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Research Paper

Producton and marketing dynamics of major vegetables in Bharuch district of South Gujarat

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ABSTRACT : Gujarat has a vast contribution to the Indian horticulture sector. It contributes nearly five per cent of the total vegetable production in India. The state also enjoys leading position at all-India level in the productivity levels of major vegetables like onion, potato, tomato, brinjal etc. Bharuch district is situated on the Bank of Narmada river, the lifeline of Gujarat and is well known for its well developed Industrial areas. Arabian Sea braces its west side. The geology of the district with vast area affected by inherent/coastal salinity, presents a complex hydrogeological pattern, consequently leading to vast variation in the quality and quantity of vegetables produced. The return from vegetable cultivation is also volatile due to its highly perishable nature and instable prices. Thus, due to dearth of literature about the economics of production, marketing and associated constraints for Gujarat state, a study was conducted to work out the cost of cultivation and returns per hectare, the marketing cost per quintal, marketing efficiency as well as to identify the constraints related to cultivation and marketing of selected vegetables *viz*., brinjal, green tur, bottle gourd, okra, pointed gourd. Some of the results which emerged from the study were that the total marketing cost incurred per quintal by the vegetable growers was the lowest in case of in green tur crop (Rs. 70.50) while highest in case of bottle gourd (Rs. 98.00). On an average, the total marketing cost per quintal incurred was Rs. 80.25/qtl of which major share was accounted by transportation cost *i.e.* Rs. 54.25/qtl (67.60 %) followed by packing cost (26.79 %) and loading-unloading (5.61 %).The net return per hectare was found to be positive in all vegetable crops. The net return/hectare over cost C_2 was highest (Rs. 449041.00) in case of pointed gourd and lowest in bottle gourd (Rs. 172236.00).The input –output ratio over Cost C_2 was the lowest in case of green tur (1:1.49) and highest in pointed gourd (1:2.24).

KEY WORDS : Marketing costs, Margins, Cost of cultivation, Marketing efficiency, Price spread

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INTRODUCTION :

India is the second largest vegetable producer in the world, contributing to the tune of about 13 per cent in the world vegetable production. It is the largest producer of cauliflower and peas in the world and it also ranks second in brinjal and onion. In spite of India being the largest producer of many vegetables in the world, the export increased only to Rs. 5462.93 crores in 2013-2014. Gujarat is a major contributor to the Indian horticulture sector. The state contributes nearly five per cent of the total vegetable production of the country.

The state also enjoys leading position at all-India level in the productivity levels of major vegetables like onion, potato, tomato, brinjal etc. Bharuch district in Gujarat is situated on the Bank of Narmada river, the lifeline of Gujarat and is well known for its well developed Industrial areas. Arabian Sea braces its west side. The geology of the district with vast area affected by inherent/coastal salinity, presents a complex hydrogeological pattern, consequently leading to vast variation in the quality and quantity of vegetables produced. The return from vegetable cultivation is also volatile due to its highly perishable nature and instable prices. Since there exists a dearth of literature about the economics of production, marketing and their associated constraint for vegetables in Gujarat state, a study was conducted to work out the cost of cultivation and returns per hectare and the marketing cost per quintal related to cultivation and marketing of selected vegetables *viz*., brinjal, green tur, bottle gourd okra, pointed gourd with the objectives of working out the cost of cultivation and returns per hectare and estimating the marketing cost per quintal of different vegetables.

MATERIALS AND METHODS :

The study was restricted to three *Rabi* and two summer vegetables cultivated in Bharuch district of South Gujarat. A total of 105 vegetable growers were selected from 6 purposively selected villages to have adequate sample size of each vegetable crop under study. The primary data on various inputs used and output were collected from the selected vegetable growers by interviewing them personally during the *Rabi* and Summer season for the year 2014-15.The information about production and marketing constraints were collected from randomly selected 60 farmers. The market related data were collected from major regulated markets *viz*., Bharuch, Ankleshwar and Surat markets. A sample of 6 traders (3 wholesalers and 3 retailers) was selected from each of the above markets. In all, 9 wholesalers and 9 retailers of vegetables were interviewed for collection of data. The information about production and marketing constraints were collected from 60 randomly selected farmers from the above regulated markets. The details of sample selection of vegetable growers and traders are given in Table A and B.

Table A : Distribution of sample vegetable growers

Sr. No.	District	Taluka	No. o f villages	No. of farmers
1.	Bharuch	Bharuch	2	20
2.		Ankleshwar	2	20
3.		Hansot	2	20
Total		3	6	60

Table B : Vegetables crop wise distribution of sample farmers

Sr. No.	Crops	No. of farmers
1.	Brinjal	20
2.	Green Tur/ Pigeonpea	20
3.	Bottle gourd	15
4.	Okra	20
5.	Pointed gourd	30
Total		105

Data analysis:

Tabular analysis was used extensively for data analysis. The cost of cultivation and returns were estimated using various cost concepts *viz.*, Cost A, Cost B, Cost C_1 and Cost C_2. The marketing efficiency was worked out using the following formula derived by Shepherd.

ME= V/ I-1

where,

ME = Index of marketing efficiency

V=Value of goods sold (consumers price)

I= Total marketing cost and total margin.

RESULTS AND DATA ANALYSIS :

The economics of production and marketing of selected vegetables which emerged from the study is as follows:

Brinjal:

The details of costs and yield of brinjal are presented in Table 1. It can be observed from the Table 1 that the average total cost (Cost C_2) of brinjal was Rs.141046 / ha. The average Cost A (operating cost) was estimated to be 45.74 per cent (64506 Rs./ha) of the total cost. The item wise cost components indicated that human labour ranked first (34.28%), followed by chemical fertilizer (7.98 %), irrigation (5.86 %), insecticides (4.64 %), seedlings (4.64 %) etc. The result showed that yield per hectare of brinjal was 280.52 quintals. The gross return

per hectare was Rs. 227336.00 which was higher than the total cost C_2.

The details of costs and returns of brinjal are presented in Table 1 indicated that the estimated returns per hectare over cost C_2 was Rs. 86290.00. It is also apparent from the table that the average total cost (Cost C_2) of production per quintal of brinjal was Rs.502.80. The average farm harvest price per quintal of brinjal was reported to be Rs. 810.41 which was higher than the cost of production per quintal. The input-output ratio (over Cost C_2) was 1:1.61 indicating the economic viability of brinjal crop.

Green tur :

The details of cost of cultivation of green tur crop are presented in Table 2. It can be observed from the table that the average total cost (Cost C_2) of green tur was Rs. 126814 /ha. The average Cost A (operating cost) was estimated to be 41.70 per cent (52886.00 Rs./ha) of the total cost. The item wise cost components indicated that human labour ranked first (48.83 %), followed by chemical fertilizer and (6.97%), irrigation (2.72%). The result showed that yield per hectare of green tur was 45.44 quintals.The gross return per hectare was Rs.

Table 1: Details of cost of cultivation of brinjal crop per hectare in Gujarat, 2014-15

Sr. No.	Items	Physical unit	Value Rs.	% to Cost C_2
1.	Human labour			
	Family (man days)	158.75	27059	19.18
	Hired (man days)	131.25	21304	15.10
2.	Bullock labour (pair days)	0.50	250	0.14
3.	Seeds (kg)	13363	6209	4.40
4.	Manures (kg)	6	1155	0.82
5.	Chemical fertilizers (kg) N	227	11254	7.98
	P	102		
	K	80		
6.	Irrigation		8266	5.86
7.	Insecticides/pesticides		6539	4.64
8.	Miscellaneous costs		6784	4.81
9.	Depreciation cost		276	0.20
10.	Interest on working capital		2481	1.76
11.	Rental value of owned land		36374	25.79
12.	Interest on owned fixed capital		285	0.20
13.	Management cost		12823	9.90
14.	Cost A		64506	45.74
15.	Cost B		101164	71.73
16.	Cost C_1		128223	90.91
17.	Cost C_2		141046	100.00
18.	Yield: Main product (q/ha)	280.52	227336	
	By-product (q/ha)	-	-	
19.	Farm harvest price of main product (Rs./q)		810.41	
	Income from by-product (Rs./ha)		-	
20.	Gross income: Main product + by-product (Rs./ha)			227336

Summary results

	Costs	Returns/ha over costs (Rs.)	Costs/q (Rs.)	Input-output ratio over costs
1.	Cost A	162830	229.95	1:3.52
2.	Cost B	126172	360.63	1:2.25
3.	Cost C_1	99113	457.09	1:1:77
4.	Cost C_2	86290	502.80	1:1.61

188921.00 which was higher than the total cost C_2.

The details of costs and returns of green tur are presented in Table 2 indicated that the estimated returns per hectare over cost C_2 was Rs. 62107.00. It is also apparent from the table that the average total cost (Cost C_2) of production per quintal of green tur was Rs. 2790.80. The average farm harvest price per quintal of green tur was reported to be Rs. 4157.59 which was higher than the cost of production per quintal. The input-output ratio (over Cost C_2) was 1:1.49 indicating the economic viability of green tur crop.

Bottle gourd :

The details of cost of cultivation of bottle gourd crop are presented in Table 3. It can be observed from the table that the average total cost (Cost C_2) of bottle gourd was Rs. 100366 /ha. The average Cost A (operating cost) was estimated to be 45.94 per cent (46109 Rs./ha) of the total cost. The item wise cost components indicated that human labour ranked first (30.96%), followed by chemical fertilizer (9.70 %), insecticides (6.74%), seeds (2.90%), manures (2.44 %) *etc.* The results showed that yield per hectare of bottle gourd was 276.70 quintals. The

Table 2 : Details of cost of cultivation of green tur crop per hectare in Gujarat, 2014-15

Sr. No.	Items	Physical unit	Value Rs.	% to cost C_2
1.	Human labour			
	Family (man days)	196.5	32032	25.26
	Hired (man days)	184.5	29882	23.54
2.	Bullock labour (pair days)	-	-	-
3.	Seeds (kg)	15	1511	1.19
4.	Manures (kg)	-	-	-
5.	Chemical fertilizers (kg) N	179	8830	6.97
	P	99		
	K	27		
6.	Irrigation		3447	2.72
7.	Insecticides/pesticides		2088	1.63
8.	Miscellaneous costs		4864	3.84
9.	Depreciation cost		231	0.18
10.	Interest on working capital		2034	1.60
11.	Rental value of owned land		30227	23.84
12.	Interest on owned fixed capital		140	0.11
13.	Management cost		11529	9.09
14.	Cost A		52886	41.70
15.	Cost B		83253	65.65
16.	Cost C_1		115285	90.91
17.	Cost C_2		126814	100.00
18.	Yield: Main product (q/ha)	45.44	188921	
	By-product (q/ha)	-	-	
19.	Farm harvest price of main product (Rs./q)		4157.59	
	Income from by-product (Rs./ha)	-	-	
20.	Gross income: main product + by-product (Rs./ha) 188921.00			

Summary results

	Costs	Returns/ha over costs (Rs.)	Costs/q (Rs.)	Input-output ratio over costs
1.	Cost A	136035	1163.86	1:3.57
2.	Cost B	105668	1832.15	1:2.27
3.	Cost C_1	73636	2537.08	1:1.64
4.	Cost C_2	62107	2790.80	1:1.49

gross return per hectare was Rs. 172236.00 which was higher than the total cost C_2. The details of costs and returns of bottle gourd are presented in Table 3 indicated that the estimated returns per hectare over cost C_2 was Rs. 71870.00. It is also apparent from the Table 3 that the average total cost (Cost C_2) of production per quintal of bottle gourd was Rs. 362.72. The average farm harvest price per quintal of bottle gourd was reported to be Rs. 622.46 which was higher than the cost of production per quintal. The input-output ratio (over Cost C_2) was 1:1.72 indicating the economic viability of bottle gourd crop.

Okra :

The details of cost of cultivation of okra crop are presented in Table 4. It can be observed from the table that the average total cost (Cost C_2) of pointed gourd was Rs. 192397 /ha. The average Cost A (operating cost) was estimated to be 52.14 per cent (100319.00 Rs./ha) of the total cost. The item wise cost components indicated that human labour ranked first (26.62%), followed by seeds (7.50 %), chemical fertilizer (6.26%), insecticides (5.48 %), manure (2.45 %) *etc.* The results showed that yield per hectare of okra was 142.35 quintals. The gross

Table 3: Details of cost of cultivation of bottle guard crop per hectare in Gujarat, 2014-15

Sr. No.	Items	Physical unit	Value Rs.	% to cost C_2
1.	Human labour			
	Family (man days)	101.75	17162	17.10
	Hired (man days)	83.25	13907	13.86
2.	Bullock labour (pair days)	-	-	-
3.	Seeds (kg)	3.00	2908	2.90
4.	Manures (kg)	12	2453	2.44
5.	Chemical fertilizers (kg) N	181	9737	9.70
	P	92		
	K	67		
6.	Irrigation		6768	6.74
7.	Insecticides/pesticides		2458	2.45
8.	Miscellaneous costs		5830	5.81
9.	Depreciation cost		276	0.27
10.	Interest on working capital		1773	1.77
11.	Rental value of owned land		27558	27.46
12.	Interest on owned fixed capital		412	0.41
13.	Management cost		9125	9.09
14.	Cost A		46109	45.94
15.	Cost B		74079	73.81
16.	Cost C_1		91242	90.91
17.	Cost C_2		100366	100.00
18.	Yield: Main product (q/ha)	276.70	172236	
	By-product (q/ha)	-	-	
19.	Farm harvest price of main product (Rs./q)		622.46	
	Income from by-product (Rs./ha)	-	-	
20.	Gross income: Main product + by-product (Rs./ha) 172236.00			

Summary results

	Costs	Returns/ha over costs (Rs.)	Costs/q (Rs.)	Input-output ratio over costs
1.	Cost A	126127	166.64	1:3.74
2.	Cost B	98157	267.72	1:2.33
3.	Cost C_1	80994	329.75	1:1.89
4.	Cost C_2	71870	362.72	1:1.72

return per hectare was Rs. 296108.00 which was higher than the total cost C_2. The details of costs and returns of okra are presented in Table 4 indicated that the estimated returns per hectare over cost C_2 was Rs. 103711.00. It is also apparent from the table that the average total cost (Cost C_2) of production per quintal of okra was Rs. 1351.58. The average farm harvest price per quintal of pointed gourd was reported to be Rs. 2080.14 which was higher than the cost of production per quintal. The input-output ratio (over Cost C_2) was 1:1.54 indicating the economic viability of pointed gourd crop.

Pointed gourd :

The details of cost of cultivation of pointed gourd crop are presented in Table 5. It can be observed from the table that the average total cost (Cost C_2) of pointed Gourd was Rs. 200665/ha. The average Cost A (operating cost) was estimated to be 43.84 per cent (87974.00 Rs./ha) of the total cost. The item wise cost components indicated that human labour ranked

Table 4 : Details of cost of cultivation of okra crop per hectare in Gujarat, 2014-15

Sr. No.	Items	Physical unit	Value Rs.	% to cost C_2
1.	Human labour			
	Family (man days)	156.75	26683	13.87
	Hired (man days)	142.25	24525	12.75
2.	Bullock labour (pair days)	4.25	1784	0.92
3.	Seeds (kg)	6.00	14431	7.50
4.	Manures (kg)	23.00	4706	2.45
5.	Chemical fertilizers (kg) N	374	12052	6.26
	P	106		
	K	20		
6.	Irrigation		10550	5.48
7.	Insecticides/pesticides		12431	6.46
8.	Miscellaneous costs		15471	8.04
9.	Depreciation cost		511	0.27
10.	Interest on working capital		3859	2.01
11.	Rental value of owned land		47377	24.63
12.	Interest on owned fixed capital		526	0.27
13.	Management cost		17491	9.09
14.	Cost A		100319	52.14
15.	Cost B		148223	77.04
16.	Cost C_1		174906	90.91
17.	Cost C_2		192397	100.00
18.	Yield: Main product (q/ha)	142.35	296108	
	By-product (q/ha)	-	-	
19.	Farm harvest price of main product (Rs./q)		2080.14	
	Income from by-product (Rs./ha)	-	-	
20.	Gross income: main product + by-product (Rs./ha) 296108.00			

Summary results

	Costs	Returns/ha over costs (Rs.)	Costs/q (Rs.)	Input-output ratio over costs
1.	Cost A	195789	704.73	1:2.95
2.	Cost B	147885	10.41.26	1:2.00
3.	Cost C_1	121202	1228.701	1:1.69
4.	Cost C_2	103711	1351.58	1:1.54

first (20.63%), followed by chemical fertilizer (6.95 %), seedlings (6.44%), insecticides (5.36%), manures (1.36%) *etc*. The results showed that yield per hectare of pointed gourd was 212.80 quintals. The gross return per hectare was Rs. 449041 which was higher than the total cost C_2. The details of costs and returns of pointed gourd are presented in Table 5 indicated that the estimated returns per hectare over cost C_2 was Rs. 248376.00. It is also apparent from the Table 5 that the average total cost (Cost C_2) of production per quintal of pointed gourd was Rs. 942.97. The average farm harvest price per quintal of pointed gourd was reported to be Rs. 2110.16 which was higher than the cost of production per quintal. The input-output ratio (over Cost C_2) was 1:2.24 indicating the economic viability of pointed gourd crop.

Marketing cost and margins :

The break-up of marketing costs incurred by vegetable growers are given in Table 6. It is evident from the results that on an average, total marketing cost incurred by vegetable growers was Rs. 80.25 per quintal.

Table 5 : Details of cost of cultivation of pointed guard crop per hectare in Gujarat, 2014-15

Sr. No.	Items	Physical unit	Value Rs.	% to cost C_2
1.	Human labour			
	Family (man days)	130.25	22147	11.04
	Hired (man days)	113.50	19243	9.59
2.	Bullock labour (pair days)	2.50	837	0.42
3.	Seeds (kg)	4876	12929	6.44
4.	Manures (kg)	15	2722	1.36
5.	Chemical fertilizers (kg) N	262	13936	6.95
	P	149		
	K	70		
6.	Irrigation		10717	5.34
7.	Insecticides/pesticides		10756	5.34
8.	Miscellaneous costs		12994	6.46
9.	Depreciation cost		456	0.23
10.	Interest on working capital		3384	1.69
11.	Rental value of owned land		71847	35.80
12.	Interest on owned fixed capital		455	0.23
13.	Management cost		18243	9.09
14.	Cost A		87974	43.84
15.	Cost B		160275	79.87
16.	Cost C_1		182422	90.91
17.	Cost C_2		200665	100.00
18.	Yield: Main product (q/ha)		212.80	449041
	By-product (q/ha)		-	-
19.	Farm harvest price of main product (Rs./q)		2110.16	
	Income from by-product (Rs./ha)	-	-	
20.	Gross income: main product + by-product (Rs./ha)	449041.00		

Summary results

Sr. No.	Costs	Returns/ha over costs (Rs.)	Costs/q (Rs.)	Input-output ratio over costs
1.	Cost A	361067	413.41	1:5.10
2.	Cost B	288766	753.17	1:2.80
3.	Cost C_1	266619	857.25	1:2.46
4.	Cost C_2	248376	942.97	1:2.24

of which the highest share was of transportation cost which accounted for 67.60 per cent (Rs. 54.25/qtl) followed by packing cost (26.79 %) and loading, unloading charges (5.61 %). The total marketing cost incurred by vegetable growers was highest in case of bottle gourd (Rs. 98.00/qtl) while it was lowest in case of green tur (Rs. 70.50/qtl). The transportation charges was the major marketing cost component which observed to varied between Rs. 52.25 in brinjal to Rs. 62.75 in bottle gourd. The second important cost component is packing cost which varied from Rs. 15.25/ qtl in green tur to Rs. 25.75 in bottle gourd. The loading and unloading cost varied from Rs. 4.25/qtl in brinjal to Rs. 9.50/qtl in bottle gourd.

Thus, the transportation charges and packing cost were the major marketing cost components at producer's level.

Marketing cost and margins in different vegetables:

The data on average marketing cost and margins at

Table 6: Major components of marketing cost of different vegetables at farmers level

Sr. No.	Vegetables	Cost component			
		Packing	Loading –unloading	Transportation	Total
1.	Brinjal	20.50 (26.62)	4.25 (5.52)	52.25 (67.86)	77.00 (100.00)
2.	Green tur	15.25 (21.63)	4.50 (6.38)	50.75 (71.99)	70.50 (100.00)
3.	Bottle gourd	25.75 (26.28)	9.50 (9.69)	62.75 (64.03)	98.00 (100.00)
4.	Okra	20.25 (25.16)	4.75 (5.90)	55.50 (68.94)	80.50 (100.00)
5.	Pointer gourd	21.50 (26.79)	4.50 (5.61)	54.25 (67.60)	80.25 (100.00)
	Average	20.65 (25.42)	5.50 (6.77)	55.10 (67.82)	81.25 (100.00)

Table 7: Marketing cost and margins in different vegetables

Item	Brinjal		Green tur		Bottle gouard		Okra		Pointed gouard	
	Rs.	%	Rs.	%	Rs.	%	Rs.	%	Rs.	%
Wholesaler level										
Purchase price	1175.50	61.87	4425.00	79.02	1100.00	61.11	2300.00	74.19	2425.00	75.78
Packing charge	22.75	1.20	23.50	0.42	27.25	1.51	25.50	0.82	23.75	0.74
Loading unloading	8.50	0.45	8.75	0.16	9.50	0.53	9.25	0.30	9.00	0.28
Transport cost	12.50	0.66	13.25	0.24	12.75	0.71	12.25	0.40	12.75	0.40
Commission	70.50	3.71	265.50	4.74	66.00	3.67	138.00	4.45	145.50	4.55
Market cess	11.75	0.62	44.25	0.79	11.00	0.61	23.00	0.74	24.25	0.76
Weighing	5.75	0.30	5.75	0.10	5.50	0.31	5.00	0.16	5.75	0.18
Gross margin	214.00	11.26	552.00	9.86	266.00	14.78	307.00	9.90	375.00	11.72
Marketing cost	131.75	6.93	361.00	6.45	132.00	7.33	213.00	6.87	221.00	6.91
Net margin	82.25	4.33	191.00	3.41	134.00	7.44	94.00	3.03	154.00	4.81
Retailer level										
Purchase price	1389.00	73.11	4977.00	88.88	1366.00	75.89	2607.00	84.10	2800.00	87.50
Packing charge	38.75	2.04	39.25	0.70	43.75	2.43	38.25	1.23	39.25	1.23
Loading unloading	7.25	0.38	7.25	0.13	8.50	0.47	7.50	0.24	7.25	0.23
Transport cost	25.25	1.33	27.50	0.49	39.25	2.18	24.50	0.79	27.25	0.85
Weighing	5.75	0.30	6.00	0.11	6.25	0.35	6.25	0.20	6.25	0.20
Spoilage	92.00	4.84	74.00	1.32	58.25	3.24	130.50	4.21	84.00	2.63
Consumer price	1900.00	100.00	5600.00	100.00	1800.00	100.00	3100.0	100.00	3200.00	100.00
Gross margin	511.00	26.89	623.00	11.13	434.00	24.11	493.00	15.90	400.00	12.50
Marketing cost	169.00	8.89	154.00	2.75	156.00	8.67	207.00	6.68	164.00	5.13
Net margin	342.00	18.00	469.00	8.38	278.00	15.44	286.00	9.23	236.00	7.38

wholesaler and retailers level are given in Table 7. The share of price received (purchase price and whole seller) by the vegetables growers in consumer prices was found the highest (9.02%) in green tur whereas it was lowest (61.11%) in bottle gourd. Among the marketing cost components at wholesaler level, the cost of commission charges was found the highest varying from Rs.66.00/qtl in bottle gourd to Rs. 265.00/qtl in green tur. The rate of commission was charged at the rate of 6 per cent of purchase price of wholesaler. Other important marketing cost at wholesaler level was packing charges which vried from Rs. 22.75 per quintal (brinjal) to Rs. 27.25 in bottle gourd; transportation charges which varied from Rs. 12.25 per quintal in okra to 13.25 in green turn and loading-unloading charges which varied from Rs. 8.50 per quintal in brinjal to Rs. 9.50 in bottle gourd. The total marketing cost incurred by the wholesaler was the highest in case of green tur (Rs. 361/qtl.) and the lowest in brinjal (Rs. 131.75). The net margin of wholesaler was the highest in case of green tur (Rs. 191/qtl.) and the lowest in brinjal (Rs. 82.25/qtl.). The share of net margins of wholesalers in consumer's prices varied from 3.03 to 7.44 per cent.

The major marketing cost component at retailer's level was spoilage which ranged from Rs. 58.25 (3.24 % of consumer's price) in case of bottle gourd to Rs. 130.50 per quintal (4.21% of consumer's price) in okra. The another important cost at retailer's level were packing charges and transportation cost accounted for about 0.70 to 2.43 per cent and 0.49 to 2.18 to consumers price, respectively. The total cost of marketing at retailer's level was the highest in okra (Rs. 207/qtl) and the lowest in green tur (Rs. 154/ qtl). The net margin of retailers was found the highest in green tur (Rs. 469/qtl) and the lowest in pointed gourd (Rs. 236/qtl). Where, the net margin earned per quintal by the retailers was above 2.50 times higher than wholesaler in marketing of vegetables.

Conclusion:

Production and marketing of vegetables is quick earning and employment generating as they are labour intensive crops. Increased demand for vegetables due to increased awareness about nutrition and special promotional efforts made by the government through Horticultural Mission may encourage vegetable farming. The recent development in rural road linkage would definitely increase marketable and exportable surplus and also minimize the spoilage losses during the transition period. These all go in favour of bright future of vegetable farming. At this juncture, it would be worthy to study the economics of marketing of vegetable crops and constraints associated with this.

The primary data were collected from 105 farmers for 5 vegetable crops grown in rabi and summer season in Bharuch district for the year 2014-15. The data regarding marketing costs and margins were collected from 9 wholesalers and 9 retailers of vegetables from the two major regulated markets of Bharuch and one of Surat district.

The important findings are given below:

The total cost of cultivation (Cost C_2) per hectare varied from Rs. 100366.00 in bottle gourd to Rs. 200665.00 in pointed gourd crop.

The major items of cost of cultivation in vegetable crops under study were human labour which varied from 20.63 per cent in pointed gourd to 48.83 per cent in green tur crop, chemical fertilizer 6.26 per cent in okra to 9.98 in brinjal crop, seed (1.19) per cent in green tur to (7.50) in okra and insecticides/pesticides (1.63) per cent in green tur to 6.74 in bottle gourd) .

The net return per hectare was found to be positive in all the vegetable crops. The net return/hectare over cost C_2 was highest 4490.41.00 in case of pointed gourd and lowest in bottle gourd (Rs. 172236.00).

The input –output ratio over Cost C_2 was the lowest in case of green tur (1:1.49) and highest in pointed gourd (1:2.24).

The total marketing cost incurred per quintal by the vegetable grower was the lowest in case of in green tur crop (Rs. 70.50) while it was highest in case of bottle gourd (Rs. 98.00).

On an average the total marketing cost per quintal incurred by the vegetable growers was Rs. 80.25/qtl of which major share was transportation cost that is Rs. 54.25/qtl (67.60 %) followed by packing cost (26.79 %) and loading-unloading (5.61 %).

The total marketing cost per quintal incurred by wholesaler varied from Rs. 131.75 in case of brinjal to Rs. 361.00 in green tur whereas, at retailing stage it varied from Rs. 154.00 in green tur to Rs. 207.00 in okra.

The total marketing cost per quintal net market margin of wholesaler varied from Rs. 82.25 in case of brinjal to Rs. 191.00 in green tur whereas, at margin of retailer was found between Rs. 236.00 in pointed gourd

to Rs. 469.00 in green tur.

The total price spread per quintal was highest in case of green tur *i.e.* Rs.1175.00 (20.98 % of consumers price) and the lowest in bottle gourd *i.e.* Rs. 700.00 (38.89 % of consumer's price).

Note : * The study has been carried out based on survey conducted as a part of University research project. Moreover, the primary survey based data has been utilized for the above study.

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