percent in medium group and 0.47 percent in large group. Losses due to breakage and spoilage were 4.19 percent of the total production in small group, 4.49 percent in medium group and 5.39 percent in large group. This showed that losses increased with increase in farm size. Total marketed surplus was 316.91 quintal per hectare (95.10 percent) in small group, 309.25 quintal per hectare (94.95 percent) in medium group and 303.55 quintal per hectare (93.92 percent) in large group. The disposal pattern revealed that marketed surplus decreased with increase in farm size. The reason being higher post harvest losses and lower productivity in large farms resulting from poor management practices.

Marketing channel of Tomato:

Marketing channels are the routes through which agricultural as well as horticultural products move from producers to consumers. The length of the channel varies from commodity to commodity, depending on the quality to be moved, the form of consumer demand and degree of regional specialization in production.

The prominent marketing channels of tomato in Manipur are shown in Table 3.

Table 3: Marketing channel of Tomato

Particulars	Supply chain
Channel 1	Producer - Retailer - Consumer
Channel 2	Producer - Wholesaler -Retailer - Consumer
Channel 3	Producer - Village trader - Wholesaler - Retailer - Consumer

The channel-wise distribution of tomato growers and quantity handled in different marketing channels is given in Table 4.

Table 4: Quantity handled in different marketing channel of Tomato

Marketing channel	Quantity handled (q)	% to the total	No. of growers	% to total
Channel 1	8253.41	62.20	87	72.50
Channel 2	3813.16	28.74	17	14.17
Channel 3	1203.12	9.07	16	13.33
Total	13269.69	100	120	100

It is observed from the table that the maximum quantity of tomato was passed through Channel 1 (62.20 percent), followed by Channel 2 (28.74 percent) and the lowest

quantity of tomato was sold through Channel 3 (9.07 percent). Again, it was observed from the table that majority of the farmers market their produce through Channel 1 (72.50 percent), followed by Channel 2 (14.17 percent) and Channel 3 (13.33 percent).

Marketing costs and marketing margins per quintal of tomato for Channel 1 in Manipur have been presented in Table 5. The farmer's share in the consumer's rupee has been found to be 82.75 percent. Total marketing expenses incurred by farmer is worked out to be Rs.122.41 per quintal of which losses consumed highest share, *i.e.*, about 67.72 percent of the cost incurred by producer. Cost of transportation ranks second (Rs.24.14 per quintal), followed by weighing (Rs.12.43 per quintal) and then cost of packing material (Rs.2.94 per quintal). For packing the tomato, the farmers used basket made of bamboo which cost about Rs. 40 -50 per basket. These baskets can be used for a year. Transportation is done by bus, auto or Tata DI depending upon the distance. Table shows that the producer, on an average receives Rs.1945.24 per quintal. It is observed from the table that tomato producer fetches Rs.1822.83 per quintal as his net margin.

Table 5: Marketing cost and Marketing margin of tomato (Channel 1)

Item	Unit	Cost	% Consumer Price
Farm gate price at village	Rs/q	1822.83	82.75
sorting	Rs/q	0	0
packing material	Rs/q	2.94	0.13
Weighing	Rs/q	12.43	0.56
transport	Rs/q	24.14	1.10
losses	Rs/q	82.89	3.76
Total marketing cost	Rs/q	122.41	5.56
Farmers' selling price to Retailer	Rs/q	1945.24	88.31
sorting	Rs/q	0	0
packing material	Rs/q	10.00	0.45

loading/ unloading	Rs/q	10.00	0.45
spoilage	Rs/q	34.22	1.55
transport	Rs/q	0.00	0.00
Market fee	Rs/q	1.12	0.05
storage	Rs/q	13.71	0.62
Total marketing cost	Rs/q	69.04	3.13
Marketing margin	Rs/q	188.47	8.56
Retailers price to consumer	Rs/q	2202.75	100

The retailer has to incur a cost amounting Rs.69.04, *i.e.*, 3.13 percent of retail price to market one quintal of tomato. Of this cost about 50 percent are losses due to spoilage of the produce, 20 percent storage and 14 percent each for packing material and loading/unloading. The cost of packing material used by retailer is Rs.40 per unit of 25 kg capacity. This can be used for 4-5 times. However, he fetches Rs.188.47 which accounts for 8.56 percent of the price received by him as profit or margin. In Channel 1, the producers incur more marketing cost than the retailers.

Table 6: Marketing cost and Marketing cost of tomato (Channel 2)

Item	**Unit**	**Cost**	**% Consumer Price**
Farm gate price at village	Rs/q	1436.04	51.90
sorting	Rs/q	0	0
packing material	Rs/q	2.11	0.08
Weighing	Rs/q	12.50	0.45
transport	Rs/q	25.78	0.93
losses	Rs/q	90.69	3.28
Total marketing cost	Rs/q	131.09	4.74
Farmers' selling price to wholesaler	Rs/q	1567.12	56.63

sorting	Rs/q	0	0
packing material	Rs/q	0	0
loading/ unloading	Rs/q	10.21	0.37
spoilage	Rs/q	164.91	5.96
transport	Rs/q	0.00	0.00
market fee	Rs/q	20.91	0.76
storage	Rs/q	0	0
Total marketing cost	Rs/q	196.03	7.08
Marketing margin	Rs/q	386.47	13.97
Wholesaler price to retailer	Rs/q	2149.62	77.68
sorting	Rs/q	0	0
packing material	Rs/q	10.00	0.36
loading/ unloading	Rs/q	10.00	0.36
spoilage	Rs/q	33.76	1.22
transport	Rs/q	28.49	1.03
Market fee	Rs/q	2.18	0.08
storage	Rs/q	11.02	0.40
Total marketing cost	Rs/q	95.44	3.45
Marketing margin	Rs/q	522.09	18.87
Retailers price to consumer	Rs/q	2767.16	100

Marketing costs and marketing margins per quintal of tomato for Channel 2 in Manipur have been presented in Table 6. The farmer's share in the consumer's rupee has been found to be 51.90 percent. Total marketing expenses incurred by farmer is worked out to be Rs.131.09 of which losses consumed highest share, *i.e.*, about 69.19 percent of the cost incurred by producer. Cost of transportation ranks second (Rs.25.78 per quintal), followed by weighing (Rs.12.50 per quintal) and then cost of packing material (Rs.2.11 per quintal). Transportation is done by bus, auto or Tata DI depending upon the distance.

Table shows that the producer, on an average receives Rs.1567.12 per quintal. It is observed from the table that tomato producer fetches Rs.1436.04 per quintal as his net margin.

The wholesaler has to incur a cost amounting Rs. 196.03, *i.e.,* 7.08 percent of the retail price to market one quintal of tomato. Of this cost about 84 percent is because of losses due to spoilage of the crop. Loading/unloading (5 percent) and market fee (11 percent) form the remaining marketing cost. The wholesaler sells the crop to retailers at Rs. 2149.62 per quintal. He, however, fetches Rs.386.47 which accounts for 13.97 percent of the retail price as his profit.

At retailer's level, an amount of Rs.95.44 (3.45 percent of the retail price) is required as marketing cost. It is noted that out of the total marketing cost about 35 percent is retailer's loss in the form of spoilage of the fruit. Cost of transportation (30 percent of the total marketing cost), storage (12 percent), packing material (10 percent), loading/unloading (10 percent) and market fee (2 percent) constitute the remaining marketing cost incurred by the retailer. The retail price of one quintal of tomato in Channel 2 is Rs.2767.16. The retailer, however, fetches Rs.522.09, about 18.87 percent of the retail price as his profit.

It is observed from the table that maximum marketing cost in this channel is incurred by wholesaler which is associated with high spoilage losses during storing and handling. It is further observed that maximum profit is reaped by retailer.

Table 7: Marketing cost and Marketing cost of tomato (Channel 3)

Item	Unit	Cost	% Consumer Price
Farm gate price at village	Rs/q	1321.76	42.81
sorting	Rs/q	0	0
packing material	Rs/q	3.26	0.11
Weighing	Rs/q	0	0
transport	Rs/q	0	0
Losses	Rs/q	67.72	2.19
Total marketing cost	Rs/q	70.98	2.30
Farmers' selling price to local assembly trader at rural market	Rs/q	1392.75	45.10
sorting	Rs/q	0	0
packing material	Rs/q	0	0
Weighing	Rs/q	13.50	0.44
loading/ unloading	Rs/q	15.00	0.49
transport	Rs/q	64.56	2.09
Total marketing cost	Rs/q	93.06	3.01
Marketing margin	Rs/q	414.19	13.41
Assembly traders price to wholesaler	Rs/q	1900	61.53
sorting	Rs/q	0	0
packing material	Rs/q	0	0
loading/ unloading	Rs/q	10	0.32
spoilage	Rs/q	150	5
transport	Rs/q	0	0
market fee	Rs/q	30.70	0.99
storage	Rs/q	0	0
Total marketing cost	Rs/q	190.70	6.18
Marketing margin	Rs/q	370.15	11.99

Wholesaler price to retailer	Rs/q	2460.85	79.70
sorting	Rs/q	0	0
packing material	Rs/q	10	0.32
loading/ unloading	Rs/q	10	0.32
spoilage	Rs/q	34.88	1.13
transport	Rs/q	19.94	0.65
Market fee	Rs/q	1.04	0.03
storage	Rs/q	6.50	0.21
Total marketing cost	Rs/q	82.36	2.67
Marketing margin	Rs/q	544.62	17.64
Retailers price to consumer	Rs/q	3087.83	100

Marketing costs and marketing margins per quintal of tomato for Channel 3 in Manipur have been presented in Table 7. The farmer's share in the consumer's rupee has been found to be 42.81 percent. Total marketing expenses incurred by farmer is worked out to be Rs.70.98 of which losses consumed highest share, *i.e.*, about 95 percent of the cost incurred by producer. Packing material constitute the remaining 5 percent. Farmers do not incur any cost towards transportation and weighing. These costs are bore by village traders. Table shows that the producer, on an average receives Rs.1392.75 per quintal. It is observed from the table that tomato producer fetches Rs.1321.76 per quintal as his net margin.

The village traders have to meet Rs.93.06 per quintal, *i.e.*, 3.01 percent of the retail price as marketing cost. It is noted that about 69 percent of this cost is taken away as transportation charge. Next importation item of cost is loading/unloading which amounts to Rs.15 per quintal and weighing (Rs.13.50 per quintal). It is further observed from the table that the village traders sell their load to the wholesaler at Rs. 1900 per quintal and earn a profit of Rs.414.19, *i.e.*, 13.41 percent of the retail price.

In this channel, the wholesaler has to incur a cost amounting Rs. 190.70, *i.e.*, 6.18 percent of the retail price to market one quintal of tomato. Of this cost about 78 percent is because of losses due to spoilage of the crop. Market fee (16 percent) and

loading/unloading (6 percent) form the remaining marketing cost. The wholesaler sells the crop to retailers at Rs. 2460.85 per quintal. He, however, fetches Rs.370.15 which accounts for 11.99 percent of the retail price as his profit.

At retailer's level, an amount of Rs.82.36 (2.67 percent of the retail price) is required as marketing cost. It is noted that out of this marketing cost about 42 percent is retailer's loss in the form of spoilage of the fruit. Cost of transportation (24 percent), packing material (12 percent), loading/unloading (12 percent), storage (7 percent) and market fee (1 percent) constitute the remaining marketing cost incurred by the retailer. The retail price of one quintal of tomato in Channel 3 is Rs.3087.83. The retailer, however, fetches Rs.544.62, about 17.64 percent of the retail price as his profit.

It is observed from the table that maximum marketing cost in this channel is incurred by wholesaler which is associated with high spoilage losses during storing and handling. It is further observed that maximum profit is reaped by retailer.

Channel-wise marketing cost and marketing margin of tomato is shown in Table 10. Marketing cost and marketing margin vary considerably from channel to channel and were related directly to the length of the channel, *i.e.*, longer the channel, more were the marketing cost and marketing margin. Channel 3 (Producer - Village trader - Wholesaler - Retailer - Consumer) being the longer channel and in this channel the highest marketing cost and marketing margin per quintal, *i.e.*, Rs.437.10 and Rs.1328.97 respectively were observed. Channel 1 (Producer - Retailer - Consumer) is the shortest channel accounting for lowest marketing cost and marketing margin, *i.e.*, Rs.191.45 and Rs.188.47 per quintal respectively. Thus it can be concluded that as the length of channel increases the marketing cost and marketing margin also increases and vice-versa. In other words, the more the numbers of intermediaries involved between the producer and the ultimate consumers, the more is the marketing cost and marketing margin of the intermediaries.

It can also be seen from the table that as the consumer paid the lowest price (Rs.2202.75 per quintal) when they purchased from retailer who purchased directly from the producer (Channel1) and paid the highest price (Rs.3087.83 per quintal) when three intermediaries were involved between the producer and consumer *i.e.* village trader, wholesaler and retailer in Channel 3. The price paid by the consumer increased with the increase in the

length of the marketing channel or with the increased in the numbers of intermediaries involved between the producer and the ultimate consumers.

Table 8: Marketing cost and Marketing margin of tomato (Rs./q)

	Channel 1		Channel 2		Channel 3	
Item	**Cost**	**% Consumer Price**	**Cost**	**% Consumer Price**	**Cost**	**% Consumer Price**
Farm gate price	1822.83	82.75	1436.04	51.90	1321.76	42.81
Marketing cost						
Producer	122.41	5.56	131.09	4.74	70.98	2.30
Assembler/Trader	-	-	-	-	93.06	3.01
Wholesaler	-	-	196.03	7.08	190.70	6.18
Retailer	69.04	3.13	95.44	3.45	82.36	2.67
Total Marketing Cost	191.45	8.69	422.56	15.27	437.10	14.16
Marketing margin						
Assembler/Trader	-	-	-	-	414.19	13.41
Wholesaler	-	-	386.47	13.97	370.15	11.99
Retailer	188.47	8.56	522.09	18.87	544.62	17.64
Total Marketing Margin	188.47	8.56	908.56	32.83	1328.97	43.04
Consumer Price	2202.75	100	2767.16	100	3087.83	100

Tomato was marketed through various intermediaries starting from producer to the ultimate consumers. Intermediaries rendered variety of services in the marketing of tomato with a view to earn some profit. The price spread in the various channels involved in the marketing of tomato is given in Table 9. Price spread refers to the difference between the price paid by the consumer and the price received by the producer for equivalent quantity of farm produce. This price spread consists of the marketing costs

and marketing margins of the intermediaries, which ultimately determine the overall effectiveness of the marketing system. The price spread in Channel 1 was found to be lowest (Rs.379.92 per quintal) and highest in Channel 3 (Rs.1766.07 per quintal). Thus it can be concluded that as the length of channel increases the price spread also increases and vice-versa.

Table 9: Price spread of Tomato (Rs./q)

Particulars	Channel 1	Channel 2	Channel 3
Price received by the farmer	1945.24	1567.12	1392.75
Cost incurred	122.41	131.09	70.98
Margin	1822.83	1436.04	1321.76
Village trader's purchase price	-	-	1392.75
Cost incurred	-	-	93.06
Margin	-	-	414.19
Wholesaler's purchase price	-	1567.12	1900.00
Cost incurred	-	196.03	190.70
Margin	-	386.47	370.15
Retailer's purchase price	1945.24	2149.62	2460.85
Cost incurred	69.04	95.44	82.36
Margin	188.47	522.09	544.62
Price paid by consumer	2202.75	2767.16	3087.83
Price spread	379.92	1331.12	1766.07

A comparative view of producer's share and the shares of the various intermediaries involved in the different marketing channels is presented in Table 10. It is evident from the table that the producer's share in consumer's rupee decreased with the increase in the length of the marketing channels. The producer's net share was the highest (82.75 percent) in Channel 1 while lowest (42.81 percent) in Channel 3. Thus, Channel 3 was the least favorable to the producers as their share was the lowest in consumer's rupee. It was due to the presence of large number of intermediaries in between the producer and

the consumer. So, the farmers were not getting good remunerative price for their produce in Channel 3.

The retail margin was more compared to wholesaler in Channel 2 and both wholesaler and village trader in Channel 3. The profit margin of the wholesaler was 13.97 percent and that of retailer was 18.87 percent in Channel 2. While in Channel 3, the profit margin of the wholesaler was 11.99 percent; that of village trader was 13.41 percent and that of retailer was 17.64 percent.

Table 10: Share of different agencies during marketing of tomato

			Share in final price		
Sl.No.	**Agency**	**Function**	**Channel 1**	**Channel 2**	**Channel 3**
1	Retailers	Retailing	8.56	18.87	17.64
2	Wholesalers	Breaking bulk	-	13.97	11.99
3	Village traders	Assembling/transportation	-	-	13.41
4	Farmers	Production	82.75	51.90	42.81
	Total		91.31	84.73	85.84

Marketing efficiency was also calculated for the identified three channels by Conventional method, Shephered's method and Acharya's method and presented in Table 13. The marketing efficiency was found to be highest in Channel 3 (4.04), followed by Channel 2 (3.15) and least in Channel 1 (1.98) when calculated by Conventional method (*i.e.* value added by marketing system divided by total marketing cost). On the other hand when marketing efficiency was calculated by Shephered's method (*i.e.* retailer's sale price divided by total marketing cost), it was found to be highest in Channel 1 (11.51); followed by Channel 3 (7.06) and lowest in Channel 2 (6.55). Again, when calculated by Acharya's method (*i.e.* price received by farmers divided by total marketing cost and margin), it was found to be highest in Channel 1 (4.80); followed by Channel 2 (1.08) and lowest in Channel 3 (0.75).

Table 11: Measurement of Marketing efficiency of Tomato

Sl.No.	Particulars	Unit	Channel 1	Channel 2	Channel 3
1	Retailer's sale price (RP)	Rs./q	2202.75	2767.16	3087.83
2	Total marketing cost (MC)	Rs./q	191.45	422.56	437.10
3	Total margins of intermediaries (MM)	Rs./q	188.47	908.56	1328.97
4	Price received by farmers (FP)	Rs./q	1822.83	1436.04	1321.76
5	Value added by the marketing system (1-4)	Rs./q	379.92	1331.12	1766.07
	Index of Marketing Efficiency				
	Convention method (E) (5/2)	Ratio	1.98	3.15	4.04
	Shephered's method (ME) (1/2)	Ratio	11.51	6.55	7.06
	Acharya's method (MME) [4/(2+3)]	Ratio	4.80	1.08	0.75

Based on the information furnished by the sample respondents, the constraints being faced by them in the marketing of tomato were ranked and prioritized by using Garrett's ranking method, and have been recorded in Tables below.

Table 12: Constraints perceived by the farmers in marketing of Tomato

Constraints	Mean score	Rank
Perishability	76.54	1
Transportation	73.04	2
Presence of exploitative middlemen	72.42	3
Low price	58.50	4
Bands, blockade, strikes, curfew	56.49	5
Lack of market information	55.08	6
Lack of knowledge of proper grading & packaging	47.50	7
Inadequate facilities in market	44.50	8
Lack of storage facilities	34.55	9
Non-availability of market credit	30.43	10
Faulty weighment	29.49	11
No facilities for personal stay at market	21.53	12

Perishable nature of the product was ranked as the first major constraints (with a mean score of 76.54) faced by the tomato farmers in the marketing of the product (Table 12). Tomato is highly perishable; the quality of produce deteriorates after sometime of their harvest, so the farmers have to market their produce as soon as possible at the prevailing market price even if the price is very low. Next second rank with the score value of 73.04 was given to the problem of transportation. The farmers have to bring their produce to the local as well as wholesaler market and transportation posed a major problem as the transportation charge is very high and there are not enough facilities, such as trucks for bringing their produce to the market. Third rank with the score value of 72.42 was given to presence of exploitative middlemen. At the market place the farmers are exploited by the middlemen by offering low prices. The farmers are compelled to accept the price offered by the middlemen as their bargaining power is weak. The farmers cannot negotiate since they may be denied even a low price and their products could be liable to

rotting, since it is perishable. Moreover, farmers could not keep their product for long because they did not have storage facilities. Low price, bands, blockade, strikes, curfew, lack of market information, lack of knowledge of proper grading & packaging, inadequate facilities in market, lack of storage facilities, non-availability of market credit, faulty weighment and no facilities for personal stay at market were allotted fourth, fifth, sixth, seventh, eighth, ninth, tenth, eleventh and twelfth ranks with mean score values of 58.50, 56.49, 55.08, 47.50, 44.50, 34.55, 30.43, 29.49 and 21.53 respectively.

Table 13: Constraints perceived by the retailer in marketing of Tomato

Constraints	Mean score	Rank
Inadequate facilities in market	77.40	1
Band, blockage, strikes, curfew	68.80	2
Perishability	58.80	3
Lack of storage facilities	55.20	4
Payment of unauthorized fee (bribing)	52.40	5
Non-availability of market credit	49.47	6
Lack of market information	37.53	7
Transportation	26.60	8
High market fee	24.80	9

Inadequate facilities in market were ranked as the first major constraints (with a mean score of 77.40) faced by the tomato retailers in the marketing of the product (Table 13). There is lack of facilities in the market, such as limited seats, no place for parking, dirty market place, difficulty during rain, etc. These posed a major problem to the tomato retailers. Next second rank with the score value of 68.80 was given to the problem of bands, blockade, strikes, curfew, etc. which hinder business. Third rank with the score value of 58.80 was given to the problem of perishability of the product. Due to highly perishable nature of tomato, a delay of one or two days in its marketing can cause considerable losses. Lack of storage facilities, payment of unauthorized fee (bribing), non-availability of market credit, lack of market information, transportation and high

market fee were allotted fourth, fifth, sixth, seventh, eighth, ninth ranks with mean score values of 55.20, 49.47, 37.53, 26.60 and 24.80 respectively. There are no adequate storage facilities in the market, so the retailers have to sell their produce on that day itself, otherwise the quality will deteriorate and they will incur loss. The retailers have to pay many unauthorized fees to many persons so that they can sell their produce. Those who do not pay these fees are either beaten up or their produce thrown away and not allow to seat and sell their produce.

Table 14: Constraints perceived by the wholesaler in marketing of Tomato

Constraints	Mean score	Rank
Bands, blockade, strike, curfew	76.20	1
Perishability	66.30	2
Lack of storage facilities	59.10	3
Inadequate facilities in market	58.00	4
Payment of unauthorized fee (bribing)	57.30	5
Non-availability of market credit	42.20	6
Small size of market	39.40	7
High market fee	26.20	8
Lack of market information	23.80	9

Bands, blockade, strikes, curfew, was ranked as the first major constraints (with a mean score of 76.20) faced by the tomato wholesaler in the marketing of the product (Table 14). Next second rank with the score value of 66.30 was given to the problem of perishability of the product. Third rank with the score value of 59.10 was given to the problem of lack of storage facilities. Due to highly perishable nature of tomato, the produce cannot be kept for long. If bands, blockade, strikes, curfew, etc. occurred, the market will be close for the day and this will hinder the business and the produce may be loss. Again, lack of adequate storage facilities compelled the wholesaler to get rid of their produce as soon as possible. Inadequate facilities in market, payment of

unauthorized fee (bribing), non-availability of market credit, small size of market, high market fee and lack of market information were allotted fourth, fifth, sixth, seventh, eighth, ninth ranks with mean score values of 58.00, 57.30, 42.20, 39.40, 26.20 and 23.80 respectively.

Suggestions of farmers, retailers and wholesaler for increasing the marketing efficiency of tomato are presented in Table 15, Table 16 and Table 17 respectively.

Table 15: Suggestions of farmers for increasing marketing efficiency of tomato

Sl.No.	Suggestions
1	Quick and efficient means of transport with good packing.
2	Introduction of an efficient market regulation.
3	Intervention by State Government agencies by fixing reasonable price.
4	Organization of intensive training related to post harvest handling of the produce at government level.
5	Establishment of adequate cold storage facilities.
6	Provision of adequate facilities in market.
7	Improvement of market information delivery system.
8	Numbers of bands, blockade, strikes, curfew, etc. should be reduced.

The transportation facilities need to be strengthened especially for transporting vegetable to consuming market so as to take benefit of higher prices in these markets. The defects and malpractices in existence in most of the markets can be improved by exercising proper control over the markets by the government officials. Regulated markets should be developed. The State Government agencies should fix reasonable and remunerative prices for the produce. The Government should organize intensive training related to post harvest handling of the produce. The storage facilities need to be created which suits all vegetables for storage during the glut season which will help to decrease intra-seasonal price variation. Improvement in market infrastructure such as cold storage, godowns,

loading and unloading facilities mechanically, weighing facilities and improving transparency through supervision and making availability of up-to-date market information to the farmers is the need of the hour. Bands, blockade, strikes, curfew, etc. hinders business so the Government as well as the private organization should try to avoid such kind of unwanted situations as far as possible.

Table 16: Suggestions of retailer for increasing marketing efficiency of tomato

Sl.No.	Suggestions
1	Provision of adequate facilities in market.
2	Numbers of bands, blockade, strikes, curfew, etc. should be reduced.
3	Establishment of adequate cold storage facilities.
4	Punishment of those taking and demanding unauthorized fees.
5	Market credit should be made easily available.

Table 17: Suggestions of wholesaler for increasing marketing efficiency of tomato

Sl.No.	Suggestions
1	Numbers of bands, blockade, strikes, curfew, etc. should be reduced.
2	Establishment of adequate cold storage facilities.
3	Provision of adequate facilities in market.
4	Punishment of those taking and demanding unauthorized fees.
5	Market credit should be made easily available.

Provision of adequate marketing facilities such as proper seating place, packing space for vehicles, clean market place, etc. so that the retailers and the wholesalers do not face any difficulty in marketing their produce. Bands, blockade, strikes, curfew, etc. hinders business so the Government as well as the private organization should try to avoid such kind of unwanted situations as far as possible. The retailers and the wholesalers have to

pay many unwanted or illegal fees to many persons so that they can market their produce. They should unite together and stand against these persons and make efforts to get these illegal charges removed. The government should punish those persons demanding and taking illegal fees from the retailers. Adequate cold storage facilities should be established in the market. Market credit should be made available easily and quickly.

3.2 CABBAGE

The cabbage sample farmers were classified into three categories, viz., (i) Small having upto 0.99 hectares of area under cabbage; (ii) Medium having 1 – 1.49 hectares of area under cabbage and (iii) Large having 1.5 hectares and above area under cabbage. The information on size group-wise distribution of sample farmers is presented in Table 18. Of the total number of 120 sample farmers, 67.50 percent were in small group operating about 35.48 percent of the total area, while large group accounting for about only 10 percent of the total sample farmers shared about 27.06 percent area. Farmers in Medium group formed about 22.5 percent operating 37.46 percent of the total area. The average farm size was 0.32 hectares, 1 hectare and 1.63 hectares respectively in small, medium and large groups with an overall average of 0.60 hectares.

Table 18: Distribution of sample Cabbage cultivators

Sl.	Category	Holding Size (ha.)	No. of cultivators	Total area under cabbage (ha.)	Average area under cabbage (ha.)
1	Small	0 - 0.99	81 (67.50)	25.575 (35.48)	0.32
2	Medium	1 - 1.49	27 (22.50)	27.00 (37.46)	1.00
3	Large	1.5 & above	12 (10.00)	19.50 (27.06)	1.63
4	Total		120 (100)	72.075 (100)	0.60

Figures in the parentheses indicate percentages to the total

The per hectare disposal pattern of cabbage is shown in Table 19. The farmers marketed almost all the produce (96.13 percent) from the farm after using 0.47 percent for home consumption and 0.46 percent for payment in kind and as gift to relatives. It was observed that losses due to breakage and spoilage accounted for 2.94 percent of the total production.

Table 19: Per Hectare Disposal of Cabbage (Quantity in quintals)

Sl. No.	Particular	Groups			
		Small	**Medium**	**Large**	**Overall**
I	Production	419.08	215.20	176.56	277.09
		(100)	(100)	(100)	(100)
II	Quantity consumed on farm				
	a) Home consumption	2.32	0.83	0.60	1.30
		(0.55)	(0.38)	(0.34)	(0.47)
	b) Payment in kind & as gift	2.46	0.73	0.46	1.27
		(0.59)	(0.34)	(0.26)	(0.46)
	c) Losses (due to breakage & spoilage)	7.61	8.39	8.54	8.15
		(1.82)	(3.90)	(4.84)	(2.94)
III	Marketed surplus	406.69	205.25	166.96	266.37
		(97.04)	(95.38)	(94.56)	(96.13)

Figures in the parentheses indicate percentages to the total production

Again, it was observed from the table that out of the total production 0.55 percent was consumed at home in small group, 0.38 percent in medium group and 0.34 percent in large group; 0.59 percent was used for payment in kind and as gift to relatives in small group, 0.34 percent in medium group and 0.26 percent in large group. Losses due to breakage and spoilage were 1.82 percent of the total production in small group, 3.90 percent in medium group and 4.84 percent in large group. This showed that losses increased with increase in farm size. Total marketed surplus was 406.69 quintal per hectare (97.04 percent) in small group, 205.25 quintal per hectare (95.38 percent) in medium group and 166.96 quintal per hectare (94.56 percent) in large group. The disposal pattern revealed that marketed surplus decreased with increase in farm size.

Marketing channel of Cabbage:

Marketing channels are the routes through which agricultural as well as horticultural products move from producers to consumers. The length of the channel varies from commodity to commodity, depending on the quality to be moved, the form of consumer demand and degree of regional specialization in production.

The prominent marketing channels of cabbage in Manipur are shown in Table 20. Most of the farmers in hilly region of Manipur market their produce through Channel 1 and Channel 4 while those in the plain regions market their produce through Channel 2 and Channel 3.

Table 20: Marketing channel of Cabbage

Particulars	Supply chain
Channel 1	Producer - Consumer
Channel 2	Producer - Retailer - Consumer
Channel 3	Producer - Wholesaler -Retailer - Consumer
Channel 4	Producer - Village trader - Wholesaler - Retailer - Consumer

The channel-wise distribution of cabbage growers and quantity handled in different marketing channels is given in Table 21.

Table 21: Quantity handled in different marketing channel of Cabbage

Marketing channel	Quantity handled (q)	% to the total	No. of growers	% to total
Channel 1	1618.96	8.48	11	9.17
Channel 2	2541.90	13.31	13	10.83
Channel 3	8942.60	46.82	46	38.33
Channel 4	5997.30	31.40	50	41.67

Total	19100.76	100	120	100

It is observed from the table that the maximum quantity of cabbage was passed through Channel 3 (46.82 percent), followed by Channel 4 (31.40 percent), Channel 2 (13.31 percent) and the lowest quantity of cabbage was sold through Channel 1 (8.48 percent). Again, it was observed from the table that majority of the farmers market their produce through Channel 4 (41.67 percent), followed by Channel 3 (38.33 percent), Channel 2 (10.83 percent) and the least through Channel 1 (9.17 percent).

Table 22: Marketing cost and Marketing margin of cabbage (Channel 1)

Item	**Unit**	**Cost**	**% Consumer Price**
Farm gate price at village	Rs/q	662.02	94.57
Sorting and Cleaning	Rs/q	12.41	1.77
Packing material	Rs/q	2.23	0.32
Weighing	Rs/q	0.00	0.00
Transport	Rs/q	18.68	2.67
Losses due to spoilage	Rs/q	4.66	0.67
Total marketing cost	Rs/q	37.98	5.43
Farmers' selling price to Consumer	Rs/q	700.00	100.00

Marketing costs and marketing margins per quintal of cabbage for Channel 1 in Manipur have been presented in Table 22. The farmer's share in the consumer's rupee has been found to be 94.57 percent. Total marketing expenses incurred by farmer is worked out to be Rs.37.98 of which transportation consumed highest share, *i.e.*, about 49 percent of the cost incurred by producer. Sorting and cleaning (33 percent) ranks second, followed by losses (12 percent) and then cost of packing material (6 percent). For packing the cabbage, the farmers used gunny bags which cost about Rs. 10 per bag and the mouth of the bags are tied with plastic ropes. These bags can be used for a year. Transportation is done by bus, auto or Tata DI depending upon the distance. In this channel, the producers bring the produce to the local market and sell directly to the consumer. Table shows that

the producer, on an average receives Rs.700 per quintal. It is observed from the table that tomato producer fetches Rs.662.02 per quintal as his net margin.

Table 23: Marketing cost and Marketing margin of cabbage (Channel 2)

Item	Unit	Cost	% Consumer Price
Farm gate price at village	Rs/q	806.35	80.63
Sorting and Cleaning	Rs/q	11.94	1.19
Packing material	Rs/q	2.84	0.28
Weighing	Rs/q	9.89	0.99
Transport	Rs/q	23.94	2.39
Losses due to spoilage	Rs/q	9.99	1.00
Total marketing cost	Rs/q	58.61	5.86
Farmers' selling price to Retailer	Rs/q	864.95	86.50
Sorting and Cleaning	Rs/q	0	0.00
Packing material	Rs/q	0	0.00
Loading/ unloading	Rs/q	0	0.00
Spoilage	Rs/q	0	0.00
Transport	Rs/q	17.95	1.79
Market fee	Rs/q	0.56	0.06
Losses due to spoilage	Rs/q	6.41	0.64
Total marketing cost	Rs/q	24.91	2.49
Marketing margin	Rs/q	110.13	11.01
Retailers price to consumer	Rs/q	1000.00	100.00

Marketing costs and marketing margins per quintal of cabbage for Channel 2 in Manipur have been presented in Table 23. The farmer's share in the consumer's rupee has been found to be 80.63 percent. Total marketing expenses incurred by farmer is worked out to be Rs. 58.61 of which transportation consumed highest share, *i.e.*, about 41 percent of the cost incurred by producer. Cost of sorting and cleaning (20 percent) ranks second, followed by losses (17 percent), cost of weighing (16 percent) and then cost of packing material (5 percent). Table shows that the producer, on an average receives Rs. 864.95 per quintal. It is observed from the table that tomato producer fetches Rs.806.35 per quintal as his net margin.

The retailer has to incur a cost amounting Rs. 24.91, *i.e.*, 2.49 percent of retail price to market one quintal of tomato. Of this cost about 72 percent is incurred as transportation cost, 26 percent storage and 2 percent market fee. However, he fetches Rs. 110.13 which accounts for 11.01 percent of the price received by him as profit or margin. In Channel 2, the producers incur more marketing cost than the retailers.

Table 24: Marketing cost and Marketing margin of cabbage (Channel 3)

Item	Unit	Cost	% Consumer Price
Farm gate price at village	Rs/q	753.11	68.43
sorting & cleaning	Rs/q	11.56	1.05
packing material	Rs/q	2.13	0.19
Weighing	Rs/q	10.00	0.91
transport	Rs/q	22.39	2.03
losses	Rs/q	9.31	0.85
Total marketing cost	Rs/q	55.39	5.03
Farmers' selling price to wholesaler	Rs/q	808.50	73.46
sorting	Rs/q	0	0.00
packing	Rs/q	0	0.00
loading/ unloading	Rs/q	9.89	0.90
spoilage	Rs/q	7.61	0.69
transport	Rs/q	11.12	1.01
market fee	Rs/q	1.78	0.16
storage	Rs/q	6.00	0.55
Total marketing cost	Rs/q	36.40	3.31
Marketing margin	Rs/q	105.10	9.55
Wholesaler price to retailer	Rs/q	950.00	86.32
sorting	Rs/q	0	0.00
packing	Rs/q	0	0.00
loading/ unloading	Rs/q	0	0.00
spoilage	Rs/q	0	0.00

transport	Rs/q	18.00	1.64
Market fee	Rs/q	0.42	0.04
storage	Rs/q	4.50	0.41
Total marketing cost	Rs/q	22.92	2.08
Marketing margin	Rs/q	127.64	11.60
Retailers price to consumer	Rs/q	1100.56	100.00

Marketing costs and marketing margins per quintal of cabbage for Channel 3 in Manipur have been presented in Table 24. The farmer's share in the consumer's rupee has been found to be 68.43 percent. Total marketing expenses incurred by farmer is worked out to be Rs. 55.39 of which transportation consumed highest share, *i.e.*, about 40 percent of the cost incurred by producer. Cost of sorting and cleaning (21 percent) ranks second, followed by weighing (18 percent), losses due to spoilage and breakage (17 percent) and then cost of packing material (4 percent). Transportation is done by bus, auto or Tata DI depending upon the distance. Table shows that the producer, on an average receives Rs. 808.50 per quintal. It is observed from the table that cabbage producer fetches Rs. 753.11 per quintal as his net margin.

The wholesaler has to incur a cost amounting Rs. 36.40, *i.e.*, 3.31 percent of the retail price to market one quintal of cabbage. Of this cost about 31 percent is incurred as transportation cost. Loading/unloading (27 percent), losses due to spoilage and breakage (21 percent), storage (16 percent) and market fee (5 percent) form the remaining marketing cost. The wholesaler sells the crop to retailers at Rs. 950 per quintal. He, however, fetches Rs.105.10 which accounts for 9.55 percent of the retail price as his profit.

At retailer's level, an amount of Rs.22.92 (2.08 percent of the retail price) is required as marketing cost. It is noted that out of the total marketing cost about 78 percent is incurred as transportation cost. Storage (20 percent) and market fee (2 percent) constitute the remaining marketing cost incurred by the retailer. The retail price of one quintal of cabbage in Channel 3 is Rs.1100.56. The retailer, however, fetches Rs.127.64, about 11.60 percent of the retail price as his profit.

It is observed from the table that maximum marketing cost in this channel is incurred by producer. It is further observed that maximum profit is reaped by retailer.

Table 25: Marketing cost and Marketing margin of cabbage (Channel 4)

Item	Unit	Cost	% Consumer Price
Farm gate price at village	Rs/q	644.12	53.73
Sorting	Rs/q	13.92	1.16
packing material	Rs/q	1.95	0.16
Weighing	Rs/q	0.00	0.00
transport	Rs/q	9.49	0.79
Losses	Rs/q	9.12	0.76
Total marketing cost	Rs/q	34.48	2.88
Farmers' selling price to local assembly trader at rural market	Rs/q	678.61	56.61
Sorting	Rs/q	0	0.00
packing material	Rs/q	4.56	0.38
Weighing	Rs/q	10.00	0.83
loading/ unloading	Rs/q	7.13	0.59
transport	Rs/q	35.67	2.98
Total marketing cost	Rs/q	57.36	4.78
Marketing margin	Rs/q	114.03	9.51
Assembly traders price to wholesaler	Rs/q	850.00	70.91
Sorting	Rs/q	0	0.00
packing material	Rs/q	0	0.00
loading/ unloading	Rs/q	8.76	0.73
Spoilage	Rs/q	6.11	0.51
transport	Rs/q	0	0.00
market fee	Rs/q	1.56	0.13

Storage	Rs/q	6.00	0.50
Total marketing cost	Rs/q	22.43	1.87
Marketing margin	Rs/q	127.57	10.64
Wholesaler price to retailer	Rs/q	1000.00	83.42
Sorting	Rs/q	0	0.00
packing material	Rs/q	0	0.00
loading/ unloading	Rs/q	0	0.00
Spoilage	Rs/q	0	0.00
transport	Rs/q	14.14	1.18
Market fee	Rs/q	0.57	0.05
Storage	Rs/q	4.00	0.33
Total marketing cost	Rs/q	18.71	1.56
Marketing margin	Rs/q	180.03	15.02
Retailers price to consumer	Rs/q	1198.74	100.00

Marketing costs and marketing margins per quintal of cabbage for Channel 4 in Manipur have been presented in Table 25. The farmer's share in the consumer's rupee has been found to be 53.73 percent. Total marketing expenses incurred by farmer is worked out to be Rs.34.48 of which sorting and cleaning consumed highest share, *i.e.*, about 40 percent of the cost incurred by producer. Transportation cost (28 percent), losses due to spoilage and breakage (26 percent) and packing material (6 percent) constitute the remaining marketing cost incurred by the farmers. Farmers do not incur any cost towards weighing. This cost is bore by village traders. Table shows that the producer, on an average receives Rs.678.61 per quintal. It is observed from the table that cabbage producer fetches Rs.644.12 per quintal as his net margin.

The village traders have to meet Rs.57.36 per quintal, *i.e.*, 4.78 percent of the retail price as marketing cost. It is noted that about 62 percent of this cost is taken away as transportation charge. Next importation item of cost is weighing which amounts to Rs.10 per quintal; loading/unloading (Rs.7.13 per quintal) and packing material (Rs.4.56 per quintal). It is further observed from the table that the village traders sell their load to the

wholesaler at Rs. 850 per quintal and earn a profit of Rs.114.03, *i.e.*, 9.51 percent of the retail price.

In this channel, the wholesaler has to incur a cost amounting Rs. 22.43, *i.e.*, 1.87 percent of the retail price to market one quintal of cabbage. Of this cost about 39 percent is loading/ unloading charges. Storage (27 percent), losses due to spoilage (26 percent) and market fee (7 percent) form the remaining marketing cost. The wholesaler sells the crop to retailers at Rs. 1000 per quintal. He, however, fetches Rs.127.57 which accounts for 10.64 percent of the retail price as his profit.

At retailer's level, an amount of Rs.18.71 (1.56 percent of the retail price) is required as marketing cost. It is noted that out of this marketing cost about 76 percent is incurred as transportation cost. Cost of storage (21 percent) and market fee (3 percent) constitute the remaining marketing cost incurred by the retailer. The retail price of one quintal of cabbage in Channel 4 is Rs.1198.74. The retailer, however, fetches Rs.180.03, about 15.02 percent of the retail price as his profit. It is observed from the table that maximum marketing cost in this channel is incurred by village trader which is associated with high transportation cost. It is further observed that maximum profit is reaped by retailer.

Channel-wise marketing cost and marketing margin of cabbage is shown in Table 26. Marketing cost and marketing margin vary considerably from channel to channel and were related directly to the length of the channel, *i.e.*, longer the channel, more were the marketing cost and marketing margin. Channel 4 (Producer - Village trader - Wholesaler - Retailer - Consumer) being the longest channel and in this channel the highest marketing cost and marketing margin per quintal, *i.e.*, Rs. 132.98 and Rs. 421.63 respectively were observed. Channel 1 (Producer - Consumer) is the shortest channel accounting for lowest marketing cost, *i.e.*, Rs.37.98 per quintal. Channel 2 (Producer - Retailer - Consumer) is the next shortest channel accounting for lower marketing cost and marketing margin, *i.e.*, Rs. 83.52 and Rs. 110.13 per quintal respectively. Thus it can be concluded that as the length of channel increases the marketing cost and marketing margin also increases and vice-versa.

Table 26: Marketing cost and Marketing margin of cabbage (Rs./q)

	Channel 1		Channel 2		Channel 3		Channel 4	
		% Consumer		% Consumer		% Consumer		% Consumer
Item	**Cost**	**Price**	**Cost**	**Price**	**Cost**	**Price**	**Cost**	**Price**
Farm gate price	662.02	94.57	806.35	80.63	753.11	68.43	644.12	53.73
Marketing cost								
Producer	37.98	5.43	58.61	5.86	55.39	5.03	34.48	2.88
Assembler/Trader	-	-	-	-	-	-	57.36	4.78
Wholesaler	-	-	-	-	36.40	3.31	22.43	1.87
Retailer	-	-	24.91	2.49	22.92	2.08	18.71	1.56
Total Marketing Cost	37.98	5.43	83.52	8.35	114.71	10.42	132.98	11.09
Marketing margin								
Assembler/Trader	-	-	-	-	-	-	114.03	9.51
Wholesaler	-	-	-	-	105.10	9.55	127.57	10.64

Retailer	-	-	110.13	11.01	127.64	11.60	180.03	15.02
Total Marketing Margin	**-**	-	110.13	11.01	232.74	21.15	421.63	35.17
Consumer Price	700.00	100.00	1000.00	100.00	1100.56	100.00	1198.74	100.00

In other words, the more the numbers of intermediaries involved between the producer and the ultimate consumers, the more is the marketing cost and marketing margin of the intermediaries.

It can also be seen from the table that as the consumer paid the lowest price (Rs.700 per quintal) when they purchased directly from the producer (Channel 1) and paid the highest price (Rs.1198.74 per quintal) when three intermediaries were involved between the producer and consumer *i.e.* village trader, wholesaler and retailer in Channel 4. The price paid by the consumer increased with the increase in the length of the marketing channel or with the increased in the numbers of intermediaries involved between the producer and the ultimate consumers.

Cabbage was marketed through various intermediaries starting from producer to the ultimate consumers. Intermediaries rendered variety of services in the marketing of cabbage with a view to earn some profit. The price spread in the various channels involved in the marketing of cabbage is given in Table 27.

Table 27: Price spread of cabbage (Rs./q)

Particulars	Channel 1	Channel 2	Channel 3	Channel 4
Price received by the farmer	700.00	864.95	808.50	678.61
Cost incurred	37.98	58.61	55.39	34.48
Margin	662.02	806.35	753.11	644.12
Village trader's purchase price	-	-	-	678.61
Cost incurred	-	-	-	57.36
Margin	-	-	-	114.03
Wholesaler's purchase price	-	-	808.50	850
Cost incurred	-	-	36.40	22.43
Margin	-	-	105.10	127.57

Retailer's purchase price	-	864.95	950.00	1000.00
Cost incurred	-	24.91	22.92	18.71
Margin	-	110.13	127.64	180.03
Price paid by consumer	700.00	1000.00	1100.56	1198.74
Price spread	37.98	193.65	347.45	554.62

Price spread refers to the difference between the price paid by the consumer and the price received by the producer for equivalent quantity of farm produce. This price spread consists of the marketing costs and marketing margins of the intermediaries, which ultimately determine the overall effectiveness of the marketing system. The price spread in Channel 1 was found to be lowest (Rs. 37.98 per quintal); followed by Channel 2 (Rs. 193.65 per quintal) and Channel 3 (Rs. 347.45 per quintal); and highest in Channel 4 (Rs. 554.62 per quintal). Thus it can be concluded that as the length of channel increases the price spread also increases and vice-versa.

Table 28: Share of different agencies during marketing of cabbage

			Share in final price			
Sl. No.	**Agency**	**Function**	**Channel 1**	**Channel 2**	**Channel 3**	**Channel 4**
1	Retailers	Retailing	-	11.01	11.60	15.02
2	Wholesalers	Breaking bulk	-	-	9.55	10.64
3	Village traders	Assembling/transportation	-	-	-	9.51
4	Farmers	Production	94.57	80.63	68.43	53.73
	Total		94.57	91.65	89.58	88.91

A comparative view of producer's share and the shares of the various intermediaries involved in the different marketing channels is presented in Table 28. It is evident from the table that the producer's share in consumer's rupee decreased with the increase in the length of the marketing channels. The producer's net share was the highest (94.57 percent) in Channel 1

while lowest (53.73 percent) in Channel 4. Thus, Channel 4 was the least favourable to the producers as their share was the lowest in consumer's rupee. It was due to the presence of large number of intermediaries in between the producer and the consumer. So, the farmers were not getting good remunerative price for their produce in Channel 4.

The retail margin was more compared to wholesaler in Channel 3 and both wholesaler and village trader in Channel 4. The profit margin of the wholesaler was 9.55 percent and that of retailer was 11.60 percent in Channel 3. While in Channel 4, the profit margin of the village trader was 9.51 percent; and that of wholesaler was 10.64 percent and that of retailer was 15.02 percent.

Marketing efficiency was also calculated for the identified three channels by Conventional method, Shephered's method and Acharya's method and presented in Table 29. The marketing efficiency was found to be highest in Channel 4 (4.17), followed by Channel 3 (3.03) and Channel 2 (2.32)and least in Channel 1 (1.00) when calculated by Conventional method (*i.e.* value added by marketing system divided by total marketing cost). On the other hand when marketing efficiency was calculated by Shephered's method (*i.e.* retailer's sale price divided by total marketing cost), it was found to be highest in Channel 1 (18.43); followed by Channel 2 (11.97) and Channel 3 (9.59) and lowest in Channel 4 (9.01). Again, when calculated by Acharya's method (*i.e.* price received by farmers divided by total marketing cost and margin), it was found to be highest in Channel 1 (17.43); followed by Channel 2 (4.16) and Channel 3 (2.17) and lowest in Channel 4 (1.16).

Table 29: Measurement of Marketing efficiency of Cabbage

Sl.No.	Particulars	Unit	Channel 1	Channel 2	Channel 3	Channel 4
1	Retailer's sale price (RP)	Rs./q	700.00	1000.00	1100.56	1198.74
2	Total marketing cost (MC)	Rs./q	37.98	83.52	114.71	132.98
3	Total margins of intermediaries (MM)	Rs./q	-	110.13	232.74	421.63
4	Price received by farmers (FP)	Rs./q	662.02	806.35	753.11	644.12
5	Value added by the marketing system (1-4)	Rs./q	37.98	193.65	347.45	554.62

Index of Marketing Efficiency					
Convention method (E) (5/2)	Ratio	1.00	2.32	3.03	4.17
Shephered's method (ME) (1/2)	Ratio	18.43	11.97	9.59	9.01
Acharya's method (MME) [4/(2+3)]	Ratio	17.43	4.16	2.17	1.16

Based on the information furnished by the sample respondents, the constraints being faced by them in the marketing of cabbage were ranked and prioritized by using Garrett's ranking method, and have been recorded in Tables below.

Transportation problem was ranked as the first major constraints (with a mean score of 80.33) faced by the cabbage farmers in the marketing of the product (Table 30). Next second rank with the score value of 75.67 was given to the presence of exploitative middlemen. Third rank with the score value of 64.96 was given to low price. The cabbage fields for most of the farmers are located at a long distance from their homes or local market. So they have to incur a lot of money to bringing their produce from the field. Again, due to poor distribution systems arising from poor farm to market roads, absence of adequate storage facilities, high transportation charges and not enough facilities, such as trucks for bringing their vegetables out of their villages, the farmers were constrained to accept the low price offered by the traders operating in the village. Even in the market also they are exploited by the wholesalers by offering low prices. The farmers cannot negotiate since they may be denied even a low price and their products could be liable to rotting, since it is perishable. As the farmers cannot take back their produce, they have to accept the prevailing price. Moreover, the farmers could not keep their vegetable for more than a week to wait for better prices because they did not have adequate storage facilities. Bands, blockade, strikes, curfew, lack of market information, lack of knowledge of proper grading & packaging, inadequate facilities in market, perishability, lack of storage facilities, no facilities for personal stay at market, non-availability of market credit and faulty weighment were allotted fourth, fifth, sixth, seventh, eighth, ninth, tenth, eleventh and twelfth ranks with mean score values of 62.04, 56.13, 52.88, 47.43, 44.57, 36.62, 34.31, 27.00 and 19.49 respectively.

Table 30: Constraints perceived by the farmers in marketing of Cabbage

Constraints	Mean score	Rank
Transportation	80.33	1
Presence of exploitative middlemen	75.67	2
Low price	64.96	3
Band, blockage, strikes, curfew	62.04	4
Lack of market information	56.13	5
Lack of knowledge of proper grading & packaging	52.88	6
Inadequate facilities in market	47.43	7
Perishability	44.57	8
Lack of storage facilities	36.62	9
No facilities for personal stay at market	34.31	10
Non-availability of market credit	27.00	11
Faulty weighment	19.49	12

Bands, blockades, strikes, curfews was ranked as the first major constraints (with a mean score of 79.00) faced by the cabbage traders in the marketing of the product (Table 31). Next second rank with the score value of 65.83 was given to the transportation problem. Third rank with the score value of 64.80 was given to payment of unauthorized fee & taxes to unwanted elements. If bands, blockade, strikes, curfew, etc. occurred, the market will be close for the day and this will hinder their business. They cannot collect the produce from the farmers and also they cannot sell the produce to the wholesaler. Delay of one or two days in the marketing of the produce will reduce the market value of the produce. Due to poor farm to market roads and bad condition of the existing roads, the traders have to bear high transportation charges. The traders have to pay many illegal taxes so that they can do business in that area.

Competition from other traders, low volume of product, no facilities for personal stay at market, inadequate facilities in market, non-availability of market credit, lack of knowledge of proper grading & packaging and faulty weighment were allotted fourth, fifth, sixth, seventh, eighth, ninth, tenth and eleventh ranks with mean score values of 59.53, 58.40, 52.43, 48.87, 38.80, 37.20, 24.70 and 20.30 respectively. The traders have to compete with other traders to collect more produce due to low volume of marketable produce brought out by the farmers for sale. There no facilities for personal stay in the market, so traders coming from distance places faced many difficulties.

Table 31: Constraints perceived by the traders in marketing of Cabbage

Constraints	Mean score	Rank
Bands, blockades, strikes, curfews	79.00	1
Transportation charge very high	65.83	2
Payment of unauthorized fee & taxes	64.80	3
Presence of exploitative middlemen	59.53	4
Competition from other traders	58.40	5
Low volume of product	52.43	6
No facilities for personal stay at market	48.87	7
Inadequate facilities in market	38.80	8
Non-availability of market credit	37.20	9
Lack of knowledge of proper grading & packaging	24.70	10
Faulty weighment	20.30	11

Table 32: Constraints perceived by the retailers in marketing of Cabbage

Constraints	Mean score	Rank
Inadequate facilities in market	79.97	1
Band, blockage, strikes, curfew	66.07	2
Payment of unauthorized fee (bribing)	63.53	3
Lack of storage facilities	55.40	4
Non-availibility of market credit	50.37	5
Perishability	47.20	6
Lack of market information	36.60	7
Transportation	28.07	8
High market fee	23.80	9

Inadequate facilities in market was ranked as the first major constraints (with a mean score of 79.97) faced by the cabbage retailers in the marketing of the product (Table 32). There is lack of adequate facilities in the market, such as lack of seating space, no packing place, difficulty during rainy season, dirty market place, etc. These posed a major problem for the cabbage retailers. Next second rank with the score value of 66.07 was given to the problem of bands, blockade, strikes, curfew, etc. which hinder business. Third rank with the score value of 63.53 was given to the payment of unauthorized fee (bribing). The retailers have to pay many unauthorized fees to many persons so that they can sell their produce. Those who do not pay these fees are either beaten up or their produce thrown away and not allow to seat and sell their produce. Lack of storage facilities, non-availability of market credit, problem of perishability of the product, lack of market information, transportation and high market fee were allotted fourth, fifth, sixth, seventh, eighth, ninth ranks with mean score values of 55.40, 50.37, 47.20, 36.60, 28.07 and 23.80 respectively. There are no adequate storage facilities in the market, so the retailers have to sell their produce on the day they bought the produce from the wholesaler or farmers itself, otherwise they will incur loss.

Bands, blockade, strikes, curfew, was ranked as the first major constraints (with a mean score of 79.27) faced by the cabbage wholesaler in the marketing of the product (Table 12.4). If bands, blockade, strikes, curfew, etc. occurred, the market will be close for the day and this will hinder the business and the market value of the produce will be reduced. Next second rank with the score value of 66.18 was given to inadequate facilities in market.

Table 33: Constraints perceived by the wholesaler in marketing of Cabbage

Constraints	Mean score	Rank
Bands, blockade, strike, curfew	79.27	1
Inadequate facilities in market	66.18	2
Lack of storage facilities	60.45	3
Perishability	56.09	4
Payment of unauthorized fee (bribing)	48.00	5
Non-availabilty of market credit	46.09	6
Small size of market	40.27	7
High market fee	32.36	8
Lack of market information	22.27	9

There is lack of adequate facilities in the market, such as lack of seating space, no packing place, difficulty during rainy season, dirty market place, etc. Third rank with the score value of 60.45 was given to the problem of lack of storage facilities. Again, lack of adequate storage facilities compelled the wholesaler to get rid of their produce as soon as possible. Perishability, payment of unauthorized fee (bribing), non-availability of market credit, small size of market, high market fee and lack of market information were allotted fourth, fifth, sixth, seventh, eighth, ninth ranks with mean score values of 56.09, 48.00, 46.09, 40.27, 32.36 and 22.27 respectively.

Suggestions of farmers, traders, retailers and wholesaler for increasing the marketing efficiency of cabbage are presented in Table 34, Table 35, Table 36 and Table 37 respectively.

The transportation facilities need to be strengthened especially for transporting vegetable to consuming market so as to take benefit of higher prices in these markets. The defects and malpractices in existence in most of the markets can be improved by exercising proper control over the markets by the government officials. Regulated markets should be developed. The State Government agencies should fix reasonable and remunerative prices for the produce. The Government should organize intensive training related to post harvest handling of the produce.

Table 34: Suggestions of farmers for increasing marketing efficiency of Cabbage

Sl.No.	Suggestions
1	Quick and efficient means of transport with good packing.
2	Introduction of an efficient market regulation.
3	Establishment of adequate cold storage facilities.
4	Intervention by State Government agencies by fixing reasonable price.
5	Provision of adequate facilities in market.
6	Improvement of the market information delivery system.
7	Numbers of bands, blockade, strikes, curfew, etc. should be reduced.

The storage facilities need to be created which suits all vegetables for storage during the glut season which will help to decrease intra-seasonal price variation. Improvement in market infrastructure such as cold storage, godowns, loading and unloading facilities mechanically, weighing facilities and improving transparency through supervision and making availability of up-to-date market information to the farmers is the need of the hour. Bands, blockade, strikes, curfew, etc. hinders business so the Government as well as the private organization should try to avoid such kind of unwanted situations as far as possible.

Table 35: Suggestions of trader for increasing marketing efficiency of cabbage

Sl.No.	Suggestions
1	Transportation charges should be reduced.
2	Numbers of bands, blockade, strikes, curfew, etc. should be reduced.
3	Punishment of those taking and demanding unauthorized fees.
4	Production should be increased.
5	Provision of adequate facilities in market.
6	Establishment of adequate cold storage facilities.
7	Market credit should be made easily available.

The transportation facilities need to be strengthened by constructing new roads and improving the condition of the existing ones and increasing the number of transport vehicle with cold storage facility. Bands, blockade, strikes, curfew, etc. hinders business so the Government as well as the private organization should try to avoid such kind of unwanted situations as far as possible. The traders have to pay many illegal taxes so that they can do business in that area. The government should take action against those persons demanding and taking illegal fees. The farmers should increase their production by adopting new and improved production techniques. Improvement in market infrastructure such as cold storage, godowns, loading and unloading facilities mechanically, weighing facilities and improving transparency through supervision and making availability of up-to-date market information is the need of the hour. Low cost timely institutional finance should be provided to the traders.

Table 36: Suggestions of retailer for increasing marketing efficiency of cabbage

Sl.No.	Suggestions
1	Provision of adequate facilities in market.
2	Numbers of bands, blockade, strikes, curfew, etc. should be reduced.
3	Punishment of those taking and demanding unauthorized fees.
4	Establishment of adequate cold storage facilities.

5	Introduction of an efficient market regulation.
6	Market credit should be made easily available.

Table 37: Suggestions of wholesaler for increasing marketing efficiency of cabbage

Sl.No.	Suggestions
1	Numbers of bands, blockade, strikes, curfew, etc. should be reduced.
2	Provision of adequate facilities in market.
3	Establishment of adequate cold storage facilities.
4	Punishment of those taking and demanding unauthorized fees.
5	Market credit should be made easily available.

Provision of adequate marketing facilities such as proper seating place, packing space for vehicles, clean market place, etc. so that the retailers and the wholesalers do not face any difficulty in marketing their produce. Bands, blockade, strikes, curfew, etc. hinders business so the Government as well as the private organization should try to avoid such kind of unwanted situations as far as possible. The retailers and the wholesalers have to pay many unwanted or illegal fees to many persons so that they can market their produce. They should unite together and stand against these persons and make efforts to get these illegal charges removed. The government should punish those persons demanding and taking illegal fees from the retailers. Adequate cold storage facilities should be established in the market. Regulated markets should be developed. Market credit should be made available easily and quickly.

Table38: Factors affecting Marketing Efficiency of Vegetable (Tomato and Cabbage) in Manipur

Sl.No.	Factors	Coefficient	Standard error	't' value
1	Constant	14.138***	3.616	3.910
2	Marketing cost	-1.143***	0.001	-4.447
3	Marketing margin	0.765***	0.002	3.572
4	Transport cost	-0.487*	0.002	-1.774
5	Open Market price	-0.868***	0.063	-6.453
6	Labour wages	-0.046	0.024	-0.444
7	Controlling middlemen	-	-	-
8	Volume of produce handled	0.935***	0.001	6.841
9	Presence of cold storage facilities	-	-	-
10	Length of market channel	-	-	-
11	Existence of competition in selling	-	-	-
12	Nature of produce	-0.057	0.153	-1.158
13	R-square	0.760		
14	Adjusted R-square	0.745		
15	No. of observation	120		

(***) Significant at 1%

(**) Significant at 5%

(*) Significant at 10%

The marketing efficiency of vegetable (tomato and cabbage) in Manipur is significantly affected by marketing cost, marketing margin, open market price and volume of produce handled at 1% significant level and by transport cost at 10% significant level. The marketing

efficiency will increase with the decrease in the marketing cost, transport cost and open market price and with the increase in the marketing margin and volume of the produce handled. The labour wage and the nature of the produce had no significant effect on the marketing efficiency of vegetables (tomato and cabbage).

3.3 PASSION FRUIT

Passion fruit is a native of the South American rain forests covering the Amazon region in Brazil, Paraguay and North Argentina. In India, it is found in the forests of Manipur, Nagaland, Arunachal Pradesh and Karnataka states. There are two types of passion fruits: the purple species (*Passiflora edulis*), thrives from cool subtropics to high altitudes in the tropics and the golden species (*P. edulis f. flavicarpa*) which is found mostly in tropical lowlands. Both the types of passion fruits are grown in Manipur. The purple species are mostly grown in Senapati district and the golden species in Churachandpur district of Manipur.

Table 39: Distribution of sample Passion fruit cultivators

Sl.	Category	Holding Size (ha.)	No. of cultivators	Total Area under Passion Fruit (ha.)	Average Area under Passion Fruit (ha.)
1	Small	0 - 0.99	91 (75.83)	46.45 (55.17)	0.51
2	Medium	1 - 1.49	18 (15.00)	18.50 (21.97)	1.03
3	Large	1.5 & above	11 (9.17)	19.25 (22.86)	1.75
4	Total		120 (100)	84.20 (100)	0.70

Figures in the parentheses indicate percentages to the total

The passion fruit farmers were classified into three categories, viz., (i) Small having upto 0.99 hectares of land under passion fruit; (ii) Medium having 1 – 1.49 hectares and (iii) Large having 1.5 hectares and above land under passion fruit. The information on size group-wise distribution of sample farmers is presented in Table 1. Of the total number of 120 sample

farmers, 75.83 percent were in small group operating about 55.17 percent of the total area, while large group accounting for about only 9.17 percent of the total sample farmers shared about 22.86 percent area. Farmers in medium group formed about 15 percent operating only 21.97 percent of the total area. The average farm size was 0.51 hectares, 1.03 hectares and 1.75 hectares respectively in small, medium and large groups with an overall average of 0.70 hectares.

The per hectare disposal pattern of tomato is shown in Table 40. The farmers marketed almost all the produce (90.93 percent) from the farm after using 1.25 percent for home consumption and 2.14 percent for payment in kind and as gift to relatives. It was observed that losses due to breakage and spoilage accounted for 5.69 percent of the total production.

Table 40: Per Hectare Disposal of Passion fruit (Quantity in quintals)

Sl. No.	Particular	Groups			
		Small	**Medium**	**Large**	**Overall**
I	Production	159.78	159.73	133.30	153.71
		(100)	(100)	(100)	(100)
II	Quantity consumed on farm				
	a) Home consumption	1.64	2.51	2.01	1.92
		(1.03)	(1.57)	(1.51)	(1.25)
	b) Payment in kind & as gift	3.16	3.96	2.96	3.29
		(1.98)	(2.48)	(2.22)	(2.14)
	c) Losses (due to breakage & spoilage)	8.83	8.98	8.31	8.74
		(5.52)	(5.62)	(6.24)	(5.69)
III	Marketed surplus	146.15	144.28	120.02	139.76
		(91.47)	(90.33)	(90.04)	(90.93)

Figures in the parentheses indicate percentages to the total production

Again, it was observed from the table that out of the total production 1.03 percent was consumed at home in small group, 1.57 percent in medium group and 1.51 percent in large group; 1.98 percent was used for payment in kind and as gift to relatives in small group, 2.48 percent in medium group and 2.22 percent in large group. Losses due to breakage and

spoilage were 5.52 percent of the total production in small group, 5.62 percent in medium group and 6.24 percent in large group. In terms of quantity, losses due to breakage and spoilage were highest in medium group (8.89 quintal per hectare) and least in large group (8.31 quintal per hectare). Total marketed surplus was 146.15 quintal per hectare (91.47 percent) in small group, 144.28 quintal per hectare (90.33 percent) in medium group and 120.02 quintal per hectare (90.04 percent) in large group. The disposal pattern revealed that marketed surplus decreased with increase in farm size.

Marketing channel of Passion fruit:

Marketing channels are the routes through which agricultural as well as horticultural products move from producers to consumers. The length of the channel varies from commodity to commodity, depending on the quality to be moved, the form of consumer demand and degree of regional specialization in production. The prominent marketing channels of passion fruit in Manipur are shown in Table 5. Here the society is the Passion Beekeeping Dev. Association (A subsidiary of Passion Fruit Growers Association) of Churachandpur district, Manipur.

Table 41: Marketing channel of Passion fruit

Particulars	Supply chain
Channel 1	Producer - Society - Juice factory
Channel 2	Producer - Wholesaler -Retailer - Consumer
Channel 3	Producer - Retailer - Consumer

The channel-wise distribution of passion fruit growers and quantity handled in different marketing channels is given in Table 42. It was observed from the table that the maximum quantity of passion fruit was passed through Channel 1 (86.02 percent), followed by Channel 2 (11.53 percent) and the lowest quantity of passion fruit was sold through Channel 3 (2.45 percent). Again, it was observed from the table that majority of the farmers market their produce through Channel 1 (80.83 percent), followed by Channel 2 (15.83 percent) and Channel 3 (3.33 percent).

Table 42: Quantity handled in different marketing channel of Passion fruit

Marketing channel	Quantity handled (q)	% to the total	No. of growers	% to total
Channel 1	10099.12	86.02	97	80.83
Channel 2	1353.09	11.53	19	15.83
Channel 3	288.00	2.45	4	3.33
Total	11740.21	100	120	100

Marketing costs and marketing margins per quintal of passion fruit for Channel 1 in Manipur have been presented in Table 43. The farmer's share has been found to be 61.11 percent. Total marketing expenses incurred by farmer is worked out to be Rs.80.57 of which losses consumed highest share, *i.e.*, about 53.67 percent of the marketing cost incurred by producer. Sorting and packing (42.20 percent) rank second, followed by cost of transportation (4.14 percent). For weighing, the farmers do not incurred any cost. The Society brings its own balance while collecting the fruits from different collection point. For packing the fruit, the farmers used bag of 35 kg capacity, which cost about Rs. 5-8 per bag. These bags can be used many times. Transportation to the collection point is done by hand-drawn-card as the distance is not very far. Table shows that the producer, on an average receives Rs.600 per quintal. It is observed from the table that passion fruit producer fetches Rs.519.43 per quintal as his net margin. The Society has to incur a cost amounting Rs.110, *i.e.*, 12.94 percent of retail price to market one quintal of passion fruit. Of this cost about 60 percent transportation cost, 27 percent are losses due to spoilage and shrinkage of the produce, 9 percent sorting and packing and 3 percent for loading/unloading. The Society sells the produce to the juice factory at Mao @ Rs. 850 per quintal. However, the Society fetches Rs.140 which accounts for 16.47 percent of the price received by it as profit or margin. In this channel, the producers incur less marketing cost than the Society.

Table 43: Marketing cost and Marketing margin of passion fruit (Channel 1)

Item	Unit	Cost	% Consumer Price
Farm gate price at village	Rs/q	519.43	61.11
sorting and packing	Rs/q	34.00	4.00
Weighing	Rs/q	0	0
transport	Rs/q	3.33	0.39
losses	Rs/q	43.24	5.09
Total marketing cost	Rs/q	80.57	9.48
Farmers' selling price to Society	Rs/q	600.00	70.59
sorting and packing	Rs/q	10.00	1.18
loading/unloading	Rs/q	3.33	0.39
spoilage	Rs/q	30.00	3.53
transport	Rs/q	66.67	7.84
Market fee	Rs/q	0	0
storage	Rs/q	0	0
Total marketing cost	Rs/q	110.00	12.94
Marketing margin	Rs/q	140.00	16.47
Society selling price to factory	Rs/q	850.00	100.00

Marketing costs and marketing margins per quintal of passion fruit for Channel 2 in Manipur have been presented in Table 44. The farmer's share in the consumer's rupee has been found to be 57.05 percent. Total marketing expenses incurred by farmer is worked out to be Rs.90.82 of which losses consumed highest share (31 percent of the marketing cost). Cost of transportation (28 percent) ranks second, followed by sorting and packing (27 percent) and then weighing (14 percent). Transportation is done by bus, auto or Tata DI depending upon the distance. Table shows that the producer, on an average receives Rs.1100 per quintal. It is

observed from the table that passion fruit producer fetches Rs.1009.18 per quintal as his net margin.

The wholesaler has to incur a cost amounting Rs. 69.55, *i.e.*, 3.93 percent of the retail price to market one quintal of passion fruit. Of this cost about 86 percent is because of losses due to spoilage and shrinkage (weight loss) of the crop. Loading/unloading (2 percent), transportation (4 percent) and market fee (7 percent) form the remaining marketing cost. The wholesaler sells the crop to retailers at Rs. 1364.29 per quintal. He, however, fetches Rs.194.73 which accounts for 11.01 percent of the retail price as his profit.

Table 44: Marketing cost and Marketing margin of passion fruit (Channel 2)

Item	Unit	Cost	% Consumer Price
Farm gate price at village	Rs/q	1009.18	57.05
sorting & packing	Rs/q	25.03	1.14
Weighing	Rs/q	12.50	0.71
transport	Rs/q	25.00	1.41
losses	Rs/q	28.29	1.60
Total marketing cost	Rs/q	90.82	5.13
Farmers' selling price to wholesaler	Rs/q	1100.00	62.18
sorting & packing	Rs/q	0	0
loading/unloading	Rs/q	1.42	0.08
spoilage	Rs/q	60.00	3.39
transport	Rs/q	3.10	0.18
market fee	Rs/q	5.03	0.28
storage	Rs/q	0	0
Total marketing cost	Rs/q	69.55	3.93

Marketing margin	Rs/q	194.73	11.01
Wholesaler price to retailer	Rs/q	1364.29	77.12
sorting & packing	Rs/q	0	0
Loading/unloading	Rs/q	13.23	0.75
spoilage	Rs/q	52.48	2.97
transport	Rs/q	3.33	0.19
Market fee	Rs/q	3.98	0.23
storage	Rs/q	6.69	0.38
Total marketing cost	Rs/q	79.73	4.51
Marketing margin	Rs/q	325.04	18.37
Retailers price to consumer	Rs/q	1769.05	100.00

At retailer's level, an amount of Rs.79.73 (4.51 percent of the retail price) is required as marketing cost. It is noted that out of the total marketing cost about 66 percent is retailer's loss in the form of spoilage and shrinkage of the fruit. Cost of loading/unloading (17 percent), storage (8 percent), market fee (5 percent) and transportation (4 percent) constitute the remaining marketing cost incurred by the retailer. The retail price of one quintal of passion fruit in Channel 2 is Rs. 1769.05. The retailer, however, fetches Rs. 325.04, about 18.37 percent of the retail price as his profit.

It is observed from the table that maximum marketing cost in this channel is incurred by producer which is associated with high spoilage losses during storing and handling. It is further observed that maximum profit is reaped by retailer.

Table 45: Marketing cost and Marketing margin of passion fruit (Channel 3)

Item	Unit	Cost	% Consumer Price
Farm gate price at village	Rs/q	1242.62	72.56
sorting & packing	Rs/q	31.30	1.83
Weighing	Rs/q	12.50	0.73
transport	Rs/q	15.85	0.93
losses	Rs/q	22.74	1.33
Total marketing cost	Rs/q	82.38	4.81
Farmers' selling price to retailer	Rs/q	1325.00	77.37
sorting & packing	Rs/q	0	0
unloading	Rs/q	8.51	0.50
spoilage	Rs/q	59.71	3.49
transport	Rs/q	0.00	0.00
Market fee	Rs/q	4.71	0.28
storage	Rs/q	2.90	0.17
Total marketing cost	Rs/q	75.83	4.43
Marketing margin	Rs/q	311.67	18.20
Retailers price to consumer	Rs/q	1712.50	100

Marketing costs and marketing margins per quintal of passion fruit for Channel 3 in Manipur have been presented in Table 45. The farmer's share in the consumer's rupee has been found to be 72.56 percent. Total marketing expenses incurred by farmer is worked out to be Rs. 82.38 of which cost on sorting and packing consumed the highest share, *i.e.*, about 38 percent of the marketing cost incurred by producer. Losses (28 percent) ranks second, followed by transportation (19 percent) and then weighing (15 percent). Transportation is done by bus, auto or Tata DI depending upon the distance. Table shows that the producer, on an average

receives Rs. 1325 per quintal. It is observed from the table that passion fruit producer fetches Rs. 1242.62 per quintal as his net margin.

The retailer has to incur a cost amounting Rs. 75.83, *i.e.,* 4.43 percent of retail price to market one quintal of passion fruit. Of this cost about 79 percent are losses due to spoilage and shrinkage (weight loss) of the produce, 11 percent loading/unloading, 6 percent market fee and 4 percent storage. However, he fetches Rs. 311.67 which accounts for 18.20 percent of the price received by him as profit or margin. In Channel 3, the producers incur more marketing cost than the retailers.

Channel-wise marketing cost and marketing margin of passion fruit is shown in Table 46. Marketing cost and marketing margin vary considerably from channel to channel and were related directly to the length of the channel, *i.e.,* longer the channel, more were the marketing cost and marketing margin. Channel 2 (Producer - Wholesaler - Retailer - Consumer) being the longer channel and in this channel the highest marketing cost and marketing margin per quintal, *i.e.,* Rs. 240.10 and Rs. 519.77 respectively were observed. Channel 3 (Producer - Retailer - Consumer) accounted for lowest marketing cost, *i.e.,* Rs.158.22 per quintal. Channel 1 (Producer - Society - Juice factory) accounted for the lowest marketing margin, *i.e.* Rs.140 per quintal.

It can also be seen from the table that Channel 1 had the lowest retail price (Rs.850 per quintal) and Channel 2 the highest retail price (Rs.1769.05 per quintal) when two intermediaries were involved between the producer and consumer *i.e.* wholesaler and retailer. The retail price in Channel 3 was found to be Rs.1712.50 per quintal.

Table46: Marketing cost and Marketing margin of passion fruit (Rs./q)

	Channel 1		Channel 2		Channel 3	
Item	**Cost**	**% Consumer Price**	**Cost**	**% Consumer Price**	**Cost**	**% Consumer Price**
Farm gate price	519.43	61.11	1009.18	57.05	1242.62	72.56
Marketing cost						
Producer	80.57	9.48	90.82	5.13	82.38	4.81
Society	110.00	12.94				
Wholesaler	-	-	69.55	3.93	-	-
Retailer	-	-	79.73	4.51	75.83	4.43
Total Marketing Cost	190.57	22.42	240.10	13.57	158.22	9.24
Marketing margin						
Society	140.00	16.47	-	-	-	-
Wholesaler	-	-	194.73	11.01	-	-
Retailer	-	-	325.04	18.37	311.67	18.20
Total Marketing Margin	140.00	16.47	519.77	29.38	311.67	18.20
Consumer Price	850.00	100	1769.05	100	1712.50	100

The price paid by the consumer increased with the increase in the length of the marketing channel or with the increased in the numbers of intermediaries involved between the producer and the ultimate consumers. Passion fruit was marketed through various intermediaries starting from producer to the ultimate consumers. Intermediaries rendered variety of services in the marketing of tomato with a view to earn some profit. The price spread in the various channels involved in the marketing of passion fruit is given in Table 47. Price spread refers to the difference between the price paid by the consumer and the price received by the producer for equivalent quantity of farm produce. This price spread consists of the marketing costs and marketing margins of the intermediaries, which ultimately determine the overall effectiveness of the marketing system. The price spread in Channel 1 was found to be lowest (Rs.330.57

per quintal) and highest in Channel 2 (Rs.759.87 per quintal). The price spread in Channel 3 was Rs.469.88 per quintal. Thus it can be concluded that as the length of channel increases the price spread also increases and vice-versa.

Table 47: Price spread of Passion fruit (Rs./q)

Particulars	Channel 1	Channel 2	Channel 3
Price received by the farmer	600.00	1100.00	1325.00
Cost incurred	80.57	90.82	82.38
Margin	519.43	1009.18	1242.62
Society's purchase price	600.00	-	-
Cost incurred	110.00	-	-
Margin	140.00	-	-
Wholesaler's purchase price	-	1100.00	-
Cost incurred	-	69.55	-
Margin	-	194.73	-
Retailer's purchase price	-	1364.29	1325.00
Cost incurred	-	79.73	75.83
Margin	-	325.04	311.67
Price paid by consumer	850.00	1769.05	1712.50
Price spread	330.57	759.87	469.88

A comparative view of producer's share and the shares of the various intermediaries involved in the different marketing channels is presented in Table 48. It is evident from the table that the producer's share in consumer's rupee decreased with the increase in the length of the marketing channels. The producer's net share was the highest (72.56 percent) in Channel 3 while lowest (57.05 percent) in Channel 2. The producer's net share in Channel 1 was 61.11 percent. Thus, Channel 2 was the least favourable to the producers as their share was the

lowest in consumer's rupee. It was due to the presence of large number of intermediaries in between the producer and the consumer. So, the farmers were not getting good remunerative price for their produce in Channel 3.

The retail margin was more compared to wholesaler in Channel 2. The profit margin of the wholesaler was 11.01 percent while that of retailer was 18.37 percent in Channel 2. While in Channel 3, the profit margin of the retailer was 18.20 percent; and that of Society was 16.47 percent in Channel 1.

Table 48: Share of different agencies during marketing of passion fruit

			Share in final price		
Sl.No.	**Agency**	**Function**	**Channel 1**	**Channel 2**	**Channel 3**
1	Retailers	Retailing	-	18.37	18.20
2	Wholesalers	Breaking bulk	-	11.01	
3	Society	Assembling/transportation	16.47		
4	Farmers	Production	61.11	57.05	72.56
	Total		77.58	86.43	90.76

Marketing efficiency was also calculated for the identified three channels by Conventional method, Shephered's method and Acharya's method and presented in Table 49. The marketing efficiency was found to be highest in Channel 2 (3.16), followed by Channel 3 (2.97) and least in Channel 1 (1.73) when calculated by Conventional method (*i.e.* value added by marketing system divided by total marketing cost).

Table 49: Measurement of Marketing Efficiency of Passion fruit

Sl.No.	Particulars	Unit	Channel 1	Channel 2	Channel 3
1	Retailer's sale price (RP)	Rs./q	850.00	1769.05	1712.50
2	Total marketing cost (MC)	Rs./q	190.57	240.10	158.22
3	Total margins of intermediaries (MM)	Rs./q	140.00	519.77	311.67
4	Price received by farmers (FP)	Rs./q	519.43	1009.18	1242.62
5	Value added by the marketing system (1-4)	Rs./q	330.57	759.87	469.88
	Index of Marketing Efficiency				
	Convention method (E) (5/2)	Ratio	1.73	3.16	2.97
	Shephered's method (ME) (1/2)	Ratio	4.46	7.37	10.82
	Acharya's method (MME) [4/(2+3)]	Ratio	1.57	1.33	2.64

On the other hand when marketing efficiency was calculated by Shephered's method (*i.e.* retailer's sale price divided by total marketing cost), it was found to be highest in Channel 3 (10.82); followed by Channel 2 (7.37) and lowest in Channel 1 (4.46). Again, when calculated by Acharya's method (*i.e.* price received by farmers divided by total marketing cost and margin), it was found to be highest in Channel 3 (2.64); followed by Channel 1 (1.57) and lowest in Channel 2 (1.33).

Based on the information furnished by the sample respondents, the constraints being faced by them in the marketing of passion fruit were ranked and prioritized by using Garrett's ranking method, and have been recorded in Tables below.

Low price of the product was ranked as the first major constraints (with a mean score of 79.78) faced by the passion fruit farmers in the marketing of the product (Table 50). Next second rank with the score value of 71.57 was given to the presence of exploitative middlemen. Third rank with the score value of 69.85 was given to inadequate facilities in market. Most of the farmers in the sample area market their produce through the Society.

The Society pay them only Rs.6/kg for their produce. They want to sell their produce for a higher price. But they are compelled to accept the price paid by the Society as there is lack of adequate storage facilities, high transportation charges, poor market linkages and not enough facilities, such as trucks for bringing their produce out of their villages to the market. Lack of market information, perishability, lack of storage facilities, lack of knowledge of proper grading & packaging, bands, blockade, strikes, curfew, transportation, faulty weighment, non-availability of market credit and no facilities for personal stay at market were allotted fourth, fifth, sixth, seventh, eighth, ninth, tenth, eleventh and twelfth ranks with mean score values of 61.23, 57.23, 51.67, 48.40, 43.00, 40.27, 30.82, 25.84 and 21.34 respectively. The farmers lack market information about the prevailing prices in the market and other markets, so they are easily exploited by the middlemen. If the produce is stored for more than 3 days, there is loss of weight, so they farmers have to sell their produce as soon as possible; otherwise they will incur some loss.

Lack of demand of raw fruits was ranked as the first major constraints (with a mean score of 75.87) faced by the passion fruit retailers in the marketing of the product (Table 51). There is lack of demand of raw fruits as there is lack of awareness about the fruits by many people. So the retailers feel difficulty in finding consumer.

Table 50: Constraints perceived by the farmers in marketing of Passion fruit

Constraints	Mean score	Rank
Low price	79.78	1
Presence of exploitative middlemen	71.57	2
Inadequate facilities in market	69.85	3
Lack of market information	61.23	4
Perishability	57.23	5
Lack of storage facilities	51.67	6
Lack of knowledge of proper grading & packaging	48.40	7
Band, blockage, strikes, curfew	43.00	8

Transportation	40.27	9
Faulty weighment	30.82	10
Non-availability of market credit	25.84	11
No facilities for personal stay at market	21.34	12

Next second rank with the score value of 72.67 was given to the problem of inadequate facilities in market. There is lack of adequate facilities in the market, such as lack of seating space, no packing place, difficulty during rainy season, dirty market place, etc. These posed a major problem for the passion fruit retailers in marketing their produce.

Table 51: Constraints perceived by the retailers in marketing of Passion fruit

Constraints	**Mean score**	**Rank**
Lack of demand	75.87	1
Inadequate facilities in market	72.67	2
Band, blockage, strikes, curfew	65.33	3
Payment of unauthorized fee (bribing)	54.30	4
Lack of storage facilities	52.10	5
Perishability	47.67	6
Non-availability of market credit	46.67	7
Transportation	35.83	8
Lack of market information	26.40	9
High market fee	22.77	10

Third rank with the score value of 65.33 was given to the problem of bands, blockade, strikes, curfew, etc. which hinder business. If bands, blockade, strikes, curfew, etc. occurred, the market will be close for the day and this will hinder the business and the market value of the produce will be reduced. Payment of unauthorized fee (bribing), lack of storage facilities, perishability of the product, non-availability of market credit, transportation, lack of market

information and high market fee were allotted fourth, fifth, sixth, seventh, eighth, ninth and tenth ranks with mean score values of 54.30, 52.10, 47.67, 46.67, 35.83, 26.40 and 22.77 respectively.

Table 52: Constraints perceived by the wholesaler in marketing of Passion fruit

Constraints	Mean score	Rank
Bands, blockade, strike, curfew	77.00	1
Inadequate facilities in market	73.00	2
Payment of unauthorized fee (bribing)	60.00	3
Competition from others	58.00	4
Lack of storage facilities	48.33	5
Perishability	46.67	6
Non-availability of market credit	32.50	7
High market fee	31.33	8
Lack of market information	24.17	9

Bands, blockade, strikes, curfew, was ranked as the first major constraints (with a mean score of 77.00) faced by the passion fruit wholesaler in the marketing of the product (Table 52). If bands, blockade, strikes, curfew, etc. occurred, the market will be close and this will hinder the business and the market value of the produce will be reduced if they are stored for long and they may incur some loss. Next second rank with the score value of 73.00 was given to the problem of inadequate facilities in market. There is lack of adequate facilities in the market, such as lack of seating space, no packing place, difficulty during rainy season, dirty market place, etc. Third rank with the score value of 60.00 was given to the problem of payment of unauthorized fee (bribing). The wholesalers of passion fruit have to bribe many personals so that they can do business. Competition from others, lack of storage facilities, perishability, non-availability of market credit, high market fee and lack of market information were allotted fourth, fifth, sixth, seventh, eighth and ninth ranks with mean score

values of 58.00, 48.33, 46.67, 32.50, 31.33 and 24.17 respectively. There is competition from other wholesaler to take possession of more produce.

Table 53: Constraints perceived by the society in marketing of Passion fruit

Constraints	Rank
High transportation charge	1
Exploitation by factory	2
Illegal taxes and fees	3
Adulteration with low quality fruits by farmers	4
Lack of storage facilities	5
Perishability	6
Band, blockage, strikes, curfew	7
Non-availability of market credit	8
Competition from others	9

High transportation charge was ranked as the first major constraints faced by the society in the marketing of the product (Table 53). Due to the nature of terrain and the status of connectivity of the area, the Society has to incur high transportation charges. Next second rank was given to the problem of exploitation by the juice factory. After bringing the produce to the juice factory, factory sometimes exploit the Society by offering low price or refusing to take the produce. The Society is compelled to accept the price offered by the factory as they cannot return the produce to the farmers as well as there is no other market where they can sell the produce. Third rank was given to the problem of payment of illegal taxes and fees. The Society has to pay many illegal taxes so that they can do business in that area. Adulteration with low quality and unripe fruits by the farmers, lack of storage facilities, perishability of the product, bands, blockades, strikes, curfew, etc. non-availability of market credit and competition from others were allotted fourth, fifth, sixth, seventh, eighth and ninth ranks. The farmers sometimes mixed unripe and diseased fruits with the good ones, thus lowering the value of the produce.

Suggestions of farmers, retailers, wholesaler and society for increasing the marketing efficiency of passion fruits are presented in Table 54, Table 55, Table 56 and Table 57 respectively.

Table 54: Suggestions of farmers for increasing marketing efficiency of passion fruits

Sl.No.	Suggestions
1	Intervention by State Government agencies by fixing reasonable price.
2	Introduction of an efficient market regulation.
3	Provision of adequate facilities in market.
4	Establishment of adequate cold storage facilities.
5	Improvement of the market information delivery system.
6	Numbers of bands, blockade, strikes, curfew, etc. should be reduced.
7	Quick and efficient means of transport with good packing.

The State Government agencies should fix reasonable and remunerative prices for the produce. Formation of more Grower's Association/ Societies or Organization in the region to facilitate market channel as well as proper technology transfer and effective capacity building. Introduction of an efficient market regulation would make the marketing system more transparent and perfect. Improving transparency of the marketing activities of the various middlemen involved through supervision and making availability of up-to-date market information to the farmers is the need of the hour. Cold storage facilities should be established near the production area. Bands, blockade, strikes, curfew, etc. hinders business so the Government as well as the private organization should try to avoid such kind of unwanted situations as far as possible. The transportation facilities need to be strengthened especially for transporting produce to consuming market so as to take benefit of higher prices in these markets.

The people should be made aware about the fruit by advertising in newspapers and radio, etc. so that there is demand of the fruit. There is a need to widen the market for passion fruit/ juice by extension and popularization methods.

Table 55: Suggestions of retailer for increasing marketing efficiency of passion fruit

Sl.No.	Suggestions
1	Creating awareness about the fruit.
2	Provision of adequate facilities in market.
3	Numbers of bands, blockade, strikes, curfew, etc. should be reduced.
4	Punishment of those taking and demanding unauthorized fees.
5	Establishment of adequate cold storage facilities.
6	Introduction of an efficient market regulation.
7	Market credit should be made easily available.

Table 56: Suggestions of wholesaler for increasing marketing efficiency of passion fruit

Sl.No.	Suggestions
1	Numbers of bands, blockade, strikes, curfew, etc. should be reduced.
2	Provision of adequate facilities in market.
3	Punishment of those taking and demanding unauthorized fees.
4	Production should be increased
5	Establishment of adequate cold storage facilities.
6	Market credit should be made easily available.

Provision of adequate marketing facilities such as proper seating place, packing space for vehicles, clean market place, etc. so that the retailers and the wholesalers do not face any difficulty in marketing their produce. Bands, blockade, strikes, curfew, etc. hinders business so the Government as well as the private organization should try to avoid such kind of unwanted situations as far as possible. The retailers and the wholesalers have to pay many

unwanted or illegal fees to many persons so that they can market their produce. They should unite together and stand against these persons and make efforts to get these illegal charges removed. The government should punish those persons demanding and taking illegal fees from the retailers. Adequate cold storage facilities should be established in the market. Regulated markets should be developed. Market credit should be made available easily and quickly.

Table 57: Suggestions of society for increasing marketing efficiency of passion fruit

Sl.No.	Suggestions
1	Transportation charges should be reduced.
2	Establishment of proper road connectivity.
3	Setting up/ strengthening of new/ existing processing and semi-processing units.
4	Numbers of bands, blockade, strikes, curfew, etc. should be reduced.
5	Punishment of those taking and demanding unauthorized fees.
6	Introduction of an efficient market regulation.
7	Production should be increased.
8	Market credit should be made easily available.
9	Provision of adequate facilities in market.

The transportation facilities need to be strengthened by constructing new roads and improving the condition of the existing ones and increasing the number of transport vehicle with cold storage facility. Setting up/ strengthening of new/ existing processing and semi-processing units. Bands, blockade, strikes, curfew, etc. hinders business so the Government as well as the private organization should try to avoid such kind of unwanted situations as far as possible. Efficient market regulation should be introduced. Production of the fruit should be increased. Market credit should be made available easily and quickly.

The marketing efficiency of passion fruit in Manipur is significantly affected by marketing cost, marketing margin, transport cost and length of the market channel at 1% significant level and by volume produce handled at 10% significant level. The marketing efficiency will

increase with the decrease in the marketing cost and length of the marketing channel; and with the increase in the marketing margin, transport cost and volume of the produce handled.

Table 58: Factors affecting Marketing Efficiency of Passion Fruit in Manipur

Sl.No.	Factors	Coefficient	Standard error	't' value
1	Constant	1.834***	0.025	73.190
2	Marketing cost	-4.191***	0.001	-19.368
3	Marketing margin	1.458***	0.002	14.328
4	Transport cost	3.071***	0.001	14.808
5	Open Market price	-	-	-
6	Labour wages	-	-	-
7	Controlling middlemen	-	-	-
8	Volume of produce handled	0.176*	0.002	1.810
9	Presence of cold storage facilities	-	-	-
10	Length of market channel	-0.709***	0.017	-11.590
11	Existence of competition in selling	-	-	-
12	Nature of produce	-	-	-
13	R-square	0.866		
14	Adjusted R-square	0.859		
15	No. of observation	120		

(***) Significant at 1%

(**) Significant at 5%

(*) Significant at 10%

Due to the lack of demand and awareness, passion fruit do not fetch good price in the local market, but if the fruit is transported to the juice factory at Mao or to the Imphal market by

incurring some extra transportation cost, the farmers get good return for their produce. Thus marketing efficiency increase with the increase in transport cost.

3.4 ANTHURIUM FLOWER

Anthurium is one of the most popular of the tropical cut flowers which are being grown commercially for export as well as for the local market. Anthuriums are perennials with creeping habitat. They prefer to grow under shade. Anthuriums are cultivated for its attractive long lasting 'flower' which is not really a flower but an inflorescence rising from the base of a bract.

Anthurium (*Anthurium andreanum* Lind.) belongs to the family Araceae. There are two types of anthurium under cultivation: the foliage and the flowering types. The foliage is grown for their velvety leaves while the flowering type is for their showy flowers, which consists of spadix and spathe. The true flowers are borne on a spike called spadix protruding from the base of the spathe. The spathe is a modified leaf typically heart shape. It comes in different colors – pink, white, green and red.

Flowers are sold according to sizes of the spathe (length across the broadest part)

1. jumbo (10.0 cm and above)
2. extra large (8.0 – 8.5 cm)
3. large (7.0 – 7.5 cm)
4. medium (6.0 – 6.5 cm)
5. small (5.5 cm and below)

Anthurium in Mizoram

Taking into account the ideal climatic condition of Mizoram, the Department of Horticulture started encouraging farmers for commercial cultivation of Anthurium in the month of November, 2002 under Technology Mission for Integrated Development of Horticulture in North East States. At first 24 potential grower's were identified for taking up anthurium cultivation by providing quality planting materials along with shade nets and other required inputs like coco peat, sprinkler irrigation etc. and the first batch of export to neighbouring states was achieved in the month of October, 2003 i.e. within a short span of time 11 months from planting to production of cut flowers.

Selected farmers are provided basic training in cultivation and maintenance of their gardens by field officers of the department. It is worth mentioning that most of the selected growers are women, which is the fulfillment of the aim to uplift women in the state. The income of the

24 initial growers varies from Rs. 6000 to Rs. 10,000 per month. About one third of the total cut flowers produced in the state have been sold outside the state through Bangalore based exporter, ZOPAR Export Ltd. and the remaining consumed in the state. At present, different International varieties of Anthurium are cultivated by the growers. The flowers of anthurium are in great demand and at present there are more than 300 farmers who are earning their livelihood from anthurium cultivation. The area possessed by these individual farmers' ranges from 300 sq.m. to 500 sq.m. accommodating about 3000–5000 plants, with a production of 5,000-10,000 cut flowers in a year depending on the area of their cultivation. The area possessed by these individual farmers may be small, but the farmers bring their products at one collection centre and create large volume as little drops of water makes a mighty ocean.

Some anthurium varieties planted in Mizoram are Tropical, Fire, Calisto, Choco, Sirian, Cheers, Rosa, Simba, Emeralda, Grace, Alcapana, Terussal, etc.

ZO-Anthurium Growers' Society Limited (ZAGS)

The anthurium growers of Mizoram formed a society called 'ZO- Anthurium Grower's Society', which helps in communicating the hardship/drawback faced by the farmers in prices, markets, inputs, expansion etc. The society participated in various state level and national level exhibition show etc.

The aims and objectives of ZAGS are

1. Promotion of Anthurium cultivation for bulk production to generate income from other Indian States and abroad.
2. To enhance family income and to also promote and generate self employment with special target on weaker section of the community.
3. To create awareness and incalculate among the general public that floriculture is a sustainable source of livelihood/ income.
4. To bring together all Anthurium growers under one umbrella for mutual interest from cultivation, care and sale of products.
5. To extend possible co-operation and support to the State Government in steps taken in the cultivation and sale of Anthurium.

The membership of ZAGS is open to all the growers having not less than 1000 Anthurium plants. The members should pay membership fee of Rs.500 and annual fee of Rs.50 every year. The power of recruitment of new members is vested to the Executive Committee. Any

member failing to pay annual fee till April end following the preceeding year disqualify himself/ herself from membership of the Society.

The Office Bearers of ZAGS comprises of President, Vice President, General Secretary, Asst. Secretary, Treasurer and Financial Secretary. Election of Office bearer is conducted at a General Assembly by secret ballot either post by post or by simultaneous election of six Office Bearer members who amongst themselves designate posts.

The Executive Committee comprises not more than 20 members. Office Bearers appoint the members within one week from the date of election. Handing over and taking of charge is concluded within 14 days from the date of election. The Executive Committee has the power to appoint not more than two Senior Advisers. The Headquarter of ZAGS is at Aizawl.

The success of the initial growers has inspired other so much in the capital and also in other towns of the state. The gardeners and florists wish to take up the same venture too. Most of the growers are still expanding their farm with their own resources and more than 30 growers have even availed Bank Loans for the expansion of the same. This venture has not only brought about a change in the Horticulture scenarios of the state, but also uplifts the living condition of the growers to a great extent. It provides employment and regular income to the growers and other unskilled labour. It is expected that it will bring about increase in the export income substantially.

It is worth mentioning that the first consignment of Anthurium cut flowers from Mizoram was sent of on 23rd August, 2006 to UAE through ZOPAR Exports Pvt. Ltd.

As per the latest record, there are 472 families in Mizoram engaged in anthurium cultivation who get financial assistance from the horticulture department, government of Mizoram. Aizawl district tops the list in family wise with as many as 313 families while Lunglei seconded with 67 families followed by Serchhip district with 43 families.

Marketing Channel

All the sample anthurium growers in Mizoram are members of ZO- Anthurium Grower's Society and they market their produce through Bangalore based exporter, ZOPAR Export Ltd. A large volume of the cut flower is sold to wholesalers in other states like Kolkata, Delhi, Mumbai and Bangalore and a very small quantity of flowers are sold in state itself. The prominent marketing channel followed by anthurium grower in Mizoram is given in Table 59

Table 59: Marketing channel of Anthurium in Mizoram

Particulars	Supply chain
Channel 1	Producer – ZOPAR (Wholesaler) – Wholesaler/Retailer in other states
Channel 2	Producer – Retailer – Consumer

Quantity handled

The number of stem purchased by ZOPAR Export Ltd. from ZO- Anthurium Grower's Society (ZAGS) and sold to other states in 2008-09 is 717480 stems (98.91 percent) worth Rs.5089475.50. The number of stems sold is the Mizoram is only 7890 (1.09 percent), worth Rs.31560.

Table 60: Quantity handled in different marketing channel of Anthurium

Marketing channel	No. of Spike	% to the total	Value (Rs.)
Channel 1	717480	98.91	5089475.50
Channel 2	7890	1.09	31560.00
Total	725370	100	5121035.50

Marketing cost

The marketing cost incurred by the anthurium growers in Mizoram is given in Table 61.

Table 61: Marketing Cost of Anthurium incurred by the Farmers

(Rs. per stem)

Items	Cost	% to total marketing cost
Farm gate Price	9.41	-
Cleaning & sorting	0.56	70.34
Packing material	0.08	9.59
Losses	0.14	17.73
Transportation	0.02	2.34
Total marketing cost	0.79	100
ZAGS average selling price to ZOPAR	10.20	-

It can be seen from the table that the marketing cost incurred by the anthurium growers is Rs.0.79 per stem, of which cleaning and sorting consumed the highest share (70.34 percent), followed by losses (17.73 percent), packing material (9.59 percent) and transportation (2.34 percent).

Anthurium is sold outside Mizoram to states like Kolkata, Bangalore, Mumbai and Delhi. The flower is transported through air after proper packing. The packing cost and air freight calculation are given in the tables below. After proper packing, the flowers are flown to Kolkata and then to Bangalore, Mumbai or Delhi.

Table 62: Packing cost calculation for Anthurium

Size	Master Box	Inner Box	Flowers/ inner box	Total no. of flower	Inner Box (Rs.35*5=Rs.175)	Master box (Rs.95)	Cost/stem (Rs.)
Small	1	5	50	250	0.70	0.38	1.08
Medium	1	5	40	200	0.88	0.48	1.35
Large	1	5	30	150	1.17	0.63	1.80
Extra Large	1	5	25	125	1.40	0.76	2.16
Jumbo	1	5	15	75	2.33	1.27	3.60

From the above table it can be seen that anthurium flower is packed first in the inner box and then in the master box. Five inner boxes can be placed inside a master box. The number of flowers that can be placed inside the inner box is 50 small, 40 medium, 30 large, 25 extra large or 15 jumbo size flowers. Thus the total number of flowers per master box is 250 small, 200 medium, 150 large, 125 extra large or 75 jumbo. The packing cost of master box is Rs.95 and that of the inner box is Rs.35. The packing cost per stem is calculated as Rs.1.08, Rs.1.35, Rs.1.80, Rs.2.16 and Rs.3.60 for small, medium, large, extra large and jumbo size flowers respectively.

Table 63: Air Freight calculation for Anthurium

(Rs. per stem)

Size	Total no. of flower in master box	Volume weight	Aizawl-Kolkata (Rs.23)	Kolkata-Bangalore (Rs.24)	Kolkata-Mumbai (Rs.22.85)	Kolkata-Delhi (Rs.19.4)
Small	250	23	2.12	2.21	2.10	1.78
Medium	200	23	2.65	2.76	2.63	2.23
Large	150	23	3.53	3.68	3.50	2.97
Extra Large	125	23	4.23	4.42	4.20	3.57
Jumbo	75	23	7.05	7.36	7.01	5.95

From the above table it can be seen that the air freight per unit volume weight is Rs.23 for Aizawl – Kolkata, Rs.24 for Kolkata – Bangalore, Rs.22.85 for Kolkata – Mumbai and Rs.19.40 for Kolkata – Delhi. The air freight per stem for Aizawl – Kolkata is calculated to be Rs.2.12, Rs.2.65, Rs.3.53, Rs.4.23 and Rs.7.05 for small, medium, large, extra large and jumbo size flowers respectively. The air freight per stem for Kolkata – Bangalore is calculated to be Rs.2.21, Rs.2.76, Rs.3.68, Rs.4.42 and Rs.7.36 for small, medium, large, extra large and jumbo size flowers respectively. The air freight per stem for Kolkata – Mumbai is calculated to be Rs.2.10, Rs.2.63, Rs.3.50, Rs.4.20 and Rs.7.01 for small, medium, large, extra large and jumbo size flowers respectively. The air freight per stem for Kolkata – Delhi is calculated to be Rs.1.78, Rs.2.23, Rs.2.97, Rs.3.57 and Rs.5.95 for small, medium, large, extra large and jumbo size flowers respectively.

Table 64: Cost incurred by ZOPAR (Wholesaler) upto the destination

(Rs. per stem)

Size	ZAGS Price	Packing cost	Air freight from Aizawl				ZOPAR landed cost			
			Kolkata	Bangalore	Mumbai	Delhi	Kolkata	Bangalore	Mumbai	Delhi
Small	5	1.08	2.12	4.32	4.22	3.9	8.20	10.41	10.30	9.98
Medium	7	1.35	2.65	5.41	5.27	4.88	11.00	13.76	13.63	13.23
Large	12	1.80	3.53	7.21	7.03	6.5	17.33	21.01	20.83	20.30
Extra Large	13	2.16	4.23	8.65	8.44	7.8	19.39	23.81	23.59	22.96
Jumbo	14	3.60	7.05	14.41	14.06	13.00	24.65	32.01	31.66	30.60
Average	10.20	2.00	3.92	8.00	7.80	7.22	16.11	20.20	20.00	19.41

Table 64 shows the cost incurred by ZOPAR (Wholesaler) up to the destination, which include ZAGS selling price to ZOPAR, packing cost and air freight from Aizawl.

At the destination ZOPAR has to incur some more cost for marketing the flower and is shown in Table 65. The marketing cost incurred by ZOPAR at the destination is found to be Rs.1.90 per stem, of which spoilage occupy the highest share (74.56 percent), followed by transportation (18.78 percent), sorting (4.03 percent), carrying charge (1.88 percent) and loading/unloading (0.75 percent). About 20 percent of the flower is damage when they reach the destination. The cost of transportation is Rs.1500 per 30 boxes (1 box contains 140 flowers), loading/unloading is Rs.2 per box and carrying charge is Rs.5 per box.

Table 65: ZOPAR (Wholesaler) marketing cost at destination

(Rs. per stem)

Items	Cost	% to total marketing cost
Sorting	0.08	4.03
Spoilage	1.42	74.56
Transportation	0.36	18.78
Loading/unloading	0.01	0.75
Carrying charge	0.04	1.88
Total	1.90	100.00

Marketing costs and marketing margins per stem of anthurium flower for Channel 1 in Mizoram have been presented in Table 10. The farmer's share has been found to be 45.42 percent, 37.31 percent, 37.38 percent and 38.33 percent in Kolkata, Bangalore, Mumbai and Delhi respectively. Total marketing expenses incurred by farmer is worked out to be Rs.0.79 per stem, of which cleaning and sorting consumed highest share of the marketing cost incurred by producer. Post harvest losses rank second, followed by cost of packing material and then transportation. Table shows that the producer, on an average receives Rs.10.20 per stem. It is observed from the table that passion fruit producer fetches Rs.9.41 per stem as his net margin.

The ZOPAR has to incur a total marketing cost of Rs.7.82 (37.72 percent), Rs.11.90 (47.19 percent), Rs.11.70 (47.08 percent) and Rs.11.12 (45.28 percent) to market one stem of anthurium flower in Kolkata, Bangalore, Mumbai and Delhi respectively. This cost included packing cost, air-freight from Aizawl and marketing cost at destination. The ZOPAR's selling price of one stem of anthurium flower is found to be Rs.20.72, Rs.25.22, Rs.24.86 and Rs.24.55 in Kolkata, Bangalore, Mumbai and Delhi respectively. However, ZOPAR fetches Rs.2.70 (13.05 percent), Rs.3.12 (12.36 percent), Rs.2.96 (11.89 percent) and Rs.3.32 (13.17 percent) as profit or margin. In this channel, the producers incur less marketing cost than ZOPAR.

Table 66: Marketing Cost and marketing Margin of Anthurium (Channel 1)

(Rs. per stem)

Items	Cost	% Consumer Price in			
		Kolkata	Bangalore	Mumbai	Delhi
Farm gate Price	9.41	45.42	37.31	37.85	38.33
Cleaning & sorting	0.56	2.68	2.20	2.23	2.26
Packing material	0.08	0.37	0.30	0.30	0.31
Losses	0.14	0.68	0.56	0.56	0.57
Transportation	0.02	0.09	0.07	0.07	0.08
Total marketing cost	0.79	3.81	3.13	3.18	3.22
ZAGS selling price to ZOPAR	10.20	49.23	40.44	41.03	41.55
Packing cost	2.00	9.64	7.92	8.04	8.14
Air freight					
Aizawl-Kolkata	3.92	18.90			
Aizawl-Bangalore	8.00		31.73		
Aizawl-Mumbai	7.80			31.39	
Aizawl-Delhi	7.22				29.39
ZOPAR marketing cost at destination					
Sorting	0.08	0.37	0.30	0.31	0.31
Spoilage	1.42	6.84	5.62	5.70	5.78
Transportation	0.36	1.72	1.42	1.44	1.45
Loading/unloading	0.01	0.07	0.06	0.06	0.06
Carrying charge	0.04	0.17	0.14	0.14	0.15
Total	1.90	9.18	7.54	7.65	7.75
ZOPAR total marketing cost					
Kolkata	7.82	37.72			
Bangalore	11.90		47.19		
Mumbai	11.70			47.08	

Delhi	11.12				45.28
ZOPAR marketing margin					
Kolkata	2.70	13.05			
Bangalore	3.12		12.36		
Mumbai	2.96			11.89	
Delhi	3.23				13.17
ZOPAR selling price					
Kolkata	20.72	100			
Bangalore	25.22		100		
Mumbai	24.86			100	
Delhi	24.55				100

Table 67: Marketing Cost and marketing Margin of Anthurium (Channel 2)

(Rs. per stem)

Items	**Cost**	**% Consumer Price**
Farm gate Price	3.21	38.51
Cleaning & sorting	0.56	6.66
Packing material	0.08	0.91
Losses	0.14	1.68
Transportation	0.02	0.24
Total marketing cost	0.79	9.49
Farmers' selling price to retailer	4.00	48.00
Sorting	0.00	0.00
Spoilage	0.18	2.16
Transport	0.05	0.60
Total marketing cost	0.23	2.76

Marketing margin	4.10	49.24
Retailers price to consumer	8.33	100.00

Marketing costs and marketing margins per stem of anthurium flower for Channel 2 in Mizoram have been presented in Table 67. The farmer's share in the consumer's rupee has been found to be 38.51 percent. Total marketing expenses incurred by farmer for marketing one stem of the flower is worked out to be Rs. 0.79 of which cost on cleaning and sorting consumed the highest share, *i.e.*, about 70.20 percent of the marketing cost incurred by producer. Losses (17.70 percent) ranks second, followed by packing material (9.57 percent) and then transportation (2.53 percent). Table shows that the producer, on an average receives Rs. 4 per stem of anthurium. It is observed from the table that anthurium producer fetches Rs. 3.21 per stem of anthurium as his net margin.

The retailer has to incur a cost amounting Rs. 0.23, *i.e.*, 2.76 percent of retail price to market one stem of anthurium flower. Of this cost about 78 percent are losses and the remaining 22 percent transportation cost. However, he fetches Rs. 4.10 which accounts for 49.24 percent of the price received by him as profit or margin. In Channel 2, the producers incur more marketing cost than the retailers.

Table68: Marketing cost and Marketing margin of anthurium (Rs./stem)

ITEMS	CHANNEL 1										CHANNEL 2	
	Kolkata		Bangalore		Mumbai		Delhi		Average			
	Cost	% Consumer Price	Cost	% Consumer Price	Cost	% Consumer Price	Cost	% Consumer Price	Cost	% Consumer Price	Cost	% Consumer Price
Farm gate price	9.41	45.42	9.41	37.31	9.41	37.85	9.41	38.33	9.41	39.48	3.21	38.51
Marketing cost												
Producer	0.79	3.81	0.79	3.13	0.79	3.18	0.79	3.22	0.79	3.31	0.79	9.49
ZOPAR	7.82	37.72	11.90	47.19	11.70	47.08	11.12	45.28	10.63	44.61	-	-
Retailer	-	-	-	-	-	-	-	-	-	-	0.23	2.76
Total Marketing Cost	8.61	41.53	12.69	50.32	12.49	50.25	11.91	48.49	11.42	47.92	1.02	12.25
Marketing margin												

ZOPAR	2.70	13.05	3.12	12.36	2.96	11.89	3.23	13.17	3.00	12.60	-	-
Retailer	-	-	-	-	-	-	-	-	-	-	4.10	49.24
Total Marketing Margin	2.70	13.05	3.12	12.36	2.96	11.89	3.23	13.17	3.00	12.60	4.10	49.24
Consumer Price	20.72	100.00	25.22	100.00	24.86	100.00	24.55	100.00	23.84	100.00	8.33	100.00

Channel-wise marketing cost and marketing margin of anthurium is shown in Table 68. Marketing cost and marketing margin vary considerably from channel to channel. Marketing cost and marketing margin are found to be higher in Channel 1 then in Channel 2. The average marketing cost for Channel 1 is estimated to be Rs.11.42 (Rs.8.61, Rs.12.69, Rs.12.49 and 11.91 per stem of the flower in Kolkata, Bangalore, Mumbai and Delhi respectively). And the average marketing margin for Channel 1 is estimated to be Rs.3 (Rs.2.70, Rs.3.12, Rs.2.96 and 3.23 per stem of the flower in Kolkata, Bangalore, Mumbai and Delhi respectively). While the marketing cost and marketing margin for Channel 2 is found to be Rs.1.02 and Rs.4.10 per stem of anthurium flower respectively.

Table 69: Price spread of Anthurium (Rs./stem)

Particulars	Channel 1					Channel 2
	Kolkata	Bangalore	Mumbai	Delhi	Average	
Price received by the farmer	10.20	10.20	10.20	10.20	10.20	4.00
Cost incurred	0.79	0.79	0.79	0.79	0.79	0.79
Margin	9.41	9.41	9.41	9.41	9.41	3.21
ZOPAR's purchase price	10.20	10.20	10.20	10.20	10.20	-
Cost incurred	7.82	11.90	11.70	11.12	10.63	-
Margin	2.70	3.12	2.96	3.23	3.00	-
Retailer's purchase price	-	-	-	-	-	4.00
Cost incurred	-	-	-	-	-	0.23
Margin	-	-	-	-	-	4.10
ZOPAR selling price/ Price paid by consumer	20.72	25.22	24.86	24.55	23.84	8.33
Price spread	11.31	15.81	15.45	15.14	14.43	5.12

The price spread in the various channels involved in the marketing of anthurium is given in Table 69. This price spread consists of the marketing costs and marketing margins of the intermediaries, which ultimately determine the overall effectiveness of the marketing system. The price spread in Channel 1 was found to be higher (Rs.14.43 per stem) than in Channel 2 (Rs.5.12 per stem).

Table 70: Share of different agencies during marketing of anthurium

Sl.No.	Agency	Function	Share in final price					
			Channel 1					Channel 2
			Kolkata	Bangalore	Mumbai	Delhi	Average	
1	Retailers	Retailing	-	-	-	-	-	49.24
2	ZOPAR	Assembling/ transportation	13.05	12.36	11.89	13.17	12.62	-
3	Farmers	Production	45.42	37.31	37.85	38.33	39.73	38.51
	Total		58.47	49.68	49.75	51.51	52.35	87.75

A comparative view of producer's share and the shares of the various intermediaries involved in the different marketing channels is presented in Table 70. The producer's net share was the higher (average 39.73 percent) in Channel 1 than in Channel 2 (38.51 percent). ZOPAR's share was found to be 13.05 percent, 12.36 percent, 11.89 percent and 13.17 percent in Kolkata, Bangalore, Mumbai and Delhi respectively. The retailers' share in final price in Channel 2 was found to be 49.24 percent.

Marketing efficiency was also calculated for the identified two channels by Conventional method, Shephered's method and Acharya's method and presented in Table 71. The marketing efficiency was found to be higher in Channel 2 (5.02 and 8.16) than in Channel 1 (1.26 and 2.09) when calculated by Conventional method (*i.e.* value added by marketing system divided by total marketing cost) and Shephered's method (*i.e.* retailer's sale price divided by total marketing cost). But, when calculated by Acharya's method (*i.e.* price

received by farmers divided by total marketing cost and margin), it was found to be higher in Channel 1 (0.65) than in Channel 2 (0.63).

Table 71: Measurement of Marketing Efficiency of anthurium

Sl.No.	Particulars	Unit	Channel 1					Channel 2
			Kolkata	Bangalore	Mumbai	Delhi	Average	
1	Retailer's sale price (RP)	Rs./stem	20.72	25.22	24.86	24.55	23.84	8.33
2	Total marketing cost (MC)	Rs./stem	8.61	12.69	12.49	11.91	11.42	1.02
3	Total margins of intermediaries (MM)	Rs./stem	2.70	3.12	2.96	3.23	3.00	4.10
4	Price received by farmers (FP)	Rs./stem	9.41	9.41	9.41	9.41	9.41	3.21
5	Value added by the marketing system (1-4)	Rs./stem	11.31	15.81	15.45	15.14	14.43	5.12
	Index of Marketing Efficiency							
	Convention method (E) (5/2)	Ratio	1.31	1.25	1.24	1.27	1.26	5.02
	Shephered's method (ME) (1/2)	Ratio	2.41	1.99	1.99	2.06	2.09	8.16
	Acharya's method (MME) [4/(2+3)]	Ratio	0.83	0.60	0.61	0.62	0.65	0.63

Marketing Constraints

Based on the information furnished by the sample respondents, the constraints being faced by them in the marketing of anthurium were ranked and prioritized by using Garrett's ranking method, and have been recorded in Tables below.

Table 72: Constraints perceived by the farmers in marketing of Anthurium

Constraints	Mean score	Rank
Forced to sell to ZOPAR due to absence of other market	79.67	1
Low price	71.98	2
High cost of packing	62.64	3
Inadequate market information	58.51	4
Lack of technology to keep freshness of flower	51.63	5
Frequent emergence of new hybrid	48.57	6
Lack of storage facilities	41.21	7
High rate of damage in transit	37.79	8
Transportation	27.60	9
Non-availability of market credit	20.40	10

Forced to sell to ZOPAR due to absence of other market was ranked as the first major constraints (with a mean score of 79.67) faced by the anthurium growers in the marketing of the product (Table 73). Next, second rank with the score value of 71.98 was given to low price. Almost all of the anthurium growers in the sample area market their produce through ZOPAR as there is no other market. ZOPAR pay them only Rs.5, Rs.7, Rs.12, Rs.13 and Rs.14 for small, medium, large, extra large and jumbo size flowers. These prices have been constant for many years and the farmers want ZOPAR to increase the price. But they are compelled to accept the price paid by the ZOPAR as there is no other market for their produce. High cost of packing ranked third

with a mean score of 62.64. Inadequate market information ranked fourth with a mean score of 58.51. The farmers lack market information about the prevailing prices in the market and other markets, so they are easily exploited by the middlemen. Lack of technology to keep freshness of flower, frequent emergence of new hybrid, lack of storage facilities, high rate of damage during transit, transportation and non-availability of market credit were ranked fifth, sixth, seventh, eighth, ninth and tenth with mean score values of 51.63, 48.57, 41.21, 37.79, 27.60 and 20.40 respectively.

Table 73: Constraints perceived by ZOPAR (Wholesaler) in marketing of Anthurium

Constraints	Rank
High transportation cost	1
High cost of packing	2
Less number of flight from Aizwal	3
Frequent cancellation of flight	4
Lack of storage facilities in airport	5
Less supply in winter	6
Post harvest loss due to bad practice by farmers	7
High rate of damage in transit	8
Lack of technology to keep freshness of flower	9

High transportation charge was ranked as the first major constraints faced by ZOPAR in the marketing of the product (Table 74). Due to the nature of terrain and the status of connectivity of the area, ZOPAR has to incur high transportation charges, which include transporting the produce from farm to airport and air freight from Aizawl to Kolkata and then from Kolkata to Bangalore, Mumbai or Delhi. Next second rank was given to the high cost of packing and packing material. The flowers have to be packed properly, otherwise they will get spoilt. There are two main methods of packing followed by ZOPAR – (i) Mauritius and Hawaii (the flowers are packed with slightly moist shredded newspaper in the box) and (ii) Taiwan (the flowers are

packed in layers and well secured with tape in the middle to prevent movement in the box). Less number of flights from Aizawl and frequent cancellation of flight ranked third and fourth. This create problem in the transportation of the flower to other states. Lack of storage facilities in airport ranked fifth. Due to lack of storage facilities in airport, when flights are cancelled, ZOPAR has to bear the additional cost of transporting the flower back. There is less supply of flower in winter because of low production in winter. Post harvest loss due to bad practice by farmers and high rate of damage in transit ranked seventh and eight. The farmers use more amounts of fertilizers and chemicals and most of them do not pluck the flower in the proper way, so post harvest loss is high and the flowers are easily damaged in transit. Lack of technology to keep freshness of flower ranked ninth.

Table 74: Constraints perceived by Retailer in marketing of Anthurium

Constraints	Mean score	Rank
Fluctuation in demand	78.4	1
Inadequate facilities in market	72.9	2
Lack of technology to keep freshness of flower	64.9	3
High rate of damage in transit	56.8	4
Lack of storage facilities	52.4	5
Erratic fluctuation in price	47.6	6
Transportation	42.2	7
Non-availability of market credit	36.6	8
Inadequate market information	29.0	9
High market fee	20.4	10

Fluctuation in demand of the flower was ranked as the first major constraints (with a mean score of 78.4) faced by the anthurium retailers in the marketing of the product (Table 18). The flowers are not always in demand; they are demanded only on some occasions like for churches, functions, funerals, weddings, etc. So the retailers feel difficulty in finding consumer. Next

second rank with the score value of 72.9 was given to the problem of inadequate facilities in market. There is lack of adequate facilities in the market, such as lack of selling space, etc. Third rank with the score value of 64.9 was given to the problem of lack of technology to keep freshness of flower. The retailers do not have proper knowledge of how to keep the flower fresh for a longer time. High rate of damage in transit, lack of storage facilities, erratic fluctuation in price, transportation, non-availability of market credit, inadequate market information and high market fee were allotted fourth, fifth, sixth, seventh, eighth, ninth and tenth ranks with mean score values of 56.8, 52.4, 47.6, 42.2, 36.6, 29.0 and 20.4 respectively.

Suggestions

Table 75: Suggestions of anthurium growers for increasing marketing efficiency

Sl.No.	Suggestions
1	Development of new markets for anthurium
2	Remunerative prices
3	Research in packing and post harvest practices
4	Improvement in the market information delivery system
5	Establishment of cold storage facilities
6	Quick and efficient means of transport
7	Market credit should be made easily available

Almost all of the anthurium growers sell their produce to ZOPAR as there is no other market. They are compelled to accept the price offered by ZOPAR. New market and other marketing co-operatives should be developed so that farmers have the choice to sell to other market and have more bargaining power. Cultivation of antrhurium is capital intensive and required large amount of investment. The farmers should be offered remunerative prices and incentives. There is high rate of post harvest losses. This can be somewhat reduced by properly packing the flower. Research in proper packing and post harvest practices should encouraged. It was observed that most of the farmers were

unaware about the market charges, rules and regulations of the market and prevailing prices in market. The Government should establish market information office, distribute pamphlets, leaflets, drawing charts to the farmers and market information should be broadcast in radio and local T.V. channels. Cold storage facilities should be established so that the farmers can store their produce for a longer time. The transportation facilities need to be strengthened by constructing new roads and improving the condition of the existing ones and increasing the number of refrigerated vans. Government credit agencies should provide loans on easy installment and simple procedure should be adopted so that the farmers can take advantage of the Government loans. It can save the farmers from the clutches of commission agents and hence marketing output can be improved.

Table 76: Suggestions of ZOPAR for increasing marketing efficiency of anthurium flower

Sl.No.	Suggestions
1	Transportation charges and air freight rate should be reduced.
2	Research in packing and post harvest practices
3	Frequency of flight from Aizawl should be increased
4	Establishment of cold storage facilities in airport
5	Farmers should plant more flower under Hi-tech condition so as to give steady supply of flower
6	Farmers should follow good cultivation practices like using lesser amounts of fertilizers and chemicals and plucking/ harvesting the flowers in the proper way.

ZOPAR incurred high amount of cost on transporting the flower. Inorder to increase marketing efficiency, transportation charges and air freight rate should be reduced. The Government should subsidize the air freight rate. There is high rate of post harvest losses. This can be somewhat reduced by properly packing the flower. Research in proper packing and post harvest practices should encouraged. The number of flight from Aizawl should be increased and cancellation of flights should be avoided as far as possible. Cold storage facilities should be established in the

airport so that the flowers can be stored in the airport itself in case of cancellation of flights instead of transporting back to the office. The farmers should be encouraged to plant more flowers under Hi-tech conditions by giving financial assistance and technical knowhow. The Government should organize training and workshops for framers regarding good cultivation practices, proper harvesting, handling and post harvest management practices.

Table 77: Suggestions of retailer for increasing marketing efficiency of anthurium flower

Sl.No.	Suggestions
1	Provision of adequate facilities in market
3	Quick and efficient means of transport
4	Establishment of cold storage facilities
5	Improvement in the market information delivery system
6	Market credit should be made easily available

Adequate marketing facilities should be provided. The transportation facilities need to be strengthened by constructing new roads and improving the condition of the existing ones and increasing the number of transport vehicle with cold storage facility. Cold storage facilities should be established so that the retailer can store their produce for a longer time in the market. The Government should take initiative to improve the market information delivery system by establishing market information office, distributing pamphlets, leaflets, drawing charts to the farmers and market information should be broadcast in radio and local T.V. channels. Market credit should be made easily and quickly made available.

Table78: Factors affecting Marketing Efficiency of Anthurium in Mizoram

Sl.No.	Factors	Coefficient	Standard error	't' value
1	Constant	0.445***	0.020	22.286
2	Marketing cost	-	-	-
3	Marketing margin	-0.363**	0.002	-2.379
4	Transport cost	0.030	0.001	0.295
5	Open Market price	-3.706***	0.003	-20.542
6	Labour wages	-	-	-
7	Controlling middlemen	-	-	-
8	Volume of produce handled	0.343*	0.001	1.978
9	Presence of cold storage facilities	-	-	-
10	Length of market channel	3.328***	0.043	18.749
11	Existence of competition in selling	-	-	-
12	Nature of produce	-	-	-
13	R-square	0.997		
14	Adjusted R-square	0.996		
15	No. of observation	30		

(***) Significant at 1%

(**) Significant at 5%

(*) Significant at 10%

The marketing efficiency of anthurium in Mizoram is significantly affected by open market price and length of market channel at 1% significant level, by marketing margin at 5% level of significant and by volume produce handled at 10% significant level. The marketing efficiency will increase with the decrease in marketing margin and open market price; and with the increase in volume of the produce handled and length of market channel. Transport cost had no significant effect on the marketing efficiency of anthurium. About one third of the total cut flowers produced in the state have been sold outside the state through Bangalore based exporter,

ZOPAR Export Ltd. and the remaining consumed in the state. The anthurium growers get good return if they sell their produce through ZOPAR (wholesaler) instead of selling to the retailer in the state as there is fluctuation of demand in the state. In Mizoram, the flowers are demanded only on some occasions like for churches, functions, funerals, weddings, etc. Thus, marketing efficiency of anthurium in Mizoram increases with the increase in the length of the marketing channel.

4. CONCLUSION AND POLICY IMPLICATIONS

4.1 Conclusion

It was observed that the maximum quantity of tomato in the sample area was marketed through retailer. As tomato is highly perishable, losses consumed highest share in the total marketing cost. Most of the farmers in hilly region of Manipur market their cabbage through village traders while those in the plain regions market their produce through wholesaler. The passion fruit growers of Churachandpur district market their produce through the Passion Beekeeping Development Association (A subsidiary of Passion Fruit Growers Association) of Churachandpur district, Manipur. About one third of the total cut flowers of anthurium produced in the Mizoram have been sold outside the state through Bangalore based exporter, ZOPAR Export Ltd. and the remaining consumed in the state. Transportation cost consumed the highest share in the marketing cost of these produces. The cost of transporting the produce from inaccessible production belts to the nearest market outlets is high due to the nature of terrain and the status of connectivity. Transportation of perishable products is perhaps the most serious constraints in the horticultural development of NE region. Marketing cost and marketing margin vary considerably from channel to channel and were related directly to the length of the channel, *i.e.*, longer the channel, more were the marketing cost and marketing margin. The price paid by the consumer increased with the increase in the length of the marketing channel or with the increased in the numbers of intermediaries involved between the producer and the ultimate consumers. As the length of channel increases the price spread also increases and vice-versa. The retail margin was more compared to the margin of the other middlemen. The marketing efficiency was found to vary inversely with the length of the channel. The major constraints of marketing horticultural crops include lack of market to absorb the production, low price for the products, large number of middlemen in marketing system, lack of marketing institutions safeguarding farmers' interest and rights over their marketing (e.g. cooperatives), lack of coordination among producers to increase their bargaining power, poor product handling and packaging, imperfect pricing system, lack of transparency in market information system.

4.2 Policy Implications

1. Vegetable growers should be given intensive training related to post harvest handling of the produce at government level. Such training should cover improved technologies including grading, packaging, pre-cooling, storage and transportation.
2. Provisions for incentives and credit facilities for farmers should be made to encourage them to undertake cultivation of horticultural crops in the region.
3. Subsidies on poly/ green house, planting materials and specialized equipments should be provided.
4. Economically viable and technically feasible greenhouse technology suitable for the agro-climatic and geographical conditions of the NE region is needed at the earliest. Works should be channelized in finding suitable and locally available construction material for low and medium cost greenhouse.
5. Formation of new cooperatives societies and strengthening of existing ones in the states that will take care of both production and marketing through institutional approach to backward and forward linkages is needed and recommended.
6. Formation of more Grower's Association/ Societies or Organization for specific crops in the region to facilitate market channel as well as proper technology transfer and effective capacity building.
7. Promotion of market channel and export coupled with price stability and reducing the risk through insurance.
8. Establishment of processing unit near the producing area to ensure higher return to the producers.
9. The storage facilities need to be created near the production area for storage of the produce during the glut season which will help to decrease intra-seasonal price variation and to assure regular supply of the produce and reduction of wastage.
10. The government can give subsidy for building simple storage facilities so that they can keep their vegetables for some time when price are still low in the market.
11. Cheap and adequate supply of packing material should be ensured.
12. The transportation facilities need to be strengthened for transporting the produce to the consuming market so as to take benefit of higher prices in these markets.

13. The strengthening of market infrastructure, strict implementation of regulatory measures and immediate pro-active measures of government during adverse conditions, are very much essential in the present scenario to avoid distress sales by the actual growers during good harvesting years and sustain the production levels of the horticultural commodities.
14. Improvement in the dissemination of market information through all possible mass media communication aids for the benefit of the farming community.
15. Provision of needed training to the farmers as well as to the traders or product dealers on grading and standardization of produce to fetch higher price in the rural market.
16. The encouragement of rural agri-business by establishment of commodity specific markets in rural areas with proper grading, storage and finance facilities.
17. Regulation of commission agents or traders who are actually grabbing the market in times of large arrivals.
18. Rapid dissemination of market prices prevailing in different markets and bringing awareness on quality standards of the products to be maintained among the farming community.
19. Research on post harvest management of the horticultural crops should be encouraged.
20. As indicated by the preceding results, the Farmers – retailers – consumers channel in vegetables marketing gave the highest efficiency. A farmer's market model may be developed particularly for vegetables with basic infrastructure such as store house, weighting, drinking water, electricity and night halt facilities. The system successfully integrates many producers with consumers/retailers, eliminates middlemen, cuts maximum marketing cost, provides good market infrastructure and environment. One such leading example is Uzahavar Sandai in Tamilnadu, Apni Mandi in Punjab and Rajasthan, Rythu Bazar in Andhra Pradesh and Raithara Santhegalu in Karnataka.
21. In case of fruits and flowers, public – private partnership resulted into higher marketing efficiency as in anthurium in Mizoram and passion fruit in Manipur. Development of such marketing system may strengthen the supply chain management. Therefore, public – private partnership in the marketing of fruits and flowers as Zopar in Mizoram and Passion Beekeeping Development Association in Manipur may a model for the NEH region.

5) References

Acharya, S.S. and Agarwal, N.L. (1999) Agriculture Marketing in India, Oxford & IBH publishing Co. Pvt. Ltd., New Delhi

Ashturker, B.M. and Deole, C.D. (1985) Producers' Share in Consumers Rupee: A Case Study of Fruit marketing in Marathwada, *Indian Journal of Agricultural Economics*, 40: 3

Chole, V.M., Talathi, J.M. and Naik, V.G. (2003) Price Spread in Marketing of Brinjal in Maharashtra State, *Agricultural Marketing*, 45 (3):5-7

G. Sunil Kumar Babu, Sri Hari Naidu and Y. Eswara Prasad (2003) Price Spread and Marketing of Green Chillies – A case Study in Andhra Pradesh, *Agricultural Marketing,* 45 (3):21-23

Gadre, A.V., Talathi, J.M. and Wadkar, S.S. (2002) Price Spread in Marketing of White Onion in Raigad District of Maharashtra State, *Agricultural Marketing*, 44 (4):22-25

Gangwari, L.S. and Singh, S. (1999) Marketing of Nagpur Mandarins: A case study of Nagpur District of Maharashtra, *Agricultural Marketing*, 41 (1):18-20

Garg, J.S. and Misra, J.P. (1996). Costs and Margins in the Marketing of Vegetables in Kanpur, *Agricultural Marketing*, 8:2

Gogoi, M. (1978) Marketing of Orange in Dibrugarh District – A Case Study (Unpublished M.Sc. Thesis), Department of Agricultural Economics, AAU, Jorhat.

Goswami, S.M. (1991) Price Spread of Tomato in a Vegetable Market of Kamrup District Assam, *Agricultural Marketing,* 33(4):13-16

Goswami, S.N. and Singh, S.B. (2000) Problems and Prospects of Marketing of Horticultural Crops in North-East India, *Agricultural Marketing*, 42 (2):23-26

Goyal, S.K. (1999) Economics of Rose Cultivation and its marketing in Sonepat District of Haryana State, *Indian Journal of Agricultural Marketing*, 13(3):44-51

Saikia, T.N. (1985) Price Structure of Pineapple: A Study in Meghalaya, *Indian Journal of Agricultural Economics*, 40:3

Shapoo, J.A. and Banerjee, B.N. (2003) Economics of Apple Trade in Anantnag District of Jammu and Kashmir, *Agricultural Marketing*, 45 (3):36-39

Singh, M. (1985) Price Spread of Vegetables Marketing, *Indian Journal of Agricultural Economics*, 40:3

Singh, R. (1988) A Study of Marketing of Pineapple in Central District of Manipur (Unpublished M.Sc. Thesis), Department of Agricultural Economics, AAU, Jorhat.

Subbanarasaiah, N. (1991) Marketing of Horticultural Crops in India, Anmol Publishing Co., Delhi.

ZOPAR Export Pvt. Ltd. (www.zopar.in)

Estimating Marketing Efficiency of Horticultural Commodities under Different Supply Chains in Rajasthan

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1. Introduction

1.1 Background

Rajasthan state has vast potential for horticultural development as the diverse agro-climatic conditions are very much favoring growing of large number of horticultural crops like fruits, vegetables, spices, flowers and medicinal & aromatic plants throughout the year. During 1989 separate department of horticulture came into existence with ultimate objective of harnessing the potential of horticulture in the State in a systematic and planned manner so as to increase area, production and productivity of different horticultural crops and thereby to improve nutritional as well as economic status of people of State. As a result during 2007-08, about 7.51 lakhs ha area is reported to be under horticultural crops against gross cropped area of 221 lakhs ha. This includes 0.29 lakh ha under fruit crops, 1.43 lakhs ha under vegetable crops, 5.7 lakhs ha under spices crops, 0.033 lakh ha under flowers and 1.98 lakhs ha area under medicinal & aromatic crops which comes to about 4.28% of gross cropped area. As far as production of these crops is concerned, it is 5.6 lakhs MT fruits, 8.5, 5.29, 0.6 & 0.94 lakhs MT vegetables, spices, flowers and medicinal & aromatic crops respectively.

Marketing of fruits and vegetables in Rajasthan has different features than food grains marketing. While fruits crops are mostly sold through contract system where farmer gives advance contract before actual harvesting of crop, vegetables are sold either in regulated market or special procurement stalls established by traders during peak production season. The main reason behind giving advance contract for fruits is that farmers want to minimize risk in production as well as price. Another major factor is that local market is not able to consume large quantity of production, hence it needs disposal at the earliest to other major cities in the country that needs advance planning and investment. In case of vegetables produce is received at different intervals

and traders procure produce from regulated markets where there is fluctuation in prices on daily basis. Present study investigated in detail different marketing channels and highlighted the marketing efficiency of different supply chain systems for four fruit and vegetable crops viz. Kinnow, Aonla, Carrot and Tomato.

1.2 Policy research questions

1. What is the marketing cost and marketing margins under various supply chains?
2. What is the price spread and marketing efficiency under various supply chains?
3. Which are the constraints perceived by various stakeholders?
4. What are the strategies to enhance the marketing efficiency?

1.3 Objectives of the study

1. To ***estimate*** the marketing cost and marketing margin of different functionaries for selected horticultural commodities under various supply chains
2. To ***analyze*** the price spread, marketing efficiency and farmer's share in consumer rupee in various supply chains
3. To ***identify*** the constraints perceived by various stakeholders; and study the factors influencing the marketing cost, market margin and marketing efficiency
4. To ***suggest*** suitable strategies to enhance the marketing efficiency for horticultural commodities

2. Data and Methodology

2.1 Study area:

Present study was conducted in Jaipur and Sriganganagar districts of Rajasthan. Sriganganagar district was selected for study of kinnow and carrot crop while aonla and tomato crop, Jaipur district was selected. These districts were selected based on significant area under selected fruits and vegetables crop.

2.2 Data on items:

Data related to production, consumption and marketed surplus of various crops was collected. Beside this marketing channels through which different produces were sold were also identified. The share of different channels in sale of farmers' produce was identified. Information was also collected on price on which produce was sold, expenses incurred by different agencies on marketing of produce till it reaches to consumer for final consumption. The price paid by consumer and share of market intermediaries in marketing cost and marketing margin under different marketing channels was also noted.

2.3 Sample size:

Sample size was kept uniform for all fruits and vegetable crops. For each crop 120 farmers were selected. Beside this information was also collected from 30 wholesalers/ traders/ contractors and 30 retailers for each fruit and vegetables crop studied.

2.4 Sampling method:

Multistage stratified random sampling technique was adopted for selection of tehsils, villages and farmers. Sriganganagar and Jaipur districts were selected for present study. Two tehsils Sriganganagar and Karanpur were selected for collecting detailed data from kinnow growers in Sriganganagar district. For carrot crop Sriganganagar tehsil in that district was selected. For collecting detailed information on aonla and tomato crop, Chomu tehsil in Jaipur district was selected as it has largest area as well as well established market for aonla and tomato sale.

2.5 Statistical techniques:

The techniques adopted for analyzing data to meet the objectives of the study are as follows

- Tabular : Market margin, market cost, price spread, marketing efficiency
- Graphical : Pie charts for market costs, price spread
- Flow chart for market channels
- Functional
    - Liner Regression Analysis: Factors affecting marketing efficiency
- Garrett's Ranking Technique : Constraints of the farmers and other market intermediaries
- Delphi technique: Experts opinion on performance of markets

3. Results and Discussion

3.1 Status of the fruits and vegetables production

Both aonla and kinnow are important fruit crops grown in Rajasthan. Sriganganagar district with 86 percent and Jaipur with 15 percent area under kinnow and aonla, respectively are the leading districts of the state for production of these crops (table 1). In carrot Sriganganagar with 17 percent area and Jaipur with 38 percent of state's area under tomato crop were the leading districts producing these crops. Regarding production of vegetables, Sriganganagar district contributes 49 percent and Jaipur 38 percent in states carrot and tomato production, respectively (table 2)

Table 1: Status of fruit and vegetable area (2007-08)

Name of district	**Name of fruit/ vegetable**	**Area under district (ha)**	**Area under state (ha)**	**% of state's area**
Sriganganagar	Kinnow	3648.0	4264.0	85.55
	Carrot	177.0	1053.0	16.81
Jaipur	Aonla	258.4	1730.0	14.94
	Tomato	6306.0	16588.0	38.02

Source: Department of Horticulture, Government of Rajasthan

Table 2: Status of vegetable production (2007-08)

Name of district	Name of vegetable	District's Production (M.T.)	State's Production (M.T.)	% of State's Production
Sriganganagar	Carrot	5310.0	10763.0	49.34
Jaipur	Tomato	21208.0	55508.0	38.21

Source: Department of Horticulture, Government of Rajasthan

3.1 Kinnow

Marketing channels in Kinnow

There were three important marketing channels (table 3) through which kinnow produce were sold by farmers in Sriganganagar district. The marketing channel- I was most famous as about 71 percent produce was sold through it (table 7). In channel-II farmers directly brought produce in the mandi and sold it through commission agents either in local or distant markets in same or other states. In channel III producers sell the produce after grading and processing. The produce is either processed by farmers himself at his processing plant or on payment basis at grading plants situated around Ganganagar city. About 50 percent kinnow produce is processed (graded and waxed) and then sent to distant markets with distance more than 1000 kms from production belt in the cities like Mumbai, Pune, Hyderabad, Banglore, Chennai, Coimbatore etc. Few farmers have their own grading/ waxing plant at Ganganagar district while out of total produce procured by contractors; about 50% share is of processors cum contractors.

Table 3: Marketing Channels in sale of Kinnow (2008-9)

Particulars	Supply Chain
Channel 1	Producer – Contractor- Commission Agent/ Wholesaler – Retailer – Consumer Producer – Contractor cum Processor- Commission Agent/ Wholesaler – Retailer – Consumer
Channel 2	Producer – Commission Agent/ Wholesaler -Retailer – Consumer
Channel 3	Producer cum Processor- Commission Agent- Wholesaler – Retailer – Consumer

Table 4: Quantity handled in different marketing channels of kinnow (2008-9)

S.N.	Marketing channel	Quantity handled (Q)	Percent share
1	Channel 1 (Contractor)	22054	71.10
2	Channel 2 (CA/ Wholesaler)	4164	13.43
3	Channel 3 (Producer cum processor)	4798	15.47
	Total	31016	100.00

Marketing cost in kinnow

It depends on variety of factors like number of intermediaries in the marketing chain, extent of processing, quality of packaging material used, and distance of market place from production region etc. The detail marketing cost for both channels has been shown in tables 5a, 5b, 6a and 6b. The produce to distant markets (More than 1000 kms away) are transported after grading and waxing only while in short and medium distance it is transported without waxing. It affects marketing cost as for short distance generally waxing is not done and it saves the marketing cost. Kinnow is packed in 10 kg cardboard boxes for transportation. Sometime depending upon requirement of buyers it is packed in wooden boxes also as kinnow meant for export in Bangladesh is transported in wooden boxes. The low grade kinnow is loaded loose

in truck or packed in jute bags weighing about 25 kg each. Again every market has its demand for specific size of kinnow, buyers want specific numbers of fruits in 10 kg box as in many cities of South India this fruit is sold on number basis without taking actual weight. Total marketing cost of about Rs 807 was observed in channel-I when sold to distant markets in south e.g. Bangalore city. The cost was shared by contractors (65.30%), commission agents (3.72 %) and retailers (30.98%). The maximum cost of marketing was shared by contractors as he arranges labour for fruits harvesting, packing and pays the cost of packing material and transportation cost. Total marketing cost had 29.49 and 15.67 percent share (table 9 a, 9b) in consumer price in channel I and II, respectively.

Table 5 a: Marketing cost and Marketing Margin in Kinnow (Rs*/q)*

(Channel 1)

Item	**Cost**	**% Consumer Price**
Farm gate price at village	605.77	22.14
+sorting		
+packing		
+transport		
+others		
Total marketing cost	0.00	0.00
Net price realized by farmer	881.93	32.23
Farmer's Selling Price to Local Assembly Trader/ Contractor	881.93	32.23
+sorting		
+packing		
+storage		
+transport		
+commission		
Total marketing cost	526.96	19.26
Marketing margin	232.11	8.48

Assembly traders/ Contractor price to wholesaler	1641.00	59.98
+sorting		
+packing		
+storage		
+transport		
Market fee		
Total marketing cost	30.00	1.10
Marketing margin	145.00	5.30
CA/ Wholesalers price to retailers	1816.00	66.37
+transport		
+packing		
Total marketing cost	250.00	9.14
Marketing margin	670.00	24.49
Retailers price to consumer	2736.00	100.00

Table 5 b: Marketing cost and Marketing Margin in Kinnow *(Rs/q)*

(Channel-II)

Item	**Cost**	**% Consumer Price**
Farm gate price at village (Cost of production)	605.77	34.07
+sorting		0.00
+packing		0.00
+transport		0.00
+others		0.00
Total marketing cost	150.00	8.44
Net price realised by farmer	916.00	51.53
Farmer's Selling Price to Wholesaler	1066.00	59.96
+sorting		0.00
+packing		0.00
+storage		0.00
+transport		0.00
+commission	63.96	3.60
Market fee	17.06	0.96
Total marketing cost	81.02	4.56
Marketing margin	125.00	7.03

Wholesalers price to retailers	1272.02	71.55
+transport	17.00	0.96
+packing	30.50	1.72
Total marketing cost	47.50	2.67
Marketing margin	458.24	25.78
Retailers price to consumer	1777.76	100.00

Table 6 a: Marketing cost and Marketing Margin of Kinnow (Rs/q)

(Channel 1)

Item	**Amount in Rs**	**% Consumer Price**
Farm gate price	881.93	32.23
Marketing cost		
Producer	0	0.00
Contractor	526.96	19.26
Commission Agent/Wholesaler	30	1.10
Retailers	250	9.14
Total marketing cost	806.96	29.49
Marketing margin		
Contractor	232.11	8.48
Commission Agent/Wholesaler	145	5.30
Retailer	670	24.49
Total marketing margin	1047.11	38.27
Consumer price	2736	100.00

Note: Ave commission 9.67 percent of sale price at CA shop

Table 6b: Marketing cost and Marketing Margin of Kinnow (Rs/q)

(Channel II)

Item	**Cost**	**% Consumer Price**
Farm gate price	916.00	51.53
Marketing cost		
Producer	150.00	8.44
Contractor	0.00	0.00
Commission Agent/Wholesaler	81.02	4.56
Retailers	47.50	2.67
Total marketing cost	278.52	15.67
Marketing margin		
Contractor	0.00	0.00
Commission Agent/Wholesaler	125.00	7.03
Retailer	458.24	25.78
Total marketing margin	583.24	32.81
Consumer price	1777.76	100.00

Price spread in kinnow

Price spread for both channels is shown in table 7 a, and 7 b. The price received for a quintal of kinnow by farmer was about eight hundred and eighty two rupees (Channel I). The consumer paid rupees 2,736/- only for equivalent quantity of produce. Farmers share in consumer rupee was found 32.23 percent. The margins earned by contractors, wholesalers and retailers were 8.48 percent, 5.30 percent and 24.49 percent, respectively (table 10a, 10b). The margins of retailers were highest as he sells the produce in small quantities. Contractors had advance contracts with farmers and price was predetermined before actual harvesting of crop. At the time of harvesting of crop usually total amount of produce value is given to farmers but in some cases a fraction of payment is made and rest amount is paid after receiving money from wholesalers by contractors in distant markets. In recent years farmers do not believe much to contractors and in majority of the cases they try to get whole money at the time of loading of produce in the trucks. Though, farmers' share in consumer rupee was more in channel II (table 11a, 11b) as produce is directly brought by farmers in regulated market for sale, but this channel had smaller market share compared to channel I. The channel II was mostly preferred by small orchard owners who could not arrange advance contract for their orchard or for sale of second grade fruit which left after grading and cannot be sent to distant markets.

Table 7 a: Price spread in Kinnow

(Channel I)

Particulars	**Amount (Rs)**	**Percent**
Price received by the farmer	881.93	32.23
Contractor's purchase price	881.93	32.23
Cost incurred	526.96	19.26
Margin	232.11	8.48
CA/ Wholesaler's purchase price	1641	59.98
Cost incurred	30	1.10
Margin	145	5.30
Retailer's purchase price	1816	66.37
Cost incurred	250	9.14
Margin	670	24.49
Price paid by the consumer	2736	100.00

Table 7 b: Price spread in Kinnow

(Channel II)

Particulars	**Amount (Rs)**	**Percent**
Price received by the farmer	916.00	51.53
Contractor's purchase price	0	0.00
Cost incurred	0	0.00
Margin	0	0.00
CA/ Wholesaler's purchase price	1066.00	59.96
Cost incurred	81.02	4.56
Margin	125.00	7.03
Retailer's purchase price	1272.02	71.55
Cost incurred	47.50	2.67
Margin	458.24	25.78
Price paid by the consumer	1777.76	100.00

Table 8 a: Share of different agencies during marketing of kinnow

Channel I

S. No.	Agency	Function	Share in final price (%)
I	Farmer	Production	32.23
II	Contractor	Assembling, Processing, Transporting	8.48
III	Commission agent/ Wholesalers	Market/making /Breaking bulk	5.30
IV	Retailers	Retailing	24.49
V	Marketing cost		29.49
	Consumer price		2736.00 (100.00)

Table 8 b: Share of different agencies during marketing of kinnow

Channel II

S. No.	Agency	Function	Share in final price (%)
I	Farmer	Production	51.53
II	Contractor	Assembling, Processing, Transporting	0.00
III	Commission agent/ Wholesalers	Market/making /Breaking bulk	7.03
IV	Retailers	Retailing	25.78
V	Marketing cost		15.67
	Consumer price		1777.76

Marketing efficiency

The marketing efficiency of kinnow was calculated using different formulas. Acharya's modified measure of marketing efficiency was 0.48 and 1.06 in channel I and II, respectively (table 9). It was higher in channel II as price received by farmers was higher and both marketing cost and marketing margin were lower than channel I. Though marketing efficiency in channel II was higher but its market share in total quantum of kinnow sold was lower as Sriganganagar regulated fruit and vegetable market was not well developed for marketing of large quantity of this fruit. Hence, contractors played major role and procured the produce directly from farmers' orchard and transported to bigger markets in different parts of the country.

Table 9: Measurement of Marketing Efficiency of Kinnow

S. No.	Particulars	Unit	Channel I	Channel II
1	Retailer's sale price (RP)	Rs/q	2736.00	1777.76
2	Total marketing costs (MC)	Rs/q	806.96	278.52
3	Total margins of intermediaries (MM)	Rs/q	1047.11	583.24
4	Price received by farmer (FP)	Rs/q	881.93	916.00
5	Value added by the marketing system (1-4)	Rs/q	1854.07	861.76
	Conventional method (E) (5 / 2)	Ratio	2.30	3.09
	Shepherd's method (ME) (1 / 2)	Ratio	3.39	6.38
	Acharya's method (MME) [4 / (2+3)]	Ratio	0.48	1.06

Constraints in kinnow production and marketing

Kinnow is a semi perishable fruit crop and it can maximum remain unspoiled in the field for seven days after harvesting. Farmers are generally not sure about its prices, hence to check price risk, they prefer advance contract to traders/ contractor where price of fruit crop is predetermined. All the constraints perceived by the farmers were analyzed and ranked following Garret ranking technique and shown in table 10. The most common and important constraint is about its price; here contractors generally make a cartel and offer lower prices to farmers. As farmer wants to be assured about price of his product, he is forced to give advance contract at lower prices even if he is not satisfied with it. Though Ganganagar district produces large quantity of this produce but there is not a single large fruit processing industry where its juice can be prepared. The absence of fruit juice industry causes damage to crop if it is not disposed timely and causes losses to farmers or other intermediaries. The low grade fruit can easily be consumed for preparation of fruit juice which can be kept for more time compared to fruit in its original form. Further local mandi yard is also not well developed for sale of large quantity of produce during main season.

Table 10: Constraints perceived by farmers in Kinnow production and marketing

Sr. No.	Constraint	Score	Garret Ranking
1.	Contractor make a pool and offer lower price	96.96	1
2.	Farmer is not sure about price he will get	91.96	2
3.	Fruit is perishable and farmer can't wait for long time for sale	88.97	3
4.	No processing industry in production area	87.06	4
5.	Local mandi yard is not developed for sale of kinoo	84.98	5
6.	Contractor sometime do not respect pre-harvest contract	83.14	6
7.	Delay in payment by traders	82.04	7
8.	Contractor do not clear the field by 15 Jan and delay up to Feb end	80.06	8
9.	Contractors take less interest in small orchards	78.98	9
10.	No electric connection for drip irrigation	77.93	10
11.	Quality planting material is not available	76.91	11
12.	Heavy commission charged in other states	75.98	12
13.	High cost of labour due to NAREGA	75.02	13
14.	Problem of duplicate pesticides	74.04	14
15.	Damage by blue bull	73.18	15

Factors affecting Marketing Efficiency of Kinnow

The findings of multiple linear regression model is presented in table 11 that shows negative and significant relationship between marketing efficiency and marketing cost and marketing margin. The volume of produce had positive and significant relationship which shows that larger orchard owner with higher quantum of produce could better bargain for prices while small orchard owner face difficulty in giving advance contract and they are comparatively offered lower prices. The increasing numbers of market intermediaries raises the marketing margin, hence it affected negatively to marketing efficiency. Though open market prices had positive relationship with efficiency but it was not found significant, it may be due to the fact that maximum farmers give advance contract and fluctuations in price at the time of actual sale do not affect much to the farmers.

Table 11: Factors affecting Marketing Efficiency of Kinnow

S. No.	Factors	Coefficient	't' value
1	Constant	0.52723***	3.8478
2	Marketing cost (x1)	-0.00030***	-6.4906
3	Marketing margin (x2)	-0.00008***	-3.6848
4	Open market prices (x3)	0.00005^{NS}	0.8186
5	Volume of the produce handled (x4)	0.00062***	3.07746
6	Length of the market channel (No. of market intermediaries) (x5)	-0.00762**	-2.2960
7	R2	0.7765	
8	Adjusted R 2	0.7666	
9	No. of observation (N)	120	

Note : ***, **, * indicate significance at 1 %, 5 % and 10% level, respectively.

3.3 Aonla

Marketing channels in Aonla

There were three important marketing channels (table 12) through which aonla produce were sold by farmers in Jaipur district. The marketing channel-I was most famous as about 87 percent produce was sold through it (table 13). In channel-II farmers directly brought produce in the mandi and sold it through commission agents. Produce procured in channel I is sold mainly in Delhi market from where it is distributed all over India. In channel II commission agents buy produce on behalf of traders in Rajasthan, Haryana and Punjab and this produce is sold through commission agents to retailers in respective mandis. Retailers from Jaipur city also procure aonla in Chomu mandi through channel II. In channel I, traders take advance contract and harvest crop employing their own labour. Produce collected from different orchards is loaded in the truck and sent to Delhi market for further sale. There are two grades of aonla. Ist grade is sold for preparation of murabba while II nd garde is purchased for preparing chawanpras etc by Dabur India and Baba Ramdev at Hariwar. Small scale producer bring their produce for sale in chomu mandi as contractor do not take contract of small orchards. Contractors also bring II nd grade produce at Chomu mandi as there are few traders at mandi who buy this produce for further sale to processing industry. The produce sold in channel I and II is about 87 and 2 percent of produce while 11 percent is sold through channel III (table 16).

Table 12: Marketing Channels in sale of Aonla (2008-9)

Particulars	**Supply Chain**
Channel I	Producer – Contractor/ Trader – Commission agent -Retailer – Consumer
Channel II	Producer –Commission agent- Retailer- Consumer
Channel III	Producer – Contractor -Commission agent- Trader- Consumer (Processing Industry) ***(****II grade Aonla)*

Table 13: Quantity handled in different marketing channels of Aonla (2008-9)

S.N.	Marketing channel	Quantity handled (Q)	Percent share
1	Channel I	107136	87.00
2	Channel II	2498	2.00
3	Channel III	13392	11.00
	Total	123026	100.00

Marketing cost in Aonla

It depends on place of final disposal of produce and kind of packaging material used during transportation of produce. During survey it was found that grade I aonla was sent to distant markets in card board boxes while grade II aonla was filled in 50 kg capacity jute bags and transported to mainly processing industries situated around Delhi and U. P. state. The produce to Delhi market was mainly sent in card board boxes which cost higher than jute bags. The marketing cost in channel II was lower than channel I (table 15a, 15b), as produce was directly brought by farmers in the mandi and sold through retailers to consumers after paying taxes of market and fee of commission agents.

Table 14 a: Marketing cost and Marketing Margin in Aonla (Rs/*q*)

(Channel I)

Item	**Cost**	**% Consumer Price**
Farm gate price at village	149.99	9.37
sorting		
packing		
transport		
others		
Total marketing cost		
Net price realized by farmer	442.47	27.65
Farmer's Selling Price to Local Assembly Trader/ Contractor	442.47	27.65
sorting	24.44	1.53
packing	56.11	3.51
transport	46.19	2.89
commission & tax	60.00	3.75
Miscellaneous	5.42	0.34
Total marketing cost	192.16	12.01
Marketing margin	365.37	22.84

Traders' price to retailers	1000.00	62.50
transport	25.00	1.56
packing	30.00	1.88
Total marketing cost	55.00	3.44
Marketing margin	545.00	34.06
Retailers price to consumer	1600.00	100.00

Table 14 b: Marketing cost and Marketing Margin in Aonla *(Rs/q)*

(Channel-II)

Item	**Cost**	**% Consumer Price**
Farm gate price at village (Cost of production)	149.99	9.78
sorting	25.00	1.63
packing	7.00	0.46
transport	17.60	1.15
others	2.8	0.18
Total marketing cost	52.40	3.42
Net price realised by farmer	913.98	59.58
Farmer's Selling Price to Retailers	966.38	63.00
transport	20.00	1.30
packing	25.00	1.63
Commission & tax	73.44	4.79
Total marketing cost	118.44	7.72
Marketing margin	449.18	29.28
Retailers price to consumer	1534.00	100.00

Table 15 a: Marketing cost and Marketing Margin of Aonla (Rs/q)

(Channel I)

Item	Amount in Rs	% Consumer Price
Farm gate price	442.47	27.65
Marketing cost		
Producer	0.00	0.00
Contractor	192.16	12.01
Commission Agent/Wholesaler	0	0.00
Retailers	55	3.44
Total marketing cost	247.16	15.45
Marketing margin		
Contractor	365.37	22.84
Commission Agent/Wholesaler	0.00	0.00
Retailer	545.00	34.06
Total marketing margin	910.37	56.90
Consumer price	1600.00	100.00

Note: Ave commission 9.67 percent of sale price at CA shop

Table 15 b: Marketing cost and Marketing Margin of Aonla (Rs/q)

(Channel II)

Item	**Cost**	**% Consumer Price**
Farm gate price	913.98	59.58
Marketing cost		
Producer	52.40	3.42
Trader	0.00	0.00
Commission Agent/Wholesaler	0.00	0.00
Retailers	118.44	7.72
Total marketing cost	170.84	11.14
Marketing margin		
Trader	0.00	0.00
Commission Agent/Wholesaler	0.00	0.00
Retailer	449.18	29.28
Total marketing margin	449.18	29.28
Consumer price	1534.00	100.00

Price spread in aonla

Price spread for both channels is shown in tables 16 a, 16 b and 17. The price received for a quintal of aonla was more than double in channel II compared to channel I. It was due to the fact farmers in channel I gave advance contract for their produce, but prices increased at the time of actual sale. As the farmers in channel II directly brought their produce for sale they took advantage of hike in prices and fetched better prices than channel I. The consumer paid almost same amount to retailers in both the channels. Farmers share in consumer rupee was found higher in channel II. The margins of retailers were highest in both channels as he sells the produce in small quantities. Contractors had advance contracts with farmers and price was predetermined before actual harvesting of aonla crop. At the time of harvesting of crop usually total amount of produce value is given to farmers but in some cases a fraction of payment is made and rest amount is paid after receiving money from wholesalers by contractors in distant markets. It is a kind of unwritten agreement and mutual faith between farmers and contractors. In recent years about 50 percent farmers do not believe much to contractors and try to get whole money at the time of loading of produce in the trucks. The channel II despite of having higher share of farmers in consumer rupee had smaller market share compared to channel I, as to check price uncertainty farmers preferred advance contract. The channel II was mostly preferred by small orchard owners who could not arrange advance contract for their orchard or for sale of second grade aonla fruit which left after grading and cannot be sold to distant markets.

Table 16 a: Price spread in Aonla

(Channel I)

Particulars	**Amount (Rs)**	**Percent**
Price received by the farmer	442.47	27.65
Contractor's purchase price	442.47	27.65
Cost incurred	192.16	12.01
Margin	365.37	22.84
CA/ Wholesaler's purchase price	0	0.00
Cost incurred	0	0.00
Margin	0.00	0.00
Retailer's purchase price	1000.00	62.50
Cost incurred	55.00	3.44
Margin	545	34.06
Price paid by the consumer	1600.00	100.00

Table 16 b: Price spread in Aonla

(Channel II)

Particulars	**Amount (Rs)**	**Percent**
Price received by the farmer	913.98	59.58
Cost incurred	52.40	3.42
Contractor's purchase price	0	0
Margin	0	0.00
CA/ Wholesaler's purchase price	0	0.00
Cost incurred	0	0.00
Margin	0	0.00
Retailer's purchase price	966.38	63.00
Cost incurred	118.44	7.72

Margin	449.18	29.28
Price paid by the consumer	1534.00	100.00

Table 17: Share of different agencies in marketing of Aonla

S. No.	**Agency**	**Function**	**Share in final price (%)**	
			Channel I	**Channel II**
I	Farmer	Production	27.65	59.58
II	Contractor	Assembling, Processing, Transporting	22.84	0.00
III	Commission agent/ Wholesalers	Market/making /Breaking bulk		0.00
IV	Retailers	Retailing	34.06	29.28
V	Marketing cost		15.45	11.14
	Consumer price		1600.00 (100.00)	1534.00 (100.00)

Marketing efficiency

The marketing efficiency of aonla was calculated using different methods. Acharya's modified measure of marketing efficiency was 0.38 and 1.47 in channel I and II, respectively (table 18). It was higher in channel II as price received by farmers was higher and both marketing cost and marketing margin were lower than channel I. Though marketing efficiency in channel II was higher but its market share in total quantum of aonla sold was lower as Chomu regulated fruit and vegetable market was not well developed for marketing of large quantity of this fruit. Hence, contractors played major role and procured the produce directly from farmers orchard and transported to mainly Delhi market from where produce was distributed to different locations in India.

Table 18: Measurement of Marketing Efficiency of Aonla

S. No.	Particulars	Unit	Channel I	Channel II
1	Retailer's sale price (RP)	Rs/q	1600.00	1534.00
2	Total marketing costs (MC)	Rs/q	247.16	170.84
3	Total margins of intermediaries (MM)	Rs/q	910.37	449.18
4	Price received by farmer (FP)	Rs/q	442.47	913.98
5	Value added by the marketing system (1-4)	Rs/q	1157.53	620.02
	Conventional method (E) (5 / 2)	Ratio	4.68	3.63
	Shephered's method (ME) (1 / 2)	Ratio	6.47	8.98
	Acharya's method (MME) [4 / (2+3)]	Ratio	0.38	1.47

Constraints in aonla production and marketing

Aonla like kinnow is a semi perishable fruit crop and it can maximum remain unspoiled in the field for seven days after harvesting. Farmers are generally not sure about its prices, hence to check price risk, they prefer advance contract to traders/ contractor where price of fruit crop is predetermined. All the constraints perceived by the farmers were analyzed and ranked following Garret ranking technique and shown in table 19. The most common and important constraint is about its price; here contractors generally make a cartel and offer lower prices to farmers. As farmer wants to be assured about price of his product, he is forced to give advance contract at lower prices even if he is not satisfied with it. Though Jaipur district produces large quantity of this produce but there is not a single large fruit processing industry which can take care processing of aonla produced in this region. Hence traders are mostly depending on aonla processing industries in Delhi and U P state and prices are determined based on demand from these big industries. Further local mandi yard is also not well developed for handling of large quantity of produce during main season and farmers are not sure about timely disposal of their produce. The procedure of open auction in Chomu fruit and vegetable market was occasionally followed and there is virtually no competition among buyers, prices are fixed by few traders on daily basis and whole produce on that particular day is bought at that price.

Table 19: Constraints perceived by farmers in Aonla production and marketing

Sr. No.	Constraint	Score	Garret Ranking
1.	Contractor make a cartel and offer lower price	37.65	1
2.	Farmer is not sure about price he will get	34.95	2
3.	No major processing industry in production area	36.30	3
4.	Contractors take less interest in small orchards	29.50	4

5.	Contractor sometime do not respect pre-harvest contract	28.65	5
6.	Avoidance of open auction method for purchase by traders	28.20	6
7.	Encroachment on farmers platform by traders & renting out	28.05	7

Factors affecting marketing efficiency of aonla

The findings of multiple linear regression model is presented in table 23 that shows negative and significant relationship between marketing efficiency and marketing cost and marketing margin. The volume of produce had positive and significant relationship which shows that large orchard owner with higher quantum of produce could better bargain for prices while small orchard owner face difficulty in giving advance contract and they are comparatively offered lower prices. The increasing numbers of market intermediaries raises the marketing margin, hence it affected negatively to marketing efficiency. Open market prices had positive relationship with efficiency showing benefit to farmers during rising prices in the market. It may be due to better deal to the farmers who give orchard on contract basis and rise in daily prices in Chomu mandi.

Table 20: Factors affecting Marketing Efficiency of Aonla

S. No.	Factors	Coefficient	't' value
1	Constant	0.76058***	23.92882
2	Marketing cost (x1)	-0.00038*	-1.565
3	Marketing margin (x2)	-0.00048***	-8.65358
4	Open market prices (x3)	0.00008***	5.802124
5	Volume of the produce handled (x4)	0.00003***	2.633177
6	Length of the market channel (No. of market intermediaries) (x5)	-0.00293^{NS}	-0.99767
7	R2	0.7598	
8	Adjusted R 2	0.7493	
9	No. of observation (N)	120	

Note: ***, **, * indicate significance at 1 %, 5 % and 10% level, respectively

3.4 Carrot

Marketing channels in Carrot

There were two important marketing channels (table 21) through which carrot produce were sold by farmers in Ganganagar district. The marketing channel-I was most famous as about 85 percent produce was sold through it (table 22). Traders from adjoining states like Punjab, Haryana and other parts of Rajasthan were participating in the auction which takes place on the bank of Gang canal. Farmers had the facility of canal water for washing and cleaning of produce by machines at this place. Though there was not a single government official present during auction but it was very fair system as observed during survey. One member of farmers' community acts as secretary and facilitates the auction work for all the farmers. The auction usually takes place during evening time as produce is prepared for sale and filled in jute bags weighing 50 kg each during day time. After completion of auction work, produce is loaded in trucks and taken to different markets in Punjab, Haryana and Rajasthan. This produce is sold in respective markets to retailers. The quality of carrot produced in Ganganagar district is very good and liked by buyers in other states. Farmers were happy with this system as they were able to dispose their produce same day during evening time and were receiving payments within a week from the traders. The only problem they faced was from irrigation department, which wants to vacate that place of sale and does not allow washing/cleaning of carrot with canal water. In channel II retailers from Ganganagar or adjoining towns buy produce through commission agents at regulated market. This produce is sold in the district itself to consumers. The channel II gets only 15 percent share in the total carrot produce sold by farmers.

Table 21: Marketing Channels in sale of Carrot (2008-9)

Particulars	**Supply Chain**
Channel I	Producer –Trader/ Wholesaler- Commission agent – Retailer – Consumer
Channel II	Producer – Commission Agent- Retailer – Consumer

Table 22: Quantity handled in different marketing channels of Carrot (2008-9)

S.N.	Marketing channel	Quantity handled (Q)	Percent share
1	Channel I	36484.25	85.17
2	Channel II	6354.50	14.83
	Total	42838.75	100.00

Marketing cost in Carrot

It depends on kind of produce, distance of market from farmer's field and kind of packaging material used during transportation of produce. The share of marketing cost in consumer price for farmer, local trader, wholesaler and retailer was 10.23%, 4.17%, 4.67% and 4.77% in channel I (table 23). The absolute value of marketing cost for farmers was almost same in both channels (table 23 & 24). Farmers spent money for sorting of carrot i.e. segregating small size carrot from bigger one for getting higher price during auction. He also spent money on transportation of produce to market place, purchase of packing material i.e. jute bags, washing and cleaning of produce through machines etc. Other market functionaries spent money on transportation of produce to different markets, paying of taxes and commission in the markets etc. The total marketing cost was lower in channel II compared to I because produce was not taken to distant places and number of intermediaries were also fewer (table 24 a, 24b).

Table 23 a: Marketing cost and Marketing Margin in Carrot (Rs*/q)*

(Channel I)

Item	**Cost**	**% Consumer Price**
Farm gate price at village (Cost of production)	123.04	15.23
sorting	18.19	2.25
packing	21.86	2.71
transport	23.12	2.86
others	19.51	2.41
Total marketing cost	82.68	10.23
Net price realized by farmer	202.63	25.08
Farmer's Selling Price to Local Assembly Trader/ Contractor	285.31	35.31
Total marketing cost	33.70	4.17
Marketing margin	100.00	12.38
Assembly traders' price to wholesalers	419.01	51.86
Market fee	16.76	2.07
Commission	20.95	2.59
Total marketing cost	37.71	4.67

Marketing margin	60.00	7.43
Wholesalers price to retailers	516.72	63.95
Total marketing cost	38.57	4.77
Marketing margin	252.71	31.28
Retailers price to consumer	808.00	100.00

Table 23 b: Marketing cost and Marketing Margin in Carrot (Rs*/q)*

(Channel II)

Item	**Cost**	**% Consumer Price**
Farm gate price at village (Cost of production)	123.04	18.93
sorting	18.19	2.80
packing	21.86	3.36
transport	23.12	3.56
others	20.26	3.12
Total marketing cost	83.43	12.84
Net price realized by farmer	214.77	33.04
Farmer's Selling Price to Wholesaler at GNR regulated market	298.20	45.88
Market fee	4.77	0.73

Commission	17.89	2.75
Total marketing cost	22.66	3.49
Marketing margin	55.00	8.46
Traders'/ Wholesalers price to retailers	375.86	57.83
transport		
packing		
Total marketing cost	38.57	5.93
Marketing margin	235.57	36.24
Retailers price to consumer	650.00	100.00

Table 24 a: Marketing cost and Marketing Margin of Carrot (Rs/q)

(Channel I)

Item	**Cost**	**% Consumer Price**
Farm gate price	202.63	25.08
Marketing cost		
Producer	82.68	10.23
Trader	33.70	4.17
Commission Agent/Wholesaler	37.71	4.67
Retailers	38.57	4.77

Total marketing cost	192.66	23.84
Marketing margin		
Trader	100.00	12.38
Commission Agent/Wholesaler	60.00	7.43
Retailer	252.71	31.28
Total marketing margin	412.71	51.08
Consumer price	808.00	100.00

Table 24 b: Marketing cost and Marketing Margin of Carrot (Rs/q)

(Channel II)

Item	**Amount in Rs**	**% Consumer Price**
Farm gate price (Net price received by farmer)	214.77	33.04
Marketing cost		
Producer	83.43	12.84
Contractor	0.00	0.00
Commission Agent/Wholesaler	22.66	3.49
Retailers	38.57	5.93
Total marketing cost	144.66	22.26
Marketing margin		

Contractor	0.00	0.00
Commission Agent/Wholesaler	55.00	8.46
Retailer	235.57	36.24
Total marketing margin	290.57	44.70
Consumer price	650.00	100.00

Price spread in carrot

Price spread for both channels is shown in tables 25 a, 25 b and 26. The price received for a quintal of carrot and farmers share in consumer rupee was more in channel II. Despite of this majority of farmers preferred channel I as they could dispose the produce during evening time as daily auction takes place during this time. The higher price paid by consumer in channel I was due to the fact that produce was taken to different states while in channel II it was sold in the district itself. The retailers share in consumers' rupee was more than 30 percent in both channels as he sells the produce in small quantities and some quantity of produce gets spoiled also. Overall farmers' preference was for channel I as they were more assured about sale of their produce within shortest possible time. Traders from other states also had the advantage of buying produce in channel I as they could get fresh produce which could be sold next day in the any market of Punjab and Haryana. Further traders were saving on account of market tax and commission charged by commission agents in regulated market as market in channel I, was managed by farmers and no record was kept regarding quantity sold and prices determined on a particular day.

Table 25 a: Price spread in Carrot

(**Channel I)**

Particulars	**Amount (Rs)**	**Percent**
Price received by the farmer	202.63	25.08
Cost incurred	82.68	10.23
Contractor's purchase price	285.31	35.31
Cost incurred	33.70	4.17
Margin	100	12.38
CA/ Wholesaler's purchase price	419.01	51.86
Cost incurred	37.71	4.67
Margin	60.00	7.43
Retailer's purchase price	516.72	63.95
Cost incurred	38.57	4.77
Margin	252.71	31.28
Price paid by the consumer	808.00	100.00

Table 25 b: Price spread in Carrot

(Channel II)

Particulars	**Amount (Rs)**	**Percent**
Price received by the farmer	214.77	33.04
Cost incurred	83.43	12.84
CA/ Wholesaler's purchase price	298.20	45.88
Cost incurred	22.66	3.49
Margin	55.00	8.46
Retailer's purchase price	375.86	57.82
Cost incurred	38.57	5.93
Margin	235.57	36.24
Price paid by the consumer	650.00	100.00

Table 26: Share of different agencies in marketing of Carrot

S. No.	Agency	Function	Share in final price (%)	
			Channel I	**Channel II**
I	Farmer	Production	25.08	33.04
II	Contractor/ Trader	Assembling, Processing, Transporting	12.38	0
III	Commission agent/ Wholesalers	Market/making /Breaking bulk	7.43	8.46
IV	Retailers	Retailing	31.28	36.24
V	Marketing cost		23.84	22.26
	Consumer price		808.00 (100.00)	650.00 (100.00)

Marketing efficiency

The marketing efficiency of carrot was calculated using different methods. Acharya's modified measure of marketing efficiency was 0.33 and 0.49 in channel I and II, respectively (table 27). It was higher in channel II as price received by farmers was higher and both marketing cost and marketing margin were lower than channel I. Though marketing efficiency in channel II was higher but its market share in total quantum of carrot sold was lower as farmers could sell their produce during evening time in channel I while in channel II produce was usually sold during early morning to 11 a.m. Hence, after harvesting of crop, farmers were not much interested in keeping the produce at home or field during night time and preferred to dispose it off through channel II during evening time.

Table 27: Measurement of Marketing Efficiency of Carrot

S. No.	Particulars	Unit	Channel I	Channel II
1	Retailer's sale price (RP)	Rs/q	808.00	650.00
2	Total marketing costs (MC)	Rs/q	192.66	144.66
3	Total margins of intermediaries (MM)	Rs/q	412.71	290.57
4	Price received by farmer (FP)	Rs/q	202.63	214.77
5	Value added by the marketing system (1-4)	Rs/q	605.37	435.23
	Conventional method (E) (5 / 2)	Ratio	3.14	3.01
	Shephered's method (ME) (1 / 2)	Ratio	4.19	4.49
	Acharya's method (MME) [4 / (2+3)]	Ratio	0.33	0.49

Constraints in carrot production and marketing

Carrot crop after harvesting cannot be kept more than 2-3 days and it has to be disposed at the earliest to maintain its quality and fetch better price in the market. All the constraints perceived by the farmers were analyzed and ranked following Garret ranking technique and shown in table 28. The most important constraint was about price of the produce as farmer was not sure that at what price his produce will be sold on a particular day. The demand of carrot in different cities and competition with produce of other regions also played major role in deciding the price. Sometime small size carrot has no buyers in the market and they have to feed it to their animals. Though, auction of produce takes place daily in both channels but farmers felt that traders make a cartel and offer lower prices to producers that some time is too low to meet even cost of production. Farmers faced lot of problems in procuring quality seed material at affordable rates. The problem of poor quality seed is common and farmers felt cheated after sowing of seed. Further, facility of cold storage for this crop is also lacking which causes sale of produce at lower prices during peak season.

Table 28: Constraints perceived by farmers in Carrot production and marketing

Sr. No.	Constraint	Score	Garret Ranking
1.	Farmer is not sure about price he will get	96.70	1
2.	Vegetable is perishable and farmer can't wait for long time	93.03	2
3.	Vegetable purchasers make a cartel in mandi and offer less price	89.16	3
4.	Problem in getting quality seed material	86.85	4
5.	Delay in payment by traders	85.12	5
6.	No facility of cold storage in the area	83.06	6

7.	High cost of labour due to NAREGA	82.01	7
8.	No facility of refrigerated containers	80.14	8

Factors affecting marketing efficiency of carrot

The findings of multiple linear regression model is presented in table 29 that shows negative and significant relationship between marketing efficiency and marketing cost and marketing margin. The volume of produce had positive and significant relationship which shows that large carrot growers could bargain and fetched better prices in the market. Though increasing numbers of market intermediaries had negative relationship with marketing efficiency but this factor was not significant. Open market prices had positive relationship with efficiency showing benefit to farmers during rising prices in the market but this factor was also not significant that shows that it was always not a case that with rise in open market price, procurement price may also increase.

Table 29: Factors affecting Marketing Efficiency of Carrot

S. No.	**Factors**	**Coefficient**	**'t' value**
1	Constant	1.044271***	2.415557
2	Marketing cost (x1)	-0.00228**	-1.70483
3	Marketing margin (x2)	-0.00188***	-4.48311
4	Open market prices (x3)	0.000005^{NS}	0.038808
5	Volume of the produce handled (x4)	0.001428***	3.560875
6	Length of the market channel (No. of market intermediaries) (x5)	-0.00081^{NS}	-0.11708
7	R2	0.80256	

8	Adjusted R 2	0.7939	
9	No. of observation (N)	120	

Note : ***, **, * indicate significance at 1 %, 5 % and 10% level, respectively

3.5 Tomato

Marketing channels in tomato

There were two important marketing channels (table 30) through which tomato produce were sold by farmers in Jaipur district. Produce procured in channel I, was sold in different markets of Rajasthan viz. Jaipur, Sikar, Ganganagar, Hanumangarh, Sardarshahar, Churu and various cities in Punjab and Haryana etc. While in Channel II produce is directly procured by retailers and sold in Chomu or Jaipur city. About 40 percent of tomato produced in Jaipur district was consumed in this district itself while 60 percent was sold in other markets of Rajasthan and different cities in Punjab and Haryana state. For procurement of tomato either traders of other cities directly comes in Chomu mandi or local commission agents buy the produce for outside traders and transport the produce by trucks to distant places as per order. The quantity of produce handled in Ist and IInd Channel was about 80 percent and 20 percent, respectively (table 34). The marketing channel-I was most famous and traders from adjoining states like Punjab, Haryana and other parts of Rajasthan were procuring tomato either from Chomu mandi or from major production regions in Jaipur district. During peak season sometime there was no space left in the market to keep large quantity of produce, hence traders were procuring from production region directly. Retailers from Jaipur city or Chomu were buying produce directly (Channel II) in mandi through commission agents. Tomato produced in Jaipur district especially in Chomu and Bassi is very famous outside the state and has great demand.

Table 30: Marketing channels in sale of Tomato (2008-9)

Particulars	Supply Chain
Channel I	Producer – Commission agent-Wholesaler/ Trader – Retailer – Consumer
Channel II	Producer – Commission agent- Retailer – Consumer

Table 31: Quantity handled in different marketing channels of Tomato (2008-9)

S.N.	Marketing channel	Quantity handled (Q)	Percent share
1	Channel I	38999.68	80.00
2	Channel II	9749.92	20.00
	Total	48749.60	100.00

Marketing cost in tomato

It depends on distance of market from farmer's field and kind of packaging material used during transportation of produce. The detail information on marketing cost is presented in tables 32a, 32b, 33a and 33b. Traders had highest share in marketing cost in channel I while both farmers and retailers had similar expenses on marketing of tomato produce in channel II. Farmers spent money for sorting of tomato i.e. segregating small size and spoiled tomato from bigger one for getting higher price during sale. They also spent money on transportation of produce to market place, purchase of packing material i.e. wooden baskets and plastic boxes etc. Other market functionaries spent money on transportation of produce to different markets, paying of taxes and commission in the markets etc. The total marketing cost was lower in channel II compared to I because produce was not taken to distant places and number of intermediaries were also fewer (table 33a, 33b). The channel I was more famous with farmers as there was great demand of tomato from other regions and neighboring states and traders were procuring it directly from production region during peak production. In the absence of outside traders it was very difficult for local traders to procure the whole produce and due to

low competition prices fetched by farmers may also come down. In channel I, produce was not auctioned and prices were determined by selected commission agents on daily basis based on demand supply position at Jaipur market. In channel II also auction was rarely done. The commission agents were facilitating sale of produce in channel II by issuing rate slips to farmers, if he agreed than produce was weighed and amount paid to farmers. In channel I, money is not paid immediately after sale and farmers sometime had to wait for seven days till commission agents receive money from outside traders.

Table 32 a: Marketing cost and Marketing Margin in Tomato (Rs*/q)*

(Channel I)

Item	**Cost**	**% Consumer Price**
Farm gate price at village (Cost of production)	263.44	20.91
sorting	34.37	2.73
packing	4.60	0.37
transport	37.86	3.00
others	12.46	0.99
Total marketing cost	89.29	7.09
Net price realized by farmer	522.32	41.45
Farmer's Selling Price to Wholesaler/ Trader	611.61	48.54
Total marketing cost	192.19	15.25
Marketing margin	86.20	6.84
Wholesalers price to retailers	890.00	70.63
transport	8.50	0.67
packing	25.00	1.98
Commission & tax	67.64	5.37
Total marketing cost	101.14	8.03
Marketing margin	268.86	21.34
Retailers price to consumer	1260.00	100.00

Table 32 b: Marketing cost and Marketing Margin in Tomato (Rs*/q)*

(Channel II)

Item	**Cost**	**% Consumer Price**
Farm gate price at village (Cost of production)	263.44	25.93
sorting	34.37	3.38
packing	4.60	0.45
transport	37.86	3.73
others	12.46	1.23
Total marketing cost	89.29	8.79
Net price realized by farmer	530.71	52.24
Farmer's Selling Price to Retailers	620	61.02
transport	12.00	1.18
packing	30.00	2.95
Commission & tax	47.12	4.64
Total marketing cost	89.12	8.77
Marketing margin	306.88	30.20
Retailers price to consumer	1016.00	100.00

Table 33 a: Marketing cost and Marketing Margin of Tomato (Rs/q)

(Channel I)

Item	**Cost**	**% Consumer Price**
Farm gate price	522.32	41.45
Marketing cost		
Producer	89.29	7.09
Trader	192.19	15.25
Commission Agent/Wholesaler	0	0.00
Retailers	101.14	8.03
Total marketing cost	382.62	30.37
Marketing margin		
Trader	86.20	6.84
Commission Agent/Wholesaler	0.00	0.00
Retailer	268.86	21.34
Total marketing margin	355.06	28.18
Consumer price	1260.00	100.00

Table 33 b: Marketing cost and Marketing Margin of Tomato (Rs/q)

(Channel II)

Item	Amount in Rs	% Consumer Price
Farm gate price (Net price received by farmer)	530.71	52.24
Marketing cost		
Producer	89.29	8.79
Contractor	0.00	0.00
Commission Agent/Wholesaler	0	0.00
Retailers	89.12	8.77
Total marketing cost	178.41	17.56
Marketing margin		
Contractor	0.00	0.00
Commission Agent/Wholesaler	0.00	0.00
Retailer	306.88	30.20
Total marketing margin	306.88	30.20
Consumer price	1016.00	100.00

Price spread in tomato

Price spread for both channels is shown in tables 34 a, 34 b and 35. The price received for a quintal of tomato and farmers share in consumer rupee was more in channel II. Despite of this majority of farmers preferred channel I as they could dispose large quantity of the produce through channel I. Another advantage farmers had in channel I is that traders were receiving farmers' produce during evening time and transporting tomatoes during night itself to distant markets so that next day that produce could be sold in respective markets. The importance of outside trade was more as Jaipur district alone had no capacity to consume whole tomato produce produced in that region. The share of marketing cost was higher in channel I because produce was taken to distant markets. The retailers share in consumers' rupee was more in channel II, it may be due to heavy demand in Jaipur city and taking more margins by retailers which has the largest population in Rajasthan state. Overall farmers' preference was for channel I as they were more assured about sale of their produce within shortest possible time. Traders from other states also had the advantage of buying produce in channel I as they could get fresh produce which could be sold next day in the any market of Punjab and Haryana.

Table 34 a: Price spread in Tomato

(Channel I)

Particulars	**Amount (Rs)**	**Percent**
Price received by the farmer	522.32	41.45
Cost incurred	89.29	7.09
Traders's purchase price	611.61	48.54
Cost incurred	192.19	15.25
Margin	86.20	6.84
CA/ Wholesaler's purchase price	0	0
Cost incurred	0	0
Margin	0	0
Retailer's purchase price	890.00	70.63
Cost incurred	101.14	8.03
Margin	268.86	21.34
Price paid by the consumer	1260.00	100.00

Table 34 b: Price spread in Tomato

(Channel II)

Particulars	**Amount (Rs)**	**Percent**
Price received by the farmer	530.71	52.24
Cost incurred	89.29	8.79
CA/ Wholesaler's purchase price	0	0
Cost incurred	0	0
Margin	0	0
Retailer's purchase price	620.00	61.02
Cost incurred	89.12	8.77
Margin	306.88	30.20
Price paid by the consumer	1016.00	100.00

Table 35: Share of different agencies in marketing of Tomato

S. No.	Agency	Function	Share in final price (%)	
			Channel I	**Channel II**
I	Farmer	Production	41.45	52.24
II	Contractor/ Trader	Assembling, Processing, Transporting	6.84	0.00
III	Commission agent/ Wholesalers	Market/making /Breaking bulk	0	0.00
IV	Retailers	Retailing	21.34	30.20
V	Marketing cost		30.37	17.56
	Consumer price		1260.00 (100.00)	1016.00 (100.00)

Marketing efficiency

The marketing efficiency of tomato was calculated using different methods. Acharya's modified measure of marketing efficiency was 0.71 and 1.09 in channel I and II, respectively (table 36). It was higher in channel II as price received by farmers was higher and both marketing cost and marketing margin were lower than channel I. Though marketing efficiency in channel II was higher but its market share in total quantum of tomato sold was lower as farmers could sell their produce during evening time in channel I while in channel II produce was usually sold during early morning to 11 a.m. Hence, after harvesting of crop farmers were not much interested in keeping the produce at home or field during night time and preferred to dispose it off through channel I during evening time. Thus, despite having higher marketing

efficiency in channel II, channel I had more share in quantity of tomato brought for sale in the market.

Table 36: Measurement of Marketing Efficiency of Tomato

S. No.	Particulars	Unit	Channel I	Channel II
1	Retailer's sale price (RP)	Rs/q	1260.00	1016.00
2	Total marketing costs (MC)	Rs/q	382.62	178.41
3	Total margins of intermediaries (MM)	Rs/q	355.06	306.88
4	Price received by farmer (FP)	Rs/q	522.32	530.71
5	Value added by the marketing system (1-4)	Rs/q	737.68	485.29
	Conventional method (E) (5 / 2)	Ratio	1.93	2.72
	Shephered's method (ME) (1 / 2)	Ratio	3.29	5.69
	Acharya's method (MME) [4 / (2+3)]	Ratio	0.71	1.09

Constraints in tomato production and marketing

Tomato crop after harvesting cannot be kept for more days and it has to be disposed at the earliest to maintain its quality and fetch better price in the market. All the constraints perceived by the farmers were analyzed and ranked following Garret ranking technique and shown in table 37. The most important constraint was about price of the produce as farmer was not sure that at what price his produce will be sold on a particular day. The demand of tomato in different cities and competition with produce of other regions also played major role in deciding the price. Another major constraint was that auctioning system was not followed at the regulated market

yard and traders had a cartel and offered lower prices to farmers. Farmers after taking produce to market yard can't take it back and he has to dispose it off even at lower prices. During peak season market yard at Chomu had no sufficient space for keeping farmers produce and they had to keep it outside the market yard which caused inconvenience to farmers. Farmers face lot of problems in procuring quality seed material at affordable rates. The problem of poor quality seed is common and farmers felt cheated after sowing of seed.

Table 37: Constraints perceived by farmers in tomato production and marketing

Sr. No.	Constraint	Score	Garret Ranking
1.	Farmer is not sure about price he will get	96.27	1
2.	Traders make a cartel in mandi and offer less price	92.33	2
3.	Avoidance of auction system by traders	89.43	3
4.	Estimating whole produce weight based on one box weight	86.57	4
5.	Lack of market space to keep produce specially during main season	85.20	5
6.	Encroachment on farmers platform by traders	83.23	6
7.	Problem in getting quality seed material	81.78	7
8.	High cost of labour due to NAREGA	80.22	8

Factors affecting marketing efficiency of tomato

The findings of multiple linear regression model is presented in table 38 that shows negative and significant relationship between marketing efficiency and marketing cost and marketing margin. The relationship of all other factors with marketing efficiency was not significant. The volume of produce handled and open market prices had positive relationship with efficiency showing benefit to farmers during rising prices in the market but these factors relationship with efficiency was not significant that shows that it was always not a case that with rise in open market price, procurement price may also increase. Though increasing numbers of market intermediaries had negative relationship with marketing efficiency but this factor was also not found significant.

Table 38: Factors affecting Marketing Efficiency of Tomato

S. No.	Factors	Coefficient	't' value
1	Constant	1.914389***	11.52208
2	Marketing cost (x1)	-0.00159***	-3.0663
3	Marketing margin (x2)	-0.0017***	-2.92864
4	Open market prices (x3)	0.000003^{NS}	0.063176
5	Volume of the produce handled (x4)	0.000002^{NS}	0.044185
6	Length of the market channel (No. of market intermediaries) (x5)	-0.00193^{NS}	-0.49432
7	R2	0.6844	
8	Adjusted R 2	0.6705	
9	No. of observation (N)	120	

Note : ***, **, * indicate significance at 1 %, 5 % and 10% level, respectively

4. Strategies for increasing marketing efficiency of fruits & vegetables

Strategies to enhance marketing efficiency of fruits and vegetables vary according to nature of produce and kind of marketing facilities in a particular region. Discussions were held with farmers, contractors, wholesalers, processors and retailers to get the idea about improvement in marketing system so that efficiency of the whole marketing system is improved and farmers get adequate returns from this enterprise to remain in horticulture crops farming. Regarding fruits both kinnow and aonla are important fruit crops of Rajasthan. More than 50 percent produce of both fruits are transported outside state for further processing or for direct consumption. There is not a single fruit processing industry for kinnow in the production region. So to enhance marketing efficiency following suggestions & strategies came out after discussion with different stakeholders' and these can be followed by concerned agencies to enhance efficiency of both fruits & vegetables in Rajasthan.

- Establishment of Multi-fruit processing units in production area
- Development of kinnow and aonla mandi with all the required facilities for outside traders at Ganganagar and Chomu, respectively
- Export promotion of kinnow by government so that farmers get better price
- Increase in number of grading/ waxing plants for timely disposal of kinnow fruits
- Modern agricultural implements used in kinnow/ aonla cultivation may be provided on subsidized rates
- Market fee should not be charged from farmers in states like Maharashtra, Karnataka, Tamilnadu etc. and it should be from buyers like in Rajasthan
- Sriganganagar should be declared as kinnow growing hub with better technical and marketing facilities from concerned departments
- Subsidy on fencing material is to be provided to farmers to protect crop from attack of blue bull and other wild animals
- Farmers friendly insurance schemes for fruit orchards must be implemented
- Better varieties of kinnow is to be developed to fetch more market price from sale of fruit
- Availability of quality planting and seed material must be ensured
- Assurance of minimum floor price for major fruits and vegetable like cereals

- Encouragement to form cooperatives by small fruit and vegetable growers for easy disposal of produce and better bargain for prices
- Registration of contractors agreements with farmers at regulated market office so that farmers do not suffer with non compliance of it by traders
- Market official must strictly ensure auction of both fruit and vegetables at mandi yard so that farmers get maximum price for their produce
- Use of farmers platform at Chomu market yard must be ensured for producers
- Crop specific cold storage facilities with facility to take loan on that basis are to be developed to avoid distress sale by farmers
- Proper measurement of produce weight must be ensured at mandi yard
- Illegal deductions from farmers produce must be checked
- More space is to be created in Chomu market yard to keep farmers produce properly and to avoid inconvenience to farmers
- Linking of NAREGA work with farmers irrespective of farm size, it will make labour available to farmers at critical time, enhance farm productivity and reduce the financial burden on government

5) References

Acharya, S. S. and N.L. Agarwal (2005). Agricultural marketing in India. Oxford & IBH Publishing Co. (P) Ltd., New Delhi.

Baba S.H., M.H. Wani, S.A. Wani and Yousuf Shahid (2010). Marketed surplus and price spread of vegetables in Kashmir valley. Agril. Econ. Res. Rev., 23 (10): 115-128.

Dhaka and Poonia (2010). Identification of constraints encountered by the farmers in production and marketing of vegetables in Bundi district of Rajasthan. Ind. Jour. Agril. Mktg., 24 (1): 20-25.

Government of Rajasthan (2009) Rajasthan Horticulture Statistics, Directorate of Horticulture, Pant Krishi Bhawan, Jaipur (Various issues)

Kaur, H. and I.P. Singh (2010). Marketing of kinnow in Sri Ganganagar district of Rajasthan state. Ind. Jour. Agril. Mktg., 24 (1): 141-149.

Saraswat S.P., Prem Singh Dahia, and Pratap Singh (2006). Production and marketing of peach fruit: A case study of Rajgarh area of district Sirmour in Himachal Ptradesh. Ind. Jour. Agril. Mktg., 20 (2): 81-91.

Tripathi, A.K., Subhasis Mandal, K.K. Datta and M. R. Verma (2006). A study on marketing of ginger in RI – BHOI district of Meghalaya. Ind. Jour. Agril. Mktg., 20 (2): 106-116.

Singh, Ram, D.K. Bishnoi and Abhey Singh (2010). Cost benefit analysis and marketing of mushroom in Haryana. Agril. Econ. Res. Rev., 23 (10): 115-128.

Data sites for NCAP study

Fruit/ Vegetable	District	Tehsils	Hamlets/ Villages
Kinnow	Sriganganagar	Sriganganagar	CHAK 9 Q, CHAK 10 Q, CHAK 11 Q, CHAK 10 F, CHAK 8 H (BARA), CHAK 1 H (BARA) MADERAN,Bakhtana, Sangatpura, Mirjawala, Santpur, FATUI, 12 EE, 1 G (BARI), 6 ZA, 1Z1, 4 Z, Chak 3 H (BARA), 8 HH, 5 ML, Netawala
		Karanpur	CHAK 16H, CHAK 17 H, CHAK 18 H, CHAK 19 H, CHAK 24 H, CHAK 26 H, CHAK 31 H, CHAK 2 U, CHAK 23 F, CHAK 2 W, CHAK 3 "O", CHAK 5 "U", CHAK 5 "O",CHAK 2 T JODHAWALA, CHAK 3 W, CHAK 2

			M, CHAK 35 F, CHAK 5 Z, DALPATSINGHPUR, CHAK 2 M FUSAWALA, CHAK 5 Z
Carrot	Sriganganagar	Sriganganagar	Sadhuwali, Chak 2 D CHHOTI, Chak 3 D CHHOTI, Chak 4 D CHHoTI, Kaluwala 1 ML, 6 LNP, Kundalawala
Aonla	Jaipur	Chomu	Hathnoda, Morija
		Aamer	Achrol, Tala, Tola
Tomato	Jaipur	Chomu	Cheetwari, Hathnoda, Harota, Morija
		Aamer	Isarwala, Pokhiriyawala

Estimating Efficiency of Horticultural Commodities under Different Supply Chains in Punjab

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1. Introduction

1.1 Background

The declining farm incomes, almost stagnant foodgrains productivity and growing demand for fruits and vegetables due to increase in per capita income and changes in consumption pattern calls for increase in the production of high value crops such as fruits, vegetables, etc in the Punjab state. These crops not only enhance income of the cultivators but also generate more employment through diversified farming. These are more beneficial for the marginal and small farmers whose family labour availability per unit of land is high. Due to their small size of operational holdings, it will not be possible to improve income of these households merely by raising the yield of food and non-food crops. Therefore, the poverty as well as the nutritional insecurity of large number of farm holdings can be reduced with the introduction of high value crops on these holdings. The vegetable production is one of the potential alternatives due to short cultivation period, small investments (unlike fruits) and their growing demand. Besides, in several cases, the diversification of crops is need of the hour to restore the degraded natural resource base of the state caused by monoculture of cereal crops.

The most important factor determining the pattern, if not the pace, of diversification is the market. There are a number of studies in India and other developing countries, which suggest high elasticity of demand of the high value crops (HVC_s) in response to income and prices. The price response however, is one aspect of the impact of the market on the cropping pattern. Equally important is the marketing efficiency. The profitability of the crop/enterprise is the guiding force for resource allocation decisions of the farmers, which apart from production efficiency, depends upon the prices received by the producers in terms of consumer rupee. Empirical studies have shown that a large number of the intermediaries are involved in the movement of the horticultural produce from producer to consumer, who appropriate a large proportion of the consumer price and the share of producer becomes very low. In case of perishables, the storage of which is very difficult, the share of the producer is in the range of 30 to 60 per cent and the market efficiency is low. However, in recent years, many new supply chains involving large sized agri retail/ companies, contract farming system, producer groups, etc. are emerging, which are considered to be better marketing models giving higher prices to the producers and better marketing efficiency through vertical integration/coordination of the

market. Therefore, it becomes imperative that such marketing/supply chain models are studied and then contrasted with the prevailing traditional market models in order to measure the efficiency of different supply chains in term of better prices to the producers as well as consumers. Therefore, the present study focuses on these issues and tries to highlight the marketing efficiency of different supply chain systems in case of vegetables in the Punjab state.

1.2 The specific objectives of the study were:

i) to estimate the marketing cost and marketing margin of different functionaries for the selected horticultural commodities under various supply chains;

ii) to analyze the price spread, marketing efficiency and farmer's share in consumer's rupee in various supply chains;

iii) to identify the constraints perceived by the various stakeholders and study the factors influencing the marketing cost, margins and efficiency; and

iv) to suggest suitable strategies to enhance the marketing efficiency for the horticultural commodities.

2) Data and Methodology

The study has been conducted in Punjab. Five important vegetables are studied in the study. These are potato, tomato, green peas, brinjal and okra. Only those districts were purposively selected for the study where there was considerable area under particular vegetable crop. Keeping this in view, Jalandhar district was selected for potato, Kapurthala for tomato, Hoshiarpur for green peas, and Jalandhar for brinjal and okra. The convenience sampling technique was used for selection of different types of respondents in the study. For each vegetable, the sample consisted of 120 farmers except 93 farmers for brinjal (Table 2). Further, for each vegetable, 30 wholesalers, 30 retailers and 30 farmers from Apni Mandi were selected.

Table 1 : Sample size of different types of respondents

Sr. No.	Name of the crop	Particulars	No. of respondents
A.	**Potato**		
i.		Farmers	120
ii.		Wholesalers	30
iii.		Retailers	30
iv.		Farmers from Apni Mandi	30
B.	**Tomato**		
i.		Farmers	120
ii.		Wholesalers	30
iii.		Retailers	30
iv.		Farmers from Apni Mandi	30
C.	**Green peas**		

i.		Farmers	120
ii.		Wholesalers	30
iii.		Retailers	30
iv.		Farmers from Apni Mandi	30
D.	**Brinjal**		
i.		Farmers	93
ii.		Wholesalers	30
iii.		Retailers	30
iv.		Farmers from Apni Mandi	30
E.	**Okra**		
i.		Farmers	120
ii.		Wholesalers	30
iii.		Retailers	30
iv.		Farmers from Apni Mandi	30
F.	**Total sample size**		
i.		Farmers	573
ii.		Wholesalers	150
iii.		Retailers	150
iv.		Farmers from Apni Mandi	150
	Grand total		1023

Thus, the total sample consisted of 573 farmers, 150 wholesalers, 150 retailers and 150 farmers from Apni Mandi. For the present study, the total number of all types of respondents was 1023.

The information was collected from the selected farmers about their socio-economic profile, area and production of each vegetable crop, consumption of each vegetable crop at home and quantity kept for seed purpose, payment in kind to labour, miscellaneous use and marketed surplus of each vegetable. The data were also collected from the farmers about their expenses on human and machine labour, seed and seed treatment, fertilizer and farm yard manure, insecticides, pesticides and herbicides, irrigation, miscellaneous expenses, etc. The data were also collected about yield, price, volume of main product and by-product, gross returns and returns over variable cost. For rabi season, the return over variable cost of potato and green peas have been compared with wheat (the principal rabi crop). Similarly, for the Kharif season, the returns over variable costs of tomato, brinjal and okra have been compared with paddy (the principal kharif crop).

The data were collected from the selected farmers, wholesalers, and retailers about their costs of marketing of different vegetables. The net price received by farmers for each vegetable has been worked out. The margin of market intermediaries have also been worked out. The price spread was worked out by using the 'Mode Method'. The marketing efficiency was worked out by using the Acharya's Modified Method. Cobb-Douglas type production function was applied to study the factors affecting marketing efficiency of vegetables. Both linear and log-linear production functions were fitted. Best fit function was determined on the basis of the level of significance of the explanatory variables, the value of coefficient of multiple determination (R^2) and the logical signs of the explanatory variables included in the model. Cobb-Douglas function of the following form was considered the most appropriate for the present investigation:

$$Y = A \prod_{i=1}^{n} X_i^{b_i} e^{u}$$

Where, Y represents the marketing efficiency of the channels under different vegetable crops under study. X_i the selected explanatory variables; A, the technical efficiency parameter and b_i the coefficient of production elasticity of the respective variable X_i at the mean level of input used and output obtained. the 'e' is an error term. The estimated form of the equation becomes:

$$\text{Log } Y = \text{Log } A + \sum_{i=1}^{n} b_i \log x_i + u$$

$$\text{Log } Y = \text{Log } A + b_1 \log x_1 + b_2 \log x_2 + \ldots\ldots\ldots\ldots + b_6 \log x_6 + u$$

Where,

Y = Marketing Efficiency (%)

X_1 = Marketing Cost (Rs.)

X_2 = Transport Charges (Rs.)

X_3 = Labour Charges (Rs.)

X_4 = Marketing Margin (Rs.)

X_5 = Volume of the produce handled (Kg.)

X_6 = Net price received by producer (Rs.)

The ranking of various types of production and marketing constraints as perceived by the selected farmers and wholesalers was done according to the Garrett's technique given as under:

$$\text{Percent position} = 100(Rij - 0.50) / Nij$$

Where, R_{ij} is the rank given to ith item by jth individual

N_{ij} is the number of items ranked by jth individual

The percent position of each rank is converted into scores by referring tables given by Garrett and Woodworth (1969). Then for each factor, the scores of individual respondents are added together and divided by the number of respondents for whom scores are added. The mean scores for all the factors are ranked by arranging in descending order.

2.1 Scenario of area under vegetables

The information regarding the district wise area under vegetable and total cropped area in Punjab for the year 2007-08 is shown in Table 3. The total area under vegetables was 2.20 per cent of the total cropped area. Among different vegetable crops, potato was the dominant one having one per cent share in the cropped area. The share of tomato, green peas, brinjal and okra was 0.11 per cent, 0.23 per cent, 0.04 per cent and 0.03 per cent respectively. The major reason for more area under potato was its semi-perishable nature as compared to other vegetables which are perishable. Besides, the cold storage facilities are available for potatoes in the state. It may be

Table 2: District-wise area under vegetables vis-à-vis total cropped area in Punjab, 2007-08.

(000 hect)

Sr. No.	District	Potato	Tomato	Green peas	Brinjal	Okra	Total area under vegetables	Total cropped area
1	Gurdaspur	0.91 (0.18)	0.33 (0.07)	0.29 (0.06)	0.11 (0.02)	0.06 (0.01)	3.92 (0.78)	504
2	Amritsar	4.64 (1.09)	0.80 (0.19)	4.91 (1.16)	0.36 (0.08)	0.18 (0.04)	14.97 (3.53)	424
3	Tarn Taran	0.72 (0.18)	0.88 (0.22)	0.95 (0.24)	0.11 (0.03)	0.08 (0.02)	8.52 (2.16)	395
4	Kapurthala	5.73 (2.09)	1.90 (0.69)	0.43 (0.16)	0.32 (0.12)	0.13 (0.05)	12.98 (4.74)	274
5	Jalandhar	19.74	0.86	1.32	0.39	0.44	32.95	422

		(4.68)	(0.20)	(0.31)	(0.09)	(0.10)	(7.81)	
6	S.B.S. Nagar	2.08 (1.16)	0.68 (0.38)	2.33 (1.30)	0.19 (0.11)	0.21 (0.12)	9.65 (5.39)	179
7	Hoshiarpur	16.08 (4.53)	0.18 (0.05)	5.31 (1.50)	0.10 (0.03)	0.05 (0.01)	23.94 (6.74)	355
8	Roop Nagar	0.88 (0.63)	0.12 (0.09)	0.06 (0.04)	0.07 (0.05)	0.10 (0.07)	2.87 (2.05)	140
9	S.A.S. Nagar	1.32 (1.11)	0.22 (0.18)	0.10 (0.08)	0.29 (0.24)	0.08 (0.07)	5.77 (4.85)	119
10	Ludhiana	7.16 (1.20)	0.33 (0.06)	0.29 (0.05)	0.17 (0.03)	0.12 (0.02)	11.27 (1.89)	595
11	Firozpur	0.83 (0.09)	0.24 (0.03)	0.14 (0.02)	0.12 (0.01)	0.11 (0.01)	4.24 (0.48)	875
12	Faridkot	0.27 (0.11)	0.04 (0.02)	0.01 (neg)	0.05 (0.02)	0.01 (neg)	0.98 (0.38)	255
13	Muktsar	0.17 (0.04)	0.02 (neg)	0.09 (0.02)	0.01 (neg)	0.01 (neg)	0.46 (0.10)	445
14	Moga	6.17 (1.63)	0.02 (0.01)	0.03 (0.01)	0.03 (0.01)	0.01 (neg)	7.25 (1.91)	379
15	Bathinda	3.27	0.13	0.06	0.03	0.03	5.06	555

		(0.59)	(0.02)	(0.01)	(0.01)	(0.01)	(0.91)	
16	Mansa	0.17 (0.05)	0.03 (0.01)	0.05 (0.01)	0.02 (0.01)	0.01 (neg)	1.58 (0.43)	366
17	Sangrur	0.60 (0.10)	0.19 (0.03)	0.30 (0.05)	0.21 (0.03)	0.33 (0.05)	5.81 (0.94)	617
18	Barnala	1.59 (0.65)	0.06 (0.02)	0.07 (0.03)	0.03 (0.01)	0.05 (0.02)	2.22 (0.91)	243
19	Patiala	4.88 (0.91)	0.96 (0.18)	1.50 (0.28)	0.34 (0.06)	0.23 (0.04)	14.03 (2.62)	535
20	Fatehgarh Sahib	1.80 (0.94)	0.46 (0.24)	0.21 (0.11)	0.08 (0.04)	0.05 (0.03)	4.87 (2.54)	192
	Total	79.01 (1.00)	8.45 (0.11)	18.45 (0.23)	3.03 (0.04)	2.29 (0.03)	173.34 (2.20)	7869

Note : i) neg means neglibible

ii) Figures in parentheses indicate percentages to total cropped area

stated that there are 491 cold stores with storage capacity of 16.20 lakh tonnes in the state. Most of this cold storage capacity is utilized for potato only.

The district wise data about area under vegetables indicated that Jalandhar, Hoshiarpur, S.B.S. Nagar, Kapurthala and SAS Nagar were the major vegetable producing districts during the year 2007-08. About eight per cent of the total cropped area of Jalandhar district was under vegetables. The figure was 6.74 per cent for Hoshiarpur, 5.39 per cent for S.B.S. Nagar, 4.85 per cent for S.A.S. Nagar and 4.74 per cent for the Kapurthala. In all the districts, potato was the main vegetable crop. The area under other vegetables was less on account of perishable nature,

price fluctuations, no market intervention by the State and Union Governments and lack of minimum support price (MSP). On the other hand, the effective public procurement of wheat and paddy is there at the MSP. Therefore, these two crops taken together occupy about 79 per cent of the total cropped area of the state.

2.2 Marketed surplus of vegetables

The information regarding per holding production, consumption and marketed surplus of vegetable is given in Table 12 and graphic presentation is shown in Figure 1. The per holding production of potato, tomato, green peas, brinjal and okra was about 2328, 953, 106, 349 and 134 quintals respectively. The total consumption of these vegetables was about 15 per cent, 0.55 per cent, three per cent, three per cent and one per cent respectively. The consumption of potato was high due to its more quantity kept for seed purpose. This was not so in case of other vegetables. The marketed surplus was the maximum (99.45 per cent) for the tomato followed by okra (98.96 per cent), green peas (97.46 per cent), brinjal (97.32 per cent) and potato (84.67 per cent). As already discussed, due to high seed rate of potato, its marketed surplus was low on the selected farmers.

Table 3: Per holding marketed surplus of different vegetables of the selected farmers

(Qtls)

Sr. No.	Particulars	Name of the vegetable				
		Potato	**Tomato**	**Green peas**	**Brinjal**	**Okra**
i.	Area (acres)	23.11	9.98	4.42	5.41	4.15
ii.	Production	2327.96	952.91	105.96	349.41	134.05
iii.	Family consumption	3.97 (0.17)	0.63 (0.07)	0.28 (0.26)	0.51 (0.15)	0.46 (0.34)
iv.	Quantity kept for seed	339.44 (14.58)	-	0.22 (0.21)	-	-
v.	Payment in kind to labour	7.21 (0.31)	3.15 (0.33)	1.80 (1.70)	6.61 (1.89)	0.83 (0.62)
vi.	Miscellaneous uses	6.36 (0.27)	1.46 (0.15)	0.39 (0.37)	2.25 (0.64)	0.10 (0.07)
vii.	Total consumption (iii to vi)	356.98 (15.33)	5.24 (0.55)	2.69 (2.54)	9.37 (2.68)	1.39 (1.04)
viii.	Marketed surplus (ii- vii)	1970.98 (84.67)	947.67 (99.45)	103.27 (97.46)	340.04 (97.32)	132.66 (98.96)

Note: Figures in parentheses are percentages of production

2.3 Sale pattern

The information regarding the sale pattern of the selected vegetable growers is shown in Table 4.The maximum quantity of different vegetables was sold by the growers in the wholesale market. The sale in this market varied from about 83 per cent for potato to about 92 per cent in case of tomato. The sale at the

Table 4: Sale pattern of vegetables of the selected growers

(qtls)

Sr.No.	Particulars/crop	Potato	Tomato	Green peas	Brinjal	Okra
i)	Sale at the farm	149.72 (7.60)	36.25 (3.83)	6.50 (6.29)	16.75 (4.92)	8.85 (6.67)
ii)	Sale in the village	28.50 (1.45)	26.75 (2.82)	2.45 (2.37)	8.80 (2.59)	5.15 (3.88)
iii)	Sale in the wholesale market	1643.81 (83.40)	872.17 (92.03)	92.06 (89.15)	301.60 (88.69)	113.57 (85.61)
iv)	Sale in the distant market (Delhi)	101.70 (5.15)	-	-	-	-
v)	Sale in the Apni Mandi	47.25 (2.40)	12.50 (1.32)	2.26 (2.19)	12.89 (3.80)	5.09 (3.84)
	Per holding marketed surplus	1970.98 (100.00)	947.67 (100.00)	103.27 100.00	340.04 (100.00)	132.66 (100.00)

Note: Figures in the parentheses indicate percentages to the marketed surplus.

farm was maximum (about 8 per cent) for potato followed by okra (about 7 per cent), green peas (about 6 per cent), brinjal (about 5 per cent) and tomato (about 4 per cent). The vegetable retailers operating in the rural areas were the main buyers of the vegetables from the farm. About one per cent to four per cent vegetables were sold by the growers in the village to the petty shopkeepers and non-vegetable growing rural households (farm and non-farm). Except potato, no sale was done in the distant market by the growers. Even in case of potato, this figure was meagre (about 5per cent). Since vegetables are perishable in nature, its transportation to the distant markets is a major constraint. Potato comes under separate category being semi-perishable in nature. The selected growers sold very limited quantity of vegetables in the Apni Mandi. The sale there varied from about one per cent for potato to about four per cent each in case of brinjal and okra. The growers had to stay for long hours for sale of vegetables in the Apni Mandi. There were other constraints too. Therefore, majority of the growers preferred to sell vegetables in the wholesale market.

Price spread of potato

Price spread is defined as the difference between the price paid by the consumer and price received by the producer of the farm product. It includes market cost and margins of the market intermediaries also. As already discussed, potato is the most important vegetable in Punjab. The price spread though three main supply chains of potato have been worked out in the study. The supply chain I (Producer-wholesaler (through commission agent)-retailer-consumer) has been discussed in Table 14 and graphic presentation is shown in Figure 2. A perusal of the table reveals that producer's sale price of potato was Rs 500 per qtl in Jalandhar market which was about 67 per cent of the consumer's purchase price. The expenses borne by the producer were Rs 66 per qtl which were about 9 per cent of the consumer's purchase price. The net price received by the producer was Rs 434 per qtl which was about 58 per cent of the consumer's price. The expenses borne by the wholesaler and retailer were about Rs 58 and Rs 52 per qtl respectively which were about 8 and 7 per cent of the consumer's price (Rs 750 per qtl). The margin of the wholesaler was about 6 per cent whereas this figure was about 13 per cent in case of retailer. The margin of the wholesaler was less on account of high volume of business as compared to the retailer who handles low volume of business.

The price spread of potato in supply chain II (Producer-retailer (through commission agent)-consumer) has been presented in Table 15 and graphic presentation is shown in Figure 3. The producer's sale price of potato was Rs 520 per qtl in Jalandhar market which about 69 per cent of the consumer's purchase price

Table 5: Price spread of potato in Jalandhar market, January 2009

(Supply chain I: Producer-wholesaler (through commission agent)-Retailer-consumer)

Sr. No.	Particulars	Rs per qtl	%age share in consumer's price
1.	**Producer's sale price/ wholesaler's purchase price**	**500.00**	**66.67**
2.	Expenses borne by the producer	65.78	8.77
i.	Grading, filling, stitching etc.	13.92	1.86
ii.	Cost of packing	29.93	3.99
iii.	Transportation cost	12.31	1.64
iv.	Loading, unloading and wastage	9.62	1.28
3.	Net price received by the farmer	434.22	57.90
4.	Expenses borne by the wholesaler	58.09	7.74
i.	Market fee @ 2 %	10.00	1.33
ii.	RDF @ 2%	10.00	1.33
iii.	Commission @ 5 %	25.00	3.33

iv.	Miscellaneous expenses	13.09	1.75
5.	Margin of the wholesaler	41.91	5.59
6.	**Wholesaler's sale price/ retailer's purchase price**	**600.00**	**80.00**
7.	Expenses borne by the retailer	51.59	6.88
i.	Transportation cost	10.25	1.37
ii.	Labour	2.70	0.36
iii.	Rent of shop/*rehri*	1.92	0.26
iv.	Packing cost	14.22	1.89
v.	Loss, wastage and spoilage @ 2.50%	15.00	2.00
vi.	Miscellaneous cost	7.50	1.00
8.	Margin of the retailer	98.41	13.12
9.	**Retailer's sale price/ consumer's purchase price**	**750.00**	**100.00**

(Rs 750 per qtl). The expenses borne by the producer were Rs 66 per qtl which were about nine per cent of the consumer's purchase price. The net price received by the producer was about Rs 454 per qtl which was 61 per cent of the consumer's price. The expenses borne by the retailer were about Rs 111 per qtl which were 15 per cent of the consumer's price. The retailer's margin was Rs 119 per qtl which in percentage terms was about 16 of the consumer's purchase price. The margin of the retailer was high in supply chain II as compared to the supply chain I because the wholesaler was not there in the latter.

Table 6: Price spread of potato in Jalandhar market, January 2009

(Supply chain II: Producer-retailer (through commission agent)-consumer)

Sr. No.	Particulars	Rs per qtl	%age share in consumer's price
1.	**Producer's sale price/ retailer's purchase price**	**520.00**	69.33
2.	Expenses borne by the producer	65.78	8.77
i.	Grading, filling, stitching etc.	13.92	1.86
ii.	Cost of packing	29.93	3.99
iii.	Transportation cost	12.31	1.64
iv.	Loading, unloading and wastage	9.62	1.28
3.	**Net price received by the farmer**	**454.22**	**60.56**
4.	Expenses borne by the retailer	111.27	14.84
i.	Market fee @ 2 %	10.40	1.39
ii.	RDF @ 2%	10.40	1.39
iii.	Commission @ 5 %	26.00	3.46
iv.	Miscellaneous expenses	16.85	2.25
v.	Transportation cost	10.25	1.37
vi.	Rent of shop/*rehri*	2.02	0.27
vii.	Labour	8.10	1.08
viii.	Loss, wastage and spoilage @	13.00	1.73

	2.50%		
ix.	Packing cost	14.25	1.90
5.	Margin of the retailer	118.73	15.83
6.	**Retailer's sale price/ consumer's purchase price**	**750.00**	**100.00**

The price spread of the potato in Apni Mandi of Jalandhar market has been worked out in Table 7 and graphic presentation is shown in Figure 4. It may be stated that there is no middleman involved in the sale of farm produce in the Apni Mandi. There is direct sale of the produce by the producer to consumer. This scheme was introduced in major cities/towns of Punjab at the initiative of the then Financial Commissioner (Development), Punjab, Mr Manohar Singh Gill, IAS in February, 1987. The major objective of this scheme was to increase producer's share in the consumer's purchase price particularly for perishable commodities like vegetables. Another aim was to supply fresh vegetable to the consumers at low price in comparison to the prevailing market price through traditional supply chains.

A perusal of Table 7 reveals that producer's sale price/consumer's purchase price was Rs 700 per qtl in Apni Mandi of Jalandhar market. The expenses borne by the producer were Rs 52 per qtl which were 7.45 per cent of the consumer's price. The net price received by the producer was 93 per cent of the consumer's price. As compared to the supply chain I and II, the producer's share in supply chain III was more on account of direct sale by the producer to the consumer. But this is also a fact that major share of the vegetables can not be sold through Apni Mandi because the traditional wholesalers and retailers have their own role in vegetable marketing. It is a part of the Indian culture that traditional vegetable hawkers supply various vegetables at the doorsteps of the consumers in various localities of cities and towns.

Table 7: Price spread of potato in Apni Mandi of Jalandhar market, January 2009

(Supply chain III: Producer-consumer)

Sr. No.	Particulars	Rs per qtl	%age share in consumer's price
1.	**Producer's sale price**	**700.00**	**100.00**
2.	Expenses borne by the Producer	52.17	7.45
i.	Grading, filling, stitching etc.	13.92	1.99
ii.	Cost of packing	3.00	0.43
iii.	Transportation cost	11.00	1.57
iv.	Loading and wastage	5.00	0.71
iv.	Packing cost (carry bags)	14.25	2.04
ix.	Miscellaneous expenses	5.00	0.71
3.	Net price received by producer	647.83	92.55
4.	**Consumer's purchase price**	**700.00**	**100.00**

Marketing efficiency of potato

The marketing efficiency of potato under different supply chains has been worked out by Acharya's Modified Method and it is shown in Table 8. A perusal of the table reveals that supply chain III was the most efficient one because marketing efficiency was 12.42 in this chain as compared to 1.97 in supply chain II and 1.74 in supply chain I. The low marketing efficiency in supply chain I was on account of more number of market intermediaries in this chain.

Table 8: Marketing efficiency of potato under different channels

(Rs/qtl)

Sr. No.	Particulars	Supply chain I	Supply chain II	Supply chain III
i.	Consumer's purchase price	750.00	750.00	700.00
ii.	Producer's sale price	500.00	520.00	700.00
iii.	Total marketing costs	109.69	111.27	52.17
iv.	Total margins of intermediaries	140.31	118.73	-
v.	Net price received by farmer	434.22	454.22	647.83
	Marketing efficiency	**1.74**	**1.97**	**12.42**

Price spread of tomato

The price spread of tomato in Kapurthala market in supply chain I (Producer-wholesaler (through commission agent)-retailer-consumer) has been worked out in Table 18 and graphic presentation is shown in Figure 5. The producer's sale price of tomato was Rs 600 per qtl which was only 50 per cent of the consumer's purchase price (Rs 1200 per qtl). The expenses borne by the producer were Rs 46.40 per qtl which were about four per cent of the consumer's price. The net price received by the producer was about Rs 554 per qtl which in percentage terms was about 46 per cent of the consumer's purchase price. The expenses borne by the wholesalers and retailers were Rs 68 and Rs 84 per qtl respectively. These respective expenses were about six and seven per cent of the consumer's purchase price. The margin of the wholesaler and retailer in absolute terms was Rs 132 and Rs 316 per qtl respectively which in percentage terms was 11 per cent and 26 per cent of the purchase price of consumer.

Table9: Price Spread of tomato in Kapurthala market, June 2009

(Supply chain I: Producer-wholesaler (through commission agent)-retailer-consumer)

Sr. No.	Particulars	Rs per qtl	%age share in consumer's price
1.	**Producer's sale price/ wholesaler's purchase price**	**600.00**	**50.00**
2.	Expenses borne by the producer	46.40	3.87
i.	Grading, filling, stitching etc.	7.50	0.63
ii.	Cost of packing	9.34	0.78
iii.	Transportation cost	20.34	1.69
iv.	Loading, unloading and wastage	9.22	0.77
3.	Net price received by the farmer	553.60	46.13
4.	Expenses borne by the wholesaler	67.95	5.66
i.	Market fee @ 2 %	12.00	1.00
ii.	RDF @ 2%	12.00	1.00
iii.	Commission @ 5 %	30.00	2.50
iv.	Miscellaneous expenses	13.95	1.16
5.	Margin of the wholesaler	132.05	11.00
6.	**Wholesaler's sale price/ retailer's purchase price**	**800.00**	**66.67**

7.	Expenses borne by the retailer	83.74	6.98
i.	Transportation cost	13.88	1.17
ii.	Labour	2.72	0.23
iii.	Rent of shop/*rehri*	0.43	0.03
iv.	Packing cost	17.34	1.44
v.	Loss, wastage and spoilage @ 5%	40.00	3.33
vi.	Miscellaneous cost	9.37	0.78
8.	Margin of the retailer	316.26	26.36
9.	**Retailer's sale price/ consumer's purchase price**	**1200.00**	**100.00**

As in case of potato, the margin of wholesaler was low in comparison to the retailer for tomato also on account of high volume of business of the wholesaler. The retailer's volume of business was low, therefore, he kept high margin for himself on per unit sale of tomato.

The producer's sale price was Rs 625 per qtl in supply chain II (Producer-retailer-(through commission agent)-consumer) in Kapurthala market (Table 10) and the graphic presentation is shown in Figure 6. The share of the producer's sale price was 52 per cent in the consumer's purchase price (Rs 1200 per qtl). The producer's expenses were Rs 46 per qtl which were about four per cent of the consumer's price. The expenses borne by the retailer were Rs 146 per qtl which were about 12 per cent of the consumer's purchase price. The margin of the retailer was Rs 429 per qtl which was 36 per cent of the consumer's price. The retailer's sale price was the same i.e. Rs 1200 per qtl in both the supply chain I and II. The retailer's margin was comparatively less in supply chain I as compared to supply chain II.

Table10: Price Spread of tomato in Kapurthala market, June 2009

(Supply chain II: Producer-retailer-(through commission agent)-consumer)

Sr. No.	Particulars	Rs per qtl	%age share in consumer's price
1.	**Producer's sale price/ retailer's purchase price**	**625.00**	**52.07**
2.	Expenses borne by the producer	46.40	3.87
i.	Grading, filling, stitching etc.	7.50	0.63
ii.	Cost of packing	9.34	0.78
iii.	Transportation cost	20.34	1.69
iv.	Loading, unloading and wastage	9.22	0.77
3.	**Net price received by the farmer**	**578.60**	**48.20**
4.	Expenses borne by the retailer	146.48	12.21
i.	Market fee @ 2 %	12.50	1.04
ii.	RDF @ 2%	12.50	1.04
iii.	Commission @ 5 %	31.25	2.60
iv.	Miscellaneous expenses	12.66	1.06
v.	Transportation cost	13.88	1.16
vi.	Rent of shop/*rehri*	8.14	0.68
vii.	Labour	2.21	0.19

viii.	Loss, wastage and spoilage @ 5%	31.25	2.60
ix.	Packing cost	22.09	1.84
5.	Margin of the retailer	428.52	35.72
6.	**Retailer's sale price/ consumer's purchase price**	**1200.00**	**100.00**

The price spread of tomato in Apni Mandi of Kapurthala market in supply chain III (Producer-consumer) has been worked out in Table 11 and graphic presentation is shown in Figure 7. The producer's sale price of tomato was Rs 1100 per qtl. He had to bear expenses to the extent of Rs 76 per qtl. These expenses were about seven per cent of the consumer's purchase price (Rs 1100 per qtl). The net price received by the producer was Rs 1024 per qtl which was 93 per cent of the consumer's purchase price. As already discussed in case of potato, the producer's share was the maximum in supply chain III because no market intermediary was involved.

Table 11: Price Spread of tomato in Apni Mandi of Kapurthala market, June 2009

(Supply chain III: Producer-consumer)

Sr. No.	Particulars	Rs per qtl	%age share in consumer's price
1.	**Producer's sale price**	**1100.00**	**100.00**
2.	Expenses borne by the producer	76.27	6.93
i.	Grading, filling, stitching etc.	7.50	0.68
ii.	Cost of packing	15.34	1.39
iii.	Transportation cost	13.54	1.23
iv.	Loading and wastage	10.14	0.92
iv.	Packing cost (carry bags)	20.09	1.83
ix.	Miscellaneous expenses	9.66	0.88
3.	Net price received by producer	1023.73	93.07
4.	**Consumer's purchase price**	**1100.00**	**100.00**

Marketing efficiency of Tomato

The marketing efficiency of all the three supply chains of tomato brought out that supply chain III was the most efficient one (Table 12). The marketing efficiency of this supply chain was 13.42 as against 1.01 in supply chain II and 0.92 in supply chain I. The marketing efficiency of supply chain III was high on account of the fact that no middleman was involved and produce was directly sold to consumers. As compared to supply chain I, the marketing efficiency of tomato was marginally high in supply chain II due to less number of intermediaries in the latter.

Table12: Marketing Efficiency of tomato under different channels

(Rs per qtl)

Sr. No.	Particulars	Supply chain I	Supply chain II	Supply chain III
i.	Consumer's purchase price	1200.00	1200.00	1100.00
ii.	Producer's sale price	600.00	625.00	1100.00
iii.	Total marketing costs	151.69	146.48	76.27
iv.	Total margins of intermediaries	448.31	428.52	-
v.	Net price received by farmer	553.60	553.60	1023.73
	Marketing Efficiency	**0.92**	**1.01**	**13.42**

Price spread of the green peas

The price spread of the green peas in Hoshiarpur market in supply chain I (Producer-wholesaler (through commission agent)-retailer-consumer) has been given in Table 13 and graphic presentation is shown in Figure 8. The producer's sale price was Rs 900 per qtl which was 72 per cent of the consumer's purchase price. The expenses borne by the producer were Rs 67 per qtl which were 5.36 per cent of the consumer's price. The net price received by the producer was Rs 833 per qtl. This was about 67 per cent of the consumer's price. The expenses borne by the wholesaler and retailer were Rs 94 and Rs 92 per qtl respectively. These respective expenses were 7.52 per cent and 7.36 per cent of the consumer's purchase price (Rs 1250 per qtl). The margin of the wholesaler was Rs 56 per qtl and that of retailer was Rs 108 per qtl. The wholesaler's and retailer's margins were 4.48 per cent and 8.64 per cent respectively. The retailer's margin was high on account of his low volume of business in comparison to the wholesaler.

Table 13: Price spread of green peas in Hoshiarpur market, January 2009

(Supply chain I: Producer-wholesaler (through commission agent)- retailer-consumer)

Sr. No.	Particulars	Rs per qtl	%age share in consumer's price
1.	**Producer's sale price/ wholesaler's purchase price**	**900.00**	**72.00**
2.	Expenses borne by the producer	66.96	5.36
i.	Grading, filling, stitching etc.	7.05	0.56
ii.	Cost of packing	22.42	1.79
iii.	Transportation cost	16.46	1.33
iv.	Loading, unloading and wastage	21.03	1.68
3.	Net price received by the farmer	833.04	66.64
4.	Expenses borne by the wholesaler	94.00	7.52
i.	Market fee @ 2 %	18.00	1.44
ii.	RDF @ 2%	18.00	1.44
iii.	Commission @ 5 %	45.00	3.60
iv.	Miscellaneous expenses	13.00	1.04
5.	Margin of the wholesaler	56.00	4.48
6.	**Wholesaler's sale price/ retailer's purchase price**	**1050.00**	**84.00**
7.	Expenses borne by the retailer	91.94	7.36

i.	Transportation cost	15.73	1.26
ii.	Labour	2.33	0.19
iii.	Rent of shop/*rehri*	0.91	0.07
iv.	Packing cost	22.09	1.77
v.	Loss, wastage and spoilage @ 3%	31.50	2.52
vi.	Miscellaneous cost	19.38	1.55
8.	Margin of the retailer	108.06	8.64
9.	**Retailer's sale price/ consumer's purchase price**	**1250.00**	**100.00**

The price spread in green peas in Hoshiarpur market in supply chain II (Producer-retailer (through commission agent)-consumer) is given in Table 14 and graphic presentation is shown in Figure 9. The producer's sale price of green peas was Rs 930 per qtl which was 74 per cent of the consumer's purchase price (Rs 1250 per qtl). The expenses incurred by the producer were Rs 67 per qtl which were 5.36 per cent of the consumer's price. The producer received a net price of Rs 863 per qtl, which was 69 per cent of the consumer's purchase price. The expenses borne by the retailer were Rs 176 per qtl which were 14 per cent of the consumer's price. The retailer's margin was Rs 144 per qtl, which was 12 per cent of the consumer's price.

Table 14: Price spread of green peas in Hoshiarpur market, January 2009

(Supply chain II: Producer-retailer (through commission agent)-consumer)

Sr. No.	Particulars	Rs per qtl	%age share in consumer's price
1.	**Producer's sale price/ retailer's purchase price**	**930.00**	**74.40**

2.	Expenses borne by the producer	66.96	5.36
i.	Grading, filling, stitching etc.	7.05	0.56
ii.	Cost of packing	22.42	1.79
iii.	Transportation cost	16.46	1.33
iv.	Loading, unloading and wastage	21.03	1.68
3.	**Net price received by the farmer**	**863.04**	**69.04**
4.	Expenses borne by the retailer	176.10	14.09
i.	Market fee @ 2 %	18.60	1.49
ii.	RDF @ 2%	18.60	1.49
iii.	Commission @ 5 %	46.50	3.72
iv.	Miscellaneous expenses	17.19	1.37
v.	Transportation cost	15.73	1.26
vi.	Rent of shop/*rehri*	1.59	0.13
vii.	Labour	7.90	0.63
viii.	Loss, wastage and spoilage @ 3%	27.90	2.23
ix.	Packing cost	22.09	1.77
5.	Margin of the retailer	143.90	11.51
6.	**Retailer's sale price/ consumer's purchase price**	**1250.00**	**100.00**

The price spread in green peas in Apni Mandi of Hoshiarpur market in supply chain III (Producer-consumer) is depicted in Table 14 and the graphic presentation in Figure 10. The

producer's sale price/consumer's purchase price of green peas was Rs 1100 per qtl. The producer's expenses were Rs 69 per qtl which were 6.32 per cent of the consumer's purchase price. It was seen that producer realised higher price in supply chain III as compared to the supply chain II and I. Similarly, the consumer benefited in supply chain III as his purchase price was lower in comparison to his price in the latter two supply chains. Hence, we can say that producers as well as consumers were the gainers in the Apni Mandi. The sale of vegetables in the Apni Mandi resulted in more income to the producers and monetary savings to the consumers. However, the volume of produce sold by vegetable producers in Apni Mandi was very small of the total production.

Table 15: Price spread of green peas in Apni Mandi of Hoshiarpur market, January 2009 (Supply chain III: Producer-consumer)

Sr. No.	Particulars	Rs per qtl	%age share in consumer's price
1.	**Producer's sale price**	**1100.00**	**100.00**
2.	Expenses borne by the Producer	69.48	6.32
i.	Grading, filling, stitching etc.	7.05	0.64
ii.	Cost of packing	4.50	0.41
iii.	Transportation cost	15.47	1.41
iv.	Loading and wastage	11.03	1.00
iv.	Packing cost (carry bags)	21.05	1.91
ix.	Miscellaneous expenses	10.38	0.94
3.	Net price received by producer	1030.52	93.68
4.	**Consumer's purchase price**	**1100.00**	**100.00**

Marketing efficiency of green peas

Table 16 shows the marketing efficiency of green peas under different supply chains. The supply chain III was the most efficient one because the value of marketing efficiency was 14.83 as against 2.70 in supply chain II and 2.38 in supply chain I. The marketing efficiency in supply chain II was high as compared to supply chain I because the number of intermediaries was less in the former.

Table 16: Marketing efficiency of green peas under different channels

(Rs per qtl)

Sr. No.	Particulars	Supply chain I	Supply chain II	Supply chain III
i.	Consumer's purchase price	1250.00	1250.00	1100.00
ii.	Producer's sale price	900.00	930.00	1100.00
iii.	Total marketing costs	185.40	176.10	69.48
iv.	Total margins of intermediaries	164.06	143.90	-
v.	Net price received by farmer	833.04	863.04	1030.52
	Marketing efficiency	**2.38**	**2.70**	**14.83**

Price spread of brinjal

The price spread of brinjal in Jalandhar market in supply chain I (Producer-wholesaler (through commission agent)-retailer-consumer) is shown in Table 17 and Figure 11. The producer's sale price of brinjal was Rs 650 per qtl which was 65 per cent of the consumer's purchase price which was Rs 1000 per qtl. The marketing expenses of the producer were Rs 64 per qtl which formed 6.40 per cent of the consumer's price. The net price received by the producer was Rs 586 per qtl

which was 59 per cent of the consumer's price. The respective expenses borne by the wholesaler and retailer were Rs 78 and Rs 44 per qtl which were eight and four per cent of the consumer's price. The margin of the wholesaler was 10.16 per cent whereas the margin was 12.65 per cent in case of retailer. As in case of other vegetables, the margin of the retailer was high in case of brinjal too on account of low volume of business in comparison to the wholesaler.

Table 17: Price spread of brinjal in Jalandhar market, July 2009

(Supply chain I: Producer-wholesaler (through commission agent)- retailer-consumer)

Sr. No.	Particulars	Rs per qtl	%age share in consumer's price
1.	**Producer's sale price/ wholesaler's purchase price**	**650.00**	**65.00**
2.	Expenses borne by the producer	64.01	6.40
i.	Grading, filling, stitching etc.	13.43	1.34
ii.	Cost of packing	20.69	2.07
iii.	Transportation cost	23.43	2.34
iv.	Loading, unloading and wastage	6.46	0.65
3.	Net price received by the farmer	585.99	58.60
4.	Expenses borne by the wholesaler	78.39	7.84
i.	Market fee @ 2 %	13.00	1.30
ii.	RDF @ 2%	13.00	1.30
iii.	Commission @ 5 %	32.50	3.25
iv.	Miscellaneous expenses	19.89	1.99

5.	Margin of the wholesaler	101.61	10.16
6.	**Wholesaler's sale price/ retailer's purchase price**	**830.00**	**83.00**
7.	Expenses borne by the retailer	43.54	4.35
i.	Transportation cost	8.27	0.82
ii.	Labour	1.32	0.13
iii.	Rent of shop/*rehri*	0.38	0.04
iv.	Packing cost	10.59	1.06
v.	Loss, wastage and spoilage @ 2 %	16.60	1.66
vi.	Miscellaneous cost	6.38	0.64
8.	Margin of the retailer	126.46	12.65
9.	**Retailer's sale price/ consumer's purchase price**	**1000.00**	**100.00**

The price spread of brinjal in Jalandhar market in supply chain II (Producer-retailer (through commission agent)-consumer) is presented in Table 18 and the graphic presentation is shown in Figure 12. The producer's sale price was Rs 670 per qtl which was 67 per cent of the consumer's purchase price (Rs 1000 per qtl). The producer's expenses were Rs 64 per qtl which were 6.40 per cent of the consumer's price. The retailer's costs and margins were Rs 109 and Rs 221 per qtl which were 11 per cent and 22 per cent of the consumer's purchase price respectively. It may be stated that producer's sale price was high (Rs 670 per qtl) in supply chain II in

Table 18: Price Spread of brinjal in Jalandhar market, July 2009

(Supply chain II: Producer-retailer (through commission agent)-consumer)

Sr. No.	Particulars	Rs per qtl	%age share in consumer's price
1.	**Producer's sale price/ retailer's purchase price**	**670.00**	**67.00**
2.	Expenses borne by the producer	64.01	6.40
i.	Grading, filling, stitching etc.	13.43	1.34
ii.	Cost of packing	20.69	2.07
iii.	Transportation cost	23.43	2.34
iv.	Loading, unloading and wastage	6.46	0.65
3.	**Net price received by the farmer**	**605.99**	**60.60**
4.	Expenses borne by the retailer	108.68	10.87
i.	Market fee @ 2 %	13.40	1.34
ii.	RDF @ 2%	13.40	1.34
iii.	Commission @ 5 %	33.50	3.35
iv.	Miscellaneous expenses	8.27	0.83
v.	Transportation cost	10.11	1.01
vi.	Rent of shop/*rehri*	1.41	0.14
vii.	Labour	2.60	0.26
viii.	Loss, wastage and spoilage @ 2 %	13.40	1.34

ix.	Packing cost	12.59	1.26
5.	Margin of the retailer	221.32	22.13
6.	**Retailer's sale price/ consumer's purchase price**	**1000.00**	**100.00**

Comparison to Rs 650 per qtl in supply chain I but consumer's purchase price of brinjal was the same in both the supply chains. The producer's sale price/consumer's purchase price was Rs 900 per qtl in Apni Mandi in Jalandhar for brinjal (Table 19 and Figure 13). Both the producer's sale price and consumer's purchase price was low in this supply chain as compared to supply chain I and II. This happened due to absence of middlemen for sale and purchase of vegetables in Apni Mandi. The expenses borne by the producer were Rs 63 per qtl for sale through supply chain III.

Table 19: Price Spread of brinjal in Apni Mandi of Jalandhar market, July 2009

(Supply chain III: Producer-consumer)

Sr. No.	Particulars	Rs per qtl	%age share in consumer's price
1.	**Producer's sale price**	**900.00**	**100.00**
2.	Expenses borne by the Producer	63.14	7.01
i.	Grading, filling, stitching etc.	13.43	1.49
ii.	Cost of packing	6.00	0.67
iii.	Transportation cost	20.45	2.27
iv.	Loading and wastage	3.25	0.36
iv.	Packing cost (carry bags)	9.63	1.07
ix.	Miscellaneous expenses	10.38	1.15
3.	Net price received by producer	836.86	92.98
4.	**Consumer's purchase price**	**900.00**	**100.00**

This figure was seven per cent of the consumer's price. The net price received by the producer was about 93 per cent of the consumer's price. It was significantly higher as compared to the net price received by the producer in supply chain I and II.

Marketing efficiency of brinjal

The marketing efficiency of brinjal in three supply chains is shown in Table 20. The marketing efficiency was the highest (13.25) in supply chain III as compared to 1.78 in supply chain II and 1.67 in supply chain I. The marketing efficiency of supply chain III was high on account of the fact that no middleman was involved in this chain. The marketing efficiency in supply chain II was high in comparison to supply chain I due to less number of intermediaries in the former.

Table 20: Marketing Efficiency of brinjal under different channels

(Rs per qtl)

Sr. No.	Particulars	Supply chain I	Supply chain II	Supply chain III
i.	Consumer's purchase price	1000.00	1000.00	900.00
ii.	Producer's sale price	650.00	670.00	900.00
iii.	Total marketing costs	121.93	108.68	63.14
iv.	Total margins of intermediaries	228.07	221.32	-
v.	Net price received by farmer	585.99	585.99	836.86
	Marketing Efficiency	**1.67**	**1.78**	**13.25**

Price spread of okra

Table 21 and Figure 14 show the price spread of okra in Jalandhar market under supply chain I (Producer-wholesaler (through commission agent)-retailer-consumer). The producer's sale price for okra was Rs 1150 per qtl which was about 70 per cent of the consumer's purchase price (Rs 1650 per qtl). The producer's marketing expenses were Rs 77 per qtl which were about five per

cent of the consumer's price. The producer received net price of Rs 1073 per qtl, which was 65 per cent of the consumer's purchase price. The marketing expenses of wholesaler and retailer were Rs 120 and Rs 94 per qtl which were about seven and six per cent of the consumer's price respectively. The margins of the wholesaler and retailer were about seven and 11 per cent respectively. The margin of the former was low but his volume of business was high. This scenario was opposite in case of the retailer.

Table 21: Price spread of okra in Jalandhar market, July 2009

(Supply chain I: Producer-wholesaler (through commission agent)-retailer-consumer)

Sr. No.	Particulars	Rs per qtl	%age share in consumer's price
1.	**Producer's sale price/ wholesaler's purchase price**	**1150.00**	**69.70**
2.	Expenses borne by the producer	76.71	4.65
i.	Grading, filling, stitching etc.	33.42	2.03
ii.	Cost of packing	23.78	1.44
iii.	Transportation cost	11.21	0.68
iv.	Loading, unloading and wastage	8.30	0.50
3.	Net price received by the farmer	1073.29	65.05
4.	Expenses borne by the wholesaler	120.40	7.29
i.	Market fee @ 2 %	23.00	1.39
ii.	RDF @ 2%	23.00	1.39
iii.	Commission @ 5 %	57.50	3.48

iv.	Miscellaneous expenses	16.90	1.03
5.	Margin of the wholesaler	109.60	6.63
6.	**Wholesaler's sale price/ retailer's purchase price**	**1380.00**	**83.63**
7.	Expenses borne by the retailer	93.83	5.69
i.	Transportation cost	25.69	1.56
ii.	Labour	1.32	0.08
iii.	Rent of shop/*rehri*	0.34	0.02
iv.	Packing cost	19.83	1.20
v.	Loss, wastage and spoilage @ 3%	41.40	2.51
vi.	Miscellaneous cost	5.25	0.32
8.	Margin of the retailer	176.17	10.68
9.	**Retailer's sale price/ consumer's purchase price**	**1650.00**	**100.00**

The price spread of okra in the supply chain II (Producer-retailer (through commission agent)-consumer) given in Table 22 and Figure 15 shows that the producer's sale price was Rs 1180 per qtl and the consumer's price was Rs 1650 per qtl. The producer price formed 72 per cent of the consumer price. The expenses borne by the producer for marketing of okra were about Rs 77 per qtl, which was about 5 per cent of the consumer's price. The producer's net price was, therefore, Rs 1103 per qtl which was 67 per cent of the consumer's price. The retailer's expenses were Rs 218 per qtl and margin Rs 252 per qtl, which were 13 per cent and 15 per cent of the consumer's price respectively.

Table 22: Price spread of okra in Jalandhar market, July 2009

(Supply chain II: Producer-retailer (through commission agent)-consumer)

Sr. No.	Particulars	Rs per qtl	%age share in consumer's price
1.	**Producer's sale price/ retailer's purchase price**	**1180.00**	**71.52**
2.	Expenses borne by the producer	76.71	4.65
i.	Grading, filling, stitching etc.	33.42	2.03
ii.	Cost of packing	23.78	1.44
iii.	Transportation cost	11.21	0.68
iv.	Loading, unloading and wastage	8.30	0.50
3.	**Net price received by the farmer**	**1103.29**	**66.87**
4.	Expenses borne by the retailer	218.45	13.24
i.	Market fee @ 2 %	23.60	1.43
ii.	RDF @ 2%	23.60	1.43
iii.	Commission @ 5 %	59.00	3.58
iv.	Miscellaneous expenses	18.15	1.10
v.	Transportation cost	25.69	1.56
vi.	Rent of shop/*rehri*	0.95	0.06
vii.	Labour	12.07	0.73
viii.	Loss, wastage and spoilage @ 3%	35.40	2.14

ix.	Packing cost	19.99	1.21
5.	Margin of the retailer	251.55	15.24
6.	**Retailer's sale price/ consumer's purchase price**	**1650.00**	**100.00**

The price spread of okra in Apni Mandi of Jalandhar market categorised as supply chain III (Producer-consumer) presented in Table 23 and Figure 16 revealed that producer's sale price/consumer's purchase price was Rs 1000 per qtl while his marketing expenses were about Rs 74 per qtl. The net price received by the producer was, therefore, Rs 926 per qtl, which constituted about 93 per cent of the consumer price. Like other vegetables, the producer's share was significantly higher than other supply chains in case of okra also in supply chain III where no middleman was involved.

Table 23: Price spread of okra in Apni Mandi of Jalandhar market, July 2009

(Supply chain III: Producer-consumer)

Sr. No.	Particulars	Rs per qtl	%age share in consumer's price
1.	**Producer's sale price**	**1000.00**	**100.00**
2.	Expenses borne by the Producer	73.70	7.37
i.	Grading, filling, stitching etc.	33.42	3.34
ii.	Cost of packing	5.42	0.54
iii.	Transportation cost	10.00	1.00
iv.	Loading and wastage	5.03	0.50
iv.	Packing cost (carry bags)	16.83	1.68

ix.	Miscellaneous expenses	3.00	0.30
3.	Net price received by producer	926.30	92.63
4.	**Consumer's purchase price**	**1000.00**	**100.00**

Marketing efficiency of okra

The marketing efficiency of okra under different supply chains is presented in Table 24. The supply chain III was found to be the most efficient one because the marketing efficiency was 12.56, while it was 2.35 in supply chain II and 2.15 in supply chain I. The marketing efficiency in supply chain II was high as compared to supply chain I due to less number of intermediaries in the former supply chain.

Table 24: Marketing efficiency of okra under different channels

(Rs per qtl)

Sr. No.	Particulars	Supply chain I	Supply chain II	Supply chain III
i.	Consumer's purchase price	1150.00	1180.00	1000.00
ii.	Producer's sale price	1650.00	1650.00	1000.00
iii.	Total marketing costs	214.23	218.45	73.70
iv.	Total margins of intermediaries	285.77	251.55	-
v.	Net price received by farmer	1073.29	1103.29	926.30
	Marketing efficiency	**2.15**	**2.35**	**12.56**

2.4 Factors affecting marketing efficiency

The functional analysis of the factors affecting the marketing efficiency of different vegetables is shown in Table 25. The crop-wise details are as follows.

Potato

In case of potato, market margins and costs were the major explanatory variables significantly affecting the marketing efficiency. It infers that with one percent increase in marketing margin and cost, the resultant marketing efficiency declined by 0.61 and 0.37 percent respectively. The impact of costs in reducing marketing efficiency was smaller than that of margins. The coefficients of other explanatory variables such as transportation and labour costs were also significantly negatively related with marketing efficiency. However, the coefficient of volume of the produce handled was negative but non significant. On the contrary, the coefficient of net price received was significantly and positively related with marketing efficiency which infers that with one percent increase in the net price received, the marketing efficiency increased by 0.98 per cent.

Tomato

In case of tomato, the coefficients of marketing margins and costs were significantly and negatively related with the marketing efficiency. The coefficient indicated that one percent increase in these variables resulted into fall in the marketing efficiency by 0.69 percent and 0.38 percent respectively. Transportation and labour costs were also significantly and negatively influencing the marketing efficiency in tomato. The net price received by the farmers was efficiency enhancing while volume of the produce handled was non-significant and thus did not affect efficiency. One percent increase in net price received was found to increase the marketing efficiency by 1.10 per cent.

Table 25: Regression coefficients of Cobb-Douglas type functions for different Vegetables of the selected farmers

Particulars	Potato	Tomato	Green peas	Brinjal	Okra
Intercept	-0.3735 (0.0784)	-0.6798 (0.3465)	-0.9358 (0.1444)	-1.9838 (0.1928)	-0.9469 (0.1313)
Marketing costs (Rs)	-0.3703* (0.0102)	-0.3814* (0.0088)	-0.4467* (0.0103)	-0.3274* (0.0175)	-0.3752* (0.0132)
Transportation costs (Rs)	-0.1021* (0.0044)	-0.0671* (0.0121)	-0.0780* (0.0019)	-0.0920* (0.0076)	-0.0650* (0.0022)
Labour charges (Rs)	-0.0609* (0.0118)	-0.0607* (0.0098)	-0.0325* (0.0059)	-0.0655* (0.0096)	-0.0465* (0.0027)
Marketing margins (Rs)	-0.6100* (0.0073)	-0.6972* (0.0148)	-0.4554* (0.0236)	-0.5778* (0.0122)	-0.5442* (0.0054)
Volume of the produce handled (Kg)	-0.0017 (0.0051)	0.0058 (0.0066)	-0.0005 (0.0027)	-0.0077 (0.0068)	0.0015 (0.0014)
Net price received (Rs)	0.9878* (0.0078)	1.1036* (0.0549)	0.9947* (0.0062)	1.1874* (0.0293)	1.0095* (0.0165)
Adjusted coefficient of multiple determination (R^2)	0.9951	0.9913	0.9965	0.9923	0.9965

Figures in parentheses are standard errors of regression coefficients

* indicate significance 1 percent level of significance

Green peas

In case of green peas, market margins and costs were the major explanatory variables significantly affecting the marketing efficiency. It infers that with one percent increase in these variables the resultant marketing efficiency declined by 0.45 and 0.44 percent respectively. These coefficients were significant at one percent level of significance. The coefficients of other explanatory variables such as transportation costs, labour costs and volume of the produce handled were negatively related with dependent variable but the coefficient of latter one was non-significant. On the other hand, the coefficient of net price received was significantly and positively related with marketing efficiency which infers that with one percent increase in the net price received, the marketing efficiency increased by 0.99 percent.

Brinjal

In case of brinjal, the various explanatory variables included in the model were significantly affecting the marketing efficiency. The coefficients of market margins and costs were significantly negatively related with the dependent variable. It can be inferred that with one percent increase in these variables, the marketing efficiency declined by 0.57 percent and 0.32 percent respectively. The coefficients were significant at one percent level of significance. Besides this, the coefficients of other explanatory variables such as transportation and labour costs were significantly and negatively related with dependent variable. The coefficient of net price received was positively and volume of the produce handled was negatively related. However, the former was significant at one percent level of significance. It can be inferred that with one percent increase in net price received, the resultant marketing efficiency increased by 1.18 percent.

Okra

In case of okra, the various explanatory variables included in the model were significantly affecting the marketing efficiency. The coefficients of market margins and costs were significantly negatively related with the dependent variable. It can be inferred that with one percent increase in these variables, the marketing efficiency declined by 0.54 percent and 0.37 percent respectively. These coefficients were significant at one percent level of significance. Besides this, the coefficients of other explanatory variables such as transportation and labour

costs were significantly and negatively related with dependent variable. The coefficient of net price received and volume of the produce handled were positively related. However, the former was significant. Thus, with one percent increase in net price received, the resultant marketing efficiency increased by one per cent.

2.5 Production and marketing constraints as perceived by the selected farmers

The production and marketing constraints as perceived by the selected farmers for different vegetables are discussed as under:

Potato

According to Garrett's ranking technique, the major constraint in case of potato was high cost of agro-chemicals like insecticides, pesticides and fungicides (Table 26). It may be stated that potato can have attack of 90 different types of viral, fungal and bacterial diseases. Potato is quite susceptible to the attack of diseases and insect pests. Therefore, the high cost of insecticides, pesticides and fungicides was reported by the selected farmers as their major constraint. The next most important constraint faced by the farmers was high transportation cost followed by malpractices in the market, inadequate market infrastructure, high margins of middlemen, high marketing cost and fluctuations in price. It must be noted that price risk was not as important for potato growers as other constraints such as incidence of diseases and insect-pests and marketing inefficiencies.

Table 26: Production and marketing constraints of potato as perceived by the selected farmers.

Sr. No.	Particulars	Ranking according to Garrett's technique
1.	High cost of insecticides, pesticides and fungicides	1
2.	High transportation cost	2
3.	Malpractices in the market	3

4.	Inadequate market infrastructure	4
5.	High margins of middlemen	5
6.	High marketing cost of the grower	6
7.	Fluctuations in price	7

Tomato

Fluctuations in prices were the most important constraint for tomato producers inhibiting expansion of its production in the state (Table 27). Tomato is a highly perishable vegetable and price determination occurs on the basis of forces of demand and supply. The tomato production has picked up in the state in late 1980's and early 1990's due to entry of Pepsi in processing of tomato encouraging contract farming in tomato. But closure of Pepsi tomato processing plant discouraged tomato production in the state. The next constraint was non-availability of packing material followed by lack of procurement, malpractices in the market and transportation problem. Degree of perishability was very high in tomato and a transportation loss in traditional transport facilities (tractor trolleys) was very high.

Table 27: Production and marketing constraints of tomato as perceived by the selected farmers.

Sr. No.	Particulars	Ranking according to Garrett's technique
1.	Fluctuations in price	1
2.	Non-availability of packing material	2
3.	Lack of procurement	3
4.	Malpractices in the market	4
5.	Transportation problem	5

Green peas

The major constraint as perceived by the selected farmers was high cost of labour in case of green peas as picking of green peas requires a lot of labour and higher wage rates in the state cause high labour cost for peas (Table 28). The next constraint was high marketing cost, high transportation cost, malpractices in market, un remunerative price, exploitation by the commission agents and fluctuation in the price in green peas.

Table 28: Production and marketing constraints of green peas as perceived by the selected farmers.

Sr. No.	Particulars	Ranking according to Garrett's technique
1.	High cost of labour	1
2.	High marketing cost	2
3.	High transportation cost	3
4.	Malpractices in the market	4
5.	Un remunerative price	5
6.	Exploitation by commission agents	6
7.	Fluctuations in price	7

Brinjal

Brinjal is also highly vulnerable vegetable to the attack of insect-pests and diseases and therefore, requires heavy dosage of agro-chemicals. Lack of awareness in using the right agro-chemicals for their control and higher expenditure on their use were thus the major constraints in the cultivation of brinjal faced by the farmers (Table 29). According to the Garret's technique, the number one constraint as perceived by the selected farmers was non-availability of insecticides, pesticides and seedlings followed by high cost on insecticides and pesticides. High transportation cost, inadequate facilities in the market, high margins of the middlemen and un remunerative price were the other important constraint in the production and marketing of brinjal.

Table 29: Production and marketing constraints of brinjal as perceived by the selected farmers.

Sr. No.	Particulars	Ranking according to Garrett's technique
1.	Non availability of insecticides, pesticides and seedlings	1
2.	High cost of insecticides/pesticides	2
3.	High transportation cost	3
4.	Inadequate facilities in the markets	4
5.	High margins of middlemen	5
6.	Un remunerative price	6
7.	Fluctuations in price	7

Okra

The most important constraint as perceived by the selected farmers in case of okra was high cost of insecticides and pesticides because large numbers of sprays are done to protect crop from insect-pests and diseases (Table 30). The other constraints (rank-wise) were: inadequate facilities in the market, high transportation cost, high marketing cost of farmers, high margins of the middlemen, payment of commission to the commission agents, un remunerative price, malpractices in the market and fluctuation in the prices.

Table 30: Production and marketing constraints of okra as perceived by the selected farmers.

Sr. No.	Particulars	Ranking according to Garrett's technique
1.	High cost of insecticides and pesticides	1
2.	Inadequate facilities in the markets	2
3.	High transportation cost	3
4.	High marketing cost	4
5.	High margins of middlemen	5
6.	Payment of commission to the commission agent	6
7.	Un remunerative price	7
8.	Malpractices in the market	8
9.	Fluctuations in price	9

2.6 Marketing constraints as perceived by the selected farmers in Apni Mandi

The major constraints as perceived by the selected farmers were non-availability of drinking water in the Apni Mandi (Table 31). It is common observation of the researchers of the present study that farmers in the Apni Mandi have to make payment for the supply of drinking water. The vendors supply drinking water to the farmers there but they charge for this service although not at par with price of bottle of mineral water. This constraint becomes more severe particularly in the months of May and June every year. The next important constraint was unhygienic conditions in

Table 31: Marketing constraints as perceived by the selected farmers in the Apni Mandi

Sr. No.	Particulars	Ranks according to Garrett's technique
1.	Non-availability of drinking water	1
2.	Unhygienic conditions in the markets	2
3.	Inadequate market infrastructure	3
4.	Frequent change in site for the farmer	4
5.	Dominance of traditional retailers	5
6.	Not Apni Mandi in the real sense	6

the market, inadequate market infrastructure, frequent change in site for the farmers, dominance of traditional retailers and not Apni Mandi in the real sense. It has been observed that large number of vendors come to the Apni Mandi for the sale of grocery items, plastic goods, ready-made garments, cosmetics, eatables particularly snacks, cold drinks, ice-cream, etc. Such a congested scenario in Apni Mandi creates traffic problems for the general public and loss of business for the framers.

2.7 Constraints as perceived by the selected wholesalers in the market

The wholesalers highlighted the non-availability of drinking water as the number one constraint in the wholesale vegetable markets (Table 32). The next constraint was unhygienic conditions in the market followed by inadequate market

Table 32: Constraints as perceived by the selected wholesalers in the market

Sr. No.	Particulars	Ranks according to Garrett's technique
1.	Non-availability of drinking water	1
2.	Unhygienic conditions in the markets	2
3.	Inadequate market infrastructure	3
4.	Non-availability of cold stores in the markets	4

infrastructure and non-availability of cold stores in the markets. It may be stated that unhygienic conditions in the markets become more severe in rainy season i.e. in the months of July and August every year.

3. Summary and conclusions

Five important vegetables are studies in the study. These are potato, tomato, green peas, brinjal and okra. Only those districts were purposively selected for the study, where there was considerable area under particular crop. The convenience sampling technique was used for selection of different types of respondents in the study. For each vegetable, the sample consisted of 120 farmers except 93 for brinjal. Further, for each vegetable, 30 wholesalers, 30 retailers and 30 farmers from Apni Mandi were selected. Thus, the total sample consisted of 573 farmers, 150 wholesalers, 150 retailers and 150 farmers from Apni Mandi. For the present study, the total number of all types of respondents was 1023. The personal interview method was used for collection of data from the respondents.

The total area under vegetables was 2.20 per cent of the total cropped area during the year 2007-08. Among different vegetable crops, potato was the dominant one having one per cent share in the cropped area. The major reason for more area under potato was its semi-perishable nature as compared to other vegetables which are perishable. Besides, the cold storage facilities are available for potato in the state. The district-wise area under vegetables indicate that Jalandhar, Hoshiarpur, S.B.S. Nagar, Kapurthala and SAS Nagar were the major vegetable producing districts during the year 2007-08. The production of potato was 20.14 lakh tonnes during the year 2008-09. This figure was 1489, 1120, 468 and 193 hundred tonnes for tomato, green peas, brinjal and okra respectively in the same year.

The price spread of potato in supply chain I in Jalandhar market brought out that the net price received by the producer was Rs 434 per qtl which was about 58 per cent of the consumer's price. The expenses borne by the wholesaler and retailer were about Rs 58 and Rs 52 per qtl respectively which were about 8 and 7 per cent of the consumer's price (Rs 750 per qtl). The margin of the wholesaler was about 6 per cent whereas this figure was about 13 per cent in case of retailer. The margin of the wholesaler was less on account of high volume of business as compared to retailer who handles low volume of business. The price spread of potato in supply chain II in Jalandhar market revealed that the net price received by the producer was about Rs 454 per qtl which was 61 per cent of the consumer's purchase price. The expenses and margins of the retailer were 15 per cent and 16 per cent respectively of the consumer's purchase price. The margin of the retailer was high in supply chain II as compared to the supply chain I because the wholesaler was not there in the latter. There is direct sale of the

produce by the producer to the consumer in the Apni Mandi. The study indicated that producer's sale price/consumer's purchase price was Rs 700 per qtl in Apni Mandi of Jalandhar market. The expenses borne by the producer were Rs 52 per qtl which were 7.45 per cent of the consumer's price. The net price received by the producer was 93 per cent of the consumer's price. As compared to the supply chain I and II, the producer's share in supply chain III was more on account of direct sale by the producer to the consumer. The supply chain III was the most efficient one because marketing efficiency was 12.42 in this chain as compared to 1.97 in supply chain II

and 1.74 in supply chain I. The low marketing efficiency in supply chain I was on account of more number of market intermediaries in this chain.

The study brought out that the net price received by the producer was about Rs 554 per qtl which in percentage terms was about 46 per cent of the consumer's purchase price in supply chain I in Kapurthala market. The expenses borne by the wholesaler and retailer were Rs 68 and Rs 84 per qtl. These respective expenses were about 6 and 7 per cent of the consumer's purchase price. The margin of the wholesaler and retailer was 11 per cent and 26 per cent of the purchase price of consumer. The producer's net price received was Rs 579 per qtl in supply chain II. This was about 48 per cent of the consumer's purchase price. The expenses and margins of the retailer were about 12 per cent and 36 per cent of the consumer's price. The retailer's margins was comparatively less in supply chain I as compared to supply chain II. For sale of tomato in supply chain III (Apni Mandi), the net price received by the producer was Rs 1024 per qtl which was 93 per cent of the consumer's purchase price. The marketing efficiency in supply chain III was 13.42 as against 1.01 in supply chain II and 0.92 in supply chain I. The marketing efficiency in supply chain III was high on account of the fact that no middleman was involved and produce was directly sold to consumers. As compared to supply chain I, the marketing efficiency of tomato was marginally high in supply chain II due to less number of the intermediaries in the latter.

The price spread of green peas in Hoshiarpur market in supply chain I revealed that the net price received by the producer was Rs 833 per qtl which was about 67 per cent of the consumer's price. The expenses borne by the wholesaler and retailer were 7.52 and 7.36 per cent respectively of the consumer's purchase price (Rs 1250 per qtl). Their respective margins were 4.48 per cent and 8.64 per cent of the consumer's price. In supply chain II, the producer received a net price of

Rs 863 per qtl which was 69 per cent of the consumer's purchase price. The expense and margins of the retailer were about 14 per cent and 12 per cent respectively of the consumer's price. For sale of green peas in Apni Mandi (supply chain III), the producer's sale price/consumer's purchase price was Rs 1100 per qtl. The producer's expenses were Rs 69 per qtl which were 6.32 per cent of the consumer's purchase price. The producer realised higher price in supply chain III as compared to the supply chain II and I. Similarly, the consumer benefitted in supply chain III as his purchase price was lower in comparison to his price in the latter two supply chains. Therefore, both the producer as well as consumer was the gainers in Apni Mandi. The marketing efficiency of green peas in supply chain III was most efficient one because the value of the marketing efficiency was 14.83 as against 2.70 in supply chain II and 2.38 in supply chain I. The marketing efficiency in supply chain II was high as compared to supply chain I because the number of the intermediaries was less in the former.

The price spread of brinjal in Jalandhar in supply chain I brought out that the net price received by the producer was Rs 586 per qtl which was 59 per cent of the consumer's price. The expenses borne by the wholesaler and retailer were 8 per cent and 5 per cent of the consumer's price. Their respective margins were about 10 per cent and 13 per cent. As in case of other vegetables, the margins of the retailer were high in case of brinjal too on account of low volume of business in comparison to the wholesaler. In supply chain II, the producer's net price was Rs 586 per qtl which was 59 per cent of the consumer's purchase price (Rs 1000 per qtl). The retailer's costs and margins were 11 per cent and 22 per cent of the consumer's purchase price respectively. Producer's sale price/consumer's purchase price was Rs 900 per qtl in Apni Mandi (supply chain III). Both the producer's sale price and consumer's purchase price was low in this supply chain as compared to supply chain I and II. This happened due to the non-presence of middlemen for sale and purchase of vegetables in Apni Mandi. The net price received by producer was about 93 per cent of the consumer's price. It was significantly higher as compared to the net price received by the producer in supply chain I and II. The marketing efficiency was the highest (13.25) in supply chain III as compared to 1.78 in supply chain II and 1.67 in supply chain I. The marketing efficiency of supply chain III was high on account of the fact that no middleman was involved in this chain. The marketing efficiency in supply chain II was high in comparison to supply chain I due to less number of intermediaries in the former.

The study revealed that producer received net price of Rs 1073 per qtl, which was 65 per cent of the consumer's purchase price of okra in Jalandhar market (supply chain I). The marketing expenses of the wholesaler and retailer were about seven and six per cent of the consumer's price respectively. Their respective margins were about seven and 11 per cent respectively. The margin of the former was low but his volume of business was high. This scenario was opposite in case of the retailer. In supply chain II, the producer's net price was Rs 1103 per qtl which was 67 per cent of the consumer's price. The retailer's expenses were Rs 218 per qtl and margin Rs 252 per qtl, which were 13 per cent and 15 per cent of the consumer's price respectively. The net price received by the producer was Rs 926 per qtl which constituted about 93 per cent of the consumer price. Like other vegetables, the producer's share was significantly higher than other supply chains in case of okra in supply chain III where no middleman was involved. The marketing efficiency of supply chain III was found to be most efficient one because the marketing efficiency was 12.56 where it was 2.35 in supply chain II and 2.15 in supply chain I. The marketing efficiency in supply chain II was high as compared to supply chain I due to less number of intermediaries in the former supply chain.

The functional analysis of the factors affecting the marketing efficiency revealed that market margins and costs were the major explanatory variables significantly affecting the marketing efficiency of potato. It was inferred that with one per cent increase in marketing margins and costs, the marketing efficiency declined by 0.61 and 0.37 per cent respectively. The impact of cost in reducing marketing efficiency was smaller than that of margins. The coefficient of net price received was positively and significantly related with marketing efficiency. It was inferred that marketing efficiency increased by 0.98 per cent with one per cent increase in the net price received. In case of tomato, marketing margins and costs were negatively and significantly related with the marketing efficiency. Thus, with one per cent increase in these variables, the resultant marketing efficiency declined by 0.69 and 0.38 per cent respectively. The coefficient of net price received was positively related with the marketing efficiency, thereby increasing it by 1.10 per cent.

The marketing margins and costs were the major explanatory variables affecting marketing efficiency of green peas. It inferred that with one per cent increase in these variables, the marketing efficiency declined by 0.45 and 0.44 per cent respectively. Only net price received was positively and significantly related variable which resulted in increase in marketing

efficiency by 0.99 per cent. In brinjal too, marketing margins and costs were the major variables affecting the marketing efficiency of the crop. It was inferred that with one per cent increase in these variables, the marketing efficiency declined by 0.57 and 0.32 per cent respectively. The coefficient of net price received was positively and significantly related variable which resulted in increase in marketing efficiency by 1.18 per cent. The marketing margins and costs were the variables significantly affecting marketing efficiency of okra. It inferred that with one per cent increase in these variables, the marketing efficiency declined by 0.54 and 0.37 per cent respectively. The coefficient of net price received by positively related with marketing efficiency. It showed that with one per cent increase in the net price, the marketing efficiency also increased by one per cent.

According to Garret's ranking technique, the major production and marketing constraints in case of potato was high cost of agro-chemicals like insecticides, pesticides and fungicides. The next most important constraint faced by the farmers was high transportation cost followed by malpractices in the market, inadequate market infrastructure, and high margin of middlemen, high marketing cost and fluctuations in price. Fluctuations in prices were the most important constraint for tomato producers inhibiting expansion of its production in the state. The next constraint was non-availability of packaging material followed by lack of procurement, malpractices in the market and transportation problem. The major constraint as perceived by the selected farmers was high cost of labour in case of green peas as picking of the green peas require a lot of labour and higher wage rates in the state cause higher labour cost for peas. The next constraint was high marketing cost, high transportation cost, malpractices in the market, unremunerative price, and exploitation by the commission agents and fluctuations in the price of green peas.

Brinjal is also highly vulnerable vegetable to the attack of insect-pests and diseases and therefore, requires heavy dosage of agro-chemicals. Lack of awareness in using the right agro-chemical for their control and higher expenditure on their use were thus the major constraints in the cultivation of brinjal faced by the farmers. According to the Garret's technique, the number one constraint as perceived by the selected farmers was non-availability of insecticides, pesticides and seedlings followed by high cost on insecticides and pesticides. High transportation cost, inadequate facilities in the market, high margins of the middlemen and unremunerative price were the other important constraints in the production and marketing of brinjal. The most

important constraint as perceived by the selected farmers in case of okra was high cost of insecticides and pesticides because large numbers of sprays are done to protect the crop from insect-pests and diseases. The other constraint (rank-wise) were: inadequate facilities in the market, high transportation cost, high marketing cost of farmers, high margins of middlemen, un remunerative price, malpractices in the market and fluctuations in the prices.

The major constraint as perceived by the selected farmers was non-availability of drinking water in the Apni Mandi. The next important constraint was unhygienic conditions in the market, inadequate market infrastructure, frequent change in the site of the farmers, dominance of the traditional retailers and not Apni Mandi in the real sense. The wholesalers highlighted the non-availability of the drinking water as the number one constraint in the wholesale vegetable markets. The next constraint was unhygienic conditions in the market followed by the inadequate market infrastructure and non-availability of cold stores in the markets. The unhygienic conditions in the market become more severe in rainy season, i.e. the months of July and August every year.

4. Suggestions to improve marketing efficiency

The high transportation has emerged as one of the major marketing constraints of the vegetable farmers. It is suggested that vegetable farmers may form informal cooperatives/ groups. As a large group, their per unit transportation will definitely come down. This will encourage vegetable cultivation in the state. There are various malpractices in the markets. The enforcement of Punjab Agriculture Produce Markets Act, 1961 and various other amendments made in this regard may be made more effective at ground level. In the era of liberalization, privatisation and globalisation (LPG), the existing market infrastructure is not up to the mark. A lot of efforts are required in this direction. It is a known fact that state government and Punjab Mandi Board alone can not build modern market infrastructure of the international standard. Therefore, the modern market infrastructure may be built up with the public-private partnership to bring efficiency in the marketing of vegetables.

The study revealed that there was no sale of vegetables in the distant markets by the selected farmers except in case of potato. The farmers may prefer cooperative/group marketing for sale of vegetables in the distant markets like Delhi. The distance of Delhi from Punjab is not too long. This distance from Amritsar, Jalandhar and Ludhiana is about 450, 375 and 325 km respectively. At present, the population of Delhi is about 160 lakh having large consumption of vegetables. Besides, Delhi has become a big

distribution market of vegetables for the states like Uttar Pradesh, Haryana, Rajasthan, Himachal Pradesh, Jammu and Kashmir, Punjab, Uttrakhand, Madhya Pradesh, Chandigarh, etc. The returns of the vegetable growers will definitely increase from sale in a big consuming market like Delhi.

The Apni Mandi was introduced in Punjab in February, 1987. During the last more than 23 years, the concerned market committee could not make the arrangement of drinking water in these markets. The existing infrastructure in Apni Mandi is inadequate. A large number of vegetable vendors are also there. It does not look like Apni Mandi in the real sense. The concerned market committee must ensure that only a genuine vegetable grower should do their business in the Apni Mandi. The identity cards should be issued to the genuine vegetable growers by the concerned market committee. It will enhance marketing efficiency in the Apni Mandi. All these suggestions will definitely bring improvement in the marketing efficiency of vegetables in the state.

5) Annexure

Appendix I: Area, production and yield of important vegetables in Punjab, 2000-01 through 2008-09

Area (000 ha)					
Year	**Potato**	**Tomato**	**Green peas**	**Brinjal**	**Okra**
2000-01	59.60	6.85	13.46	2.35	1.52
2001-02	57.20	7.28	14.39	2.46	1.58
2002-03	67.40	7.29	14.50	2.46	1.68
2003-04	66.40	7.38	15.95	2.49	1.75
2004-05	67.80	7.75	16.75	2.61	1.83
2005-06	71.40	8.02	17.21	2.68	1.89
2006-07	75.60	8.27	18.13	2.79	1.94
2007-08	89.80	8.45	18.45	3.03	2.29
2008-09	82.10	6.14	18.49	3.11	2.54
Production (000 tonnes)					
Year	**Potato**	**Tomato**	**Green peas**	**Brinjal**	**Okra**
2000-01	1166.00	165.35	80.69	33.20	11.42
2001-02	1147.10	175.89	86.28	34.69	11.84
2002-03	1390.00	275.08	86.87	34.86	12.64
2003-04	1381.60	179.18	95.65	35.21	13.14

2004-05	1400.40	187.31	100.51	37.00	13.79
2005-06	1164.60	193.85	103.33	37.96	14.28
2006-07	1352.60	153.58	108.97	41.25	14.61
2007-08	1713.80	202.31	110.98	44.79	17.30
2008-09	2013.50	148.86	111.96	46.79	19.27
Yield (qtls per ha)					
Year	**Potato**	**Tomato**	**Green peas**	**Brinjal**	**Okra**
2000-01	195.63	241.39	59.95	141.28	75.12
2001-02	200.55	241.61	59.98	141.32	75.17
2002-03	205.72	240.29	59.91	141.70	75.24
2003-04	200.23	242.64	59.96	141.78	75.28
2004-05	201.80	242.31	60.01	141.83	73.27
2005-06	163.11	241.70	60.41	141.92	75.33
2006-07	170.30	185.70	60.09	147.86	75.13
2007-08	186.97	239.45	60.14	147.83	75.72
2008-09	246.80	242.60	60.56	150.39	75.94

Source i) : Statistical Abstract of Punjab, various issues

ii): Department of Horticulture, Punjab, Chandigarh

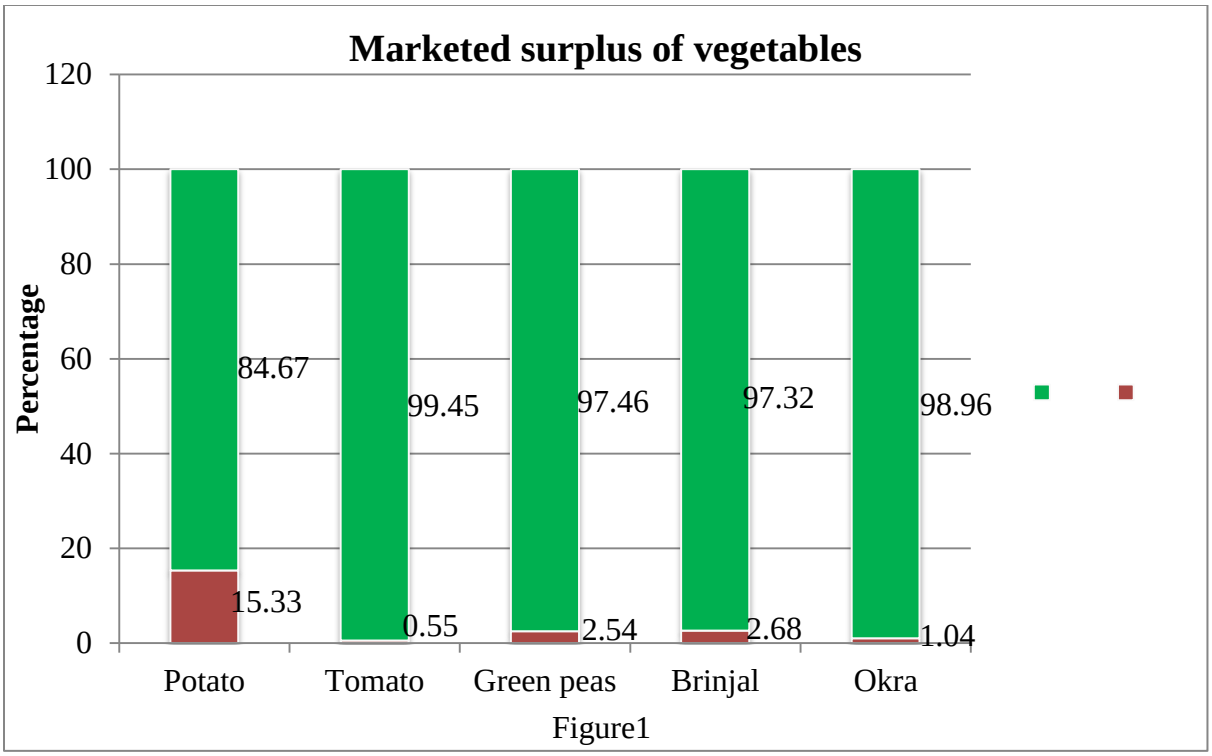

Marketed surplus of vegetables
120
100
80
60
40
20
0
Percentage
84.67
15.33
99.45
0.55
97.46
2.54
97.32
2.68
98.96
1.04
Potato
Tomato
Green peas
Brinjal
Okra

Figure1

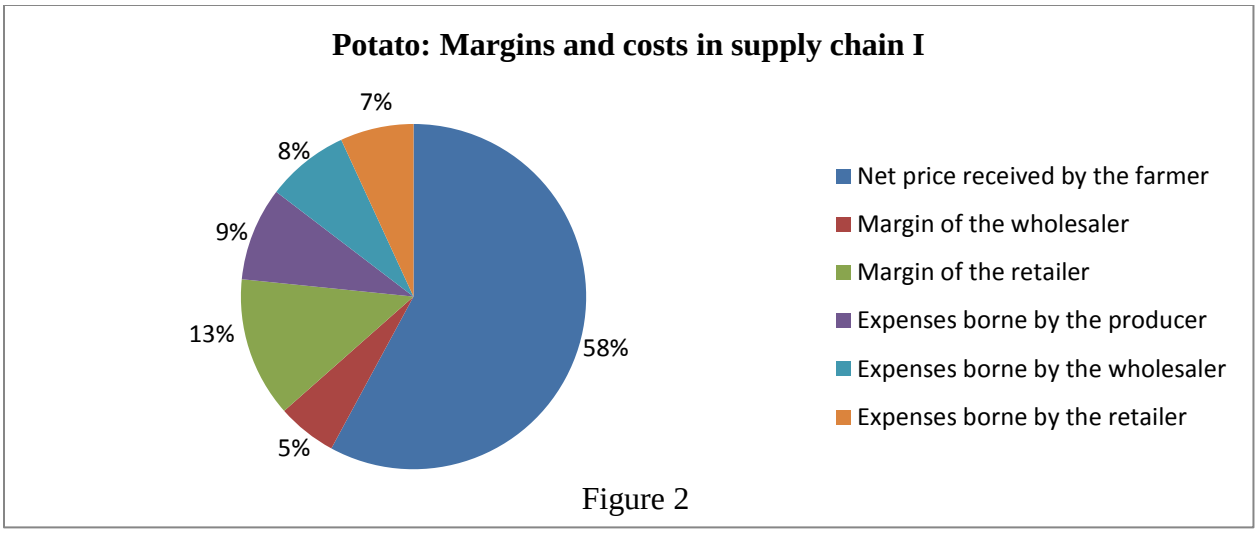
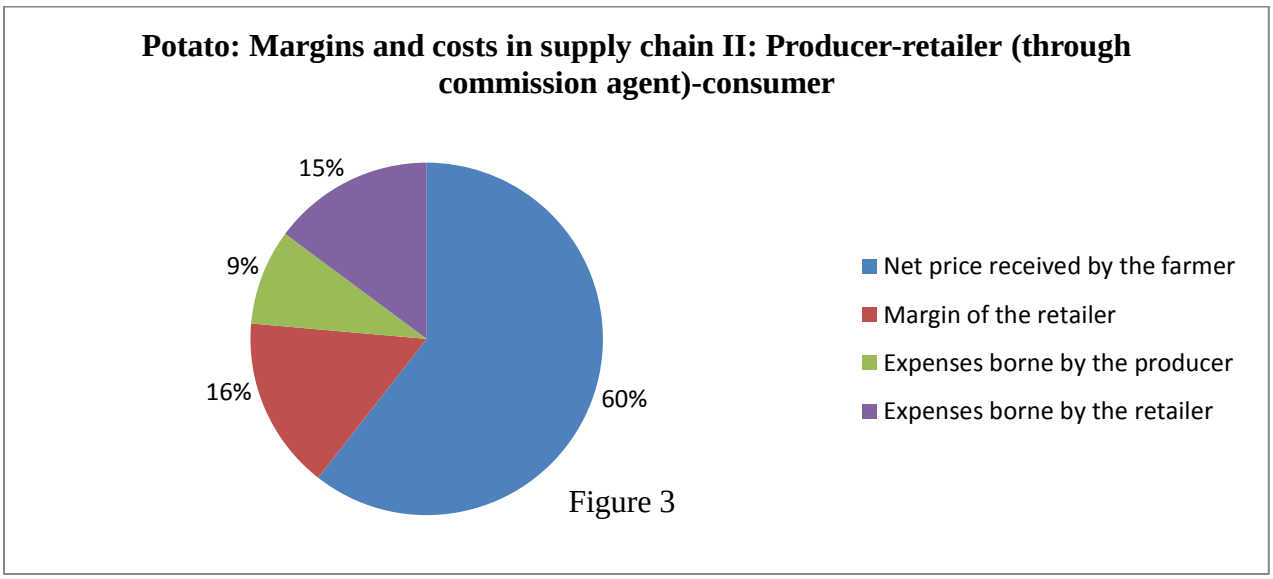


Figure 2



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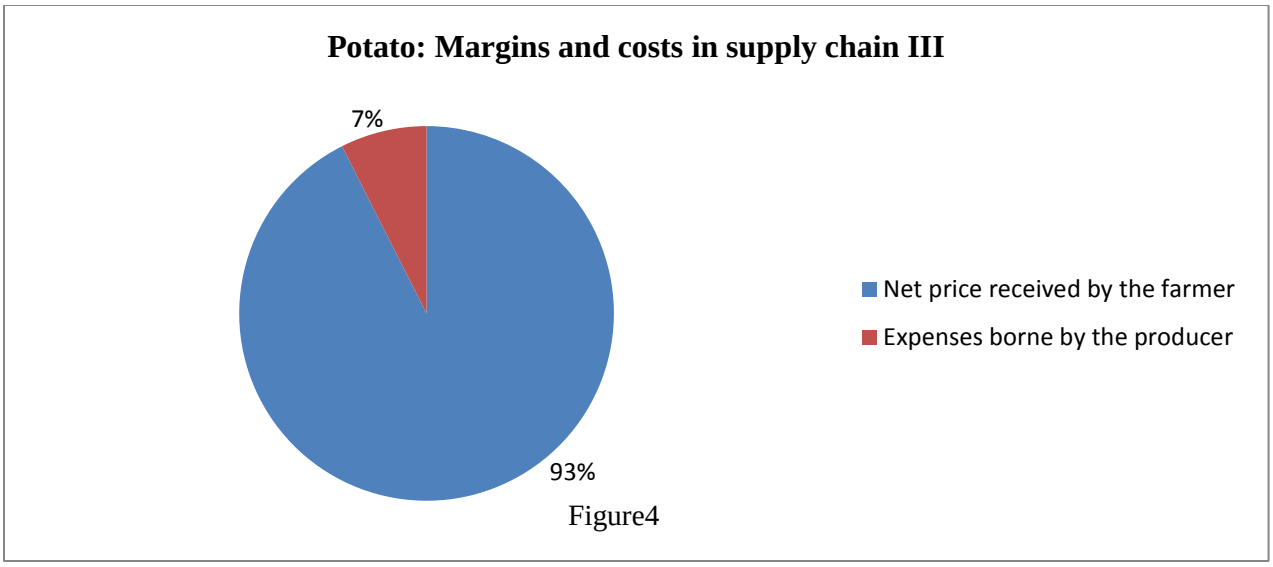

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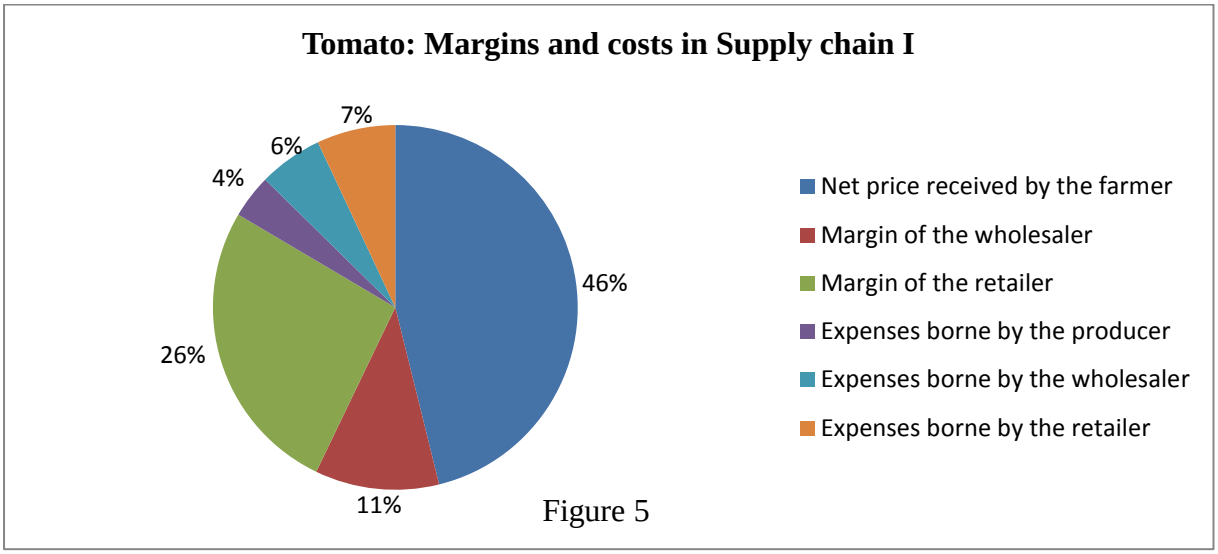

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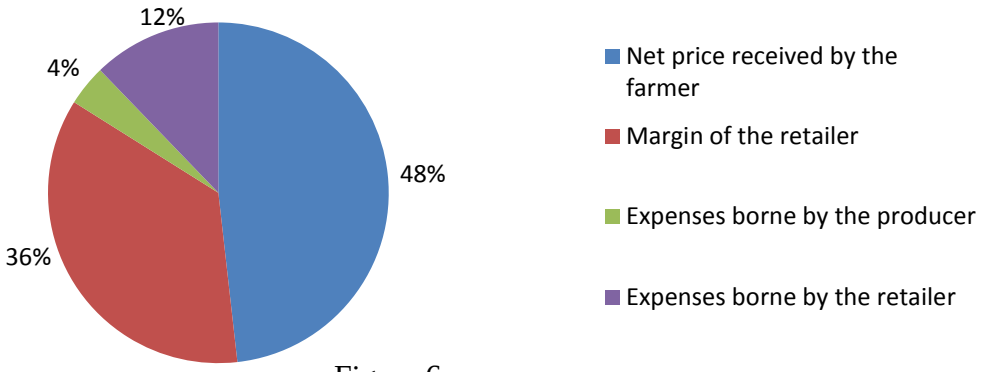

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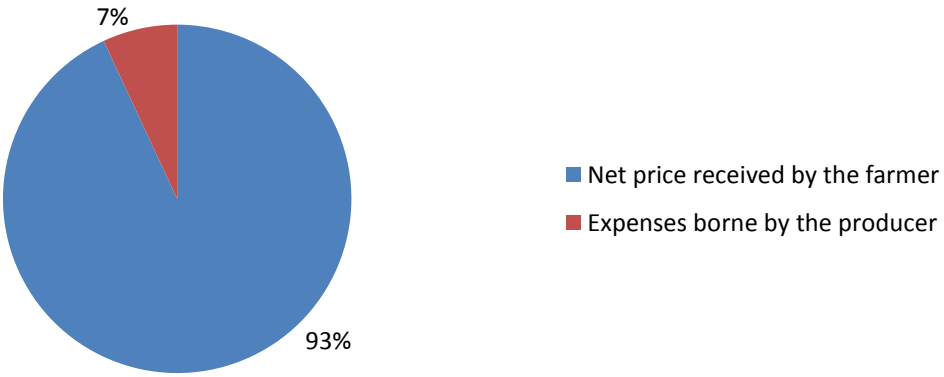

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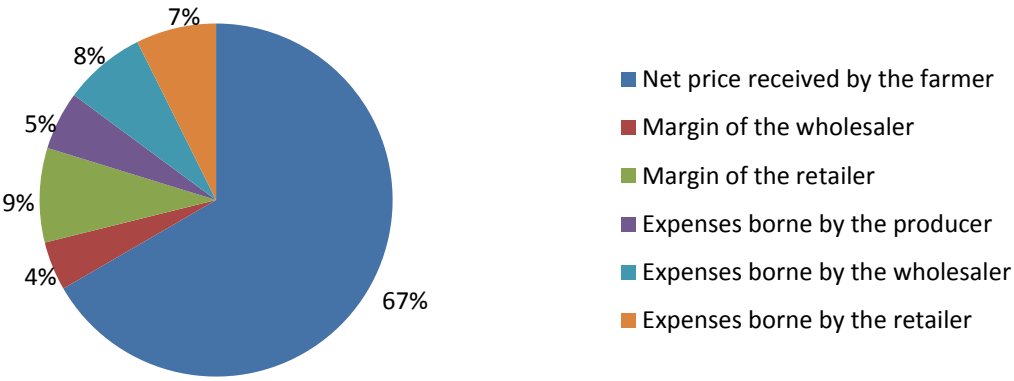


Figure 8

Green peas: Margins and costs in Supply chain II: Producer-retailer (through commission agent)-consumer

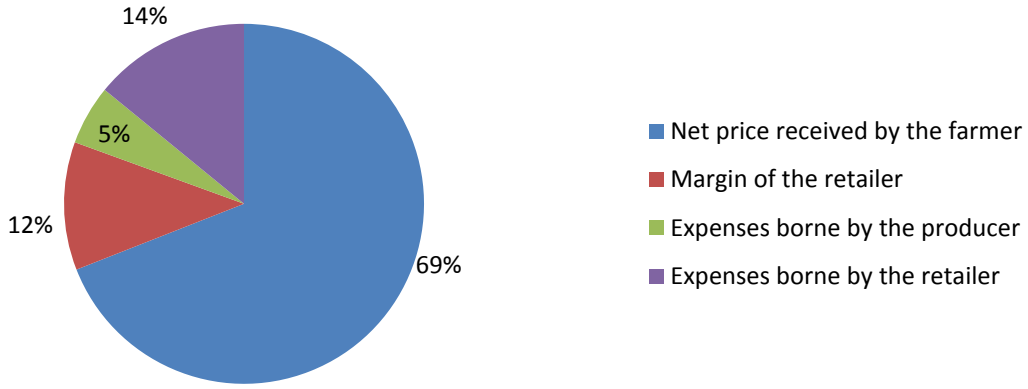


Figure 9

Green peas: Margins and costs in Supply chain III

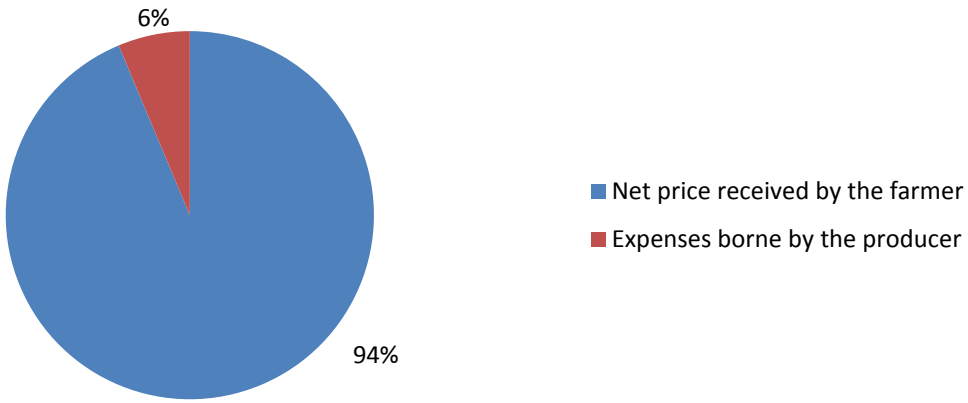


Figure 10

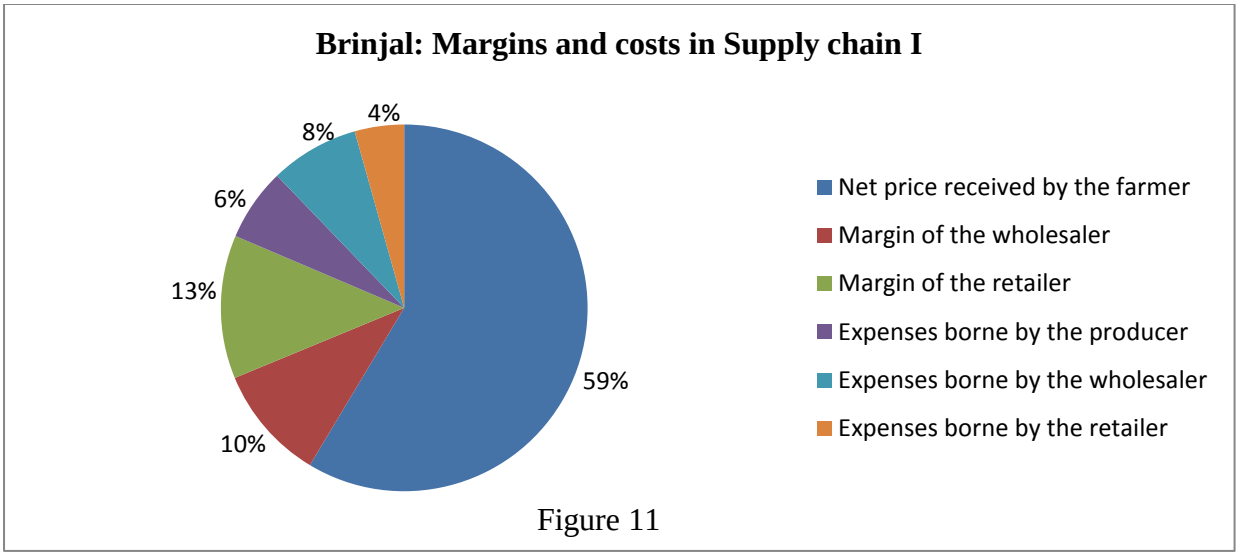
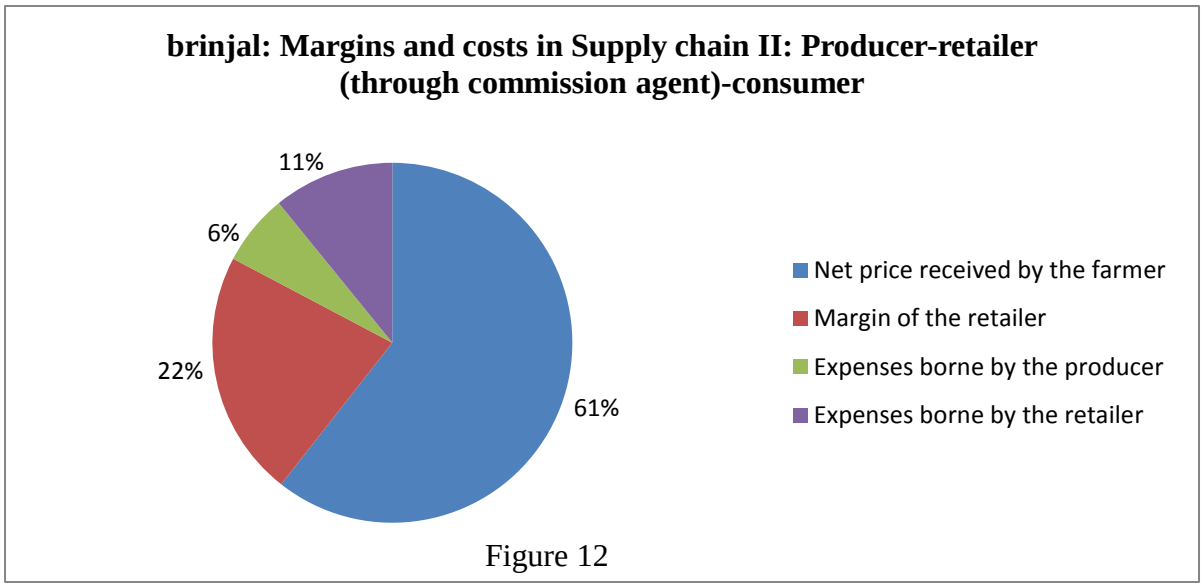


Figure 11



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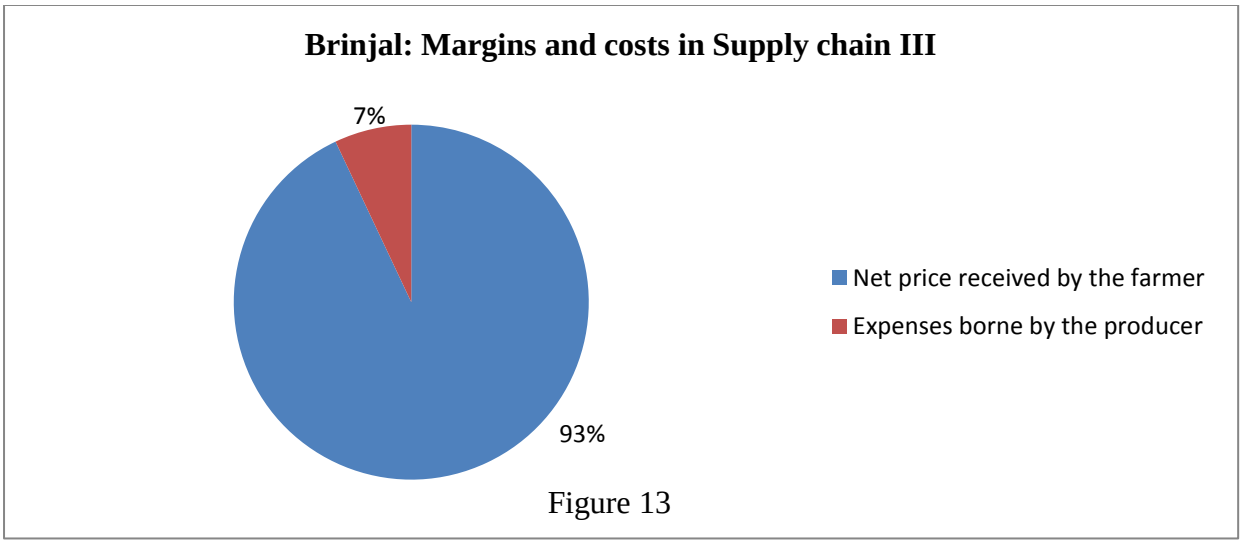

Figure 13

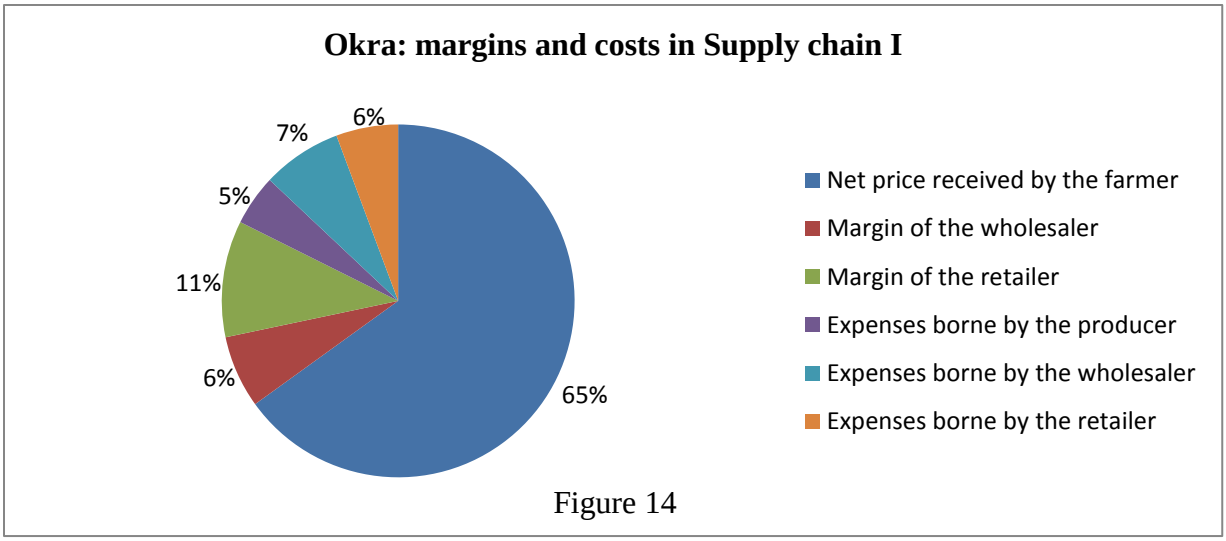

Figure 14

Okra: Margins and costs in Supply chain II: Producer-retailer (through commission agent)-consumer

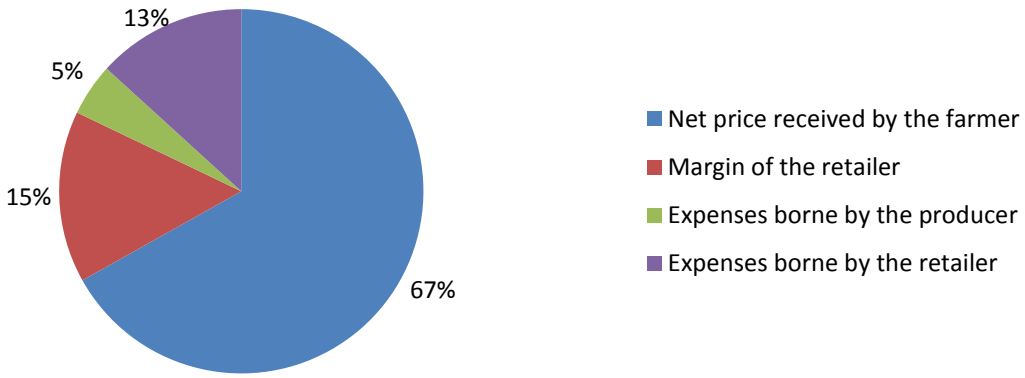

Figure 15

Okra: Margins and costs in Supply chain III

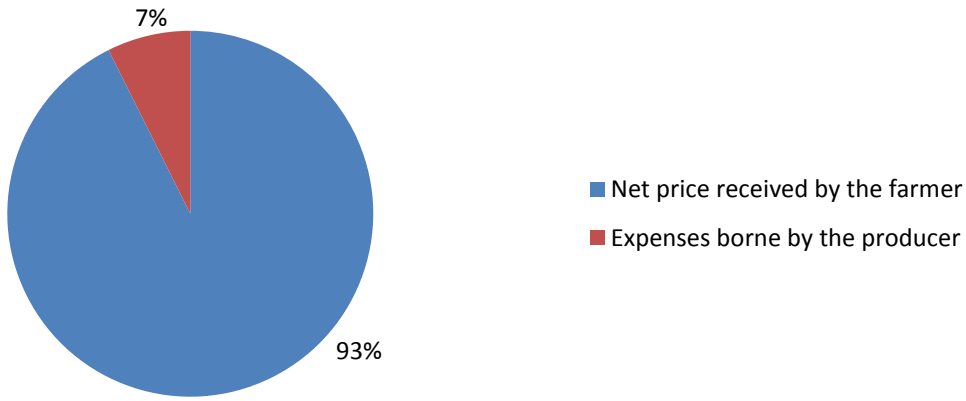

Figure16

6) References

Government of Punjab, Statistical Abstract- Various issues

Shergill, H.S. (1998), Rural credit and indebtedness in Punjab, Monograph Series-IV, Institute for Development and Communication, Chandigarh, pp 1-95.

Shergill, H.S. (2010), Growth of farm debt in Punjab- 1997 to 2008, Institute for Development and Communication, Chandigarh, pp 1-92.

Bibliography

Annual reports of Horticultural mission of Andhrapradesh from 2005 to 2008

Seasonal and crop reports – (2007-08) Published by Directorate of Economics and statistics

Annual reports of Horticultural university (2007-08)

India stat.com

Garratt (1969) Statistics in psychology education .

Aphorticulte.com

Annual report of Maize research center for the year 2007-08 Prepared by Maize Research station.

Annual report of Kothapet Fruit Market for the year 2008-09.

Estimating Marketing Efficiency of Vegetables in Tamil Nadu

Bibliography

Action Plan for Tamil Nadu National Horticulture Mission Prepared by Rabo India Finance Pvt. Ltd for Ministry of Agriculture Government of India September 2005

Birari K.S., D.S. Navadkar and J.T. Dorge "Marketing Efficiency of Cole Vegetables in Western Maharashtra" Agricultural Marketing VOL.-XLVII, No.:3 pp23-28

Chennai, Martketing of Fruits and Vegetables in and Around Chennai, Research Study No.130, Agro Economic Research Centre, University of madras, 2002-03, Coimbatore -3 August, 2006

Farmers' Market in Tamil Nadu – An Assessment of Current Performance and Potentials for Future Expansion, Research report of the Department of Agricultural Economics Tamil Nadu Agricultural University

Gangwar L.S., Dinesh Singh and D.B. Singh "Estimation of Post-Harvest Losses in Kinnow Mandarin in Punjab Using a Modified Formula" *Agricultural Economics Research Review* July-December 2007 Vol. 20 pp 315-331

Kusum Jain, Umesh Kumar Sharma, R. S. Kadian, R. K. Malik and S.L. Bhella. 2008. Direct Marketing. Technical Bulletin (27), Directorate of Extension Education, CCS Haryana Agricultural University, Hisar, India.

Rengasamy S, J Devavaram, T Marirajan, N Ramavel, K Rajadurai, M Karunanidhi, N Rajendra Prasad and A Erskine "Farmers' markets in Tamil Nadu: increasing options for rural producers, improving access for urban consumers**"** *Environment and Urbanization* 2003; 15; 25

Season and Crop Report, Department of Economics and Statistics,Government of Tamil Nadu, 2005-06

Shamsher Singh and S.K. Chauhan "Marketing of Vegetables in Himachal Pradesh" Agricultural Marketing VOL.-XLVII, No.:3 pp5-10

Srinivas T., M.Anantharaman Cassava Marketing System in India, Technical Bulletin Series: 43 CTCRI (ICAR), Kerala, India, December, 2005

Sudhandhiran C, The Sago & Starch Industry Cluster Salem (Tamil Nadu), SME Diagnostic Study developed under the Cluster Development Agent Training Programme, Organised By Unido Cdp, New Delhi & (Edii), Ahmedabad 2001

Viswanadham N, Food and Retail Chains in India, ISAS Working Paper No. 15 –October 2006

Estimating Marketing Efficiency of Vegetables in West Bengal

Bibliography

Acharya, S. S. and Agrawal, N. L. (2001). Agricultural Marketing in India, Oxford & IBH Publishing Company, New Delhi.

Agmarknet (2010 a), Directorate of Marketing & Inspection, Ministry of Agriculture, Govt. of India, http://agmarknet.nic.in/

Agmarknet (2010 b), Salient Features of the Model Act on Agricultural Marketing, Directorate of Marketing & Inspection, Ministry of Agriculture, Govt. of India, http://agmarknet.nic.in/

L.S. Gangwar, L. S, Singh, Dinesh and Singh, D.B. (2007) Estimation of Post-Harvest Losses in Kinnow Mandarin in Punjab Using a Modified Formula, Agricultural Economics Resaerch Review, Vol 20, July-December, pp. 315-331

Dhillon, Ashok, Khatkar, R.K. and Kumar, Arun (2005) Marketing Costs and Price Spread for Marigold Flower in Haryana, Agricultural Marketing, Vol.XLVIII, No:1, pp.9-12.

Govt. of West Bengal (2010), Department of Sundarban Affairs, Block profile, www. http://www.sadepartmentwb.org/Profile.htm

Govt. of West Bengal, (2010b), State Agricultural Marketing Board

Indian Horticulture Database 2008, Ministry of Agriculture, Govt. of India, www.nhb.gov.in

Metro Cash & Carry India, www.metro.co.in

ANNEXURE

Table 24. Arrival and Modal price of Bhindi and Brinjal at Baruipur market (Canning) during 2009-10

Months	Bhindi		Brinjal	
	Arrivals (kg)	Modal Price (Rs/q)	Arrivals (kg)	Modal Price (Rs/q)
May, 1	1900	1500	2800	1300
May, 15	1500	2000	2200	1300
June, 1	1500	2200	2500	1700
June, 15	1600	1300	2100	1500
July, 1	1800	1400	2300	1600
July, 15	2000	2200	2400	2200
August, 1	3800	1300	3500	1400
August, 15	3600	1100	2800	1400
September, 1	3700	1300	3000	1500
September, 15	3200	1300	4100	1400
October, 1	3700	1300	3000	1500
October, 15	3200	1300	4100	1400

Source: http://agmarknet.nic.in/

Table 25. Arrival and Modal price of Tomato at Baruipur market (Canning) during 2009-10

Months	Arrival (q)	Modal Price (Rs/q)
May, 1	3300	1100
May, 15	2200	2300
June, 1	2200	2300
June, 15	700	3800
July, 1	2100	3100
July, 15	2200	2900
August, 1	2500	3000
August, 15	2000	2800
September, 1	2800	2500
September, 15	2900	2400
October, 1	2800	2500
October, 15	2900	2400
November, 1	1800	1900
November, 15	1700	2400
December, 1	1700	3800
January, 1	7700	600
January, 15	7500	700
February, 1	6600	700
February, 15	7500	600

March, 1	7500	400
March, 15	2200	1300
April, 1	5000	350
April, 15	5000	500

Source: http://agmarknet.nic.in/

Table 26. Arrival and Modal price of Guava at Baruipur market (Canning) during 2009-10

Months	Arrival (q)	Modal Price (Rs/q)
May, 1	22	3900
May, 15	25	4100
June, 1	20	4200
June, 15	15	4300
July, 1	60	2600
July, 15	125	1600
August, 1	500	700
August, 15	1300	450
Sept, 1	1150	550
Sept, 15	725	700
October, 1	1150	550
October, 15	725	700
Nov, 1	200	900

Dec, 15	135	800
January, 15	16	1000
February, 15	8	1300
March, 15	2	2100
April, 1	20	2000
April, 15	15	2400

Source: http://agmarknet.nic.in/

Bibliography

Acharya, S. S. and N.L. Agarwal (2005). Agricultural marketing in India. Oxford & IBH Publishing Co. (P) Ltd., New Delhi.

Baba S.H., M.H. Wani, S.A. Wani and Yousuf Shahid (2010). Marketed surplus and price spread of vegetables in Kashmir valley. Agril. Econ. Res. Rev., 23 (10): 115-128.

Dhaka and Poonia (2010). Identification of constraints encountered by the farmers in production and marketing of vegetables in Bundi district of Rajasthan. Ind. Jour. Agril. Mktg., 24 (1): 20-25.

Government of Rajasthan (2009) Rajasthan Horticulture Statistics, Directorate of Horticulture, Pant Krishi Bhawan, Jaipur (Various issues)

Kaur, H. and I.P. Singh (2010). Marketing of kinnow in Sri Ganganagar district of Rajasthan state. Ind. Jour. Agril. Mktg., 24 (1): 141-149.

Saraswat S.P., Prem Singh Dahia, and Pratap Singh (2006). Production and marketing of peach fruit: A case study of Rajgarh area of district Sirmour in Himachal Ptradesh. Ind. Jour. Agril. Mktg., 20 (2): 81-91.

Tripathi, A.K., Subhasis Mandal, K.K. Datta and M. R. Verma (2006). A study on marketing of ginger in RI – BHOI district of Meghalaya. Ind. Jour. Agril. Mktg., 20 (2): 106-116.

Singh, Ram, D.K. Bishnoi and Abhey Singh (2010). Cost benefit analysis and marketing of mushroom in Haryana. Agril. Econ. Res. Rev., 23 (10): 115-128.

Data sites for NCAP study

Fruit/ Vegetable	District	Tehsils	Hamlets/ Villages
Kinnow	Sriganganagar	Sriganganagar	CHAK 9 Q, CHAK 10 Q, CHAK 11 Q, CHAK 10 F, CHAK 8 H (BARA), CHAK 1 H (BARA) MADERAN,Bakhtana, Sangatpura, Mirjawala, Santpur, FATUI, 12 EE, 1 G (BARI), 6 ZA, 1Z1, 4 Z, Chak 3 H (BARA), 8 HH, 5 ML, Netawala
		Karanpur	CHAK 16H, CHAK 17 H, CHAK 18 H, CHAK 19 H, CHAK 24 H, CHAK 26 H, CHAK 31 H, CHAK 2 U, CHAK 23 F, CHAK 2 W, CHAK 3 “O”, CHAK 5 “U”, CHAK 5 “O”,CHAK 2 T JODHAWALA, CHAK 3 W, CHAK 2 M, CHAK 35 F, CHAK 5 Z,

			DALPATSINGHPUR, CHAK 2 M FUSAWALA, CHAK 5 Z
Carrot	Sriganganagar	Sriganganagar	Sadhuwali, Chak 2 D CHHOTI, Chak 3 D CHHOTI, Chak 4 D CHHoTI, Kaluwala 1 ML, 6 LNP, Kundalawala
Aonla	Jaipur	Chomu	Hathnoda, Morija
		Aamer	Achrol, Tala, Tola
Tomato	Jaipur	Chomu	Cheetwari, Hathnoda, Harota, Morija
		Aamer	Isarwala, Pokhiriyawala

Bibliography

Acharya, S.S. and Agarwal, N.L. (1999) Agriculture Marketing in India, Oxford & IBH publishing Co. Pvt. Ltd., New Delhi

Ashturker, B.M. and Deole, C.D. (1985) Producers' Share in Consumers Rupee: A Case Study of Fruit marketing in Marathwada, *Indian Journal of Agricultural Economics*, 40: 3

Chole, V.M., Talathi, J.M. and Naik, V.G. (2003) Price Spread in Marketing of Brinjal in Maharashtra State, *Agricultural Marketing*, 45 (3):5-7

G. Sunil Kumar Babu, Sri Hari Naidu and Y. Eswara Prasad (2003) Price Spread and Marketing of Green Chillies – A case Study in Andhra Pradesh, *Agricultural Marketing*, 45 (3):21-23

Gadre, A.V., Talathi, J.M. and Wadkar, S.S. (2002) Price Spread in Marketing of White Onion in Raigad District of Maharashtra State, *Agricultural Marketing*, 44 (4):22-25

Gangwari, L.S. and Singh, S. (1999) Marketing of Nagpur Mandarins: A case study of Nagpur District of Maharashtra, *Agricultural Marketing*, 41 (1):18-20

Garg, J.S. and Misra, J.P. (1996). Costs and Margins in the Marketing of Vegetables in Kanpur, *Agricultural Marketing*, 8:2

Gogoi, M. (1978) Marketing of Orange in Dibrugarh District – A Case Study (Unpublished M.Sc. Thesis), Department of Agricultural Economics, AAU, Jorhat.

Goswami, S.M. (1991) Price Spread of Tomato in a Vegetable Market of Kamrup District Assam, *Agricultural Marketing*, 33(4):13-16

Goswami, S.N. and Singh, S.B. (2000) Problems and Prospects of Marketing of Horticultural Crops in North-East India, *Agricultural Marketing*, 42 (2):23-26

Goyal, S.K. (1999) Economics of Rose Cultivation and its marketing in Sonepat District of Haryana State, *Indian Journal of Agricultural Marketing*, 13(3):44-51

Saikia, T.N. (1985) Price Structure of Pineapple: A Study in Meghalaya, Indian Journal of *Agricultural Economics*, 40:3

Shapoo, J.A. and Banerjee, B.N. (2003) Economics of Apple Trade in Anantnag District of Jammu and Kashmir, *Agricultural Marketing*, 45 (3):36-39

Singh, M. (1985) Price Spread of Vegetables Marketing, *Indian Journal of Agricultural Economics*, 40:3

Singh, R. (1988) A Study of Marketing of Pineapple in Central District of Manipur (Unpublished M.Sc. Thesis), Department of Agricultural Economics, AAU, Jorhat.

Subbanarasaiah, N. (1991) Marketing of Horticultural Crops in India, Anmol Publishing Co., Delhi.

ZOPAR Export Pvt. Ltd. (www.zopar.in)

Bibliography

Government of Punjab, Statistical Abstract- Various issues

Shergill, H.S. (1998), Rural credit and indebtedness in Punjab, Monograph Series-IV, Institute for Development and Communication, Chandigarh, pp 1-95.

Shergill, H.S. (2010), Growth of farm debt in Punjab- 1997 to 2008, Institute for Development and Communication, Chandigarh, pp 1-92.