

Economics of Production and Marketing of Vegetables in Madhya Pradesh, India

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Introduction

- India is the largest producer of vegetables in the world after China, contributes over 13% to world vegetable production and occupies first position in the production of cauliflowers, second in onions and third in cabbages.
 - According to provisional figures from the **Economic Survey (Ministry of Finance, Govt. of India) 2003-4**, India has 7.59 million hectares of vegetables under cultivation with a production of 97.50 million tonnes.
 - This sector was boosted by an increase in outlay from Rs. 1000 crore in the Eighth Plan to Rs. 1454 crore in the Ninth Five-Year Plan and Rs. 2105 crore in the Tenth Plan. Consequently, the horticulture sector has grown significantly over the years and India has maintained its leadership in many vegetables.
 - More than 40 kinds of vegetables from different groups such as the solanaceous, cucurbitaceous, leguminous, cruciferous, root and leafy are grown in tropical, sub-tropical and temperate regions. Tomatoes, onions, brinjals, cabbages, cauliflowers, okra and peas are among the most important vegetables grown.
 - In Indian society, vegetables are consumed in fresh, cooked and preserved forms. The daily meal is not complete unless it contains vegetables.
 - The vegetable business provides an excellent opportunity for producers and consumers alike to diversify their business and their tastes respectively.
- improve the marketing system to aid development for two reasons: firstly, if additional produce does not fetch additional revenue in the market, it may work as a disincentive to increased production; secondly, if the market does not supply consumers with produce at reasonable prices and at the time and place needed, then increased production has no meaning in a welfare society.
- Like any marketing system, vegetable marketing is a process which begins with the decision to produce a saleable commodity and involves all aspects of market structure, functional and institutional, based on technical and economic considerations. It also includes pre- and post-harvest operations – assembling, grading, storage, transportation and distribution. Increased production results in a greater percentage increase of marketable surplus, accompanied by an increase in demand from the urban population which ultimately calls for rapid improvements in the existing vegetable business system.
 - As a link between producer and consumer, marketing plays a very important role, not only in stimulating production and consumption but also in increasing the rate of economic development. Its dynamic functions are thus of primary importance in promoting economic activities and it has therefore been described as the most important factor in the development of the vegetable business.

The Inter-relationship of Production and Marketing

- It is not enough just to produce a vegetable; it must be produced efficiently and marketed successfully. It is necessary to

Why this study has been conducted

A study of the vegetable marketing system is necessary to understand the complexities involved and to identify bottlenecks with a view to providing efficient services in the transfer of farm products and inputs from producers to

consumers. An efficient marketing system minimizes costs and benefits all sections of society.

Expectations of the system vary from group to group and the objectives are often in conflict. The efficiency and success of the system depends on how these conflicting objectives are reconciled.

For Producers

Vegetables producers want the marketing system to purchase their produce without loss of time and to provide the maximum possible share in the consumer's rupee. They want the best possible price for their surplus produce and they also want the system to supply them with inputs at the lowest possible price.

For Consumers

Vegetable consumers want a marketing system that can provide vegetables in sufficient quantity and of good quality at the lowest possible price. Clearly, this objective is in direct conflict with the objectives of producers.

For Market Middlemen

Market middlemen are interested in a marketing system which provides them with a steady and increasing income from the purchase and sale of vegetables. This objective can be achieved by purchasing vegetables from producers at low prices and selling them to consumers at higher ones.

For Government

The objectives and expectations of all three groups – producers, consumers and middlemen – conflict with one another. All three groups are indispensable to society. The government has to act as a watchdog to safeguard the interests of all groups. It tries to provide the maximum share of the consumer's rupee to the producer; food of the required quality and lowest possible price to the consumers; and enough margin to enable middlemen to remain in the trade and not drop out, thus jeopardizing the whole marketing mechanism. The government wants the marketing system to be one that brings overall benefit to all segments of society.

Objectives

The overall objective of the study was to analyze the production and marketing of

vegetables in Madhya Pradesh. Specific objectives were:

1. to estimate the production cost and net profit of vegetables
2. to analyze the marketing of vegetables with the following dimensions:
 - a) to estimate the marketable surplus and marketed surplus of vegetables
 - b) to estimate the marketing costs and margins of vegetables
 - c) to estimate the producers' and middlemen's share in the consumer's rupee
 - d) to analyze the marketing efficiency of vegetables
3. to identify the issues in the vegetable business and suggest measures to improve the system.

Limitations to the study

1. The most important limitation of this study is that it pertains to data collected for the agricultural year 1997-8. However, to make it more relevant to today's context, all the money-termed data has been upgraded with the help of the wholesale price index for 2003-4.
2. Vegetable producers do not keep records of their package practices and so have provided information based on their recall/memory.
3. The study is based on primary data so limitations regarding primary data obviously apply.
4. it does not include the market arrivals of vegetables from outside Madhya Pradesh.
5. It does not include vegetable production in kitchen gardens or the barter system of transactions in this business.

Methodology

Bearing in mind the cropping pattern, irrigation facilities and level of fertiliser consumption, it was logical to sample districts from each of five different crop zones in the state, assuming the zone to be homogeneous. The methodology was designed under the following headings:

Sampling Design

Multi-stage and multi-phase sampling techniques were used. Simple random sampling was used to select the

respondents (growers) and the selection of vegetables was made on the basis of the maximum acreage under cultivation. The Mahakoshal region was purposely selected as it is approachable and convenient with regards to facilities and available resources of time, energy, manpower, funds etc. Thus respondent growers were selected with simple random sampling with the replacement technique. The number of respondent vegetable growers was 180 (30 respondents selected from each of six districts, specifically from the block having the maximum acreage under the vegetable). Six blocks from six districts were chosen.

Bargi block in district Jabalpur was selected for tomatoes; Baihar in Balaghat district for arvi; Parasia in Chhindwara district for potatoes; Chapara in Seoni district for okra; Nainpur in district Mandla for onions; and Gotegaon in Narsinghpur district for brinjals.

Collection of Data

Primary data collection was done through pre-tested questionnaires. The respondents were interviewed personally. The questionnaire included both open-ended and close-ended questions. A list of growers in the respective blocks was prepared with the help of block-level officials of the State Agriculture and Horticulture Department and respondents were then selected randomly. Only those growers were listed who were in the business of vegetable production and marketing regularly in the last five years.

To collect secondary data, various official records used included:

- Directorate of Agriculture, Govt. of M.P., Bhopal, M.P.
- Commissioner, Land Record and Settlement, Govt. of M.P., Gwalior
- Directorate of Horticulture, Govt. of M.P., Bhopal
- Directorate of Economics and Statistics, Govt. of M.P., Bhopal
- Food and Agriculture Organisation (FAO), Rome, Italy

Analysis of Data

Production Cost of Vegetables

Vegetables are seasonal during their production period so issues related with their production cost accountability are few. To work out production costs of the vegetables, all the financial activity carried

out during the production period of a particular vegetable was considered, but due to limitations of funding, a standard package for estimating production costs, as prescribed by the Government of India, could not be used. Production cost was considered as cost per quintal of produce.

Marketing Costs

This comprised all marketing charges from local assembling to retailing in the marketing process. These costs limit the income of vegetable growers and affect the cost of living of consumers.

Marketable Surplus

This refers to the quantity of produce which can be made available to the non-farm population, that is, the residual left with the producer/farmer after meeting his requirements for family consumption, seeds, feed for cattle, payment to labour in kind, payment to artisans (carpenter, blacksmith, potter, mechanic), payment to landlord as rent and social and religious payments in kind. This is expressed as $MS = P - C$ where MS = Marketable Surplus, P = Total Production and C = Total requirements.

Marketed Surplus

This is the quantity of produce which the producer/farmer actually sells in the market, irrespective of his other requirements.

Marketing Margin

This includes all the expenses and profits of marketing agencies or functionaries.

Producer's Share in Consumer's Rupee

To estimate the producer's share at the time of the first sale, the following formula was used:

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

where

P_s denotes the producer's share per unit
 P_f denotes the price received by the farmer/producer at the time of the first sale of per unit produce
 P_r denotes the retail price per unit produce

Middlemen's Share in the Consumer's Rupee

To calculate the middlemen's share in the consumer's rupee, the following measure was used:

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

where

TABLE 1 – Crop Zones/Agro-climatic Regions of Districts under Mahakoshal Region

CROP ZONE / AGRO-CLIMATIC /REGION	DISTRICT COVERED	DISTRICT UNDER STUDY
1. RICE ZONE		
1) Chhatisgarh Plains	Raipur, Durg, Raigarh, Bilaspur, Rajnangaon, Balaghat	Balaghat
2) Bastar Plateau	Bastar	--
3) Northern Hill Region of Chhatisgarh	Sarguja, Mandla, Sidhi, Shahdol	Mandla
2. WHEAT ZONE		
4) Vindhyan Plateau	Sagar, Damoh, Bhopal, Sehore, Raisen, Vidisha	--
5) Central Narmada Valley	Narsinghpur, Hoshangabad	Narsinghpur
3. RICE/WHEAT ZONE		
6) Kymore Plateau and Satpura Hills	Jabalpur, Seoni, Panna, Rewa, Satna	Jabalpur and Seoni
4. JOWAR/WHEAT ZONE		
7) Gird Region	Gwalior, Shivpuri, Guna, Morena, Bhind	--
8. Bundelkhand Region	Chhatarpur, Tikamgarh, Datia	--
9) Satpura Plateau	Chhindwara, Betul	Chhindwara
5. COTTON/JOWAR ZONE		
10. Malwa Plateau	Indore, Dhar, Ujjain, Mandsaur, Ratlam, Dewas, Shajapur, Rajgarh	--
11. Nimar Valley	Khandwa, Khargone	--
12. Jhabua Hills	Jhabua	--

Source: Indian Council of Agricultural Research New Delhi, India.
This classification is meant for undivided Madhya Pradesh State of the Indian Union.

P_{mi} denotes the percentage margin of middlemen per unit produce
P_{ri} denotes the sale price per unit produce
P_{pi} denotes the purchase price per unit produce
C_{mi} denotes the marketing cost per unit produce

Marketing Efficiency

This is broadly interpreted as the ratio of output (satisfaction) to input (cost). In this study, marketing efficiency is compared by using the following formula:

$$M.E. = \frac{\text{Value added by Marketing}}{\text{Cost of Marketing}} \times 100$$

where

M.E. denotes the marketing efficiency

RESULTS AND DISCUSSION

Sample Profile – Social Class and Status of Vegetable Growers

Table 2 shows that respondent vegetable growers were maximum in percentage in the category of Scheduled Tribe, followed

by vegetable growers of Other Backward Class, Other vegetable growers and vegetable growers of Scheduled Caste category. **The conclusion is that growers of the Other Backward Class and Scheduled Tribes were sharing the major part of the business of vegetable production in the study area.**

Social status wise, the breakdown of respondent vegetable growers shows that about 9% and 7% vegetable growers were the panch and sirpanch respectively, while about 32% were members of co-operative societies and the remaining 51% had social status of Other type. **This confirms that the sample was dominated by a few leading people who had higher and special social status in society.**

Table 2: social Class and Status of Respondent Vegetable Growers (Unit in %)

Districts/Block	Vegetable crop	Social Class	Social Class	Social Class	Social Class	Social Status	Social Status	Social Status	Social Status
		SC	ST	OBC	Other	Panch	Sirpanch	Member of co-operative society	Other
Jabalpur (Bargi)	Tomato	10	23.33	46.67	20	6.66	6.66	23.33	63.33
Mandla (Nainpur)	Onion	13.33	40	33.33	13.33	13.33	10	33.33	43.33
Balaghat (Baihar)	Arvi	10	60	23.33	6.66	10	6.66	36.67	46.67
Seoni (Chapara)	Okra	13.33	50	23.33	13.33	6.66	3.33	40	50
Narsinghpur (Gotegaon)	Brinjal	20	20	46.67	13.33	10	6.66	26.66	56.67
Chhindwara (Parasia)	Potato	13.33	30	36.67	20	10	13.33	30	46.67
Total		13.33	37.22	35	14.44	9.44	7.44	31.67	51.11

The education level of respondent vegetable growers was identified, as shown in Table 3. About 41% were literate, 26% were school pass, 23% were illiterate and only 10% were college/university pass. **Thus among all**

the selected respondent vegetable growers, over 75% were educated.

Table 3: Education Level of Respondent Vegetable Growers

Districts/Blocks	Vegetable crops	Educational Level	Educational Level	Educational Level	Educational Level
		Illiterate	Literate	School Pass	College/University Pass
Jabalpur (Bargi)	Tomato	20	33.33	30	16.66
Mandla (Nainpur)	Onion	33.33	40	20	6.66
Balaghat (Baihar)	Arvi	23.33	46.66	23.33	6.66
Seoni (Chapara)	Okra	16.66	50	20	13.33
Narsinghpur (Gotegaon)	Brinjal	20	40	30	9.99
Chhindwara (Parasia)	Potato	26.66	33.33	33.33	6.66
Total		23.33	40.55	26.11	10

The analysis of the size of families of respondent vegetable growers revealed that there were 29% adult males, 27% adult females, 23% children and 20% old people. Thus the contribution of about 44% of family members was negligible.

The conclusion is that only 56% of constituent family members perform the real work of vegetable production in the study area. The average family size was 5.5 in total.

Table 4: Size of family of respondent vegetable growers (Unit in %)

Districts/Blocks	Vegetable Crop	Member-wise family breakdown	Member-wise family breakdown	Member-wise family breakdown	Member-wise family breakdown	Average size of family
		Adult Male	Adult Female	Children	Old People	
Jabalpur (Bargi)	Tomato	33.33	30	20	16.66	6.0
Mandla (Nainpur)	Onion	28	28.66	23.33	20	5.0
Balaghat (Baihar)	ARvi	27.22	26.11	25	21.66	6.0
Seoni (Chapara)	Okra	26.66	24.66	26.66	22	5.0
Narsinghpur	Brinjal	31.11	28.33	17.22	23.33	6.0
Chhindwara	Potato	26	25.33	29.33	19.33	5.0
Total		28.88	27.27	23.23	20.50	5.5

(Children – a person between 7 and 15 years of age; Adult Male – a male person between 15 and 60 years of age; Adult Female – a female person between 15 to 50 years of age; Old People – a person above 60 years of age)

Availability of Transport Facilities to Vegetable Growers

Transport facilities are very important to vegetable growers as they deal with short duration crops and their produce and this requires frequent movement. Table 5 shows the transportation available to respondents. **All respondents were well**

connected with pukka roads and train routes and used trains, buses, trucks, bullock carts and cycles.

Table 5: Transport for Respondent Vegetable Growers

Districts/Blocks	Vegetable	Transport Infrastructure			Means of Transportation			
		Train Track	Kachcha Road	Pukka Road	Train	Bus/Truck	Tractor/Two/Three wheeler	Bullock Cart/Cycle
Jabalpur (Bargi)	Tomato	X	XX	X	+	++	+++	++
Mandla (Nainpur)	Onion	X	XX	X	+	++	+++	++
Balaghat (Baihar)	Arvi	X	XX	X	-	++	+++	++
Seoni (Chapara)	Okra	X	XX	X	-	++	+++	++
Narsinghpur (Gotegaon)	Brinjal	X	XX	X	+	++	+++	++
Chhindwara (Parasia)	Potato	X	XX	X	+	++	+++	++

X indicates transport infrastructure is available

XX indicates transport infrastructure is not available

+ indicates means of transportation is available

++ indicates means of both transportation cited is available

+++ indicates means of all transportation cited is available

- indicates means of transportation is not available

Size of Land Holding of Vegetable Growers:

Analysis of data revealed that the average size of the total land holdings of respondent vegetable growers was 3.19 hectares (Table 6) while the average land holding for vegetable crops was 1.43 hectares. The conclusion is that vegetable farming was the main occupation of small and medium sized farmers in the study area. They grow vegetables for business as well as fulfilling urgent needs for cash

for various purposes such as input for the next crop season, payments to labourers, household expenses etc.

Table 6: Size of Land Holdings of Vegetable Growers

Districts/Blocks	Vegetable	Total Land Areas of Vegetable Growers	Average Size of Land Holding of Vegetable Growers in Hectares
Jabalpur (Bargi)	Tomato	97	3.23
Mandla (Nainpur)	Onion	154	5.13
Balaghat (Baihar)	Arvi	76	2.53
Seoni (Chapara)	Okra	69	2.30
Narsinghpur (Gotegaon)	Brinjal	89	2.96
Chhindwara (Parasia)	Potato	90	3.0
Total		575	3.19

Production and Returns of Vegetables

The data given in Table 7 shows the cost of cultivation and returns of vegetable crops under study in the Mahakoshal region. The cost of cultivation per hectare for tomatoes, onions, arvi, okra, brinjal and potato was an estimated Rs. 12,599, Rs. 13,338.10, Rs. 9,742.10, Rs. 10,046.40, Rs. 11,274.60 and Rs. 13,480.20 respectively. About 95% of the cost of

cultivation consisted of human labour and working capital costs. The cost of bullock labour for these vegetables ranged from 4% to 5%.

Table 7: Production Costs and Returns of Vegetables per Hectare

Crop	Hectares	Labour	Labour	Working Capital (%)	Cost of cultivation in Rs.	Gross Return	Gross Return	Net Profit in Rs.	Net profit on per quintal produce
		Value of human labour (%)	Value of Bullock Labour (%)			Quantity in quintals	Value in Rupees		
Tomato	48	46.00	3.61	50.38	12599.00	131.55	44069.25	31470.25	239.23
Onion	59	44.39	4.84	50.76	13338.10	148.33	39752.44	26414.34	178.08
Arvi	35	42.24	4.48	53.27	9742.10	100.50	31758.00	22015.90	219.06
Okra	29	41.21	5.22	53.57	10046.40	115.00	41400.00	31353.60	272.64
Brinjal	44	44.06	4.53	51.41	11274.60	126.50	40480.00	29205.40	230.87
Potato	43	43.72	4.74	51.53	13480.20	152.19	38808.45	25328.25	166.42

Producer's Sale Price – Tomatoes @ Rs. 335/- per quintal

Arvi @ Rs. 316/- per quintal

Brinjal @ Rs. 320/- per quintal

Value of Human Labour – Male @ Rs. 40/- per day

Female @ Rs. 35/- per day

Value of Bullock Labour - @ Rs. 60/- per day per pair

Human Labour includes expenses on manpower utilised for performing various activities in fields/farms.

Working capital includes expenses on fertiliser, irrigation, manure, plant protection, picking and other primary and secondary intercultural operations.

Onions @ Rs. 268/- per quintal

Okra @ Rs. 360/- per quintal

Potato @ Rs. 255/- per quintal

No. of Sampled Growers – 30 for each crop

Marketing of Vegetables

Marketing any product is the ultimate stage of any production system. It includes the marketable surplus of vegetables, the marketing cost of vegetables at both the producer's level and the middleman's level, comparison of marketing costs and margin of vegetables, comparison of marketable surplus and marketed surplus of vegetables, producer's and middleman's share in the consumer's rupee, the marketing efficiency of vegetables and the marketing channels involved in vegetable marketing.

was available as marketable surplus to the grower.

Marketable Surplus of Vegetables

A marketable surplus of vegetable produce refers to the quantity of produce which is available for marketing after meeting family and self consumption requirements, wage payment to labourers, gift and donations at growers' level. Table 8 shows the marketable surplus of vegetables in the study area. It indicates that about 3% of total vegetable produce was exhausted at grower's level for various purposes and the rest, up to 97%,

Table 8: Marketable Surplus and Marketed Surplus of Vegetable Produce

Crop	Total Production in quintals	Quantity used for family and self consumption		Quantity given as wage payment, gift etc		Loss of produce during handling		Marketable surplus in quintals
		Quantity in quintals	Value in Rs.	Quantity in quintals	Value in Rs.	Quantity in quintals	Value in Rs	
Tomato	6314.4	47	15745	42	14070	70	23450	6155.40 (97.48)
Onion	8751.47	77	20636	35	9380	41	10988	8598.47 (98.25)
Arvi	3517.50	23	7268	40	12640	20	6320	3434.50 (97.64)
Okra	3335.00	38	13680	31	11160	27	9720	3239.00 (97.12)
Brinjal	5566.00	40	12800	30	9600	32	10240	5464.00 (98.17)
Potato	6544.17	69	17595	22	5610	34	8670	6419.17 (98.09)

Producers' Sale Price – Tomato @ RS. 335/- per quintal; Onion @ Rs. 268/- per quintal; Arvi @ Rs. 316/- per quintal; Okra @ Rs. 360/- per quintal; Brinjal @ Rs. 320/- per quintal; Potato @ Rs. 255/- per quintal (Figures in parenthesis show the percentage)

Marketing Cost of Vegetable Produce at Producer's Level

The marketing cost per quintal was highest for potatoes, followed by onions, tomatoes, brinjal, okra and arvi. To estimate the marketing cost of vegetable produce at growers' level, the cost of packing and packaging, weighing costs, transportation costs, chungi (tax), dalai (commission), corporation tax and other miscellaneous expenses were taken into account.

Table 9 shows that the quantity of vegetable produce available as marketed surplus was the same as the quantity of vegetable produce available as marketable surplus. A comparative position of marketable surplus and marketed surplus is further described in this table.

Table 9: Marketing Costs of Vegetable Produce at Growers' Level

Crop	Marketing	Cost of	Produce	at	Producers'	Level	(per quintals)	Total marketing cost of produce in Rs.	Quantity sold by growers to middlemen in quintals
	Cost of packing & packaging in Rs.	Weighing cost in Rs.	Transportation cost in Rs.	Chungi in Rs.	Dalali in Rs.	Corporation tax in Rs.	Other miscellaneous expenses in Rs.		
Tomato	13.00	7.00	7.00	0.50	10.00	5.00	15.00	57.50 (17.16)	6155.40
Onion	7.50	5.00	6.20	0.50	20.00	5.00	17.00	61.20 (22.83)	8598.47
Arvi	3.95	5.00	6.00	0.50	5.00	5.00	16.00	41.45 (13.12)	3434.50
Okra	9.40	4.75	5.75	0.50	10.00	5.00	15.50	49.90 (13.86)	3239.00
Brinjal	10.10	4.90	6.25	0.50	10.00	5.00	15.30	52.05 (16.26)	5464.00
Potato	11.00	5.00	6.50	0.50	25.00	5.00	16.00	69.00 (27.06)	6419.17

Producers' Sale Price – Tomato @ RS. 335/- per quintal; Onion @ Rs. 268/- per quintal; Arvi @ Rs. 316/- per quintal; Okra @ Rs. 360/- per quintal; Brinjal @ Rs. 320/- per quintal; Potato @ Rs. 255/- per quintal (Figures in parenthesis show the percentage)

Marketing Costs and Margins of Vegetables at the Middleman's Level

Data in Table 10 shows that the marketing cost of vegetable crops at the middleman's level for tomatoes, onions, arvi, okra, brinjal and potato was estimated to be Rs. 40, 23, 25, 27, 28 and 26 respectively. The marketing margin of middlemen was found

to be Rs. 215/- for tomato, Rs. 132/- for onion, Rs. 314/- for arvi, Rs. 230/- for okra, Rs. 210/- for brinjal and Rs. 145/- for potato, clearly indicating the importance of the middleman's marketing costs and margins in the marketing of vegetables.

Table 10: Marketing Costs and Margins of Vegetables at Middleman's Level in Rs./Quintals.

Crop	Quantity purchased by middlemen in quintals	Middlemen's purchase price in Rs./quintals	Middlemen's sale price in Rs. /quintals	Expenses in purchasing and disposing of produce				Quantity sold by middlemen		Mi me ma in l qu
				Transportation	Labour	Other expenses	Total marketing cost	Quantity in quintals	Value in Rs.	
Tomato	6314.40	335	550	10	15	15	40	6314.40	3472920	21
Onion	8751.47	268	400	5	8	10	23	8751.47	3500588	13
Arvi	3517.50	316	630	6	7	12	25	3517.50	2216025	31
Okra	3335.00	360	590	8	9	10	27	3335.00	1967650	23
Brinjal	5566.00	320	530	10	9	9	28	5566.00	2949980	21
Potato	6544.17	255	400	6	8	12	26	6544.17	2617668	14

Comparison of Marketing Costs and Margins of Vegetables

Table 11 shows the comparative position of marketing costs and margins of vegetables and reveals that costs were higher in all cases at producers' level than at middleman's. The same was the case

with margins, except for arvi. **Producers got a higher margin with higher investment compared to middlemen's marketing costs and margins.**

Table 11: Comparative Position of Average Marketing Costs and Margins of Vegetables

Crop	Producers' Level	Level	Total	Prod'r's	Prod'r's	Middlemen's	Level	Margin	Total	Total
	Production cost in Rs/ Quintals	Marketing Cost in Rs./Qtl	cost in Rs/Qtl	price in Rs./Qtl	margin in Rs/Qtl	Consumer's price in Rs/Qtl	Marketing cost in Rs/Qtl	of middlemen in Rs/Qtl	Cost	Margin
Tomato	95.77	57.50	153.27	335	239.23	550	40	215	97.50	454.23
Onion	89.92	61.20	151.12	268	178.08	400	23	132	84.20	310.08
Arvi	96.94	41.45	138.39	316	219.06	630	25	314	66.45	533.06
Okra	87.36	49.90	137.26	360	272.64	590	27	230	76.90	505.64
Brinjal	89.13	52.05	141.18	320	230.87	530	28	210	80.05	440.87
Potato	88.57	69.00	157.57	255	166.42	400	26	145	95.00	311.42

Comparison of Marketable Surplus and Marketed Surplus

Table 12 shows that the amount of marketable surplus and the amount of marketed surplus was equal, leading to

the conclusion that growers were not keeping a quantity of produce for their own use.

Table 12: Comparison of Marketable Surplus and Marketed Surplus

Crop	Total of	Production vegetables	Marketable of	Surplus Vegetables	Marketed Of	Surplus Vegetables
	Quantity in Qtls	Value in Rs	Quantity in Qtls	Value in Rs	Quantity in Qtls	Value in Rs.
Tomato	6314.40	2115424.50	6155.40	2062059.00	6155.40	2062059.00
Onion	8715.47	2345393.96	8598.47	2304389.96	8598.47	2304389.96
Arvi	3517.50	1111530.00	3434.50	1085302.00	3434.50	1085302.00
Okra	3335.00	1200600.00	3239.00	1166040.00	3239.00	1166040.00
Brinjal	5566.00	1781120.00	5464.00	1748480.00	5464.00	1748480.00
Potato	6544.17	1668763.35	6419.17	1636888.35	6419.17	1636888.35

Producers' Sale Price – Tomato @ Rs. 335/- per quintal; Onion @ Rs. 268/- per quintal; Arvi @ Rs. 316/- per quintal; Okra @ Rs. 360/- per quintal; Brinjal @ Rs. 320/- per quintal; Potato @ Rs. 255/- per quintal

Producer's Share and Middleman's Share in the Consumer's Rupee

An estimate was made to find out the producer's share in the consumer's rupee – 60.90% for tomato, 67% for onion, 50.15% for arvi, 61.01% for okra, 60.37% for brinjal and 63.75% for potato. The middleman's share was 39.09%, 33%, 49.85%, 38.99%, 39.63% and 36.25% respectively.

Thus the producer's share ranged between 50 and 67% and the rest went

to the middlemen. The latter's share needs to be reduced in such a way that it provides better remuneration to the producer without affecting the vegetable marketing business adversely.

Marketing Efficiency

Arvi was the vegetable with the highest efficiency, followed by okra, brinjal, tomato, onion and potato. Clearly these latter vegetables need more attention to improve their marketing efficiency.

Table 13: Marketing Efficiency of Vegetables

Crop	Total cost of marketing service in Rs.	Value added by marketing (difference in consumer's price & price received by growers) Rs/Qtl	Marketing efficiency in percentage
Tomato	97.50	550 – 335 = 215	220.51
Onion	84.20	400 – 268 = 132	156.77
Arvi	66.45	630 – 316 = 324	487.58
Okra	76.90	590 – 360 = 230	299.09
Brinjal	80.05	530 – 320 = 210	262.34
Potato	95.00	400 – 255 = 145	152.63

Marketing Channels in the Vegetable Business

Five marketing channels were identified:

1. Producer to consumer. No middlemen used this channel and only 8.78% of respondents used it.
2. Producer to retailer to consumer. One middleman used this and 20.15% respondents used it.
3. (a) Producer to wholesaler to retailer to consumer. Two middlemen used this. 41.63% respondents used it.
(b) Producer to wholesaler to consumer. One middleman used this.
4. Producer to village level collector to retailer to consumer. Two middlemen used this channel and 15% respondents.
5. (a) Producer to village level collector to wholesaler to retailer to consumer. Three middlemen used this channel and 14.44% respondents.
(b) Producer to village level collector to wholesaler to consumer. Two middlemen used this channel.

Issues in Vegetable Marketing and Production

At Producer's Level

On the basis of higher priority, respondent producers largely faced problems related with production e.g. lack of information, manpower, finance/credit, inputs, production levels, insect/pest, diseases, synchronous maturity and theft. Problems related to marketing included transportation, standardisation and grading, infrastructure, unfair deductions, storage, market-related information and bargaining. There were also other, less important problems.

At Middleman's Level

Most middlemen faced problems related to the uncertainty of the arrival of producers and consumers, the arrival of quantities of produce, standardisation and grading, storage, information on market prices, quality of produce, varied mixture in produce and highly perishable nature of produce.

Table 14: Issues reported at Producer's Level

Problems reported by Producers	% of Respondent Reported
<u>PRODUCTION RELATED</u>	
• Lack of information regarding horticultural varieties and package of practices	75.25%
• Non-availability of manpower (mechanical or manual)	80.00
• Non-availability of finance/credit	59.69
• Non-availability of timely inputs (seeds, fertiliser, pesticides etc)	71.25
• Low level of crop production	72.48
• Non-availability of irrigation from government sources	65.78
• Problems of insect, pests and diseases	85.88
• Lack of synchronous maturity in horticultural crops	78.60
• Problems of theft of produce	51.22
<u>MARKETING RELATED</u>	
• Non-availability of cheap transportation	55.21
• Lack of information regarding standardization and grading at grower level	76.80
• Poor infrastructure at market place	69.15
• Unfair deductions by marketing agents	60.00
• Non-availability of storage facilities at village/producer level	57.83
• Non-availability of market-related information regarding prices of produce & their trends at producer level	87.50
• Too much bargaining regarding prices of produce	52.18

Table 15: Issues reported at Middleman's Level

Problems Reported at Middleman's Level	% of Respondent Reported
• Arrival of Producer & Consumer in any particular market always uncertain	90.12
• Arrival quantity of produce with producer always uncertain	84.63
• Lack of standardization & grading of produce	92.40
• Lack of storage facilities at middleman's level	55.72
• Lack of information regarding market prices of produce at middleman's level	51.05
• Lack of quality produce	70.00
• Varied mixture in produce	80.22
• Highly perishable nature of produce	89.19

Table 16: Issues reported at Consumer's Level

Problems reported at Consumer's Level	% of Respondent Reported
• Problems of non-availability of quality produce	60.13
• Problem of varied mixture of produce	71.25
• High level bargaining used	70.83
• Very high fluctuation in prices of produce	66.85
• Problems related to freshness of produce	53.18
• Problems of non-availability of standardized and graded produce	50.65
• Problems related with poor storability of horticultural produce	90.52
• Problems of cheating during weighing of the produce	71.14

Suggestions for Improvement

Suggestions made to improve the existing production and marketing system of horticultural produce at every level were:-

1. Storage facilities should be provided at every level
2. The infrastructure should be improved to maintain hygienic conditions
3. Market-related information such as daily and weekly prices of horticultural produce should be disseminated among those needing this information
4. Cheaper transportation should be provided to reduce marketing costs at producer and middleman levels
5. Regular checks of measures and weights should be made to ensure exact weighing
6. Extension agencies should provide information on new varieties and packages of practices as well as procedures of standardization and grading of produce and their benefits
7. Banking institutions should provide finance/credit with less formality to meet credit requirements
8. Market regulatory authorities should address the issue of unfair deductions at the market place
9. Horticultural crop producers' co-operative societies should be formed for better performance and achievement
10. Some specific minimum prices should be declared for vegetables to ensure benefit for the producers.

CONCLUSIONS – General Observations

1. The majority of respondent growers did vegetable farming to fulfil their urgent need for money for daily life.
2. The lower and backward strata of society were vegetable producers in the study area. The higher strata of respondents were not very interested in the vegetable production business.
3. The vegetable production business was not taken as per the prescribed package of practice.
4. A lack of adequate institutional credit facilities at producer level was prevalent in the study area.
5. The majority of selected vegetable crop growers produced vegetables only in the **Kharif** or rainy season and **Rabi** or winter season, because of the lack of irrigation facilities.

Sample Profile

The highest percentage of vegetable growers were from Scheduled Tribes, followed by Other Backward Class, Others and Scheduled Castes. About 9% and 7% were *panch* and *sarpanch* respectively; about 32% were members of co-operative societies and 51% had social status of Other type.

About 41% respondents were literate, 26% were School Pass, 23% were illiterate and 10% were College/University Pass.

Respondents' families included 29% adult male, 27% adult female, 23% children and 20% old people, indicating that about 44%

made a negligible contribution to the production system and 56% performed the real work. The average family size was 5.5.

Various kinds of transport was available, including trains and pukka roads which enabled respondents to use buses, trucks, tractors, two/three-wheelers, bullock carts and cycles.

The average land holding was 3.19 hectares, suggesting that vegetable production in the study area was carried out by small and medium producers with less than five hectares land.

Production Costs and Returns

The cost of cultivation per hectare was Rs 12599.00 for tomatoes, Rs 13338.10 for onions, Rs. 9742.10 for arvi, Rs. 10046.40 for okra, Rs. 11274.60 for brinjals and 13480.20 for potatoes, with 95% of the cost going to human labour and working capital costs with bullock labour counting for 4 to 5%. Net profit per hectare was Rs. 31470.25 for tomatoes, Rs. 26414.34 for onions, Rs. 22015.90 for arvi, Rs. 31353.60 for okra, Rs. 29205.40 for brinjals and Rs. 25328.25 for potatoes.

Marketing of Vegetable Crops

Marketable surplus was about 97% of total produce with only 3% used at growers' level for various purposes. Marketing costs were highest for potatoes, followed by onions, tomatoes, brinjal, okra and arvi. This included packing, packaging, weighing, transportation, chungli, dalali, corporation tax and miscellaneous expenses.

For middlemen, marketing costs were Rs. 40 for tomatoes, Rs. 23 for onions, Rs. 25 for arvi, Rs. 27 for okra, Rs. 28 for brinjal and Rs. 26 for potatoes. The marketing margin was Rs. 215 for tomatoes, Rs. 132 for onions, Rs. 314 for arvi, Rs. 230 for okra, Rs. 210 for brinjal and Rs. 145 for potatoes. Marketing margins were higher at producers' level except for arvi while producers were getting higher margins with higher investment compared to middlemen.

The marketable surplus and marketed surplus of vegetable produce was equal, indicating that producers were not keeping produce for storage, possibly because of lack of adequate storage facilities.

The producers' share in the consumer's rupee was 60.90 for tomato, 67 for onion, 50.15 for arvi, 61.01 for okra, 60.37 for brinjal and 63.75 for potato with the rest going to the middlemen.

Arvi had the highest marketing efficiency followed by okra, brinjal, tomato, onion and potato. Five marketing channels were identified. The majority of producers used the producer – wholesaler – retailer – consumer or producer – wholesaler – consumer channels with the lowest number using producer – consumer.

Constraints

Respondent producers reported production problems such as lack of information, manpower, finance/credit, inputs, insect/pest and diseases, synchronous maturity and theft. Marketing problems included poor transportation, standardization and grading, infrastructure, unfair deductions, storage, information and bargaining. Middlemen had problems of uncertainty of arrival of producers and consumers, produce quantities, standardization and grading, storage, information on market prices, quality of produce, varied mixture of produce and its highly perishable nature. Consumers' problems were quality and mixture of produce, bargaining, fluctuation in prices, freshness, standardized and graded produce, poor storability of produce and cheating during weighing.

Recommendations

1. The higher strata of society should be encouraged to be involved in the commercial vegetable production business.
2. Cheaper, faster transportation should be available to cut down the time of transit.
3. Adequate institutional credit facilities should be provided in time to growers to avoid distress sale of produce
4. Growers should be informed of the latest varieties and their precise package of practice to achieve better production levels.
5. Improvement of infrastructure facilities of irrigation, fertilizer, pesticide etc so that growers could consider producing crops in the **Zaid** or summer season.

6. Provision of market-related information at the doorstep of producers so that they fetch the exact prices for produce.
7. Minimize the number of middlemen in marketing channels.
8. Introduce essential grading and standardization packing and packaging of produce to ensure quality of produce for the consumer.

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