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An economic analysis production and marketing of pigeon pea in Surguja district of Chhattisgarh

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Abstract

The present study was conducted in Surguja district of Chhattisgarh, 150 farmers were selected purposely on the basis of total number of farmers in district with categories by different farm category from the 12 villages. The main aim of study was to examine the cost and return of Pigeon pea. The primary data was collected in the cropping year 2017-18 from sampled households through personal interview method. Average farm size of sample farmers was 3.03 hectare and average cropping intensity (139.57 per cent). An average cost of cultivation per hectare of pigeon pea was calculated of Rs. 25562.77. An average yield of pigeon pea 13.54 qtl. per hectare. On an average input output ratio in pigeon pea came 1:1.86 on the sample farms. Average cost of production per quintal of pigeon pea, was worked out to be, Rs. 1887.94, the net income was calculated of pigeon pea is Rs. 47533.78 per hectare. The channels prevalent for Pigeon pea marketing in the study area were as following:- Channel I: Producer - Consumers, Channel-II: Producer - Village trader/Agent - Wholesalers - Processor - Retailers - Consumers, Channel III: Producer - Wholesaler - Processor - Retailer - Consumers. In particular to the study area there was a lack of implementation of MSP. Based on the findings it is a suggested that government needs to accelerate the establishment of processing units especially for as pulses crops. Govt. should procure to major agricultural farm produce in the Primary Agricultural Cooperative Societies. It should promote small scale industries to improve the economy of farmers as well as Chhattisgarh; also procurement of major agricultural produce in Minimum Support Price should be done.

Keywords: Pigeon pea, cost and returns, marketing and major constraints

1. Introduction

Indian economy is predominantly rural and agricultural where there is a severe issue with the decreasing trend in the average size of the farm holding. The linear growth in population and unplanned colonization lead to rapid fragmentation of land holdings and shrinkage in fertile cultivated land. Agriculture plays a crucial role in the economy of India. 54.6% of the population is involved, in agriculture land and related operation and adds 17.4% to the country. Total pulses production during 2017-18 is estimated at record 23.95 million tonnes which is higher by 0.82 million tonnes than the previous year's production of 23.13 million tonnes. Moreover, the production of pulses during 2017-18 was higher than the five years 'average production by 5.10 million tonnes. Pigeon pea (*Cajanus cajan*) is an importance pulse crop, commonly known as Pigeon pea. Globally pigeon pea it is the fifth most important pulse crop. In India total pulse production 16.47 mt. with Pigeon pea production with 2.90 mt. of production in an area of 4.01 million ha at productivity level of 725 kg/ha, the ever highest yield in the year (2014-15) The area under Pigeon pea in Chhattisgarh during 2015-16 was 56.109 thousand ha while production was 30.601 thousand tonnes with an average productivity in 470 kg/ha. In Chhattisgarh Pigeon pea is mostly grown in Surguja, Raigarh, Jashpur, Jagdalpur, Mahasamund, Kanker, Rajnandgaon and Korba districts which together account for about 3948 ha. area and 75.04% (4.616 thousand mt.) production. Higher productivity of Pigeon pea is obtained in surguja (1187 kg/ha). Very few studies have been conducted in the past to examine the production and marketing of pigeon pea in Chhattisgarh more so, in Surguja district and so looking to above facts, a study is essential to undertake through which a detailed insight can be obtained to analyse "An economic analysis of cost and return of pigeon pea in Surguja district of Chhattisgarh" with the following specific objectives:

1. To work out the cost and returns of Pigeon pea crop in the study area.
2. To examine the marketing pattern of Pigeon pea crop in the study area.
3. To identify the constraints in production and marketing of Pigeon pea crop and to suggest remedial measures to overcome them.

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2. Methodology

2.1 Cost of cultivation

The cost concepts approach to farm costing is widely used in India. To work out the cost of cultivation standard method of cost of cultivation employed by Commission on Agricultural Costs and Price (CACP), Directorate of Economics and Statistics, Government of India was adopted which include Cost A1, Cost A2, Cost B1, Cost B2, Cost C1, Cost C2 and Cost C3.

2.2. Disposable pattern

To examine the marketing pattern of pigeon pea at different categories of farms, simple analysis was done. To estimate the marketable surplus of produce, total quantity used for different purposes was estimated as under:

MS = Total quantity produced - Quantity used at home for different purposes

3. Results and Discussion

3.1 Cost of cultivation of pigeon pea crops

The cost of cultivation of pigeon pea is shown in table 1. And fig 1. It can be seen that on an average per hectare cost of cultivation of pigeon pea was estimated as Rs. 25562.77 which varied from Rs.23622.82 per hectare at marginal farms to Rs. 26574.01 per hectare at large farms respectively. The share of major cost on the cultivation of pigeon pea was observed human labour. The average per hectare human labour cost was estimated as Rs. 5242.07 per hectare which varied from Rs. 4692.70 per hectare at marginal farms to Rs. 5697.03 per hectare at large farms respectively. The contribution of family human labour and hired human labour was observed 9.51 per cent and 11.34 per cent respectively of the total cost of cultivation. The next major cost was observed as bullock and machinery which was estimated as Rs. 2644.94 per hectare, which varied from Rs. 2398.54 per hectare at marginal farms to Rs. 2644.94 per hectare at large farms respectively, the contribution of bullock and machinery was observed 10.53 per cent respectively of the total cost of cultivation respectively.

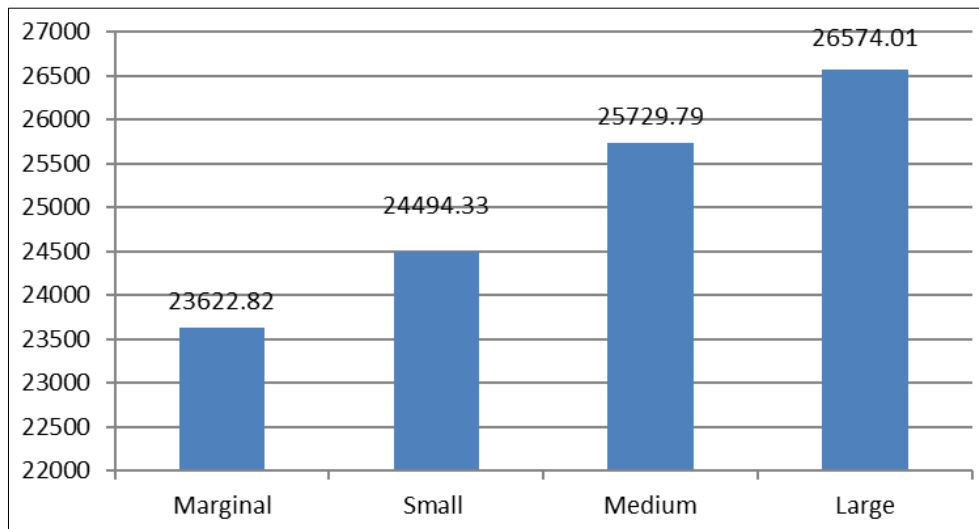


Fig 1: Cost of cultivation of pigeon pea at sampled households (Rs/ha.)

Table 1: Cost of cultivation of pigeon pea at different size groups of farms. (Rs/ha)

S. no.	Particular	Marginal	Small	Medium	Large	Overall
A	Variable cost					
1	Human labour					
a)	Family labour	2710.10 (11.47)	2440.30 (9.96)	2296.50 (8.93)	2044.40 (7.69)	2271.90 (9.51)
b)	Hired labour	1982.60 (8.39)	2673.13 (10.91)	3168.60 (12.31)	3652.63 (13.75)	3136.18 (11.34)
	Total human labour	4692.70 (19.87)	5113.43 (20.88)	5465.10 (21.24)	5697.03 (21.44)	5242.07 (20.85)
2	Bullock and machinery power					
a)	Bullock	326.08 (1.38)	313.43 (1.28)	244.18 (0.95)	130.99 (0.49)	228.69 (1.03)
b)	Machinery	2072.46 (8.77)	2249.25 (9.18)	2525.58 (9.82)	2717.78 (10.23)	2492.55 (9.50)
	Total bullock and machinery	2398.54 (10.15)	2562.68 (10.46)	2769.76 (10.76)	2848.77 (10.72)	2644.94 (10.53)
3	Seed	3600.00 (15.24)	3546.26 (14.48)	3600.00 (13.99)	3600.00 (13.55)	3585.73 (14.31)
4	Manure & fertilizers	3852.17 (16.31)	3888.05 (15.87)	4038.83 (15.70)	4346.66 (16.36)	4092.90 (16.06)
5	Plant protection	250.00 (1.06)	418.85 (1.71)	664.18 (2.58)	790.29 (2.97)	619.06 (2.08)
6	Irrigation charge	101.44 (0.43)	138.80 (0.57)	211.62 (0.82)	225.73 (0.85)	191.04 (0.67)

7	Miscellaneous cost	100.00	120.00	150.00	180.00	150.00
		(0.42)	(0.49)	(0.58)	(0.68)	(0.54)
8	Interest on working capital	491.39	533.90	584.12	625.76	579.82
		(2.08)	(2.18)	(2.27)	(2.35)	(2.22)
Total variable cost		15486.24	16321.97	17483.61	18314.24	17337.36
		(65.56)	(66.64)	(67.95)	(68.92)	(67.82)
B	Fixed cost					
9	Land revenue	12.00	12.00	12.00	12.00	12.00
		(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
10	Depreciation	103.62	138.80	211.62	225.73	191.04
		(0.44)	(0.57)	(0.82)	(0.85)	(0.75)
11	Interest on fixed capital	532.96	533.56	534.56	534.04	534.37
		(2.26)	(2.18)	(2.08)	(2.01)	(2.09)
12	Rental value of owned land	7500.00	7500.00	7500.00	7500.00	7500.00
		(31.75)	(30.62)	(29.15)	(28.22)	(29.34)
Total fixed cost		8148.58	8184.36	8258.18	8271.77	8237.41
		(34.49)	(33.41)	(32.10)	(31.13)	(32.22)
C	Total cost (A+B)	23622.82	24494.33	25729.79	26574.01	25562.77
		(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Note: Figures in the parentheses are percentage to total cost of cultivation of pigeon pea

3.2 Yield Value of Output and Cost of Production of Pigeon pea

The yield value of output per hectare and production price per quintal of Pigeon pea is provided in Table 2 the average cost was to be estimated as Rs. 25562.77 per hectare which varied from Rs. 23622.82 per hectare at marginal farms to Rs. 26574.01 per hectare at large farms. Overall with total output was observed 21.19 quintals per hectare. The average gross

return was varied From Rs. 73096.55 the gross return was varied from Rs. 57100 per hectare at marginal farms to Rs. 79690 per hectare at large farms. On an average the net income was Rs. 47533.78 per hectare. The average output price per quintal has been cost estimated as Rs. 1887.94. On an average Input Output Ratio was 1:1.86 which varies from 1:1.42 at marginal farms to 1:2.00 at large farms.

Table 2: Economics Value of Pigeon pea at sample farms (Rs. / ha)

S. No.	Particulars	Marginal	Small	Medium	Large	Overall
1	Main yield (qt /ha.)	10.5	12.5	13.6	14.8	13.54
	Price/qt.	4400	4400	4400	4400	4400
	Return (Rs./ha.)	54600	65000	70720	76960	70433.92
2	By product yield (qt /ha.)	7.2	7.5	7.8	8.1	7.65
	Price/qt.	50	50	50	50	50
	Return (Rs./ha.)	2500	2575	2630	2730	2662
3	Gross Return (Rs./ha.)	57100	67575	73410	79690	73096.55
4	Cost of cultivation (Rs./ha.)	23622.82	24494.33	25729.79	26574.01	25562.77
5	Net Return (Rs./ha.)	33477.18	43080.67	47680.21	53115.99	47533.78
6	Cost of production (Rs/qt.)	2249.79	1959.54	1891.89	1795.54	1887.94
7	Input-output ratio	1:1.42	1:1.76	1:1.85	1:2.00	1:1.86

3.3 Cost and returns of the pigeon pea crop on the basis of cost concept

Costs and return based on cost concept in pigeon pea production were provided in table 3. Overall on an average Cost-A1, Cost-A2, Cost-B1, Cost- B2, Cost-C1, Cost-C2 and Cost-C3 were worked out to Rs. 15256.50, Rs. 15256.50, Rs.

15790.87, Rs. 23290.87, Rs. 18062.77, Rs. 25562.77, Rs. 28119.05 per hectare respectively on the sampled farms. On an average net income over Cost-A1, Cost-A2, Cost-B1, Cost- B2, Cost-C1, Cost-2 and Cost-C3 were calculated to be Rs. 57840.05, Rs. 57840.05, Rs. 57305.68, Rs. 49805.68., Rs. 55033.78, Rs. 47533.78 and Rs. 44977.50 respectively.

Table 3: Break-up of total cost, cost concept wise income over different cost of pigeon pea (Rs./ha)

S. No.	Particular	Marginal	Small	Medium	Large	Overall
A	Break-up of cost					
1	Cost A1	12879.76	14020.47	15398.73	16495.57	15256.50
2	Cost A2	12879.76	14020.47	15398.73	16495.57	15256.50
3	Cost B1	13412.72	14554.03	15933.29	17029.61	15790.87
4	Cost B2	20912.72	22054.03	23433.29	24529.61	23290.87
	A2+FL	15589.86	16460.77	17695.23	18539.97	17528.40
5	Cost C1	16122.82	16994.33	18229.79	19074.01	18062.77
6	Cost C2	23622.82	24494.33	25729.79	26574.01	25562.77
7	Cost C3	25985.10	26943.76	28302.77	29231.41	28119.05
B	Gross income over different cost					
1	Income over cost A1	44220.24	53554.53	58011.27	63194.43	57840.05
2	Income over cost A2	44220.24	53554.53	58011.27	63194.43	57840.05
3	Income over cost B1	43687.28	53020.97	57476.71	62660.39	57305.68

4	Income over cost B2	36187.28	45520.97	49976.71	55160.39	49805.68
5	Income over cost C1	40977.18	50580.67	55180.21	60615.99	55033.78
6	Income over cost C2	33477.18	43080.67	47680.21	53115.99	47533.78
7	Income over cost C3	31114.90	40631.24	45107.23	50458.59	44977.50

3.4 Quantity sold of Pigeon pea

The three type of marketing channel identified in the study area were as Channel I: Producer - Consumers. Channel II: Producer - Village trader /Agent - Wholesalers - Processor - Retailers - Consumers. Channel III: Producer - Wholesaler - Processor - Retailer - Consumers. It is clear from table 4 that most of the produce was sold through the consumer by marginal and medium farmers about 54.55 percent and 48.57

percent respectively in the study area second large quantity sold through village traders about 35.48 percent and 27.27 percent by small and marginal farmers. Overall maximum farm product sold through direct consumer about 46.24 percent then second by the village traders 27.96 percent. There are no major difference between village traders and wholesalers

Table 4: Marketable surplus of pigeon pea of sample farms (Qtl./farm)

S. No.	Particulars	Marginal	Small	Medium	Large	Overall
Pigeon pea						
1	Total quantity	10.50	12.50	13.60	14.80	13.54
	Produced	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)
2	Quantity retained for seed	0.15	0.10	0.08	0.10	0.11
		(1.39)	(0.83)	(0.59)	(0.68)	(0.79)
3	Consumption	0.74	1.07	1.37	1.69	1.22
		(7.06)	(8.59)	(10.06)	(11.40)	(8.99)
4	Total quantity Utilized	0.89	1.18	1.45	1.79	1.33
		(8.45)	(9.42)	(10.65)	(12.08)	(9.79)
5	Marketable Surplus	9.61	11.32	12.15	13.01	11.52
		(91.55)	(90.58)	(89.35)	(87.92)	(85.12)

Note: Note: Figures in parenthesis indicate percentage to total marketable surplus per farm.

Table 5: Quantity of pigeon pea seeds sold by producer to different functionaries of sample household (Qtl./farm)

S. No.	Particulars	Marginal		Small		Medium		Large		Overall	
		No.	Quantity	No.	Quantity	No.	Quantity	No.	Quantity	No.	Quantity
1	Consumer	6.00	5.35	13.00	5.32	17.00	5.50	7.00	3.40	43.00	4.89
		(54.55)	(55.67)	(41.94)	(47.00)	(48.57)	(45.27)	(43.75)	(26.13)	(46.24)	(42.46)
2	Agent	(2.00)	(1.75)	(5.00)	(2.25)	(6.00)	(2.35)	(3.00)	(3.75)	(16.00)	(2.53)
		(18.18)	(18.21)	(16.13)	(19.88)	(17.14)	(19.34)	(18.75)	(28.82)	(17.20)	(21.91)
3	Village Traders	3.00	2.51	11.00	2.40	9.00	2.50	3.00	3.25	26.00	2.67
		(27.27)	(26.12)	(35.48)	(21.20)	(25.71)	(20.58)	(18.75)	(24.98)	(27.96)	(23.13)
4	Wholesaler	0.00	0.00	2.00	1.35	3.00	1.80	3.00	2.61	8.00	1.44
		(0.00)	(0.00)	(6.45)	(11.93)	(8.57)	(14.81)	(18.75)	(20.06)	(8.60)	(12.50)
5	Miller/Processor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	Total	11.00	9.61	31.00	11.32	35.00	12.15	16.00	13.01	93.00	11.52
		(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Note: Figure in the parenthesis are quantity of pigeon pea seeds sold by producer to different functionaries of sample household.

3.5 Constraints in marketing of Pigeon pea crops

The major constraints in marketing of Pigeon pea crops are presented in Table 6 The major problem faced by lack implementation of MSP and lack of sufficient number of processing units Rank I and Rank II (100.00 per cent and

100.00per cent). Whether you like to store your produce in storage to get high prices and Low price of product are Rank III and IV so very low marketing constraint of Lack of small Marketable Surplus and Lack of awareness about market news and intelligence (29.03 and 63.44 percent)

Table 6: Constraints in marketing of pigeon pea crop

S. No.	Particular	Pigeon pea No.	Rank
1	Lack of implementation of MSP in Cereal, pulses and oilseed ?	93.00 (100.00)	I
2	Low price of product	76.00 (81.72)	IV
3	Lack of sufficient-number of processing unit	93.00 (100.00)	II
4	Exploitation by middleman	64.00 (68.82)	VII
5	Whether you like to store your produce in storage to get high prices	78.00 (83.87)	III
6	Lack of marketing information	72.00	VI

		(77.42)	
7	Whether you face problem because the quantity is small	63.00	VIII
		(67.74)	
8	Lack of storage facilities in growing area	74.00	V
		(79.57)	
9	Lack of awareness about market news and intelligence	59.00	IX
		(63.44)	
10	Lack of small Marketable Surplus	27.00	X
		(29.03)	

Note: Figure in the parenthesis are constraints in marketing of pigeon pea crop.

4. Conclusion and Suggestion

The quantity of pigeon pea sold per farm was very less which was mainly due to low productivity, do not provide of MSP policy and insufficient number of processing unit. Policy makers can utilize these results for policy for policy implication to fix MSP policy in pigeon pea by Improved and high yielding varieties, technology, irrigation, marketing, policy and price support and effective extension. Farmer should make local arrangement of storage facility on his house and demand processing unit from government. Analyses the technology used by farmers for cultivation, marketing and assessment of demand for farm produce scope for research work.

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