AN ECONOMIC STUDY OF PRODUCTION AND MARKETING OF MAJOR VEGETABLES IN DURG DISTRICT OF CHHATTISHGARH

M. Sc. (Ag.) THESIS

by

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DEPARTMENT OF AGRICULTURAL ECONOMICS

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AN ECONOMIC STUDY OF PRODUCTION AND MARKETING OF MAJOR VEGETABLES IN DURG DISTRICT OF CHHATTISHGARH

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CERTIFICATE – I

This is to certify that the thesis entitled **"AN ECONOMIC STUDY OF PRODUCTION AND MARKETING OF MAJOR VEGETABLES IN DURG DISTRICT OF CHHATTISGARH"** submitted in the partial fulfillment of the requirements for the degree of **"MASTERS OF SCIENCE IN AGRICULTURE IN AGRICULTURE ECONOMICS"** of Indira Gandhi Krishi Vishwavidyalaya, Raipur, is the bona-fide research work carried out by **Mr. LOKESH SATANKAR** under my guidance and supervision. The subject of the thesis has been approved by the Student's Advisory Committee and the Director of Instructions.

No part of the thesis has been submitted for any other degree or diploma (certified, awarded etc.) or has been published / published part has been fully acknowledged. All the assistance and help received during the course of the investigation have been duly acknowledged by him.

Date: 23/8/2013

Dr. Hulas Pathak
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THESIS APPROVED BY THE STUDENT'S ADVISORY COMMITTEE

Chairman	**Dr. Hulas Pathak**	----------
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CERTIFICATE – II

This is to certify that the thesis entitled **"AN ECONOMIC STUDY OF PRODUCTION AND MARKETING OF MAJOR VEGETABLES IN DURG DISTRICT OF CHHATTISGARH"** submitted by **Mr. LOKESH SATANKAR** to Indira Gandhi Krishi Vishwavidyalaya, Raipur in partial fulfillment of the requirements for the degree of **M.Sc. (Ag.)** in the **DEPARTMENT OF AGRICULTURAL ECONOMICS** has been approved by the External Examiner and Student's Advisory Committee after the oral examination.

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CHAPTER - I

INTRODUCTION

1.1 The Problem

Horticulture accounts for about 30% of India's agricultural GDP from 13.08% of cropped area. According to the Economic Survey (Ministry of Finance, Govt.of India) 2010-11. It also provides about 37% of the total exports of agricultural commodities. The horticultural sector was boosted by an increase in outlay from Rs. 1000 crore in the Eighth Plan to Rs.1454 crore in the Ninth Five-Year Plan and Rs. 2105 crore in the Tenth Plan. Consequently, the horticulture sector has grown significantly over the years and India has maintained its leadership in many vegetables. Vegetables play an important role in the development of our country by improving the economic and social status of the people India grows the largest number of vegetables from temperate to humid tropics and from sea-level to snowline, Vegetables are excellent source of vitamins, particularly niacin, riboflavin, thiamine and vitamins A and C. They also supply minerals such as calcium and iron besides proteins and carbohydrates. Vegetables combat under nourishment and are known to be cheapest source of natural protective tools.

India is the largest producer of vegetables in the world after China, contributes over 13% to world vegetable production and occupies first position in the production of cauliflower, second in onion and third in cabbage. Amongst vegetables, India is the largest producer of Ginger and Okra and ranks second in Potatoes production (10%), Onions, Cauliflowers, Brinjal, and Cabbages, etc. During 2010-11, India exported vegetables worth Rs.1221 crores.The average productivity of vegetables in the country is 14.7 mt/ha.

According to the National Horticulture Board, during 2009-2010, India produced 134 million metric tonnes of vegetables. The area under cultivation for

vegetables is 8 million hectares and as per the Economic Survey (Ministry of Finance, Govt. of India) 2010-11; India has 8.49 million hectares of vegetables under cultivation with a production of 146.50 million tonnes. More than 40 kinds of vegetables from different groups such as the solenaceous, cucurbitaceous, leguminous, cruciferous, root and leafy are grown in tropical, subtropical and temperate regions. Tomatoes, Onions, Brinjals, Cabbages, Cauliflowers, Okra and Peas are among the most important vegetables grown in the world. In Indian society, vegetables are consumed in fresh, cooked and preserved forms. The daily meal is not complete unless it contains vegetables. The vegetable business provides an excellent opportunity for producers and consumers alike to diversify their business and their tastes respectively.

The national scenario of the vegetable production has witnessed considerable growth during the recent past. West Bengal is the top vegetable growing state in India producing 227.04 lakh tonnes of vegetables annually from 13.23 lakh hectares with a productivity of 17.20 tonnes per hectare. Small and marginal farmers of West Bengal (93%) have chosen vegetable growing as the best alternative for their livelihood. They hold 72% of the total arable land of the state (average holding size less than one hectare). About 10% of the sown land is under vegetables, the highest in the country, is the testimony to this proposition. The West Bengal state is currently the leading producer of brinjal (29%), cabbage (34%) and cauliflower (35%).

1.2 Area production and productivity of major vegetables in India

The area production productivity of major vegetable in presented in table 1.1.Major vegetables-Potato, Brinjal, Tomato, Tapioca, Onion and Cabbage cover 70% production in the country. Per capita availability of vegetables is 300 gms/per day. West Bengal, U.P. Maharashtra, Andhra, Tamilnadu, Karnataka, Orissa, Bihar, Kerala and Gujarat are the leading states in horticulture production.(Contributing

more than 80% output - first 5 states producing more than half the total output) nearly 60% output. West Bengal, U.P., Bihar and Orissa are the leading vegetable producers contributing over 60% output; first 2 states producing about 40%. So, major part of horticulture production is concentrated in some states.

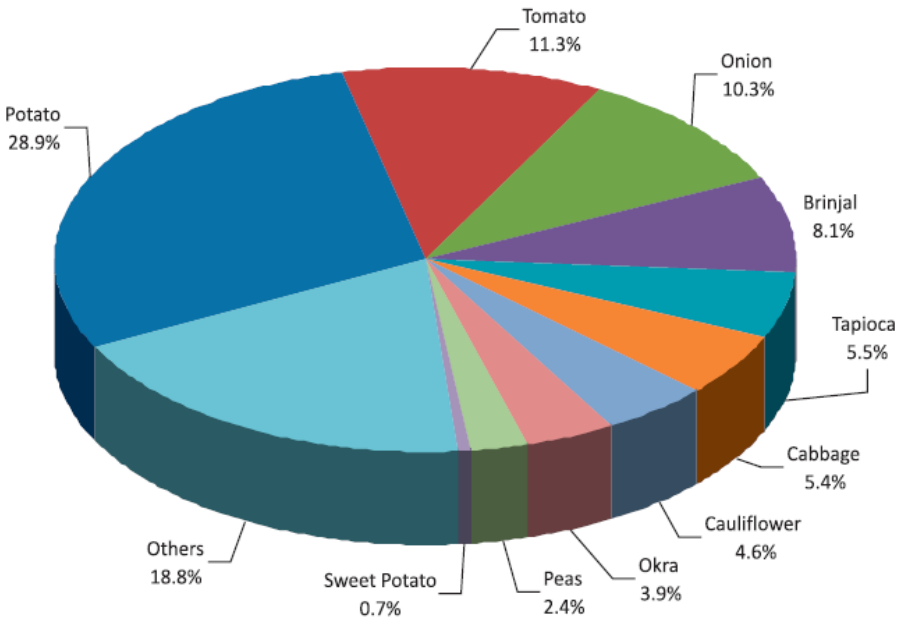
Table 1.1: All India area, production and productivity of major vegetables

sno	Crop	Area (in 000'' ha)	Percent of total veg. area	Production (IN 000''MT)	Percent of total veg. production	Productivity (in mt. / ha)
1	Brinjal	680.00	8.00	11896.00	8.10	17.50
2	Cabbage	369.00	4.30	7949.00	5.40	21.50
3	Cauliflower	369.00	4.30	6745.00	4.60	18.30
4	Okra	498.00	5.90	5784.00	3.90	11.60
5	Tomato	865.00	10.20	16826.00	11.30	19.50

Sources: - Indian Horticulture Database – 2011

Potato is most widely grown vegetable crop in the country with a share of 28.9 per cent. Uttar Pradesh is the leading potato growing state in the country with a production of 13, 57, 66,000 metric tonnes followed by West Bengal and Bihar. Tomato is one of the important crops used as fresh vegetable and for preparing a variety of processed products. Tomato in 2008-2009 occupied 52,300 hectares in West Bengal with an annual production of 9, 99,700 tonnes and yield of 19.10 t/ha (NHB, 2009), a slightly higher than national average. Tomato occupies second position amongst the vegetable crops in terms of production. The total production of tomato in the country in 2010-11 was 1, 68, 26,000 Metri Tonne from an area of 8, 65,000 ha. Andhra Pradesh is the largest grower of tomato with a production of 5926.2 metric tonne. Egg plant occupies the forth position amongst vegetable crops. The production of Egg plant in the year 2010-11 was 118.96 Lakh Tonnes from an area 6, 80,000 ha. West Bengal is the largest producer of Egg plant followed by Maharashtra and Bihar. Cabbage is the sixth most widely grown vegetable crop of our

country. India is the leading country producing Cabbage. West Bengal produces 2, 08, 78,000 metric tons and is the largest grower of the cabbage. The other important vegetable crops grown in the country are onion, chillies, peas, beans, okra, cabbage, cauliflower, pumpkin, bottle gourd, cucumber, watermelon, palak, methi, carrot and radish. Cauliflower occupies seventh position amongst the vegetable crops in terms of production. The total production of Cauliflower in the country in 2010-11 was 6745,000 Metric Tonne from an area of 0.46 M.ha. West Bengal is the largest grower of Cauliflower with a production of 1777.2 metric tonne. Okra or 'Lady's Finger' is one of the most popular vegetables grown throughout the tropics and warm parts of the temperate zone. The green tender fruits of Okra are rich in Vitamins, proteins, calcium and iron. Mostly it is used in fresh stage but the tender fruits can be preserved by canning in brine, dehydration and freezing. It is also exported as fresh green vegetable to Gulf countries. okra occupies eight position amongst the vegetable crops in terms of production The production of Okra in the year 2010-11 was 57,84,000 metric tonne from an area 4,98,000 ha. Andhra Pradesh is the largest producer of okra with the production of 118, 42,000 metric tonne.(Fig.1.1)



Sources: Indian horticulture database - 2011

Fig .1.1 Production Share of Major Vegetable Crops in India (2010-11)

1.3 Scenario of vegetable production in Chhattisgarh

Chhattisgarh stands 15th among all states of India in vegetables cultivation for the year 2008-09. Export opportunities have boosted vegetable production in Chattisgarh state for the last few years. Vegetable businesses in Chattisgarh state have gone lucrative as international markets have opened up to the yield. Present area under horticultural crops in Chattisgarh is 1.25 lakh ha (Horticulture Department, Government of Chattisgarh).Chattisgarh state is rich in diversity of biotic, abiotic as well as socio-economic condition, which favours the cultivation of various horticultural crops like vegetables. Though about 25% cultivated area is irrigated, In Chhattisgarh, mostly all vegetable crops like Solenaceous crops, Cucurbits, Beans, Cabbage, Cauliflower etc., are grown very well in the state. The total area of vegetable crops in the state was recorded 3,34,916.92 ha. in the year 2010-11 with the production of 41,49,042.11 MT. Chhattisgarh occupied an important place in the horticulture map of the country, Horticultural crops occupied an area of 4.84 lakh ha. with a production 42.17 lakh tonne although the area comprises only 7.39 percent of the net cultivated area, but the total income generated from horticulture sector accounts to over 33.83 percent of total income derived from combined agriculture sector in the state of Chhattisgarh.

Production wise Tomato, Potato, Brinjal, Cauliflower, Cabbage, Okra, Onion and Cowpea are the major vegetables in 27 district of Chhattisgarh. Durg district has first rank in production of Cabbage, Brinjal, Bittergourd Cauliflower and second rank in production of Okra, Cowpea, Onion and Pointed gourd in the state.(Table 1.2)

Table 1.2: Top five vegetable grown in Durg District

S.no	Name of vegetable	Total area Under Vegetable Crops(ha) in chhattisgarh	Area Under Vegetable Crops(ha) Durg	Percent-age (%)	Total production Under vegetable Crops (in metric-ton) in chhattisgarh	Production Under vegetable Crops (in metric-ton) in Durg	Percentage (%)	Productivity (mt)/ha
(1)	Cauliflower	18384.45	4937.00	26.85	305974.54	98740.00	32.27	20
(2)	Cabbage	14715.20	4735.00	32.17	257739.16	94700.00	36.74	20
(3)	Brinjal	26702.85	5300.00	19.84	439518.90	132500.00	30.14	25
(4)	Tomato	42918.87	7015.00	16.34	627868.82	175375.00	27.93	25
(5)	Okra	26702.85	4380.00	16.40	249048.12	43800.00	17.58	10

Source:-Directorate of Horticulture, Raipur (Chhattisgarh),year-2010-11

1.4 Justification

Vegetables occupy hardly 2 per cent of the total cropped area of the country which is very low in view of the national need. Hence, it is necessary to increase the production and productivity of vegetables to meet the demand of growing population to ensure better nutrition by adopting improved technology. An increase of 2.5 % per year in vegetable production is also necessary. Present production of 1.5 million tones of vegetable supply only 145 g per capita per day against recommended requirements of 300 g.

The prosperity of the region and economic stability to the growers mainly depends upon the optimum scale of the vegetable crop enterprise and its rationalized production. Vegetables cultivation deserves attention from this point of view.

In view of the agro-climate condition and increasing popularity of vegetable cultivation in Durg District. It is felt necessary to study economics of vegetable production and marketing in Durg District in order to assess potential of vegetable crop. Also in the last five years no research had been done on economics of production and marketing of vegetable in Durg District. Looking to these facts, the present study is being undertaken with the following specific objectives:

1. To estimate the cost of cultivation of major vegetables in the study area.
2. To examine the marketing pattern of major vegetables.
3. To identify the constraints in production and marketing of major vegetables.
4. To suggest policy measures for improvement in production and marketing of major vegetables.

1.5 Limitation of the study

During the course of investigation several difficulties were faced in the collection of from cultivator. The cultivators generally did not maintain any farm record and supply any data on the basis of their memory, which may not be very correct. The illiteracy of the farmer also added in this problem. Some of the farmers did not co-operate in giving data because of some misunderstanding regarding agricultural taxes, ceiling etc. they were biased in giving data towards lower productivity. However, sufficient care was taken by cross checking with the educated neighboring farmers and other village leaders, gram panchayat sarpanch etc.

1.6. Setup

Following introduction, review of literature is presented in chapter-II, materials and method are presented in chapter-III and chapter-IV presents the result and discussion. The major outcomes and direction for future research are suggested in the last chapter of summary, conclusions and suggestion for future research work.

REVIEW OF LITERATURE

CHAPTER -II

REVIEW OF LITERATURE

In this chapter, an attempt has been made to review pertinent literature keeping in view the problem entitled. "An Economic study of Production and Marketing of major Vegetables in Durg district of Chhattisgarh" A brief account of the work reported by the past researchers has been discussed under the following heads:

1 Economics of production and marketing of vegetable crops,

2 Constraints in production and marketing of vegetable crops,

2.1 Economics of production and marketing of vegetable crops-

Painkra (1986) conducted a study on economics of production of vegetable crops grown in the catchments area of Kharun River in Raipur district. The main aim of the study was to examine the farm business income and expenditure, cropping pattern, cost and return of cereal and vegetable crops and its constraints. Twenty-four respondents were selected from the different size of farms: small, medium, and large. Cash farm expenditure was found highest 73.61 per cent on small farm and lowest on large farm 53.93 per cent. Cauliflower-Early Potato-fallow was noticed most profitable crop rotation for medium farms and Cowpea-Brinjal-fallow for large and small farms.

Rathore (1993) studied on economics of production and marketing of vegetables in Raipur District of Madhya Pradesh. The main objective of study was, to compare the economics of vegetables and resource-use efficiency vis-à-vis paddy and examine the marketing pattern and suggest policy measures of vegetables crops. The study revealed that four marketing channels were found for sale of vegetable produce. Over the categories, the per hectare production of different vegetables was observed

to be increased except on medium farms. The per hectare net return after inclusion of marketing cost was estimated as Rs.46844.44, Rs.102119.32, Rs.103418.48 and Rs.104171.11 at marginal, small, medium and large farms respectively. The highest (1:3.92) benefit-cost ratio was recorded in cauliflower at large farm. Increasing return to scale for all vegetables was observed at group-I and as an aggregate. At group-II, it was decreasing return to scale. On an average, the farmers were selling 88.66 per cent of their produce through commission agent. The vegetable producers were receiving more prices directly from consumer in case of all the vegetables, as compared to commission agent.

Chahal *et al.* (1997) examined the market structure, price spreads, marketing costs and margins overtime and space for Punjab tomatoes. The study revealed that the marketing structure had changed over time. Due to small holdings and lack of farmers' organizations, it was found that the volume of sales in the terminal market decreased and sales at local market have increased. The intra-state analysis revealed that producers' share in consumers' rupee had declined overtime whereas the net margin of intermediaries had increased; indicating that tomato marketing system in Punjab was not conducive to the interest of the producers and consumers.

Jain and Tegar (2003) studied the economics of production and marketing of tomato in Jashpur district of Chhattisgarh. The study assured about profit level, cost of cultivation is measures that help the farmers to take rational decision about production. The analysis was divided into four categories marginal group (34 farmers), small group (24 farmers), medium group (18 farmers) and large group (14 farmers). The cropping intensity on various farm sizes was estimated to be 108.18 per cent, 111.15 per cent, 115.01 per cent and 118.38 per cent on marginal, small, medium and large farms respectively. The total cost was estimated by adding variable

cost, fixed cost and marketing cost. It showed maximum cost at large farms while minimum at marginal firms. The total marketing cost ranged from 19.87 per cent at marginal farm to 13.52 per cent at medium farms. Net return on various sizes of farms was examined as Rs.25317 per ha. at marginal, Rs.28022 per ha. at small, Rs.29987 per ha. at medium and Rs.52192 per ha. at large farms. The cost – benefit ratio on large farms was observed to be highest among various sizes of farms. It was noted as 1:1.91, 1:1.98, 1:2.22 and 1:2.90 at marginal, small, medium and large farms respectively.

Gadrel *et. al* (2003) examined the Price Spread in Marketing of White Onion in Raigad District of Maharashtra State. It was observed that the production of white onion on sample farms was 144.91 quintals per hectare, of which 89.23 per cent was marketed surplus. The marketing system for white onion was in the hands of marketing functionaries to the extent of 93 percent. The maximum quantity of white onion was passed through Channel IV i.e. Producer-Wholesaler-Retailer-Consumer (66.96%) followed by Channel III i.e. Producer-Retailer-Consumer (17.32%) Channel II i.e. Producer-Wholesaler-Consumer (14.62%) and Channel I i.e. Producer-Consumer (1.07%).The producer share in consumer's rupee was the highest in Channel I (98.85%) and it was lowest (65.60%) in Channel II. The percentage share of marketing margins in consumer price paid was 11.56, 31.99, 29.57 and 28.88 per cent in Chanel I, II, III and IV respectively. The marketing efficiency (ME) was much higher in Channel I (84%) than that of Channel II (2.19) and Channel III (2.38) and Channel IV (2.46). The white onion cultivators should streamline marketing stragegy to minimize the role of marketing functionaries to harness better from white onion cultivation.

Malik D, and Hooda (2004) analysed the Economics of Production and Export of Onion in India. The results indicated that significant increase was recorded in area, production and productivity in all countries during the period 1980-2000. The state-wise analysis revealed that all major onion producing states registered positive and significant growth in area, production and productivity of onion in India. The quantity and value of onion export from India decreased at the rate of 2.82 and 5.21 per cent per annum, respectively. Further, the decline in export of onion to different countries was observed except Malaysia. The productivity of onion was extremely low in comparison to the countries like Egypt and China. There was need to develop high yielding and area specific varieties. The Govt. should popularize the improved production technology among the cultivators through effective extension system. Marketing, financial, storage and processing facilities need to be strengthened. Cultivators should be encouraged to grow export oriented good quality varieties of onion. Market survey of potential importing countries should be done and export promotion policies should be liberalized.

Singh and Banafar (2006) conducted a study on an economic analysis of production and marketing of cauliflower in Durg District and C.G state. The main objective of study was to find out the cost of production, marketing channel and marketing efficiency. It was concluded that the average cost of cultivation of cauliflower per hectare was Rs.25228.57.It showed a rising trend with the rise in the size of farm. It was due to the fact that the large farm could incur more expenditure on modern input. Average per hectare output was Rs.48156.20. Average, per hectare benefit cost ratio (BCR) was estimated to 1:1.91. Slightly higher share i.e.85.91 percent and 80.15 percent in Shastri market, where it was 83.60 and 78.37 percent for

the same vegetable respectively. Channel -2 was found to be more efficient as compare to channel-1

Singh (2006) worked out the economics of production and marketing of vegetable in madhya Pradesh, Indian institute of forest Publications, Bhopal. The main objectives of study marketable surplus, marketed surplus of vegetable and marketing cost and margin of vegetable, and it was concluded that the lower and backward strata of society were vegetable producer in the study area and the higher strata of respondent were not very interested in the vegetable production business.

Basavaraj C. Rajur (2007) studied the production and marketing performance of chilli in karnataka – an economic analysis, In Gulbarga district, keeping in view the objectives, the data pertinent to the present study were elicited from various sources and analyzed through various appropriate techniques. The results of the analysis are presented growth rate in area showed a positive trend in both periods (3.79% in period I and 7.59% in period II respectively). The growth rate of area in overall period was 1.69%. The growth rate in yield was significantly (31.91%) in the period I, while it was positive but not significant during the period II (9.21%). The overall growth rate of yield in Gulbarga district was 5.40%. In case of production, the growth rate was also significant and more (36.91%) in the period I, while it was positive (17.50%) but not significant in period II. Thus, the overall growth for production in Gulbarga district was positive (7.14%).

Jema Haji (2008) examined the economic efficiency and marketing performance of vegetable production in the eastern and central parts of ethiopia. The objective was to examine the production and marketing performance of vegetables in the eastern and central parts of Ethiopia. Efficiency estimation and identification of their determinants in mixed-crop and market driven (vegetables) production systems

was performed in two districts of eastern Ethiopia. The results of this study revealed the existence of considerable economic inefficiency in production, poor contract enforcement, and imperfect competition in the marketing of vegetables. The findings of this study indicated the need for governmental and/or private institutions interventions to improve the production and marketing performance of vegetables by providing the necessary institutional support to the smallholder farmers in the study areas.

Ramya.S.Iyer (2009) analyzed the production and marketing of major vegetables in Bilaspur District of Chhattisgarh, The main objectives of study were to examine the marketing pattern, and find out the constraints in production and marketing of vegetable and suggest suitable measures. It was concluded that the cost of cultivation of Tomato, Brinjal and Okra was calculated Rs 29782.82, Rs26252.01 and Rs29788.78 respectively and its input output ratio was 1:2.76, 1:2.83 and 1:2.36 on the sample farms.

Mohammad Fateh Mari (2009) conducted study on structure and efficiency analysis of vegetable production and marketing in Sindh, Pakistan. The study made a valuable addition to the knowledge required for efficient production and marketing of onion, tomato and chilies in Sindh. The results revealed that there was high degree of competition among wholesalers and retailers, which suggested that their market margins were not excessive except wholesalers where indications of collusive oligopoly could be said as the profit margins and returns to investment of wholesalers were significantly higher when compared with other actors. The results further revealed that the market of onion, tomato and chilies across location in Pakistan were efficient as the market price information in regional markets were transferred to other

markets. The results further revealed that markets were integrated and there were spatial price linkages across regional markets.

Mishra Mani Shankar (2009) studied horticulture as a livelihood activity for rural people and value chain analysis of tomato in Rajnandgaon district of Chhattisgarh. The study defined horticulture as a livelihood activity for rural people focusing with the value chain analysis of tomato. The value chain was the range of services required to bring a product from conception to the final consumer. A theoretical basis of value chain analysis, as the value added at each step of the chain, was explained along with problem analysis of tomato production. Despite the difficulties of obtaining data, the study demonstrates some common trends space in the tomato cultivation (as a potential horticulture crop) in Rajnandgon district.

Joshi (2011) examined the marketed surplus and price spread of Brinjal in Western Uttar Pradesh. The study was undertaken to analyze marketed surplus and price spread for brinjal in Western Uttar Pradesh. Cluster sampling techniques was used to select the sample villages and respondents. Primary data were collected by personal interview of respondents. Simple statistical tools were employed to accomplish different objectives of the study. The marketed surplus of the medium category of farms have slightly higher surplus than marginal, large and small categories of farms. Their relative proportion was 94.84 per cent, 94.51 per cent, 94.49 per cent and 94.48 per cent respectively of the total production. The share of producer in consumer rupee was high in channel were there are less number of intermediaries. The marketing cost incurred by wholesaler in different channels were estimated 5.01 per cent,6.39 per cent and 7.88 per cent of the consumer price respectively and their corresponding net margins were 9.68 per cent, 9.61 per cent and 10.23 per cent of the price paid by the consumer.

Barakade *et al*. (2011) estimated the Economics of onion cultivation and its marketing pattern in Satara district of Maharashtra. The present study was carried out into March-April 2010 to determine the economics of onion cultivation, price spread, marketing channels and marketing efficiency of onion in Satara district. A sample of 180 onion growers was selected randomly from 20 villages in ten tahsils of Satara district of Maharashtra State. Onion cultivation is concentrated in the eastern part of the Satara district. The selected cultivators were classified into three categories i.e. small (below 2 ha.), medium (2-4 ha.) and large (above 4 ha.) based on land holding size of the farmers. The primary data were collected by survey method with the help of pre-tested schedule of questionnaire through personal interview.

Akter and Islam (2011) analysed economics of winter vegetables production in some selected areas of Narsingdi district, Bangladesh. The study was designed to assess the comparative profitability of selected winter vegetables: namely tomato, cauliflower and cabbage. In total, 90 farmers (30 each growing tomato, cauliflower and cabbage) were randomly selected from two villages under Shibpur Upazila in Narsingdi district. Both tabular and quantitative analyses were done to achieve the major objectives of the study. The major findings of the study revealed that production of all the selected vegetables were profitable. The per hectare gross cost of production of tomato, cauliflower and cabbage were Tk. 118000, 116977 and 120522, respectively and the corresponding gross returns were Tk. 217020, 210000 and 220000, respectively. The per hectare net returns of producing tomato, cauliflower and cabbage were Tk. 97000,93023 and 99478, respectively. The study reported some problems and constraints which are related to production and marketing of these vegetables. Based on the findings of the study, some recommendations were made to

improve cultural and management practices for selected winter vegetables farming with a view to increase the income and employment opportunities of the farmers.

Sangeetha and Banumathy (2011) conducted an economic analysis of marketing of major vegetables in Cuddalore district. The first hypothesis of the study was there exists a direct relationship between total marketing cost and the number of middlemen involved in the identified marketing channel. It was clear from the results that the total marketing cost of Tomato and Brinjal was observed as the highest in the marketing channel I.The second hypothesis of the study was current arrivals of vegetables is an important source of information for determining the current wholesale price. The result of the regression analysis showed that there was a significant and negative relationship between current price and current market arrivals of Tomato and Brinjal. Thus, market arrivals played an important role in fixing current wholesale price rather than lagged price. The vegetable market is an unregulated market and due to the lack of organized marketing, the vegetable grower get low share for their produce it was concluded therefore it was suggested that establishment of vegetables cooperatives would benefit of farmers.

Joshi (2012) analysed the marketed surplus and price spread of Okra in Western Uttar Pradesh, Cluster sampling techniques was used to select the sample villages and respondents. Primary data were collected by personal interview of respondents. Simple statistical tools were employed to accomplish different objectives of the study. The marketed surplus of the small category of farms had slightly higher surplus than large, marginal and medium categories of farms. Their relative proportion was 95.31 per cent, 94.88 per cent, 94.85 per cent and 92.76 per cent respectively of the total production. The share of producer in consumer rupee was high in channel were there were less number of intermediaries. The marketing cost

incurred by wholesaler in different channels were estimated 6.92 per cent,6.98 per cent and 8.29 per cent of the consumer price respectively and their corresponding net margins were 9.76 per cent, 10.13 per cent and 12.78 per cent of the price paid by the consumer.

2.2 Constraints in production and marketing of vegetable crops,

Gupta and Rathore (1998) made an attempt to assess the share of different categories of farmers in vegetables marketing, the disposal pattern of vegetables, marketing cost and various constraints in the production and marketing of vegetables. They found that the market share of farmers increased with the increase in the size of holding. It was about 4 per cent, 13 per cent, 24 per cent, and 59 per cent on marginal, small, medium, and large farms respectively, of the total marketing cost.

Jain and Chetan (2002) studied the marketing of major horticulture crops in Dharsiwa Block of Raipur. The main objective of study was to identify the different marketing channels involved in marketing of fruits and vegetables, estimate the marketing cost and marketing margins in fruit and vegetable marketing and estimate the marketing efficiency prevailing in different marketing channel. The result of study showed that the area under horticulture crops increased at small and medium farm but decreased at large farm.

Babu *et al*. (2003) conducted studied on Price Spread and Marketing of Green Chillies-A Case Study in Andhra Pradesh. It was clear from the study that the producer's shares in the consumer's rupee as well as marketing efficiency were high in the channel II, where there were no middlemen. But, the majority of the farmers were forced to dispose of their commodity to the village merchant who provided credit to them. The main problems associated with marketing of green chillies were, absence of cold storage structures, high transportation cost unawareness of market

information, lack of support price and unsatisfactory marketing arrangements. Based on the findings of the study, the policy implications which emerged out are (i) there is a need of installation of cold storage structures (ii) Proper market information should be made available to the farmers. For that, the extension agency should be strengthened (iii) Adequate and timely credit should be provided to the farmers. (iv)The government should give priority for the establishment and smooth functioning of regulated markets. (v) Production and marketing techniques have to be integrated to reduce postharvest losses and (vi) The government should provide a good support price for the produce.

Balappa and Hugas (2003) studied the Economic Evaluation of Onion Production and its Marketing System in Karnataka. In view of the major cost on labour, there was immediate need to develop the labour saving practices such as use of weedicides, improved tools for planting, harvesting, etc. Appropriate extension method may be adopted to evaluate the farmers on optimum use of inputs. Though the farmers are producing adequate quantity of onion to meet the consumer demand, they were facing problems in marketing of their produce. On the other hand, market intermediaries were accruing higher margin by incurring less cost and services. Therefore, in order to regulate the expenditure on commission, transportation and packing, efforts should be made to develop the necessary infra-structure for the marketing of onion in the state. Alternatively, it was suggested to develop the farmer's market for vegetables in general and onion in particular.

Chole *et al*. (2003) examined the Price Spread in Marketing of Brinjal in Maharashtra State. In case of brinjal following three channels were patronized by the vegetable growers for marketing of their produce: Channel - I (Producer - Retailer-Consumer), Channel - II (Producer- Wholesaler –Retailer - Consumer) Channel -III

(Producer - Commission agent — Wholesaler -Retailer-Consumer). The channel II was most favoured channel in the study area as maximum (nearly 50%) quantity was passed through this channel. The producer's share in consumer's rupee was maximum in channel I (68.28%), followed by channel II (57.94%) and channel III (53.14%). The share of retailer in consumers price 21.04 per cent in channel I, 24.37 per cent in channel II and 25.83 per cent in channel III. The share of wholesaler in consumer's price was 5.12 per cent in channel II and 5.06 per cent in channel III. The net share of commission agent was 6.17 per cent in consumer's rupee in channel III. The total marketing cost was maximum in channel III (46.86%) and minimum in channel I (30.72%). It was also revealed that the marketing efficiency was higher in Channel-I (2.25) followed by Channel-II (1.37) and Channel-III (1.13).It is revealed that the marketing efficiency was higher in channel I (2.25) followed by channel II (1.37) and channel III (1.13).

G. B. Lokesh, *et al*. (2005) examined the Economic Analysis of Tomato Production, Marketing and Processing in Karnataka. The study indicated that the productivity had increased, through over years the area under tomato cultivation had remained stagnant. Tomato was cultivated throughout the year; long duration variety is cultivated in Kharif season and short duration variety in summer season. Supply of good quality raw material was not a constraint and hence existing processing units had to be rehabilitated with modern equipments and quality specifications of national and international standards for the products must be excused for the success and survival of the tomato processing industry. Marketing of the finished products has to be promoted through different media to create awareness among consumers, and in turn increase demand for the produce.

Abdulai (2006) examined the resource use efficiency in vegetable production :the case of smallholder farmers in the Kumasi metro polis .they study revealed that the mean technical units ranging of the pooled sample was 66.67 %.efficiency level varied across all production units ranging from 12.9% to 95.02 .there was no significant difference in technical efficiency indices for land and labour obtained from the study were 0.4556 and 0.4651 respectively .the productivity of land labour and water were estimated to be ¢91, 525,684 per hectare ,¢ 72,119 per man days and ¢ 654,754 per cubic meter respectively. Crop water use efficiency as well as water efficiency was also estimated to be 1061.71 kg/m^3 and 203.71 kg/m^3 respectively.

Sultan and Waqas (2007) worked out the economics of vegetable production by farm location. Three vegetables namely bitter gourd, tinda gourd and muskmelon were selected to determine the profitability of these vegetables with special emphasis on location of the farms with respect to market. The study was based on secondary data. Two categories were made leg the farms near to market and the farms far from market and profitability was determined separately for each category thereby indicated that cost of production per acre was higher on the farms near to market than that of the ·farms far from market. Nevertheless, higher returns were also estimated for this category. Results of the study highlighted the need for the development of market infrastructure to boost up vegetable production in the country to meet the increasing requirement of food supplies and to create more employment opportunities in the rural economy.

Chaudhary (2010) studied the analysis of Tomato Marketing System in Lalitpur District,Nepal. This study was carried out to analyze the marketing system of tomato in Lalitpur district of Nepal during the year 2010. Specifically, this study was intended to identify marketing channels, to estimate gross margin, marketing margin

and producer share, to find out the situation of market information and to identify constraints related to production and marketing of vegetables, especially tomato. Accordingly, a representative sample size of 20 tomato growers comprising 10 each from Lamatar and Lubhu village development committees were purposively selected. Similarly, 10 wholesalers from Kalimati fruits and vegetables wholesale market and 10 retailers from Lagankhel vegetable market were purposively selected. In the marketing system, the channel of producer wholesaler-retailer- consumer was most common where about 50 percent tomato passed to consumer through this channel. The marketing margin was estimated to be Rs. 20 per kg and producer share in the study area was 67 percent, which was highest among chain factors.

MATERIALS AND METHODS

CHAPTER-III

MATERIALS AND METHODS

The conceptual and analytical framework used in this study is presented in this chapter. Selection of the study area, method of selection of respondents, collection of data and the analytical framework are briefly discussed here.

3.1 Selection of the study area

In the district approximately 23% cultivated area are under horticultural crops (36979hectare), out of which 65 % area is under vegetable cultivation (26182 hectare) during 2010-11. Crop diversification and selection of appropriate site for crop cultivation can bring a major breakthrough not only in productivity but also in economic lift up of small & marginal farmers. Paddy should be replaced from upland where it gives only nominal yield. Horticulture crops are the best alternative for crop diversification. Out of nineteen Development Blocks of Durg district of Chhattisgarh till 2012, Durg block was selected purposively as it represents more or less similar agro-socio-economic condition of the district. From the Durg block, three villages namely Karanja Bhilai ,Pisegaon and Kotani were selected randomly for the study.

3. 2 Selection of respondents (vegetable growers)

Out of 1365 farmers family a sample of 4.39 percent respondents (i.e.60 farmers) were selected by using probability proportional to size technique method subject to condition that at least 15 respondents should be included in sample from each of the four categories of farms i.e. marginal (up to 1.0 ha.), small (>1 –2 ha), medium (>2-4 ha) and large farmers (above 4 ha.) (Table 3.1 and Appendix-II).

Table 3.1: Number of sample households under different categories

		Total Number of households				Number of selected households			
S.No.	Particular	Karanja Bhilai	Pisegaon	Kotani	**Total**	Karanja Bhilai	Pisegaon	Kotani	**Total**
1	Marginal	283 (54.42)	334 (57.39)	131 (49.81)	748 (54.80)	5 (25.00)	5 (25.00)	5 (25.00)	15 (25.00)
2	Small	182 (35.00)	218 (37.46)	98 (37.26)	498 (36.48)	5 (25.00)	5 (25.00)	5 (25.00)	15 (25.00)
3	Medium	39 (7.50)	22 (3.78)	28 (10.65)	89 (6.52)	5 (25.00)	5 (25.00)	5 (25.00)	15 (25.00)
4	Large	16 (3.08)	8 (1.37)	6 (2.28)	30 (2.20)	5 (25.00)	5 (25.00)	5 (25.00)	15 (25.00)
	Total	520 (100)	582 (100)	263 (100)	1365 (100)	20 (100)	20 (100)	20 (100)	60 (100)

Note: Figures in parentheses indicate percentage to total

3.3 Method of enquiry and collection of data

Primary data was collected from selected vegetable growers. Data was collected through personal interview method with the help of pre-tested questionnaires (Appendix-I).

The secondary data was collected from scan through reviews and literature and published sources of village, block and district head quarter level statistics.

3. 4 Period of enquiry

The detail enquiry was done for the year 2012-13.

3.5 Analytical tools

The stated objectives of this study were fulfilled through tabulation and analysis of the data pertaining to study. To work out the cost of cultivation simple arithmetic and statistical techniques of analyses viz. average, percentage and standard method of cost of cultivation were adopted to fulfill the objectives of the study.

3.5.1 Farm business analysis:

These include the detailed analysis of cost and returns of the individual vegetable crop as well as the farm as whole, the various measures used for the analysis included.

(a)Total input:

a-1 Wages of hired human labour (permanent and casual) in cash or kind.

a-2 Imputed wages for the farmer and his family used in crop and livestock production.

a-3 Value of seed manure ,fertilizer and other cash expenses.

a-4 Cost of feed ,fodder and concentrates

a-5 Repairs to dead stock.

a-6 Depreciation on dead stock and livestock's.

a-7 Interest on fixed and working capital.

a-8 Rent of land whether rented or owned.

(b) Total output:

The quantity of product produced for different crops and livestock enterprises was treated as the total output when output is multiplied by its price then it is the output value.

(c) Net income:

It is the difference between total receipts and total expenses. It includes the farm manager and interest on capital invested in the business. It was calculated as:

(d) Family labour income:

It includes net income or loss plus imputed value of wages for the labour of farmer and his family.

(e) Farm business income:

It is the gross income minus total expenses of production excluding wages of family labour, interest on owned and rental value of land. It is measure of the earning s of a farmer and his family for their capital investment, labour and managerial work. It can be expressed as:

FBI=Family labour income + interest on working capital + rental value of land

(f) Input-output ratio

It can be expressed as the ratio of output to input. The ratio was calculated as:

$$\text{Input-output ratio} = \frac{0}{I}$$

Where,

I = Total input

0 = Total output

(g) Cost of production per quintal

It refers to total input cost divided by output value and then multiplying by the respective prices of main and by-product.

(h) Cost concept

The cost of production of vegetable has been presented in terms of Cost A, Cost A_1 Cost B and Cost C. The cost concepts are given below.

Cost A:

- Value of hired human labour (permanent and casual)
- Value of owned bullock labour
- Value of hired bullock labour
- Value of owned machinery
- Hired machinery charges
- Value of fertilizers

- Value of manure (owned and purchased)
- Value of seed (farm produce and purchased)
- Value of insecticide and pesticide
- Irrigation charges (both owned and hired)
- Canal water charges
- Land revenue and other taxes
- Depreciation on farm implements (bullock drawn and use by human labour)
- Depreciation on farm building, farm machinery and irrigation structure.
- Interest on working capital.
- Miscellaneous expenses (artisans, ropes and repair to small farm implement).

Cost A_1:

A + Rent paid for leased in land

Cost B:

A_1 + Imputed rental value of owned land (less, land revenue paid those upon) + interest on fixed capital (excluding land)

Cost C:

Cost B + Imputed value of family labour

3.5.2 Tabular analysis:

Tabular analysis was used to compare the value of cost, returns and cost of production of different size groups**.**

3.5.3 Marketable Surplus

It is the quantity of produce left after meeting out the requirements of the producer for family consumption, cattle feed, paid as wages, used for seed purpose etc. In mathematical equation, the marketable surplus of the produce may be expressed as:

$MS = P–\{C + C_f + W + S\}$

Where,

MS - Marketable Surplus

P - Total Production

C - Family Consumption

C_f - Quantity use for cattle feed

W - Quantity use for wage

S - Quantity kept for seed

3.6 Rental value of land

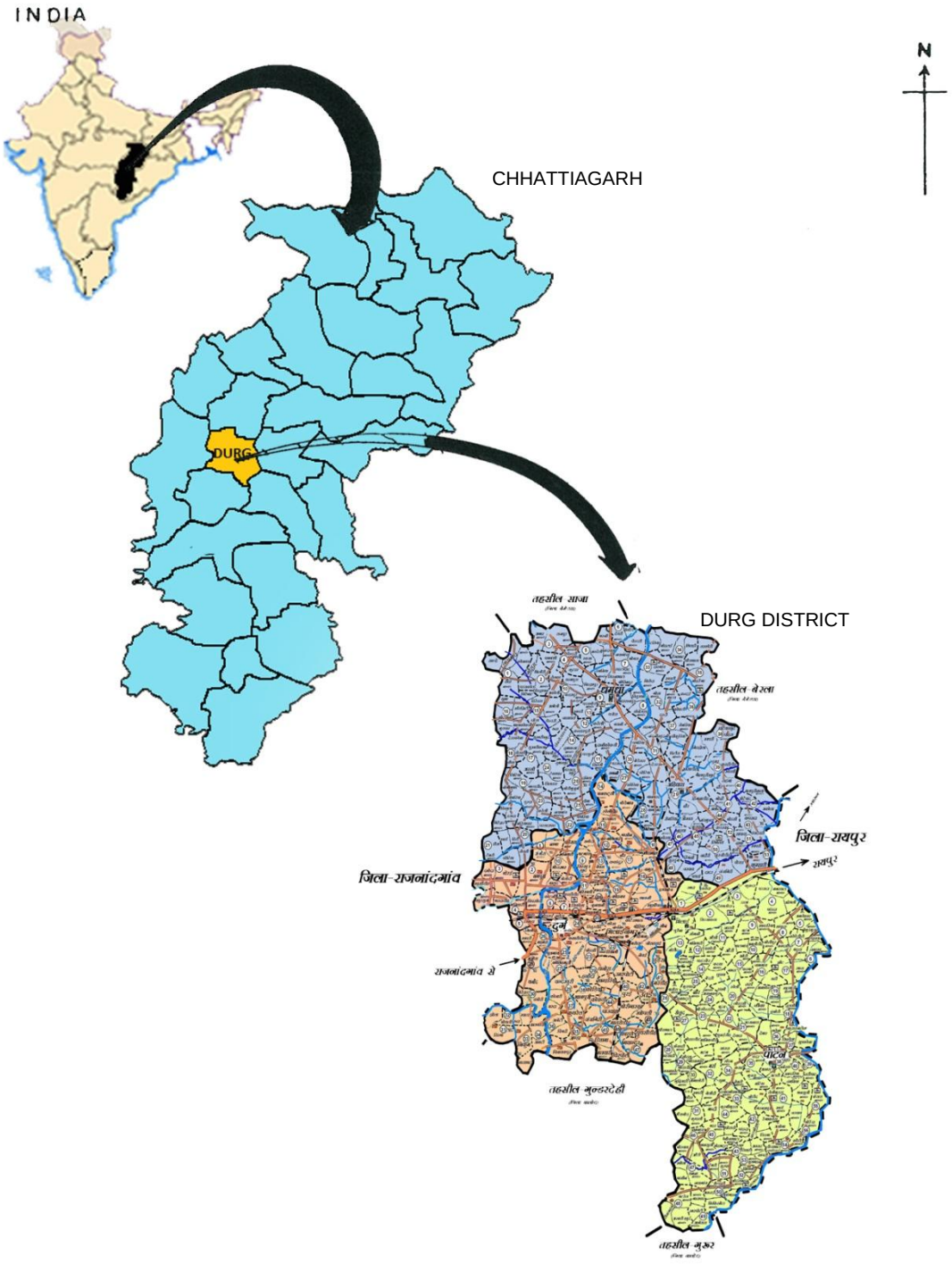
The rental value of major vegetables included for study was estimated at prevailing market rate which varied from 10,000 to 14,000 Rs per hectare in the study area .It was calculated only for specific crop duration .The crop duration was taken 4 month for cauliflower, cabbage ,tomato , 3 month for okra and 6 month for brinjal.

3.7 Marketing pattern followed by the respondents

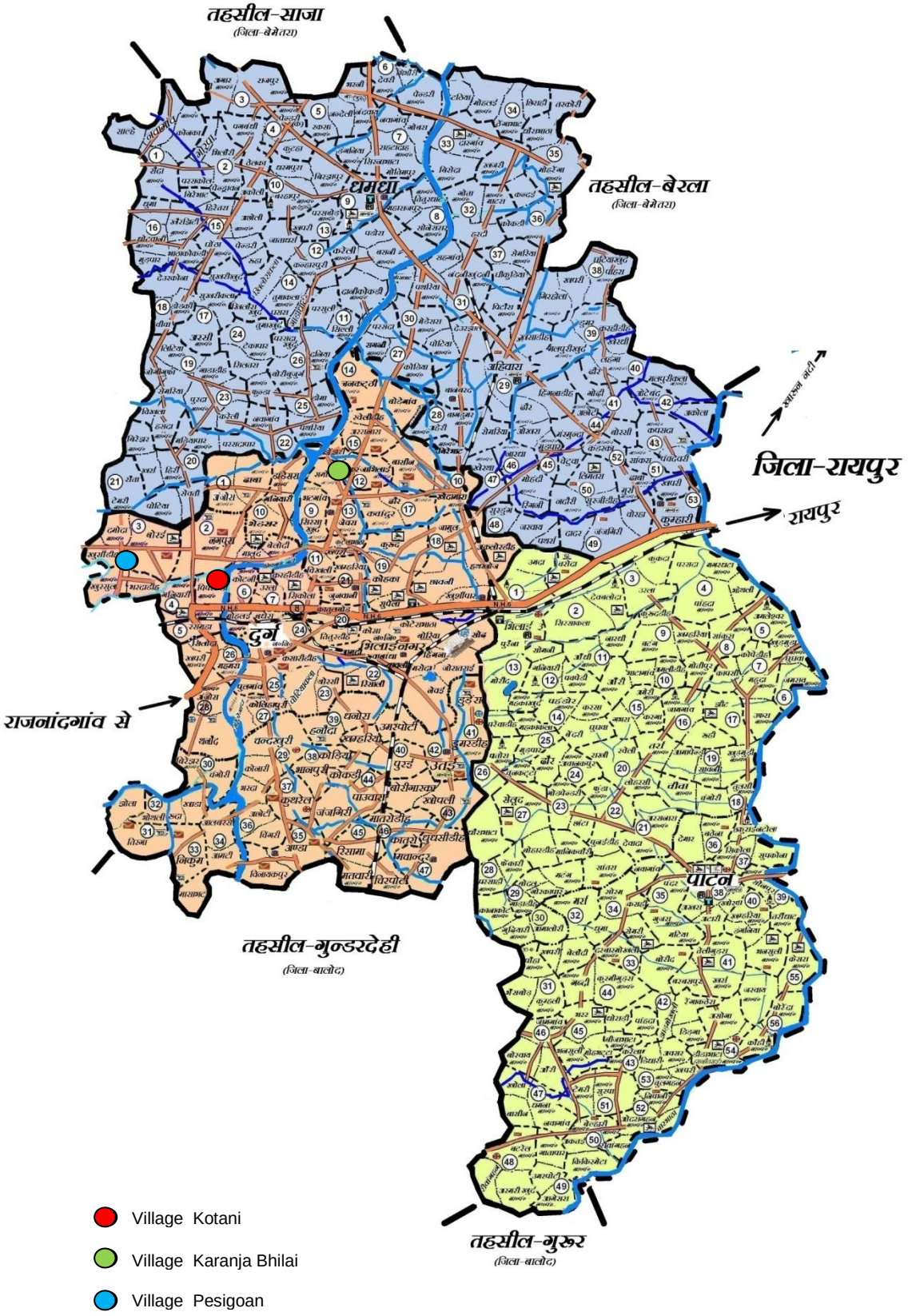
To study the marketing pattern of the respondents, they were asked to indicate the nature of marketing, it includes where, when, to whom and through which channel, they sell their produce of vegetables. Responses obtained from the farmers were expressed in frequencies and percentages.

3.8 Marketing pattern followed by the respondents

The problems faced in cultivation and marketing of vegetables growers of the study area were listed out during pre-test and also in consultation with the extension personnel of State Department of Horticulture. For the responses obtained from the vegetables growers, frequency and percentages were calculated for each constraint faced by the respondent.



Map-I Map of Study Area (Durg District)



Map - II Map of Study Area (Block & village)

3.9 General profile of the study area:

A research programme requires knowledge of the region in which the investigation is to be carried out. Understanding of the general characteristics of the study area is essential for conducting the study. This study was confined to the Durg block of Durg district of Chhattisgarh (Map-I & Map-II). The selected villages represent fairly well the agro-climatic, socio-economic situation of the Chhattisgarh state.

To understand the general characteristics of the study area, this chapter has been divided in to 14 sections, namely general profile of the area, Distribution of land holdings, soil and topography, rivers, climate and rainfall, population, Demographics, land use pattern, water resources, area, production and yield of different crops, Nurseries, Transport and communication, agri-mandies, basic infrastructure facilities in the district.

3.9.1 Situation

In this chapter, background information about the study area is given. The study was conducted in Durg district of Chhattisgarh. Durg district is one of the densely populated districts of the Chhattisgarh state of India. Durg district is situated in the southern part of the rich Chhattisgarh plain. Area of district Durg is 2238.36 Sq. Km. The total geographical area of the district is more than 2.32 lakh hectare. The district lies between 20°54' and 21°32' north latitude & 81°10' and 81°36' east longitude. District is 317 meters above mean sea level. The district is bounded by Bemetara district in the north, Rajnandgaon district in the west, Balod district in the south and Raipur district in the east.

The information is also spelled out of the villages in which the present study was conducted. This study was confined to the three villages namely Karanja Bhilai, Kotani and Pisegaon. (Map-II).

3.9.2 Distribution of land holdings

The distribution of land holding in Durg district is given in table 3.2.The distribution of land holdings according to size and the total cultivated area falling in each category are given in the table. The largest number of holdings falls under marginal farm size category. However, farmers in this category owned only a small proportion of the cultivated land. Drug district has 47% marginal farmers own 21% land and 17% small farmers own 23% land.(Fig 3.2)

Table 3.2 Distribution of Land holdings in sampled area

		Total land holding of Sampled village			
S.NO.	Particulars	Karanja bhilai	Kotani	Pisegaon	Total
1	Marginal	122.4	120.49	110.39	353.28
2	Small	139.73	102.52	143.01	385.26
3	Medium	90.96	85.61	106.21	282.78
4	Large	76.34	43.69	76.16	196.19
	Total	429.43	352.3	418.2	1199.89

Source: District Statistical Book (Year Book) 2011, Office of the District Planning and Statistics, Durg district (C.G.).

3.9.3. Soil and Topography

The major soil type is present in table 3.3. District has four different types of soils Bhata, Matasi, Dorsa and Kanhar. Bhata soil also known as lateritic soil mainly rich from gravels, sand and iron. Matasi soils are also known as sandy loam humus rich soil and best for horticultural crops with irrigation facility. Dorsa soil also known as clay loam soil which is rich of clay particles and Kanhar soil which has very poor drainage and good for water loving crops like rice etc. In the district Bhata and Matasi soil covers about 40 % of the cultivated land. In this type of soil have greater potential and scope to increase horticultural crops area by providing irrigation and fencing facilities.

Table 3.3 Major soils in Durg district

Major Soils	Area ('000 ha)	Percent (%) of total
Entisol (Bhata-gravely)	81.1	15
Inceptisol (Matasi-Sandyloam)	114.8	21
Alfisols (Dorsa-clayloam)	95.7	17
Vertisols (Kanhar-clayey)	157.5	29
Bharri	92.5	17

Source: Directorate of Agriculture, 2009, Govt. of Chhattisgarh

3.9.4 Rivers

The general slope of the district is towards the north-east in which direction the major streams of the district flow. Sheonath is main river of District Durg. Shivnath river is tributary of Mahanadi river. Shivnath River originates from Mountain at height of 625 meter at Panabaras situated in south western parts of Rajnandgaon and flows towards north east direction. Shivnath River measures in length about 345 km. City Durg is situated on east bank of Shivnath River. It flows towards north east passing through Khujji, Rajnandgaon, Durg, Dhamdha and Nandghat and joins (meet) Mahanadi near Shivari Narayan of Bilaspur District Kharun river flows in eastern parts of the district starting from Petechua in Balod District. This river flows towards north and joins (meet) Shivnath river at Somnath. This river determines the boundary of Raipur and Durg district. The length of this river is about 120 km.

3.9.5 Climate and Rainfall

The climate of district is moderate but on a warmer side in summer season. Climate of the district is of tropical type. Summer is a little bit hotter. In summer the temperature goes to a maximum of 43-45 degree Celsius. In winter the minimum temperature falls to 12 degree Celsius. Average rain fall is around 1024 mm per year.

During the year, most rainfall occurs during the monsoon months June to September. July is the month of highest rainfall.

3.9.6 Population distribution

As per Census 2011 (provisional), the population of the district is 17, 21,726. In which 6, 17,184 is rural population and 11, 04,542 is urban population**.** The density of population in urban areas is very high as compared to rural area. The population of scheduled caste and scheduled tribe constitute 13.29 and 5.87percent respectively of the total population (Table 3.4)

Table 3.4: Population in Durg district

S. No.	Particulars	Durg District		Durg block	
		Durg district	percentage	Durg	percentage
1	Total population	33,43,079	-	17,21,726	-
2	Rural population	2058958	61.58%	6,17,184	35.84%
3	Urban population	1284121	38.42%	11,04,542	178.96%
4	Schedule caste	388131.47	11.61%	228817.385	13.29%
5	Schedule tribe	1063099.1	31.80%	36228.7008	5.87%
6	Obc	1165164.3	56.59%	915958.2	53.20%
8	Agriculture labour	-	-	390013.78	35.31%

Source: District Statistical Book (Year Book) 2011, Office of the District Planning and Statistics, Durg district (C.G.)

3.9.7 Demographics

According to the 2011 census, Durg district has a population of 3,343,079.This gives it a ranking of 100th in India (out of a total of 640 districts). The district has a population density of 391 inhabitants per square kilometre (1,010 /sq mi). Its population growth rate over the decade 2001-2011 was 18.95%.Durg has a sex ratio of 988 females for every 1000 males, and a literacy rate of 79.69%.

3.9.8 Land use pattern

The district has total geographical area of 8, 70,100 hectares. About 14.30 percent area was covered by the forest. The district has 4.459 percent land not available for cultivation and 14.7percent fallow land of the total geographical area of the district. The net and gross cropped area is about 63.01percent and 34.90 percent respectively of the total geographical area of the district. The cropping intensity is 135 percent only.

The average size of holding in the district is 1.6 ha. In the district about 36 percent of the total areas of land holding are in the categories of medium and large farms. The classification of land reveals that in almost in the district about 64 percent of the total number of land holdings in categories of marginal and small farms (Table 3.5).

Table: 3.5 Land use pattern of Durg District

S. No.	Particulars	Durg District (In hectare)	Percentage Share
1	Total geographical area	870.1	-
2	Area under forest	99.6	11.44
3	Cultivable area	548.3	63.01
3	Land under non-agricultural use	90.7	10.42
4	Barren and uncultivable land	38.8	4.459
5	Permanent pasture and other grazing land	61.4	7.05
6	Cultivable waste land	0	0
7	current Fallow land	14.7	14.7
8	other Fallow land	18.9	18.9
9	Land under Misc.tree crops and groves	0.2	0.0229
10	Cropping intensity (%)	143	-

Source: Agricultural Statistics, 2009, Commissioner of land records, Raipur, Govt. of Chhattisgarh

3.9.9 Water Resources

The net irrigated area covers only 62% percent of the total net cropped area, there by indicating active water scarcity in the district for agriculture purpose. Most of the open wells also go dry during summer months. Major source of irrigation are canals and Tube wells (Table 3.6).

Table 3.6 Water resources in Durg district

S. no.	Soures of Irrigation	Chattisgarh			Durg district	
		Area (In Lac Ha.)	%Age	Area (In Lac Ha.)	No of Sources	%Age
1	Canals	8.76	70.00	1.27	296.00	53.59
2	Tanks	0.53	4.00	0.03	306.00	1.27
3	Tube-wells	2.06	16.00	0.92	1458.00	38.82
4	Wells	0.35	3.00	0.02	33938.00	0.84
5	Other Sources	0.79	7.00	0.13	0.00	5.49
Total		12.49	100.00	2.37	35998.00	100.00
Net irrigated area		26				

Source: District Statistical Book (Year Book) 2011, Office of the District Planning and Statistics, Durg district (C.G.).

3.9.10 Area, Production and Yield of different crops

In the district approximately 23% cultivated area are under horticultural crops (36979 ha), out of which 65 % area is under vegetable cultivation (26182 ha.) during 2010-11. Crop diversification and selection of appropriate site for crop cultivation can bring a major breakthrough not only in productivity but also in economic lift up of small & marginal farmers. Paddy should be replaced from upland where it gives only nominal yield. Horticulture crops are the best alternative for crop diversification. (Table 3.7)

Table 3.7 Area, production and productivity of different crops Top five vegetable grown in Durg District

s.no	Name of vegetable	Total Area under vegetable crops(in ha) in (C.G.)	Durg Area under vegetable crops(in ha	Percent-age (%)	Total Production under vegetable crops (in Metric-ton)	Durg Production under vegetable crops (in Metric-ton)	Percen-tage (%)	productivity (mt)/ha
(1)	Cauliflower	18384.45	4937.00	26.85	305974.54	98740.00	32.27	20
(2)	Cabbage	14715.20	4735.00	32.17	257739.16	94700.00	36.74	20
(3)	Brinjal	26702.85	5300.00	19.84	439518.90	132500.00	30.14	25
(4)	Tomato	42918.87	7015.00	16.34	627868.82	175375.00	27.93	25
(5)	Okra	26702.85	4380.00	16.40	249048.12	43800.00	17.58	10

Sources:-Directorate of Horticulture, Raipur (Chhattisgarh),year-2010-11

3.9.11 Nurseries:

There are 3 departmental nurseries situated in different 3 blocks of the districts. (Table 3.8)

Table 3.8 Horticultural Nurseries in the District

Sl. No.	Nurseries	Block	Area (ha.)	Establishment year	Remark
1	Atari	Patan	6.04	1979-80	Modernization and.
2	Ruabandha	Durg	4	1985-86	up-gradation work has been
3	Aheri	Dhamdha	5.8	1992-93	done under NHM

3.9.12 Transport and Communication

The district is well interconnected by roads. The National Highway No. 6 traversing the district is the Mumbai-Calcutta G.E. Road. Other important roads of district are Durg-Dhamdha-Bemetara Road. Kawardha-Bemetara- Simga Road, Kumhari-Patharia Road, Rajnandgaon-Antagarh Road, Durg-Utai Road etc.

Durg town is favourably situated on the main line of the South Eastern Railway midway between Mumbai-Calcutta. The main railway line cuts across the District at its narrowest width, the total length of the line being only 17 Kms.

3.9.13 Agriculture Mandies

There are 3 agriculture mandies with their working jurisdiction as under. Average distance of 25 km has been worked out to reach the nearest mandi in the district, whereas the maximum distance is more than 70 kms. (Table 3.9)

Table 3.9 Agriculture mandies in district

Sl. No.	Block	Main mandies	Rural mandies/haat market
1	Patan	Patan	Jamgaon M, Jamgaon R, Selud, Funda
2	Durg	Durg/Bhilai	Jeorasirsa, Nagpura,Utai, Anda
3	Dhamdha	Dhamdha	Ahivara, Murmunda, Kumhari, Kapsda, Bori

Source: District Statistical Book (Year Book) 2011, Office of the District Planning and Statistics, Durg district (C.G.).

3.9.14 Basic infrastructural facilities:

The basic infrastructure network in terms of transport directly communication, basic needs like drinking water, health care education facilities market and banks network is poor in village .the markets are situated in village Karanja Bhilai, Kotani and Pisegoan.(Table 3.10)

Table no.3.10 Infrastructure facilities in the Karanja bhilai, kotani and Pisegaon village

(No/Distance in Km)

S.N.	Facility	Karanja bhilai	Kotani	Pisegaon
1	Primary school	1	1	1
2	Secondary school	1	1	1
3	college	8 km	12 km	4km
4	co-operative society	0	0	0
5	Bank	5km	7km	2km
6	Health center	3 km	2 km	3 km
7	Fish market	12km	8km	6km
8	Artificial insemination	14 km	12km	6km
9	Patwari office	1km	1km	1km
10	RAEO office	1km	1km	1km
11	Bus service	2km	5km	1km

Source: Secretary, Gram Punchayat of respective village

RESULT AND DISCUSTION

CHAPTER – IV

RESULTS AND DISCUSTION

This chapter includes the cost of production, disposable pattern and constraints in production and marketing of major vegetables in the study area. The outcomes of this study yielded many useful findings regarding economics of production marketing pattern and constraints in major vegetables of sample households of the study area. The present chapter has been broadly discussed under the following sub heads.

4.1 General characteristics of sample households

4.2 Land distribution and cropping pattern

4.3 Economics of production of major vegetables

4.4 Disposable pattern of major vegetables

4.5 Constraints in production and marketing of vegetables

4.1 General characteristics of sample house holds

The general characteristics of the sample households are presented in table 4.1, Fig.4.1 and Fig 4.2 It can be seen from the table that the average family size was seven. It varied from 7.6 in marginal farms to 6.93 among large farms. The literacy percent was 82.35 which were good as most of the family members were above primary educated.

4.2 Land distribution and cropping pattern

4.2.1 Land use pattern

Land use pattern at sampled farm is presented in table 4.2 and Fig 4.3. The average size of holding was 3.44 ha amongst the respondents. It varied from 0.64 ha on marginal farms to 8.72 ha on large farms. The cultivation area was observed to be 0.64 hectares, 1.53 hectares 2.88 hectares and 8.72 hectares at marginal, small, medium and large farms respectively. It is clear from the table that no land was leased by the marginal but small, medium, and large farms leased the land.

Table 4.1: General characteristics of sample households

S. No.	Particular	Farm Size				Overall
		Marginal	Small	Medium	Large	
(1)	Total no of sample house hold	15	15	15	15	60
(2)	Average Family Size	7.6	6.13	8.8	6.93	7.37
(3)	Literacy					
(a)	Illiterate	24 (21.05)	19 (20.65)	23 (17.42)	12 (11.54)	78 (17.65)
(b)	Primary	38 (33.33)	24 (26.09)	33 (25.00)	18 (17.31)	113 (25.57)
(c)	Middle	21 (18.42)	18 (19.57)	25 (18.94)	32 (30.77)	96 (21.72)
(d)	Higher Secondary	18 (15.79)	13 (14.13)	30 (22.73)	19 (18.27)	80 (18.10)
(f)	Graduate And Above	13 (11.40)	18 (19.57)	21 (15.91)	23 (22.11)	75 (16.97)
	Total	114 (100)	92 (100)	132 (100)	104 (100)	442 (100)
(4)	**Age Group**					
(a)	Up To 18	32 (28.07)	24 (26.09)	37 (28.03)	21 (20.19)	114 (25.79)
(b)	>18-40	46 (40.35)	30 (32.61)	46 (34.85)	28 (26.92)	150 (33.94)
(c)	>40-60	15 (13.16)	18 (19.57)	32 (24.24)	36 (34.62)	101 (22.85)
(d)	60 To Above	21 (18.42)	20 (21.74)	17 (12.88)	19 (18.27)	77 (17.42)
Total		114 (100)	92 (100)	132 (100)	104 (100)	442 (100)

Note: Figures in parentheses indicate percentage to total

Table 4.2 Land use pattern of sampled house hold

(ha./farm)

S.no	Particular	Farm size				
		Marginal	Small	Medium	Large	Average
(1)	Owned land	0.64 (100.00)	1.50 (100.00)	2.79 (100.00)	8.44 (100.00)	3.34 (100.00)
(2)	Leased in	0.00 (0.00)	0.05 (3.64)	0.18 (6.42)	0.57 (6.70)	0.20 (5.98)
(3)	Leased out	0.00 (0.00)	0.02 (1.28)	0.09 (3.36)	0.28 (3.30)	0.10 (2.93)
(4)	Total cultivated land	0.64 (100.00)	1.53 (100.00)	2.88 (100.00)	8.72 (100.00)	3.44 (100.00)

Note: Figures in parentheses indicate percentage to total

Fig 4.1 Literacy percent of sample households

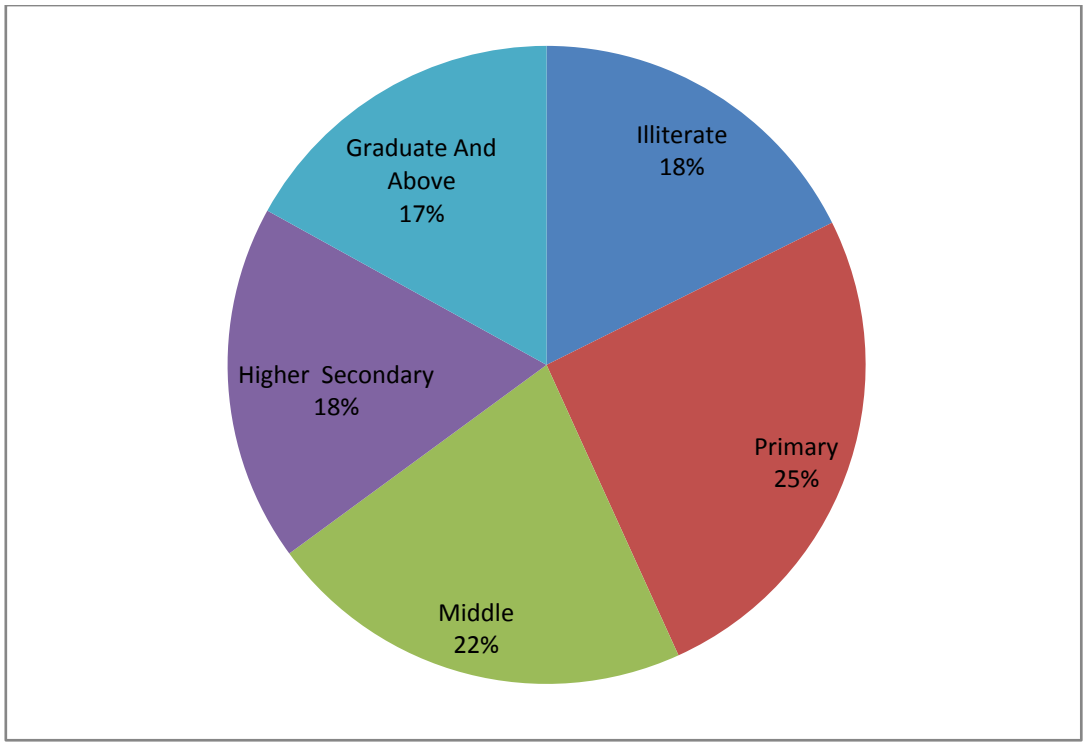
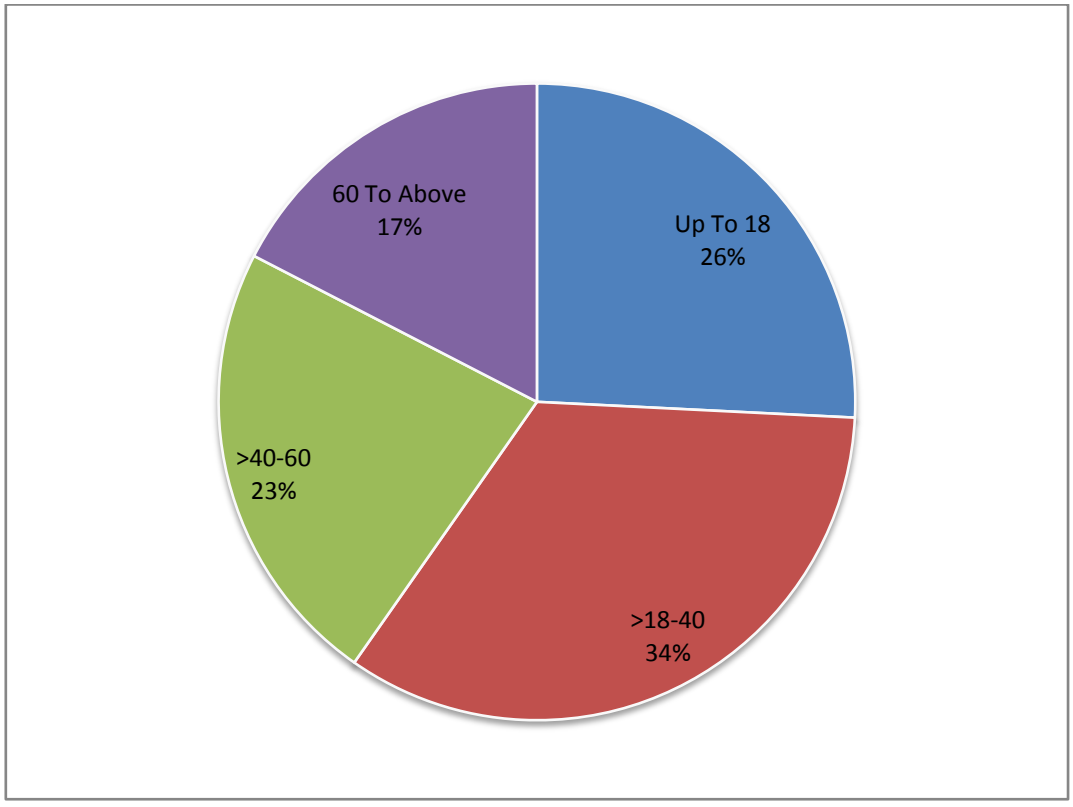


Fig 4.2 Age group of sample households



4.2.2 Irrigation

The category wise irrigation areas at the sample farms are shown in table 4.3 and Fig 4.4 most of the area under irrigation is covered by tube well followed by the canal, well and tank.

Table 4.3 Sources-wise irrigated area at sampled farm

(ha./farm)

S.No	Category	Irrigated Area	Pond	Well	Tube Well	Canal	Tank
(1)	Marginal	0.64 (100.00)	0.08 (12.50)	0.19 (29.69)	0.28 (43.75)	0.09 (14.06)	0.00 (0.00)
(2)	Small	1.53 (100.00)	0.13 (8.48)	0.26 (16.96)	0.89 (58.07)	0.25 (16.31)	0.00 (0.00)
(3)	Medium	2.88 (100.00)	0.00 (0.00)	0.28 (9.90)	1.87 (65.04)	0.40 (13.87)	0.16 (5.63)
(4)	Large	8.72 (100.00)	0.00 (0.00)	0.35 (4.01)	6.37 (73.03)	1.08 (12.38)	0.75 (8.60)
(5)	Over all	1.33 (100.00)	0.02 (1.57)	0.11 (8.13)	0.94 (70.54)	0.18 (13.63)	0.09 (6.84)

Note: Figures in parentheses indicate percentage to total

4.2.3 Cropping Pattern

The Table 4.4 and Fig 4.5, 4.5.1 reveals the cropping pattern in the sampled households. It can be seen that in Kharif paddy on an average occupied the largest area (32.14 percent) fallowed by tomato (19.21 percent), beans (17.48percent), brinjal (16.89 percent), okra (14.28 percent). In rabi season cabbage (22.64 percent), followed by (Knol-Khol 21.00 percent), tomato (19.30 percent), cauliflower (19.65 percent), brinjal (18.52 percent) were the major vegetables. Cucurbits crop on an average occupied maximum area (23.47 percent) followed by, okra (21.03 percent), tomato (19.83 percent), cabbage (17.44 percent) and brinjal (18.22 percent) in zaid. The cropping intensity was observed to be 276.84 percent and it shows a decreasing trend with the rise in farm size.

Fig 4.3 Land use pattern of sampled house hold

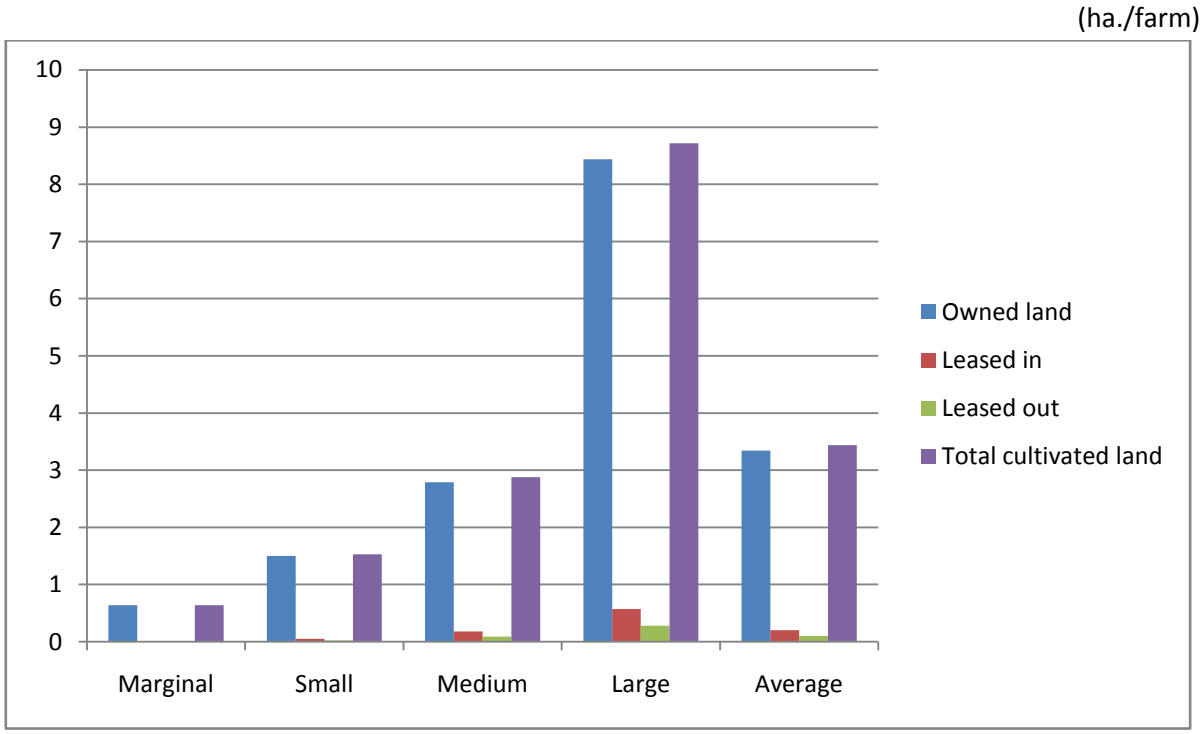


Fig 4.4 Source wise irrigated area at sampled farm

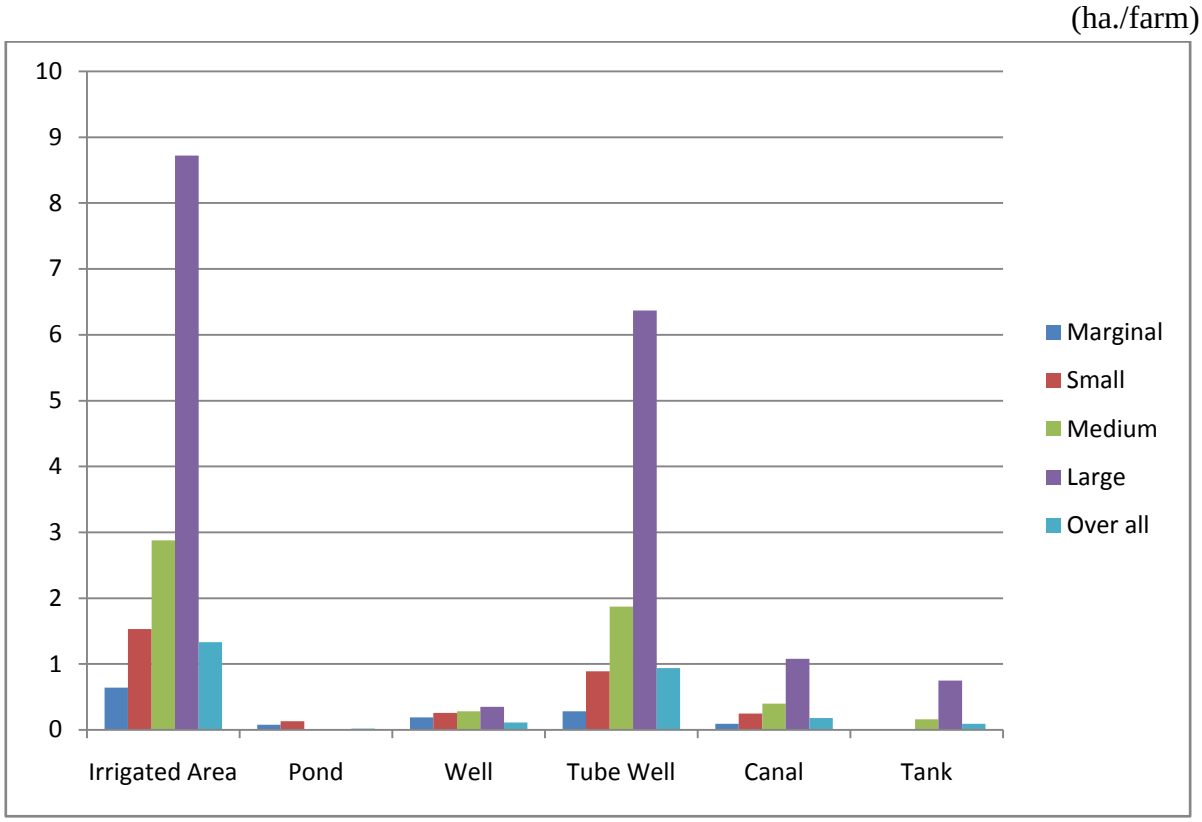


Table 4.4: Cropping pattern of sample households

Crops	Marginal	Small	Medium	large	Overall %
A. Kharif					
(1)Paddy	0.15 (22.54)	0.39 (25.28)	0.92 (31.79)	2.98 (34.16)	1.11 (32.14)
(2)Tomato	0.17 (25.85)	0.21 (13.51)	0.66 (22.89)	1.61 (18.50)	0.66 (19.21)
(3)Brinjal	0.15 (23.78)	0.32 (20.92)	0.41 (14.34)	1.44 (16.52)	0.58 (16.89)
(4)Okra	0.05 (8.27)	0.40 (26.16)	0.40 (13.87)	1.11 (12.77)	0.49 (14.28)
(5)Beans	0.13 (19.54)	0.22 (14.12)	0.49 (17.11)	1.57 (18.05)	0.60 (17.48)
Total Kharif (A)	**0.64** (100.00) (35.76)	**1.53** (100.00) (33.86)	**2.88** (100.00) (37.30)	**8.72** (100.00) (37.51)	**3.44** (100.00) (36.97)
B. Rabi					
(1)Tomato	0.10 (16.72)	0.29 (19.30)	0.49 (20.22)	1.44 (19.15)	0.58 (19.30)
(2)Brinjal	0.15 (25.30)	0.33 (21.93)	0.41 (16.94)	1.33 (17.73)	0.56 (18.52)
(3)Cabbage	0.14 (23.65)	0.32 (21.05)	0.53 (21.86)	1.73 (23.05)	0.68 (22.64)
(4)Cauliflower	0.10 (16.94)	0.31 (20.18)	0.59 (24.04)	1.36 (18.09)	0.59 (19.65)
(5) Knol-Khol	0.11 (17.38)	0.31 (20.18)	0.47 (19.13)	1.65 (21.99)	0.63 (21.00)
Total Rabi (B)	**0.61** (100.00) 33.62	**1.52** (100.00) 33.66	**2.44** (100.00) 31.57	**7.52** (100.00) 32.35	**3.01** (100.00) 32.36
C. Summer					
(1)Okra	0.09 (16.55)	0.37 (25.45)	0.49 (20.50)	1.45 (20.65)	0.60 (21.03)
(2) Cabbage	0.07 (13.41)	0.16 (10.91)	0.47 (19.39)	1.29 (18.46)	0.50 (17.44)
(3) Tomato	0.15 (26.57)	0.19 (13.18)	0.54 (22.44)	1.39 (19.79)	0.57 (19.83)
(4)Brinjal	0.11 (19.93)	0.31 (20.91)	0.41 (17.17)	1.25 (17.89)	0.52 (18.22)
(5)Cucurbits Crop	0.13 (23.55)	0.43 (29.55)	0.49 (20.50)	1.63 (23.22)	0.67 (23.47)
(C) Total Summer	0.55 (100.00) **(30.62)**	1.47 (100.00) **(32.48)**	2.41 (100.00) **(31.13)**	7.01 (100.00) **(30.14)**	2.86 (100.00) **(30.68)**
Total Cropped area (ha)					
(A+B+C)	1.80	4.52	7.73	23.25	9.32
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)
Net cropped area	0.64	1.53	2.88	8.72	3.44
Copping intensity	281.28	296.51	285.24	270.73	276.84

Note: Figures in parentheses indicate percentage to total kharif, rabi, summer and cropped area

Fig 4.5 Cropping pattern of sample households

(ha./farm)

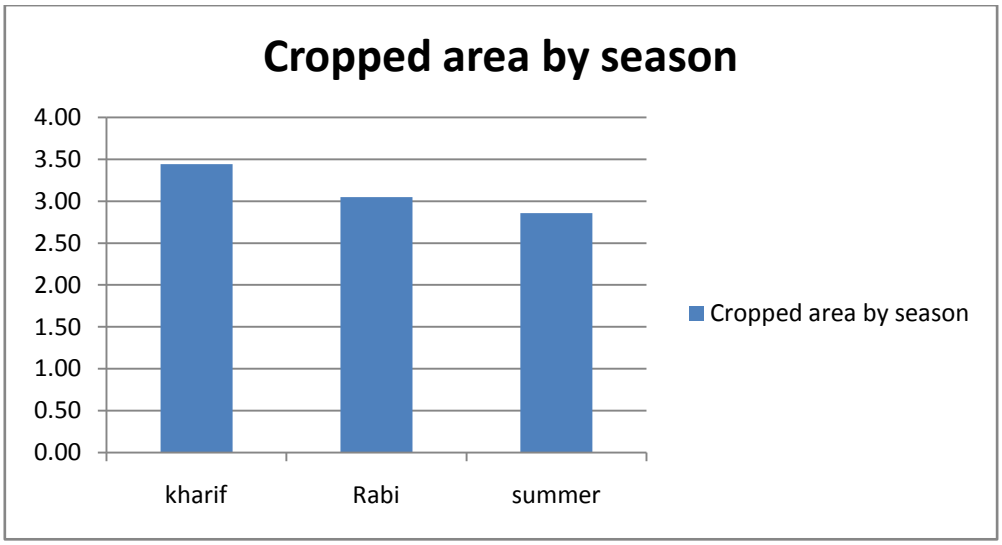
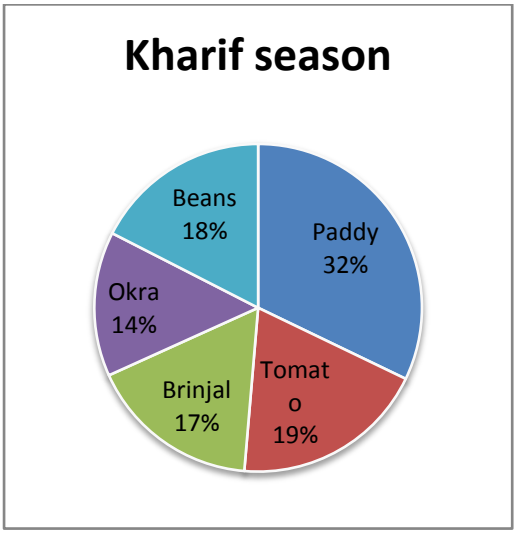
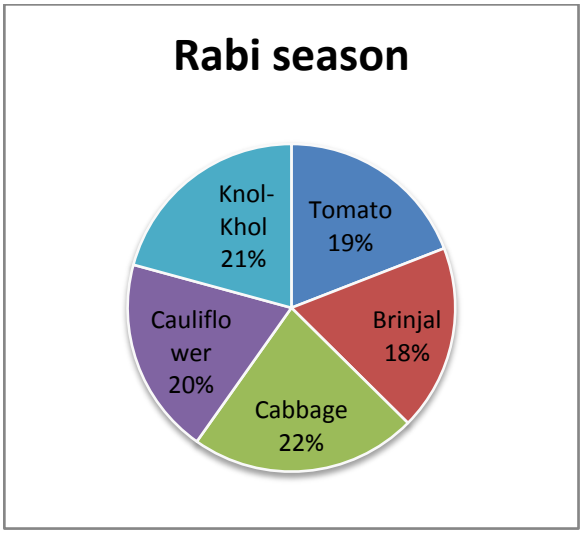
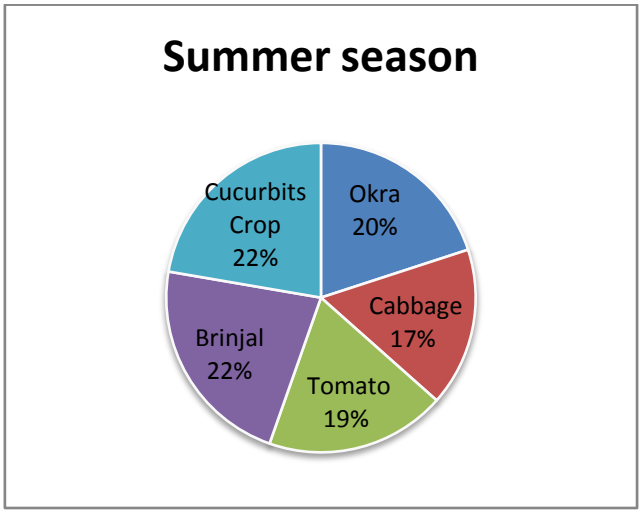


Fig 4.5.1 Cropwise area percentage in different season







4.3. Eonomics of major vegetable crop production

4.3.1. Economics of cauliflower crop

The economics of cauliflower crop is presented in table 4.5.It clearly shows that the cost of cultivation per hectare of cauliflower was higher on large farms as compared to marginal farms. Over all, on an average the cost of cultivation per hectare of cauliflower was found to be Rs. 53021.02 per hectare. The cost of cultivation in case of large farm was higher (Rs. 59487.47/ha.) as compared to marginal farms (Rs. 51854.67/ha.), small (Rs. 54665.64/ha.) and medium farms (Rs. 56517.04/ha.). The cost of cultivation per hectare showed a rising trend with the increase in size of farm. It was due to the fact that the large farmers incurred more expenditure on modern farm input like quality seed, fertilizer, plant protection material, hired labour etc. as a result of borrowing from credit institutions and better economic status compared to marginal, small and medium farmers.

4.3.1.1 Yield, value of output and cost of production per quintal

The yield, value of output per hectare and cost of production per quintal of cauliflower on the sample farms have been worked out in table 4.6. It indicates that the average yield per hectare of cauliflower was 245.97 quintal on the sample farms.

The cost of production per quintal of cauliflower on an average was worked out to Rs. 215.56.It came to Rs. 270.60, Rs. 265.07, Rs. 239.27 and Rs. 221.66 for marginal, small, medium and large farm size respectively. It decreased with the increased in the size of farm due to higher yields in return to the cost of cultivation on the large farm. The average value of production per hectare came to Rs.146088.39. It was Rs113558.35, Rs.122502.60, 140307.75 and Rs.159413.29 on marginal, small, medium and large farm respectively. The higher value of output on large farms was associated with the higher yield.

Table 4.5: Economics of cauliflower on different farm size groups farm

(Rs/ha.)

		Marginal	Small	Medium	Large	Average
	A. Variable cost					
(1)	Family labour	23187.01 (44.72)	11746.70 (21.49)	7451.04 (13.18)	4251.96 (7.15)	7365.01 (13.89)
(2)	Hired labour	2043.48 (3.94)	14629.67 (26.76)	16998.96 (30.08	20602.50 (34.63)	17403.60 (32.82)
(3)	Total labour	25230.40 (48.66)	26376.33 (48.25)	24450.00 (43.26)	24854.40 (41.78)	24768.60 (46.71)
(5)	Bullock labour	1630.43 (3.14)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	42.57 (0.08)
(6)	Machine power	0.00 (0.00)	2000 (3.66)	2000 (3.54)	2000 (3.36)	156.66 (0.30)
(7)	Seed	1793.85 (3.46)	2185 (4.01)	2724.25 (4.82)	3805.2 (6.40)	568.14 (1.07)
(8)	FYM	1686.96 (3.25)	1786.67 (3.27)	2400 (4.25)	2901.96 (4.88)	2528.46 (4.77)
(9)	Fertilizer	4254.35 (8.20)	5229.17 (9.57)	5689.17 (10.07)	5709.90 (9.6)	5079.63 (9.58)
(10)	Plant protection	1745.87 (3.37)	1977.08 (3.62)	2842.4 (5.03)	3189.31 (5.36)	2825.77 (5.33)
(11)	Irrigation charges	1956.52 (3.77)	1916.67 (3.51)	2031.25 (3.59)	2009.8 (3.38)	1997.39 (3.77)
(12)	Interest on working capital	2297.9 (4.43)	2488.26 (4.55)	2528.22 (4.47)	2668.24 (4.49)	2278.03 (4.30)
(A)	**Total variable cost**	**40596.3** (78.29)	**41959.2** (76.76)	**42665.3** (75.49)	**45138.8** (75.88)	**40088.60** (75.61)
B.	**Fixed cost**					
(13)	Rental value of land	10000 (19.28)	10000 (18.29)	10000 (17.69)	10000 (16.81)	10000 (18.86)
(14)	Land revenue	12 (0.02)	12 (0.02)	12 (0.02)	12 (0.02)	12 (0.02)
(15)	Depreciation	1246.35 (2.40)	2694.47 (4.93)	3839.76 (6.79)	4336.65 (7.29)	2920.40 (5.51)
(B)	**Total fixed cost**	11258.35 (21.71)	12706.47 (23.24)	13851.76 (24.51)	14348.65 (24.12)	12932.40 (24.39)
	C. Gross cost=(A+B)	**51854.67 (100.00)**	**54665.64 (100.00)**	**56517.04 (100.00)**	**59487.47 (100.00)**	**53021.02 (100.00)**

Note: Figures in parentheses indicate percentage to total

Table 4.6 Per ha. yield value of output and cost of production per quintal cauliflower crop:

(Rs/ha.)

S.No	Particular	Farm Size				Average
		Marginal	Small	Medium	Large	
1.	Gross Cost(Rs/ha.)	51854.67	54665.64	56517.04	59487.47	53021.02
2.	Yield (qt/ha.)	191.63	206.23	236.21	268.37	245.97
3.	Price (Rs/ qt)	600.00	600.00	600.00	600.00	600.00
4.	Value of Production(Rs)	113558.35	122502.60	140307.75	159413.29	146088.39
Total	Cost of production (Rs/qt)	270.60	265.07	239.27	221.66	215.56

4.3.1. 2 Measures of farm profit

The values of net income, family labour income and farm business the per hectare the sample farms of different size groups have been worked out in the table 4.7 and fig 4.6.The table indicates that, on an average the value of net average family labour income and farm business income per hectare came Rs. 100432.38 and Rs. 19643.04, respectively, on the sample farms of different sizes. Overall on an average the input-output ratio of cauliflower came to 1: 2.75 on the sample farms.

Table 4.7: **Cost and return of cauliflower on the sample farms for different group of farms** **(Rs/ha.)**

So.No	Particular	Farm Size				
		Marginal	Small	Medium	Large	Average
1	Gross cost (Rs)	51854.67	54665.64	56517.04	59487.47	53021.01
2	Output value (Rs/qt)	113558.35	122502.60	140307.75	159413.29	146088.39
3	Net income (Rs)	61703.68	67836.96	83790.71	99925.82	93067.37
4	Family labour income(Rs)	84890.63	79583.63	91241.75	104177.78	100432.38
5	Farm business income(Rs)	35484.86	24234.92	19979.27	16920.20	19643.04
6	Input –output ratio	1:2.19	1:2.24	1:2.48	1:2.68	1:2.75

Fig 4.6 Cost and Returns of cauliflower on sample farm for different groups of farm

(Rs/hac)

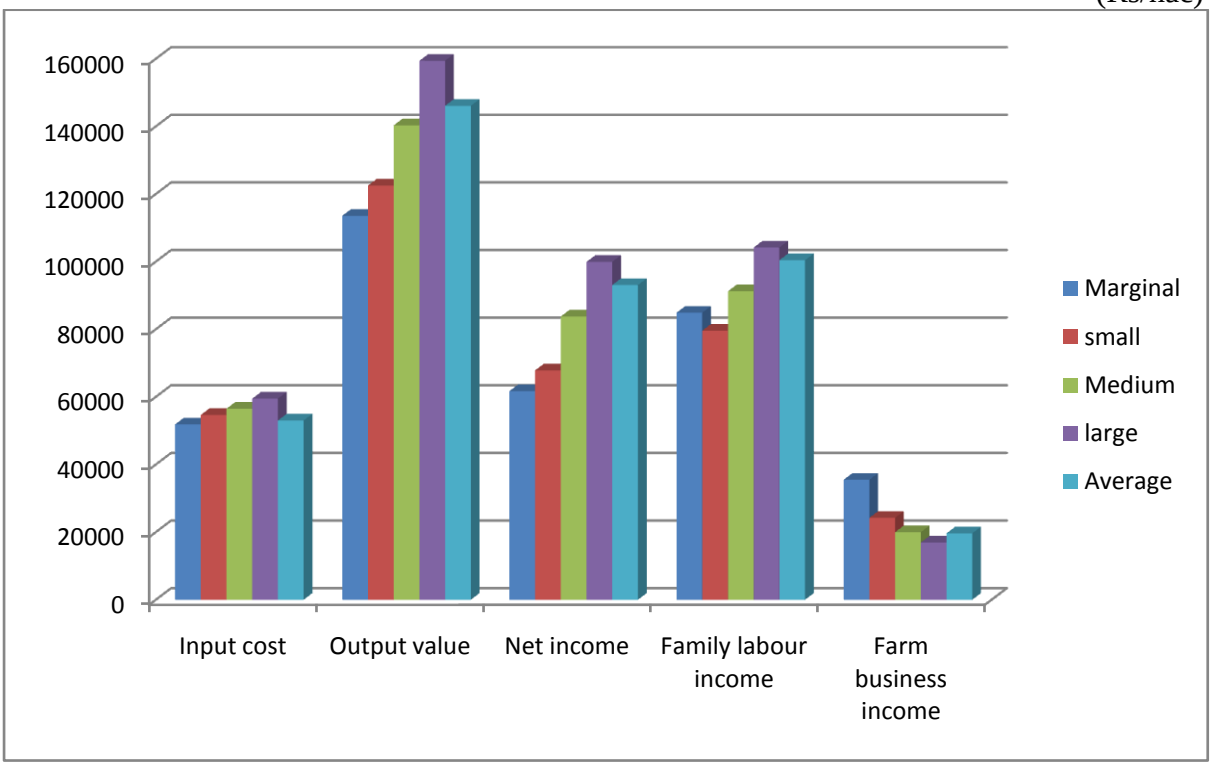
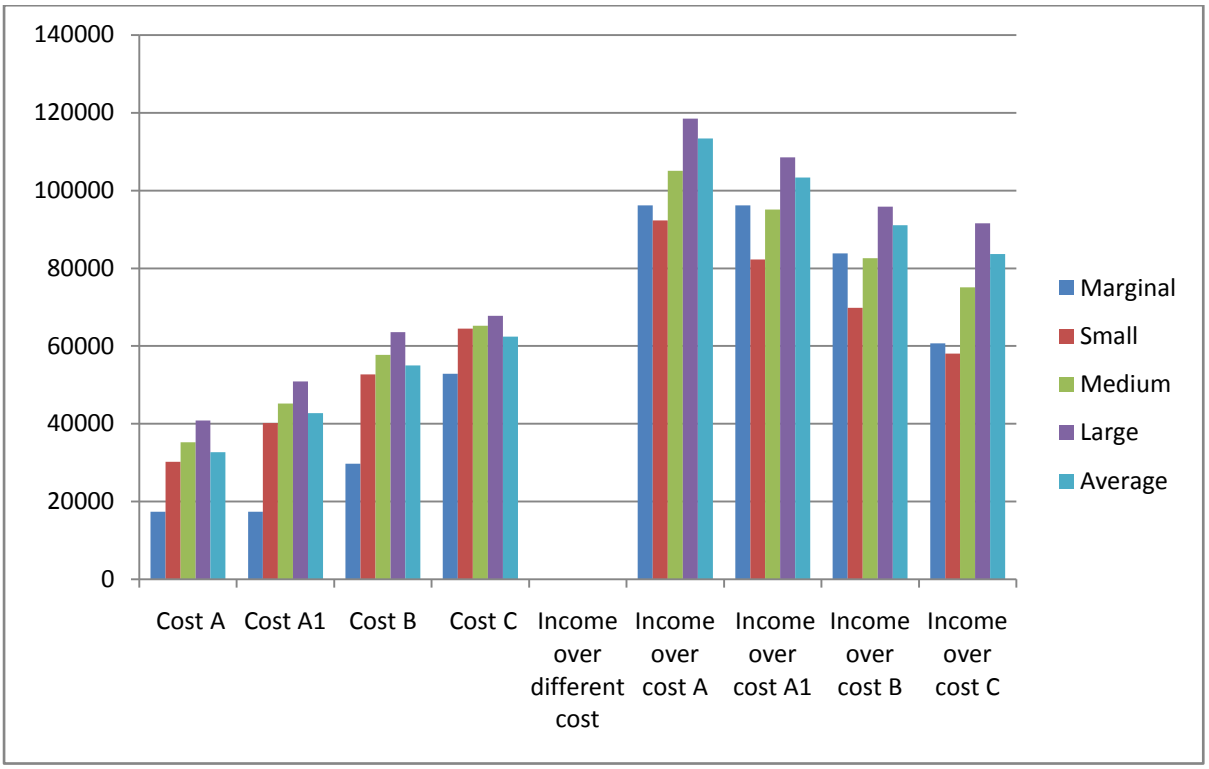


Fig 4.7 Cost and Returns on the basis of Cost concept of cauliflower

Rs/hac)



4.3.1. 3 The Cost and returns on the basis of cost concept

The cost and returns on the basis of cost concept in the production of cauliflower have been presented in table 4.8 and fig.4.7.

The cost and return on the basis of cost concept in the production cauliflower on the sample farm of different size groups have been average Cost A, Cost A1, Cost B and Cost C were worked out to Rs. 32723.60, Rs. 42723.60 Rs 55021.51, and Rs. 62386.52 per hectare respectively on the sample farms. The income over different cost were also worked out .the average income over cost A ,cost B and cost C were calculated as Rs. 113364.79 Rs 103364.79 Rs.91066.88 and Rs 83701.87 respectively.

Table 4.8: Break-up of total cost, cost concept wise income over different cost in cauliflower crop

(Rs./ha)

		Farm Size				
S.No.	**Particulars**	**Marginal**	**Small**	**Medium**	**Large**	**Average**
A.	Break-up of cost					
	a. Cost A	17409.36	30212.51	35214.24	40886.86	32723.60
	b. Cost A1	17409.36	40212.51	45214.24	50886.86	42723.60
	c. Cost B	29707.27	52700.76	57742.47	63555.1	55021.51
	d. Cost C	52894.22	64447.43	65193.51	67807.06	62386.52
B.	Income over different cost					
	a. Income over cost A	96148.99	92290.1	105093.51	118526.43	113364.79
	b. Income over cost A1	96148.99	82290.1	95093.51	108526.43	103364.79
	c. Income over cost B	83851.08	69801.84	82565.28	95858.2	91066.88
	d. Income over cost C	60664.13	58055.17	75114.24	91606.24	83701.87

4.3.2 Economics of Cabbage crop

The economics of cabbage crop is presented in table 4.9.It clearly shows that the cost of cultivation per hectare of cabbage was higher on large farms as compared to marginal farms. Over all, on an average the cost of cultivation per hectare of cabbage was found to be Rs. 57135.41 per hectare. The cost of cultivation in case of large farm was higher (Rs. 62406.76/ha.) as compared to marginal farms (Rs. 53113.32/ha.), small (Rs. 55754.01/ha.) and medium farms (Rs. 59587.40/ha.).

The cost of cultivation per hectare showed a rising trend with the increase in size of farm. It was due to the fact that the large farmers incurred more expenditure on modern farm input like quality seed, fertilizer, and plant protection material, hired lab our etc. as a result of borrowing from credit institutions and better economic status compared to marginal, small and medium farmers.

4.3.2 .1 Yield, value of output and cost of production per quintal:

The yield, value of output per hectare and cost of production per quintal of Cabbage on the sample farms have been worked out in table 4.10.It indicates that the average yield per hectare of Cabbage was 493.78 quintals on the sample farms.

The cost of production per quintal of cabbage on an average was worked out to Rs. 115.71 of Cabbage came to Rs. 138.33, 127.10, Rs. 122.23, and Rs. 120.49for marginal, small, medium and large farm size respectively. It decreased with the increased in the size of farm due to higher yields in return to the cost of cultivation on the large farm. The average value of production per hectare came to Rs.1,68,325.36.It was Rs.1,32,108.72,Rs.1,50,084.67, 1,66,367.25 and Rs.1,76,267.65 on marginal, small, medium and large farm respectively. The higher value of output on large farms was associated with the higher yield.

Table 4.9: Economics of cabbage on different size of group farm

(Rs/ha.)

A.	**Variable cost**	**Marginal**	**Small**	**Medium**	**Large**	**Average**
(1)	Family labour	21646.51 (40.76)	16283.33 (29.21)	5186.73 (8.70)	3912.69 (6.27)	6753.13 (11.82)
(2)	Hired labour	5718.14 (10.77)	11943 (21.42)	23225.51 (38.98)	24047.69 (38.53)	21315.18 (37.31)
(3)	Total labour	27364.65 (51.52)	28226.33 (50.63)	28412.24 (47.68)	27960.38 (44.80)	28068.3 (49.13)
(5)	Bullock labour	1744.19 (3.28)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	39.69 0.07
(6)	Machine power	0.00 (0.00)	2000 (3.59)	2000 (3.36)	2000 (3.20)	136.52 (0.24)
(7)	Seed	800 (1.51)	1400 (2.51)	3201.33 (5.37)	4480.28 (7.18)	741.69 (1.30)
(8)	FYM	1637.21 (3.08)	1776.67 (3.19)	2026.53 (3.40)	2431.54 (3.90)	2212.97 (3.87)
(9)	Fertilizer	4431.4 (8.34)	4896.83 (8.78)	5251.02 (8.81)	5586.77 (8.95)	5586.77 (9.78)
(10)	Plant protection	1430.23 (2.69)	1750.00 (3.14)	2000.00 (3.36)	2480.77 (3.98)	2222.41 (3.89)
(11)	Irrigation charges	2372.09 (4.47)	3083.33 (5.53)	3010.2 (5.05)	3307.69 (5.30)	3164.96 (5.54)
(12)	Interest on working capital	2386.79 (4.49)	2587.99 (4.64)	2754.08 (4.62)	2894.85 (4.64)	2530.4 (4.43)
	Total variable cost (A)	**42166.55 (79.39)**	**43721.16 (78.42)**	**46655.41 (78.30)**	**49142.28 (78.75)**	**44567.19 (78.00)**
B.	**Fixed cost**					
(13)	Rental value of land	10000 (18.83)	10000 (17.94)	10000 (16.78)	10000 (16.02)	10000 (17.50)
(14)	Land revenue	12 (0.02)	12 (0.02)	12 (0.02)	12 (0.02)	12 (0.02)
(15)	Depreciation	934.77 (1.76)	2020.85 (3.62)	2919.99 (4.90)	3252.49 (5.21)	2556.22 (4.47)
	Total fixed cost (B)	10946.77 (20.61)	12032.85 (21.58)	12931.99 (21.70)	13264.49 (21.25)	12568.22 (22.00)
C.	**Gross cost=(A+B)**	**53113.32 (100.00)**	**55754.01 (100.00)**	**59587.4 (100.00)**	**62406.76 (100.00)**	**57135.41 (100.00)**

Note: Figures in parentheses indicate percentage to gross cost

Table 4.10: Cabbage crop per ha. yield value of output

(Rs/ha.)

So.No	Particular	Farm Size				Average
		Marginal	Small	Medium	Large	
1	Gross Cost(Rs/ha.)	53113.32	55754.01	59587.40	62406.76	57135.41
2	Yield (qt/ha.)	383.95	438.67	487.52	517.94	493.78
3	Price (Rs/qt)	350.00	350.00	350.00	350.00	350.00
4	Value of Production (Rs/ha.)	132108.72	150084.67	166367.25	176267.65	168325.36
5	Cost of production (Rs/qt)	138.33	127.10	122.23	120.49	115.71

4.3.2 .2 Measures of farm profit

The values of net income, family labour income and farm business per hectare on the sample farms of different size groups have been worked out in the table 4.11 and fig 4.8.

The table clearly indicates that, on an average the value of net average family labour income and farm business income per hectare came Rs.117943.08 and Rs.19283.53, respectively, on the sample farms of different sizes. Overall on an average the input-output ratio of Cabbage came to 1: 2.95 on the sample farms.

Table 4.11: **Cost and return of cabbage on the sample farms for different group of farms**

(Rs/ha.)

So.No	Particular	Farm Size				
		Marginal	small	Medium	large	Average
1	Gross cost (Rs)	53113.32	55754.01	59587.40	62406.76	57135.41
2	Output value(Rs)	132108.72	150084.67	166367.25	176267.65	168325.36
3	Net income (Rs)	78995.40	94330.66	106779.85	113860.89	111189.96
4	Family labour income (Rs)	100641.91	110613.99	111966.58	117773.58	117943.08
5	Farm business income (Rs)	34033.30	28871.32	17940.81	16807.54	19283.53
6	Input –output ratio	1:2.49	1:2.69	1:2.79	1:2.82	1:2.95

Fig 4.8 Cost and Returns of cabbage on sample farm for different groups of farm

(Rs/hac)

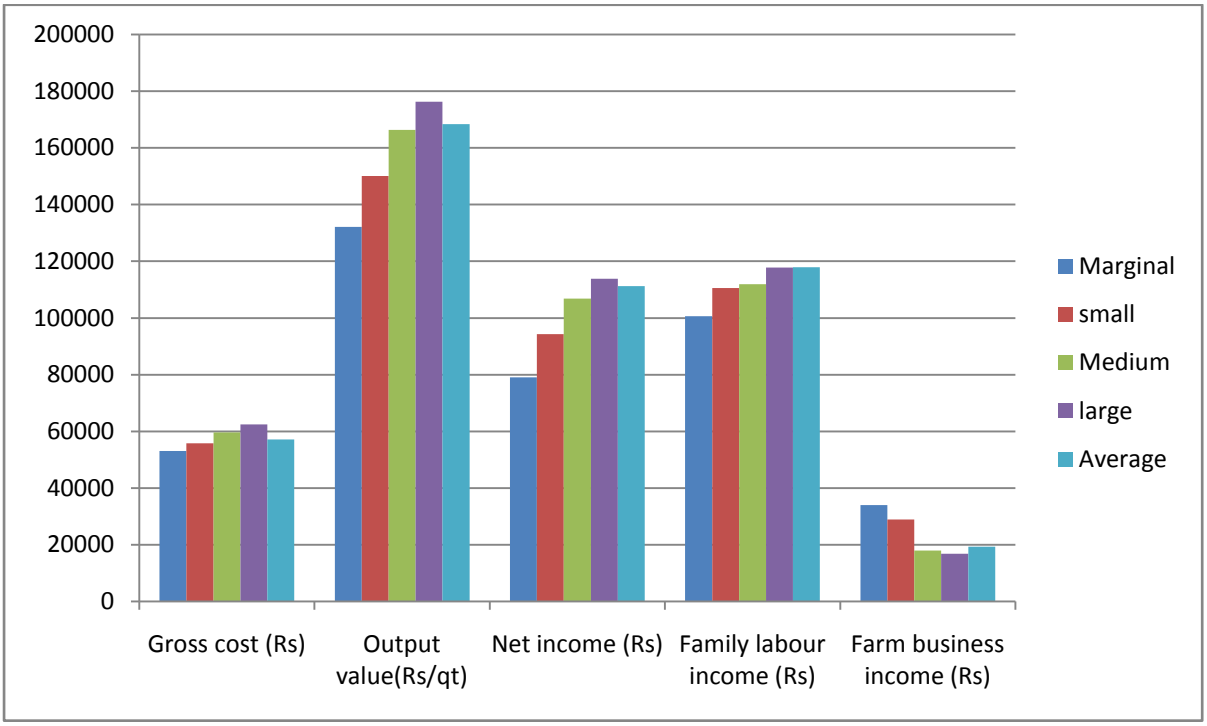
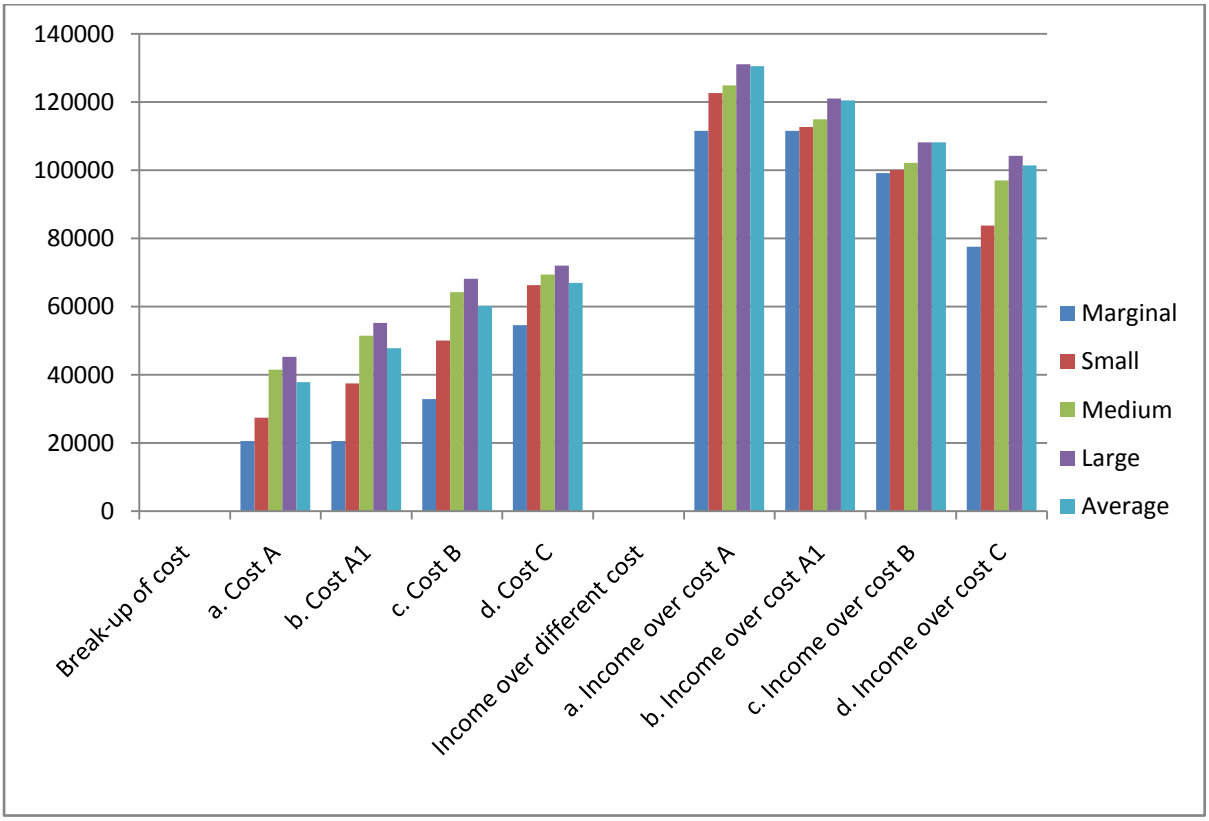


Fig 4.9 Cost and Returns on the basis of Cost concept of cabbage

(Rs/hac)



4.3.2 .3 Cost and returns on the basis of cost concept

The Cost and returns on the basis of cost concept in the production Cabbage on the sample farm of different size groups have been presented Table 4.12 and Fig.4.9 that on an average Cost A, Cost A1, Cost B and Cost C were worked out to Rs. 37814.06, Rs. 47814.06 Rs 60200.85, and Rs. 66953.98 per hectare respectively on the sample farms. The incomes over different cost were also worked out .The average income over Cost A, CostA1, Cost-B and Cost C were calculated as Rs. 130511.30 Rs. 120511.30 Rs. 108124.52, and Rs. 101371.39 respectively.

Table 4.12: Break-up of total cost, cost concept wise income over different cost in cabbage

(Rs/ha.)

S.No.	Particulars	Farm Size				
		Marginal	**Small**	**Medium**	**Large**	**Average**
A.	Break-up of cost					
	a. Cost A	20520.04	27437.82	41468.67	45229.58	37814.06
	b. Cost A1	20520.04	37437.82	51468.67	55229.58	47814.06
	c. Cost B	32906.83	50025.81	64222.75	68124.43	60200.85
	d. Cost C	54553.34	66309.15	69409.49	72037.12	66953.98
B.	Income over different cost					
	a. Income over cost A	111588.68	122646.84	124898.58	131038.07	130511.30
	b. Income over cost A1	111588.68	112646.84	114898.58	121038.07	120511.30
	c. Income over cost B	99201.89	100058.85	102144.50	108143.22	108124.52
	d. Income over cost C	77555.38	83775.52	96957.76	104230.53	101371.39

4.3.3 Economics of tomato crop

The economics of tomato crop is presented in table 4.13. It clearly shows that the cost of cultivation per hectare of tomato was higher on large farms as compared to marginal farms. Over all, on an average the cost of cultivation per hectare of tomato was found to be Rs. 64,595.36 per hectare. The cost of cultivation in case of large farm was higher (Rs. 70,696.26/ha.) as compared to marginal farms (Rs. 54,759.30/ha.), small (Rs. 62,492.68/ha.) and medium farms (Rs. 65,957.61/ha.).The cost of cultivation per hectare showed a rising trend with the increase in size of farm. It was due to the fact that the large farmers incurred more expenditure on modern farm input like quality seed, fertilizer, plant protection material, hired labour etc. as a result of borrowing from credit institutions and better economic status compared to marginal, small and medium farmers.

4.3.3 .1 Yield value of output and cost of production per quintal

The yield, value of output per hectare and cost of production per quintal of tomato on the sample farms have been worked out in table 4.14.It indicate that the average yield per hectare of tomato was 439.58 quintal on the sample farms.

The cost of production per quintal on an average was worked out to Rs. 439.58 tomato. It was Rs. 299.38, 367.52, Rs. 428.34, and Rs. 479.37 for marginal, small, medium and large farm size respectively. It decreased with the increase in the size of farm due to higher yields in return to the cost of cultivation on the large farm. The average value of production per hectare came to Rs.1,93,856.82 .It was Rs. 132028.62, Rs162075.67,188898.13 and Rs. 211402.33 on marginal, small, medium and large farm respectively. The higher value of output on large farms was associated with the higher yield.

Table 4.13: Economics of tomato on sampled farm

(Rs/ha.)

		Marginal	Small	Medium	Large	Average
	A. Variable cost					
(1)	Family labour	22703.85 (41.46)	12007.41 (19.21)	8476.60 (12.85)	4344.91 (6.15)	7625.64 (11.81)
(2)	Hired labour	4228.08 (7.72)	16881.11 (27.01)	20417.02 (30.95)	26876.39 (38.02)	22425.67 (34.72)
(3)	Total labour	26931.92 (49.18)	28888.52 (46.23)	28893.62 (43.81)	31221.30 (44.16)	30051.31 (46.52)
(5)	Bullock labour	1442.31 (2.63)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	36.98 (0.06)
(6)	Machine power	0.00 (0.00)	2000.00 (3.20)	2000.00 (3.03)	2000.00 (2.83)	2000.00 (3.10)
(7)	Seed	1892.69 (3.46)	2636.67 (4.22)	3741.62 (5.67)	4398.15 (6.22)	701.08 (1.09)
(8)	FYM	1850.00 (3.38)	2548.15 (4.08)	2825.53 (4.28)	3114.81 (4.41)	2882.31 (4.46)
(9)	Fertilizer	5116.15 (9.34)	5284.44 (8.46)	5609.40 (8.50)	6130.91 (8.67)	6130.91 (9.49)
(10)	Plant protection	793.27 (1.45)	1259.26 (2.02)	1811.17 (2.75)	2185.19 (3.09)	1874.04 (2.90)
(11)	Staking	0.00 (0.00)	3500.00 (5.60)	3539.89 (5.37)	3517.36 (4.98)	3519.23 (5.45)
(12)	Irrigation charges	3306.23 (6.04)	3373.37 (5.40)	3489.72 (5.29)	3500.00 (4.95)	3467.07 (5.37)
(13)	Interest on working capital	2479.95 (4.53)	2969.42 (4.75)	3114.66 (4.72)	3364.06 (4.76)	3039.78 (4.71)
(14)	**Total variable cost (A)**	**43812.53 (80.01)**	**50459.83 (80.75)**	**53025.61 (80.39)**	**57431.78 (81.24)**	**51702.70 (80.04)**
	B. Fixed cost					
(14)	Rental value of land	10000.00 (18.26)	10000.00 (16.00)	10000.00 (15.16)	10000.00 (14.15)	10000.00 (15.48)
(15)	Land revenue	12.00 (0.02)	12.00 (0.02)	12.00 (0.02)	12.00 (0.02)	12.00 (0.02)
(16)	Depreciation	934.77 (1.71)	2020.85 (3.23)	2919.99 (4.43)	3252.49 (4.60)	2880.66 (4.46)
	Total fixed cost (B)	10946.77 (19.99)	12032.85 (19.25)	12931.99 (19.61)	13264.49 (18.76)	12892.66 (19.96)
	C. Gross cost=(A+B)	**54759.30 (100.00)**	**62492.68 (100.00)**	**65957.61 (100.00)**	**70696.26 (100.00)**	**64595.36 (100.00)**

Note: Figure in parentheses indicate percentage to gross cost

Table 4.14: Per ha. yield value of output and cost of production per quintal tomato

(Rs/ha.)

So.No	Particular	Farm Size				Average
		Marginal	Small	Medium	Large	
1	Gross Cost(Rs/ha.)	54759.30	62492.68	65957.61	70696.26	64595.36
2	Yield (qt/ha.	299.38	367.52	428.34	479.37	439.58
3	Price (Rs/qt)	450.00	450.00	450.00	450.00	450.00
4	Value of Production (Rs/ha.)	132028.62	162075.67	188898.13	211402.33	193856.82
Total	Cost of Cultivation (Rs/qt)	182.91	170.04	153.98	147.48	146.95

4.3.3 .2 Measures of farm profit

The values of net income, family labour income and farm business the per hectare on the sample farms of different size groups have been worked out in the table 4.14 and fig 4.10.

The table clearly indicates that, on an average the value of net average family labour income and farm business income per hectare came Rs. 136887.09 and Rs. 20665.42, respectively, on the sample farms of different sizes. Overall the input-output ratio of tomato came to 1: 3.01 on the sample farms

Table 4.15: **Cost and return of Tomato on the sample farms for different group of farms**

(Rs/ha.)

So.No	Particular	Farm Size				
		Marginal	small	Medium	large	Average
1	Gross cost (Rs)	54759.30	62492.68	65957.61	70696.26	64595.36
2	Output value (Rs)	132028.62	162075.67	188898.13	211402.33	193856.82
3	Net income (Rs)	77269.32	99582.98	122940.52	140706.07	129261.45
4	Family labour income (Rs)	99973.17	111590.39	131417.11	145050.98	136887.09
5	Farm business income (Rs)	35183.80	24976.83	21591.25	17708.97	20665.42
6	Input –output ratio	1:2.41	1:2.59	1:2.86	1:2.99	1:3.01

Fig 4.10 Cost and Returns of tomato on sample farm for different groups of farm

(Rs/hac)

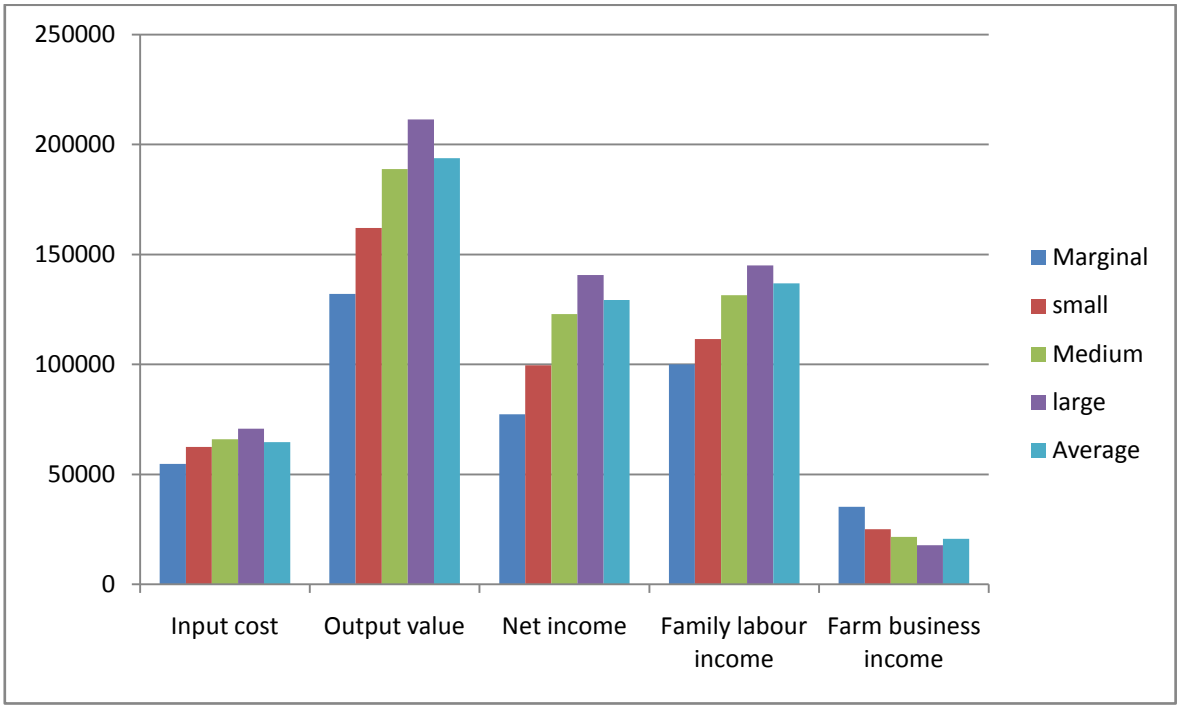
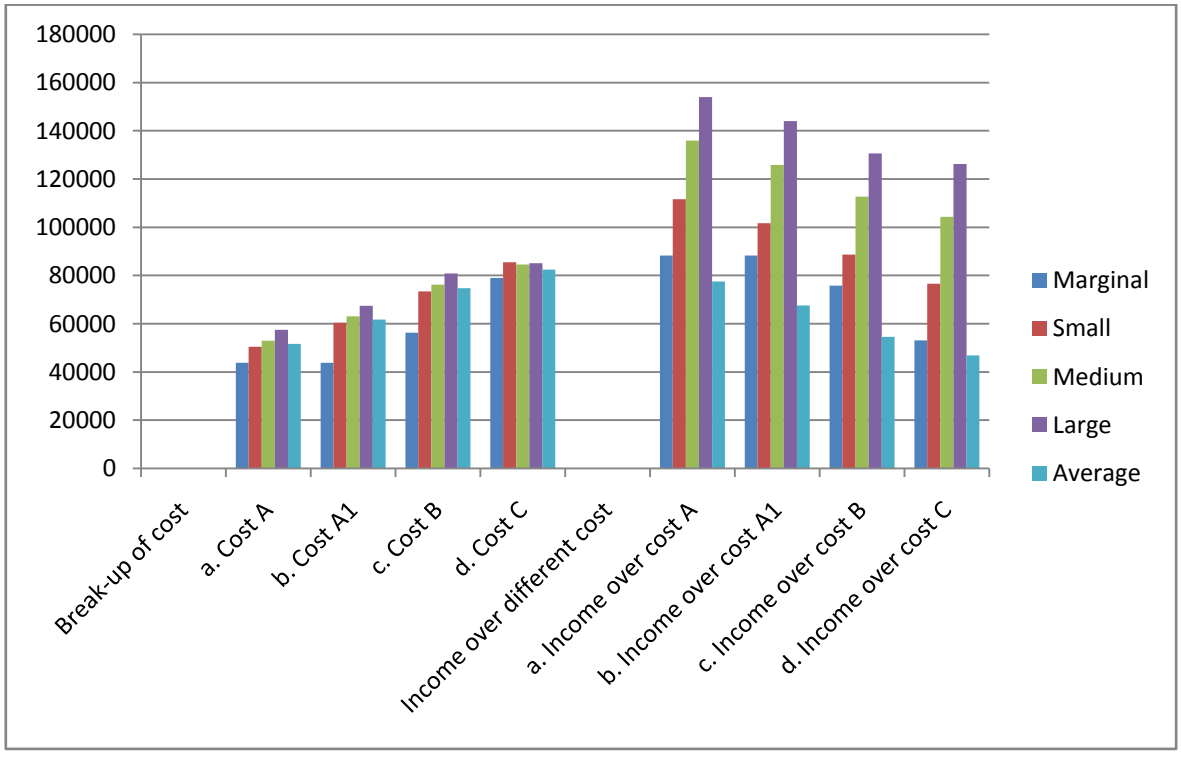


Fig 4.11 Cost and Returns on the basis of Cost concept of tomato

(Rs/hac)



4.3.3 .3 Cost and returns on the basis of cost concept

The cost and returns based on cost concept in the production tomato on the sample farm of different size groups have been presented table.16 and fig.4.11that on an average Cost A, Cost A1, Cost B and Cost C were worked out to Rs. 51702.70, Rs. 61702.70 Rs 74742.48, and Rs. 82368.12 per hectare respectively on the sample farms. The income over different cost were also worked out .The average income over Cost A, Cost A1, Cost B and Cost C were calculated as Rs 77558.75, Rs 67558.75, Rs 54518.97, and Rs 46893.33 respectively.

Table 4.16: Break-up of total cost, cost concept wise income over different cost in tomato crop (Rs./ha)

S.No.	Particulars	Farm Size				
		Marginal	**Small**	**Medium**	**Large**	**Average**
A.	Break-up of cost					
	a. Cost A	43812.53	50459.83	53025.61	57431.78	51702.70
	b. Cost A1	43812.53	60459.83	63025.61	67431.78	61702.70
	c. Cost B	56292.49	73429.26	76140.27	80795.84	74742.48
	d. Cost C	78996.33	85436.66	84616.87	85140.75	82368.12
B.	Income over different cost					
	a. Income over cost A	88216.08	111615.83	135872.51	153970.56	77558.75
	b. Income over cost A1	88216.08	101615.83	125872.51	143970.56	67558.75
	c. Income over cost B	75736.13	88646.41	112757.86	130606.49	54518.97
	d. Income over cost C	53032.28	76639.00	104281.26	126261.59	46893.33

4.3.4 Economics of brinjal crop

The economics of brinjal crop is table 4.17.It clearly shows that the cost of cultivation per hectare of brinjal was higher on large farms as compared to marginal farms. Over all on an average the cost of cultivation per hectare of Brinjal was found to be Rs. 80498.36 per hectare. The cost of cultivation in case of large farm was higher (Rs. 85700.84/ha.) as compared to marginal farms (Rs. 72453.48/ha.), small (Rs. 77159.98/ha.) and medium farms (Rs. 82204.53/ha.).The cost of cultivation per hectare showed a rising trend with the increase in size of farm. It was due to the fact that the large farmers incurred more expenditure on modern farm input like quality seed, fertilizer, plant protection material, hired labour etc. as a result of borrowing from credit institutions and better economic status compared to marginal, small and medium farmers.

4.3.4 .1 Yield value of output and cost of production per quintal:

The yield, value of output per hectare and cost of production per quintal of Brinjal on the sample farms have been worked out in table 4.18.It indicates that the average yield per hectare of brinjal was 458.33 quintals on the sample farms.

The cost of production per quintal on an average was worked out to Rs. 175.63 of brinjal came to Rs. 205.04, 197.64, Rs. 180.31, and Rs. 175.47 for marginal, small, medium and large farm size respectively. It decreased with the increased in the size of farm due to higher yields in return to the cost of cultivation on the large farm.

The average value of production per hectare came to Rs.221870.27.It was Rs. 172183.70, Rs.189846.00, Rs.221113.81 and Rs.235908.00 on marginal, small, medium and large farm respectively. The higher value of output on large farms was associated with the higher yield.

Table 4.17: Economics of brinjal on different size of group farm

(Rs/ha.)

A.	**Variable cost**	**Marginal**	**Small**	**Medium**	**Large**	**Average**
(1)	Family labour	25643.48 (35.39)	12906 (16.72)	6454.76 (7.85)	3602.5 (4.20)	6996.64 (8.69)
(2)	Hired labour	4810 (6.64)	18205.6 (23.59)	26158.33 (31.82)	28307 (33.03)	24872.86 (30.90)
(3)	Total labour	30453.48 (42.03)	31111.6 (40.32)	32613.1 (39.67)	31909.5 (37.23)	31869.5 39.59
(5)	Bullock labour	1630.43 (2.25)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	45.67 0.06
(6)	Machine power	0.00 (0.00)	2000 2.59	2000 2.43	2000 2.33	168.07 0.21
(7)	Seed	629.3 (0.87)	829.44 (1.07)	921.43 (1.12)	1349.96 (1.58)	189.36 (0.24)
(8)	FYM	1732.61 (2.39)	1816 (2.35)	1976.19 (2.40)	2436 (2.84)	2195.66 (2.73)
(9)	Fertilizer	9869.13 (13.62)	12517 (16.22)	13303.45 (16.18)	15531.15 (18.12)	15531.15 (19.29)
(10)	Plant protection	1937.5 (2.67)	2190 (2.84)	2380.95 (2.90)	2731 (3.19)	2521.74 (3.13)
(11)	Irrigation charges	6173.91 (8.52)	6240 (8.09)	6571.43 (7.99)	6480 (7.56)	6448.18 (8.01)
(12)	Interest on working capital	3145.58 (4.34)	3402.24 (4.41)	3585.99 (4.36)	3746.26 4.37	3538.16 (4.40)
	Total variable cost (A)	**55571.95 (76.70)**	**58106.28 (75.31)**	**61352.54 (74.63)**	**64183.87 (74.89)**	**62339.42 (77.44)**
B.	**Fixed cost**					
(13)	Rental value of land	15000 (20.70)	15000 (19.44)	15000 (18.25)	15000 (17.50)	15000 (18.63)
(14)	Land revenue	12 (0.02)	12 (0.02)	12 (0.02)	12 (0.02)	12 (0.02)
(15)	Depreciation	1869.53 2.58	4041.7 5.24	5839.99 7.1	6504.97 7.59	3146.94 3.91
	Total fixed cost (B)	16881.53 23.3	19053.7 24.69	20851.99 25.37	21516.97 25.11	18158.94 22.56
C.	**Gross cost=(A+B)**	**72453.48 (100.00)**	**77159.98 (100.00)**	**82204.53 (100.00)**	**85700.84 (100.00)**	**80498.36 (100.00)**

Note: figures in parentheses indicate percentage to gross cost

Table4.18: Per hectare yield, value of output and cost of production per quintal of brinjal

(Rs/ha.)

So. No	Particular	Farm Size				Average
		Marginal	Small	Medium	Large	
1	Gross Cost(Rs/ha.)	72453.48	77159.98	82204.53	85700.84	80498.36
2	Yield (qt/ha.)	353.37	390.40	455.90	488.40	458.33
3	Price (Rs/qt)	500.00	500.00	500.00	500.00	500.00
4	Value Of Production (Rs/ha.)	172183.70	189846.00	221113.81	235908.00	221870.27
Total	Cost of production (Rs/qt)	205.04	197.64	180.31	175.47	175.63

4.3.4 .2 Measures of farm profit

The values of net income, family labour income and farm business the per hectare on the sample farms of different size groups have been worked out in the table 4.19 and fig 4.12.

The table clearly indicates that, on an average the value of net average family labour income and farm business income per hectare come Rs. 148368.55 and Rs. 25534.80, respectively, on the sample farms of different sizes. Overall on an average the input-output ratio for brinjal was estimated to be 1:2.76 on the sample farms.

Table 4.19: **Cost and return of brinjal on the sample farms for different group of farms** **(Rs/ha)**

S. No	Particular	Farm Size				
		Marginal	small	Medium	large	Average
1	Gross cost (Rs)	72453.48	77159.98	82204.53	85700.84	80498.36
2	Output value(Rs/qt)	172183.70	189846.00	221113.81	235908.00	221870.27
3	Net income (Rs)	99730.21	112686.02	138909.28	150207.16	141371.91
4	Family labour income (Rs)	125373.69	125592.02	145364.04	153809.66	148368.55
5	Farm business income (Rs)	43789.06	31308.24	25040.75	22348.76	25534.80
6	Input –output ratio	1:2.38	1:2.46	1:2.69	1:2.75	1:2.76

Fig 4.12 Cost and Returns of brinjal on sample farm for different groups of farm

(Rs/hac)

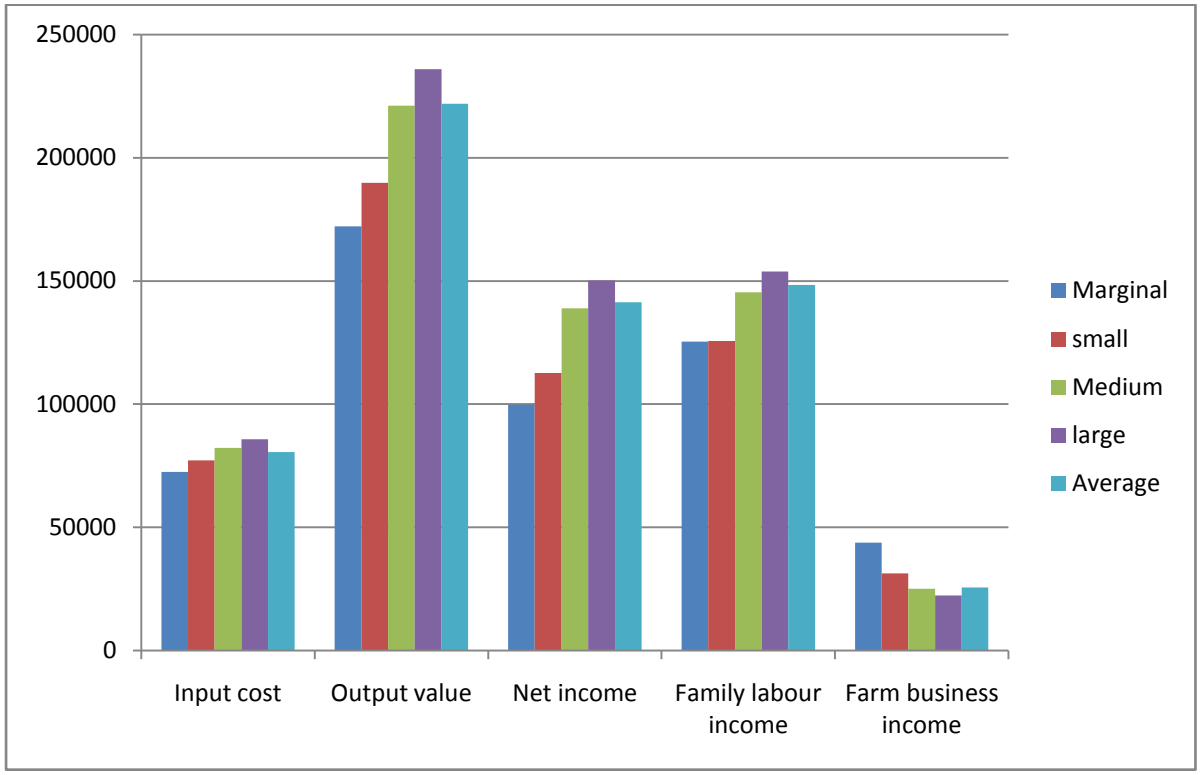
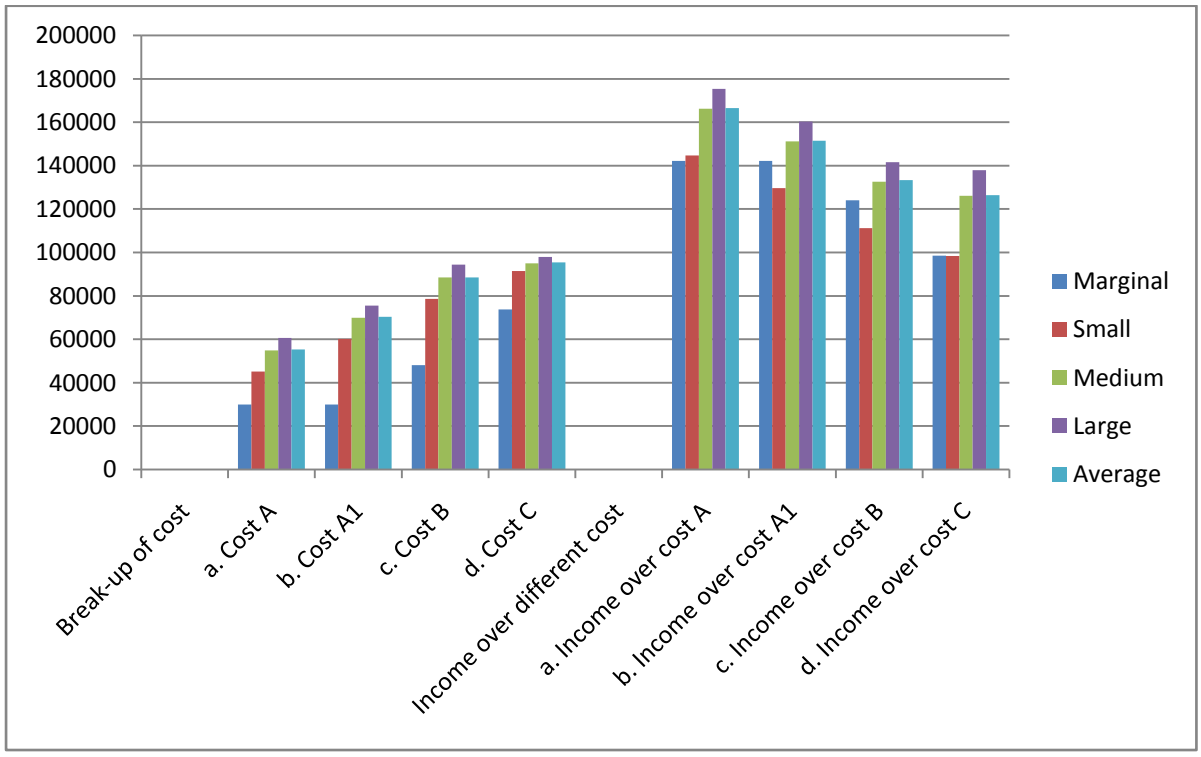


Fig 4.13 Cost and Returns on the basis of Cost concept of brinjal

(Rs/hac)



4.3.4 .3 Cost and returns on the basis of cost concept

The Cost and returns on the basis of cost concept in the production brinjal on the sample farm of different size groups have been presented table 4.20 and fig4.13.

It is evident from table 4.20 and Fig.4.13 that, on an average Cost A, Cost A1, Cost B and Cost C were worked out to Rs. 55342.78, Rs. 70342.78 Rs 88488.36, and Rs. 95485.00 per hectare respectively on the sample farms .The income over different cost were also worked out .the average income over Cost A ,Cost B and Cost C were calculated as Rs.166527.49, Rs 151527.49, Rs 133381.91, and Rs 126385.27, respectively.

Table 4.20: Break-up of total cost,cost concept wise income over different cost in brinjal crop. **(Rs/ha)**

S.No.	Particulars	Farm Size				
		Marginal	**Small**	**Medium**	**Large**	**Average**
A.	Break-up of cost					
	a. Cost A	29928.47	45200.28	54897.78	60581.37	55342.78
	b. Cost A1	29928.47	60200.28	69897.78	75581.37	70342.78
	c. Cost B	48074.06	78602.52	88483.77	94327.62	88488.36
	d. Cost C	73717.53	91508.52	94938.53	97930.12	95485.00
B.	Income over different cost					
	a. Income over cost A	142255.22	144645.72	166216.03	175326.63	166527.49
	b. Income over cost A1	142255.22	129645.72	151216.03	160326.63	151527.49
	c. Income over cost B	124109.64	111243.48	132630.04	141580.38	133381.91
	d. Income over cost C	98466.16	98337.48	126175.28	137977.88	126385.27

4.3.5 Economics of okra crop

The economics of okra crop is presented in Table 4.20.It clearly shows that the cost of cultivation per hectare of Okra was higher on large farms as compared to marginal farms. Over all on an average the cost of cultivation per hectare of okra was found to be Rs. 38266.03 per hectare. The cost of cultivation in case of large farm was higher (Rs. 40653.71/ha) as compared to marginal farms (Rs.32075.89/ha), small (Rs. 35344.30/ha) and medium farms (Rs.38903.73/ha). The cost of cultivation per hectare showed a rising trend with the increase in size of farm. It was due to the fact that the large farmers incurred more expenditure on modern farm input like quality seed, fertilizer, plant protection material, hired labour etc. as a result of borrowing from credit institutions and better economic status compared to marginal, small and medium farmers.

4.3.5 .1Yield value of output and cost of production per quintal

The yield, value of output per hectare and cost of production per quintal of Okra on the sample farms have been worked out in table 4.21. It indicates that the average yield per hectare of okra was 108.05 quintal on the sample farm.

The cost of production per quintal on an average was worked out to Rs. 354.14 of Okra came to Rs. 390.42, 377.15, Rs.359.41, and Rs.346.28 for marginal, small, medium and large farm size respectively. It decreased with the increased in the size of farm due to higher yields in return to the cost of cultivation on the large farm.

The average value of production per hectare came to Rs. 94132.71.It was Rs. 73870.00, Rs. 83735.04, 93576.28 and Rs.101493.56 on marginal, small, medium and large farm respectively. The higher value of output on large farms was associated with the higher yield.

Table 4.21: Economics of okra on different size of group farm

(Rs/ha)

	A. Variable cost	**Marginal**	**Small**	**Medium**	**Large**	**Average**
(1)	Family labour	10973.68 (34.21	6541.07 (18.50)	6329.73 (16.27)	4882.48 12.01	6231.82 16.29
(2)	Hired labour	600.00 (1.87)	6583.93 (21.45)	7354.05 (18.90)	10509.49 (25.85)	8216.43 (21.47)
(3)	Total labour	11573.68 (36.08)	13125.00 (39.96)	13683.78 (35.17)	15391.97 (37.86)	14448.25 (37.76)
(5)	Bullock labour	1973.68 (6.15)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	69.01 0.18
(6)	Machine power	0.00 (0.00)	2000 (5.66)	2000 (5.14)	2000 (4.92)	209.79 (0.55)
(7)	Seed	854 (2.66)	1240.43 (3.51)	1819.41 (4.68)	1839.42 (4.52)	221.75 (0.58)
(8)	FYM	1410.53 (4.40)	1221.43 (3.46)	2066.43 (5.31)	2201.46 (5.42)	1922.08 (5.02)
(9)	Fertilizer	4098.16 (12.78)	4027.5 (11.40)	5515.14 (14.18)	5134.82 (12.63)	5134.82 (13.42)
(10)	Plant protection	750 (2.34)	872.86 (2.47)	1162.16 (2.99)	1180.75 (2.90)	1087.04 (2.84)
(11)	Irrigation charges	1631.58 (5.09)	2750 (7.78)	2500 (6.43)	2335.77 (5.75)	2412.59 (6.30)
(12)	Interest on working capital	1337.5 (4.17)	1574.23 (4.45)	1724.82 (4.43)	1805.05 (4.44)	1530.32 (4.01)
	Total variable cost (A)	**23629.13 (73.67)**	**25811.45 (73.03)**	**28471.73 (73.19)**	**29889.23 (73.52)**	**26825.86 (70.10)**
	B. Fixed cost					
(13)	Rental value of land	7500 (23.38)	7500 (21.22)	7500 (19.28)	7500 (18.45)	7500 (19.60)
(14)	Land revenue	12 (0.04)	12 (0.03)	12 (0.03)	12 (0.03)	12 (0.03)
(15)	Depreciation	934.77 (2.91)	2020.85 (5.72)	2919.99 (7.51)	3252.49 (8.00)	3928.17 (10.27)
	Total fixed cost (B)	8446.77 (26.33)	9532.85 (26.97)	10431.99 (26.81)	10764.49 (26.48)	11440.17 (29.90)
	C. Gross cost=(A+B)	**32075.89 (100.00)**	**35344.3 (100.00)**	**38903.73 (100.00)**	**40653.71 (100.00)**	**38266.03 (100.00)**

Note: Figure in parentheses indicate percentage to gross cost

Table no 4.22: Okra crop per ha. yield value of output (Rs/ha.)

S.No	Particular	Farm Size				Average
		Marginal	Small	Medium	Large	
1	Gross Cost(Rs/ha.)	32075.89	35344.30	38903.73	40653.71	38266.03
2	Yield (qt/ha.)	82.16	93.71	108.24	117.40	108.05
3	Price (Rs/qt)	950.00	950.00	950.00	950.00	950.00
4	Value of Production (Rs/ha.)	73870.00	83735.04	93576.28	101493.56	94132.71
	Cost of production (Rs/qt)	390.42	377.15	359.41	346.28	354.14

4.3.5 .2 Measures of farm profit

The values of net income, family labour income and farm business, the per hectare on the sample farms of different size groups have been worked out in the table 4.22 and fig 4.14.

The table clearly indicates that, on an average the value of net average family labour income and farm business income per hectare came Rs. 62,098.50 and Rs. 15,262.14, respectively, on the sample farms of different sizes. Overall on an average the input-output ratio for okra was estimated to be 1: 2.46 on the sample farms.

Table 4.23 Cost and returns of okra on the sample farms for different group of farms **(Rs/ha)**

So.No	Particular	Farm Size				
		Marginal	Small	Medium	large	Average
1	Gross cost(Rs)	32075.89	35344.30	38903.73	40653.71	38266.03
2	Output value(Rs)	73870.00	83735.04	93576.28	101493.56	94132.71
3	Net income (Rs)	41794.11	48390.74	54672.56	60839.85	55866.68
4	Family labour income (Rs)	52767.79	54831.81	62026.61	65722.33	62098.50
5	Farm business income(Rs)	19811.18	15515.30	16578.87	14187.53	15262.14
6	Input –output ratio	1:2.30	1:2.37	1:2.41	1:2.50	1:2.46

Fig 4.14 Cost and Returns of okra on sample farm for different groups of farm

(Rs/hac)

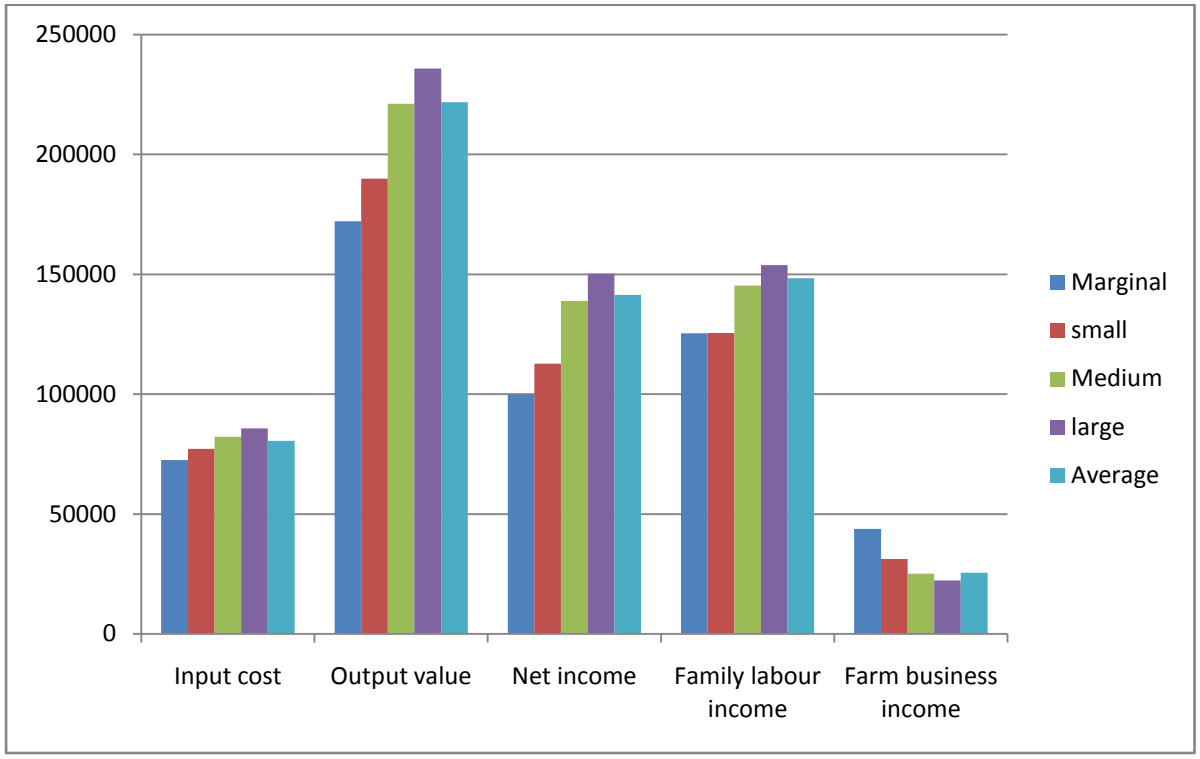
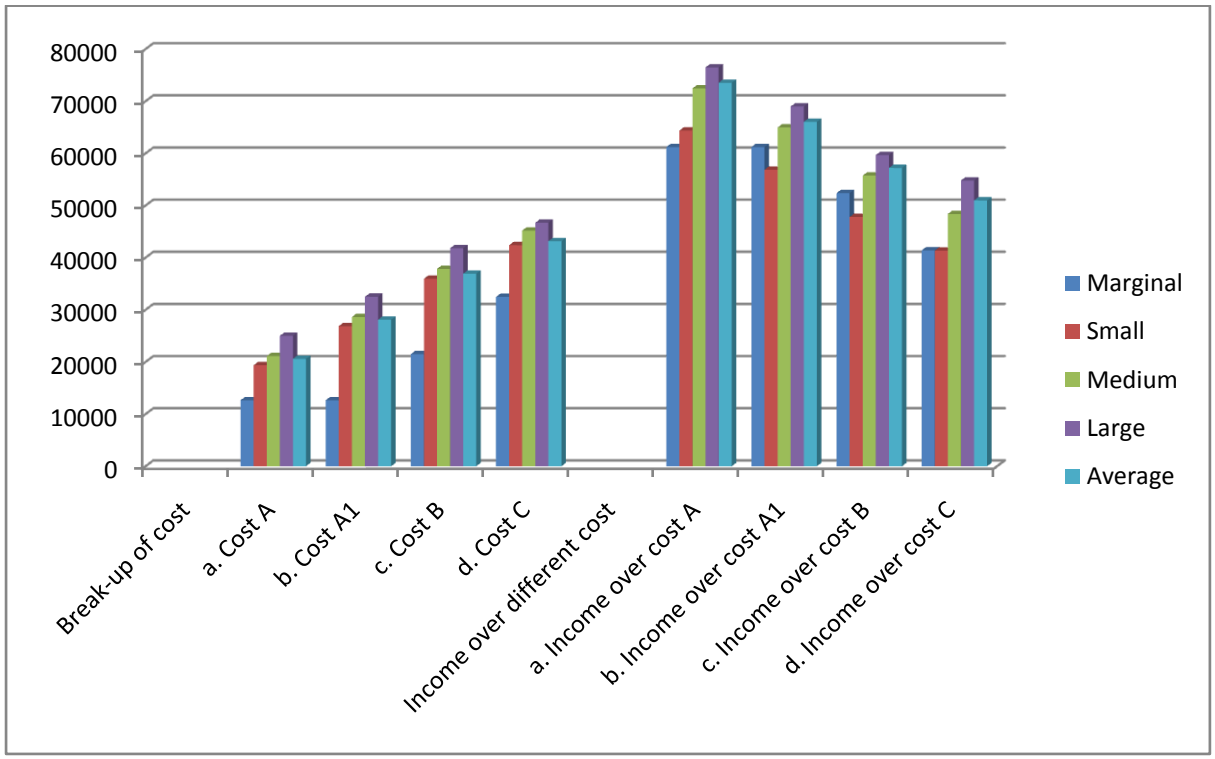


Fig 4.15. Cost and Returns on the basis of Cost concept of okra

(Rs/hac)



4.3.5 .3 Cost and returns on the basis of cost concept

The Cost and returns on the basis of cost concept in the production okra on the sample farm of different size groups have been presented table 4.23 and fig.4.15.

It is evident that table 4.23 that on an average Cost A, Cost A1, Cost B and Cost C were worked out to Rs. 20594.04, Rs. 28094.04 Rs 36931.54, and Rs. 43163.35 per hectare respectively on the sample farms. The income over different cost were also worked out .the average income over Cost A ,Cost B and cost C were calculated as Rs. 73538.67, Rs 66038.67, Rs 57201.17, and Rs 50969.36 respectively.

Table 4.24 Break-up of total cost, cost concept wise income over different cost in okra crop **(Rs/ha.)**

S.No.	Particulars	Farm Size				
		Marginal	Small	Medium	Large	Average
A.	Break-up of cost					
	a. Cost A	12655.45	19370.38	21117.68	25006.75	20594.04
	b. Cost A1	12655.45	26870.38	28617.68	32506.75	28094.04
	c. Cost B	21492.94	35944.61	37842.50	41811.80	36931.54
	d. Cost C	32466.63	42385.68	45196.55	46694.28	43163.35
B.	Income over different cost					
	a. Income over cost A	61214.55	64364.66	72458.60	76486.81	73538.67
	b. Income over cost A1	61214.55	56864.66	64958.60	68986.81	66038.67
	c. Income over cost B	52377.06	47790.43	55733.79	59681.76	57201.17
	d. Income over cost C	41403.37	41349.36	48379.73	54799.28	50969.36

4.4 Marketing of vegetables

A study of the vegetables marketing system is necessary to understand the complexities involved and to identify bottlenecks with a view of providing efficient services in the transfer of farm produce and input from producer to consumer. An efficient marketing system minimizes costs and benefits all section of society. Thus, marketing of any product is the ultimate stage of any production system.

A marketing system should be such that the produce should reach to consumer in good state without damage with least cost and within a shortest time after harvest.

Marketing of vegetables poses more problems as compared to other agricultural commodities as they have a high degree of perishability, bulkiness and existence of large number of middlemen. An efficient marketing system is an important mean for raising the income level of the farmers.

The main objectives of an efficient marketing system are: (a) to enable the primary producers to reap the best possible benefits; (b) to make available all products of farm origin to consumers at reasonable price without impairing the quality of the produce; (c) to provide facilities for lifting all produce, the farmers are willing to sell at an incentive price; (d) to reduce the price spread between the primary produce and ultimate consumer.

4.4.1 Marketing Pattern

Keeping in view the importance of different marketing channels in the disposal of vegetables, the following two widely used marketing channels were identified for the study

Channel – I: Producer – Consumer

Channel – II: Producer – Commission agent/Retailer-Consumer.

However, the sampled vegetables grower sold the vegetables almost entirely through channel II.

4.4.2 Marketable Surplus:

Cauliflower, cabbage, Tomato, brinjal and okra are highly perishable commodities. Being highly perishable in nature they cannot be stored at household level for a longer period without losses. Lack of infrastructural facility is another reason that forces farmers to sell their produce in the market immediately after their harvest.

Table 4.24, 4.25, 4.26, 4.27, 4.28 and Fig 4.16, 4.17, 4.18, 4.19 , 4.20 clearly reveals that the estimated average marketable surplus of cauliflower, cabbage, tomato, brinjal and okra crop was 97.45, 98.59, 98.18, 98.12 and 94.93 per cent with marginal, small, medium, large farmers. It was 93.02, 95.91, 97.14 and 98.29 for cauliflower 96.01, 97.79, 98.17 and 99.05 for cabbage 93.99, 96.80, 97.92 and 98.86 per cent for tomato 95.02, 97.42, 97.66, and 98.71 percent for brinjal and 89.36, 93.54, 93.81 and 95.87 per cent for okra respectively .

Table 4.25 Marketable surplus of cauliflower of sampled households

(quintal per farm)

S.No.	Particular	Marginal	Small	Medium	Large	Average
1	Total quantity produced	29.38 (100.00)	82.49 (100.00)	151.17 (100.00)	364.99 (100.00)	157.01 (100.00)
2	Quantity paid for wages	0.84 (2.86)	2.12 (2.57)	3.19 (2.11)	4.75 (1.30)	2.40 (1.53)
3	Quantity used for home	1.21 (4.12)	1.26 (1.53)	1.13 (0.75)	1.48 (0.41)	1.60 (1.02)
4	Total quantity utilized	2.05 (6.98)	3.38 (4.10)	4.32 (2.86)	6.23 (1.71)	4.00 (2.55)
5	Marketable surplus	27.33 (93.02)	79.12 (95.91)	146.85 (97.14)	358.75 (98.29)	153.01 (97.45)

Note: Figure in parentheses indicate percentage to total quantity produced

Fig :4.16 Marketable surplus of cualiflower crop

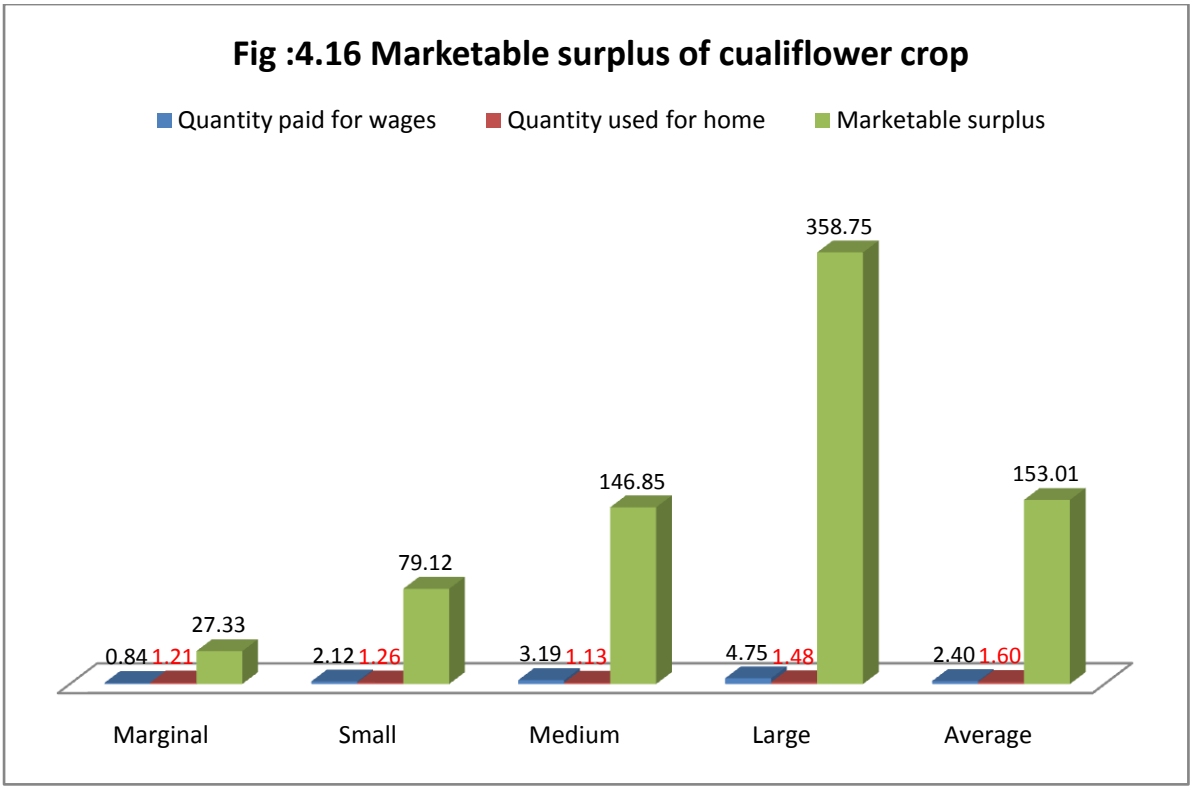


Fig :4.17 Marketable surplus of cabbage crop

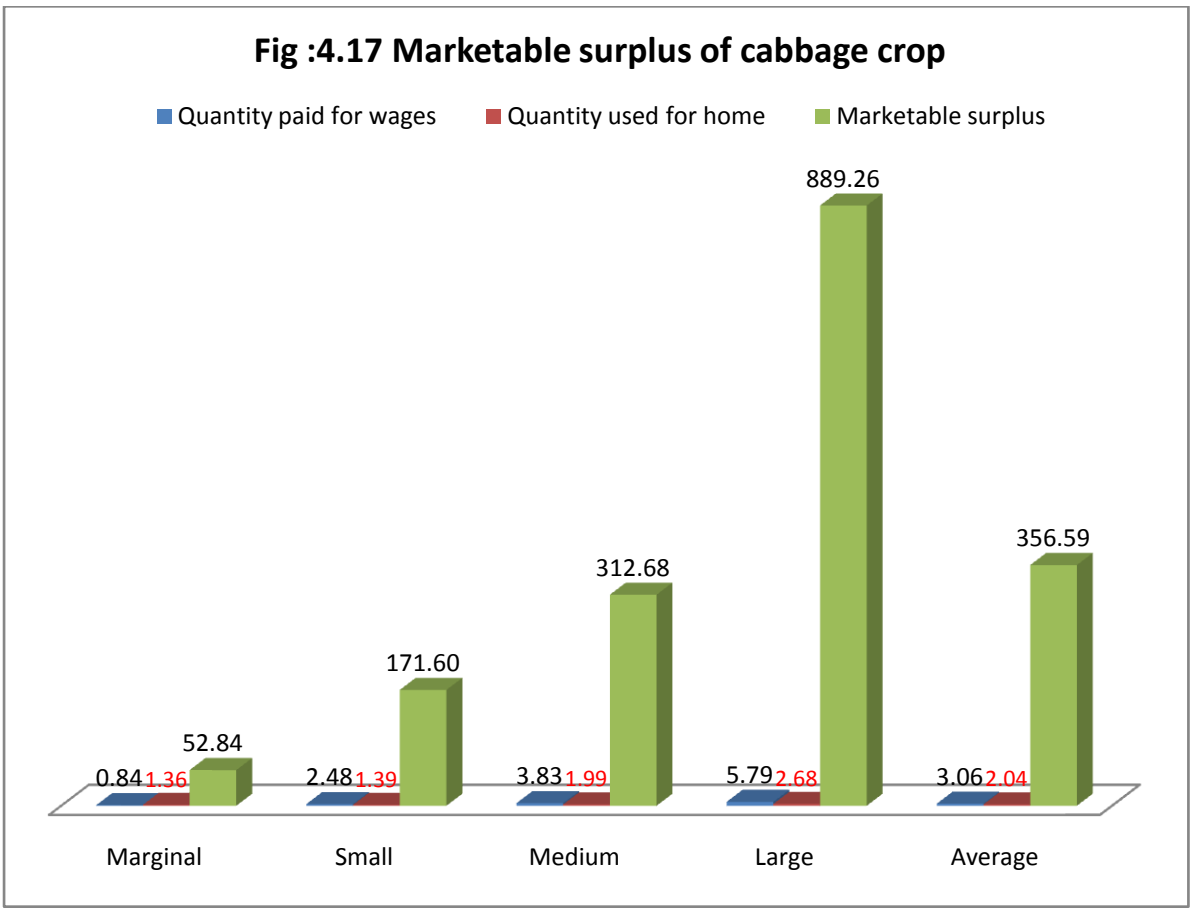


Table 4.26: Marketable surplus of cabbage of sampled households

(quintal per farm)

S.No.	Particular	Marginal	Small	Medium	Large	Average
1	Total quantity produced	55.03 (100.00)	175.47 (100.00)	318.51 (100.00)	897.77 (100.00)	361.70 (100.00)
2	Quantity paid for wages	0.84 (1.53)	2.48 (1.41)	3.83 (1.20)	5.79 (0.64)	3.06 (0.85)
3	Quantity used for home	1.36 (2.47)	1.39 (0.79)	1.99 (0.62)	2.68 (0.30)	2.04 (0.56)
4	Total quantity utilized	2.20 (4.00)	3.87 (2.21)	5.82 (1.83)	8.47 (0.94)	5.10 (1.41)
5	Marketable surplus	52.84 (96.01)	171.60 (97.79)	312.68 (98.17)	889.26 (99.05)	356.59 (98.59)

Note: Figure in parentheses indicate percentage to total quantity produced

Table 4.27: Marketable surplus of tomato of sampled households

(quintal per farm)

S.No.	Particular	Marginal	Small	Medium	Large	Average
1	Total quantity produced	51.89 (100.00)	132.31 (100.00)	268.43 (100.00)	690.29 (100.00)	285.73 (100.00)
2	Quantity paid for wages	0.84 (1.62)	2.22 (1.68)	3.19 (1.19)	4.88 (0.71)	3.12 (1.09)
3	Quantity used for home	2.28 (4.39)	2.02 (1.53)	2.39 (0.89)	2.98 (0.43)	2.08 (0.73)
4	Total quantity utilized	3.12 (6.01)	4.24 (3.20)	5.58 (2.08)	7.86 (1.14)	5.20 (1.82)
5	Marketable surplus	48.77 (93.99)	128.07 (96.80)	262.83 (97.92)	682.46 (98.86)	280.53 (98.18)

Note: Figure in parentheses indicate percentage to total quantity produced

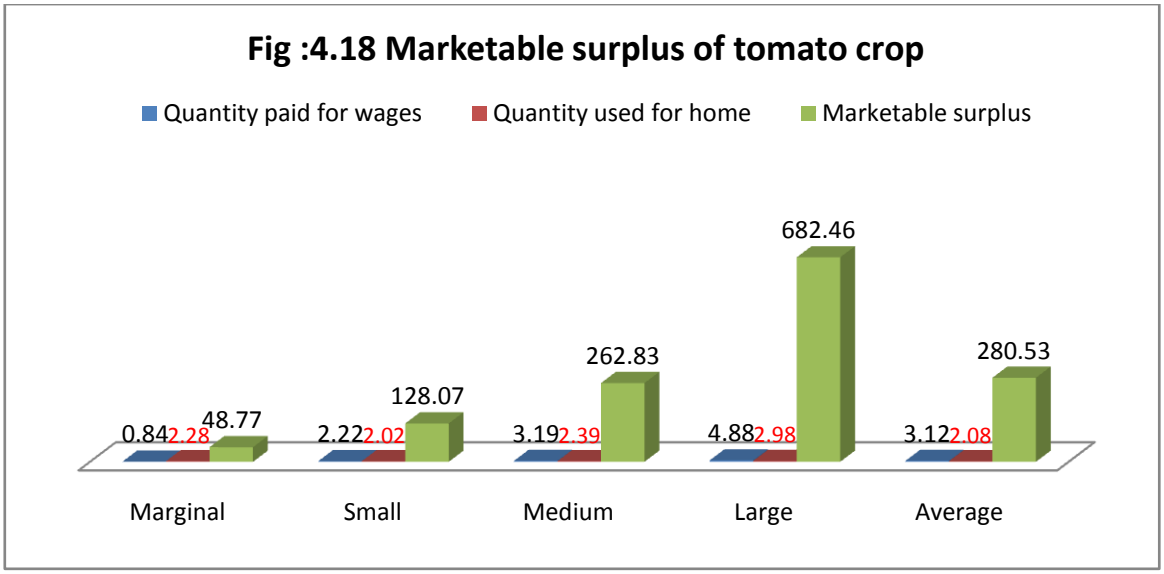


Fig :4.18 Marketable surplus of tomato crop
Quantity paid for wages
Quantity used for home
Marketable surplus
0.84
2.28
48.77
2.22
2.02
128.07
3.19
2.39
262.83
4.88
2.98
682.46
3.12
2.08
280.53
Marginal
Small
Medium
Large
Average

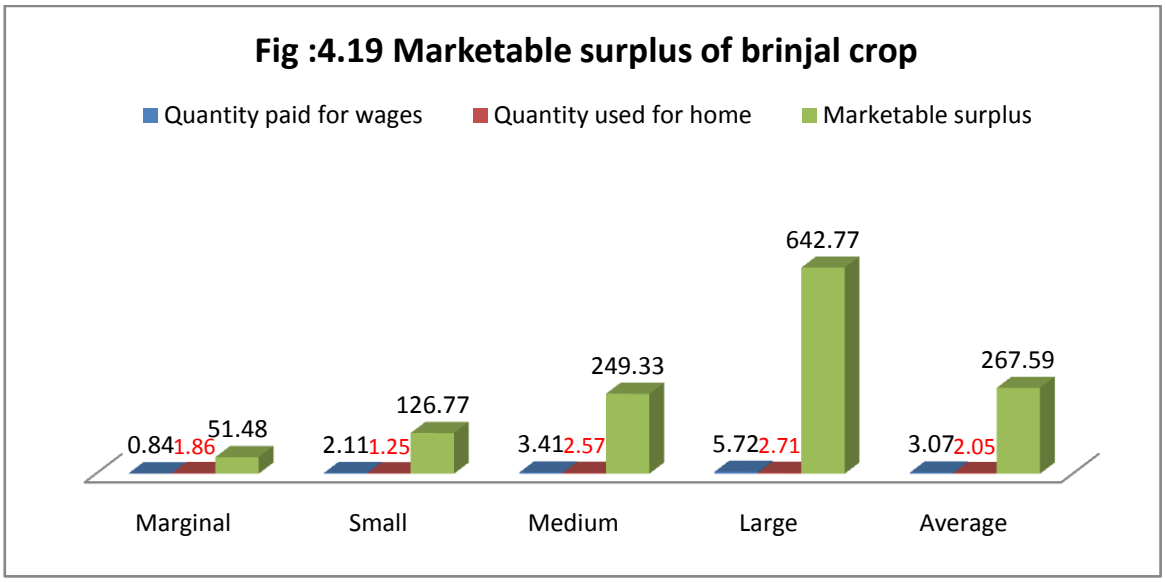


Fig :4.19 Marketable surplus of brinjal crop
Quantity paid for wages
Quantity used for home
Marketable surplus
0.84
1.86
51.48
2.11
1.25
126.77
3.41
2.57
249.33
5.72
2.71
642.77
3.07
2.05
267.59
Marginal
Small
Medium
Large
Average

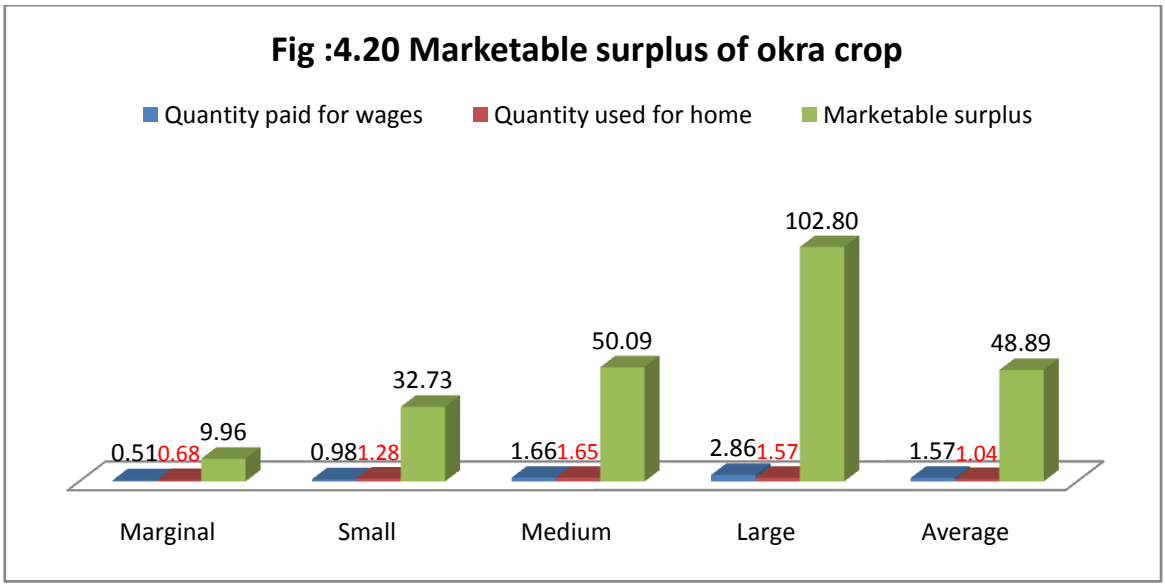


Fig :4.20 Marketable surplus of okra crop
Quantity paid for wages
Quantity used for home
Marketable surplus
0.51
0.68
9.96
0.98
1.28
32.73
1.66
1.65
50.09
2.86
1.57
102.80
1.57
1.04
48.89
Marginal
Small
Medium
Large
Average

Table 4.28: Marketable surplus of brinjal of sampled households

(quintal per farm)

S.No.	Particular	Marginal	Small	Medium	Large	Average
1	Total quantity produced	54.18 (100.00)	130.13 (100.00)	255.31 (100.00)	651.20 (100.00)	272.71 (100.00)
2	Quantity paid for wages	0.84 (1.55)	2.11 (1.62)	3.41 (1.34)	5.72 (0.88)	3.07 (1.13)
3	Quantity used for home	1.86 (3.43)	1.25 (0.96)	2.57 (1.01)	2.71 (0.42)	2.05 (0.75)
4	Total quantity utilized	2.70 (4.98)	3.36 (2.58)	5.98 (2.34)	8.43 (1.29)	5.12 (1.88)
5	Marketable surplus	51.48 (95.02)	126.77 (97.42)	249.33 (97.66)	642.77 (98.71)	267.59 (98.12)

Note: Figure in parentheses indicate percentage to total quantity produced

Table 4.29: Marketable surplus of okra of sampled households

(quintal per farm)

S.No.	Particular	Marginal	Small	Medium	Large	Average
1	Total quantity produced	11.15 (100.00)	34.99 (100.00)	53.40 (100.00)	107.23 (100.00)	51.51 (100.00)
2	Quantity paid for wages	0.51 (4.57)	0.98 (2.80)	1.66 (3.11)	2.86 (2.67)	1.57 (3.04)
3	Quantity used for home	0.68 (6.10)	1.28 (3.66)	1.65 (3.09)	1.57 (1.46)	1.04 (2.03)
4	Total quantity utilized	1.19 (10.67)	2.26 (6.46)	3.31 (6.20)	4.43 (4.13)	2.61 (5.07)
5	Marketable surplus	9.96 (89.36)	32.73 (93.54)	50.09 (93.81)	102.80 (95.87)	48.89 (94.93)

Note: Figure in parentheses indicate percentage to total quantity produced

4.5 Constraints in production and marketing

Table 4.29 reveals the constraints faced by vegetables growers. Under major constraints pertaining to cultivation of vegetables Shortage of labour was the major problem as reported by 80.00 per cent vegetables growers. The second most important constraint faced by the growers was problem of insects, pests and diseases (68.33 percent). The other most important constraints reported by the growers were lack of technical knowledge (61.67 per cent), Inadequate training of farmer (58.33 percent), high cost of technology (56.67 percent) and Lack of financing at reasonable interest rate (51.67 per cent), The other constraints was lack of soil testing facilities (41.67 per cent) and non availability of timely input (38.33 percent).looking to the problem faced by the vegetables grower it is pertinent to address these constraints. According use of low cost machine for vegetables and cultivation should be given on developing insect and pest resistant varieties of cauliflower, cabbage, tomato, brinjal and okra .there is also need to impart training skills to the vegetables grower on production aspect through extension support such as on farm training, demonstration etc. credit support should made more affordable and accessible to the vegetables grower in the region.

Table 4.30: Farmers perception on constraints in vegetables cultivation

S.No.	Particulars	No. of Farmers	Percent
1	Lack of technical knowledge/	37	61.67
	information regarding horticulture		
	varieties and package practices		
2	Non availability of timely input inputs	23	38.33
3	Lack of soil testing, facilities	25	41.67
4	Shortage of labour	48	80.00
5	Lack of financing at reasonable interest rate	31	51.67
6	Problem of insects, pests and diseases	41	68.33
7	high cost of technology	34	56.67
8	Inadequate training of farmer	35	58.33

Table 4.30 show constraints pertaining to marketing of vegetables. Lack of

storage facilities (63.33 percent) was reported as the most important constraints. The second most important constraints reported by the grower Lack of information regarding standardization and grading (51.67 per cent). The post harvest management and lack of storage facilities (46.67 per cent). Lack of regulated and cooperative market (38.33 per cent), lack of transportation (26.67),lack of awareness about market news and intelligence. (18.34) were the other prominent constraints reported by the growers in sampled areas.

The vegetables grower encountered many problems in marketing of vegetables. Looking to this, there is a need to create cold storage facilities for preservation of vegetables, the farmer also need to be informed about standardization and grading and post harvest management procedure so as to improve marketing of vegetables in addition to creating these facilities in the region. Increased extension effort is required to enhance marketing news, information and intelligence on different aspects of production and marketing of vegetables.

Table 4.31: Farmers perception on constraints in marketing of vegetables

S.No.	Particulars	No. of Farmers	Percent
1	Lack of information regarding standardization and grading	31	51.67
2	Lack of transportation	16	26.67
3	Lack of regulated and cooperative market	23	38.32
4	Lack of storage facilities	38	63.33
5	Lack of awareness about market news and intelligence	11	18.34
6	Lack of post harvest management	28	46.67

SUMMARY, CONCLUSIONS AND SUGGESTION FOR FUTURE RESEARCH WORK

CHAPTER-V

SUMMARY, CONCLUSIONS AND SUGGESTION FOR FUTURE RESEARCH WORK

5.1 Summary and conclusions

Chhattisgarh is an agricultural chief land and due to large production of rice, Chhattisgarh is known as the rice bowl. Apart from paddy, vegetables are also grown. The immense diversity in agro-climatic condition in Chhattisgarh enables to produce large varieties of vegetables. Chhattisgarh stands 15th among all states of India in vegetable cultivation for the year 2008-09. The total area of vegetable crops in the state was recorded 3, 34,916.92 ha. in the year 2010-11 with the production of 41,49,042.11 MT. Durg district of Chhattisgarh has first rank in production of Cabbage, Brinjal, Bitter gourd Cauliflower and second rank in production of Okra, Cowpea, Onion and Pointed gourd in the state.Durg district covers 14.81 percent share in total vegetable area in Chhattisgarh till 2010-11 before partition of Durg block.High risk involves in the production of vegetables owing to its perishable nature. Keeping in view the economic importance of vegetables in the study area, the present enquiry related to its production and marketing was undertaken in Durg district of Chhattisgarh with following objectives

Objectives:

1. To estimate the cost of cultivation of major vegetables in the study area.
2. To examine the marketing pattern of major vegetables.
3. To identify the constraints in production and marketing of major vegetables.
4. To suggest policy measures for improvement in production and marketing of major vegetables.

The present study was conducted in purposively selected Durg district of Chhattisgarh. Sixty farmers were selected randomly from three villages namely Karanja bhilai, Pisegoan and Kotani. The primary data were collected for the year 2012-13. Primary data regarding the farm size, cropping pattern and cost and returns of major vegetables were collected from the respondents (vegetable growers) using well designed questionnaires and schedules. The secondary data regarding the area of vegetables in Durg district and Chhattisgarh state were collected from various government sources, Directorate of Agriculture, Block development sources. To work out the cost of cultivation the standard method of cost of cultivation was adopted. To calculate marketable surplus, standard method was used.

5.2 The study yielded following major findings:

1. The average family size was 7.37 and average literacy percentage was 82.35 per cent in the study area.
2. The average cropping intensity observed in the study area was 276.84 per cent.
3. The average size of holding of vegetable growers was 3.44 hectares. It varied from 0.64 hectare on marginal farms to 8.72 hectares on large farms.
4. The cultivated area was observed to be 0.64 hectares, 1.53 hectares, and 2.88 hectares, 8.72 hectares at marginal, small, medium and large farms, respectively.
5. Out of total cropped area kharif, rabi, zaid crops occupied about 36.97 percent, 32.36 percent and 30.68 per cent of total cropped area respectively tomato and brinjal were the main crop of kharif and rabi season. In zaid tomato was the main crop.
6. On an average the cost of cultivation per hectare of cauliflower, cabbage, tomato, brinjal and okra was calculated as Rs. 53021.02, Rs. 57135.41, Rs

64595.36, Rs 80498.36 and Rs 38266.03 respectively. The cost of cultivation per hectare showed rising trend with the rise in farm size.

7. The cost of production per quintal of cauliflower, cabbage, tomato, brinjal and okra on an average was worked out to Rs. 215.56, Rs 115.71, 146.95, 175.63 and 354.14 .It came to for marginal, small, medium and large farm size respectively.
8. On an average the input –output ratio of cauliflower, cabbage tomato, brinjal and okra came to 1:2.75, 1:2.95, 1:3.01, 1:2.76 and 1:2.46 respectively on the sample farms.
9. The cost and return on the basis of cost concept in the production cauliflower on the sample farm of different size group an average Cost A, Cost A1, Cost B and Cost C were worked out to Rs. 32723.60, Rs. 42723.60 Rs 55021.51, and Rs. 62386.52 per hectare respectively on the sample farms. The income over different cost were also worked out .the average income over cost A ,cost B and cost C were calculated as Rs. 113364.79 Rs 103364.79. Rs. 91066.88 and Rs 83701.87 respectively.
10. The Cost and returns on the basis of cost concept in the production Cabbage on the sample farm of different size groups an average Cost A, Cost A1, Cost B and Cost C were worked out to Rs. 37814.06, Rs. 47814.06 Rs 60200.85, and Rs. 66953.98 per hectare respectively on the sample farms. rupees. The income over different cost was also worked out .the average income over Cost A, CostA1, Cost-B and Cost C were calculated as Rs. 130511.30 Rs. 120511.30 Rs. 108124.52, and Rs. 101371.39 respectively.
11. The Cost and returns on the basis of cost concept in the production tomato on the sample farm of different size groups have been an average Cost A, Cost

A1, Cost B and Cost C were worked out to Rs. 51702.70, Rs. 61702.70 Rs 74742.48, and Rs. 82368.12 per hectare respectively on the sample farms. The income over different cost were also worked out .the average income over Cost A, Cost A1, Cost B and Cost C were calculated as Rs 77558.75, Rs 67558.75, Rs 54518.97, and Rs 46893.33 respectively

12. The Cost and returns on the basis of cost concept in the production brinjal on the sample farm of different size groups have been average Cost A, Cost A1,Cost B and Cost C were worked out to Rs. 55342.78, Rs. 70342.78 Rs 88488.36, and Rs. 95485.00 per hectare respectively on the sample farms .the income over different cost were also worked out .the average income over Cost A ,Cost B and Cost C were calculated as Rs.166527.49, Rs 151527.49, Rs 133381.91, and Rs 126385.27 respectively.
13. The Cost and returns on the basis of cost concept in the production Okra on the sample farm of different size groups have been on an average Cost A, Cost A1, Cost B and Cost C were worked out to Rs. 20594.04, Rs. 28094.04 Rs 36931.54, and Rs. 43163.35 per hectare respectively on the sample farms. .the income over different cost were also worked out .the average income over Cost A ,Cost B and cost C were calculated as Rs. 73538.67, Rs 66038.67, Rs 57201.17, and Rs 50969.36.
14. There were two marketing channels found for the marketing of vegetables:
    a. **Channel-I:** Producer – Consumer.
    b. **Channel-II:** Producer – Commission agent/Retailer-Consumer.
15. On an average marketable surplus in cauliflower, cabbage tomato, brinjal and okra was worked out 97.45 per cent, 98.59 per cent, 98.18 percent, 98.12 per cent and 94.93 percent respectively to total production.

16. The major constraints pertaining to cultivation of vegetables were problem of insects, pests and diseases followed by non availability of timely inputs, lack of technical knowledge, lack of soil besting, facility, lack of financing at reasonable interest rate, and shortage of labour.
17. The major constraints of marketing of vegetables were lack of information regarding standardization and grading at grower level followed by lack of post harvest management, lack of storage facilities, lack of regulated and cooperative market, and lack of transportation, lack of awareness about market news and intelligence.

5.3 Suggestion for future works:

1. Varieties capable of resisting disease and pest should be grown.
2. Irrigation facilities are to be developed in the proper way so that farmers can adopt improved technologies with assured irrigation facilities.
3. Marketing infrastructure should improve to maintain hygienic condition.
4. Market related information such as daily and weekly price of horticultural products should be disseminated among those needing this information.
5. Extension agencies should provide information on new varieties and package of practices as well as procedures of standardization and grading of produce and their benefits
6. Banking institution provides finance/credit with less formality to meet credit requirement.
7. Market regulatory authorities should address the issues of unfair deduction at the market places.
8. Horticultural crop producer's cooperative societies should be formed for better performance and achievement.

9. Some specific minimum prices should be declared for vegetables to ensure benefit for the producers.
10. Government should encourage partnership between research institutions, agricultural universities, NGO's and private industries to address constraints and link vegetable farmers to markets.
11. The government should assist in the development of market and create more awareness of the importance of safe vegetable in diet.

Abstract

AN ECONOMIC STUDY OF PRODUCTION AND MARKETING OF MAJOR VEGETABLES IN DURG DISTRICT OF CHHATTISGARH

By

LOKESH SATANKAR

ABSTRACT

Vegetables being a rich and cheap source of vitamins and minerals, occupy an important place in food basket of Indian consumer. An attempt has been made in the study to examine the production and marketing aspects of major vegetables in Durg district. The study was undertaken to estimate the cost of cultivation of major vegetables in the study area, to examine the marketing pattern of major vegetables, to identify the constraints in production and marketing of major vegetables and to suggest policy measures for improvement in production and marketing of major vegetables as the main objectives.

The present study was conducted in the Durg district of Chhattisgarh. Sixty farmers were selected randomly from three villages namely Karajan Bhilai, Pisegaon and Kotani and were categorized into small, medium and large farmers based on their holding size. The primary data were collected for the year 2012-13. The major findings of this study revealed that the average size of farm was worked out to be 3.44 hectares, on an average cropping intensity was observed to be 276.84 percent. Out of total cropped area kharif, rabi, and zaid crops occupied about 36.97, 32.36 and 30.68 per cent of total cropped area respectively. On an average, the cost of cultivation per hectare of cauliflower, cabbage tomato, brinjal and okra was calculated at Rs.53021.02, Rs.57135.41, Rs 64595.36, Rs 80498.36 and Rs 38266.03, respectively. Overall the cost of production of cauliflower, cabbage tomato, brinjal and okra was observed as Rs. 215.56, Rs 115.71, Rs 146.95, Rs. 175.63 and Rs 354.14 per quintal, respectively. Cost of production per quintal of these vegetables showed decreasing trend with increase in farm size where as cost of cultivation increased with increase in the farm size. Overall,the input-output ratio of cauliflower, cabbage tomato, brinjal, okra came to1:2.75, 1:2.95, 1:3.01, 1:2.76 and 1:2.46 respectively on the sample farms. There were two marketing channels identified for the marketing of major vegetables, which were Channel-I Producer –Consumer. Channel-II: Producer – Commission agent/Retailer-Consumer. More than ninety five per cent marketable surplus was observed in all the major vegetable crops in different size groups of farmers. The major constraints pertaining to cultivation of vegetables was problem of insects, pests and diseases. A major constraint in marketing of vegetables was lack of information regarding standardization and grading at grower level in the study area. In view of findings, the study suggested that the varieties capable of resisting disease and pest should be grown. Extension agencies should provide information on new varieties and package of practices as well as procedures of standardization and grading of produce and their benefits. Horticultural Crop Producer's Cooperative Societies should be formed for better performance and achievement. Some specific minimum prices should be declared for vegetables to ensure benefit for the producers it was suggested.

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APPENDICES

APPENDIX-I

DEPARTMENT OF AGRICULTURAL ECONOMICS
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RAIPUR (CHHATTISGARH)

AN ECONOMIC STUDY OF PRODUCTION AND MARKETING OF MAJOR VEGETABLES IN DURG DISTRICT OF CHHATTISGARH

LOKESH SATANKAR

House Hold Schedule #

A. General information

1. Name of farmer ----------
2. Age (year) ---------- 3. Caste (Gen./SC/ST/OBC) ----------

4. Village ---------- 5. Post ----------

6. Tehsil ---------- 7. Distance from market (km) ----------

8. Date of interview ----------9. Education ----------

B. Details of the family

S. No.	Name of family member	Relation to head	Sex M/F	Age	Edu-Cation	Employment			Income		
						Farm	Off farm	Non farm	Farm	Off farm	Non farm
1.											
2.											
3.											
4.											
5.											
6.											
7.											
	Total										

***** 1= illiterate, 2 = Primary, 3 = High school, 4 = Graduate, 5= Post Graduate

C. Details of land holding

S.No	Particular	Area (ha)	Agriculture		Source of irrigation	Soil Type	Land quality
			Irrig.	Unirrig.			
(1)	Owned land						
i.	Cultivated						
ii.	Homestead						
iii.	Uncultivated						
(2)	Leased in						
(3)	Leased out						
	Total land						

- 1= Poor, 2= Average , 3= Good, 4=Very good

Cropping pattern

S. NO.	Season	Crops	Variety		Area (ha)		Production (quintal)	Value Rs.
			Tradition	Modern	Irrigated	Unirrigated		
(1)	Kharif							
	1.							
	2.							
	3.							
(2)	Rabi							
	1.							
	2.							
	3.							
(3)	Summer or Zaid							
	1.							
	2.							
	3.							
Total cropped area								

Farm Structure and equipment

S.No.	Items	No.	Year of Construction	Present value (Rs.)	Expenditure on Annual Repair (Rs.)
1.	Farm building				
	a. Pacca				
	b. Semi Pacca				
	c. Kutcha				
2	Irrigation structure and equipment				
3	Implements and machinery				
4.	Dairy equipment & tools				
5.	Transport equipment				
	Total				

Source of Irrigation

S.NO.	Particular	Area (ha)	Irrigation charges (Rs.)
1.	Tank		
2.	Canal		
3.	Tube well		
4.	Well		
5.	Bore well		
6.	Stop dam		
7.	Other		
	Total		

Cost of cultivation

Crop - - - - - - - - - - - - - - - - - - - Variety -

Area - (Irrigated / unrrigated)

A) Labour cost

S. N.	Operation	No. of opera-tion	Family human labour (days)			Hired human labour (days)			Bullock power			Machine power			Total expenditure on particular operation
			M	F	T	M	F	T	O	H	R	O	H	R	
1	Field preparation														
2	Sowing														
3	Application of manure														
4	Application of fertilizer														
5	Interculture														
6	Irrigation														
7	Plant protection														
8	Harvesting														
9	Threshing & winnowing														
10	Trans-portation														
11	Miscellaneous														
	Total														

M = Male, F= Female, T = Total O= Family labour, H= Hired labour, R= Rate per unit (Rs.)

Rate of male labour ----------Rs/day

Rate female labour ----------Rs/day

B) Input cost

S.N.	Input	Owned quantity	Purchased quantity	Sold quantity	Rate(Rs) / unit	Total value (Rs.)
1	Seed					
	a.					
	b.					
2	FYM					
3	Fertilizer					
	a.					
	b.					
	c.					
4	Plant protection chemicals					
	a.					
	b.					
	c.					
Total						

C. Irrigation charges ----------

D. Interest on working capital ----------

E. Fixed cost

a) Rental value of land / leased in land (Rs.) : -

b) Land revenue (Rs.) : - - - - - - - - - - - - - - - - -- - - - - - - - - - - - - - - - - - -

c) Interest on fixed capital: ----------

d) Depreciation: ----------

F) Disposal /Marketing pattern of vegetables

S.No.	Vegetables	Quantity produced	Consumed quantity	sold quantity	Sold to whom			RateRs/kg			Value(Rs)		
					1	2	3	1	2	3	1	2	3
Total													

1----------, 2. ----------,3----------

G) Marketing cost

S.No.	Particulars	Sold to*		
		1	2	3
1.	Name of vegetables			
2.	Quantity of each month sold			
3.	To whom sold			
4.	Selling place			
5.	Price (Rs./qts)			
6.	Distance from marketing place			
7.	Means of transportation			
	a. Tractor			
	b. Truck			
	c. Bullock cart			
	d. Other (specify)			
8.	Transportation cost (Rs./Qts.)			
9.	Octroi charges (Rs.)			
10.	Mandi fees (Rs.)			
11.	Loading/unloading charges (Rs./Qts.)			
12.	Commission charges (Rs.)			
13.	Cleaning charges (Rs./Qts.)			
14.	Other expenses Rs.			
	Total			

1. Sale price of producer (Rs./Qts.) ----------

2. Actual getting of price of producer (Rs./Qts.) ----------

3. Total marketing charges (Rs./Qts.) ----------

H. Constraints in production of vegetable crops:

1. Lack of latest technical know-How about the crop-Y/N

If No, why?

a. Government non approach
b. Farmers distrust
c. Any other specify

2. Lack of improved and high yielding varieties-Y/N

If yes, then?

a. Non availability of seed
b. Poor knowledge of technology
c. Old farmer practices
d. Any other specify

3. Lack of recommended package practices of the crop in the region-Y/N

If Yes ,why?

a. No such type of recommendation
b. Not frequent visit of extension workers
c. Not proper interest of farmer's

4. Lack of resources i.e. Money, equipment etc.-Y/N

If Yes, then how you managing money?

a. From bank
b. From relatives
c. From trader's

5. Lack of irrigation water –Y/N

If Yes , then how you irrigate your crop?

a. With own irrigation
b. Crop depend on rains

6. Lack of labour –Y/N

IF Yes, then in which operation

a. Weeding/thinning
b. Any other specify

7. Lack of nutrient in soil and lack of sufficient soil testing facilities-Y/N

If yes, then how you come to come to know the nutrient requirement of plant?

a.

b.

8. Lack of financing at reasonable rate of interest-Y/N

a.

b.

9. Any other

a.

b.

I. Constraints in marketing of crops:

1. Low demand of final product –Y/N
2. Low price paid to farmer's due to high marketing margin –Y/N

   If yes, what should be done?

   1)

   2)
3. Lack of transportation facilities and road from village to market-Y/N

4. Whether you face problem because the quantity is small-Y/N

   If yes, then

   What steps you have taken to pool your produce?

   1)

   2)

   3)

5. Lack of regulated market and cooperative market-Y/N

6. Whether you visit regulate market regularly-Y/N

If no give the reason for not going to the regulate markets

1)

2)

7. Lack of sufficient number of processing unit-Y/N

8. Lack of storage facilities in growing area-Y/N

9. Whether you like store your produce in storage to get high price?-Y/N

10. Lack of support price. Y/N

11. How to support price will affect the production of crop.Y/N

I. To cropping pattern change

II. short duration

III. any other

12. Lack of awareness about market news and intelligence-Y/N

13. What media do you have for marketing news?

1. Newspaper
2. Radio
3. Television
4. Other(specify)

14. How soon the news in disseminated or spread in producing area

I. within 2days
II. within 4days
III. within a week

A) Labour cost

S. N.	Operation	No. of opera-tion	Family human labour (days)			Hired human labour (days)			Bullock power			Machine power			Total expenditure on particular operation
			M	F	T	M	F	T	O	H	R	O	H	R	
1	Field preparation														
2	Sowing														
3	Application of manure														
4	Application of fertilizer														
5	Interculture														
6	Irrigation														
7	Plant protection														
8	Harvesting														
9	Threshing & winnowing														
10	Trans-portation														
11	Miscellaneous														
	Total														

M = Male, F= Female, T = Total O= Family labour, H= Hired labour, R= Rate per unit (Rs.)

Rate of male labour ----------Rs/day

Rate female labour ----------Rs/day

APPENDIX-II

NAME OF SAMPLE HOUSEHOLD

SNO	Name of respondent				
	MARGINAL	VILLAGE		MEDIUM	VILLAGE
1	Agraj Ram	Kotani	1	Nandkumar	Kotani
2	Chetan Sahu	Kotani	2	Dal Singh	Kotani
3	Mahesh Kumar	Kotani	3	Umesh Chandrakar	Kotani
4	Ajay Sahu	Kotani	4	Ashok Chandrakar	Kotani
5	Kamata Parsad	Kotani	5	Kirti Raj	Kotani
6	Vipin Sahu	karanja bhilai	6	Mayaram Patel	karanja bhilai
7	Umesh Patel	karanja bhilai	7	Kishore Sahu	karanja bhilai
8	Kamlesh Patel	karanja bhilai	8	Ganga Prasad Patel	karanja bhilai
9	Jagdish Nisad	karanja bhilai	9	Kailash Chauhan	karanja bhilai
10	Krishna Patel	karanja bhilai	10	Keshav Dubey	karanja bhilai
11	Shiv Prasad	Pisegaon	11	Chandu Yadav	Pisegaon
12	Basnt Patel	Pisegaon	12	Mannu Lal	Pisegaon
13	Krishna Nishad	Pisegaon	13	Kuleshwar Prasad	Pisegaon
14	Prakash kumar	Pisegaon	14	Harish Sahu	Pisegaon
15	Bala Ram	Pisegaon	15	Rajesh Patel	Pisegaon
	SMALL			LARGE	
1	Mohan Sahu	Kotani	1	Chhagan bhai taunk	Kotani
2	Rajkumar Nishad	Kotani	2	Bharat parmar	Kotani
3	Ishwar Sahu	Kotani	3	Bipul bhai taunk	Kotani
4	Navaram	Kotani	4	Atma Ram	Kotani
5	Pawan Sahu	Kotani	5	Bhavesh bhai taunk	Kotani
6	Kailash Babu	karanja bhilai	6	Prakash Jetwa	karanja bhilai
7	Kaushal Patel	karanja bhilai	7	Dinesh Jetwa	karanja bhilai
8	Mahesh patel	karanja bhilai	8	Yogendra Soni	karanja bhilai
9	Omkar	karanja bhilai	9	Vipul Bhai Parmar	karanja bhilai
10	Jagat Patel	karanja bhilai	10	Raju Bhai Taunk	karanja bhilai
11	Kanti Lal	Pisegaon	11	Girish Bhai Taunk	Pisegaon
12	Chayan Singh Patel	Pisegaon	12	Ghanshyam Parmar	Pisegaon
13	Ashok Kumar	Pisegaon	13	Ashok Chandrakar	Pisegaon
14	Shravan	Pisegaon	14	Pankaj solanki	Pisegaon
15	Ravish Sahu	Pisegaon	15	Deependrabhai Taunk	Pisegaon