

**BUSINESS PROFITABILITY OF
CORIANDER PRODUCTION AND
MARKETING - A CASE STUDY OF
KOTA DISTRICT OF RAJASTHAN
STATE**

BHIM SINGH NAGAR

B.Sc. (Ag.)

MASTER OF BUSINESS ADMINISTRATION

(AGRIBUSINESS MANAGEMENT)



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PRODUCTION AND MARKETING - A CASE
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BY

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B.Sc. (Ag.)

**PROJECT REPORT SUBMITTED TO THE ACHARYA N. G. RANGA
AGRICULTURAL UNIVERSITY IN PARTIAL FULFILMENT
OF THE REQUIREMENTS FOR THE AWARD OF THE
DEGREE OF**

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CHAIRPERSON: Dr. SEEMA



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2013

DECLARATION

I, **BHIM SINGH NAGAR** hereby declare that the project report entitled “**BUSINESS PROFITABILITY OF CORIANDER PRODUCTION AND MARKETING - A CASE STUDY OF KOTA DISTRICT OF RAJASTHAN STATE**” Submitted to the **Acharya N.G. Ranga Agricultural University** for the degree of **Master of Business Administration** is the result of the original work done by me. I also declare that no material contained in the project report has been published earlier in any manner.

Place: Hyderabad

(BHIM SINGH NAGAR)

Date:

I. D. No. RMBA/11- 05

CERTIFICATE

Mr. BHIM SINGH NAGAR has satisfactorily prosecuted the course of project and that the report entitled “**BUSINESS PROFITABILITY OF CORIANDER PRODUCTION AND MARKETING - A CASE STUDY OF KOTA DISTRICT OF RAJASTHAN STATE**” submitted is the result of original work and is of sufficiently high standard to warrant its presentation to the examination. I also certify that neither the project report nor its part thereof has been previously submitted by him for a degree of any University.

Date:

Chairperson

(Dr. SEEMA)

CERTIFICATE

This is to certify that the project report entitled “**BUSINESS PROFITABILITY OF CORIANDER PRODUCTION AND MARKETING - A CASE STUDY OF KOTA DISTRICT OF RAJASTHAN STATE**” submitted in partial fulfilment of the requirements for the degree of ‘Master of Business Administration in Agribusiness Management’ of the Acharya N. G. Ranga Agricultural University, Hyderabad is a record of the bonafide original work carried out by **Mr. BHIM SINGH NAGAR** under our guidance and supervision.

No part of the project report has been submitted by the student for any other degree or diploma. The published part and all assistance received during the course of investigations have been duly acknowledged by the author of the project report.

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SYMBOLS AND ABBREVIATIONS

%	:	Per cent
⁰ C	:	Degree Celsius
CGR	:	Compound Growth Rate
Dept	:	Department
<i>et al.</i>	:	and other people
Fig.	:	Figure
ha	:	Hectare
ICAR	:	Indian Council of Agricultural Research
Kg	:	Kilogram
Km ²	:	Square Kilometer
MT	:	Metric Tonnes
NHRDF	:	National Horticultural Research and Development Foundation
No.	:	Number
R & D	:	Research and Development
R.B.Q	:	Rank Based Quotient
Rs.	:	Rupees
SAU's	:	State Agricultural Universities
Sl. No.	:	Serial Number
viz	:	Namely
w.r.t.	:	With respect to

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ABSTRACT

Coriander (*Coriandrum sativum*) is dominant and highly valued spice grown in India which originated from Mediterranean countries. India is the largest producer of coriander in the world. Presently in India, coriander is cultivated in an area of about 562 thousand hectares with a total production of 530 thousand tonnes and productivity of 943 Kg/ hectare. Rajasthan produces nearly 56.00 per cent of total coriander of the country with 46.72 per cent of the area under cultivation. It is cultivated in an area of about 262.83 thousand hectares with a total production of 329.40 thousand tonnes and productivity of 1229 Kg/ hectare (<http://www.agricoop.nic.in> 2012). It is mainly cultivated in Kota, Baran, Bundi and Jhalawar district of Rajasthan. Coriander is a short duration crop and sowing starts in the middle of October and extends upto November- end and harvested from February to March-end. The main states cultivating coriander are Rajasthan, Gujarat, Andhra Pradesh, Madhya Pradesh, Tamil Nadu and Karnataka.

The study was conducted in Kota districts of Rajasthan with the following objectives

1. To study the pattern of growth in area, production and productivity of coriander in Kota district of Rajasthan state.
2. To estimate the costs and returns in coriander production in Kota district.
3. To identify the marketing channels and marketing efficiency involved in coriander marketing.
4. To identify the problems faced by the growers in production and marketing of coriander.

About 120 coriander growers and 30 market intermediaries were selected from three blocks viz. Ramgangmandi, Ladpura and Sangod. The information on area, production and

productivity was collected from the secondary source. Primary data on production and marketing was collected from the farmers and intermediaries. The results of the study showed that compound growth rate of area, production and productivity of Kota district during the period of 2002-03 to 2011-12 was 6.72, 7.05 and -0.52 per cent respectively. Cost of cultivation per hectare for overall farms was Rs. 54131.09 of which the variable cost was Rs. 21754.43 and the fixed cost was Rs. 23376.41. The gross and net returns obtained were Rs. 75266.02 and Rs. 29925.56 respectively. Four channels of marketing were identified, which are

Channel I Producer – Commission agent - Wholesaler – Retailer - Consumer

Channel II Producer – Commission agent cum wholesaler – Retailer – Consumer

Channel III Producer – Retailer – Consumer

Channel IV Producer – Consumer

The producers share in consumer's rupee in channel IV is the highest since it is the shortest channel (97.89 per cent). Whereas the producers share in consumer's rupee in channel I, II and III are 83.28 per cent, 84.37 per cent and 83.53 per cent respectively. The Marketing Efficiency Index of channel I, II, III and IV was 4.98, 5.40, 5.074 and 46.51 in the same order indicating the superiority of channel IV. The RBQ value with regard to the constraints in production placed labour shortage during the peak season of harvest as most important problem followed by high irrigation charges, lack of institutional credit, high cost of fertilizer, yield fluctuations due to climatic changes and high post harvest losses. The R.B.Q values with regard to the constraints in marketing placed price fluctuation of coriander as the most important followed by absence of markets at accessible distance, high transportation cost, lack of timely market information, lack of organized marketing, lack of infrastructure and value of quantity lost. The study suggested an overall improvement in providing market information, better infrastructure, improvement in the quality of produce for increasing the farmers income.

Chapter I

INTRODUCTION

The varied agro-climatic conditions of India provide ample scope for cultivation of as many as 63 different spices since ancient times. On this account, India is known as the 'Land of Spices'. A look at the distribution of spice crops in India shows the tropical southern states owe the credit of producing the important spices like pepper, clove and cardamom. These states together produce 30 per cent and 25-30 per cent world production in cardamom and pepper respectively. On the other hand, in the dry and arid climate of Gujarat and Rajasthan, the spices like cumin, coriander, fennel and fenugreek are cultivated in large scale. These states supply 80 per cent and 90 per cent of world's requirement in respect of coriander and cumin respectively.

Major spice producing states are Andhra Pradesh (19.0%) 1.13 million tonnes, Gujarat (15.0%) 0.89 million tonnes, Rajasthan (14.7%) 0.85 million tonnes, Karnataka (8.0%) 0.47 million tonnes, Madhya Pradesh (7.7%) 0.46 million tonnes, Tamil Nadu (7.0%) 0.42 million tonnes and Uttar Pradesh (5.1%) 0.31 million tonnes. The spice production in India is currently estimated at 5.95 million tonnes from an area of about 3.21 million ha. (Source: Spice Board of India, 2011-12)

The production of spices in the country has registered a substantial increase over the last ten years with average annual growth of 5.8%. Chilly is the major spice crop occupying about 25% of area under cultivation and contributing 22% of total spice production in the country. Garlic accounts for 8.0% of area with 21.0% share in production, while turmeric accounts for 6.8% of area with 19.6% share in production, coriander account for 5.62 lakh hectares with production of 5.30 lakh tonnes (Source: National Horticulture Board 2011-12).

Spices are aromatic vegetable products, usually dried and used for seasoning and preserving foodstuff. They play a very important part in the human diet by giving an agreeable flavor and aroma to food and add quality to the pleasure of eating. Spices are used as flavoring agents in beverages, active ingredients in Ayurvedic medicines, coloring agents in textiles and are important constituents in cosmetic and perfume products. From ancient times, spices are used for sacred offering in social and religious ceremonies.

The important spices, which occupy a sizeable area, are black pepper, cardamom, ginger, chilly, clove, coriander, cumin, fennel, fenugreek, ajwain, suva, kalajeera, celery, garlic, turmeric and saffron *etc.* Out of these, the cumin, coriander, kalajeera, fennel, fenugreek, ajwain and suva are classified as seed spices. The seed spices are mainly cultivated in Rajasthan and Gujarat with a sizeable acreage in Madhya Pradesh Haryana, Punjab, Uttar Pradesh, Andhra Pradesh and Bihar. Rajasthan and Gujarat are called as “Seed Spice Bowl of India”, accounting for 80 per cent share of the total seed spice production.

The total estimated export of Spices from the country during 2011-12 has crossed US\$ 2000 million mark. During this period a total of 5, 75,270 tons of spices and spice products valued at Rs. 9783.42 crores (US\$ 2037.76 Million) has been exported as against 5, 25,750 tons valued at Rs. 6840.70 crores (US\$ 1502.85 Million) in 2010-11, registering an increase of 9% in quantity and 43% in rupee terms of value. The increase in dollar terms over the previous year is 36%. The total export of Spices during 2011-12 has also exceeded the target in terms of both quantity and value. Compared to the target fixed of 5,00,000 tons valued Rs. 6500.00 crore (US\$ 1450 million) for the financial year 2011-12, the achievement was 115% in terms of quantity and 151 % in rupee and 141% in dollar terms. During this period, the achievement in export earning was high mainly due to the rigorous focus and initiatives taken by the Board for Value Addition and Higher End Processing of Spices. The better unit price of most of the spices during the year also helped in achieving the all time record in the export earnings. (Source: Spice Board of India, 2011-12).

The seed spices occupy prominent place in the total basket of spices of the country and play a significant role in our national economy. The group of spices account for about 37 per cent and 18 per cent of the total area and production of spices in the country, respectively. About 3.21 lakh ha area is under cultivation of seed spices in the country out of which major share that is about 46 per cent is covered in Rajasthan alone. The total annual production of seed spices in the country is around 5.95 million tonnes (2011-12), of which Rajasthan state alone produces 2,34,584 tonnes (2011-12) of seed spices. (Source: Spices Board of India 2011-12).

Table: 1 Area, Production and Productivity of Seed Spices in Rajasthan (2011 –12).

S. No.	Seed spices	Area (ha)	Production (tones)	Productivity (kg/ha)
1.	Coriander	57744	83377	1446
2.	Fenugreek	40490	47222	1166
3.	Cumin	149816	8578	603
4.	Ajwain	14218	23666	1579
	Total	315569	234584	743

Sources: Vital Agriculture Statistics (2011 – 12), Dept. of Agriculture, GOR, Jaipur.

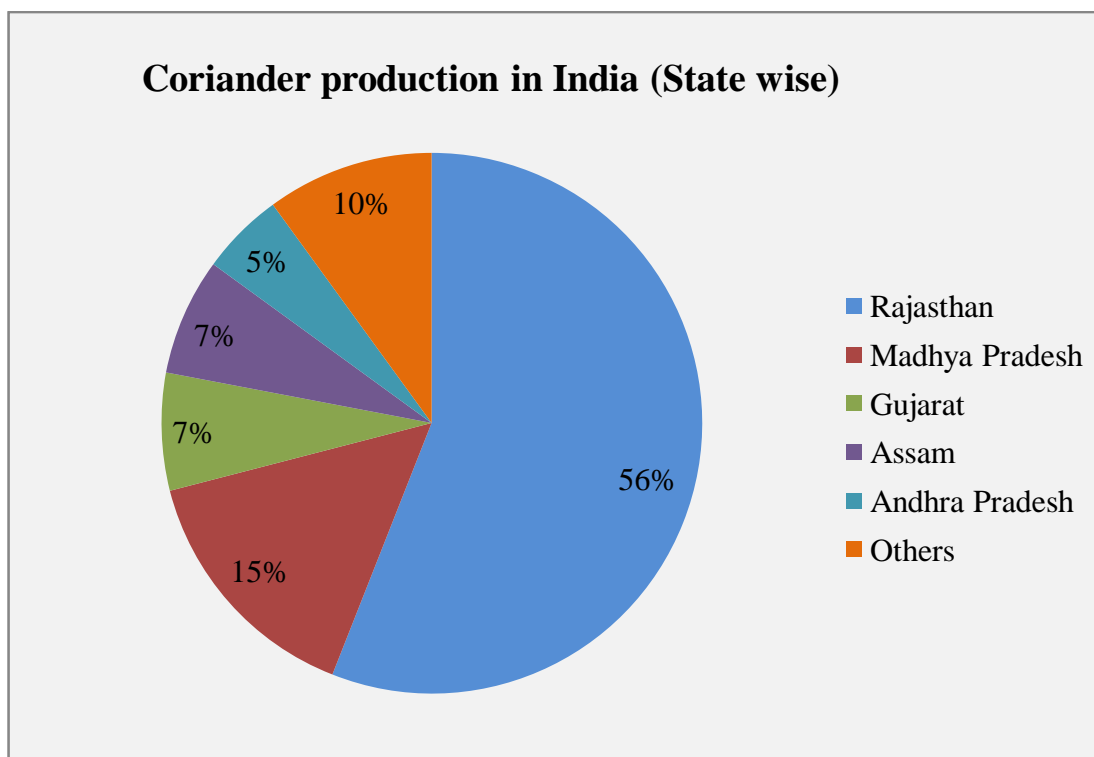
Coriander (*Coriandrum sativum* L.) commonly known as “Dania” is a dominant and highly valued spice grown in India. Coriander is believed to be a native of Mediterranean countries. Coriander belongs to *Umbelliferae* family. It is the probably the first spice to be used by men as common flavoring substance. Fresh leaves and fruits of coriander have pleasant aromatic order and are used in preparing chutneys and sauces and also for flavoring curries and soups and various food preparations including baker’s products. Coriander has a medicinal value. Good quality oleoresin can be extracted from coriander seeds, which is used for flavoring beverages, pickles and sweets. The dry grains are extensively used in preparation of curry powder, pickling spices and seasoning. The aromatic odor and taste of coriander fruits is due to an essential oil, which is made up of hydrocarbon and oxygenated compounds. The major oxygenated compound present is corianderol alerpane tiartary alcohol. Besides the essential oil, the seed contains 16.1 percent fatty acid, 14.1 per cent protein, 21.6 per cent carbohydrate, 32.6 per cent fibre, 11.2 per cent moisture, and 4.4 per cent mineral matter.

Coriander is mainly a rabi crop in India and sowing starts in the middle of October and extends until November-end. Coriander crop requires a cool climate during the growth stages and warm dry climate at maturity. It can be cultivated in most types of soils, but well-drained loamy soil suits the crop well. Suitable pH ranges are from 4.5 to 8.0, with an optimum of 6.3. Although the crop is heat loving, it has an optimum growing temperature

of 18° C. Crop climates, high altitudes may lead to superior quality seed and higher essential oil content.

The crop requires 4-6 irrigations. The sowing of coriander starts post the harvesting of these without much land preparation. The moisture content in the soil left over after harvesting of kharif crop determines the sowing pattern of coriander. Crop duration of coriander is about 110-140 days. Seeds turn a yellowish – green after maturity when the crop is harvested and dried in the shed to retain the green colour and aroma.

Coriander is a short duration crop and gives high return to the farmers. In India coriander is cultivated over an area of 5.30 lakh hectare with the production of 5.62 lakh tones and productivity of 943 kg/ha. The main states cultivating coriander are Rajasthan, Gujarat, Andhra Pradesh, Madhya Pradesh, Tamil Nadu and Karnataka. Rajasthan contributes around 56 per cent of the national production.



(Source: <http://agricoop.nic.in> Year 2012)

The major coriander producing districts of Rajasthan are Jhalawar, Baran, Kota, Chittorgarh and Bundi. Kota region contributes nearly 96 per cent of area and production of coriander crop in Rajasthan. Coriander is sown in the month of October –November and

harvested from February to March. Farmers usually grow local non-descript varieties without following recommended package of practices.

The production of coriander fluctuates widely between years which varied from less than 2 lakh tones to 4 lakh tones in 2002-2012. Official estimates of area and production in 2011- 12 is 5.62 lakh tones and area under cultivation is 5.30 lakh hectares. (Source: Spice Board of India 2011-12)

India is the largest exporter of coriander in the world. The total world trade of coriander is about 52000 tonnes to 1.0 lac tones. India annually exports around 25,000 – 30,000 tonnes of coriander. India exported 28,100 tons of coriander in 2011-12 as against 40,000 tons in 2010-11, down by about 30 percent. Export target set for the financial year 2012-13 is set at 35,000 tonnes. The major buyers are Malaysia (7050 tonnes), UAE (5450 tonnes), Pakistan (3215 tonnes) and Saudi Arabia (2475tonnes). The major domestic buyer of coriander seed in India are spices processing agencies, which are mostly located in the southern states of India and Delhi. Marketing of coriander plays an important role in the economy of a producer farmer.

This study has examined various economic aspects of coriander such as assessment of growth rate, costs and returns, price spread, marketing cost and margins, marketing channels involved and problems faced by the farmers.

1.2 OBJECTIVES

1. To study the pattern of growth in area, production and productivity of coriander in Kota district of Rajasthan state.
2. To estimate the costs and returns in coriander production in Kota district.
3. To identify the marketing channels and marketing efficiency involved in coriander marketing.
4. To identify the problems faced by the growers in production and marketing of coriander.

1.3 SCOPE OF THE STUDY

The study provides information on the production, marketing channels efficiency and constraints involved. This information is useful to the farmers, intermediaries, researchers and policy makers to take suitable steps to improve the profitability of the enterprise. The findings of the study will be useful to the coriander growers to identify the present pattern of production and marketing of coriander seed and to enable them to make decision to overcome the loopholes in the marketing system of coriander in the study area. A marketing system has to be efficient with low price spread and better returns to the producer. The present study also attempted to estimate the cost of cultivation and profitability of coriander. On the basis of marketing cost, market margin, the share of consumer rupee by different marketing functionaries can be assessed.

1.4 LIMITATION OF THE STUDY

Research conducted by a single person is always confronted with various bottlenecks and the present study is not the exception to these limitations. One of the most important limitations of the study was that it confined to a particular agro-climatic and agro- economic region and hence conclusions drawn are applicable to the area and areas with similar conditions only. Therefore, the extent of generalization has to be cautiously made. Secondly, the data is collected through survey method by interviewing farmers and intermediaries. Therefore, the objective of data is limited to the extent that the farmers are able to sum up from their memory, as they do not maintain any records. However all care has been taken to get reliable data from informants. Due to fluctuation in the price of coriander, the different price during the study period has been taken for the collection of price spread, margins and marketing efficiencies. Hence it could be considered as one of the limitation of the study. The study is also confronted with the constraints of limitation of time, sample size and resources at the disposal of investigator.

1.5 STRUCTURE OF THE PROJECT REPORT

The study is presented in five chapters as follows.

- I. Introduction:** The importance of the study, problem setting and objectives are covered.
- II. Review of Literature:** The available and relevant literature is thoroughly reviewed.
- III. Material and Methods:** The method and materials encompassing sampling, data collection, analytical tools, and method of evaluation are explained.
- IV. Result and Discussion:** The result and discussion covering the important aspects such as area, production and productivity of coriander, its cost of cultivation, profitability, marketing channels and price spread are presented.
- V. Summary and Conclusions:** The result of the study are summarized, conclusions and suggestions are drawn.

Chapter II

REVIEW OF LITERATURE

For any investigation, the findings of earlier studies may possibly give insight of the problem and sets direction for the research. An extensive survey of literature was undertaken in order to have an understanding of various concepts related to the problem concerned, interpretation of findings of the study and the limitations. Careful analysis of the earlier studies conducted in India and abroad on production and marketing provides guidance and clarity while conducting the research study. In this chapter an attempt has been made to review the literature of the past research work relevant to the present study. The review has been presented under the following heads.

2.1 Studies related to trend in area, production and productivity.

2.2 Studies related to cost and return.

2.3 Studies related to marketing channels and marketing efficiency.

2.4 Studies related to problems in production and marketing of agricultural produce.

2.1 Studies related to trend in area, production and productivity

Burark *et al.* (2011) analyzed the price of coriander in the Kota regulated market of Rajasthan. Monthly time series data on wholesale prices of coriander for the period 2000 to 2010 were collected and used to calculate price forecast with the help of an Autoregressive Integrated Moving Average (ARIMA) model. They concluded that marketing information and intelligence are crucial to enable farmers and traders to make informal decisions about what to grow, when to harvest, to which markets produce should be sent to sell and whether to store or not.

Khunt *et al.* (2008) studied export potential and barriers of onion in Gujarat and found that area, production and yield is growing positively at compound growth rate of 3.50 per cent, 3.35 per cent, and 0.15 per cent respectively indicating assurance of onion supply for export as well as for sustaining fast growing onion dehydration industries of the state. The export of fresh onion from India is highly concentrated in its neighbouring countries and middle East. Though European countries as well as U.S.A were found highly

competitive for export, the quantity exported to these countries is very small. So, there is a need to divert onion export from less competitive countries to most competitive ones.

Malik *et al.* (2008) analyzed the annual Compound Growth Rate of vegetable production in Haryana, for the period 2000-01 to 2007-08. Study revealed that the annual Compound Growth Rates of area, production and yield were 11.44, 13.38 and 1.74% for onion; 9.32, 7.27 and -1.88% for tomato; 14.52, 21.09 and 5.74% for cauliflower; 19.97, 14.23 and 2.94% for chillies; 6.69, 7.38 and 0.64% for okra and 2.82, -0.87, and -3.60% for potato, respectively. Overall, the annual growth rate for vegetable crops in the state was positive.

Sharma (2007) conducted a study on area, production and productivity of vegetable crops in North West Himalayan Region. He found that the increase in production and productivity was higher than increase in area. The area, production and productivity of vegetable crops recorded a significant growth. However, growth in production (7.51%) and productivity (4.65%) was found higher as compared to area (2.85%). The results highlighted the fact about comparative advantage of growing vegetable crops on account of its varied agro-climatic conditions.

Thumar *et al.* (2006) in their study on growth and instability in production and export marketing of garlic in Gujarat found that the area and production under garlic increased in the state but with high instability across the garlic growing district. The rate of increase in productivity registered lower and relatively more stable growth rate compared to area and production indicating that area is the main source of increasing garlic production in the state.

Mathur and Henry (2005) studied the trend in area, production and productivity of cluster bean for long-term period (1976-2000) and recent period (1991-2002) for arid Rajasthan, Rajasthan state and for the whole country. The Compound Growth Rate (CGR) for area in arid Rajasthan and Rajasthan state had an increasing trend on long term basis, but a decreasing trend on all India basis. In recent years, area under the crop revealed an increasing trend in arid Rajasthan and all India basis, but a decreasing trend in Rajasthan state. CGR for production and productivity had a decreasing trend in both arid Rajasthan and Rajasthan state. On all India basis, these indicated a positive trend both on long-term and recent years basis. The total mean production on all-India basis was 7.3 lakh tones, out

of which arid Rajasthan contributed 51%, and whole Rajasthan contribution was 67% on the long-term basis. CGR for guar gum quantity and foreign exchange earnings revealed a significant positive growth trend.

Kumar *et al.* (2004) studied the decade-wise growth trends of vegetables production in India. They observed that in 1980, vegetables production increased at an annual rate of about 4 per cent, which rose to about 5 per cent during the 1990s. Both area expansion and yield increase contributed to this growth, although the contribution of yield slowed down during the 1990s. The growth in the yield of total vegetables decelerated from about 2 per cent in 1980s to 1.50 per cent during the 1990s.

Hiremath (1994) studied growth rates for dry chillies in Dharwad district and found that the growth rate with respect to area was higher (5.9%) closely followed by production (5.18%) and productivity (0.011%). All these parameters showed positive growth rate with respect to dry chillies in Dharwad district.

2.2 Studies related to costs and returns

Hasan *et al.* (2010) conducted study on production of four important garlic growing upzila named Khanshama under Dinajpur, Gurudaspur and Baraigram under Natore and Puthia upazila under Rajshahi district to generate information of present status, profitability and potentiality of garlic production in Bangladesh. The average yield of garlic was about 4505 kg/ha. By introducing the improved varieties of garlic to the farmers field, yield has been increasing from 2002-2003. Garlic growers received on an average Taka 1,79,997/ha as net return. The Benefit Cost Ratio (1.85) indicated that garlic cultivation was profitable. The study also showed that there is a huge potentiality to increase yield by 14-33% and income of this crop by using recommended technology.

Bera and Moktan (2006) studied the economics of ginger cultivation in the hill region of West Bengal. The result of this survey work showed that this crop could provide a net return of Rs. 22245.05 per acre with a Benefit Cost Ratio of 2.21, which is much higher than traditionally grown alternative annual crops or crop combinations grown under same land situation.

Singh *et al.* (2006) examined the cost and returns of production and marketing of cauliflower and garlic in Durg district of Chattisgarh, India. They collected data from a

sample of 120 garlic growers and 35 retailers. The average cost of cultivation per hectare was estimated at Rs. 25228.57 while average gross return per hectare was Rs. 48516.20. The Benefit Cost Ratio (BCR) was found to increase with decrease in farm size.

Tripathi *et al.* (2005) conducted study to determine the economics and problems encountered by growers (n=80) of aubergines and other seasonal vegetables with different size of holdings in Vindhyan and Bundelkhand areas of Uttar Pradesh in the year of 2002-03. It was found that the overall cost of cultivation and gross return were Rs. 26 199.68 and 53 081.25 per hectare resulting in a net return of Rs. 26 881.57 per hectare. The input-output ratio was 1:2.01. However, the cost, return and input-output ratio varied significantly on different size of holdings, 1:1.9 on large holdings and 1:2.06 on marginal holdings. The low input-output ratio on large holdings could be attributed to the low yield of 187.00 qtl/ha, relative to higher yield on marginal holdings (195.47 qt/ha). This accounts for the higher production cost of aubergines on large farms Rs. 142.76 qt/ha compared to marginal holdings with Rs. 135.34 qt/ha. It is concluded that aubergines production is highly remunerative for farmers, though it has high cost.

Lokesh *et al.* (2004) studied on economics of production, marketing and processing of turmeric in Karnataka. They found that Karnataka is one of the major turmeric growing states and Chamarajanagar district produces 50 percent of the state's output. The Net Benefit Cost Ratio is 1.06 and 1.29 at price of Rs. 2200 and Rs. 2360 per quintal at a cost of production of Rs. 956 and Rs. 1141 per quintal of local and improved varieties of turmeric rhizome.

Anwarul and Fatimah (2004) studied on technical efficiency of chilli production in Rajshahi district of Bangladesh. They revealed that cultivation of chilli is highly profitable and the net returns against cultivating of chilli was Taka 73,164/ ha while the Benefit Cost Ratio (BCR) was 1.93. They concluded that 23% technical inefficiency appears which implies that the output per farm can be increased on an average by 23% through chilli production using the prevailing technology and without incurring any additional production cost.

Chandrasekhar (2001) studied on production and marketing of onion in Kurnool district of Andhra Pradesh. He found that the total cost of cultivation of onion per hectare worked out to Rs.33049.55, Rs.36282.84 and Rs.34907.88 on small, large and pooled

farms. The income measures viz., gross, net, farm business, family labour and farm investment incomes were higher on large farms compared to small farms. The returns per rupee of investment were Rs.0.39, Rs.0.47 and Rs.0.42 on the corresponding farms respectively.

Prabhavathamma (2000) studied on economics of production and marketing of chillies in Cuddapah district of Andhra Pradesh and analyzed the cost of cultivation of green and dry chillies per hectare on pooled farms which worked out to Rs.51,287.81 and Rs.53,625.58 respectively. Human labour, manures and fertilizers, plant protection chemicals and bullock labour use were the major items of cost of cultivation of green and dry chillies and showed negative relationship with the farm size. The net returns from dry chillies production were Rs.42,993.94 for the sample as a whole compared to Rs.14,232.61 per hectare from green chillies. The Benefit Cost Ratio was 0.28 and 0.80 in green and dry chillies respectively.

Patil *et al.* (1999) studied on estimating the scale of finance and cost of cultivation for selected vegetable crops in Bijapur district of Bihar. They observed that the cost cultivation was Rs.2,372.18, Rs.1,954.88, Rs.2,684.99 and Rs.3,299.64 per acre of tomato, brinjal, onion and chilli respectively. The study also revealed that per acre gross returns worked out to Rs.4,531.61, Rs.2,578.68, Rs.6,749.63 and Rs.4,200 respectively in the same order, thus establishing the fact that the cultivation of onion was more profitable compared to other vegetables. The returns per acre of investment worked out to 2.51, 1.91, 1.40 and 1.27 for onion, tomato, brinjal and chillies respectively which were on par with any other field crops.

2.3 Studies related to marketing channels and marketing efficiency

Reddy *et al.* (2010) in their study on value chain and retailing of fresh vegetables and fruits in Andhra Pradesh has revealed that the number of channels is less in modern retailing than in the traditional retailing. Vertical analysis between the two chains has also indicated the same results. In the case of vertical distribution in the traditional value chain, 19.8 per cent of the gross value goes to farmers, 11.3 per cent goes to village merchant, 14.3 per cent goes to middlemen, 15.3 per cent goes to wholesalers, 12.0 percent goes to commission agent, 16.8 per cent goes to middle men, 10.8 per cent goes to traditional retailers.

Birari *et al.* (2010) conducted survey among 180 vegetable growers in Western Maharashtra, to study the channels, costs, margins and efficiency of marketing of cole vegetables (cabbage and cauliflower). Results showed that the most important channel in both the primary and terminal markets is the one involving a commission agent, a wholesaler and a retailer. Majority of the produce are sold in the terminal markets in both seasons (kharif and rabi) for the cole vegetables. The per quintal marketing cost for cabbage was highest in the terminal market during the rabi season (Rs. 70.49) and lowest in the primary market during the kharif season (Rs. 40.57), while the per quintal marketing cost for cauliflower was also highest in the terminal market during the rabi season (Rs. 72.57). The producers' share in consumer's rupee for cabbage was more than 50% in both the markets, while that for cauliflower was higher in the primary market for both seasons. The marketing efficiency for both cabbage and cauliflower indicate that these vegetables were not marketed efficiently.

Verma (2004) studied the economic analysis of production, resource-use efficiency, marketing and constraints of garlic in Indore district of Madhya Pradesh. He observed that the marketing of garlic was done mainly under three channels. Channel-I producer – consumer, channel-II producer – retailer – consumer and channel-III producer – wholesaler – retailer – consumer. He found that the producer received maximum share in consumer's rupee in channel-I (98.97 per cent) followed by channel-II (84.65 per cent) and channel-III (79.97 per cent). The highest share in consumer's rupee was obtained by the farmers in channel-I as there was no intermediary between producers and consumers.

Indra and Velan (2004) in their study on marketing of onion in Dindigul district of Tamilnadu observed that the major share of marketing expenses is the commission charges of commission agents forming 10 per cent of value of auction. Onion growers can group together to form association or co-operatives which can help the storage of excess production and marketing of onion by avoiding dependence on wholesalers and commission agents.

Shelke and Kalyankar (2000) studied the price spread in marketing of selected vegetables in New Monda market of Parbhani district of Maharashtra. He identified that the brinjal producers share in consumers rupee worked out to be 44.93 per cent while retailer's margin was 36.75 per cent and in tomato this share was 57.87 per cent and 12.30 per cent

respectively. In tomato, the producers share was highest and retailers share was lowest. Producers can be highly benefited and increase their share to 95.85 per cent from 55.35 in consumers price by selling their vegetables directly to consumers.

Mohapatra *et al.* (1999) studied the production and marketing of onion in Balangiri district of Orissa, identified three channels of marketing for onion viz., producer-consumer (channel I), producer-trader-consumer (channel II) and producer-trader-wholesaler-retailer-consumer (channel III). He concluded that the producer received maximum share of consumer's rupee in channel I (97.97%) followed by channel II (77.09%) and channel III (53.03%).

Singh and Singh (1999) studied the production and marketing of vegetables crops in Varanasi district, Uttar Pradesh. They observed that in channel I (producer – consumer) only 7 to 23 per cent of total surplus was sold and producer's share in consumer's rupee was 89 to 96 per cent. In channel II (producer-retailer-consumer) maximum proportion of products was disposed, ranging between 32 to 75.98 per cent. The producers share in consumer's rupee was found to be 68.50 to 83.60 per cent. In channel III (producer-wholesaler-retailer-consumer) only 17 to 33 per cent surplus was sold and the share of producer in consumer's rupee was between 62.70 to 73.15 per cent.

Vasudev and Chowdry (1999) identified two marketing channels which were predominant in marketing of tomato in three regions of Andhra Pradesh, viz., Channel-I: producer - commission agent - secondary wholesaler - retailer - consumer, Channel-II: producer - commission agent - primary wholesaler - retailer - consumer. The producer's share in consumer's rupee was found to be substantially higher in channel-I over channel-II in all the regions (Coastal Andhra, Rayalseema and Telangana) of Andhra Pradesh, indicating better efficiency of channel-I over channel-II.

Shiyani *et al.* (1998) studied on marketing of vegetables in south Saurashtra zone of Gujarat. They analyzed that the marketing cost incurred by the producers was highest in case of tomato (Rs.108.04/q) followed by chillies (Rs.101.84/q), brinjal (Rs.61.75/q) and cabbage (Rs.50.44/q). The total expenditure incurred at the retailer's level was the highest in case of tomato (Rs.139.76/q) and the producers share in consumer's rupee for tomato was 56.87 per cent.

Singh and Jagdish (1995) studied the components of vegetable marketing in Himachal Pradesh. They examined the marketing costs and margins for vegetables through a comparative study of 1990-91 with 1984-85. They observed that the vegetables growers are not getting what they should because the market intermediaries are getting a lot in the name of marketing costs and margins. The study showed that the producers share in consumer's rupee had declined which is mainly accounted for high cost of packing and grading and commission to market intermediaries. The study suggests that some alternative agencies be developed for sale of vegetables so that producers share in consumer's rupee can be increased.

2.4 Studies related to Problems related to production and marketing of agricultural produces

Hile *et al.* (2012) studied the problems in production and marketing of summer capsicum in Nasik district of Western Maharashtra during the year of 2009-10. The main constraints in production of capsicum faced by sample farmers were high cost of seeds and plant protection measures, inadequate irrigation and costly fertilizers. The main problems in marketing of capsicum faced by the growers were high cost of transportation, high commission charges, lack of awareness of market price and delay in payments. It was suggested that the cultivation of summer capsicum needs to be popularized among the farmers in Igatpuri tehsil for those who are having assured irrigation facilities in summer season.

Hnamte *et al.* (2012) studied on spices in the North Eastern States of India with special reference to production and marketing. They identified that a huge quantity of good quality spices are produced, but most of the growers during peak season sell their produce at throw away prices in the local market or to the commission agent. It was suggested that the need of the hour is to promote public-private partnership so that the production technology of important spices is taken to every nook and corner of this region. There is need to improve infrastructure extension network, focused research in order to harness the potentiality of this region for quality spice production. It is suggested to form farmers' organizations/co-operatives both at local level and at the regional level for better marketing of the produce.

Dhaka and Poonia (2010) studied the constraints in production and marketing of vegetables in Rajasthan. They revealed that the perishability of vegetables, small quantity of produce and price fluctuations were the major impediments in marketing. They used Rank Based Quotient (RBQ) to rank the constraints.

Moktan and Mukherjee (2008) study on trade and marketing strategy for spice crops in Darjeeling district, identified the production per unit area as low and major constraints for such low production were poor crop management and post-harvest management practices. Farmers are getting low value for their produce due to poor marketing strategy. There is no proper marketing and trade policy for spices. The marketing system is primitive and dominated by middleman, resulting into market imperfection, inefficiencies, exploitation and high post-harvest losses. Some suggestions given were creation of modern market infrastructure like bulk handling, cold storage, cheap and quick transportation, agro-processing and value added improvement in yield and quality of the products to capture the export market, direct sale and contract farming.

Ganga *et al.* (2007) studied the problems in production and marketing of henna in Pali district of Rajasthan. They identified the problems faced by the farmers and market functionaries in production and marketing of henna. They concluded that lack of irrigation facilities, poor quality of water, problems of intercultural operations, prevailing adverse weather conditions and lack of skilled and unskilled labour were the most important problems faced by the farmers. However the problem of storage, drying, spoilage, high fluctuation in prices and high cost of labour were also faced by the market functionaries.

Thakur *et al.* (1998) identified the problems encountered by the farmers in marketing of vegetables in Himachal Pradesh. The problems were unorganized marketing, low prices paid to farmers, lack of mechanical grading, packing, and proper storage facilities, malpractices, high and undue marketing margins and costs in markets, lack of village roads, lack of sufficient and low cost transportation facilities, lack of market information and market news and lack of processing units and cooperative societies.

CHAPTER III

MATERIAL AND METHODS

This chapter presents procedural details adopted in the selection of sample, mode of data collection and analytical technique employed besides description of the study area.

The same is presented under the following subheads

3.1 Description of the study area

3.2 Sample design

3.3 Collection of data

3.4 Method of computation

3.5 Tools of analysis

3.1 DESCRIPTION OF THE STUDY AREA

3.1.1 Location of the study area

The study was conducted in Kota district of Rajasthan. Kota, formerly known as *Kotah*, is a third biggest city in the North Indian state of Rajasthan after Jaipur and Jodhpur. The district lies between 24° 25' and 25° 51' latitude and 75° 37' and 77° 26' longitude. It is bounded on North and Northwest by Sawai Madhopur, Tonk and Bundi districts. The Chambal river separates these from Kota district and forms the natural boundary. The district is bounded by Jhalawar, and Mandisor district of M.P. on the South, Baran district on the East and Chittorgarh district of Rajasthan on the West. The maximum length of the district from North to South is 153 Kms and maximum width from East to West is 84 Kms. Kota has been identified as a counter-magnet city for the national capital region to attract migrants and develop as an alternative centre of growth to Delhi. The city is the trade centre for an area in which millet, wheat, rice, pulses, coriander and oilseeds are grown; industries include cotton and oilseed milling, textile weaving, distilling, dairying, manufacture of metal handicrafts, fertilizers, chemicals and engineering equipment. It is one of the principal cities of Rajasthan state.

The city of Kota is situated at a center of the Southeastern region of Rajasthan widely known as Hadoti the land of the Hadas. The historical places and temples are getting surrounded with signs of modern development. Kota is on a high sloping tableland forming a part of the Malwa Plateau. The Mokandarra hills run from Southeast to Northwest axis of the town. It is 36 km from Bundi. Apart from the several monuments that reflect the erstwhile glory of the town, Kota is also known for its palaces and gardens.

3.1.2. Geography and demographic features

It covers an area of 12,436 km² (3.63 per cent of the Rajasthan State). In Kota district, there are 5 subs - divisions Kota, Digod, Itawa, Sangod, and Ramganjmandi. Three divisions namely Ramgangmandi ranking first, Kota stands second and Sangod stands third in coriander production in the district. As of 2011, Kota had a population of 2680429 of which male and female are 1023153 and 927328 respectively. The sex ratio was 906 and 12.74% were under six years of age. The effective literacy rate was 83.65%, with male literacy at 90.56% and female literacy at 75.90%.

3.1.4. Climate and Rainfall

Kota has a semi arid climate with high temperatures throughout the year. Summers are long, hot and dry, starting in late March and lasting till the end of June. The monsoon season follows with comparatively lower temperatures, but with higher humidity and frequent, torrential downpours. The brief, mild winter starts in late November and lasts until the last week of February. Temperatures are between 26.7°C (max) to 12°C (min).

The average annual rainfall in the Kota district is 660.6 mm. Most of the rainfall can be attributed to the southwest monsoon which has its beginning around the last week of June and may last till mid-September. Pre-monsoon showers begin towards the middle of June with post-monsoon rains occasionally occurring in October. The winter is largely dry, although some rainfall does occur as a result of the Western disturbance passing over the region.

3.1.5 Soils

The district has three types of soils viz., deep black clay, deep brown clay, deep brown loamy clay soil. It is evident from the distribution of the soils in the district that deep black clay soil is most predominant in the district followed by deep brown clay.

Table 3.1. Salient Features of Kota District of Rajasthan.

Sl. No.	Particular	Year	Unit	statistics
1.	Geographical features			
	Geographical data			
	i) Latitude			24°25' to 25°51'
	ii) Longitude			75°37' to 77°26'
	iii) Geographical area		Hectares	5217 Sq. km
	Administrative units			
	i. Subdivisions			5
	ii. Tehsils			5
	iii. Sub- tehsils			3
	iv. Panchayat samitis			5
	v. Nagar nigam			1
	vi. Nagar palika			3
	vii. Gram panchayats			461
	viii. Revenue villages			791
	ix. Assembly area			6
2.	Population			
A.	Sex –wise			
	I Male	2011	Nos.	1023153
	II Female	2011	Nos.	927328
B.	Rural Population	2011	Nos.	729948

3.	Agriculture			
A.	Land utilization			
	I Total Area	2011-12	Hectare	521324
	II Forest Cover	2011-12	“	125941
	III Non Agriculture Land	2011-12	“	60278
	IV Cultivable Barren	2011-12	“	24809
4	Forest	2011-12	Hectare	125941
5.	Livestock & Poultry			
	Cattle			
	I. Cow	2011-12	Nos.	248349
	II. Buffaloes	2011-12	Nos.	226926

Source: (www.kota.nic.in2011-12)

3.1.6. Irrigation Facilities

The main sources of irrigation both in the district and selected thesils are canals, tanks and open wells. In addition, there are tube wells, lift irrigation and other sources of minor irrigation supplying water for cultivation of crops. About 45% of the net area sown was irrigated (2011-12). Net irrigated area in Kota district is 233900 hectare and rain fed area is 167100 hectare in Kota district. For coriander production 99 per cent area is irrigated.

3.1.7. Cropping Pattern

The principal crops grown in the district as well as tehsils chosen, are soybean, mustard, wheat, coriander, paddy, gram etc. The cropping pattern further reveals that soybean and wheat are important crops grown in the district.

3.2. SAMPLE DESIGN

A purposive cum random sampling technique was used for the selection of district, tehsils, villages and respondents.

3.2.1. Selection of the District

Kota district, one of the four important districts of Rajasthan known for the cultivation of coriander, with an area of 57744 ha and production of 83377 tonnes and productivity 14.44 quintals/ha (2011-12) was purposively chosen for the study. It occupies 16.3 per cent area under coriander cultivation.

3.2.2. Selection of Tehsils

A list of all the tehsils of the districts was prepared and arranged in the descending order on the magnitude of area under coriander. Three tehsils namely Ladpura, Ramgangmandi and Sangod were selected. Ramgangmandi rank first, Ladpura stands second and Sangod stand third in coriander production in Kota district.

3.2.3. Selection of Farmers

The entire villages in the selected tehsils were arranged in the descending order as per the area under coriander cultivation. The first four villages from each tehsil having maximum area under coriander were selected for the study. The selected villages were Suket, Bhavanimandi, Raipura, Pateda, Kisanpura, Aanvas, Chechak, Modak, Dhulat, Kanvas, Davali, Kamolara.

A list of all the coriander growers from the selected villages were prepared and the farmers were categorized into three size groups viz., small, marginal and large on the basis size of the operational holding as per the IRDP norms. Those farmers with less than 2 hectares of land were considered as marginal farmers and the farmers with 2-5 hectares were considered as small farmers and the farmers with more than 5 hectares were considered as large farmers.

From each of the villages, 10 farmers representing three different size groups were selected at random. Thus, 40 marginal, 40 small, 40 large farmers constituted the sample for the

study. The total sample was 120 farmers.



Kota District Map

Table 3.2. Particulars of Sample size of the Selected Farmers

Selected tehsils and villages	Marginal farmers	Small farmers	Large farmers	Total
1. Ladpura	13	14	13	40
a. Raipura	3	4	3	10
b. Pateda	4	3	3	10
c. Kisanpura	2	4	4	10
d. Aanvas	4	3	3	10
2. Ramgangmandi	15	13	12	40
a. Sukat	3	5	2	10
b. Bhavanimandi	4	2	4	10
c. Chechak	4	3	3	10
d. Modak	4	3	3	10
3. Sangod	12	13	15	40
a. Dhulat	3	4	3	10
b. Kanvas	3	2	5	10
c. Davli	4	3	3	10
d. Kamolara	2	4	4	10
Total	40	40	40	120

3.2.4. Selection of Market Intermediaries

The study also intended to study the market functionaries/intermediaries at various levels of marketing and their marketing efficiency. therefore 10 commission agents, 10 wholesalers, 10 retailers were also selected from the selected tehsils.

Marketing channels

The following four channels were identified in the study area for marketing of coriander:-

Channel I: Producer – commission agent – wholesaler – retailer – consumer.

Channel II: Producer - commission agent cum wholesaler - retailer – consumer.

Channel III: Producer – consumer – retailer.

Channel IV: Producer – consumer.

3.3. COLLECTION OF DATA

The data used in this study to fulfill the various objectives were collected with the help of structured pretested interview schedules, through survey method for the agriculture year 2011-12. The data on socio-economic profile, cost of cultivation aspects, returns etc. were collected. A separate schedule was designed to collect the information from the market intermediaries. The data on marketing cost for all the marketing channels in coriander marketing in the study area were also collected. Every effort was made at the time of interview to elicit accurate information by convincing the respondents that the study was undertaken purely for the research and not for any other purpose.

3.4. METHOD OF COMPUTATION

The economic analysis of coriander cultivation necessitates proper estimation of cost of input, input services and the valuation of output. The procedure followed in computing production cost of coriander is described below.

3.4.1. Human Labour

Human labour was quantified in terms of productive man work units (usually about 8 hours of productive work accomplished by a worker on the farm).

3.4.2. FYM

The cost of FYM per tonne was estimated on the basis of existing market price both for purchased and owned.

3.4.3. Fertilizers and Plant Protection Chemicals

Market prices was the basis to compute the cost of fertilizer and plant protection chemicals.

3.4.4. Transportation Cost

It varied according to distance and mode of transportation. The actual amount spent on transporting the material inputs from market to farm and output from farm to market was regarded as transportation cost.

3.4.5. Electricity Charges

The actual amount paid by the farmers toward electricity charges was considered and the same was apportioned as per acreage under the selected crop.

3.4.6. Interest on Working Capital

It was computed at the rate of 12.5 per cent (the rate at which financial institution advance short term loans) for the half of the amount for full crop period and for the remaining amount for full crop period since expenditure was incurred at different stages of crop production. Only explicit costs were considered for calculation of interest on working expenses.

3.4.7. Land Revenue

Land revenue actually paid by the farmers was considered.

3.4.8. Rental Value of Owned Land

It was charged at the prevailing lease rates for the selected crop enterprise.

3.4.9. Depreciation

Annual amount of the depreciation on machinery, equipment, implement and tools, farm buildings etc., owned by the responded was computed following the straight line method. Later it was apportioned based on acreage under coriander.

3.4.10. Interest on Fixed Capital

Interest on the value of fixed assets (excluding the value of land) such as implements, machinery, irrigation structures, livestock etc has been charged at the rate of 8 per cent.

3.4.11. Marketing Aspects of Coriander

The information pertaining to marketing aspects of coriander was collected from producers, village traders, commission agents, wholesalers and retailer with regard to the quantity sold/purchased, the price paid/received, expenditure on labour, transport, taxes and other incidental charges.

3.4.11.1. Wholesalers

The merchant middlemen who buy and sell agricultural commodities in large quantities. They may buy either directly from farmers or from other commission agents.

3.4.11.2. Commission Agent

The commission agents are the ones who act as an agent between farmer – producer and wholesalers in arranging the sales.

3.4.11.3. Retailers

Retailers buy goods from wholesalers and sell them to consumers in small quantities. Retailers are closest to consumers.

3.4.11.4. Marketing Costs

These include weighing, loading and unloading charges, commission, post harvest losses, cost of gunny bags, rent, taxes etc which were paid by the market functionaries per quintal.

3.4.11.5. Marketing Margins

Marketing margins are referred to as the net share to the different market intermediaries for a particular quantity of produce, after reducing marketing cost from gross marketing margin at each stage of marketing.

3.4.11.6. Price Spread

It was calculated by taking difference between the price paid by the consumer and price received by the producer for an equivalent quantity of farm produce.

3.4.11.7. Producer Share in Consumer's Rupee

It the price received by the producer as a percentage in the consumer's price.

3.5. TOOLS OF ANALYSIS

Both conventional and functional analysis was employed to analyze the data and to arrive at valid conclusions. Simple arithmetic averages and percentages were worked out to arrive at costs, returns and farm efficiency measures. Functional analysis was used to estimate the growth rates. Some of the tools used are as follows.

3.5.1. Growth rate

3.5.2. Cost Concepts and Income measures

3.5.3. Cost of marketing

3.5.4. Producer's share in consumer's rupee

3.5.5. Marketing margin of middleman

3.5.6. Analysis of price spread under different channels

3.5.7. Analysis of marketing efficiency under different channels

3.5.8. Rank Based Quotient (RBQ)

3.5.1. Growth Rates

To fulfill the first objective of the study i.e., growth in area, production and productivity of coriander in Kota district of Rajasthan, the Compound Growth Rates (CGR) were worked out by using the following model:

$$Y = ab^t$$

$$\text{Log } y = \text{log } a + t. \text{ log } b$$

Where,

t = base period in number of years (1, 2, 3....n)

y = area / production / productivity

b = (1 + r)

r = compound growth rate and

a = constant

In log form b was calculated by using the formula.

$$\log b = \frac{\sum t \log Y - (\sum t \sum \log Y/n)}{\sum t^2 - (\sum t)^2/n}$$

Where,

n = number of years

The per cent of compound growth rate is,

$$[(\text{Anti log of } b) - 1] \times 100$$

The standard error of growth rate (SEr) was estimated by using the following formula.

$$SE_r = \sqrt{\frac{\log b \sum (\log y)^2 - \frac{(\sum \log y)^2}{n} - (\log g)^2 \sum T^2}{\log e (n - 2) \sum T^2}}$$

Where,

$$T = \bar{t} - t$$

The student 't' test was used to test the significance of growth rates.

$$T = \frac{r}{SE(r)}$$

3.5.2. Cost Concepts and Income Measures.

To achieve the second objective of the study i.e., cost structure in cultivation of coriander on different size of farms and the returns from it. Various cost concepts were used which are defined below:

Cost A₁: It includes

1. Value of hired human labour.
2. Value of owned and hired machine labour.
3. Value of seeds (both farm produced and purchased).
4. Value of manures, fertilizers, insecticides and pesticides.
5. Irrigation charges.
6. Depreciation.
7. Land revenue.
8. Interest on working capital.
9. Miscellaneous expenses.

Cost A₂: Cost A₁ + rent paid for leased in-land.

Cost B₁: Cost A₁ + interest on fixed capital assets (excluding land)

Cost B₂: Cost B₁ + rental value of owned land + rent paid for leased-in land.

Cost C₁: Cost B₁ + imputed value of family labour.

Cost C₂: Cost B₂ + imputed value of family labour.

Cost C₃: Cost C₂ + 10 per cent of cost C₂ as management cost. The cost of production was worked out by using following formula:

$$\text{Cost of Production} = \frac{\text{Cost of cultivation/ha}}{\text{Quantity of main product/ha}}$$

Following income measures were used to work out the profitability of coriander cultivation in the study area.

1. Gross income: Synonymous with value of output (both main and by product) evaluated at harvest prices.

$$GI = QM \times Pm + Qb \times Pb$$

Where,

GI = Gross Income

QM = Quantity of main product

Pm = Price of main product

Qb = Quantity of by-product

Pb = Price of by-product

2. Farm Business income: Gross income – Cost A₁ (cost A₂ in case of tenant operated land)

3. Family labour income: Gross income – Cost B₂

4. Net income: Gross income – Cost C₂

3.5.3. Cost of Marketing

The total cost incurred on marketing, in cash or in kind, by the producer-seller and by various intermediaries involved in the sale and purchase of the commodity till the commodity reaches the ultimate consumer was computed as follows.

$$C = Cf + Cm1 + Cm2 + Cm3 + \dots \dots \dots Cmn$$

Where,

C = Total cost of marketing of the commodity

Cf = Cost paid by the producer from the time, the produce leaves the farm till sale.

C_{mn} = Cost incurred by the nth middleman in the process of buying and selling the product.

3.5.4. Producer's Share in Consumer's Rupee

It is the price received by the producer as a percentage in the consumer's price.

If (P_c) is a consumer's price and (P_f) is the producer's price then the producer's share in consumer's rupee (P_s) may be expressed as follows.

$$P_s = (P_f/P_c) \times 100$$

3.5.5. Marketing Margin of Middleman

This is the difference between the total payments (cost + purchase price) and receipts (sale price) of the middleman (ith agency).

a) Absolute margin of the ith middleman (A_{mi})

$$(A_{mi}) = P_{ri} - (P_{pi} + C_{mi})$$

b) Percentage margin of the ith middlemen (P_{mi})

$$P_{mi} = \frac{P_{ri} - (P_{pi} + C_{mi})}{P_{ri}} \times 100$$

Where,

P_{ri} = Total value of receipts per unit table (sale price)

P_{pi} = Purchase value of goods per unit (purchase price)

C_{mi} = Cost incurred on marketing per unit

3.5.6. Analysis of Price Spread Under Different Channels

It is the difference between the price paid by the consumer and the price received by the producer. The price spread was worked out by using following method

$$\text{Price Spread} = P_p - P_f$$

Where,

Pp = Price paid by the consumer

Pf = Price received by the farmer

3.5.7. Analysis of Marketing Efficiency Under Different Channels

Marketing efficiency is a measure of market performance. The movement of goods from producers to the ultimate consumers at the lowest possible cost consistent with the provision of service desired by the consumers is termed as efficient marketing.

Shepherd's Formula

Shepherd (1965) suggested that the ratio of total value of goods marketed to the marketing cost could be used as a measure of marketing efficiency. The higher this ratio, higher would be the efficiency and vice versa. This can be expressed in the following form

$$ME = [(V/I)-1]$$

Where,

ME = Index of marketing efficiency

V = Value of goods sold

I = Total marketing cost

3.5.8. Rank Based Quotient (RBQ)

The constraints faced by the producers and the market intermediaries in marketing of the coriander were identified. The quantification of data was done by first ranking the constraints based on the responses obtained and then calculating the Rank Based Quotient (RBQ) which is as follows

$$R.B.Q. = \frac{\sum f_i(n + 1 - i)}{N \times n}$$

Where,

f_i = number of respondents reporting a particular constraint under ith rank

N = number of respondents

n = number of constraints identified.

Chapter IV

RESULTS AND DISCUSSION

Rajasthan is one of the important states producing spices. Among major spices, coriander occupies first position in terms of area and production. This chapter deals with analysis of data and presentation of results under the following subheads:

4.1 Socio economic characteristics of the respondents

4.2 Growth in area, production and productivity of coriander.

4.3 Costs and returns in coriander production.

4.4 Marketing channels and marketing efficiency involved in coriander marketing.

4.5 Constraints in coriander production and marketing.

4.1 SOCIO ECONOMIC CHARACTERISTICS OF THE RESPONDENTS

The socio- economic characteristics of the respondents include educational status, age group, size of the holdings, and size of the family. This analysis was required to have a comprehensive view about the socio-economic conditions of the respondents so as to execute the research in a most appropriate manner and also suggest suitable measures.

4.1.1 Educational Status of the Respondents

Particulars regarding the educational status are presented in the Table 4.1. It is observed from the figures that only 11 out of 120 respondents were illiterates, which constituted 9.16 per cent. The number of respondents having education up to 7th standard were 39 (32.50 per cent), while the number of respondents having secondary school education between 8th and 10th and even Inter standard were 36 (30.00 per cent). The number of respondents having degree qualification were 7 (5.84 per cent). Thus it indicates that only 9.16 per cent of the respondents are illiterates and remaining 90.84 per cent of the respondents are literates.

Table 4.1. Particulars of Educational Status of the Respondents

Sl. No.	Educational status	Number of respondents	Percentage
1	Illiterates	11	9.16
2	1st to 7 th	39	32.50
3	8 th to 10 th	36	30.00
4	Intermediate	27	22.50
5	Degree	7	5.84
	Total	120	100.00

(Source: Survey data of 2011-12)

4.1.2. Age Group of the Respondents

It is observed from Table 4.2 that the respondents within the age group of 35 and 55 are 106 in number which accounts for 88.33 per cent. The respondents having the age of above 56 are 14 in number which is nearly 11.68 per cent. Thus it is clear that the farmers in the age group of 35 and 45 are more in number and constitute more than 50 per cent.

Table 4.2. Particulars of Age Groups of the Respondents

Sl. No.	Age group (years)	Number of respondents	Percentage
1	35-45	65	54.16
2	46-55	41	34.16
3	56-65	11	9.16
4	66 and above	3	2.52
	Total	120	100.00

(Source: Survey data of 2011-12)

4.1.3 Average Land Holding Particulars of the Selected Farmers

Land is the basic resource for agricultural production. The size of the holding influences the choice of marketing channels and also economic returns of the farmers

significantly. The holding particulars of the 120 selected farmers are presented in the Table 4.3.

Table 4.3. Average Land Holding Particulars of the Selected Farmers

Sl.No	Particulars	Area in hectares	Percentage
1	Dry land	0.256	3.84
2	Irrigated land	4.820	96.16
3	Total holding	5.076	100.00
4	Area under coriander	4.870	95.95

(Source: Survey data of 2011-12)

It is observed from the figures in the Table 4.3 that the average size of the land holding was 5.076 hectares. The area under dry land constituted about 0.256 hectares i.e. 3.84 per cent of total holding. The area under irrigated land was 4.82 hectares i.e. 96.16 per cent. It is further observed that about 95.95 per cent of the total holding was under coriander cultivation.

4.1.4 Family Size of the Selected Farmers

Particulars regarding the family size are presented in the Table 4.4. It is observed from the table 4.4 that the majority of the respondents had a family size between 4 to 6 members (55.83 per cent) and 22.50 per cent of them were having a family size between 7 to 9 members. Only 9.17 per cent of the families had more than 10 members.

Table 4.4 Particulars of Family Size of the Selected Farmers

Sl.No	Family Size	Number of respondents	Percentage
1	Less than 4	15	12.50
2	4 to 6	67	55.83
3	7 to 9	27	22.50
4	10 & above	11	9.17
	Total	120	100.00

Thus the socio economic analysis of the respondents of the study region indicates that they are well educated and majority of them are in the age group between 35-55 years with

experience in coriander production and marketing aspects and are responsible and knowledgeable enough to take right decision and accept the suitable suggestions.

4.2 TRENDS IN AREA, PRODUCTION AND PRODUCTIVITY OF CORIANDER

4.2.1 Trends in Area, Production and Productivity of Coriander in India

In this section an attempt has been made to analyze the Compound Growth Rate (CGR) and per cent change in area, production and productivity of the coriander in India and the data pertaining to it was accessed from the secondary source for a period of ten years (2002-03 to 2011-2012).

The area, production and productivity of Coriander in India from 2002-03 to 2011-2012 has been presented in the table 4.5. The area under Coriander cultivation in 2002-03 is seen as 285.5 thousand hectares. In 2003-04 the area increased by 69.35 per cent over the previous year. In 2004-05 the area decreased by -30.69 per cent and further it decreased to 340.9 thousand hectares (-2.43 per cent) in the subsequent year. It declined to 320.8 thousand hectares (-5.75 per cent) in the year 2006-07, whereas the area increased to 384.2 thousands hectare (19.76 per cent) in the year 2007-08 and later decreased to 360.0 thousand hectares (-6.29 per cent) in 2008-09. In 2009-10, the area increased by 396.0 thousand hectares i.e., 9.09 per cent over the previous year and again it increased to 33.83 per cent in 2010-11. Finally, in 2011-12, the area was 562.0 thousand hectares i.e., 6.03 per cent increase over the previous year. The fluctuations in area was mainly due to the changes in prices existing in the market.

The production of coriander in India in 2002-03 is seen as 174.0 thousand tonnes. In 2003-04 it increased by 139.08 per cent. In 2004-05, the production decreased by - 36.24 per cent over the previous year. Whereas in 2005-06, the production further decreased to 223.4 thousand tonnes and it recovered to 233.2 thousand tonnes (4.39 per cent) in the subsequent year. In 2007-08, the production raised further by 32.76 per cent and it decreased by -23.54 per cent in the year 2008-09. In the years 2009-10, 2010-11 and 2011-12 the percentage increase was 2.28, 99.09 and 9.86 respectively.

The productivity of coriander in India in 2002-03 is seen as 609 kg/ha which increased by 32.84 per cent in 2003-04 and decreased by -12.11 per cent in the year 2004-05. Whereas in 2005-06, the productivity decreased by -7.73 per cent and then recovered to

Table 4.5. Percentage Change and Growth Rates in Area, Production and Productivity of Coriander in India (2001-02 to 2010-11)

S.No.	Year	Area (in 000' ha)	Per cent change over the previous year	Production (in 000' tonnes)	Per cent change over the previous year	Productivity (in Kg/ha)	Per cent change over the previous year
1.	2002-03	285.5	-	174.0	-	609	-
2.	2003-04	483.5	69.35	389.0	139.08	809	32.84
3.	2004-05	348.9	-30.69	248.0	-36.24	711	-12.11
4.	2005-06	340.4	-2.43	223.4	-9.91	656	-7.73
5.	2006-07	320.8	-5.75	233.2	4.39	727	10.82
6.	2007-08	384.2	19.76	309.6	32.76	806	10.87
7.	2008-09	360.0	-6.29	236.7	-23.54	658	-18.36
8.	2009-10	396.0	9.09	242.1	2.28	610	-7.29
9.	2010- 11	530.0	33.83	482.0	99.09	909	49.01
10.	2011- 12	562.0	6.03	530.0	9.96	943	3.74
	Per cent change in 2011-12 over 2002-03	96.84	-	204.59	-	54.84	-
	CGR	4.789* (2.32)		7.453 (2.11)		2.514 (1.54)	

Note: * Significant at 5 per cent level of probability

Figures in parentheses are 't' values; CGR: Compound growth rate

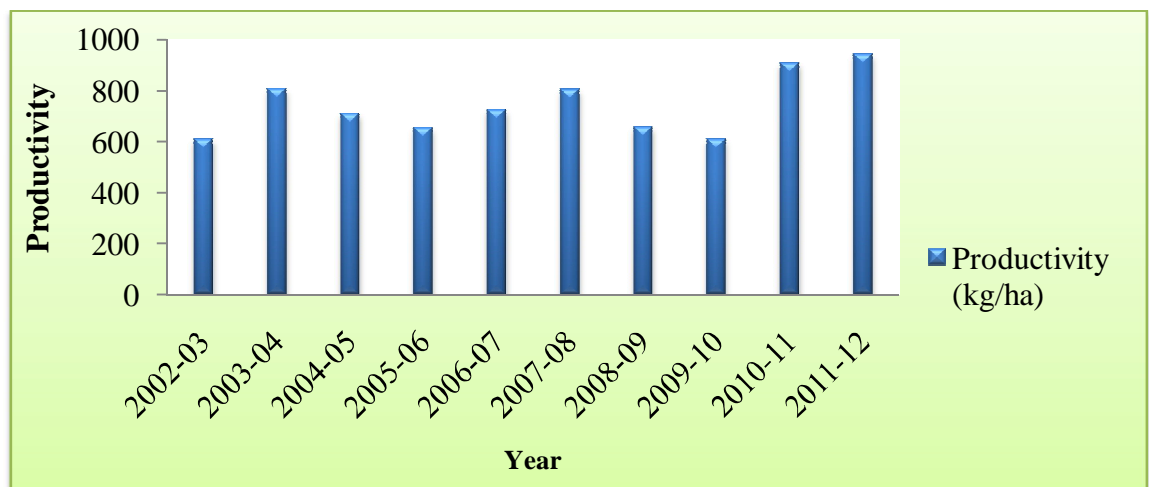
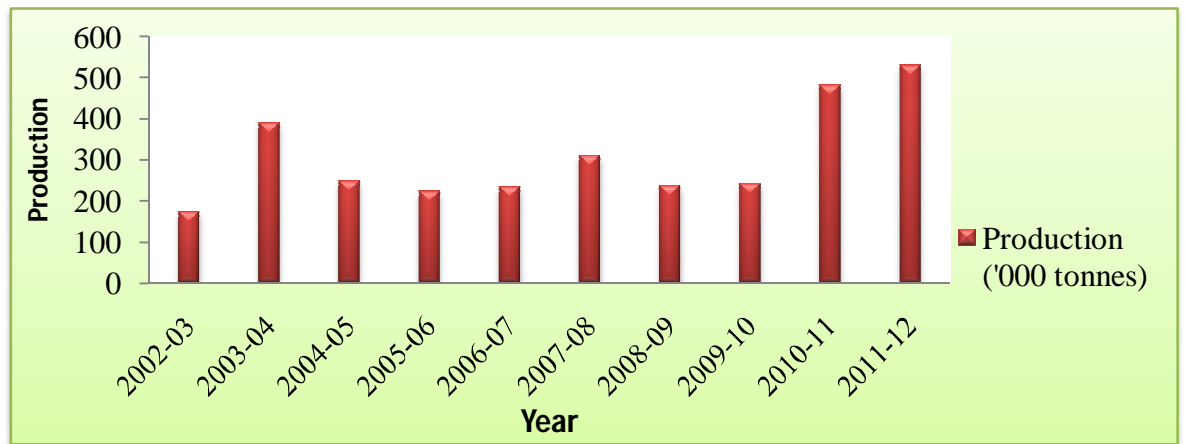
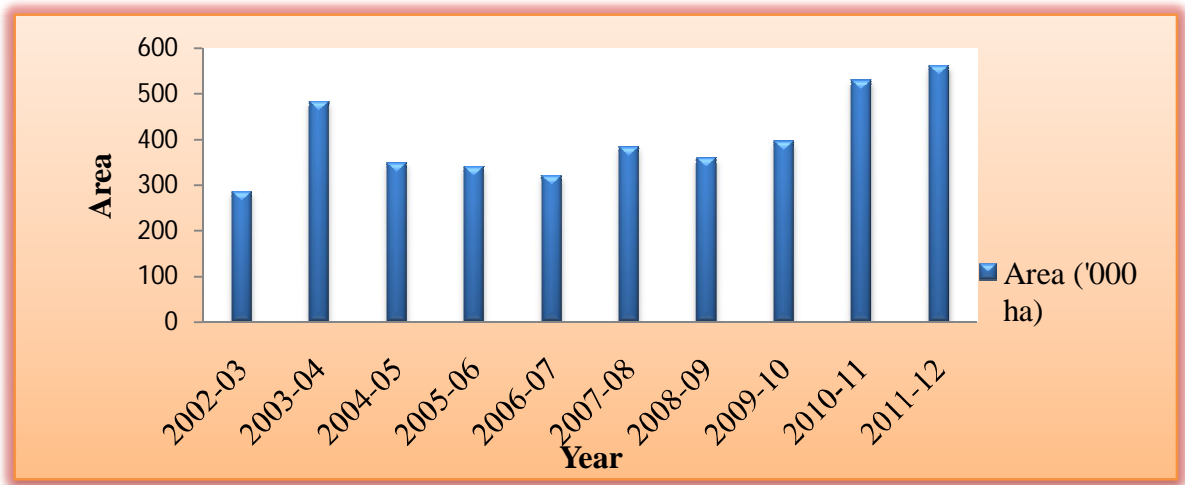


Fig. 4.1 Trends in Area, Production and Productivity of Coriander in India (2002-03 to 2011-12)

727 kg/ha (10.82 per cent) in the year 2006-07. The productivity increased to 806 kg/ha in 2007-08 and later decreased to 658 kg/ha in 2008-09. Whereas, in 2009-10, the productivity decreased by -7.29 per cent over the previous year and later it increased by 49.01 per cent in the subsequent year. Finally, in 2011-12, the productivity increased marginally by 3.74 per cent over the previous year.

The compound growth rates for area, production and productivity were 4.789 per cent, 7.453 per cent and 2.514 per cent respectively. Among all the three variables, the growth rate of area is significant.

4.2.2 Trends in Area, Production and Productivity of Coriander in Rajasthan

In this section an attempt has been made to analyze the Compound Growth Rate (CGR) and per cent change in area, production and productivity of the coriander in Rajasthan for the period of ten years (2002-03 to 2011-2012).

The area, production and productivity of coriander in Rajasthan from 2002-03 to 2011-2012 has been presented in the table 4.6. The area under coriander in 2002-03 is seen as 112.34 thousand hectares whereas in 2003-04 the area increased by 114.8 per cent over the previous year and it decreased by -38.55 per cent in the subsequent year. In 2005-06, the area decreased by -7.80 per cent and it further decreased to 131.14 thousand hectares in the subsequent year. In 2007-08, the area increased by 62.29 per cent and it further rose by 15.56 per cent in the subsequent year. In 2009-10, the area dropped to 232.27 thousand hectares (-5.23 per cent) and later to 197.90 thousand hectares (-14.79 per cent). In 2011-12, the area increased by 32.80 per cent increase over the previous year.

The production of coriander in Rajasthan in 2002-03 was 122.71 thousand tonnes. In 2003-04 it increased by 144.56 per cent over the previous year which is quite a substantial growth due to increased productivity level and area under cultivation. In 2004-05, the production decreased by -43.42 per cent and in subsequent year, it further declined by -16.13 per cent over the previous year. In 2006-07 the production increased to 155.10 thousand tonnes. Whereas in 2007-08, the production increased further by 7.05 per cent and 64.76 per cent in the subsequent year. In 2009-10, the production increased marginally by 3.04 per cent and later it decreased by -22.34 per cent in the subsequent year. Finally, in

Table 4.6. Percentage Change and Growth Rates in Area, Production and Productivity of Coriander in Rajasthan State (2002-03 to 2011-12)

S.No.	Year	Area (in 000' ha)	Per cent change over the previous year	Production (in 000' tonnes)	Per cent change over the previous year	Productivity (in Kg/ha)	Per cent change over the previous year
1.	2002-03	112.34	-	122.71	-	1093	-
2.	2003-04	241.40	114.8	300.10	144.56	1243	13.72
3.	2004-05	148.34	-38.55	169.77	-43.42	1145	-7.88
4.	2005-06	136.76	-7.80	142.37	-16.13	1041	-9.08
5.	2006-07	131.14	-4.10	155.10	8.94	1183	13.64
6.	2007-08	212.84	62.29	166.04	7.05	708	-41.55
7.	2008-09	245.10	15.56	273.58	64.76	780	10.17
8.	2009-10	232.27	-5.23	281.90	3.04	1211	55.25
9.	2010- 11	197.90	-14.79	218.90	-22.34	1106	-8.67
10.	2011- 12	262.83	32.80	329.40	50.47	1229	11.12
	Per cent change in 2011-12 over 2002- 03.	133.95	-	219.77	-	12.44	-
	CGR	6.722* (2.347)	-	7.050 (2.048)	-	-0.520 (0.229)	-

Note: * Significant at 5 per cent level of probability

Figures in parentheses are 't' values; CGR: Compound Growth Rate

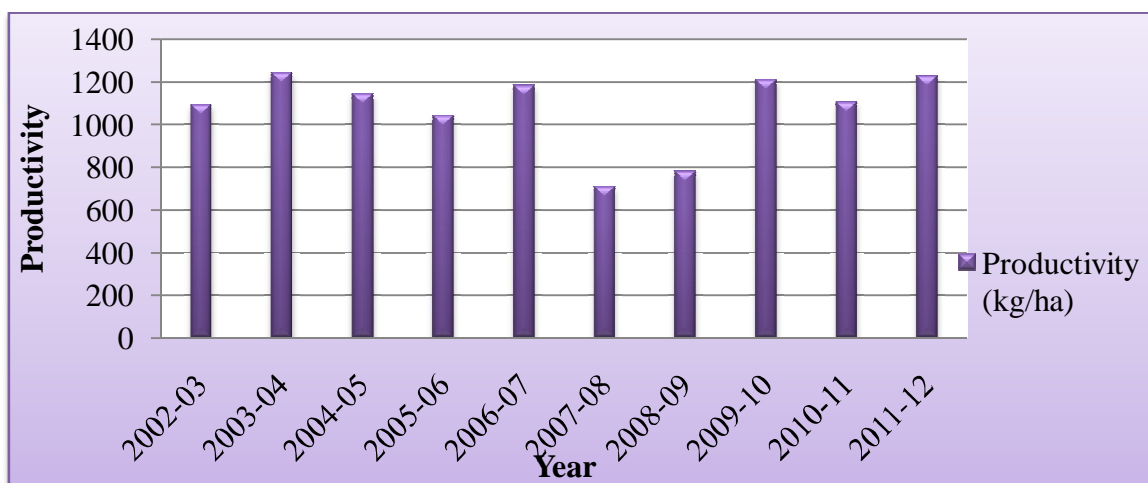
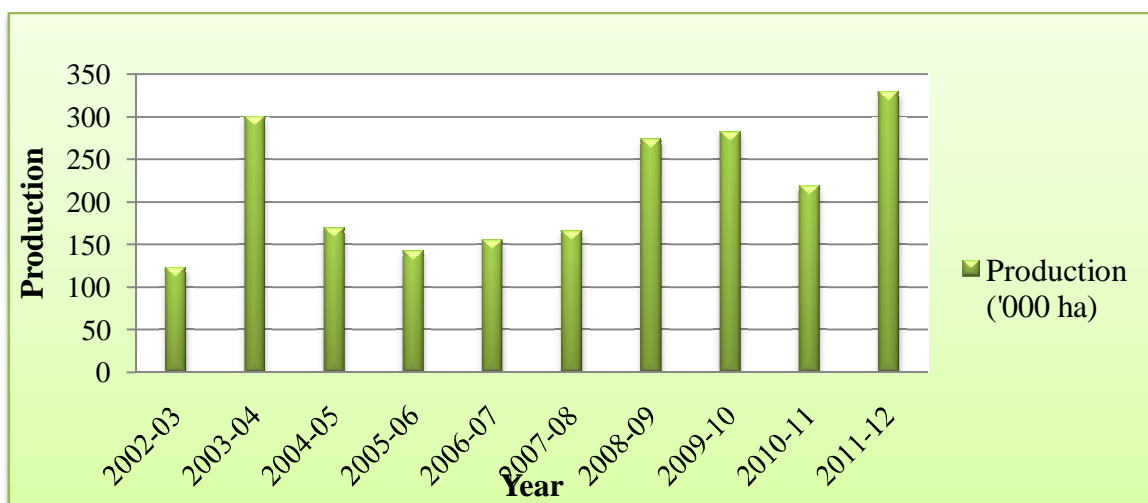
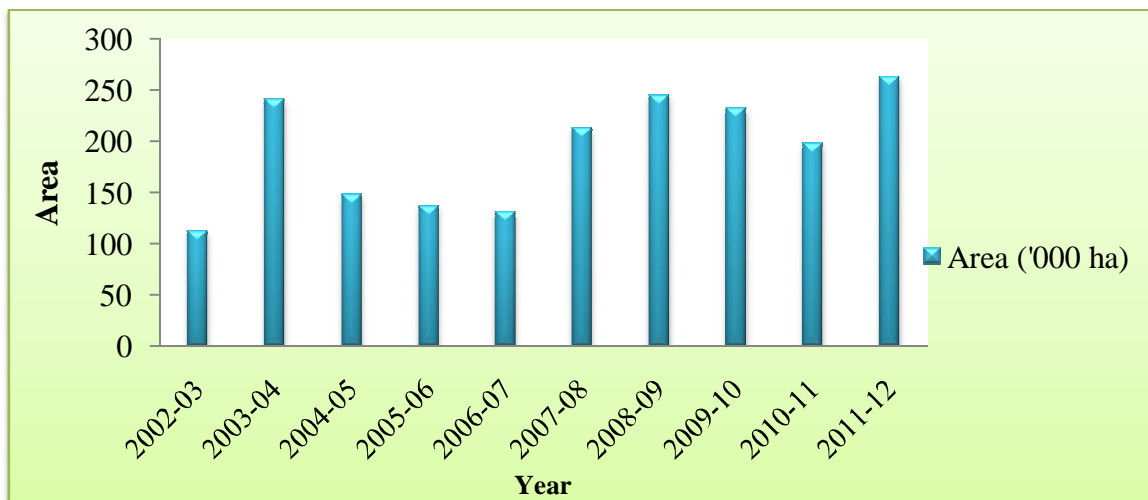


Fig. 4.2 Trends in Area, Production and Productivity of Coriander in Rajasthan (2002-03 to 2011-12)

2011-12, the production increased to 329.40 thousand tonnes i.e. 50.47 per cent rise over the previous year.

The productivity of coriander in Rajasthan in 2002-03 shows 1093 kg/ha and in 2003-04 it increased by 13.72 per cent and it decreased by -7.88 per cent in the subsequent year. In 2005-06, the productivity again decreased by -9.08 per cent and later slightly improved by 13.64 per cent in the subsequent year. In 2007-08, the productivity drastically decreased by -41.55. In 2008-09, the productivity increased to 780 kg/ha and 2009 - 10, it further increased to 1211 kg/ha. In 2010-11, the productivity decreased to 1106 kg/ha. Finally in 2011 - 12 the productivity was 1229 kg/ha.

The compound growth rates for area, production and productivity were 6.722 per cent, 7.050 per cent and -0.520 per cent respectively. Among all the three variables, only the area has shown significant growth rate which is similar to the trend at the state level.

4.2.3. Trends in Area, Production and Productivity of Coriander in Kota District of Rajasthan

The area, production and productivity of coriander in Kota district from 2002-03 to 2011-2012 has been presented in the table 4.7. The area under coriander in 2002-03 is seen as 30.81 thousand hectares whereas in 2003- 04 the area increased by 79.13 per cent. In 2004-05, the area decreased by -41.61 per cent and slightly improved by 11.08 per cent in the subsequent year. In 2006-07, the area decreased by -37.63 per cent. In 2007-08, it increased by 77.68 per cent and in 2008-09, it was 49.14 thousand hectares (23.90 per cent) and the same further increased to 50.59 thousand hectares in 2009-10. The area decreased by -1.01 per cent in 2010-11 and later in 2011-12, the area increased by 27.03 per cent.

The production of coriander in Kota district of Rajasthan in 2002-03 was 36.34 thousand tonnes. In 2003-04 it increased by 63.29 per cent and later it declined by -28.56 per cent in subsequent year. In 2005-06, the production decreased by -6.92 per cent and further decreased by -28.42 per cent in the subsequent year due to unfavorable climatic conditions. In 2007-08, the production increased to 50.60 thousand tonnes and it again jumped to 63.06 thousand tonnes in 2008-09. In 2009-10, the production increased to 67.50 thousand tonnes and later slightly decreased to 57.31 thousand tonnes in the subsequent year. Whereas during the year 2011-12, the production increased by 45.48 per cent.

Table 4.7. Percentage Change and Growth Rates in Area, Production and Productivity of Coriander in Kota District of Rajasthan (2002-03 to 2011-12)

Sl. No.	Year	Area (in 000' ha)	Per cent change over the previous year	Production (in 000' tonnes)	Per cent change over the previous year	Productivity (in Kg/ha)	Per cent change over the previous year
1.	2002-03	30.81	-	36.34	-	1179	-
2.	2003-04	55.19	79.13	59.06	63.29	1070	-9.92
3.	2004-05	32.22	-41.61	42.18	-28.56	1309	22.33
4.	2005-06	35.79	11.08	39.26	-6.92	1097	-1.62
5.	2006-07	22.32	-37.63	28.10	-28.42	1259	14.77
6.	2007-08	39.66	77.68	42.32	50.60	1067	-15.25
7.	2008-09	49.14	23.90	63.06	49.01	1283	20.24
8.	2009-10	50.59	2.95	67.50	7.04	1334	3.98
9.	2010-11	45.46	-1.01	57.31	-1.50	1261	-5.47
10.	2011-12	57.75	27.03	83.38	45.48	1444	14.51
	Per cent change in 2011-12 over 2002-03.	69.41	-	129.44	-	22.47	-
	CGR	5.01 (1.59)	-	7.18 (2.29)	-	2.06 (2.16)	-

Note: Figures in parentheses are 't' values

CGR: Compound growth rate

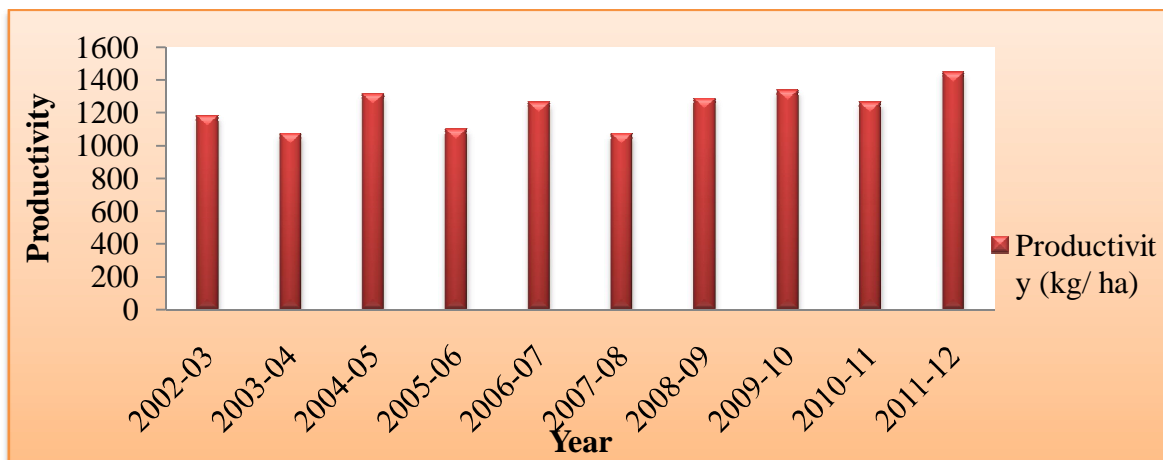
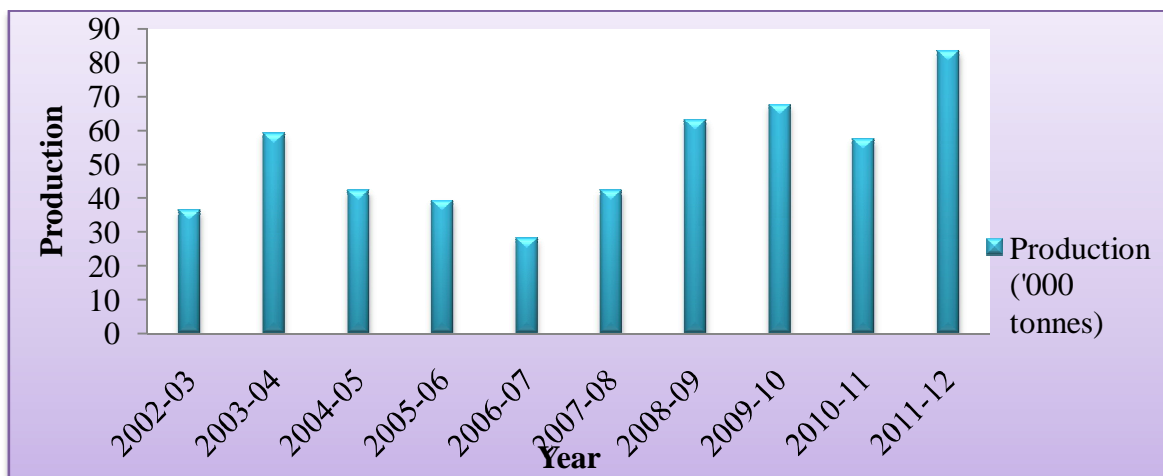
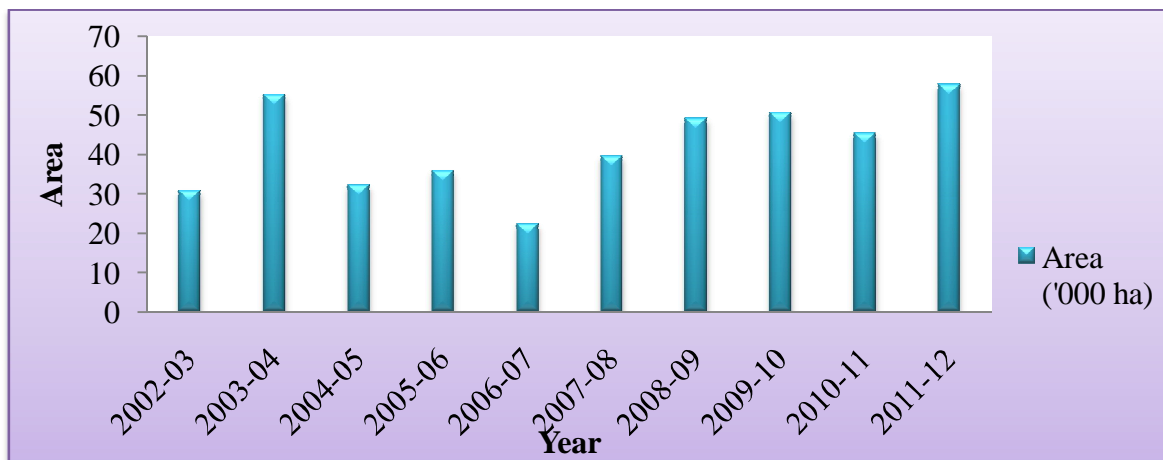


Fig. 4.1 Trends in Area, Production and Productivity of Coriander in Kota District (2002-03 to 2011-12)

The productivity of coriander in Kota district of Rajasthan in 2002-03 was 1179 kg/ha. In 2003-04, it decreased to 1070 kg/ha and it improved by 22.33 per cent in the subsequent year. In 2005-06, the productivity decreased by -1.62 per cent and again it increased by 14.77 per cent in 2006-07. It increased by 20.24 per cent in the year 2008-09. In 2009-10, the productivity by 3.98 per cent and in 2010-11, it decreased by -5.47 per cent and in the subsequent year (2011-12) the productivity improved by 14.51 per cent over the previous year. Therefore, more or less there has been an increasing trend in yield due to better varieties and improved package of practices being followed by the farmers.

The compound growth rates for area, production and productivity were 5.01 per cent, 7.18 per cent and 2.06 per cent respectively, but among all the three variables, none of them indicated significant growth rate.

4.2 COSTS AND RETURNS IN CULTIVATION OF CORIANDER

In this section, an attempt has been made to present the details of cost of cultivation on the selected farms of Kota district. The cost of cultivation and the returns from it will help in decision making about profitability of the enterprise and hence these measures were worked out for the coriander crop. For presenting the results in systematic manner, this section has been divided into four parts:

4.2.1 Cost of cultivation of coriander

4.2.2 Cost of cultivation based on various cost concepts

4.2.3 Cost of production based on various cost concepts

4.2.4 Returns from coriander cultivation

4.2.1 Cost of Cultivation of Coriander

The cost of cultivation of coriander includes fixed and variable costs, the details of all the costs for marginal, small, large and overall farms are presented in table 4.8. Perusal of the table indicated that the cost of cultivation per hectare for overall farms was Rs. 45131.09 per hectare. The same for the marginal, small, large farms was Rs. 41529.10, Rs. 46022.47 and Rs. 47841.71 per hectare indicating high cost of cultivation for large farms

and the least for marginal farms. The proportion of the fixed and variable costs was 48.20

Table 4.8. Particulars of Cost of Cultivation of Coriander (Rs./ha)

Sl. No.	Particulars	Size of farms			
		Marginal	Small	Large	Overall
A. Operational Cost					
1.	Human Labour				
	a) Owned Labour	2207.10 (5.32)	3578.55 (7.77)	1202.10 (2.51)	2329.25 (5.16)
	b) Hired Labour	2320.50 (5.58)	3863.85 (8.39)	6847.95 (14.31)	4344.10 (9.62)
	c) Machine Labour	4756.60 (11.48)	5027.80 (10.93)	5527.81 (11.55)	5104.07 (11.30)
2.	Material Cost				
	a) Seeds	1557.50 (3.76)	1652.40 (3.59)	1672.8 (3.49)	1627.60 (3.60)
	b) Manures and Fertilizers	2543.70 (6.14)	2662.50 (5.78)	2786.2 (5.81)	2664.13 (5.90)
	c) Pesticides	1968.75 (4.75)	2250.60 (4.89)	2343.75 (4.90)	2187.70 (4.84)
3.	Irrigation Charges	1281.25 (3.10)	1540.16 (3.36)	1625.72 (3.39)	1482.38 (3.29)
4.	Miscellaneous Cost	463.50 (1.11)	734.60 (1.59)	982.50 (2.05)	726.87 (1.64)
5.	Interest on Working Capital @12.5% Per Annum	1068.68 (2.57)	1331.89 (2.89)	1463.73 (3.04)	1288.10 (2.85)
	Total Operational Cost	18194.58 (43.81)	22642.15 (49.19)	24426.56 (51.05)	21754.43 (48.20)
B. Fixed Cost					
1	Depreciation	537.50 (1.29)	579.40 (1.25)	621.52 (1.29)	579.47 (1.28)
2.	Land Revenue	21.57 (0.05)	23.05 (0.05)	23.75 (0.04)	22.79 (0.05)
3.	Rental Value of Own Land	21875.20 (52.67)	21875.20 (47.54)	21875.20 (45.73)	21875.20 (48.48)
4.	Interest on Fixed Capital@ 8%	900.25 (2.17)	901.93 (1.96)	903.68 (1.88)	901.95 (1.99)
	Total fixed cost	23334.52 (56.19)	23379.58 (50.81)	23415.15 (48.95)	23376.41 (51.80)
	Total Cost	41529.10 (100)	46022.47 (100)	47841.71 (100)	45131.09 (100)

Note: Figure in the brackets are percentages to the total cost

per cent and 51.80 per cent respectively for all farms put together. Among fixed cost, rental value of land was the most important cost as it shared 48.48 per cent in total expenditure. This is followed by interest on fixed capital, depreciation and land revenue. The variable cost analysis revealed that the machinery labour cost was the most important item of variable expenditure as it accounted for more than 11.00 percent of total expenditure on overall sample farms. The cost of machinery labour increased with increased in farm size. Similarly the second important variable expenditure item was the hired human labour which shared 9.62 per cent of total cost. This component also increased with the farms size whereas the owned family labour cost declined with the increase in the farm size. The other expenditure items in the sequence based on its importance are fertilizer cost (5.90 %), pesticide cost (4.84 %), seed cost (3.60 %), irrigation cost (3.29 %) and miscellaneous cost (1.64%). The interest on working capital accounted to Rs. 1288.10 (2.85 %) on overall farms.

Thus, the above results indicates that the large farmers are incurring more expenditure due to high cost of human and machine labour and also all the other inputs involved whereas the small farmers are incurring more expenditure on owned and hired human labour than the marginal and large farmers. Both the operational and fixed costs increased with increase in the farm size in coriander production.

4.2.2 Cost of Cultivation of Coriander Based on Various Cost Concepts

Under this sub head, the cost of cultivation is presented based on the different cost concepts for different farm size groups. The table 4.9 reveals that cost A₁, for over all farms, was Rs. 20027.67. It increased with the increase in size of holding. All the farmers were owner cultivators. Hence cost A₁ and A₂ remained the same. Cost B₁ and B₂ were Rs. 20929.63 and Rs. 42798.60, respectively. The costs C₁ and C₂, for overall farms worked out to be Rs. 23258.88 and Rs. 45131.09, respectively. Cost C₃, which includes managerial cost worked out to Rs. 49644.28 per hectare. Thus, large farmers have incurred more expenditure compared to marginal and small farmers.

Table 4.9. Cost of Cultivation per Hectare of Coriander Based on Different Cost Concepts for Different Size of the Holdings (Rs.)

Cost concepts	Size of the farms			Overall
	Marginal	Small	Large	
Cost A ₁	16546.55	19666.75	23869.73	20027.67
Cost A ₂	16546.55	19666.75	23869.73	20027.67
Cost B ₁	17446.80	20568.68	24773.41	20929.63
Cost B ₂	39304.00	42443.88	46648.61	42798.60
Cost C ₁	19653.90	24147.23	25975.51	23258.88
Cost C ₂	41529.10	46022.47	47841.71	45131.09
Cost C ₃	45682.01	50624.95	52625.88	49644.28

(Source: Survey data of 2011-12)

4.2.3. Cost of Production Based on Various Cost Concepts

Under this sub head, the cost of production per quintal is presented based on the different cost concepts for different farm size groups. It is evident from the table 4.10 that the overall cost of production per quintal of coriander was Rs. 4205.24. The cost of production per quintal was highest on large farms i.e. Rs. 4576.16 per quintal followed by small and marginal farms i.e. Rs. 4319.53 and Rs. 3720.03 per quintal, respectively. This indicates that marginal farms are more efficient as compared to small and large farms.

Table 4.10. Cost of Production of Coriander on Different Size Holdings (Rs./qtl)

Cost	Size of the farms			Overall
	Marginal	Small	Large	
Cost A ₁	1347.43	1678.05	2075.62	1700.36
Cost A ₂	1347.43	1678.05	2075.62	1700.62
Cost B ₁	1420.74	1755.00	2154.20	1776.64
Cost B ₂	3203.58	3621.49	4056.40	3626.82
Cost C ₁	1600.48	2060.34	2258.74	1973.18
Cost C ₂	3381.84	3926.83	4160.14	3822.93
Cost C ₃	3720.03	4319.53	4576.16	4205.24

(Source: Survey data of 2011-12)

4.2.4. Returns from Coriander Cultivation

The table 4.11 reveals that on the overall basis, average productivity of coriander was 11.84 quintals per hectare. The yield was highest (12.28 quintals) in the case of marginal farms, followed by small farms (11.72 quintals) and large farms (11.50 quintals) which indicated that as the size of holding increased, the productivity of coriander decreased.

It is also evident from the table that overall average gross income per hectare of coriander cultivation was Rs. 75266.02 on overall farms. Among different size of farms, it was Rs. 77182.25, Rs. 74669.29 and Rs. 73316.52 on marginal, small and large farms, respectively. The gross income was highest on marginal farms as compared to small and large farms. It decreased with the increase in size of land holding mainly because of low productivity on large farms. Whereas the marginal and small farmers involved themselves personally in cultivation which resulted in efficient practices and reduced cost of production.

For overall farms the net income from coriander cultivation was Rs. 29925.56 per hectare. Among different size groups, it ranged between Rs. 25474.81 per hectare on large farms to Rs. 35653.05 per hectare on marginal farms. The, net income decreased with the increase in size of holding because of better management practices followed by marginal and small farmers.

The average BC ratio in coriander cultivation was 1:1.67. It is highest (1:1.85) in the case of marginal farmers, followed by small (1:1.62) and large farmers (1:1.53).

Farm business income represents returns over variable cost. On an average, the farm business income from coriander cultivation was Rs. 555028.34. In the case of marginal farmers, family business income was highest (Rs. 60635.70) followed by small and large farmers with Rs. 55002.54 and Rs. 49446.79 respectively. It is observed that farm business income decreased with increase in farm size. The family labour income per hectare of coriander cultivation varied from Rs. 26667.91 on large farms to Rs. 37842.25 on small farms. On an overall basis, family labour income worked out to be Rs. 32245.19 per hectare. The family labour income per hectare decreased with the increase in size of holding.

Table 4.11. Costs and Returns Structure of Coriander Production

Sl. No.	Particulars	Unit	Farm size			Overall
			Marginal	Small	Large	
1	Coriander production (per ha)	qtl.	12.28	11.72	11.50	11.84
2	Price of coriander (per qtl)	Rs.	6285.20	6371.10	6375.35	6343.88
3	Total cost per ha	Rs.	41529.10	46022.47	47841.71	45131.09
4	Gross returns per ha	Rs.	77182.25	74669.29	73316.52	75266.02
5	Net returns per ha	Rs.	35653.05	28648.82	25474.81	29925.56
6	BC Ratio	-	1:1.85	1:1.62	1:1.53	1:1.67
7.	Farm Business Income per ha	Rs.	60635.7	55002.54	49446.79	55028.34
8.	Family Labour Income per ha	Rs.	37842.25	32225.41	26667.91	32245.19

(Source: Survey data of 2011-12)

Thus the above analysis clearly indicated that the returns from marginal and small farmers was better over large farmers.

4.3. MARKETING CHANNELS AND MARKETING EFFICIENCY INVOLVED IN CORIANDER MARKETING

The marketing channel is the chain of intermediaries through whom the products move from producers to consumers.

The following channels were identified in coriander marketing in the study area

Channel I Producer – Commission agent - Wholesaler –Retailer – Consumer

Channel II Producer – Commission agent cum wholesaler – Retailer – Consumer

Channel III Producer – Retailer – Consumer

Channel IV Producer – Consumer

Among these channels, 80 per cent quantity of coriander moved through channel- I, 18.62 per cent through channel - II, 1.25 per cent through channel - III and 0.13 per cent quantity moved through channel - IV.

Table 4.12. Marketing Costs, Margins and Price spread of Coriander in Channel-1 in Kota District of Rajasthan (Producer - Commission agent - Wholesaler - Retailer - Consumer)

Sl. No.	Particulars	Rs./quintal	Per cent share of producer in consumer's rupee
1	Net price received by the producer	6343.88	83.28
	Cost incurred by producer	141.28	1.85
	Transportation	64.13	0.84
	Loading	5.00	0.06
	Unloading	3.75	0.05
	Weighment	2.50	0.03
	Net cost of gunny bag*	20.00	0.26
	Value of the quantity lost	20.40	0.27
	Miscellaneous charges**	25.50	0.33
2	Wholesaler purchase price	6485.16	85.15
	Cost incurred by wholesaler	574.25	7.53
	Transportation	45.50	0.57
	VAT	180.00	0.02
	Commission charges	45.00	0.57
	Mandi fee	72.00	0.94
	Loading	5.00	0.06
	Unloading	3.75	0.05
	Weighment	2.50	0.03
	Net cost of gunny bag*	60.00	0.78
	Value of the quantity lost	97.00	1.27
	Cleaning	5.00	0.06
	Grading	30.00	0.39
	Miscellaneous charges**	28.50	0.37

	Wholesaler margin	303.90	3.98
3	Retailer purchase price	7363.31	96.67
	Cost incurred by retailer	95.85	1.25
	Transportation	25.50	0.33
	Loading	5.00	0.07
	Unloading	3.75	0.05
	Weighment	2.50	0.03
	Cleaning	30.50	0.40
	Miscellaneous charges**	28.60	0.37
	Retailer margins	157.56	2.07
	Retailer sale price	7616.72	100.00
	Producer share in consumer's rupee		83.28
	PRICE SPREAD	1272.84	

(Source: Survey data of 2011-12)

* Farmer purchases bag @ Rs. 80/qtl and sold to the wholesaler @ Rs. 60 i.e. cost of gunny bag at farmer level was Rs 20/qtl of coriander produce.

** Miscellaneous charges include food, tea and telephone charges.

Marketing Costs, Margins and Price Spread in Channel –I

Price spread in marketing channel- I is given in table 4.12. The channel I comprised of producer – commission agent - wholesaler – retailer – consumer. The producer received the price of Rs. 6343.88 per quintal which is only 83.28 percent of the consumer's rupee. The cost incurred by the producer includes, transportation (Rs. 64.13), loading (Rs. 5.00), unloading (Rs. 3.75), weighment (Rs. 2.50), net cost of gunny bag (Rs. 20.00), value of quantity lost (Rs. 20.40) and miscellaneous charges of Rs. 25.50 per quintal. All these costs together accounted to Rs. 141.28 per quintal which is 1.85 per cent of consumer's rupee.

The price at which the producer sold to the wholesaler is Rs. 6485.16. The cost incurred by the wholesaler is Rs. 574.25 per quintal which includes transportation (Rs. 45.50), VAT (Rs. 180.00), mandi fee (Rs. 72.00), commission charges (Rs. 45.00), loading (Rs. 5.00), unloading (Rs. 3.75), weighment (Rs. 2.50), net cost of gunny bag (Rs. 60.00), value of quantity lost (Rs. 97.00), cleaning (Rs. 5.00), grading (Rs. 30.00) and

miscellaneous charges of Rs. 28.50 per quintal. The wholesaler sold to the retailer at Rs.7363.31 per quintal leaving a profit margin of Rs. 303.90 which is 3.98 per cent of consumer's rupee.

The retailer expenditure accounted to Rs.95.85 per quintal which includes transportation (Rs. 25.50), loading (Rs. 5.00), unloading (Rs. 3.75), weighment (Rs. 2.5), cleaning (Rs. 30.50) and miscellaneous charges of Rs. 28.60 per quintal. The retailer sold to the consumer at Rs. 7616.72 and received a margin of Rs. 157.56 which is 2.07 per cent of the consumer's rupee. The price spread which shows the difference between price paid by the consumer and price received by the producer is Rs. 1272.84 per quintal.

Marketing Costs, Margins and Price Spread in Channel – II

Price spread in marketing channel- II is given in table 4.13. The channel II comprised of producer - commission agent cum wholesaler - retailer - consumer. The producer received the price of Rs. 6343.88 per quintal which is 84.37 per cent of consumer's rupee. The major cost incurred was on transportation i.e., Rs. 64.13 per quintal. The other costs incurred are loading (Rs. 5.00), unloading (Rs. 3.75), weighment (Rs. 2.50), net cost of gunny bag (Rs. 20.00), value of quantity lost (Rs. 20.40) and miscellaneous charges of Rs. 25.50 per quintal. All these costs together accounted to Rs. 141.28 per quintal which is 1.87 per cent of consumer's rupee.

The price at which the producer had sold to the commission agent cum wholesaler is Rs. 6485.16. The cost incurred by the commission agent cum wholesaler is Rs. 486.75 per quintal which includes VAT (Rs. 180.00) which forms 2.39 per cent of the consumer's rupee. The other costs are commission charges (Rs. 45.00), mandi fee (Rs. 72.00), loading (Rs. 5.00), unloading (Rs. 3.75), weighment (Rs. 2.50), net cost of gunny bag (Rs. 60.00), value of quantity lost (Rs. 84.00), cleaning (Rs. 5.00) and miscellaneous charges of Rs. 28.50 per quintal.

The commission agent cum wholesaler selling price to the retailer was Rs.7265.16 per quintal which left a profit margin of Rs.293.25 which is 3.90 per cent of consumer's rupee. The cost incurred by the retailer was Rs. 95.85 of which major components are transportation cost (Rs. 25.50), loading (Rs. 5.00), unloading (3.25), weighment (Rs. 2.50), cleaning (Rs. 5.00), value of quantity lost (Rs.30.50) and miscellaneous charges Rs. (

28.60). The margin that the retailer receives is Rs.157.56 per quintal which is 2.09 per cent of consumer's rupee. The price that the ultimate consumer pays is Rs. 7518.57 per quintal. The price spread worked out to Rs. 1174.69 per quintal.

Table: 4.13. Marketing Costs, Margins and Price Spread of Coriander in Channel-II in Kota District of Rajasthan [Producer – Commission agent cum wholesaler – Retailer – Consumer]

Sl. No.	Particulars	Rs./quintal	Per cent share of producer in consumer's rupee
1	Net price received by producer	6343.88	84.37
	Cost incurred by producer	141.28	1.87
	Transportation	64.13	0.85
	Loading	5.00	0.06
	Unloading	3.75	0.04
	Weighment	2.50	0.03
	Net cost of gunny bag*	20.00	0.20
	Value of quantity lost	20.40	0.27
	Miscellaneous charges**	25.50	0.34
2	Commission agent cum -wholesaler purchase price	6485.16	86.26
	Cost incurred by wholesaler	486.75	6.43
	VAT	180.00	2.39
	Commission charges	45.00	0.59
	Mandi fee	72.00	0.95
	Loading	5.00	0.06
	Unloading	3.75	0.05
	Weighment	2.50	0.03
	Net cost of gunny bag*	60.00	0.79
	Value of quantity lost	84.00	1.11
	Cleaning	5.00	0.06
	Miscellaneous charges**	28.50	0.38
	Commission agent cum-wholesaler margin	293.25	3.90
3	Retailer purchase price	7265.16	96.62
	Cost incurred by retailer	95.85	1.27
	Transportation	25.50	0.33

	Loading	5.00	0.07
	Unloading	3.25	0.04
	Weighment	2.50	0.03
	Cleaning	5.00	0.07
	Value of quantity lost	30.50	0.40
	Miscellaneous charges**	28.60	0.38
	Retailer margins	157.56	2.09
	Retailer sale price/Consumer purchase price	7518.57	100.00
	Price spread	1174.69	
	Producer's share in consumer rupee		84.37

(Source: Survey data of 2011-12)

* Farmer purchases bag @ Rs. 80/qtl and sold to the wholesaler @ Rs. 60 i.e. cost of gunny bag at farmer level was Rs 20/qtl of coriander produce.

** Miscellaneous charges include food, tea and telephone charges.

Table 4.14. Marketing Costs, Margins and Price Spread of Coriander in Channel-III in Kota District of Rajasthan (Producer – Retailer – Consumer)

Sl. No.	Particulars	Rs./quintal	Per cent share of producer in consumer's rupee
1	Net price received by producer	6343.88	83.53
	Cost incurred by producer	134.38	1.77
	Transportation	64.13	0.84
	Loading	5.00	0.07
	Unloading	3.75	0.04
	Weighment	2.50	0.03
	Net cost of gunny bag*	20.00	0.26
	Value of quantity lost	16.50	0.22
	Miscellaneous charges	25.50	0.33
2	Retailer purchase price	6478.26	85.31
	Cost incurred by retailer	91.75	1.20

	Transportation	25.50	0.33
	Loading	5.00	0.07
	Unloading	3.25	0.04
	Weighment	2.50	0.03
	Net cost of gunny bag*	14.00	0.18
	Value of quantity lost	17.50	0.23
	Miscellaneous charges**	23.50	0.31
	Retailer margins	1023.95	13.45
	Retailer sale price	7593.99	100.00
	PRICE SPREAD	1250.11	

(Source: Survey data of 2011-12)

* Farmer purchases bag @ Rs. 80/qtl and sold to the wholesaler @ Rs. 60 i.e. cost of gunny bag at farmer level was Rs 20/qtl and retailer also sold in the market @ 46/qtl i.e. cost of gunny bag at retailer level was Rs. 14/qtl.

** Miscellaneous charges include food, tea and telephone charges.

Marketing Costs, Margins and Price Spread in Channel – III

Price spread for coriander in marketing channel-III is given in table 4.14. This table indicates that the net share of the producer in the consumer's rupee was 83.53 per cent. The cost incurred by the producer on transportation was Rs. 64.13. The other expenditure was on loading (Rs. 5.00), unloading (Rs. 3.75), weighment (RS. 2.50), net cost of gunny bag (Rs. 20.00), value of quantity lost (Rs. 16.50) and miscellaneous charges (Rs. 25.50) etc. which together worked out to Rs. 134.38 per quintal which is 1.77 per cent of the consumer's rupee. Producer sold the produce to the retailer at Rs. 6478.26 which is 85.31 per cent of consumer's rupee.

The retailer sold directly to the consumer at Rs. 7593.99 per quintal. The cost incurred by retailer on transportation (Rs. 25.50), loading (Rs. 5.00), unloading (Rs. 3.25), weighment (Rs. 2.50), net cost of gunny bag (Rs. 14.00), value of quantity lost (Rs. 17.50) and miscellaneous charges (Rs. 23.50) put together was Rs.91.75 per quintal which is 1.20 per cent of consumer's rupee. Thus, the margin retained by the retailer amounted to Rs.1023.95 per quintal which is 13.45 per cent of consumer's rupee. The price spread was Rs. 1250.11 per quintal.

Marketing Costs, Margins and Price Spread in Channel – IV

Price spread for coriander in channel-IV is given in table 4.15. This table indicates that the net share of the producer in the consumer's rupee was 97.89 per cent. The cost incurred by producer on transportation (Rs. 64.13), loading (Rs. 5.00), unloading (Rs. 3.75), weighment (Rs. 2.50), net cost of gunny bag (Rs. 20.00), value of quantity lost (Rs. 20.50) and miscellaneous charges (Rs. 25.50) was Rs. 136.38 per quintal which is 2.10 per cent of consumer's rupee. The price spread for this channel was Rs. 136.38 per quintal.

Thus the above analysis clearly shows that longer the channel and more the number of intermediaries in the system, larger is the price spread and the share of producer in consumer rupee declines.

Table 4.15. Marketing Costs, Margins and Price Spread of Coriander in Channel-IV in Kota District of Rajasthan (Producer – Consumer)

Sl. No.	Particulars	Rs./quintal	Per cent share of producer in consumer's rupee
1	Net price received by producer	6343.88	97.89
	Cost incurred by producer	136.38	2.10
	Transportation	64.13	0.99
	Loading	5.00	0.08
	Unloading	3.75	0.06
	Weighment	2.50	0.04
	Net cost of gunny bag*	20.00	0.30
	Value of quantity lost	20.50	0.32
	Miscellaneous charges**	25.50	0.39
	Consumer purchase price	6480.26	100.00
	Price spread	136.38	

(Source: Survey data of 2011-12)

* Farmer purchases bag @ Rs. 80/qtl and sold to the wholesaler @ Rs. 60 i.e. cost of gunny bag at farmer level was Rs 20/qtl.

** Miscellaneous charges include food, tea and telephone charges.

4.3.4 MARKETING CHANNEL EFFICIENCY

The efficiency of each channel is analyzed and presented in the table 4.16. Marketing Efficiency Index (MEI) represents the effectiveness of a marketing system in which it operates. The marketing efficiency for channels I, II, III and IV were 4.98, 5.40, 5.074 and 46.51 respectively. It is observed from this efficiency index that channel IV was the most efficient one. This is because of the fact that channel-IV does not involve any intermediary and hence, this channel was more efficient than channel I, channel II and channel III. The channel I is seen as the least efficient one because of the lengthier marketing channel and multiplicity of margins to the intermediaries.

Table 4.16. Marketing Efficiency of Coriander in Different Channels (Rs/qtt)

Particulars	Channel I	Channel II	Channel III	Channel IV
Value of marketing output	7616.72	7518.57	7593.99	6480.26
Total marketing cost*	1272.84	1174.69	1250.11	136.38
Marketing efficiency	4.98	5.40	5.074	46.51

Note: *Total marketing cost includes marketing cost and profit margin of intermediaries

4.5 TO STUDY CONSTRAINTS IN CORIANDER PRODUCTION AND MARKETING

4.5.1. Constraints Encountered by the Farmers

In order to take advantage of promising opportunities for coriander the farmer need to overcome a number of impediments related to coriander production and marketing. Many of these are common to agriculture production prevailing predominantly in the study area. In addition to these general constraints, farmers were facing an array of specific constraints. The constraints faced by the respondent farmers are presented in the table 4.18 and 4.19 along with their ranks given by the respondent farmers as Rank Based Quotient (RBQ) for each constraint.

4.5.2. Production Constraints

Various constraints faced by the farmers in coriander production have presented in table 4.17. It is quite clear from table that farmers are vulnerable to the most important constraint i.e., Labour shortage during the peak harvest season which was ranked first. The producers faced this problem as they cannot postpone the harvest time and the labour demands more wages, the RBQ score was 56.35. High cost of irrigation (RBQ score of 54.06) stood second in amongst the production constraints. Lack of credit facility was identified as the major impediment to coriander production with RBQ score of 46.25. High cost of fertilizer (RBQ score of 44.27) has also emerged as an important concern for farmers. In the coriander cultivation high fluctuation in yield due to climate changes (RBQ score of 35.00) was also one of the problems. Fresh coriander seed losses its weight after sun drying was the other prominent constraint reported by the farmer in the sample areas which had a RBQ score of 26.56.

Table 4.17. Constraints Encountered by the Farmers in Coriander Production

Constraints	Ranks						R.B.Q	Overall rank
	I	II	III	IV	V	VI		
Labour shortage during harvesting	42	29	21	12	8	8	56.35	I
High irrigation charges	32	37	18	13	11	9	54.06	II
Lack of institutional credit	18	22	25	29	13	13	46.25	III
High cost of fertilizer (DAP)	21	21	21	16	21	20	44.27	IV
Yield fluctuation due to climatic change	7	9	21	27	28	28	35.00	V
High post harvest losses	0	2	14	23	39	42	26.56	VI

(Source: Survey data of 2011-12)

4.5.3 Marketing Constraints

To identify the problem in marketing of Coriander, producers, wholesalers, wholesaler cum retailers, retailers etc. who are the important market intermediaries were interviewed with the help of the questionnaire. The eight most important problems encountered by them were listed and the respondents allotted the ranks to each of them. Using the Rank Based Quotient (RBQ), quantification was done based on the responses and overall ranking is done and presented in the table 4.18. Price fluctuation of coriander was biggest challenge to the farmers and has been rank as the most perceived constraint with a RBQ value of 84.38. Regulated market not located near the village (RBQ score of 80.21) and transportation of coriander to long distance (RBQ score of 77.19) were the serious constraints reported by the farmers.

Lack of timely market information to the respondents due to which the farmers were not aware of the market arrivals, the prices existing in different markets etc. resulting in distress sales and most of the times the producers are cheated. Therefore this problem is ranked as fourth amongst all the constraints with RBQ score of 48.54. Value Added Tax (VAT) more applied in organized market is ranked rank fifth amongst all the constraints with RBQ score of 48.75. In spite of Coriander being a most important crop in the area, there is no organized set up which would help in streamlining the marketing system so the producer get a reasonable price and there would be lesser lost. Therefore this problem is ranked as sixth amongst all the constraints with RBQ score of 44.50. The other problems faced in marketing are lack of infrastructure (RBQ score of 44.79) and value of quantity lost (RBQ score of 23.65) due to distant markets in the decreasing order of importance.

Table 4.18. Constraints Encountered by the Farmers in Coriander Marketing

Constraints	Ranks								R.B.Q	Over all ranks
	I	II	III	IV	V	VI	VI I	VIII		
Lack of timely market information	0	12	24	14	13	15	29	13	48.54	IV
Regulated market not near the village at accessible distance	32	34	23	14	17	0	0	0	80.21	II
Lack of organized marketing	0	4	7	31	14	20	23	21	42.50	VI
VAT	8	10	10	14	6	46	16	10	48.75	V
Price fluctuations	47	31	18	13	11	0	0	0	84.38	I
Value of quantity lost	0	0	0	0	17	11	34	58	23.65	VIII
Lack of infrastructure	0	0	17	23	27	17	18	18	44.79	VII
High transportation cost	33	29	21	11	15	11	0	0	77.19	III

(Source: Survey data of 2011-12)

Chapter V

SUMMARY AND CONCLUSION

Coriander (*Coriandrum sativum*) is dominant and highly valued spice grown in India which originated from Mediterranean countries. India is the largest producer of coriander in the world. Presently in India, coriander is cultivated in an area of about 562 thousand hectares with a total production of 530 thousand tonnes and productivity of 943 Kg/ hectare. Rajasthan produces nearly 56.00 per cent of total coriander of the country with 46.72 per cent of the area under cultivation. It is cultivated in an area of about 262.83 thousand hectares with a total production of 329.40 thousand tonnes and productivity of 1229 Kg/ hectare (<http://www.agricoop.nic.in> 2012). It is mainly cultivated in the districts of Kota, Baran, Bundi and Jhalawar district of Rajasthan. Coriander is a short duration crop and sowing starts in the middle of October and extends till November-end and harvested from February to March-end. The main states cultivating coriander are Rajasthan, Gujarat, Andhra Pradesh, Madhya Pradesh, Tamil Nadu and Karnataka.

With regard to area and production of coriander in Rajasthan, Kota district secures second rank. The demand of coriander in the country and abroad is increasing over time. It earns a sizeable amount of foreign exchange through its exports. In the light of above fact, it was felt necessary to conduct a micro level study and examine the supply chain of coriander to know the problems associated with production, marketing and preferences of producers towards different marketing channels. This study was designed to evaluate the cost and returns market margins, price spread and constraints coriander in production and marketing.

The study was under taken with following specific objectives:

1. To study the pattern of growth in area, production and productivity of coriander in Kota district Rajasthan state.
2. To estimate the cost and return in coriander production in Kota district.
3. To identify the marketing channels and marketing efficiency involved in coriander marketing.
4. To identify the problems faced by the growers in production and marketing of coriander.

The data used in this study to fulfill various objectives were collected through personal interview from the selected coriander growers and selected market intermediaries with the help of pretested scheduled designed for the purpose. Besides data on cost and return of coriander cultivation, quantity purchased, price paid/received, costs incurred were collected from the market functionaries. The data collected was subjected to various analytical tools apart from functional analysis. The problems associated with production and marketing of coriander were also considered.

MAJOR FINDINGS OF THE STUDY

Socio-Economic Profile

It is observed that only 9.16 per cent of the total respondents were illiterates. About 88.33 per cent of the farmers were in the age group of 35 and 55. The average family size of the farmers was five. The average size of the land holding was 4.87 hectares and about 95.95 per cent of the total holding was under coriander cultivation.

Trend in Area, Production and Productivity of Coriander

The compound growth rates for area, production and productivity of coriander in India during 2002-03 to 2011-12 were 4.789 per cent, 7.453 per cent and 2.514 per cent respectively. Among the all three variables, the growth rate of area was significant.

The compound growth rates of area, production and productivity of coriander in Rajasthan during 2002-03 to 2011-12 were estimated to be 6.722, 7.050 and - 0.520 per cent respectively, out of which only area was positive and statistically significant.

The growth rates of area, production and productivity of coriander in the Kota district of Rajasthan during the period of 2002-03 to 2011-12 were observed to be 5.01, 7.18 and 2.06 per cent respectively. Among all the three variables, none of them indicated significant growth rate.

Costs and Returns in Coriander Cultivation

The cost of cultivation of coriander includes fixed and variable costs. The cost of cultivation per hectare for overall farms was Rs. 45131.09 per hectare. The same for the marginal, small, large farms was Rs. 41529.10, Rs. 46022.47 and Rs. 47841.71 per hectare indicating high cost of cultivation for large farms and the least for marginal farms. The proportion of the fixed and variable costs was 48.20 per cent and 51.80 per cent respectively for all farms put together. Among fixed cost, rental value of land was

the most important cost as it shared 48.48 per cent in total expenditure. This is followed by interest on fixed capital, depreciation and land revenue. In variable cost machinery labour cost was the most important item of variable expenditure and this is followed by family labour cost, fertilizer cost, pesticide cost, seed cost, irrigation cost and miscellaneous cost .

The average production per hectare was 11.84 quintals hence, the overall Benefit Cost Ratio in coriander cultivation was found to be 1:1.67 i.e., for every rupee investment, producer is getting Rs. 1.67. Overall farm business income and family income per hectare in the study area was found to be Rs. 55028.34 and Rs. 32245.19 respectively.

Marketing

The marketing channel is the chain of intermediaries through whom the products pass from producers to consumers.

The following channels were identified in coriander marketing

Channel I Producer – Commission agent - Wholesaler –Retailer – Consumer.

Channel II Producer – Commission agent cum wholesaler – Retailer – Consumer.

Channel III Producer – Retailer – Consumer.

Channel IV Producer – Consumer.

PRICE SPREAD OF CORIANDER

Channel I

The producer received the price of Rs. 6343.88 per quintal which is 83.28 percent of the consumer's rupee. The cost incurred by the producer includes, transportation, loading, unloading, weighment, cost of gunny bag, value of quantity lost and miscellaneous charges. All these costs together accounted to Rs. 141.28 per quintal which is 1.85 per cent of consumer's rupee.

The price at which the producer sold to the wholesaler is Rs. 6485.16. The cost incurred by the wholesaler is Rs. 574.25 which accounted for 7.53 per cent of consumer rupee. This included transportation, VAT, commission charges, loading, unloading, weighment, cost of gunny bag, value of quantity lost, cleaning, grading and

miscellaneous charges. The produce is sold to the retailer at Rs.7363.31 per quintal leaving a profit margin of Rs. 303.29 which is 3.98 per cent of consumer's rupee.

The retailer expenditure accounted to Rs. 95.85 per quintal which includes transportation, loading, unloading, weighment, value of quantity lost, cleaning and miscellaneous charges. The retailer sold to the consumer at Rs. 7616.72 and received a margin of Rs. 157.56 which is 2.068 per cent of the consumer's rupee. The price spread in this channel was Rs. 1272.84.

Channel II

The producer received the price of Rs. 6343.88 per quintal which is 84.37 per cent of consumer's rupee. The major cost incurred by the producer are transportation, loading, unloading, weighment, cost of gunny bag, value of quantity lost, miscellaneous charges. All these costs accounted to Rs. 141.28 per quintal which is 1.87 per cent of consumer's rupee.

The price at which the producer had sold to the commission agent cum wholesaler is Rs. 6485.16 which is 86.26 per cent of consumer rupee. The cost incurred by the commission agent cum wholesaler is Rs. 486.75 per quintal.

The commission agent cum wholesaler's selling price to the retailer was Rs.8297.53 per quintal with a profit margin of Rs.293.25 which is 3.90 per cent of consumer's rupee. The cost incurred by the retailer was Rs. 95.85 of which various cost items were transportation, loading, unloading, weighment, cleaning, value of quantity lost and miscellaneous charges. The margin that retailer receives is Rs.157.56 per quintal which is 2.09 per cent of consumer's rupee. The price that the ultimate consumer pays is Rs. 7518.57 per quintal. The price spread is worked out to Rs. 1174.69 per quintal.

Channel III

The net share of the producer in the consumer's rupee was 83.53 per cent. The cost incurred by producer on transportation, loading, unloading, weighment, cost of gunny bag, value of quantity lost and miscellaneous charges etc. was Rs. 134.38 per quintal which is 1.769 per cent of consumer's rupee. Producer sold the produce to the retailer at Rs. 6478.26 which is 85.308 per cent of consumer's rupee.

The retailer sold directly to the consumer at Rs.7593.99 per quintal. The cost incurred by retailer on transportation, loading, unloading, weighment, cost of gunny bag, value of quantity lost and miscellaneous charges was Rs.91.75 per quintal which is 1.208 per cent of consumer's rupee. Thus, the margin retained by the retailer amounted to Rs.1023.95 per quintal which is 13.45 per cent of consumer's rupee. The price spread was Rs. 1250.11 per quintal.

Channel IV

The net share of the producer in the consumer's rupee was 97.89 per cent. The cost incurred by producer on transportation, loading, unloading, weighment, cost of gunny bag, value of quantity lost and miscellaneous charges was Rs. 136.38 per quintal which is 2.10 per cent of consumer's rupee. The price spread which shows the difference between price paid by the consumer and price received by the producer is Rs. 136.38 per quintal.

Marketing Efficiency Index (MEI) represents the effectiveness of a marketing system in which it operates. The marketing efficiency for channels I, II, III and IV were 4.98, 5.40, 5.074 and 46.51 respectively. It is observed from this efficiency index that channel IV is the most efficient one.

Production and Marketing Constraints

Labour shortage during the peak harvest season was ranked first amongst the constraints in production with RBQ score of 56.35. High cost of irrigation (RBQ score 54.06) stood second followed by lack of credit facility with RBQ score of 46.25. High cost of fertilizer (RBQ score 44.27) has also emerged as an important concern in farmers responses. In the coriander cultivation high fluctuation in yield due to climate changes (RBQ score 35.00) play important role in production. Fresh coriander seed losses its weight after sun drying which had a RBQ score of 26.56.

Eight crucial problems were found in the study area in the marketing of coriander. Each of them were allotted different rank. Price fluctuation of coriander was biggest challenge to the farmers and has been ranked as the most important perceived constraint with a RBQ value of 84.38. Regulated market not located near the village and transportation of coriander to long distance were given as second and third major constraints by the farmers with RBQ score of 80.21 and 77.19 respectively. Lack of timely market information ranked fourth amongst all the constraints with RBQ score of

48.54. Value added tax more applied in organized market therefore this problem was rank fifth amongst all the constraints with RBQ score of 48.75 whereas lack of organized set up was ranked as sixth amongst all the constraints with RBQ score of 44.50. The other problems faced in marketing are lack of infrastructure (RBQ score 44.79) and value of quantity lost (RBQ score 23.65) due to distant markets in the decreasing order of importance.

CONCLUSIONS

It may be concluded from the study that there is an immense scope for expansion of area, production and productivity of coriander in Rajasthan. Cost of cultivation on overall sample farms was Rs.45131.09 per hectare. Returns, BC ratio, farm business income and family labour income of coriander cultivation farms was Rs. 75266.02, 1:1.67, Rs. 55028.34, Rs. 32245.19 per hectare respectively indicating profitability of enterprise. The system of marketing reveals that the coriander growers get a lesser share in price paid by consumers and if the length of the channel is long with many intermediaries into it. Out of the four channels of coriander marketing, fourth channel i.e. direct channel, producer - consumer was the most efficient from producer as well as consumer point of view as the producer could get as high as 97.89 per cent of the consumers rupee while remaining 1.11 per cent of the consumer's rupee was incurred on different marketing costs by the producer. The price spread is minimum in channel-IV and maximum in the case of channel-II. Further it was found that Marketing Channel Efficiency Index was the highest in channel IV (46.51) and the lowest in channel I (4.98).

Labour shortage during harvesting in production of coriander was identified as the major problem followed by high irrigation charges, lack of institutional credit, high cost of fertilizer, yield fluctuations due to climatic change and post harvest weight losses etc. with ranking of II, III, IV, V, and VI respectively. The major constraints found in marketing of coriander were price fluctuations along with absence of organised markets in the village, high transportation cost, lack of timely market information, value added tax, lack of organized market, lack of infrastructure.

SUGGESTIONS AND POLICY IMPLICATIONS

- 1.** The trend in area, production and productivity of coriander in India, Rajasthan state and the selected district though have indicated fluctuations over the years but still there is a lot of potential for increasing and stabilizing coriander production. Therefore there is need to strengthen the infrastructure and develop a good support mechanism from research centers and the government bodies to the growers.
- 2.** Farmers are still using traditional method of cultivation which is the reason for low productivity of coriander. It is suggested that farmers can be introduced to new technology and method of scientific production of coriander. Both public and private sector agencies should educate and promote the efficient use of resources for reaping higher benefits.
- 3.** Lack of credit facility to the farmers is the problem in coriander production. It is suggested that government, co-operatives and financial institution extend sufficient and timely credit to the farmers so as to carry out the production process in time with more efficiency.
- 4.** The majority of the producers have opted for the marketing channel I involving wholesaler and retailer. The channel IV though highly efficient and the producers share in consumers rupee though highest but very few producers are marketing through this channel. Therefore it is suggested that all the farmers can form into a producers association and collectively market the produce more on the co-operative lines so that price spread can be minimized and the share of producer in consumer rupee would improve.
- 5.** With the help of an appropriate market mechanism the number of intermediaries in the system can be reduced so that the commission paid to the mediators can be avoided.
- 6.** There is immense potential for export of coriander. Therefore lot of focus may be paid towards improving the quality of the produce in order to receive good price and widen the market.
- 7.** The market intelligence service need to be improved and information made available to the growers in time.
- 8.** Most of the times, producers are not aware of the prices existing in the market and dispose of the produce at village level itself to the intermediaries. Adequate and timely

information about the market arrivals, varieties preferred, prices existing etc. will help in forecasting the demand and plan accordingly.

9. Marketing infrastructure such as better access to market yards, better roads, good transport facilities, timely payment, provision of storage facilities, credit provision etc. will improve the socio-economic conditions of the producer.

10. Research efforts may focus towards improvement of quality, productivity and production of coriander. The scientific storage can also reduce the post harvest losses.

Some of the important initiatives have been taken up by the government under which Spice Board of India has established 10 spice parks for processing in the country in the year 2012, which includes pre cleaning, grading, colour, sorting and granding at some parks and 17 exporters were set up state of the art processing lines and also cold storage facilities and facilities to produce oils and oleoresins from seed spices. The Board has also allotted individual slots for exporters on lease basis for developing their own processing plants in the Parks. The Board's regional and zonal offices have started functioning from the Spices Parks with more orientation towards the spices growing villages. A total of Rs. 167 crores are invested in the spices parks. Spices parks are established in Madhya Pradesh, Kerela, Rajasthan, Uttar Pradesh, Tamilnadu, and Andhra Pradesh. Such step will help in promotion of spices in general and coriander in particular for domestic and international markets.

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