

**PRODUCTION AND MARKETING OF VEGETABLE  
CROPS IN DISTRICT MIRZAPUR OF UTTAR PRADESH,  
INDIA**



**THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS**

**FOR THE AWARD OF THE DEGREE OF**

**Masters of Science (Agriculture)**

**In**

**Agricultural Economics**

**SUPERVISOR**

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**Through: The Head, Department of Agricultural Economics**

Dear Sir,

I have great pleasure in forwarding the thesis entitled "**Production and Marketing of Vegetable Crops in District Mirzapur of Uttar Pradesh, India**", submitted by **Ms. Sapana Saini (I.D. No. 17412AGE010)**, in partial fulfilment of the requirements for the degree of **Master of Science (Agriculture) in Agricultural Economics**, Department of Agricultural Economics, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi. No part of the thesis has been submitted for any other degree or diploma.

This is to certify that this work has been carried out solely by **Ms. Sapana Saini** under my guidance and data forming the basis of this thesis, to the best of my knowledge are genuine and original.

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Yours faithfully,

**(O. P. Singh)**  
Supervisor

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UNIVERSITY

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By  
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**Place:** Varanasi, India.

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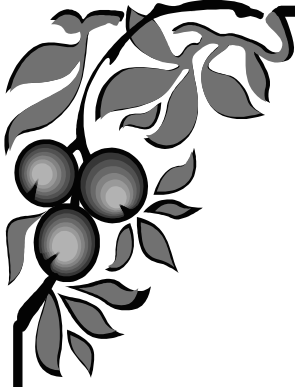
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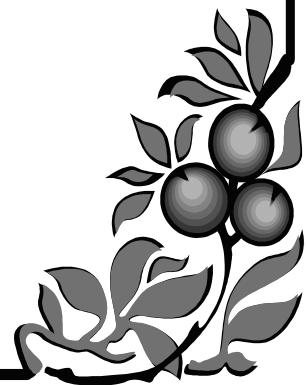
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# *Introduction*



## INTRODUCTION

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Agriculture is the backbone of Indian economy and it occupies the significant key role in rural life. For decades agriculture was very important associated with the production of essential food crop and food crop production was the biggest component of agriculture. Nowadays agriculture above and beyond farming includes forestry, dairy, fruit cultivation, poultry, bees keeping, mushroom, etc today, processing, marketing, and distribution of crop and livestock product, etc. are all acknowledged as a part of present agriculture. It is a source of livelihood approximately 70% of people directly rely on agriculture as a mean of living. ([www.fao.org](http://www.fao.org))

India has an extensive range of variety of climate and soil on which a huge number of horticultural crops like, fruit, vegetable, ornamentals, medicinal, and aromatic plants, plantation crop, and spices are generally grown. After independence in 1947, The Government of India assigned a significant emphasis on accomplishing self-sufficiency in food production mainly in cereals. After the Green Revolution of the 1960s, it was conceived that agro-climatic condition and topography of India are very well suited for horticultural crops and these crops would assist attaining sustainability of farmers with having smallholdings.

India is one most crucial vegetable producing country and varied with agro-climatic conditions. It is very common in both temperate and tropical region and grown successfully from hill to plain because of befitting agro-climatic conditions of the country. The importance of horticultural crops especially fruit and vegetable in improving the nutritional status increasing day by day.

India is the world's second largest producer of vegetables next only to China. Fruit and vegetable account for nearly 90% of total horticultural production in the country (National Horticulture database). India can claim to grow the largest number of vegetable crops compared to any other country of the world and as many as 61

annual and 4 perennial vegetable crops belonging to different groups, namely, solanaceous, cucurbitaceous, leguminous, cruciferous, root crops and leafy vegetables are generally grown in India (national horticulture database).

The horticulture sector is very fast and quick emerging as the most remunerative sector for changing the age-old subsistence farming mainly in the rained dry land, hills, arid and coastal agro-ecosystem. Horticultural crops are specially characterized by high productivity, higher return and very higher potential for employment generation and exports, comparatively lower requirement of water and easy adaptability to adverse soils and wasteland situations. The input-output ratio is very high for horticultural crops than that in the field crops and their role in developing the environment is an added advantage (Chadha and Pareek, 1993).

Horticultural crops have large number varieties of fruits and vegetables, flowers, plantation, spice crops, medicinal and aromatic plants, roots and tuber crops. With its manifold agro-climatic conditions and biodiversity, fertile soil, maximum cultivable area and above all a very long history of crop husbandry, India can boast of being one of the few countries in the world which can grow the maximum number of varieties of fruits round the year.

### **1.1 Horticulture in Indian Economy**

Horticultural crops not only provide essential constituent of nutritional and healthy foods but also provide higher net cash income to the growers. On the one side, all countries are moving towards self-reliance in food-grains production, on the other side, the demand for fruits and vegetables is regularly increasing day by day over the years. This trend may lead to a moderate contraction in food grain exports. India has the exclusive distinction of being able to grow almost all fruits and vegetables under diversified production conditions. However, export-oriented production is still at the planning stage and most Indian producers are yet to adopt world standards of quality (Maini *et al.*, 2000).

Vegetable cultivation occupies an essential place in the agricultural economy of the country. The agricultural economy of our country has characteristic of advantages mainly for small and marginal land holding and labor family for which

vegetable cultivation is most suited. Though vegetable crops grip a great promise for encouraging the economic growth and enhancing the nutrition diet of the people, yet they obtained limited attention in marketing research programmers' in India. The vegetable industry can be expected to have better growth contributed the producers are ensured better marketing facilities and feasible prices for their produce.

Vegetables are very essential constituents of nutritional security and Indian agriculture due to their special characters like economic viability, nutritional affluence, high yield, and ability to bring forth on-farm as well as off-farm employment. A large number of geographical area and innumerable agro-climatic niches in India bring to bear a consequently influence on the supply of maximum of the agricultural commodities. This is mainly true for the vegetable crops due to wider ecological amplitude and the shorter growth periods as compared to many other crops. Incremental per capita income, urbanization, health awareness of conversion farmers" preference to very high-value crops is the critical element for fuelling the vegetable cultivation in the country. A spectacular change is noticed in the consumption pattern which is characterized by reducing the share of food grains and growing share of non-food grains in appropriate vegetables and fruits in the consumption baskets (Vanita *et al* 2013).

Though a large employment and export potential of horticulture has been greatly recognized by the assuring governments, still, it is not obtaining the kind of preference it actually deserves. The Tenth Five Year Plan draft recognized that the horticulture sector contributes about 24.5 percent towards agriculture GDP from only about 8 percent of the cultivated area. Despite all these admissions, in the process while Rs. 22,467 crores were appropriate to the agricultural sector in the Eighth Plan, only Rs. 1,000 crores were allocated, out of that for horticulture development. In the Ninth Five Year Plan also the position did not change. While the total situation to the agriculture sector was increased from Rs. 22,467 to Rs. 42,462 crores, out of which, the amount allocated to the horticulture sector was raised from Rs. 1,000 crores to merge Rs. 1400 crore (GOI-2007).

**Table 1.1: Area, Production, and productivity of Total Vegetables in India**

Year	Area ('000 ha)	Production ('000 MT)	Productivity (MT/HA)
2010-2011	8495	146554	17.3
2011-2012	8989	156325	17.4
2012-2013	9205	162187	17.6
2013-2014	9396	162897	17.3
2014-2015	9541	168300	17.6
2015-2016	10106	169064	16.7
2016-2017	10238	178172	17.4
2017-2018	10259	184394	18.0
2018-2019	10436	187474	18.0

Source: (National horticulture board, MOA, GOI)

China, India, Brazil, USA, Italy, Spain, Mexico, Iran, Philippines, and France are the top ten aggregate vegetable producing countries in the world. Asia dominates the world's vegetables production with a share of 60 percent of global production. The area under vegetable crops during 1981-82 in the state was only 63.83 thousand hectares whereas it has almost remained stagnant till 1994-95 with 62.99 thousand hectares, but further, it increased from 117.1 thousand hectares in 1998-99 to 214.40 thousand hectares during 2014-15 with a total production of 1.90 and 4.24 million tonnes respectively. The production of vegetable is estimated at 187.5MT and area under coverage 103.4 million hectares in 2019. There is a clear economic advantage in producing vegetables as compared to the traditional crops, but lack of price assurance has been the major impediment. Transportation costs and marketing margins of both retailers and wholesalers were identified as the major reasons for high marketing costs of vegetables, adversely affecting the profitability of such crops (Kumar *et al.*2004).

## 1.2 Bottle gourd

Bottle gourd [*Lagenaria siceraria* (Mol.) Standl.] is an essential gourd having an extensive range of uses and is mostly cultivated in the tropics and subtropics for its edible fruits. Bottle gourd is also known as calabash gourd, trumpet gourd, white-flowered gourd, and Zucca melon. By the record, it shows that it was being cultivated in India even before 2000 B.C. It is one of the very most important summer, as well as rainy season vegetable crops, are grown throughout India and its fruits are mainly available in the market round the year.

Bottle gourd naturally gives a very important to dietary intake of vitamins (Vit A, B, and C), carbohydrates (2.9%), proteins (0.25%), fats (0.5%) and minerals (0.5%) such as calcium, iron, potassium, phosphorous. Tender fruits of bottle gourd are mainly used as a vegetable and also used for the preparation of sweets and pickles, especially in the hills. It has a good quality of cooling effect and prevents constipation and has diuretic and cardiogenic properties. Whole seed of bottle gourd has highest content of moisture (17.5 + or -0.21 %) and ash (5.80 + or - 0.83 %) while dehulled seed has highest amount of crude protein (35.0 + or -0.48 %) and crude lipid (39.22 + or -1.48 %) and seed coat contain highest amount of crude fiber (59.05 + or -0.98 %). Generally, the mineral composition of the seed is to be relatively high, indicating the seed to be a good source of dietary elements, except for Ca, Zn, Co and Cr which were very low. Its seed is a good source of protein, lipid, micro, and macronutrients and if properly utilized, could contribute in solving the major problem of malnutrition and also used as raw material for agro-based industries (Hassan *et al.*, 2008).

Its popularity is mainly due to its utility and the variety which play a wide role in our diet. It is originated in Indian sub-continent and Africa. In India, it occupied an area of 9000 hectares with the productivity of 28.9 tonnes per hectare (Anon., 2005). In 2016-17 the area of cultivation is 153 ha and production are 2529 Mt like in 2018-2019 the area of cultivation of bottle gourd is 185 ha and production is 3072MT.

**Table 1.2: Area, Production, and productivity of Bottle gourd in India**

Year	Area ('000 ha)	Production ('000 MT)	Productivity (MT/ha)
2010-2011	75	1354	18.1
2011-2012	105	1984	18.9
2012-2013	114	2090	18.3
2013-2014	103	1819	17.8
2014-2015	111	1836	16.5
2015-2016	149	2458	16.5
2016-2017	153	2529	16.5
2017-2018	157	2683	17.1
2018-2019	185	3072	16.6

Source: National horticulture board

### 1.3 Chilli

Chilli occupied an important place in the vegetable. It is a fruit of the plants *Capsicum annum* and *Capsicum frutescens* which is coming from the genus *Capsicum* and belonging to the family of *Solanaceae*, which also have tomato and potato. Chillies fruits are generally small in size and sharp acidic flavor and color. It is originated in Latin America in 7500 BC and cultivated all over the world used as a spice and also used in making beverages and medicines. This crop is early ever-domesticated in America. It became more popular in the whole of Asia fast and native Asians started cultivating this crop here as well. Chilli requires a frost-free period of four months with the best temperature of 35°C and minimum temperature 10°C is optimum for upraising chilli crop well. It is also one of the most important vegetable crops in India obtaining the biggest growing area among the vegetables. During the year 2011-12, it was cultivated over 804.79 thousand hectares with the production of 1276.3 thousand million tonnes which decreased to 774.83 thousand hectares but increased with a production of 1492 thousand million tonnes during 2013-14. In 2014-15, the area under chilli crop was 760.98 thousand hectares but production remained constant but in 2018-2019 the area under 366 thousand hectares with a production of 3737 thousand million tonnes.

It is rich in essential vitamins A and C and every 100 g dried pods provides about 246 calories of energy through 31.60 g carbohydrates, 15 g proteins, 6.2 g fat, 160 mg calcium, 370 mg phosphorus, 2.3 mg iron, 9.5 mg niacin, and 50 mg vitamin C and every 100 g of green chillies provide about 29 calories of energy through 3 g carbohydrates, 2.9 g proteins, 0.6 g fat, 30 mg calcium, 80 mg phosphorous, 4.4 mg iron, 10.9 mg niacin, and 111 mg vitamin C (Mishra *et al* 2014)

**Table 1.3: Area, Production, and productivity of Chilli in India**

Year	Area (‘000 Ha)	Production (‘000 MT)	Productivity (MT/Ha)
2010-2011	792.1	1223.4	1.5
2011-2012	805	1276	1.6
2012-2013	794	1304	1.6
2013-2014	775	1492	1.9
2014-2015	292	2955	10.1
2015-2016	268	3121	11.6
2016-2017	361	3634	10.1
2017-2018	309	3592	11.6
2018-2019	366	3737	10.2

*Horticultural Statistics at a Glance*

#### 1.4 Pumpkin

The genus *Cucurbita*, indigenous to the western hemisphere, is comprised of five domesticated species. Three of these, *Cucurbita pepo* L., *Cucurbita maxima* D. and *Cucurbita moschata* D. represent economically very important species cultivated all over the world for human consumption (Whitaker and Davis, 1962; Robinson and Decker-Walters, 1997). According to the National Horticulture Board, the India production of pumpkins, squashes, and gourds in 2018-2019 is estimated over 2093 million tons harvested from 98 million hectares. In the present analysis, the fruits of *Cucurbita maxima* D. subspecies generally growing in Jambughoda region of South Gujarat, India were collected in order to follow the differences in their biochemical properties during maturation and ripening. Pumpkin is mainly characterized by yellow

to orange colored skin, slightly globosely shaped, flattened at both stem and blossom end with pronounced ribs on its surface.

Since, India consists of a very high percentage of low-income population that requires balanced food and nutrition at reasonable prices (Pareek *et al.*, 1998).

Pusa Hybrid – 1 was the first hybrid of pumpkin available for commercial cultivation. It gave 30% higher yield than Pusa Vishwas, a high yielding commercial variety. It is very suitable for cultivation in Punjab, Kerala, Delhi and other parts of northern plains (Sirohi *et al.*, 1993).

The nutritional value in pumpkin 100-gram amount, raw pumpkin provides 110 kilojoules (26 kilocalories) of food energy and is an excellent source (20% or more the Daily Value, DV) of provitamins A beta-carotene and vitamin A (53% DV). Vitamin C has in moderate content (11% DV), but no other nutrients are in significant amounts (less than 10% DV, table). Pumpkin has 92% water, 6.5% carbohydrate, 0.1% fat and 1% protein and calcium are 2%, iron is 6%, potassium is 7% and zinc is 3%.

Sandy loam soil rich in organic matter with good drainage is suitable. The pH ranging from 6.5 - 7.5 is found ideal. The present scenario of pumpkin is that area of cultivation is near about 98 thousand hectares and production 2093 million tonnes.

**Table 1.4: Area, Production, and productivity of Pumpkin in India**

Year	Area('000Ha)	Production ('000 MT)	Productivity (MT/Ha)
2010-2011	5	143	28.6
2011-2012	11	278	25.3
2012-2013	16	373	23.3
2013-2014	20	416	20.8
2014-2015	47	1031	21.9
2015-2016	68	1509	22.2
2016-2017	74	1664	22.5
2017-2018	78	1714	21.9
2018-2019	98	2093	21.3

*Source-Horticultural Statistics at a Glance* (National horticulture database, MOA, GOI)

## **1.5 Agriculture marketing in Indian Economy**

Marketing is one of the very most important factors determining the success of any fruit or vegetable farming enterprise, surrounding all of the operations and decisions made by the producers.

Agricultural marketing plays a wide role in the transfer of commodities from the producer to the ultimate consumer and in stabilizing the prices.

Marketing of vegetable crops is quite complex and risky due to its perishable nature of the produce, seasonal production, and bulkiness. The hue cycle of prices from producer to consumer, which is an outcome of demand and supply of deal between various intermediaries at different levels in the marketing system, is also exclusive for vegetables. Moreover, the marketing preparation at various stages also plays an important role in determining price at various stages viz. from the farm gate to the ultimate user.

These features are making the marketing system of vegetables to vary from other agricultural commodities, particularly in providing time, form and space utilities (Sharan, 1998). In a generally agricultural economy like India, prices play an essential role. Due to the huge dependence on natural factors, the prices of the farm products go up and down more than that of industrial goods. Hence, in a developing country like India, the human and political significance created by prices are massive. They have a serious effect on growth, equity, and stability in developing economies and alongside affect the prices of non-farm goods. This is the main reason for the direct decision frame of the farmer that fluctuating characteristics of agricultural prices, both inside production as well as marketing. Major up and down or instability in prices is one of the greatest sources of risk next only to weather in the agricultural production system.

The differences in the market arrivals and prices can be mainly classified, as temporal variation and spatial variation. Temporal variations have the results of a complex mixture of changes combine with cyclical, seasonal and irregular components. Among these, the seasonal component is examined as the very most critical. Spatial price variations refer to the change in the prices observed in various

different markets and they occurred due to the difference in the location of production and consumption centers.

The interdependence between the price movements in various markets mostly depends upon the nature and extent of competition, dissemination of market information and attitude of market functionaries. The efficiency of any marketing system has been determined by the degree to which the wholesale prices of the commodity in various markets are related to each other. Analysis inter-relationship generally helps us in understanding the efficiency of the marketing system.

### **PROBLEM STATEMENT**

Vegetables are crucial sub-group of horticultural crops, play a very important role in human nutrition and contribute to the prosperity as well as constitute an important component in the export basket of our country.

Most of the farm products have prone to both inter and intra-year price movement up and down. It is generally more in the case of vegetables because of their high degree of perishability. The knowledge of the nature and consequence of price movements is of ultimate importance to the policymakers and those who are engaged at different levels of their production and marketing.

The market insufficiencies are providing inferences to the growers for enhancing vegetable production. The price behavior of vegetables, spatial (or) temporal, has a definitive bearing upon the rationality of decisions taken by the growers as well as traders. Hence this study on production and marketing of important vegetables Mirzapur in district Kalhut has been taken up with the following specific objectives.

### **OBJECTIVES**

The objectives of the present study were:

1. To estimate the cost of cultivation and return from chilli, pumpkin and bottle gourd in the study area;
2. To study the marketing channel, marketing margin and marketing efficiency of selected vegetable in the study area; and
3. To identify the problems faced by farmers during the marketing and production of selected vegetable crops in the study area.

### **SCOPE OF THE STUDY**

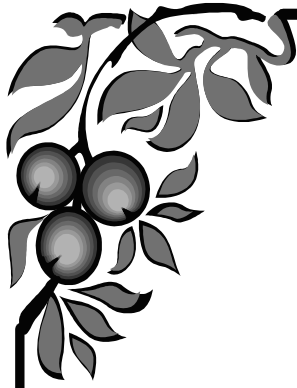
The study provides information on as to how the prices of Pumpkin, Chilli and Bottle gourd would be in different months of the year. Such information gives clues to the farmers the Returns and price so as to make necessary sowing and selling decisions. This information is further forecasts of prices in future months.

### **LIMITATIONS OF THE STUDY**

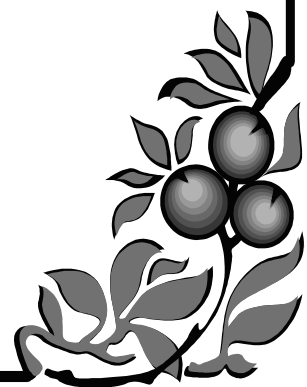
The present study is based on the primary data with regard to collect information from the farmer and some information is from a research paper. Vegetable prices observe a high degree of volatility due to their high perishability in nature and disturbances in production and supply.

### **PLAN OF THE THESIS**

The thesis is shown in five chapters. The first chapter related to the introduction along with the objectives, scope, and limitations of the study. The second chapter related to the review of the literature. The third chapter deals with methodology. The fourth chapter grid an important analysis of the results. The final or last chapter represents the summary and conclusions of the study.



*Review  
of  
Literature*



## REVIEW OF LITERATURE

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The comprehensive review of literature is an important part of any scientific investigation and a review of past research and it helps in identifying the main conceptual and methodological issues related to present study and with the help of this meaningful strengthens the research potentiality and quality by involving the better supportive reasons for discussion. Review of literature mainly helps the research workers in formulating and specifying the specific objectives, preparing a questionnaire, selecting a representative sample from the population, undertaking the survey, analysis the data, interpreting the market comparing and making the deduction. Its main role apart from concluding the work done previously, is to provide an insight into the methods and procedures adopted by other researchers to suggest changes therein.

This chapter attempts to review the significance of research literature that have been accumulated on the areas related and relevant to the objectives of the study has been compiled and presented in this chapter under the following headings: Cost and returns in the production of selected vegetable, Marketing channel, marketing margin and marketing efficiency of selected vegetable problems faced by farmers in production and marketing of vegetables.

### 2.1 Cost and returns in the production

**Mittal (1969)** conducted a study on the economics of ginger cultivation in Sirmaur district of Himachal Pradesh. The author was recorded that per hectare average cost of cultivation, gross output, and net profit was Rs. 2162.43, Rs. 5004.00 and Rs. 2841.57, respectively. The author was also found that the cost of seed was the main item of cost, contributing near about 70 percent of the total cost of cultivation,

while cost incurred by farmers on human and bullock labor was 7.9 and 12.4 percent of the total cost.

**Gangwar and Chhikara (1973)** represented data on the costs of production, yields and the returns for cauliflowers, onions, melons, tomatoes, and okra, determined from farm surveys in 1971-72. Tomatoes were the most advantageous followed by cauliflowers.

**Singh and Methai (1973)** conducted a study on costs of production, yields, and returns from 11 vegetable crops from the four-year trials and found that winter tomatoes were the most profitable vegetables as compared to other vegetable crops considered under the study.

**Basavaraja (1980)** studied the production of hybrid and local tomato varieties in Bangalore district. The study found that the cost of cultivation per acre of hybrid tomato was double than that of local tomato. The average input costs incurred by farmers were highest for hybrid and local tomato was labour accounting for 29 percent of the cost respectively. The net returns over cost 'C' in hybrid tomato was 2.5 times more than those of local tomato representing higher advantageousness of hybrid tomato over the local tomato.

A study was conducted by **Nanda *et al.* (1981)** in Sirmaur district of Himachal Pradesh to determine Cost Benefit appraisal of Ginger cultivation and explained that the average per hectare cost of cultivation for ginger was Rs. 13005. Authors examined that total cost of cultivation in different size groups of farms did not vary much accordingly because of the traditional type of ginger cultivation in the study area. The cost of seed was only considered for 37.90 percent of the total cost, followed by labour costs on all the size of farms, while hired labour cost represents rising trend with an increase in the size of the holding. The study showed on an average per hectare gross returns and net profit was Rs19321 and Rs 6312, respectively, while the input-output ratio was estimated to be 1:1.49.

**Lohar and Bansode (1984)** conducted a study to examine the costs and returns of chilli in Gadhinglaj area of district Kolhapur (M.S.). The study found that per hectare Cost A, Cost B and Cost C were Rs.2647.45, Rs.3832.80 and Rs.4473.30,

respectively. The cost of fertilizer and manures was Rs.1355.00 (30.30 percent). The hired human labour and family labour employed the second considerable item of cost i.e. Rs.879.06 (19.66 percent). By estimated value per hectare net profit gained over Cost A, Cost B and Cost C worked out to be Rs.2602.55, Rs.1473.20, and Rs.776.70 respectively. Per hectare yield of chilli (dry) was 8.50 quintals, while per quintal cost of production was Rs.526.27 with a cost-benefit ratio of 1:1.17.

**Lohar (1987)** studied the economics of hybrid tomato production in Satara district (Maharashtra). Per acre cost of cultivation of hybrid tomato had been estimated Rs. 21,803.2. Further, the cost of marketing per unit of the commodity sold was very high rate (Rs. 11,319.04 per acre) and it assumed for nearly 52.00 percent of the total cost. The major cost items accounted for 33.00 percent of the total cost for the rental value of land, manures and fertilizers, human labour and other expenses (such as bamboo & *sutali* for tying the bamboo) and plant protection charges. Per quintal cost of production was worked out to Rs. 74.09. Out of the total marketing, the cost was incurred by the producer's 55.31 percent taken towards transport charges, 70.00 percent towards wooden boxes. Per quintal marketing cost was Rs. 38.33. From the sale of 295.28 quintals of hybrid tomatoes, the gross profit was Rs. 46,361.24 and thus, the net returns, after deduction of the cost of cultivation and marketing cost, was worked out to Rs. 13,160.96 per acre.

**Sharma and Thakur (1988)** was conducted study in Solan district of Himachal Pradesh and found that the per hectare costs of cultivation for hill capsicum, tomato, cauliflower, and pea were Rs.13604, Rs. 64655, Rs. 53390 and Rs. 9506, respectively. Further, the per hectare gross returns had been estimated at Rs. 28677, Rs. 145944, Rs. 116457 and Rs. 10961 from these crops. The per hectare net returns from these vegetable crops were Rs. 15072, Rs. 81289, Rs. 63066 and Rs. 1454, respectively. The study emphasized that the cultivation of tomato was most beneficial in the study area as compared to other vegetable crops.

**Reddy et al. (1990)** studied the economics of producing hybrid and local tomato varieties in Bangalore district. The author found that most of the inputs used in the cultivation of hybrid tomatoes were higher than those of local varieties aside from seeds and bullock labour. Average total variable cost per acre was estimated in the

case of hybrid tomato was Rs. 14,006.55 which was 2.5 times more than that of local varieties (Rs. 4,109.63). In the case of hybrid tomato, the average labour required per acre was 313.21-man days accounting for 180 percent higher than that of local variety (112.55-man days). Accordingly, the total cost of production of hybrid tomatoes (Rs. 23,364) per acre was about 290 percent higher than that of local tomato (Rs. 7,894.42). Yield and gross income per acre of hybrid tomatoes were estimated 259.92 QTL and Rs. 45,778.22 respectively, which is about 225 percent and 400 percent higher than that of local variety (79.40qtl. and Rs. 9,131). Average net gain per acre received from the production of hybrid tomatoes was Rs. 21,181.64.

**Singh (1990)** studied the production and marketing of vegetables in Himachal Pradesh and the author found that the fertilizer application rates were far below the recommended level for all farm size groups. The average cost incurred on human labour was accounted for a significant proportion of the total costs for all the vegetables. The study also showed that the inputs were not efficiently used on all sizes of farms.

**Subrahmanyam (1990)** conducted a study in Delhi. The author reported that production and marketing costs of tomato were Rs. 4664 and Rs.3069 per hectare, respectively. In the case of brinjal, the production cost was estimated to be Rs. 4192 and marketing cost was Rs. 2886 and likewise the total cost of cultivation of tomato and brinjal were Rs. 7733 and Rs. 7078 per hectare, correspondingly.

**Sikka and Vaidya (1994)** deliberated vegetable cultivation in Himachal Pradesh to formulated mountain farming system sustainable. Authors discovered that vegetable cultivation has an imperative character to play in making mountain farming system sustainable, but the only restrictive factor was irrigation. Surveys in Panesh village indicated that irrigated farms could give more returns of Rs.3,600 per hectare than the un-irrigated farms (Rs.1,670).

**Hiremath (1994)** studied on cost and returns of dry chillies in Dharwad districts and the author found that the total cost of cultivation of chilli was Rs. 5,942.64 per acre, while cost A was Rs. 3,865.90 and cost B was Rs. 5,110.39. The

value of gross output was Rs. 5,531.72. The farm business income was Rs.1,466.08 per acre and family labour income were estimated to be Rs 221.33 per acre

**Pokharkaret *et al.* (1994)** studied the economics of production and marketing of onion in Western Maharashtra and obtained that per acre profit over cost A was Rs. 2,471.29 with the cost of cultivation of Rs. 4,453.97 with a yield of 4.15 quintals.

**Verma and Gujar (1994)** studied production and marketing of horticultural crops in Rajasthan found that largely cost of cultivation of green pea in Chomu and Sanganer tehsils of Jaipur district was Rs. 20095.31 and Rs. 19946.16 per hectare. Outside which, Rs. 12789.05 and Rs, 12227.05 were the operative costs and the residual was overhead cost. The comprehensive cost of production was generally estimated at Rs. 198.13 per quintal of green pea in Chomu tehsil and Rs.194.72 in Sanganer tehsil. The total gross income from green pea cultivation was Rs. 315694.43 and Rs. 31426.54 per hectare in Chomu and Sanganer tehsils, correspondingly and the total overall per hectare returns above variable cost, family labour income, farm business income, and net income were Rs. 18774.79, Rs. 13357.02, Rs. 20630.84 and Rs.11469.11, respectively in Chomu tehsil at the same time in Sanganer tehsil, these were Rs. 19199.48, Rs. 14648.31, Rs. 21779.96 and Rs. 11480.37, respectively at last per rupee return from the cultivation of green pea in both the tehsils was found Rs. 1.57.

**Kushwaha *et al.* (1994)** studied in district Muzaffarpur (Bihar) the changes in the cost of input in 1993-94 over 1980-81. The study revealed that per hectare cost of production was Rs.6404 in 1980-81, which increased to Rs. 15593.98 during the year 1993-94. The percent cost of human labour and bullock labour was higher for the year 1980-81(29.71%) as compared to 1993-94 (26.53%). The cost of modern farm inputs like the use of a tractor, fertilizers, seed, and irrigation was higher for the year 1993-94 in comparison to 1980-81 which resulted into higher per hectare cost of production of potato in the study area. Further, the study revealed that the input-output ratio was 1.51 which increased to 1.62. The cost of production per quintal of potato was Rs. 36.5 in the year 1980-81 which jumped to Rs. 77.29 in the year 1993-94.

**Swarankar (1995)** conducted a study on economic analysis of production and marketing of tomato in Ajmer district of Rajasthan recorded that the on average per hectare cost of cultivation of tomato was Rs.22229.65. It generally varies on different sized farms from Rs. 19311.18 to Rs. 23958.87 per hectare. The share of main items in total costs were the rental value of owned land, value of human labour, bullock labour, fertilizers and chemicals, irrigation cost farmyard manure, rent, and depreciation was 31.31,25.94, 16.98, 6.84, 3.02, 5.54, 3.74 and 2.47 percent respectively and per quintal average cost of production of tomato was estimated Rs. 93.55. It was Rs. 98.18, Rs. 101.09, Rs. 84.67 and Rs, 78.82 on small, semi-medium, medium and large size groups of farmers, correspondingly. The per rupee return from tomato cultivation improved with enhancing the size of the holding.

**Venkataraman and Gowda (1996)** carried out a study on the economics of tomato production on Kolar districts of Karnataka computed per acre cost and returns of tomato production. The consequences exposed that the total cost of cultivation was Rs. 36,611.51 per acre. Out of total cost, variable costs were Rs.15,648.26, fixed costs Rs. 2,556.48 and marketing cost Rs. 18,406.77. However, the net return obtained was large compared to many other costs, the high cost of production together with some other factors discouraged farmers from increasing tomato production

**Kutty, Devi, and Jaikumar (1998)** studied costs and returns of vegetable seed production based on data generated at the Agricultural Research Station, Mannuthy, Kerala, India, during the period of 1994-97. Authors have covered eight crops –viz., ash gourd, melon, bitter gourd, snake gourd, aubergine, okra, cowpea, and amaranth. The study showed the cost of cultivation very great variation from Rs.30218/ha for okra to Rs.86412/ha melon. In all cases, labour was the single maximum item of expenditure. Average labour use per crop was estimated at 1394man-days/ha with maximum variations between crops. Gross returns and net income were maximal for okra. Cowpea had a great profitable benefit: cost ratio and ash gourd and melon had the minimum benefit: cost ratios.

**Gaurha (1999)** conducted a study on the post-harvest losses in vegetable crops. The study revealed that the average per hectare net return from chilli was highest (Rs.31, 240), followed by cauliflower (Rs. 23,197), potato (Rs. 14,598),

cabbage (Rs. 12,540) and brinjal (Rs. 9,520), whereas the average per hectare total cost was the highest in case of tomato (Rs. 25,286) followed by chilli (Rs. 23,063), cauliflower (Rs.19,165), potato (Rs.18, 338), brinjal (Rs. 17,371), and cabbage (Rs.16,639), the average total net returns and cost-benefit ratio were uppermost in case of chilli.

**Singh and Singh (1999)** in their study found that highest cost of cultivation was found for potato (Rs. 20971/ha) subsequently cauliflower (Rs. 4719/ha), tomato (Rs. 12296/ha), chillies (Rs.11970/ha) and lauki (Rs.10296/ha) in Varanasi district of Uttar Pradesh. Though, return per rupee of investment was highest for chilli followed by lauki, tomato, brinjal, cauliflower, pea, and potato, respectively.

**Singh and Singh (1999b)** were found that highest cost of cultivation for potato (Rs. 8388.4 acres) subsequently cauliflower (Rs. 5,887.8 acres), tomato (Rs. 4,918.4 acres), chilli (Rs. 4,788 acres) and lauki (Rs. 4,118.4 acres) in Varanasi district of Uttara Pradesh. Though, per rupee of investment was extreme in chilli subsequently lauki, tomato, brinjal, cauliflower, pea, and potato.

**Patil, Basavaraja, Hosamani, and Mundinamani (1998)** conducted a study in Bijapur district, Karnataka, India, regarding the economics of cultivation of essential vegetable crops and examine their credit rations. Data were collected from 176 farmers who growing vegetable crops underneath irrigated conditions in the year 1985-86. The cultivation of vegetable crops was observed to be as more profitable as that of other field crops. The author found that onion was the most lucrative vegetable crop. The major constraints observed that the fluctuations in prices of vegetables and insufficient finance were the major drawback faced by growers.

**Sairam, Thambal and Umamaheswari (1999)** The article examination set out to (1) study the tendency was in growth of production and price of coconut oil as compared to other major vegetable oils; (2) to examined the relationships between prices of coconut oil and other most important vegetable oils; (3) to examined the degree of association between production and prices of major vegetable oils. The four major vegetable oils were coconut, groundnut, sesame and rapeseed/mustard. Between 1970-71 and 1994-95, most of the growth rate in production was in mustard

oil, subsequently coconut, groundnut, and sesame. Prices of coconut oil were higher than other oils with groundnut for much more of the period. This could be mainly due to the fact that coconut oil has more price inelasticity of demand as compared to other oils as it is mainly used for toiletry/industrial purposes. However, the growth rate of prices was maximum for groundnut oil, followed by mustard, coconut and sesame oil.

A study was handled by **Prasad (2001)** in the state of Bihar during the year 1999 reported that per hectare cost of cultivation of potato was Rs.22883 on sample farms. It was varying from Rs.22586 on marginal farms to Rs.22985 on large farms and surrounded by the different cost components, the rental value of own land ranked first with 26.65 percent, subsequently cost of seeds (23.32 percent) and human labour (20.92 percent). Per hectare average net return over Cost C was Rs. 11313 which ranged from Rs. 9738 on small farms to Rs.14080 on marginal farms. On average, the cost of production per quintal was Rs.137.85 and the input-output ratio was 1.49. Further, the overall cost of cultivation per hectare of Brinjal was Rs. 20829. It is different from Rs. 19728 on marginal farms to Rs. 21794 on large farms, along with the various cost components, the value of human labour ranked first with 35.46 percent of the total cost, subsequently rental value of own land (26.26percent), plant protection (10.48 percent) and manures (10.14 percent). On an average net return per hectare over Cost C was Rs.11404 which ranged from Rs. 7854 on large farms to Rs. 13667 on marginal farms. The average cost of production per quintal was Rs. estimated 138.79 and input-output ratio was observed 1.54.

**Verma (2002)** was studied the economics of onion and gained that cost of cultivation over cost A1, cost B1, cost C1 and cost C3 were worked out to Rs. 21790.24, Rs. 22309.05, Rs. 24499.05, Rs.24949.28, Rs. 27139.28 and Rs. 29853.20, respectively. On an average per hectare, the yield was 263.75 quintal and average gross return was observed to Rs. 72,531.25. It was larger at Rs. 74,580 on large farms and the lowest at Rs. 70,218.50 on small farms. Large sized farmers had incurred higher investment per hectare on modern inputs because of that average yield and gross return increases with the increase in farm size. The average net returns over cost A1, cost B1, cost C1, C2 and C3 were found to be Rs. 50741.01, Rs. 50222.20, Rs. 48032.20, Rs. 47, 581.97, Rs. 45, 391.97 and Rs. 42, 678.05 per hectare of onion

correspondingly. The average cost of production per quintal of onion was worked out to be Rs. 102.89 on cost C2 and Rs. 113.18 on cost C3. At Rs. 45,318.28 and Rs. 46,459.66 per hectare on average family labour income and farm business income were calculated. The average input-output ratio was at cost A1, cost B1, cost B2, cost C1, C2 and cost C3 worked out to be 1:3.32, 1:3.25, 1:2.96, 1:2.90, 1:2.97 and 1:2.42 respectively.

**Anonymous (2004)** was conducted a study on the economics of production of capsicum under low-cost polyhouse in Andaman and Nicobar Islands. The result was explained that the investment on polyhouse per 10 *gunta* was Rs. 71,852 and observed total cost of cultivation of capsicum in polyhouse was Rs.12,700. Among the total cost of cultivation, harvesting cost was more (Rs. 2,400). The average yield received was four tonnes with a price of Rs. 35 per kg. The net returns obtained were Rs. 63,650 and the return per rupee of investment worked out to 11.20.

**Anonymous (2005)** was studied the cost of cultivation of capsicum in the conventional and precision farming system in Tamil Nadu. The results exposed that the total cost of cultivation per acre of capsicum was estimated at Rs. 19,600 in the conventional system and Rs.28,800 in precision farming system and in term of per acre the yield was 7.2 tonnes in the conventional system and 10 tonnes in the precision farming system. Per acre net income was Rs. 38,000 in the conventional system and Rs. 61,200 in precision farming and B: C ratio was obtained of 1.93 in the conventional system and 2.12 in the precision farming system.

**Navadkaret al. (2006)** while considered the effectiveness of selected vegetables in Pune enumerated the cost and returns of capsicum production. The results explained that the average cost of construction of polyhouse per 10 *gunta* was Rs. 1,43,000. Marketing cost was Rs. 44,250. The B: C ratio was more than unity.

**Singla et al. (2006)** conducted a study on the economics of production of green peas in Punjab. The study was found that 75.85 percent of the farmers purchased pea seeds from the dealers. Per hectare yield of green peas has been found the highest on small farms among all the farm-size categories. The purposeful

examination revealed that the fertilizers, irrigation, and machinery are the impact variables, influencing the productivity of the green peas positively.

## **2.2 Marketing channel, marketing margin and marketing efficiency of selected vegetable**

**Gopal (1978)** carried out a study covered two wholesale and six retail markets. The aim of the study was to discovered defects in the existing marketing structure for tomatoes, ladies-finger, and carrots. Shares in the costs of marketing between commission agent and retailer are worked out for all these vegetables. The producers were found an overall net share of about 55% of the consumer's rupee. The cost of transportation by *lorry* was the cheapest. Most of the farmers had to sell instantly after harvesting because they need cash urgently, but they measured that the commission charged was high. The study recommends a variety of methods of increasing the usefulness of the functioning of the market including marketing cooperatives, licensing of commission agents and conservatory of marketing legislation to vegetables.

**Govardhan (1978)** was studied on the marketing of dry Chilli in selected markets of Karnataka and exposed that producers received 80.09 percent and 83.16 percent of trader's sale price when the product was sold all the way through agents and co-operative societies correspondingly.

**Lohar and Disakalkar (1979)** conducted a study on marketing of dry Chilli in Kolhapur (Maharashtra) and authors observed that the producers share in the consumer's price was 63.73 percent, whereas the margin of agent's commission produced 11.31 percent of the consumer price.

**Bhalerao, Ansari, and Tyagi (1981)** carried out a study to examine the marketing of vegetables in Varanasi city of U.P. State and analyses the pattern of arrivals, marketing costs borne by the contracting agencies and price spread of unusual vegetables. The study was explained that (1) variation in prices was positively correlated with that of arrivals in the market, (2) total marketing cost (68 to 69%) was payable by the seller (producer), and (3) the share of producer was higher

for less perishable vegetables or with facilities of cold storage than for vegetables with greater perishability

**Rathore and Verma (1983)** studied in Agra city on the various costs and margins in vegetable marketing. It was mainly covered a sample of 40 cultivators selected from five villages of Ajipur, Alwatia, Dehtora, Mohammadpur and Nagla Pati Ram in Bichpuri Block during 1980-81. The psychoanalysis showed that the producer acknowledged a very low (43%) share in the consumer price while the retailer's margin and marketing costs were moderately extensive. The major components of marketing costs were transported, labour and weighting operating expense. The cooperative enterprises were at both producer and consumer levels and the condition of cold storage and processing facilities would most likely do much to improve the marketing routine.

**Ranaasinghe (1988)** was described the paper vegetable marketing in Sri Lanka at the primary, wholesale and retail level. About 80% of the vegetables were marketing by the private sector. In which various functions in the marketing process were cleaning, grading and sorting, packing, transport and weighing. Cost components were observed and it is accomplished that while producers do not receive rational prices for their produce, consumers pay high prices due to many factors such as the behavior of middlemen, the monopolistic operation of the transport system and poor storage facilities provided at government collection centers. The action was at both the government and producer level is required.

**Kiresur and Kumar (1988)** conducted study to find out: (1) the price spread and the producers' and market intermediaries' share in the consumers' price in different vegetable marketing channels in Hubli market, Dharwad district of Karnataka state, in regulated and non-regulated markets; (2) examines and compares the extent of discrepancy in the wholesale prices of vegetables in regulated and unregulated markets; and (3) identifies problems faced by farmers in the marketing of vegetables. The study was constrained to format or vegetables: tomato and aubergine (traded in an unregulated market) and onion and potato (traded in a regulated market). Authors were found two common marketing channels through which the vegetables were sold. Channel I: Producer/seller > Commission agent-cum-wholesaler > Retailer

> Consumer and Channel II: Producer/seller > Village merchant> Commission agent-cum-wholesaler > Retailer> Consumer.

The price spread and the wholesale price inconsistency were lower in the case of regulated vegetable market as compared to the unregulated vegetable market. Authors reported that relatively larger proportion of farmers complained about problems encountering the marketing of unregulated vegetable market (congestion market, high *hamali* charges and the absence of weighing, grading and cheaper transport facilities, etc.) as compared to the regulated markets

**Singh et al. (1994)** studied the production and marketing of hill vegetables in Himachal Pradesh and show that on average production of capsicum and the marketed surplus was 1.21 and 1.16 quintals correspondingly. Generally, the very less quantity of capsicum was kept for home consumption (0.03qtls), seed purpose(0.01qtls) and for a kind wage (0.01qtls). The producers' share in consumers' rupee was 34.10 percent. The marketing cost was born by producer's accounts for 31.28 percent of the consumer's price and among them, the cost of packing material was highest (11.79 percent) subsequently transportation (7.69 percent) and commission and market fee (3.33 percent).

**Saini and Bhati (1995)** were carried out a study on ginger marketing in Himachal Pradesh. The study bares that a part of total ginger produced was retained by the farmers for meeting requirements of seed (13.6%), family consumption (1.6%) and kind payment to laborers and gift to relatives (0.2%). The enduring produce of ginger (84.6%) was marketed. It was examined that out of the total marketed surplus of ginger 60 percent was routed throughout channel: producer – primary wholesaler – secondary wholesaler-retailer – consumer. Conversely, total marketed ginger was sold in the local market only one percent and supplementary. It was also noted that was 7 percent of total produce losses during market functions and it was during storage (4.5%), followed by transportation (1.7%), assembling (0.6%), and grading and packaging (0.2%). Authors identified four major constraints related to marketing of ginger in the study area *viz.*, the prevalence of '*arihatiya*' system, very few procurement centers for ginger, non-existence of cooperative societies of ginger growers and low price of produce.

**Satapathy and Das (1996)** were ascertained problems faced by vegetable growing farmers in Gajamara village of Orissa. The major problems faced by farmer related to production were non-availability of improved or high yielding variety seeds, an infestation of diseases and pests particularly in brinjal and non-accessibility of fertilizers. The major marketing problems faced by the farmers were non-availability of cooperative society, vegetable sale centers at nearby markets and lack of cold storage facility.

**Narappanavar and Bavur (1998)** were studied the marketing problems of potato in Dharwad district of Karnataka during 1993-94. Authors mainly observed problems of high price variation (about 83%), higher *hamali* charges (75%) and absence of temporary storage facility (70%).

**Shelke and Kalyankar (2000)** determined a study on price-spread in the marketing of selected vegetables in Prabhani and observed that the transport cost and commission charges together constituted 80.09 percent and commission charges single-handedly accounted for 51.67 percent of the total marketing cost per quintal *i.e.* 38.78. According to the investigation of price-spread show that producer's share in consumer's rupee was 46.95 percent, whereas the margin of the retailer was accounted for 32.48 percent.

A case study in Andhra Pradesh was considered by **Babu et al. (2003)** on price spread and marketing of green chillies with observation to recognize marketing channels. Authors concluded that in channel-II (Producer-Local consumer) the net share of the producer in the consumers' rupee was 97.57 percent although it was low *i.e.* 41.48 percent in channel-I (Producer-village merchant-Wholesaler-Retailer-Consumer), the reason being the presence of a large number of mediators in among the producer and consumer. They also conditional that the per quintal marketing cost incurred by farmers in channel-I and channel-II was Rs.10.88 and Rs.4.65 correspondingly, while the marketing effectiveness was highest in channel-II, since the absence of mediators as well as a low marketing cost.

**Kumar and Arora (2003)** carried out a study on the marketing of vegetables in Uttaranchal. Overall marketed surplus of chilli was 95.46% and it varied from

94.45% on small farms to 96.22% on medium farms. On an average marketing cost was Rs.173.75 per quintal and it wide-ranging from Rs.163.48 on medium farms to Rs.184.60 large farms. The packing cost, transportation, and commission charge were appeared to be important determinants of marketing of chillies. The major problems in marketing were the high cost of packing material, subtraction by the trader in the form of commission and problem of transportation.

**Verma (2004)** conducted a study on the marketing of fruits and vegetables in Himachal Pradesh and the author found that 93% of the total capsicum produce goes to the markets as a marketed surplus. The author estimated that the producer's share in consumer's rupee was 43.55 percent in capsicum. Total marketing cost calculated by producers was higher and it accounted for 27.27 percent of total consumer's price in case of capsicum and almost certainly this was mostly due to perishable products in addition to it needs more packing costs to avoid deterioration process.

**Singh and Chauhan (2004)** in their study conducted on the marketing of vegetables in Himachal Pradesh. Data were collected from 80 vegetable growers in Himachal Pradesh, India. Results were explained that most of the vegetables are marketed through channel involving wholesalers/commission agents and retailers. This informed to enhance expenditure and marketing cost and moreover, due to the perishable nature of vegetables and the huge excess during the peak season, farmers do not get remunerative prices.

**Navadkar et al. (2005)** conducted a study on marketing cost of vegetables grown around Pune City. The major components of marketing cost were commission charges, transportation cost, and processing costs. The study establishes that the processors share in consumers' rupee was relatively less as a consequence of more profit margins of intermediaries and the expenses done by them in addition to the expenses incurred by the producer himself on the marketing of vegetables.

**Pawar and Pawar (2005)** in their study on Price spread and Marketing efficiency of green chillies in the watershed area of Marathwada. The study was reported that sale of green chillies took place through three channels namely, Channel- I: producer- commission agent- wholesaler-retailer- consumer; Channel -II:

producer-retailer- consumer and Channel -III: producer-consumer. Marketing cost was observed to be higher in channel-I followed by channel-II and channel-III. Producer' s share in consumer's rupee was higher in the channel - III (92.77%) as compared to channel –I (73.65%) and channel -II (56.45%).

**Sharma (2006)** conducted a study on price spread and problem in the marketing of onion in agro-climatic zone-2 of Rajasthan. In which for the selection of sampling the multistage random sampling technique was used. A calculated total of 60 farmers from four villages, four wholesalers and four retailers were selected randomly. Three marketing channels were observed viz., Channel 1: Producer-Consumer, Channel 2: Producer- Local traders- Consumer and Channel 3: Producer-Commission Agent-Retailer- Consumer. The producers' share in consumers' rupee was higher in channel-1 afterward channel-2. The study suggested that to remove the entire problem faced by the producers in the marketing of onion, proper storage facility, and marketing facility should be advised to market through co-operative marketing societies.

**Patil et al. (2007)** in their study conducted on price spread in the marketing of capsicum in Thane district of Maharashtra state acknowledged the problems encountered by the farmers in capsicum marketing. They acknowledged the following three channels viz., Channel- I: producer- wholesalers /commission agent- - retailer-consumer, Channel -II: producer- village trader-retailer- consumer and Channel -III: producer- retailer-consumer. Further, it was observed that most the capsicum producers sold their produce through channel-I (92.22%) followed by the channel-II (0.86%) and channel-III (0.22%). Producer's share in consumer's rupee was found to be highest in channel-III (49.67%) and lowest in channel-I (27.28%). Total marketing cost was the highest in channel-I (72.72%) followed by channel-II (62.80%) and channel – III (50.33%). Price spread was high in Channel II. They reported that the practice of pre-harvest contractor adopted by considerably a large number of orchardists. Channel II is the enhanced distant marketing channel for the producer is high (Rs. 1517.81/qtl) as compared to channel I.

**Hatai (2007)** studied the economics of production and marketing of strategies of potato in Orissa. For the selection of sample author used stratified random

sampling techniques. The study conducted of a selection of a total of 90 potato growers. On the basis of the diverse cost concept, the cost of cultivation has been estimated. The net returns over different cost concepts have been estimated. The study revealed that there is a scope for further increase in the human labour for potato cultivation.

**Sanjeev et al. (2008)** studied on the marketing of vegetables in Vaishali district of Bihar. Authors included Shepherd index, the marketing efficiency was measured and the marketing cost function analysis facilitated to evaluate the relative contribution of various factors to the marketing cost. Marketing efficiency was higher for cauliflower followed by Bhendi, Brinjal and tomato crop, marketing cost emerged as one of the significant components of vegetable marketing which ranged from 23.09 percent for Brinjal to 34.04 percent in tomato.

### **2.3 Problems faced by farmers in the production and marketing of vegetables**

**Palmer et al. (1994)** found that spoilage was the major problem (68.46%) during the marketing of vegetables in South Gujarat afterward malpractices in weighing (49.41%), lack of credit facilities (24.40%) and insufficient transportation facilities (23.81%) as expressed by respondents.

**Thakur et al. (1994)** conducted a study to identify the problems encountered by the farmers in the marketing of vegetables in Himachal Pradesh. They were mostly unorganized marketing and low prices paid to farmers, lack of mechanical grading, packing and proper storage facilities, malpractices, high and undue marketing margins and costs in markets, lack of village roads, lack of sufficient and low-cost transportation facilities, lack of market information and market news, lack of processing units and cooperative societies.

**Ravishankar (1995)** conducted a study in Chickamagalore district of Karnataka and reported that the constraints faced by the potato growers were lack of technical guidance, more pests, and diseases, high cost of fertilizers, high cost of plant protection chemicals, non-availability of seed materials and fertilizers in time.

**Sharma et al. (1995)** in their study on marketing of vegetable in Himachal Pradesh reported that, costly wooden boxes, time-consuming manual grading, distant markets, high transportation charges, malpractices in the market and lack of market information were the major problems faced by growers in storage, transpiration, and marketing of vegetables.

**Satapathy and Das (1996)** conducted a study to determined problems faced by vegetable growing farmers in Gajamara village of Orissa. The major problems related to production were non-availability of superior or high yielding variety seeds, a huge number of diseases and pests above all in brinjal and non-accessibility of fertilizers and the major marketing problems faced by the farmers were non-availability of cooperative society, vegetable sale centers at nearby markets and lack of cold storage facility.

**Bonny (1996)** studied the constraints in commercial production of vegetables in Pondicherry and Puthur, Kerala and reported that amplified cost of plant production chemicals was perceived as the most important factors by respondents followed by insufficient market facilities, poor storage, and other post-harvest facilities, insufficient capital and high labour costs.

**Patil et al. (1997)** surveyed on marketing efficiency of Anand vegetable market in Gujarat and reported that lack of storage facilities, delay in payment of sale proceeds, high cold storage charges, monopoly of few mediators and need of timely disposal of these perishable products, etc., were the major problems faced by the cabbage and cauliflower growers.

**Narappanavar and Bavur (1998)** studied the marketing problems of potato in Dharwad district of Karnataka during 1993-94. Authors observed that the problems of high price variation (about 83%), higher *hamali* charges (75%) and absence of temporary storage facility (70%).

**Ravishankar and Katteppa (2000)** conducted a study on potato growers in Chikmagalur district of Karnataka state. Study revealed that 94.16 percent of respondents faced the problem of lack of technical guidance, more pests, and more

diseases, high cost of fertilizer, high cost of plant protection chemicals and non-availability of fertilizers in time, were the problems faced by 90.00 per cent, 83.33 per cent, 85.00 per cent, 81.66 per cent and 68.33 per cent of respondents, respectively.

**Chandrashekar *et al.* (2001)** identified the production constraints faced by growers in the order of significance. They were lack of technical guidance, more pests, and diseases, high cost of fertilizers, high cost of plant protection chemicals, non-availability of seed materials and non-availability of fertilizer in time.

**Gavisiddappa *et al.* (2001)** observed the problems in Gherkin production and trade in Haveridistrict of Karnataka. The sample farmers were undisputed and percent in their opinion with respect to non-availability of seeds, ignorance of potentiality of the crop, lack of irrigation facilities, the problem of pests and diseases, lack of cheap labour, no proper markets in India and no refrigerated storage facilities. Irregular payment made by the company (30%) and lack of research support regarding the crop (34%) were some other problems.

**Mutkuleet *et al.* (2001)** studied on constraints in adoption of chilli technology in Nanded district of Maharashtra. Authors found that majority of the respondents (93.33%) experienced the constraint insecticides and pesticides were costly subsequently fluctuation of prices of chilli (86.00%).

**Rajkumar and Singh (2002)** identified problems in vegetable production. The problems reported were poor quality seeds (42.2%), inadequate availability of seed (40%), high cost of seed (31%) and non-availability of seed at the appropriate time (12.2%). The other problems noticed were the high cost of fertilizer, the poor state of fertilizer and plant protection deliverance system in the district. The main problems related to the cultivation of vegetables were high wages and shortage of labour.

**Seema and Annamalai (2003)** studied the constraints at R. S. Puram farmers' market of Coimbatore district, Tamil Nadu. The results revealed that majority of farmers (90%) were facing the problems in getting a stall, afterward lack of

transportation (86.67%), unsuitability of timing (80%), price fluctuations (46.67%) and distance of the market (36.67%).

**Basuet *al.* (2003)** conducted a study on price and marketing of green chillies – a case study in Andhra Pradesh identified the problems encountered by the farmers in production and marketing capsicum. The most important constraint was the non-availability of quality seeds followed by non-availability of credit from govt. and institutional agencies, high fertilizers cost, high labour cost, lack of infrastructure facilities like cold storage facilities, lack of good support price and the non-existence of regulated market yards at producing center.

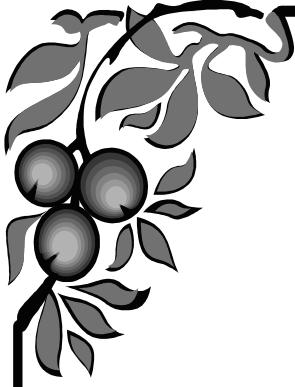
**Kumar (2004)** studied on tomato growers in Belgaum district of Karnataka revealed that majority of the farmers (75.83%) faced the problem of technical knowledge and guidance about improved cultivation practices as well as post-harvest technology. While 65 percent of their respondents faced the problem of high fluctuation in market price, afterward high transportation cost (62.53%), labour shortage and high wages (55.83%) and lack of irrigation facilities and power shortage (46.66%).

**Navadkaret *al.* (2006)** while determining the profitability of selected vegetables in Pune identified the problems encountered by the farmers in the production and marketing of capsicum. They were higher-cost of planting materials, timely inadequacy of planting materials and huge commission received by the commission agents.

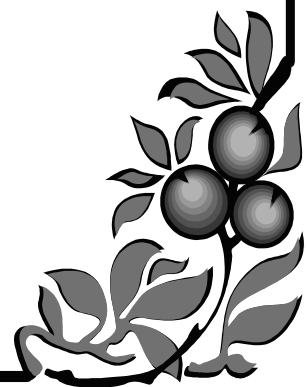
**Chandrashekhar (2007)** studied on onion production and marketing behavior of farmers in Gadag district of Karnataka. Study explained that high cost of fertilizers (94.16%), high cost of pesticides (94.16%), hand weeding on time, labour consuming and expensive (93.33%), labour problem during harvesting (85%), ineffective and costly weedicides (80.83%), lack of knowledge about recommended fertilizer doses for onion crop (80.83%) and lack of knowledge about improved varieties, their seed or planting material (68.33%) were the major problems faced by sample farmers in the study area.

**Patil et al. (2007)** while studying on price spread in the marketing of capsicum in Thane district of Maharashtra state identified the problems faced by the farmers in capsicum marketing. Authors revealed that the high cost of packing materials (95%), was the major problem followed by prices offered were less (87.50%), wholesale market is far away from producing area (77.50%), lack of market information (60.00%), transportation losses (52.50%), unsatisfactory marketing methods (47.55%), wide price fluctuations (40%) and malpractices followed in the market (25%).

**Anavrat (2010)** carried out a study on marketing constraints and technology needs of Nagpur Mandarin growers. The study reported that farmers were not getting remunerative prices were the major constraints as expressed by 82.28 percent respondents, financial constraints compels 68.57 percent orchardists for preferential selling to the pre-harvest contractors. The lack of refrigerated storage facility in the market for the storage of Nagpur mandarin fruits was also a major constraint expressed by 62.85 percent of farmers.



*Research  
Methodology*



## RESEARCH METHODOLOGY

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An economic analysis depends critically on the selection of a determined sample and elicitation of accurate data and the use of appropriate analytical tools and models. The area of the present study is Mirzapur district which has the distinction of the maximum area under Bottle gourd, Pumpkin, green chilli cultivation in Varanasi. In order to have an important effect of conclusions, it is important for the investigator to adopt suitable methods and procedures and investigation of data during the course of research work while observance this in view, the present chapter has been devoted to explain the methodology adopted to fulfill the objectives under study. Its determination with the procedure used for the selection of the sample, method of data collection, type of data collected, sources of data and analytical procedures used to get the results as per the objectives under study. The periphery of Mirzapur district is select for the selection of green chilli, Bottle gourd, and Pumpkin growers.

### 3.1 SAMPLING PROCEDURE

#### 3.1.1 Selection of State

Uttar Pradesh is one of the northern States of India. It is one most of the highest populous state in India with having an area of 243286 km<sup>2</sup>. The state consists of 72 district, 18 division, 822 development blocks, 97941 populated villages and it is relevant to reveal that the strength of workforce in the state is 23.7%, out of which 65.9% are farmers and 5.6% are industrial workers and a number of farm workers are 66%. As per the existing rate, the per capita income is Rs. 13262. Uttar Pradesh was purposively selected for the present study.

### **3.1.2 Selection of the District**

An objective appraisal of any development activity can be made only with a methodical understanding of the physical and natural bequest of the region with the socio-economic status of the population. For this reason, an attempt has been made to portray the physical, natural and socio-economic features of Mirzapur district, the area chosen for the present study.

The Mirzapur district was selected purposively for the present study. The district falls in the ester of Uttar Pradesh. The district counted in the backward district as per the record in 2006, of Ministry of Panchayati Raj. It was one of the 250 most backward districts and also still receiving funds from the Backward Region Grant Fund (BGRF) Programmers.

### **3.1.3 Selection of blocks**

The Mirzapur district consists of twelve development blocks. Out these, Narayanpur development block of selected purposively for the present study. The criterion for selecting a development block was the highest area under vegetable cultivation.

### **3.1.4 Selection of Villages**

The Narayanpur development block consists of 287 villages. Out of these villages, Kailhat village was purposively selected for the present study because farmers of the village were allocating larger area under vegetable cultivation.

### **3.1.5 Selection of respondents**

A list of vegetable growers was prepared and arranged in ascending order based on their land holding size. They were classified into four strata *viz.*, marginal (up to 1 hectare), small (1.01 to 2 hectares), and medium (2.01 to 4 hectares) and large (above 4 hectares). The relative share of each category of vegetable growers to total vegetable growers was worked out. Allowing for the size of vegetable growers, 50 vegetable growers were selected randomly using the random table.

### **3.2 DATA REQUIREMENT**

In order to study the production and marketing aspects of vegetables in Mirzapur district, the primary data on different aspects were collected by using pre-tested schedule conducting a personal interview of selected farmers. The main aspects of data requirement were as under-

- General information in relation to the sample vegetable growers.
- Complete information regarding the cost of cultivation and returns from the vegetable crop.
- Information related to marketing costs, marketing channel, marketing margins, and marketing efficiency.
- Information on various problems faced by the sample vegetable growers in the production and marketing of selected vegetables.

#### **3.2.1 Framework on data analysis**

The data collected were compiled and analyzed analytically keeping in view of the objectives of the study. Most of the analytical tools employed in the present study were tabular analysis.

**Tabular Analysis:** Tabular analysis of the introduction data was done by working out the averages of the level of input use, cost of cultivation per hectare, per quintal cost of production, returns, the pattern of disposal, marketed surplus, and marketing cost according to the size of farm.

#### **3.2.2 Estimation of Inputs**

The value of purchased input was listed as reported by the farmers after its certification, though some of the inputs used in the production process came from the family resources. In order to figure out the cost of cultivation, it is essential to compute the value of these owned inputs. The procedures used for the computation of values are indicated below:

- Family labour was valued at the prevailing rate for hired labour in the sample villages.

- The valuation of farmyard manure and seeds were estimated on the basis of market price prevailing in the village and market.
- The cost of irrigation and tractor was measured at the prevailing market rate in the village.
- The rental value of owned land was charged at the prevailing rate of leased out land in the villages.
- Marketing cost charged at the prevailing rate in the village.

### **3.2.3 Cost of Cultivation**

The cost of cultivation of vegetable crops was calculated by using the cost concept developed by the Commission on Agricultural Cost and Price (CACP). Cost concepts used for the present study as follows:

#### **1) Cost A1**

It is also called as paid out cost. Cost A1 is usually considered as the cost for the owner farmer. The cost A1 generally includes

- Wages of permanent labour
- Wages of hired human labour
- Wages of hired bullock labour
- Imputed value of owned bullock labour
- Imputed value of owned machine labour
- Charges of hired machine labour
- Imputed value of owned farm yard manures
- Cost of seeds
- Market value of fertilizers
- Irrigated charges
- Market value of pesticides, herbicides, etc.
- Interest on working capital
- Depreciation charges on machinery, farm implements, etc.
- Land revenue, cess, and other tax.
- Miscellaneous expenses (value of other items which are used up in

current production

**2) Cost A2**

The cost A2 is defined for the tenant farmer. Mathematically cost A2 can be expressed as

$$\text{Cost A2} = \text{Cost A1} + \text{Rent paid for leased-in land}$$

**3) Cost B1**

Cost B1 = Cost A1 or Cost A2 + interest on the amount of owned capital invested in the business excluding the value of land

**4) Cost B2**

Cost B2 = Cost B1 + rental value of owned land-less land revenue + rent paid for leased in land

**5) Cost C1**

Cost C1 = Cost B1 + imputed value of family labour

**6) Cost C2**

Cost C2 = Cost B2 + imputed value of family labour

**7) Cost C3**

Cost C2 + 10 per cent of Cost C2 as managerial cost.

**3.2.4 Cost of production**

The cost of production was worked by using the following formula:

$$= \text{Cost of production (Rs/qt)} = \frac{\text{Cost of cultivation/ha}}{\text{Quantity of main product/ha}}$$

**3.2.5 Income measures**

Following income measures were calculated –

1) **Gross income:** It is the total market value of the main product. It was obtained by using the following formula:

$$\text{GI} = (\text{Qm} \times \text{Pm})$$

Where,

GI = Gross income

Qm = Quantity of main product

Pm = Price of the main product

**2) Returns over variable cost (RVC):**

$$\text{RVC} = \text{Gross income} - \text{Cost A1}$$

**3) Farm business income (FBI):**

$$\text{FBI} = \text{Gross income} - \text{Cost A2}$$

**4) Family labour income (FLI) or returns to family labour**

$$\text{FLI} = \text{Gross income} - \text{Cost B2}$$

**5) Net income (NI):**

$$\text{NI} = \text{Gross income} - \text{Cost C2}$$

**6) Returns to management**

$$\text{RM} = \text{Gross income} - \text{Cost C3}$$

**7) Returns per rupee (RPR):**

$$\text{RPR} = \frac{\text{Gross income/ha}}{\text{Cost C2/ha}}$$

**3.2.6 Marketing costs of the producer-seller (MCP)**

It comprised of cleaning and packing cost, loading and unloading charges, transportation cost, commission paid and weightment charges, etc.

**1) Producer's net price (PNP)**

This was the variation between the price received (PR) and the cost incurred (MC) by the producer-seller.

$$\text{PNP} = \text{PR} - \text{MC}$$

**2) Producer's share in the consumer's rupee (PSCR)**

Producer's net price (PNP) expressed as a percentage of the retail price (RP) is defined as the producer's share in the consumer's rupee.

$$\text{PSCR} = \text{PNP/RP} \times 100$$

**3.2.7 Price of chilli, Bottle gourd, and Pumpkin**

Following two types of prices were estimated.

**(a) Producers gross selling price**

It was estimated by dividing the total sale value of chilli, Bottle gourd and Pumpkin by the total actual quantity sold by the sample growers.

**(b) Net price received by the vegetable growers**

It was estimated by deducting the marketing cost incurred by the vegetable growers from the producer's gross selling price.

**3.2.8 Marketing costs incurred by the vegetable growers**

This cost referred to the expenses incurred by the vegetable growers while marketing the vegetable from farm to the purchasing agency (i.e. commission, transportation, weighing, loading and unloading charges, deduction charges due to the moisture).

**3.2.9 Gross Margin**

The gross margin at each successive stage of marketing of vegetable crop will be exercised by taking the difference in the sale price and purchase price. The following formulae will be used to work out the gross margin for each marketing. (*Agricultural Marketing in India by Acharya and Agarwal*)

$$Mg = Si - Pi$$

Where,

Mg = Gross margin

Si = Sale value of produce for i<sup>th</sup> intermediaries

Pi = Purchase value of i<sup>th</sup> intermediaries

i = Type of intermediaries

**3.2.10 Net Margin**

The net margins of i<sup>th</sup> type market agencies will be calculated by using the following formulae

$$Nmi = PRi - (Ppi + Cmi)$$

Where,

PRi = Per kg price received of produce by i<sup>th</sup> type intermediaries

Ppi = Per kg purchase price by the i<sup>th</sup> type intermediaries

Cmi = Per kg marketing cost incurred by i<sup>th</sup> type of intermediaries

i = Net margin of i<sup>th</sup> type of market intermediaries

### 3.2.11 Producers share in the consumer's rupee

It is the price received by the farmer expressed as a percentage of the retail price (i.e., the price paid by the consumer). To calculate the producers, share in consumer rupee will be worked out by using the following formulae.

$$P_s = (P_f \setminus P_r) \times 100$$

Where,

$P_s$  = Producers share in consumer rupee

$P_f$  = Net price received by the farmer

$P_r$  = Price paid by consumer

### 3.2.12 Marketing efficiency- Acharya Approach

According to Acharya, an ideal measure of marketing efficiency, particularly for comparing the efficiency of alternate markets\channel, should be such which takes into account all of the following; (Agricultural Marketing in India by Acharya and Agarwal)

- a- Total marketing costs (MC)
- b- Net marketing margins (MM)
- c- Price received by the farmer (PF)
- d- The price paid by the consumer (RP)

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

## 3.3 Definitions of terms and concepts

### 1) Cost concepts

#### a) Fixed cost

The different items *viz.*, land development charges, planting, land rent, land revenue, depreciation and also interest on farm capital equipment owned which were used in the vegetable production comes under the fixed cost. Fixed cost included

- i. Land revenue cesses and taxes
- ii. Depreciation on implements and farmhouses.
- iii. Rent paid for lease in the land.
- iv. Imputed rental value of own land.

v. Imputed interest on own fixed capital (excluding land).

**b) Variable cost**

Variable cost comprises the expenditure on labour and material input costs for instance on seed, organic manure, fertilizers, human, bullock, and machine labour. The interest on working capital was also incorporated in variable cost. Operational cost included the cost of the following items

- i. Seed (home produced and purchased)
- ii. Manure (home produced and purchased)
- iii. Fertilizer
- iv. Pesticides
- v. Hired Human labour
- vi. Hired charges or imputed value of owned bullock labour
- vii. Hired machinery charges.
- viii. Miscellaneous expenditure
- ix. Imputed value of family labour.

**c) Total cost**

- i. Fixed cost plus
- ii. Operational cost

**2) Inputs and costs**

Following were the different inputs used in the production of vegetables.

**a) Hired human labour cost**

Hired human labour was expected by means of labour norm in Kailhut wherein 8 hours of work in a day was measured as one man and women day. The wage rates in the study area of the male labour are Rs 360 per day, whereas the charge of female labour is 120 Rs per day.

**b) Machine labour cost (Tractor)**

It was generally deliberate in terms of machine hours. One machine hour means one hour of work by machine and a man compulsory to manage this machine. It was esteemed at the rate of Rs. 450 per hour and it is generally depending upon the land and machine.

**c) Fertilizer cost**

The fertilizers cost was estimated at the actual price paid by farmers.

**d) Irrigation charge**

Mainly tube well was means of the irrigation the charge is generally used on hours basis and labour used for irrigation purpose were treated as irrigation charges.

**e) Land revenue**

These were incurred according to the actual payments incurred by the cultivators.

**f) Land rent**

The general land rent in the area for agricultural enterprises was charged for the sample farmers since all land holdings were noticed to be owner operated. The land rate in Kailhut of 1 bigha is 12000-15000 per year.

**g) Interest on fixed capital**

Interest on fixed capital was calculated at 7 percent per annum, which is the prevailing rate of investment credit. The items considered under fixed capital are implements and machinery.

**h) Interest on working capital**

This was calculated on the entire working cost of the enterprise at the prevailing bank rate interest of 6 percent per annum.

**i) Family labours**

Family labour cost was calculated on the basis of prevailing charges paid to hired labour.

**j) Gross returns**

Gross returns were attained by multiplying the total product with its unit value.

Gross product × Price

**k) Net returns**

Net returns were attained by reduced the total costs incurred from the gross returns obtained.

**l) Marketing cost**

Marketing costs are the actual operating cost incurred in delivering goods and services from the producer to the consumers

**m) Marketing margins**

Margin refers to the difference between the price paid and acknowledged by a specific marketing agency such as a single retailer, or by any type of marketing agency, *i.e.*, retailers or wholesalers or by any combination of marketing agencies in the marketing system as a whole. Total marketing margin combines the cost involved in moving the vegetables from producer to consumer and profits of a variety of market functionaries. The complete value of the total marketing margin varies from market to market, channel to channel and time to time.

**n) Market fee**

It is exciting either on the basis of weight or on the source of the value of the produce. It is generally collected from the buyers.

**o) Commission**

The charges are generally made in cash and vary from market to market.

**p) Taxes**

Unusual taxes are charged in different markets for example toll tax, terminal tax, sales tax, octroi, *etc.* These taxes livable on vegetables be at variance from market to market in the same state as also from state to state. These taxes are generally payable by the seller.

**q) Miscellaneous charges**

In calculation, some other charges are also levied. These consist of handling, weighing, loading, unloading, cleaning, charity contribution in cash and kind, *etc.* These charges are possibly payable either by the seller or by the buyers.

**3) Marketing channels**

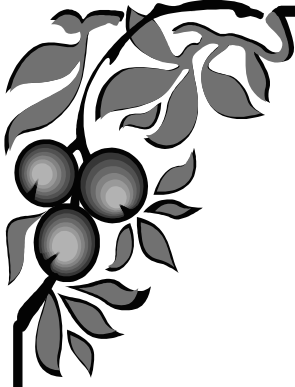
Marketing channels are defined as the routes during which the producer sellers dispose-off their produce. One main channel was noticed in the area, where farmers while selling their vegetable outputs adopted these marketing channels. This is, Channel-I: Producer-local vegetable collector-wholesaler-Retailer-consumer.

**a) Wholesale trader**

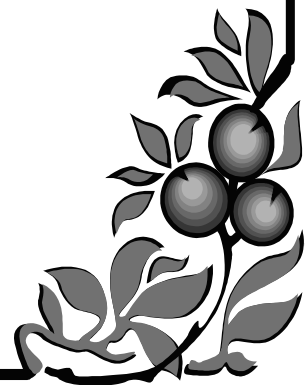
A wholesale trader is a person who buys the advice agricultural/horticulture products in the market yard either for its self or on behalf of others for the purpose of reselling the same either in the original form or after processing.

**b) Village trader**

Village merchant may be described as a person who purchases the agricultural/horticultural produce in the village directly from the producers for the purpose of subsequent selling.



*Profile  
of  
Study Area*



## PROFILE OF STUDY AREA

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### 4.1 General description of the study area

Mirzapur district is one of the 75 districts of Uttar Pradesh State in Northern India. The district is mainly bounded on the north through Sant Ravidas Nagar and Varanasi districts, going on the east by Chandauli district, resting on the south by Sonbhadra district and on the northwest by Allahabad. It is generally district occupies an area of 4521 km<sup>2</sup> and the Mirzapur town is the district headquarters.

It is a part of Mirzapur division. This district is mainly known for the Vindhyavasini temple in Vindhyachal and numerous tourist attractions like waterfalls and dams. It is mainly consisting of more than a few Ghats where historical sculptures are still present. During the festival of Ganges, these Ghats are adorned with lights and diyas. It is a part of the Red Corridor. It was one of the largest districts in Uttar Pradesh until Sonbhadra district was estranged from Mirzapur in 1989.

### 4.2 History

Before the formulation of the town, the area was an impenetrable forest and freely used by different states like Varanasi, Sakteshgarh, Vijaygarh, Nainagarh (Chunar), Naugarh, Kantit and Rewa for Hunting. British East India Company had recognized this area to fulfill the needs of a trading center between central and western India. This time Rewa was an entrenched state of central India and was straightforwardly connected with Mirzapur by the Great Deccan Road. Over time Mirzapur became a legendary trading center of Central India and started trading of cotton, and silk at very large scale.

It is the place in India where the Holy River Ganges meets with Vindhya Range. This is considered significant in Hindu Mythology and has a mention in

Vedas. It is situated at the bank of holy Ganges; Mirzapur City was a part of Banaras state in the year 1775. His Highness Wazir of Avadh rendered the sovereignty of the place to East India Company but the ruler of Banaras retained the managing administration, till 1794. On October 27<sup>th</sup> the then Kashi Naresh Mahip Narain Singh transferred the sway over the city to the then Governor General. In 1861, the district Mirzapur separately came into the existence when it was divided from Allahabad. With the view point of Area it was the largest district of United Province further in April 1989 the district was once again divided as the southern part was named as Sonebhadra (*Government of Uttar Pradesh*).

Till June 14<sup>th</sup>, 1997 Mirzapur was a part of Varanasi division. On that date, the government of U.P. created a new division VINDHAYACHAL which included Sant Ravidas Nagar and Sonebhadra and Mirzapur having its HQ at Mirzapur City.

A step towards the awareness for voting the District of Mirzapur came with the Guinness World Record for the biggest Rangoli (Alpana) created in an area of 39,125 m<sup>2</sup> using approx 120,000 kg of color by across 3500 students and teachers from 50 schools on occasion of National Voters Day (*Government of Uttar Pradesh*).

#### **4.3 Location**

It has an average elevation of 80 meters (265 feet). The District of Mirzapur lies between the parallels of 23.52 & 25.32 North latitude and 82.7 and 83.33 East longitude. It forms a portion of the Varanasi district. On the north and north-east it is bounded by the Varanasi district; on the south bounded by Sonbhadra district; on the north-west by Allahabad district. The shape to the north and west is totally regular. In no direction, except for about 13 km. in the north-east where the Ganges separates the Tehsil of Chunar from the district of Varanasi has Mirzapur a natural frontier. The Chanvar fields, considered to be one of the most fertile lands tracts in India, are located on Gangetic flood plains of the district. Also, Indian Standard Time is calculated on the basis of 82.5° E longitude, from a clock tower in Mirzapur. According to Central Statistical organisation the district of Mirzapur had an area of 4521 km<sup>2</sup>.



Figure 1: Location of Mirzapur on map of India



Figure 2: Map of Mirzapur

#### **4.4 Climate**

The Mirzapur district enjoys the sub-tropical climate and has extreme of weather condition, *i.e.*, heat of summer and cold of winter and an annual rainfall of 1043mm. There are three distinct seasons, are given below:

- Rainy season
- Winter season
- Summer season

#### **4.5 Soil**

Soil of the hilly track is generally red soil, while the plain track is mostly alluvial is generally observed, fertile with sandy deposits near to river. Soil type and drainage plain track basis it is advance subdivided as upland soil and tarai. There are good fertile loam soils in the western part of plain track.

#### **4.6 Topography**

The land in the district is regularly uneven. The landscape is scattered with hills, mountains, plateaus, waterfalls and rivers. The Vindhya mountains variety of range rises in Mirzapur district and enlarges to the south west. The for the most part beautiful waterfalls in the district are at Tanda, Windham. Ganga and Belan are the two major rivers graceful throughout the district. The soil is usually red and the terrain commonly rocky in the district. The district has 4,50,169 hectares geographical area.

#### **4.7 Forest**

The total forest cover of the mirzapur district is 109236 hectares. This is 24% of the total geographical area. The trees generally found like Mahua, Mango, Guawa, neem, saal, teak etc.

#### **4.9 Economy**

In 2006 the Ministry of Panchayati Raj named Mirzapur one of the country's 250 most backward districts (out of a total of 640). It is one most of the 34 districts in Uttar Pradesh have obtained funds from the Backward Regions Grant Fund

Programme (BRGF). Once tourism generally used to contribute in the economy but because of lack care from government officials and local people the without comparison beauty of the places like Sirshe dam and waterfall, Dadri (Pipari) dam, Vindham waterfall, Lower Khajuri, Upper Khajuri, Lakhaniya waterfall, Siddhnath Waterfall, Kotwan-Patehara forest, Fort of Chunar and Dadri-Haliya forest has become 'the stories of past'.

#### **4.10 Administrative set up**

The district falls underneath the Vindhyaachal Mandal. The headquarter is in Mirzapur tawn. The district namely Sadar, Mirzapur, Lalganj, Madiyan, and Chunar has four tehsils. The district is having 12 blocks. It has one lok sabha and five assembly areas.

#### **4.11 Population**

According to population census-2011, the district Mirzapur has a population of 2496970 and total literate people are 1428683 and literacy rate was 68.48 percent

**Table 4.11: Sex and literacy wise population of Mirzapur**

<b>Particulars</b>	<b>Population</b>	<b>Percentage</b>	<b>No. of literate persons</b>	<b>Percentage</b>
Female	1312302	52.55	865837	60.60
Male	1184668	47.4	562846	39.40
Total	2496970	100	1428683	100

*Source: Census report-2011 (Mirzapur)*

#### **4.12 Land Holding Distribution/Size of Land Holding**

Table 4.12 shows that the highest number of holding belong to marginal farmers (below 1 ha.) accounted for 74.40 percent while area accounted for only 28.51 percent out of the total area. While the large farmers up to 10 hectares of the land area having the lowest number, accounted for 2.91 percent of the total number of holdings while large farmers contributing 27.71 percent of the total land area. This

reflected the uneven land distribution in the study area.

**Table 4.12: Size, Number, Percent and Area of land holdings**

Size holding (ha)	Total number of holding	Percentage of total	Area in ha	Percentage of total
0.5-1.0	198765	7440	69870	28.51
1.0-2.0	42909	16.06	59715	24.37
2.0-4.0	17698	6.62	47556	19.41
4.0-10	7779	2.91	67916	27.71
Total	267151	100	245056	100

*Source: Census report-2011 (Mirzapur)*

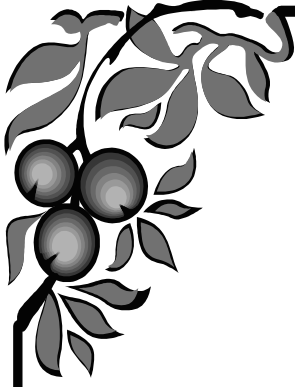
#### **4.13 Cropping intensity and season wise distribution of area under cultivation**

The Cropping intensity and season wise distribution of area under cultivation has been presented in the table given below

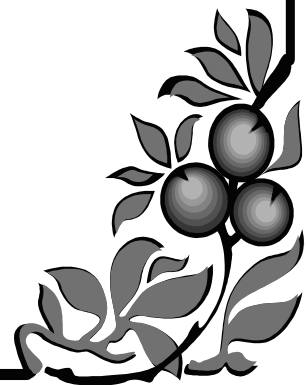
**Table 4.13: Land Use Classification and season wise distribution of area**

S.N.	Particulars	Area (ha.)
1.	Total area	24356
2.	Forest	420
3.	Agriculture waste land	614
4.	Current fellow	762
5.	Another fellow	54
6.	Inadequate and ineligible land	214
7.	Land other than agriculture	35505
8.	Pasture	10
9.	Area of trees and bushes	69
10.	Net sown area	18708
11.	Area sown more than once	12730
12.	Gross sown	31438
13.	Rabi	20039
14.	Kharif	10988
15.	Zaid	131

*Source: Statistical Magazine govt. of U.P. 2016-17*



*Results  
and  
Discussion*



## RESULTS AND DISCUSSION

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The present chapter concern with the discussion of the results obtained through the analysis of data collected for this study. The data collected from purposively and randomly selected Pumpkin, Bottle gourd, and Chilli growers and traders were analyzed and the results of the analysis are presented and discussed in this chapter. This chapter deals with the trend in area, production and productivity of selected vegetables, the comparative picture of costs and returns in respect of production of Pumpkin, Bottle gourd and Chilli over different size categories of farms and marketing efficiency, marketing margin in different marketing channels.

The findings of the study have been discussed under the following sections:

- To estimate the cost of cultivation and return from chilli, pumpkin and bottle gourd in the study area;
- To study the marketing channel, marketing margin and marketing efficiency of selected vegetable in study area; and
- To identify the problems faced by farmers during marketing and production of selected vegetable crops in the study area.

### 5.1 Production of Pumpkin, Bottle gourd and Chilli and effect of the factors of production on output

#### Average size of holding

The average size of holding of sample household has been presented in the Table 5.1.1., 5.1.2 and 5.1.3.

**Table 5.1.1 Distribution of operational holding in different size group of sample farms of Pumpkin**

Size group	Total no of farmer	Average size of operational holding (ha)	Average area under Pumpkin (ha)
Marginal farmer (0.5-1.0 Ha)	16	0.72	0.12
Small farmer (1.0-2.0 Ha)	29	1.4	0.16
Medium farmer (2.0-4.0 Ha)	7	2.6	0.15
Total	52	4.72	0.43

**Table 5.1.2 Distribution of operational holding in different size group of sample farms of Bottle gourd**

Size group	Total no of farmer	Average size of operational holding (ha)	Average area under Bottle gourd (ha)
Marginal farmer (0.5-1.0 Ha)	16	0.72	0.12
Small farmer (1.0-2.0 Ha)	29	1.4	0.14
Medium farmer (2.0-4.0 Ha)	7	2.6	0.15
Total	52	4.72	0.41

**Table 5.1.3 Distribution of operational holding in different size group of sample farms of Chilli**

Size group	Total no of farmer	Average size of operational holding (ha)	Average area under Chilli (ha)
Marginal farmer (0.5-1.0 Ha)	16	0.72	0.07
Small farmer (1.0-2.0 Ha)	29	1.4	0.11
Medium farmer (2.0-4.0 Ha)	7	2.6	0.17
Total	52	4.72	0.35

Total numbers of marginal farmers were 16 and average size of land holding was 0.72 ha, whereas the total number of small and medium farmers was 29 and 7 respectively with an average size of operational holding was 1.4 and 2.6 ha, respectively. The average size of land allocated by sample farmers under Pumpkin was 0.43 ha, Bottle gourd 0.41ha and chilli is 0.35 ha correspondingly. The area under pumpkin is decreased, Bottle gourd and chilli increases with the increase in size of holding. As indicated from the Table 5.1.1, the sample farmer's allocated area under pumpkin was 0.12 ha by marginal farmers, 0.16 ha by small farmers and 0.15 ha by medium category of farmers. In case of Bottle gourd, the area allocated by marginal, small and medium farmers was 0.12 ha, 0.14 ha and 0.15 ha respectively. Likewise, in case the chilli the sample farmers allocated area under cultivation was 0.07 ha (marginal farmer), 0.11 ha (small farmers) and 0.35 ha by in medium farms.

## **5.2 Economics of production of vegetable Crops**

In this section, input utilization, various operations and cost structure done by selected vegetable growers over different size categories of farm were considered. The full information involving to production of variable cost, marketing cost and different types of returns for pumpkin, bottle gourd and chilli growers was also discussed.

### **5.2.1 Input utilization and operations**

Per farm quantities of different input and various operations done by selected vegetable growers throughout the season are given here in Table 5.2.1.

#### **a) Seed**

From Table 5.2.1 depicted that, average quantities of seed used was for in pumpkin, bottle gourd and chilli was found to be 523.78 kg, 403.08 kg and 129.12 kg per hectare respectively.

#### **b) Fertilizers**

Various types of fertilizers were used by sample farmers for selected vegetable cultivation. Most of the farmers were using urea, DAP, Zinc and Sulphur. The total fertilizers were used by sample farmers for the cultivation of pumpkin, bottle gourd

and chilli were 1144.5 kg, 1404.72 kg and 706.66 kg per hectare respectively (Table 5.2.1).

**Table 5.2.1 Per hectare input used for Pumpkin, Bottle gourd and Chilli**

Sr. No.	Particular	Pumpkin	Bottle gourd	Chilli
<b>1</b>	<b>Seed (kg)</b>	523.78	403.08	129.12
<b>2</b>	<b>Fertilizer (Kg)</b>			
2.1	Urea	317.46	437.50	0
2.2	DAP	430.82	597.98	392.44
2.3	Zinc and sulphur	0	0	12.41
2.4	FYM	396.48	369.24	301.81
	Total	1144.76	1404.72	706.66
<b>3</b>	<b>Hired Human labour</b>			
3.1	Male	15.51	11.55	9.51
3.2	Female	42.91	41.82	38.2
<b>4</b>	<b>Family Labour</b>	0	53.37	47.72
4.1	Male	7.58	10.01	9.51
4.2	Female	23.36	31.66	29.57
<b>5</b>	<b>Machinery used(hrs)</b>			
5.1	Ploughing + leveling	4.96	5.05	5.31
5.2	Harrowing	5.56	5.32	2.51
5.3	Intercultural operation (No.)	2.35	2.19	1.25
5.4	Plant protection measures	4.17	10.31	4.17
5.5	Irrigation (hrs)	3.35	22.63	11.04
5.6	Picking/ Harvesting (No.)	11.75	11.75	7.92

#### c) Human labour

It is observed that in selected vegetable cultivation, both families as well hired labour was used by sample farmers. As seen from the Table 5.2.1, that an average family labour employed in pumpkin was 30.93 and hired labour was 58.48 both male and female. In bottle gourd the average farm family labor was 41.68 and hired labour was 53.37 both male and female. Likewise, in case of chilli the average family labour was 39.09 and hired labour was 38.20 both male as well female respectively

#### d) Machinery Labour

The machinery use pattern in selected vegetable cultivation for different farm size categories have been presented in Table 5.2.1. The average machine hours used per hectare for pumpkin, bottle gourd and chilli were 4.96, 5.05 and 5.35 respectively for

ploughing for vegetable field and for harrowing it was 5.56, 5.32 and 2.51 hours per hectare respectively (Table 5.2.1).

e) **Weeding operations**

Table 5.2.1 showed that family and hired labours were performing weeding operation for selected vegetable cultivation. The human labour used for weeding operation for pumpkin, bottle gourd and chilli operation was 2.35, 2.19 and 1.25 respectively.

f) **Plant protection measures**

In study area, insecticides, fungicides and weedicides were commonly used as plant protection measures. It was noticed from the Table 5.2.1 that the pumpkin, bottle gourd and chilli plant protection chemicals were used 4.17, 10.31 and 4.17 liter respectively.

g) **Irrigations**

It was revealed from Table 5.2.1 that the average irrigation hours used for the selected vegetable crops viz., pumpkin, bottle gourd and chilli was 3.35, 22.63 and 11.04 times during the crop period respectively.

h) **Pickings**

The harvesting of the selected vegetable crops was done at different time during the season. The average number of picking for the pumpkin, bottle gourd and chilli was 11.75, 11.75 and 7.92 times respectively.

## **5.2.2 Cost structure of selected vegetables**

The information pertaining to the expenses incurred on production for pumpkin, bottle gourd and chilli vegetables has been worked out and given in Table 5.2.2. Total variable cost was found to be Rs 47679.89 per hectare for pumpkin. In case of bottle gourd and chilli, per hectare average variable cost was Rs 52432.89 and Rs 41935.89 respectively. Out of total variable cost, major chunk of cost was used for harvesting of pumpkin, bottle gourd and chilli. Per hectare average cost incurred on harvesting of pumpkin, bottle gourd and chilli were estimated to be Rs 30685.01, Rs 36347.52 and Rs 25720.8 respectively. Per hectare average cost incurred on purchase of seed was

found to be Rs 3515.90, Rs 2446.24 and Rs 4519.23 for pumpkin, bottle gourd and chilli respectively (Table 5.2.2).

**Table 5.2.2: Per hectare average input cost used for selected vegetables**

Particular	Pumpkin		Bottle gourd		Chilli	
	Physical	Avg. cost (Rs)	Physical	Avg. cost (Rs)	Physical	Avg. cost (Rs)
<b>Seed (kg)</b>	523.78	3515.9	403.08	2446.12	129.12	4519.23
<b>Fertilizer (kg)</b>						
Urea	317.46	2107.24	437.5	3038.97		
Di-ammonium Phosphate (DAP)	430.82	12355.69	597.98	17306.85	392.44	11380.64
Zinc and sulphur					12.41	632.14
FYM	396.48	1596.34	369.24	1444.65	301.81	1207.25
<b>Human Hired Labour (No.)</b>						
Male Labour	15.51	4963.2	11.55	3695.36	9.51	3044.69
Female Labour	42.91	5149.19	41.82	5018.64	38.2	4584.18
<b>Human Family labour (No.)</b>						
Male Labour	7.58	2424.11	10.01	3203.87	9.51	3044.69
Female Labour	23.36	2803.02	31.66	3799.74	29.57	3548.57
Total Labour (No.)	89.35	15339.52	95.05	15717.6	86.8	14222.12
<b>Machinery used (hrs.)</b>						
Ploughing + levelling	4.96	8824.36	5.05	8529.87	5.31	2807.69
Harrowing	5.56	2140.22	5.32	2373.04	2.51	1005.13
Irrigation	21.41	6922.64	22.63	7019.82	11.04	9960.81
Interest on working capital		1805.07		2392.13		3598.96
Rental value of owned land		1538.64		15076.92		24000.00

### 5.2.3 Cost of cultivation

The estimates of different costs incurred for selected vegetables cultivation in the study area is presented in Table 5.2.3. The average cost A1 for pumpkin, bottle gourd and chilli were found to be Rs 47679.89, Rs 52432.89 and Rs 41935.89. Cost A2 and B1 were worked out to be Rs 47679.89, Rs 52432.89 and Rs 41935.89 respectively because of the rent paid for leased-in land was zero and interest rate of

own capital is zero. The costs B2 for selected vegetables were Rs 63064.51, Rs 67509.81 and Rs 65935.89 for pumpkin, bottle gourd and chilli respectively. The cost C1 for pumpkin, bottle gourd and chilli were found to be Rs 52886.50, Rs 58439.77 and Rs 48529.15 respectively, whereas C2 cost was Rs 68271.12, Rs 73516.69 and Rs 72529.15 for pumpkin, bottle gourd and chilli. The average cost of cultivation (C3) for pumpkin, bottle gourd and chilli were found to be Rs 75098.23, Rs 80868.36 and Rs 79782.06 respectively (Table 5.2.3).

**Table 5.2.3: Cost concept for production of pumpkin, bottle gourd and chilli (Rs/Ha)**

Particular	Pumpkin	Bottle gourd	Chilli
Cost A1	47679.89	52432.89	41935.89
Cost A2	47679.89	52432.89	41935.89
Cost B1	47679.89	52432.89	41935.89
Cost B2	63064.51	67509.81	65935.89
cost C1	52886.50	58439.77	48529.15
cost C2	68271.12	73516.69	72529.15
cost C3	75098.23	80868.36	79782.06

#### 5.2.4 Pattern and magnitude of returns

The most important objective of the producer is to get the maximum net returns, which is mostly depended upon the yield level, market price of the produce and the expenditure incurred on the production. While producer have little control over prices, they may certainly increase production and cut-down costs through proper utilization of available resources and planning. Since the efficiency of production differ from farm to farm, so there is need for independent analysis pertaining to returns over production variable cost and returns over total cost after deducting the cost of cultivation.

The details of information pertaining to different types of returns worked out for selected vegetable have been given in Table (5.2.4). As seen from Table 5.2.4, it has

been observed that per hectare an average gross income received from pumpkin, bottle gourd and chilli were obtained Rs 173899.58, Rs 213429.49 and Rs 10153900 respectively. Per hectare net return was obtained from pumpkin, bottle gourd and chilli were found to be Rs 98801.35, Rs 132561.12 and Rs 10074117.94 respectively. Per hectare income over variable cost was Rs 126219.70, Rs 160996.60 and Rs 10111964.11 for pumpkin, bottle gourd and chilli respectively in the study area. The benefit-cost ratio of pumpkin, bottle gourd and chilli were 2.32, 2.64 and 127.27 indicating profitable enterprise.

**Table 5.2.4: Per hectare return from production of selected vegetable crops**

Particular	Pumpkin	Bottle gourd	Chilli
<b>Total Production (qtl)</b>	434.75	426.86	5076.95
<b>Average Rate (Rs/q)</b>	400	500	2000
<b>Gross income</b>	173899.58	213429.49	10153900
<b>Cost of cultivation</b>	75098.23	80868.36	79782.06
<b>Net income</b>	98801.35	132561.12	10074117.94
<b>Return over total variable cost</b>	126219.70	160996.60	10111964.11
<b>Cost of production (Rs/q)</b>	172.74	189.45	15.71
<b>Benefit cost ratio</b>	2.32	2.64	127.27

### 5.2.5 Marketing efficiency in marketing channels

This section deals with the marketing efficiency, marketing margin, producers' share in consumer rupee and marketing cost of selected vegetable under different marketing channels was estimated.

#### Marketing efficiency

In the study area, following marketing channels has found to be in operation in marketing of selected vegetable.

Channel I. Producer- Local vegetable collector-wholesaler-retailer-consumer

Channel wise details of per quintal marketing expenses incurred by producer and intermediaries for marketing of selected vegetable, and efficiency of these channels given below in tables 5.2.5.1 and 5.2.5.2

#### **Producer- Local vegetable collector-wholesaler-retailer-consumer**

It is revealed from the Table 5.2.5.1 that producer's sale price of pumpkin; bottle gourd and chilli were Rs 400, Rs 500 and Rs 2000 per quintal in Kailhut market. Per quintal marketing cost incurred by the producer were Rs 65.40, Rs 95.4 and Rs 215.40 for pumpkin, bottle gourd and chilli respectively.

**Table 5.2.5.1:**

<b>Producer</b>	<b>Pumpkin (Rs/q)</b>	<b>Bottle gourd (Rs/q)</b>	<b>Chilli (Rs/q)</b>
Net price received by producer	334.6	404.6	1784.6
<b>Cost incurred by producer</b>			
Transportation cost	15	15	15
Labour charge	6.4	6.4	6.4
Weighing charge	4	4	4
Market fees	20	25	85
<b>Packaging cost</b>			
Gunny bag	40	20	20
Spoilage	20	25	85
Total cost incurred by Producer	65.4	95.4	215.4
Sale price of Producer/ Purchased price of Local vegetable collector	400	500	2000
<b>Cost incurred by local veg. Collector</b>			
Transportation cost	25	25	24.33
Labour charge	10	10	6.4
Weighing charge	4	4	4
Spoilage	8	15	
Total cost incurred by local veg. Collector	47	54	34.73
Sale price of local vegetable collector / purchased price of wholesaler	700	800	3000
Local vegetable collector margin	112.4	149.4	250.13
<b>Cost incurred by wholesaler</b>			
Transportation cost	25	25	25
Labour charge	10	10	8
Weighing charge	5	4	5
Market fees	35	25	120
Spoilage	14	15	72
<b>Total cost incurred by wholesaler</b>	<b>89</b>	<b>79</b>	<b>230</b>

Sale price of wholesaler /Purchased price of retailer	1100	1300	4270
Margin of wholesaler	311	421	1040
<b>Cost incurred by Retailer</b>			
Transportation cost	20	25	25
Labour charge	8	8	8
Weighing charge	5	5	5
Market fees	60	40	190
<b>Packing</b>			
Gunny bag + plastic	45	45	100
Spoilage	36	16	114
<b>Total cost incurred by retailer</b>	174	139	442
Sale price of retailer /Purchased price of consumer	1800	2000	5600
Margin of retailer	526	561	888
<b>Consumer</b>			
<b>Price paid by consumer</b>	1800	2000	5600

Per quintal net price received by producer for pumpkin, bottle gourd and chilli were Rs 334.60, Rs 404.6 and Rs 1784.60 respectively. The per quintal expenses incurred by the local vegetable collector was found to Rs 47, Rs 54 and Rs 34.73 for pumpkin, bottle gourd and chilli respectively. The net margins received by the local vegetable collectors were Rs 112.40, Rs 149.40 and Rs 250.13 per quintal which was lower as compare to wholesaler's margin which was Rs 311.00, Rs 421.00 and Rs 1040 per quintal for pumpkin, bottle gourd and chilli respectively. The retailer marketing costs were Rs 174, Rs 139 and Rs 442 per quintal for pumpkin, bottle gourd and chilli respectively. The final price paid by consumer for pumpkin, bottle gourd and chilli were Rs 1800, Rs 2000 and Rs 5600 per quintal.

The marketing efficiency has been worked out and presented in Table 5.2.5.2 It was observed from the Table5.2.5.2 that the total marketing costs incurred by different intermediaries were Rs 375.40, Rs 367.4 and Rs 922.13 per quintal and total net margin of different intermediaries were Rs 949.40, Rs 1131.40 and Rs and 2178.13 for pumpkin, bottle gourd and chilli respectively. Producer share in consumer rupee of pumpkin, bottle gourd and chilli were 18.59, 20.23 and 31.87 per cent respectively.

**Table 5.2.5.2: Marketing Efficiency for vegetables**

Particular	Pumpkin (Rs/q)	Bottle gourd (Rs/q)	Chilli (Rs/q)
Retailer's sale price/ consumer's Purchase price	1800	2000	5600
Total Marketing cost	375.4	367.4	922.13
total net margin of intermediaries	949.4	1131.4	2178.13
Net price received by farmer	334.6	404.6	1784.6
Marketing efficiency	1.36	1.3344	1.8063
Producer share in consumer rupee (%)	18.59	20.23	31.87

### 5.3 Problems faced by the selected vegetable grower and their suggestions

#### 5.3.1 Problems faced by the selected vegetable grower in production

Problems faced by the vegetable's growers were studied and it was presented in Table 5.3.1. It is evident from the Table 5.3.1 that, in relation to selected vegetable production serious problems was high in cost of fertilizer, insecticide and fungicide which was faced by 96.2 per cent. About 86.5 per cent growers facing the problem of high prices of seed, labour scarcity in peak period (67.3%), non-availability of good quality seed (44.2 %), irrigation problem (38.5 %), high wage rate of labour (76.9 %), loss due to stray animal/theft (48.1 %) and low profitability (76.9 %).

**Table 5.3.1: Production related problem faced by selected vegetable grower, Kailhut**

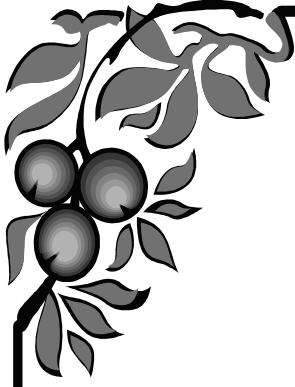
Particular	No. of respondent	Percentage
High prices of seed	45	86.5
Non availability of good quality seed	23	44.2
Irrigation problem	20	38.5
Low profitability	40	76.9
High incidence of insects	40	76.9
Labour scarcity in peak period	35	67.3
Loss due to stray animals/theft	25	48.1
High cost of fertilizer, insecticide and fungicide	50	96.2
High wage rate of labour	40	76.9
Labour scarcity	30	57.7

### 5.3.2 Problems faced by the selected vegetables growers in marketing

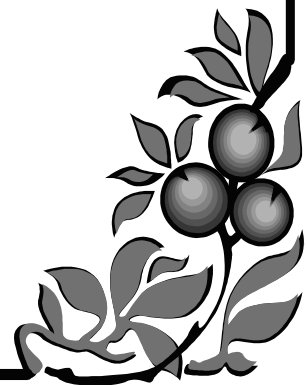
Problems related to marketing are presented in Table 5.3.2. It could be seen from the Table 5.3.2 that, in marketing of pumpkin, bottle gourd and chilli serious problem faced by the growers were remunerative prices are not received wide fluctuation in prices which was opined by 100 per cent of farmers. Another major problem next to it was high transportation cost which was expressed by 96.15 per cent farmers and the next problem was wide fluctuation in price which was expressed 92.31 per cent and the non-availability of market information was 86.45 per cent. The next problem was high cost of packing material (76.92 %) and late payment (57.69 %). The lack of packing material was observed 19.23 per cent farmers.

**Table 5.3.2: Marketing related problems faced by vegetables growers**

Particular	No. of responded	Percentage
Non availability of market information	45	86.54
Wide fluctuation in prices	48	92.31
High transportation cost	50	96.15
Late payment	30	57.69
Remunerative prices are not received	52	100
High cost of packing material	40	76.92
Lack of packing material	10	19.23



*Summary  
and  
Conclusion*



## SUMMARY AND CONCLUSION

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India is one most crucial vegetable producing country and varied with agro-climatic conditions. It is very common in both temperate and tropical region and grown successfully from hill to plain because of befitting agro-climatic conditions of the country. The importance of horticultural crops especially fruit and vegetable in improving the nutritional status increasing day by day.

The horticulture sector is very fast and quick emerging as the most remunerative sector for changing the age-old subsistence farming mainly in the rainfed dry land, hills, arid and coastal agro-ecosystem. Horticultural crops are specially characterized by high productivity, higher return and very higher potential for employment generation and exports, comparatively lower requirement of water and easy adaptability to adverse soils and wasteland situations. The input-output ratio is very high for horticultural crops than that in the field crops and their role in developing the environment is an added advantage.

Most of the farm products have prone to both inter and intra-year price movement up and down. It is generally more in the case of vegetables because of their high degree of perishability. The knowledge of the nature and consequence of price movements is of ultimate importance to the policy makers and those who are engaged at different levels of their production and marketing.

The market insufficiencies are providing inferences to the growers to enhancing vegetable production. The price behavior of vegetables, spatial (or) temporal, has a definitive bearing upon the rationality of decisions taken by the growers as well as traders. Hence this study on production and marketing of important vegetables Mirzapur in district Kalhuti has been taken up with the following specific objectives:-

1. To estimate the cost of cultivation and return from chilli, pumpkin and bottle gourd in the study area;
2. To study the marketing channel, marketing margin and marketing efficiency of selected vegetable in the study area; and
3. To identify the problems faced by farmers during the marketing and production of selected vegetable crops in the study area.

### **METHODOLOGY**

An economic analysis depends critically on the selection of a determine sample and elicitation of accurate data and use of appropriate analytical tools and models. The area of the present study is Mirzapur district which has the distinction of the maximum area under Bottle gourd, Pumpkin and green chilli cultivation in Varanasi.

An objective appraisal of any development activity can be made only with a methodical understanding of the physical and natural bequest of the region with the socio-economic status of the population. For this reason, an attempt has been made to portray the physical, natural and socio-economic features of Mirzapur district, the area chosen for the present study.

In Mirzapur, Narayanpur development block of selected purposively for present study. Kailhat village of this block was purposively selected for present study because farmers of the village were allocating larger area under vegetable cultivation. A total of 52 respondents were selected randomly.

The cost of cultivation of vegetable crops was calculated by using the cost concept developed by the Commission on Agricultural Cost and Price (CACP) and also calculates the marketing costs incurred by the vegetable growers and marketing efficiency.

The study reveals that area under the pumpkin, bottle gourd, and chillies increasing with the increase in the individual size of the land holding. The area allocated by the marginal, small and medium farmers for cultivation of pumpkin was 0.12, 0.16 and 0.15 hectares, whereas in case of bottle gourd it was 0.12, 0.14 and 0.15 hectare respectively. In case of chilli, area allocated by the marginal, small and medium farmers was 0.07, 0.11 and 0.17 hectare respectively.

Per hectare cost of cultivation for pumpkin, bottle gourd, and chilli was found to be Rs 75098.23, Rs 80868.36 and Rs 79782.06 respectively. Per hectare gross income received by received by sample farmers was Rs.173899.58, Rs. 213429.49 and Rs. 10153900 from pumpkin, bottle gourd, and chilli respectively. Per hectare net return obtained from pumpkin, bottle gourd and chilli was found to be Rs. 98801.35, Rs. 132561.12 and Rs. 10074117.94 respectively.

The average producer's sale price of pumpkin; bottle gourd and chilli were Rs 400, Rs 500 and Rs 2000 per quintal respectively in the study area. The expenses incurred by the producer were Rs 65.40, Rs 95.4 and Rs 215.40 per quintal. The expenses incurred by the local vegetable collector were Rs 47, Rs 54 and Rs 34.73 per quintal for pumpkin, bottle gourd, and chilli respectively, whereas net margins of the local vegetable collectors were Rs 112.40, Rs 149.40 and Rs 250.13 per quintal for pumpkin, bottle gourd, and chilli. Per quintal average net margin received by the wholesalers was Rs 311.00, Rs 421.00 and Rs 1040. The average retailer's marketing costs were Rs 174, Rs 139 and Rs 442 per quintal for pumpkin, bottle gourd, and chilli respectively, whereas price paid by the consumers for pumpkin, bottle gourd and chilli were Rs 1800, Rs 2000 and Rs 5600 respectively.

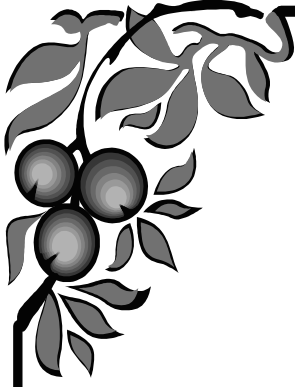
It has been found that the total marketing costs incurred by the middleman were Rs 375.40, Rs 367.4 and Rs 922.13 per quintal and a total net margin received by different intermediaries were Rs 949.40, Rs 1131.40 and Rs 2178.13 per quintal for pumpkin, bottle gourd, and chilli respectively. Producers' share in consumers' rupee of pumpkin, bottle gourd and chilli were 18.59, 20.23 and 31.87 per cent respectively.

The problems faced by the sample farmers for vegetable production was high in cost of fertilizer, insecticide, and fungicide which was faced by 96.2 per cent farmers. About 86.5 per cent growers facing the problem of high prices of seed, labour scarcity in peak period (67.3%), non-availability of good quality seed (44.2 %), non-availability of own source of irrigation (38.5 %), high wage rate of labour (76.9 %), loss due to stray animal/theft (48.1 %) and low profitability (76.9 %).

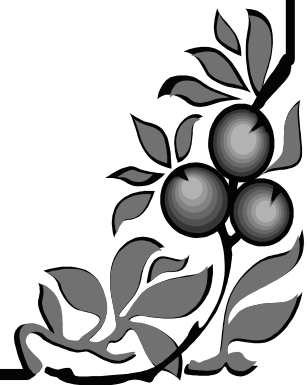
In the marketing related problems faced by the vegetable growers in the study area was lower price of vegetables. Some other major problem was high transportation cost (96.15percent) and wide fluctuation in market price (92.31 percent) and the non-availability of market information (86.45 percent), high cost of packing material (76.92 percent) and late payment of farm produce (57.69 percent).

### **Policy implication**

- ❖ The seed is one of the important inputs of vegetable cultivation and farmers are unable to get improved vegetable seed. Therefore, government should develop pest resistant and high yielding varieties for vegetables and make available to vegetable farmers.
- ❖ Government should intervene to improve transportation facility in the study area, so that vegetable growers can sell their produce in the urban area to get higher price of their produce.
- ❖ Government should provide market information especially vegetable price by enhancing the networking of market information.



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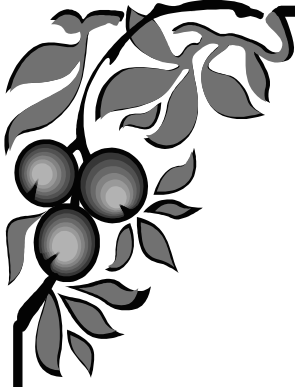
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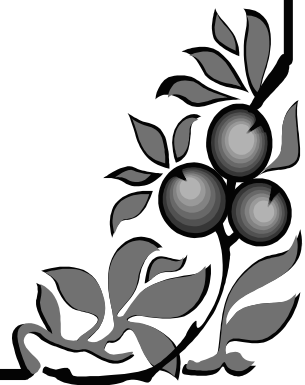
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# *Appendix*





### 3. Family composition:

Category	Age	Number	Occupation
Adult Male	Between 18-50 years		
	More than 50 years		
Adult Female	Between 18-50 years		
	More than 50 years		
Children	Less than 18 years		

### 4. Land Holding

Sr. No.	Particulars	Area (Acres)			Land revenue/rent (Rs)	Source of irrigation
		Irrigated	Un-irrigated	Total		
1.	Owned Land					
2.	Leased-in					
3.	Leased-out					
4.	Total Holding (1+2-3)					
a.	Cultivated Land					

### 5. Crop retention:

Crop	Area (ha)	Productivity (Quintal per acre)	Total production* (Qu)	Seed (Qu)	Self consumption	Feed for animal	Others*	Total retention (Qu)
Pumpkin								
Bottle guard								
Chilli								

\*(Total production: Productivity \* land under crop)

\* (Other include: Payment to Labour and Machinery usage+ Rent for land +Loan repayment, if any +payment for social activity +payment to artisans)

**Note: All payment “in kind”**

### 6. Operational cost (Per Bigha)

Operations	Bullock labour Hours (Per Bigha)				Tractor / Machinery (Number of hour/Bigha)				
	Pumpkin	Bottle-gourd	Chilli	Rate (Rs/Day)	Pumpkin	Bottle-gourd	Chilli	Rate (Rs/Bigha)	Diesel consumption (Lts. /Hr.)
Ploughing									
Harrowing									
Leveling									
Manuring									
Sowing/Transplanting									
Others									

## 7. Material cost (Rs/Bihga)

	Seed		Farm Yard Manure		Chemical fertilizers							
	Quantity (Kgs)	Rate (Rs/Kgs)	Quantity (Qts)	Rate (Rs/Kgs)	Quantity of nitrogenous fertilizer (Kgs)	Rate Rs/Kgs	Quantity of phosphatic fertilizers (Kgs)	Rate Rs/Kgs	Quantity of potassic fertilizers (Kgs)	Rate Rs/Kgs	Quantity (Kg)	Rate Rs/Kgs
Pumpkin												
Bottle-gourd												
Chilli												

	Insecticides		Irrigation			Picking	
	Quantity of (Kgs or Litre)	Rate Rs/Kgs or litre	No. of irrigation	Hour/irrigation	Rate Rs/ hour	Rs	Kinds
Pumpkin							
Bottle gourd							
Chilli							

**8. Cost of cultivation**

Sl.no.	Particulars	Pumpkin		Bottle gourd		Chilli	
		Quantity	Rate	Quantity	Rate	Quantity	Rate
1	Ploughing						
2	Harrowing						
3	Leveling						
4	Manuring						
5	Sowing/transplanting						
6	Fertilizer application						
7	Irrigation						
8	Intercultural operations						
9	Spraying						
10	Harvesting/picking						
11	Others						

## 9. Market channel

S.no.	Particulars	Pumpkin	Bottle gourd	Chilli
1.	Producer <b>a. Marketing cost</b> ❖ Transportation ❖ Labour ❖ Weighing ❖ Market fees <b>b. Packaging</b> ❖ Paper ❖ Gunny bag ❖ Cartoon <b>c. Spoilage</b> d. Sale price			
2.	<b>Local veg. agent</b> a. Purchase price b. Marketing cost (Transportation, labour, weighing, market fees) c. Packaging (paper, gunny bag, cartoon) d. Spoilage e. Sale price			

3.	<b>Wholesaler</b> <ul style="list-style-type: none"><li>a. Purchase price</li><li>b. Marketing cost (transportation, labour, weighing, market fees)</li><li>c. Packaging cost (paper, gunny bag, cartoon)</li><li>d. Spoilage</li><li>e. Sale price</li></ul>			
4.	<b>Retailer</b> <ul style="list-style-type: none"><li>a. Purchase price</li><li>b. Marketing cost (transportation, labour, weighing, marketing fees)</li><li>c. Packaging cost (paper, gunny bag, cartoon)</li><li>d. Spoilage</li><li>e. Sale price</li></ul>			
5.	<b>Consumer</b> <ul style="list-style-type: none"><li>a. Purchase price</li></ul>			