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Jorwar RM
PG Scholar, Shri Shivaji
Agriculture College Amravati,
Maharashtra, India

SM Sarap
Assistant Professor, Shri Shivaji
Agriculture College, Amravati,
Maharashtra, India

VU Chavan
PhD Scholar, Dept. of Agril.
Economics and Statistics Dr.
P.D.K.V, Akola, Maharashtra,
India

Economics of production and marketing of chilli in Amravati district

Jorwar RM, SM Sarap and VU Chavan

Abstract

In this study an attempt has been made to study the "Economics of chilli production in Amravati district" with view to work out the economics chilli production. The economic analysis of data indicating that cost 'C' was found to Rs. 168507.96, Rs. 181705.77 and Rs 184739.08 per hectare for small, medium and large growers respectively. Net returns over cost 'C' was Rs. 80619.40, Rs. 93008.90 and Rs. 107722.00 per hectare and input-Output ratio at cost 'C' was 1.48, 1.51 and 1.58 for small, medium and large growers respectively.

To study the existing marketing channels of chilli there are three channels were found

Channel-I Producer Consumer

Channel-II Producer → Retailer → Consumer

Channel-III Producer → Wholesaler → Retailer → Consumer

In case of chilli the price spread through channel-I were Rs. 214.80 per quintal. In case of channel-III the price spread of chilli was Rs. 923.26 per quintal. The marketing efficiency of chilli in channel-I was 24.02. In case of channel-III marketing efficiency of chilli was 8.24.

Keywords: chilli, cost of cultivation, marketing, price spread, marketing efficiency

Introduction

Vegetables are one of the important aspects of the horticulture sector of India in particular and of the agricultural sector of India in general. Various factors have led to the rise in the area under production of vegetables in India. India continues to be the second largest producer of vegetables in the world next to China. During 2013-14, the area under vegetables is estimated at 9.4 million ha with a production of 162.9 million tonnes in India. For this period the total vegetable production was highest in case of West Bengal (23,045 thousand tonnes) followed by Uttar Pradesh (18,545 thousand tonnes). While in Maharashtra the area under vegetable was (726.00 thousand ha) in 2013-2014 with the production of (10161.83 thousand tonnes). Per capita availability of vegetables in the country is 376.8 (in gms/person/day).

Chilli (*Capsicum annum L.*) is one of the most important commercial spice crops of India. Chilli is used in number of activities such as vegetables, spice, condiments, sauce, pickles. Chilli occupies an important place in Indian diet and it is indispensable item in the kitchen as it is consumed daily as condiment in one or the other form. India ranks second among world chilli exporters and has showed a steady decline in chilli trade due to domestic consumption. In India the area under chilli crop was sown in 2013-2014 was 140.04 thousand/ha with total production of 1687.33 thousand/tones. The area under chilli (green) in Maharashtra was about 99.50 thousand ha. During 2013-2014 and production was 45.60 thousand tons. In 2013-14, Area, Production and Productivity of chilli in Amravati district was 875(00' ha), 9494(00' tons) and 12.51 (kg/ha) respectively.

The main objective of the study was to work out economics and Marketing of chilli.

Methodology

For the present study, Amravati district was selected purposively. From Amravati district three tahsil namely viz. Amravati, Achalpur and Anjangaon surji were selected purposively by considering the maximum area under chilli cultivation. List of vegetable growing villages were obtained from taluka agriculture office of the selected tahsil and 5 villages from each tahsil were selected randomly. Two farmers from each village were selected for study. 30 growers for chilli was selected from 15 villages. The list of vegetable growers so obtained has been further regrouped under the category small, medium and large group on the basis of size of land holding. Simple tabular analysis was used for data analysis.

Correspondence

Jorwar RM
PG Scholar, Shri Shivaji
Agriculture College Amravati,
Maharashtra, India

Marketing agencies**Selection of producers**

Information from the producer who sold their produce to the direct consumer in the daily and weekly vegetable market under the scheme of producer to consumer (Shetkari- Grahak) there was selected for this study.

Selection of wholesaler

In Amravati, Achalpur and Anjangaon surji vegetable market 5 wholesalers in each market for the chilli was selected.

Selection of retailers

In Amravati vegetable market, Achalpur vegetable market and Anjangaon surji vegetable market 5 retailers for the chilli was selected purposively.

Method of collection of data

Survey method was used for collecting primary data on production and marketing of chilli vegetable. Scheduled of questionnaire containing detail information about cultivators, cultivation of crops, gross return, wholesale price, retail price, market functionaries, their expenditure, and profit etc. were prepared for collection of data.

The scheduled was pretested and thereafter finalised for collecting the information. Data pertains to the year 2014-2015

Cost concepts

The accepted standard cost concept i.e. cost A, cost B, and cost C, was used in present analysis.

Cost 'A'

It consists of all cash expenses actually incurred.

Cost 'B'

It includes Cost 'A' plus imputed rental value of owned land (less land revenue paid there upon) plus imputed interest on fixed capital (excluding land).

Cost 'C'

Cost 'C' includes Cost 'B' plus imputed value of family labour. This is total cost and it consists of all cash expenses and imputed cost in the cultivation of vegetables.

Evolution of return**Gross returns**

Returns obtained from sale of vegetable i.e. main produce and by produce

Net returns

The net return was worked out under each land holding group by subtracting the cost 'A' cost 'B' cost 'C' respectively from the gross monetary returns.

Input-output ratio**Input-output ratio in the context of Cost 'A'**

$$\text{Input-output ratio} = \frac{\text{Gross Income (Rs. /ha)}}{\text{Cost 'A'}}$$

Input-output ratio in the context of Cost 'B'

$$\text{Input-output ratio} = \frac{\text{Gross Income (Rs. /ha)}}{\text{Cost 'B'}}$$

Input-output ratio in the context of Cost 'C'

$$\text{Input-output ratio} = \frac{\text{Gross Income (Rs. /ha)}}{\text{Cost 'C'}}$$

Marketing cost and market margin

Marketing cost are the actual expenses incurred by producer, wholesaler and retailer.

Market margin is thus included total cost of marketing and the profit or loss due to intermediaries i.e. commission agent and retailer in the process of movement of produce from farmers to the final consumer.

Market margin

$$AM = P_m - (P_b + M_c)$$

Where,

Am = Absolute margin of the middlemen in the trade.

Pm = Selling price of the trader

Pb = Buying price of the trader

Mc = Marketing costs of trader

Price spread

In marketing of agricultural commodities the difference between price paid by the consumer and price received by the producer for an equivalent quantity of farm produce often known on price spread.

Marketing Efficiency

The marketing efficiency of the selected channels was studied with the help of slightly shepherd's formula as given below.

$$M.E. = \frac{V}{I} - 1$$

Where,

ME = Index of marketing efficiency

V = Value of Chilli

I = Total marketing cost

Result and Discussion**Per hectare cost of cultivation of chilli**

Table 1: Per hectare input utilization of chilli

Sr. No.	Particulars	Unit	Size of land holding			
			Small	Medium	Large	Overall
1	Hired human labour					
	a) Male	Days	33.21	43.61	47.32	39.62
	b) Female	Days	111.90	147.50	155.35	132.71
	Total		145.11	191.11	202.67	172.34
2	Bullock Pair	Pair	9.40	9.39	6.30	8.67
3	Machine charges	Hrs.	6.42	10.55	14.88	9.63
4	Manures	Carts	17.48	21.48	22.99	19.96

5	Irrigation	No.	47.97	46.89	52.38	48.67
6	Fertilizers					
	N	Kg	106.90	104.16	101.96	104.92
	P	Kg	52.02	48.61	47.44	49.92
	K	Kg	49.28	47.22	46.96	48.12
	Total		208.02	199.99	196.36	202.89
7	Seed	Kg	0.76	0.75	0.75	0.75
8	Plant protection chemicals	Liter	5.51	4.59	4.04	4.89
9	Family human labour					
	a) Male	Days	46.24	45.24	32.85	42.81
	b) Female	Days	73.30	69.60	62.14	69.58
	Total		119.54	114.84	94.99	112.40

It is seen from the Table 1 that per hectare hired human labour utilization was observed highest in large group i.e. 202.67 days, and at overall level it is 172.34 labour days. The bullock labour utilization at overall level was 8.67 pair days. The seed utilization at overall level was 0.75 kg per hectare. The farmers of large size group used more amount of manure i.e. 22.99 and at overall it is 19.96 carts per hectare. It is observed

that per hectare utilization of fertilizer was highest in small size group i.e. 208.02 kg. and at overall level it is 202.89 kg.

Per hectare cost of cultivation of chilli

The per hectare cost of cultivation of t chilli by selected growers is presented in Table 2

Table 2

Sr. No.	Particulars	Size of land holding			
		Small	Medium	Large	Overall
1	Hired human labour				
	a) Male	6642.86 (3.94)	8722.22 (4.80)	9464.28 (5.12)	7924.99 (4.47)
	b) Female	16785.70 (9.96)	22125 (12.18)	23303.57 (12.61)	19908.33 (11.24)
2	Bullock labour	4702.38 (2.79)	4699.07 (2.59)	3154.76 (1.71)	4340.276 (2.47)
3	Machine charges	1928.57 (1.14)	3166.66 (1.74)	4464.28 (2.42)	2891.66 (1.61)
4	Manures	12238.10 (7.26)	15037.04 (8.28)	16095.24 (8.71)	13977.78 (7.90)
5	Irrigation	14392.90 (8.54)	14069.44 (7.74)	15714.29 (8.51)	14604.19 (8.29)
6	Fertilizers				
	N	641.42 (0.38)	625 (0.34)	611.78 (0.33)	629.57 (0.35)
	P	1248.57 (0.74)	1166.66 (0.64)	1138.57 (0.62)	1198.33 (0.68)
	K	887.14 (0.53)	850 (0.47)	845.35 (0.46)	866.24 (0.49)
	7	Seed	18616.07 (11.05)	18958.33 (10.43)	18973.21 (10.27)
8	Plant protection	16535.7 (9.81)	13777.78 (7.58)	12142.86 (6.57)	14683.33 (8.38)
9	Incidental charges	236.90 (0.14)	224.06 (0.12)	261.90 (0.14)	238.88 (0.13)
10	Repairing Charges	200 (0.12)	253.70 (0.14)	264.28 (0.14)	231.10 (0.13)
11	Miscellaneous charges	265.47 (0.16)	266.66 (0.15)	399.40 (0.22)	297.07 (0.17)
12	Land revenue	175.83 (0.10)	177.22 (0.10)	178.09 (0.10)	176.77 (0.10)
13	Depreciation of assets	971.42 (0.58)	1052.31 (0.58)	1066.66 (0.58)	1030.13 (0.58)
14	Working capital	95321.79 (56.57)	104041.67 (57.26)	106833.81 (57.83)	100623.90 (57.07)
15	Interest on working capital	5719.31 (3.39)	6242.50 (3.44)	6410.03 (3.47)	6037.43 (3.42)
16	Cost-A	102188.35 (60.64)	111513.70 (61.37)	114488.60 (61.97)	107856.00 (61.16)
17	Rental value of land	41585.07 (24.68)	45941.60 (25.28)	48607.62 (26.31)	44530.62 (25.24)
18	Interest on fixed capital	4490.47 (2.66)	4861.57 (2.68)	5750 (3.11)	4895.69 (2.77)
19	Cost-B	148263.91 (87.99)	162316.88 (89.33)	168846.22 (91.40)	157282.30 (89.18)
20	Family human labour				
	a) Male	9248.30	9048.14	6571.42	8563.647

		(5.49)	(4.98)	(3.56)	(4.88)
	b) Female	10995.78	10440.81	9321.49	10438.62
		(6.53)	(5.75)	(5.05)	(5.95)
21	Cost-C	168507.96	181705.77	184739.08	176254.60
		(100.00)	(100.00)	(100.00)	(100.00)

It is seen from the Table 2 that the per hectare total cost of cultivation of chilli at overall level for the sample as a whole was Rs. 176254.60 amongst the different items of expenditure, overall human labour accounted 26.54 per cent share in the total cost cultivation and it is highest in all items which included in the cost of cultivation. The share of rental value of land is 25.24 per cent to the total cost. The proportion of other items of expenditure where bullock labour (2.47 per cent), machinery charges (1.61 per cent), seeds (10.68 per cent), manure (7.90 per cent), and fertilizer (1.52 per cent) the

share of interest on working capital and fixed capital was 3.42, per cent and 2.77 per cent respectively. The total cost of cultivation (cost 'C') of chilli was highest in the large size group i.e. 184739.08 per hectare followed by medium size group 181705.77 and small size group 168507.96 per hectare, respectively. At overall level per hector cost 'A' and Cost 'B' was Rs.107856.00 and Rs. 157282.30 respectively which was 61.16 per cent and 89.18 per cent of total Cost 'C'.

Economics of chilli productions

Table 3: Per hectare economics of Chilli production

Sr. No	Particulars	Size of Land holding			
		Small	Medium	Large	Overall
1	Average yield (qtl/ha)	94.52	98.70	103.92	97.96
2	Average price received per quintal	2635.71	2783.33	2814.29	2721.66
3	Gross Returns (Rs.)	249127.00	274715.00	292461.00	266914.70
4	Cost of production (Rs.)	1782.77	1840.99	1777.70	1799.05
5	Cost of cultivation (Rs.)				
	At Cost 'A'	102188.35	111514.00	114489.00	107856.20
	At Cost 'B'	148264.00	162316.88	168846.22	157282.40
	At Cost 'C'	168507.96	181706.00	184739.00	176254.60
6	Net return over cost (Rs.)				
	At Cost 'A'	146939.00	163201.00	177972.00	159058.60
	At Cost 'B'	100863.00	112398.00	123615.00	109632.30
	At Cost 'C'	80619.40	93008.90	107722.00	90660.19
7	Input-Output Ratio				
	At Cost 'A'	2.44	2.46	2.55	2.47
	At Cost 'B'	1.68	1.69	1.73	1.69
	At Cost 'C'	1.48	1.51	1.58	1.51

It could be revealed from the table 3 that the gross returns from chilli production at overall level were Rs. 266914.70 per hectare. The gross returns ranged between Rs 249127.00 in small size group to Rs. 292461.00 in large size group. Cost of cultivation at overall level cost 'A', cost 'B' and cost 'C' were Rs.107856.20, Rs. 157240.82 and Rs. 176254.60 respectively. Net returns per hectare of Cost 'A' is highest i.e. Rs 177972.00 in large size group followed by Rs. 163201.00 in medium size of group. The net return at Cost 'C' in small, medium and large size group were Rs. 80619.40, Rs.

93008.90, and Rs. 107722.00 respectively. In chilli the input-output ratio for overall size group at Cost 'A', Cost 'B' and Cost 'C' were 2.47, 1.69 and 1.51 respectively. The input-output ratio calculated at Cost 'A' and Cost 'C' were greater than unity in all the size groups indicating there by the production of chilli was profitable. Input-output ratio at Cost 'A' was highest i.e. (2.55) in large size group followed by medium (2.46) and small (2.44) size group.

To study the marketing channels of chilli

Table 4: Marketing of Chilli through channel- I. Producer → Consumer

Sr. No.	Particulars	Channel- I Producer → Consumer
1)	Price received by farmer as producer	2687.60
A)	Marketing cost incurred by producer	
i)	Loading	9.00
ii)	Cost of gunny bags/ crates	22.00
iii)	Transportation	38.00
IV)	Market fee	20.00
iv)	Weighing charges	3.50
v)	Unloading	8.50
vi)	Miscellaneous expenditure	6.40
2)	Marketing cost of producer	107.40
3)	Net price received by farmer	2580.20
4)	Consumer Price	2795.00
5)	Price Spread	214.80
6)	Producer share in consumer's rupee (%)	92.31

Table No. 4 revealed that information on marketing of chilli through marketing channel-I Producer → Consumer Amongst the three identified channels, it was the channel-I i.e. producer- to consumer. In which the farmer got the highest share of chilli was 92.31 percent to the consumer price. This is mainly due to the non- intervention of middle man. The share of total marketing cost of chilli was Rs. 107.40. The total price spread through this channel was Rs. 214.80 per quintal.

Table No. 5 revealed that information on marketing of chilli

through marketing channel-II Producer → Retailer → Consumer

It was second best channel through which the farmer got 65.66 percent share of consumer price of chilli. Marketing cost borne by the retailer accounted for Rs. 20.42 per quintal for chilli and the retailer sold the produce to the final consumer with a marginal profit of chilli was Rs. 118 per quintal. The total price spread through channel was Rs. 374.26 percent to the consumer price. The total marketing cost incurred by the farmer was Rs.117.92 per quintal.

Table 5: Marketing of chilli through channel-II Producer → Retailer → Consumer

Sr. No.	Particulars	Channel- II Producer → Retailer → Consumer
1)	Price received by farmer as a producer	2687.60
A)	Marketing cost incurred by producer	
i)	Loading	8.50
ii)	Cost of gunny bags	16.80
iii)	Transportation	33.40
iv)	Octroi	3.00
v)	Weighing charges	4.50
vi)	Commission	161.26
vii)	Unloading	4.50
viii)	Miscellaneous expenditure	3.50
2)	Marketing cost of producer	235.46
3)	Price paid by retailer to producer	2923.06
B)	Marketing cost incurred by retailer	
i)	Transportation	16.50
ii)	Hamali	2.40
iii)	Weighing charges	1.90
iv)	Market Cess	2.00
v)	Other Expenses	5.80
4)	Marketing cost of retailer	28.60
5)	Retailer margin	235.00
6)	Total marketing cost	264.06
7)	Net price received by farmer	2452.14
8)	Selling price of retailer or consumer price	3187.11
9)	Price spread	734.97
10)	Producer Share in consumer's rupee (%)	76.94

Table No. 5 revealed that information on marketing of chilli through marketing channel-II Producer Retailer Consumer

It was second best channel through which the farmer got 76.94percent share of consumer price of chilli. Marketing cost borne by the retailer accounted for Rs. 28.60per quintal for

chilli and the retailer sold the produce to the final consumer with a marginal profit of chilli was Rs. 235.00per quintal. The total price spread through channel was Rs. 734.97per quintal to the consumer price. The total marketing cost incurred by the farmer was Rs. 264.06 per quintal.

Table 6: Marketing of chilli through channel-III Producer → Wholesaler → Retailer → Consumer

Sr. No.	Particulars	Channel- III Producer → Wholesaler → Retailer → Consumer
1)	Price received by farmer as a producer	833.60
A)	Marketing cost incurred by producer	
i)	Loading	8.50
ii)	Cost of gunny bags	16.80
iii)	Transportation	28.50
iv)	Octroi	2.70
v)	Weighing charges	4.50
vi).	Commission	161.26
vii)	Unloading	4.80
viii)	Miscellaneous Expenditure	3.70
2)	Marketing cost of producer	230.75
3)	Producer selling price to wholesaler	2918.36
B)	Marketing Cost incurred by wholesaler	
i)	Transportation	16.10
ii)	Weighing charges	4.50
iii)	Hamali	3.50
iv)	Market Cess	2.00
v)	Other expenses	6.80
4)	Marketing cost of wholesaler	32.90

5)	Wholesaler margin or Profit	218.74
6)	Selling price of wholesaler	3170.00
C)	Marketing cost incurred by retailer	
i)	Transportation	14.60
ii)	Weighing Charges	3.00
iii)	Hamali	3.50
iv)	Other expenses	5.90
7)	Marketing cost of retailer	27.00
8)	Price received by retailer	3380
9)	Retailer margin or profit	183
10)	Net price received by farmer	2456.84
11)	Total marketing cost	290.66
12)	Total market margin	401.74
13)	Consumer price	3380.00
14)	Price spread	923.16
15)	Producer share in consumer rupee (%)	72.69

Table No. 6 revealed the information on marketing of chilli through marketing channel-III

Producer → Wholesaler → Retailer → Consumer

This was the most common practiced channel through which 50 per cent of vegetable produce in the district were marketed. Here, the producer share in consumer rupee of chilli was 72.69 per cent. In this marketing channel, the total marketing cost of chilli was Rs. 290.66 per quintal. The margin of wholesaler through this channel of chilli was Rs. 218.74 per quintal. Thus, out of these three channels under study, the Price spread in chilli was found to be high in

channel –III i.e. (Rs. 923.16 per quintal) owing to large number of market functionaries involved in the process of marketing of chilli. The producer share to consumer rupee was found to be highest in channel-I i.e. (92.31 per cent) as the farmer directly sold the produce to the ultimate consumer.

Marketing efficiency

Marketing efficiency moves around the fact that to what extent marketing agencies are able to move the goods at minimum cost extending maximum service from producer to final consumer.

Table 7: Marketing efficiency of chilli with different Marketing channels

Channel	Value of goods sold consumer price (Rs./q.) (V)	Total marketing cost (Rs./q.) (I)	Marketing efficiency (M)
Channel – I	2795.00	107.40	24.02
Channel – II	3187.11	264.06	9.17
Channel – III	3380.00	290.66	8.24

From the above table 7 it could be said that, marketing efficiency of chilli was highest in channel - I i.e. 24.02 than in channel-II at 9.17 for chilli, and channel- III at 8.24 for chilli.

It could be seen that the marketing efficiency was inverse relation with total cost and margin. Therefore, in order to improve the marketing efficiency and producer share in consumer price, it is necessary to reduce the number of intermediaries in marketing supply chain as well as to reduce marketing cost and marketing losses.

Conclusion

The study revealed that the Per hectare cost of cultivation of chilli at cost 'C' was highest in the large group i.e. Rs. 184739.08 followed by medium group Rs. 181705.77 and small group Rs. 168507.96. The average yield and gross returns per hectare increased with the increase in size of farms. Cost of cultivation at overall level cost 'A', cost 'B' and cost 'C' were Rs. 109396.88, Rs. 159809.00 and Rs. 176254.60 respectively. The net return at Cost 'C' in small, medium and large size group were Rs. 80619.40, Rs. 93008.90, and Rs. 107722.00 respectively. An input-output ratio for overall size groups at Cost 'A', Cost 'B' and Cost 'C' were 2.47, 1.69 and 1.51 respectively. The total marketing cost of chilli observed in channel -I was Rs 107.40 per quintal. In channel-II 264.06 per quintal. and in channel-III 290.66 per quintal respectively. The producer share in consumer rupee highest in channel-I i.e. 92.31 per cent to the consumer rupee. As regard to the marketing efficiency, it is observed that the marketing efficiency for the channel I, II and III comes out to 24.02, 9.17, and 8.24 respectively.

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