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Production and marketing of summer onion in Bhandara district, Maharashtra state

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Abstract
The study was undertaken to analyze the production economics and marketing practices of summer onion in Bhandara district, Maharashtra. A total of 60 farmers from Mohadi, Sakoli, and Pawani tehsils were selected for data collection through personal interviews. The per hectare cost of cultivation for summer onion was calculated at ₹96,361.93 (Cost C_3), yielding 132.66 quintals and generating gross returns of ₹1,81,273.26. The benefit-cost ratio was estimated at 1.88, indicating the profitability of summer onion cultivation. Among the marketing channels identified, Channel II (Producer → Wholesaler → Retailer → Consumer) was the most commonly used, accounting for the largest quantity sold. The net price received by farmers was highest in Channel I, but due to ease and access, Channel II remained preferred. The study also identified major constraints faced by farmers: lack of knowledge about improved varieties was the key issue in production (71.26%), while high transportation costs (66.75%) were the primary marketing barrier. The findings highlight the need for improved extension services and infrastructure to enhance productivity and marketing efficiency in onion farming.

Keywords: Onion, cost and returns, cultivation, constraints

Introduction
Onion (*Allium cepa L.*), often known as the bulb onion or normal onion, is a bulb-type vegetable due to the fact that it is one of the most widely produced varieties of the Alliaceae family. Allium species have adapted to several ecological niches and Onion is cultivated around the world for its important benefit.

Onion bulbs are cultivated in both tropical and temperate regions and are consumed throughout the year with high consumer preference because of their distinctive sensory and beneficial compounds Onion can be grown successfully in most fertile soils. It is an important economic crop because of its export demand, thus plays a vital role in foreign exchange. It is cultivated in a 5,039,908-ha land area worldwide with a world production of about 96,773,819 tonnes for the year 2018.

In India the area under onion was 1.91 million hectares, production was 31.27 million tonnes and productivity was 16380 kg/ha. In Maharashtra the area under onion was 925.20 thousand hectares, production was 13301.70 thousand tonnes and productivity was 14390 kg/ha. (2nd Adv Estimate. Department of Agriculture and Farmers Welfare, 2022-23). In Bhandara tonnes and productivity is 14061 kg/ha. in the year 2023-24 (SAO, Bhandara 2023-24).

With following objectives

1. To work out the cost and returns of summer onion
2. To study the marketing of summer onion.
3. To analyse the constraints faced by the farmers in production and marketing of summer onion.

Materials and Methods
The Bhandara district was purposively selected. The data pertaining to 2024-25 was considered for present investigation. From Bhandara district, three tehsils were selected *viz*. Mohadi, Sakoli and Pawani was selected on the basis of potential area under summer onion cultivation. From each selected tehsil, four villages were selected for the present study. Total 60 onion farmers were selected for the study.

The primary data were collected by keeping in view objectives of the study from selected farmers by personal interview method on different aspects.

The methods of analysis adopted in the present study were, the cost and returns of summer onion production, the standard cost concepts i.e. cost A1, cost A2, cost B1, cost B2, cost C1, cost C2 and cost C3 were used and Benefit cost ratio was worked out. Marketing cost and marketing margin was worked out from actual data collected from market intermediaries. The marketing cost incurred by selected producers was estimated from the data collected. The constraints faced by the farmers in production and marketing of onion crop was achieved by Garret ranking method.

Results and Discussions

The cost and returns of onion

The degree of management of resources can be judged for the utilization of resources, choice and decision making. Besides this, it also indicates the level of technology adopted by the farmers. The farmers required to spend on various inputs like seed, manures, fertilizers, human labour, bullock labour, machine labour, irrigation and plant protections.

It is revealed from the Table.1. that the per hectare input utilization for summer onion was hired human labour (78.59 days), bullock labour (8.55 pair days), machinery (3.33 hrs.), seed (6.46 kg.), manures (2.43 tonnes), fertilizers i.e. N (45.00 kg.), P (35.00 kg.), K (10.00 kg.), respectively. The plant protections cost was Rs. 2456.36, irrigation charges i.e. Rs. 1020.00 and family labour (52.93 days) was utilized per hectare for summer onion.

Table 1: Per hectare input utilization of summer onion

Sr. No.	Particulars	Unit	Inputs/ha
			Onion
1	Hired human labour a) Male	Days	15.69
	b) Female		62.90
	Sub-total		78.59
2	Bullock pair	Pairs day	8.55
3	Machine charges (Hired)	Hours	3.33
4	Seed	Kg	6.46
5	Manures	Tons.	2.43
6	Fertilizers a) N	Kg	45.00
	b) P	Kg	35.00
	c) K	Kg	10.00
	Sub-total		90.00
7	Irrigation charges	Rs.	1020.00
8	Plant protection		2456.36
9	Family labour a) Male	Days	29.96
	b) Female		22.97
	Sub-total		52.93

Per hectare cost of cultivation of onion

The share of each item in the total cost provides necessary due to economizing costs. The cost has been determined on the basis of standard cost concepts i.e. cost 'A1', cost 'A2', cost 'B1', cost 'B2', cost 'C1', cost 'C2' and cost 'C3'. The different cost concepts have different utilities in research.

It is revealed from the Table 2. that the per hectare cost of cultivation for summer onion at cost 'A1' and cost 'A2' was Rs. 42875.95, cost 'B1' was Rs. 44252.62 and cost 'B2' was Rs. 72210.81, whereas cost 'C1' was Rs. 59643.56, cost 'C2' was Rs. 87601.75 and cost 'C3' was Rs. 96361.93. In cost 'A1' and cost 'A2', major per cent share of hired human labour was 21.10 per cent followed by bullock labour (4.93 per cent), seed (4.47 per cent), hired machinery charges (3.27 per cent), fertilizers (2.80 per cent), plant protections (2.55 per cent), manures (1.15 per cent) and irrigation charges (1.09 per cent). All the inputs are in cash for which growers required to pay immediately from the pocket. Cost 'B1' contributes 45.92 per cent, cost 'B2' contributes to 74.94 per cent to the total cost i.e. cost 'C3'. The share of imputed value of family labour was 15.97 per cent. The per hectare yield of summer onion was obtained 132.66 quintals main produce with gross returns of Rs. 181273.26. In case of summer onion per quintal cost of production was Rs. 726.38.

Table 2: Per hectare cost of cultivation of summer onion

Sr. No.	Particulars	Unit	Input per hectare	Rate per unit of inputs (Rs.)	Total cost per hectare (Rs.)	Per cent to Cost 'C3'
1	2	3	4	5	6	7
1	Hired Human labour a) Male	Days	15.69	355.46	5576.36	5.79
	b) Female	Days	62.90	234.56	14753.74	15.31
	Sub-total	Days	78.59		20330.10	21.10
2	Bullock pair	Days	8.55	555.67	4750.98	4.93
3	Machine charges (Hired)	Hours	3.33	946.31	3151.21	3.27
4	Seed	Kg.	6.46	666.56	4305.98	4.47
5	Manures	Tons.	2.43	456.26	1108.71	1.15
6	Fertilizers a) N	Kg.	45.00	32.32	1454.40	1.51
	b) P	Kg.	35.00	29.35	1027.25	1.07
	c) K	Kg.	10.00	21.35	213.50	0.22

	Sub-total		90.00		2695.15	2.80
7	Irrigation charges (Rs.)				1050.00	1.09
8	Incidental charges (Rs.)				653.33	0.68
9	Plant Protection (Rs.)				2456.36	2.55
10	Repairing charges (Rs.)				424.66	0.44
11	Weedicide (Rs.)				0.00	0.00
12	Working Capital (1 to 11) (Rs.)				40926.48	42.47
13	Interest on working capital @ 6 per cent annum (Rs.)				1227.79	1.27
14	Depreciation charges (Rs.)				661.33	0.69
15	Land revenue (Rs.)				60.35	0.06
16	COST "A_1" (12 to 15) (Rs.)				42875.95	44.49
17	Rent paid for leased in land				0.00	0.00
18	COST "A_2" (16 + 17)				42875.95	44.49
19	Int. on fixed capital @10% per cent annum				1376.67	1.43
20	COST "B_1" (18 + 19)				44252.62	45.92
21	Rental value of land (Rs.)				27958.19	29.01
22	COST "B_2" (20 + 21)				72210.81	74.94
23	Imputed value of family a) Male human labour	Days	29.96	341.64	10236.50	10.62
	b) Female	Days	22.97	224.36	5154.44	5.35
	Sub-total	Days	52.93		15390.94	15.97
24	Cost " C_1 " (20 + 23) (Rs.)				59643.56	61.90
25	Cost " C_2 " (22 + 23) (Rs.)				87601.75	90.91
26	Supervision charges @10 per cent of Cost C_2				8760.18	9.09
27	Cost " C_3 " (25 + 26)				96361.93	100.00
28	Yield per hectare (qtl.)	Main produce	132.66	1366.45	181273.26	
29	Gross value of produce (Rs)				181273.26	
30	Per quintal cost of production (Rs.)				726.38	

Per hectare cost and returns from onion crop

The per hectare cost and returns structure of agricultural production helps cultivator in mapping adjustment in the organization and there by secure the optimum level of production and income.

It is revealed from the Table 3 that, for summer onion the per hectare average gross returns for summer onion was worked out to Rs. 181273.26. The net returns per hectare obtained at various costs were Rs. 42875.95 at cost 'A1' and 'A2', Rs. 44252.62 at cost 'B1', Rs. 72210.81 at cost 'B2', Rs. 59643.56 at cost 'C1', Rs. 87601.75 at cost 'C2', Rs. 96361.93 at cost 'C3'. Similar results were reported by Meena *et al.* (2021) the total cost of cultivation of onion was obtained Rs. 75016.00. This means summer onion crop appeared to be good for monitory benefits and profitable crop. The benefit- cost ratio at cost 'C3' was recorded 1.88. The benefit-cost ratio which is an indicator of economic efficiency in crop production for the vegetable crop and other discussion indicated that onion registered a good benefit-cost ratio, ratio 1:1.88 means there is profitable.

Table 3: Economics summer of onion

Sr. No	Particulars	Onion
1.	Yield of main produce (quintal/ha)	132.66
2.	Price per quintal (Rs.)	1366.45
3.	Value of main produce	181273.26
4.	Gross returns	181273.26
5.	**Cost of cultivation at**	
	Cost 'A_1'	42875.95
	Cost 'A_2'	42875.95
	Cost 'B_1'	44252.62
	Cost 'B_2'	72210.81
	Cost 'C_1'	59643.56
	Cost 'C_2'	87601.75
	Cost 'C_3'	96361.93
6.	**Net Returns at**	
	Cost 'A_1'	138397.30
	Cost 'A_2'	138397.30
	Cost 'B_1'	137020.63
	Cost 'B_2'	109062.44
	Cost 'C_1'	121629.69
	Cost 'C_2'	93671.50
	Cost 'C_3'	84911.33
7.	**Benefit-cost ratio**	
	Cost 'A_1'	4.23
	Cost 'A_2'	4.23
	Cost 'B_1'	4.10

	Cost 'B_2'	2.51
	Cost 'C_1'	3.04
	Cost 'C_2'	2.07
	Cost 'C_3'	1.88

Marketing of onion

Marketing is the study of all activities, agencies and policies involved in procurement of farm products by the farmers and movements of farm products from farmers to consumers. Marketing channel are route through which produce moves from producer to ultimate consumer.

Channel wise distribution of summer onion during Marketing: The summer onion farmers in Bhandara district was sold their produce through the middlemen namely wholesalers and retailers.

Marketing Channels for summer onion:

Channel I: Producer → Consumer.

Channel II: Producer → Wholesaler → Retailer → Consumer.

Channel lll: Producer → Retailer → Consumer

It is revealed from the Table 4. that the maximum quantity of summer onion (72.93 qtl.) was sold through channel II.

Table 4: Channel wise distribution of summer chilli and onion quantity sold by the farmers

Sr. No.	Channel	Summer onion	
		No. of farmers (60)	Quantity sold (qtl.)
1	Channel I	13	28.92
2	Channel II	32	72.93
3	Channel III	15	30.81
	Total	60	132.66

Marketing cost and market margin of onion

The per quintal marketing cost incurred by the producer, wholesaler, trader and retailer was estimated in all the three channels and the results are presented in the Table 5.

It is revealed from Table 5. that the per quintal marketing cost Incurred by the summer onion farmers was found the highest in channel II (Rs. 139.64) followed by channel III (Rs. 138.26) and channel I (Rs. 88.50). The total marketing cost incurred by summer onion farmers, wholesalers and retailers in channel I was Rs. 88.50, channel II Rs. 375.33 and channel III was Rs. 259.65. It is observed that total marketing margin received by different intermediaries in channel II was Rs. 406.93 and in channel III Rs. 185.53. Similar results were reported by Hattimare *et al.*, 2022 the total marketing cost of chilli was incurred in channel I was Rs. 132.00, channel II was Rs. 102.50 and channel III was Rs. 603.26.

Table 5: Marketing cost and marketing margin incurred in summer onion marketing

Sr. No.	Particulars	Total price (Rs/qtl.)		
		Channel I	Channel II	Channel III
a)	**Marketing cost incurred by producer**			
1	Cost of gunny bag	25.30	24.70	24.60
2	Loading & unloading	19.84	20.87	20.33
3	Transportation charges	29.53	27.28	28.06
4	Weghing charges	8.53	9.15	9.20
5	Packing & stiching	5.30	5.81	6.13
6	Hamali	-	9.50	10.50
	Commision	-	42.33	39.44
	Marketing cost of producer	88.50	139.64	138.26
	Selling price of producer	1258.46	1275.06	1284.00
	Net price received by producer	1169.96	1135.42	1145.74
b)	**Marketing cost incurred by wholesaler**			
1	Cost of gunny bag	-	24.84	-
2	Loading & unloading	-	19.96	-
3	Storage	-	32.18	-
4	Market access	-	12.64	-
5	Weighing charges	-	9.31	-
6	Hamali	-	10.50	-
	Marketing cost of wholesaler	-	109.43	-
	Market margin of wholesaler	-	199.31	-
	Selling price of wholesaler	-	1583.80	-
c)	**Marketing cost incurred by retailer**			
1	Cost of gunny bag	-	25.09	26.73
2	Loading & unloading	-	19.06	19.13
3	Transportation charges	-	25.75	22.46
4	Storage	-	34.68	31.66
5	Market access	-	12.62	12.75
6	Weighing charges	-	9.06	8.66
	Marketing cost of retailer	-	126.26	121.39
	Market margin of retailer	-	207.62	185.53

	Selling price of retailer	-	1917.68	1590.92
d)	Total marketing cost incurred	88.50	375.33	259.65
e)	Total marketing margin by intermediaries	-	406.93	185.53

Price spread in marketing of onion

Price spread refers to difference between price paid by the consumer and price received by the producer for an equivalent quantity of the farm produce.

It is revealed from Table 6. that the net price received by producer in the marketing of summer onion was the highest i.e. Rs. 1169.96 per quintal in channel I followed by Rs. 1145.74 per quintal in channel III and Rs. 1135.42 per quintal in channel II. Marketing margin incurred by the different intermediaries was the highest in channel II i.e. Rs. 406.93 followed by Rs. 185.53 in channel III. Producer's share in consumer's rupee was found highest i.e. 92.97 per cent in channel I followed by 72.02 per cent in channel III and 59.21 per cent in channel II in the marketing of summer onion. Similar results were reported by Usha *et al.* (2022) the producer shares in consumer rupees in channel I was 68.64 per cent, channel II was 78.27 per cent and in channel III was 95.00 per cent.

Table 6: Channel wise price spread in marketing of summer onion

Sr. No.	Particulars	Channel I	Channel II	Channel III
1	Net price received by Producer	1169.96 (92.97)	1135.42 (59.21)	1145.74 (72.02)
2	Total marketing cost	88.50 (7.03)	375.33 (19.57)	259.65 (16.32)
3	Total market margin	-	406.93 (21.22)	185.53 (11.66)
4	Consumer's price	1258.46 (100.00)	1917.68 (100.00)	1590.92 (100.00)
5	Producer’s share in consumer's rupee (%)	92.97	59.21	72.02

Constraints faced by farmers in production and marketing of onion

All the selected summer onion farmers were interviewed for the problems they are facing while production and marketing of summer onion. Based on the Garrett's score, the table 7. represents among the various summer onion production constraints lack of knowledge about improved varieties was the major production constraint (71.26 per cent) followed by less effective and costly weedicides (66.93 per cent), labour problem for weeding (52.03 per cent), insect and pests infestation (47.26 per cent), lack of knowledge about control measures (31.05 per cent), irrigation scarcity (26.58 per cent) and in marketing constraint high transportation cost was the major marketing constraints (66.75 per cent) followed by high fluctuation in market prices (61.30 per cent), open auction sale fetches low price for onion produce (44.50 per cent), lack of storage facilities (43.96 per cent) and lack of market information/news (32.48 per cent). The results were in agreement with findings of Sahu *et al.* (2013) the major technological constraints were lack of knowledge about improved varieties, seed rate and sowing time in vegetables.

Table 7: Constraints faced by farmers in production and marketing of summer onion

Sr. No.	Constraints	Mean score	Rank
A	Constraints in production of summer onion		
1	Irrigation scarcity	26.58	VI
2	Infestation of insect pest	47.26	IV
3	Lack of knowledge about improved varieties	71.26	I
4	Less effective and costly weedicides	66.93	II
5	Labour problem for weeding	52.03	III
6	Lack of knowledge about control measures	31.05	V
B	Constraints in marketing of onion		
1	High fluctuation in market prices	61.30	II
2	High transportation cost	66.75	I
3	Lack of storage facilities	43.96	IV
4	Lack of market information / news	32.48	V
5	Open auction sale fetches low price for onion produce	44.50	III

Conclusion

The per hectare input utilization for summer onion was hired human labour (78.59 days), bullock labour (8.55 pair days), machinery (3.33 hrs.), seed (6.46 kg.), manures (2.43 tonnes), fertilizers i.e. N (45.00 kg.), P (35.00 kg.), K (10.00 kg.), respectively. The plant protections cost was Rs. 2456.36, irrigation charges i.e. Rs.1020.00 and family labour (52.93 days) was utilized per hectare for summer onion.

Per hectare cost of cultivation for summer onion at cost 'A1' and cost 'A2' was Rs. 42875.95, cost 'B1' was Rs. 44252.62 and cost 'B2' was Rs. 72210.81, whereas cost 'C1' was Rs. 59643.56, cost ‘C2’ was Rs.87601.75 and cost ‘C3’ was Rs. 96361.93. The per hectare yield of summer onion was obtained 132.66 quintals main produce with gross returns of Rs. 181273.26 and per quintal cost of production was Rs. 726.38. The benefit-cost for summer onion at cost ‘C3’ 1.88, respectively.

Producer's share in consumer's rupee was found highest i.e. 92.96 per cent in channel I followed by 72.01 per cent in channel III and 59.20 per cent in channel II in the marketing of summer onion.

The major constraints faced in production of summer onion was lack of knowledge about improved varieties 71.26 per cent and in marketing high transportation cost was the major marketing constraints 66.75 per cent.

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