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## Economic analysis of redgram production and marketing constraints in Surguja district of Chhattisgarh

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### Abstract

The Present study was undertaken with a view to estimate the economics of Production and Marketing of major *rabi* crops in Surguja districts of Chhattisgarh state. For the Present study Surajpur and Lakhanpur block Surguja district was selected purposively. Random sample of 100 farmers has drawn from eight villages. The core data was gathered through personal interviews with sampled families during the cropping year 2020-21. Average size of the holding was observed 2.82 hectares. On an average cropping intensity was 119.81 percent. The average cost of cultivation per hectare of Red gram was calculated to be Rs.27696.00 respectively. The average yield of Red gram and were 15.56 quintals per hectare respectively. On the sample farms, the average input, output ratio of Red gram and were 1:2.010 respectively. The average production cost per quintal of Red gram was calculated to be Rs. 1800.35 respectively. The net income from Red gram and were calculated to be Rs.58360.78 per hectare, respectively. There were three marketing channels was prevailing in the study area, i.e. marketing channel I- produced for consumer, channel II- produced - village merchant – wholesaler- retailers-consumers and channel III- producer- Krishi upajmandi – processor- wholesaler- retailers and consumers. Overall large number of farmers sold the Red gram crops through village traders (40.77 per cent) on average the marketable surplus of Red gram was observed to be 91.92 percent respectively. The major constraints in Red gram crops were personality and high price of inputs and higher wage rate. This finding suggests that policies aimed at lowering transaction costs, increasing access to productive assets, encouraging prudent credit use, and encouraging the use of well-organized farmer groups to gain access to appropriate technology and information could improve market access and better integrate small holder farmers into markets in the study areas.

**Keywords:** Red gram, cost and returns, marketing and constraints

### 1. Introduction

Agriculture plays a vital role in India's economy. 54.6% of the total workforce is engaged in agricultural and allied sector activities (Census 2011) and accounts for 17.8% of the country's Gross Value Added (GVA) for the year 2019-20 (at current prices). India is the largest producer (25% of global production), consumer (27% of world consumption) and importer (14%) of pulses in the world. Pulses account for around 20 per cent of the area under food grains and contribute around 7-10 per cent of the total food grains production in the country. Red gram (*Cajanus cajan* (L.) Is one of the protein-rich legumes of the semi-arid tropics throughout the tropical and subtropical regions of the world? In India its major area is lying between 14° and 28°N latitude, where the majority of the world's Red gram is produced [1]. According to FAO statistics [2], worldwide Red gram was grown in about 4.23 million hectares with a production and productivity of 4.68 million tons and 751 kg/ha, respectively. Redgram's ability to produce high economic yields in soil moisture deficits makes it an important crop in both ranged and dry land agriculture. The major redgram producing states in India are Maharashtra (7.44 lakh ha; 18.88 lakh acres), Karnataka (2.37 lakh ha; 5.86 lakh acres), Telangana (2.30 lakh ha; 5.68 lakh acres), and Madhya Pradesh (1.51 lakh ha; 5.68 lakh acres). (Department of Economics and Statistics (DES 2020-21). In Chhattisgarh Red gram 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 analyze

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“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 Red gram crop in the study area.
2. To examine the marketing pattern of Red gram crop in the study area.
3. To identify the constraints in production and marketing of Red gram crop and to suggest remedial measures to overcome them.

### 2. Methodology

#### 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.

#### Disposal pattern

To examine the marketing pattern of major oilseeds 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:

$$MS = P - (C + W + Cf)$$

Where,

MS – Marketable Surplus

P – Total Production

C – Family Consumption

W - Quantity use for Wage

Cf – Quantity used for cattle feed.

### 3. Results and Discussion

#### 3.1 Cost of cultivation of pigeon pea crops

Table 1. displays the costs of cultivation of red gram crop shows fig 1. As can be observed, the cost of cultivation red gram crop was estimated to be Rs. 27696.00 per hectare on average, ranging from Rs. 26267.91 per hectare at marginal farms to Rs. 29138.19 per hectare at large farms. Human labour was shown to account for a significant portion of the cost of red gram farming. The cost of human labour per hectare was estimated to be Rs. 5436.96 on average, ranging from Rs. 4895.75 on marginal farms to Rs. 5866.20 on large farms, respectively. The cost of bullock and equipment was the next significant expense, estimated at Rs. 2850.88 per hectare, ranging from Rs. 2610.50.

**Table 1:** The cost of cultivation of red gram at different size groups of farm (Rs / ha)

S. No.	Particular	Marginal	Small	Medium	Large	Overall
<b>A</b>	<b>Variable cost</b>					
1	Human labour					
	a) Family Labour	2810.20 (10.70)	2550.30 (9.37)	2400.00 (8.52)	2150.30 (7.38)	2477.70 (8.95)
	b) Hired Labour	2085.55 (7.94)	2775.10 (10.20)	3260.50 (11.58)	3715.90 (12.75)	2959.26 (10.62)
	Total human labour	4895.75 (18.64)	5325.40 (19.57)	5660.50 (20.10)	5866.20 (20.13)	5436.96 (19.61)
2	Bullock and machinery power					
	a) Bullock	430.10 (1.64)	415.40 (1.53)	345.15 (1.23)	231.00 (0.79)	355.41 (1.30)
	b) Machinery	2180.40 (8.30)	2350.20 (8.64)	2630.50 (9.34)	2820.76 (9.68)	2495.47 (9.01)
	Total Bullock and machinery	2610.50 (9.94)	2765.60 (10.16)	2975.65 (10.56)	3051.76 (10.47)	2850.88 (10.29)
3	Seed	3750.00 (14.28)	3750.00 (13.78)	3750.00 (13.31)	3750.00 (12.87)	3750.00 (13.54)
4	Manure & Fertilizers	4000.00 (15.23)	4050.10 (14.88)	4080.30 (14.49)	4440.50 (15.24)	4142.73 (14.96)
5	Plant protection	350.00 (1.33)	520.80 (1.91)	660.20 (2.34)	890.28 (3.06)	605.32 (2.19)
6	Irrigation Charge	210.40 (0.80)	240.78 (0.88)	312.60 (1.11)	326.72 (1.12)	272.63 (0.98)
7	Miscellaneous cost	200.00 (0.76)	225.00 (0.83)	255.00 (0.91)	285.00 (0.98)	241.25 (0.87)
8	Interest on working capital	500.00 (1.90)	540.10 (1.98)	600.00 (2.13)	640.20 (2.20)	570.08 (2.06)
<b>B</b>	<b>Total Variable Cost</b>	<b>16516.65</b> (62.88)	<b>17417.78</b> (64.01)	<b>18294.25</b> (64.95)	<b>19250.66</b> (66.07)	<b>17869.84</b> (64.52)
	Fixed capital					
9	Land revenue	12.00 (0.05)	12.00 (0.04)	12.00 (0.04)	12.00 (0.04)	12.00 (0.04)
10	Depreciation	107.53 (0.41)	146.70 (0.54)	227.30 (0.81)	239.73 (0.82)	116.93 (0.42)
11	Interest on fixed capital	631.73 (2.40)	633.35 (2.33)	634.52 (2.25)	635.80 (2.18)	171.05 (0.62)
12	Rental value of owned land	9000.00	9000.00	9000.00	9000.00	9000.00

		(34.26)	(33.08)	(31.95)	(30.89)	(32.50)
	Total Fixed Cost	9751.26	9792.05	9873.82	9887.53	9299.98
		(37.12)	(35.99)	(35.05)	(33.93)	(33.58)
	Total Cost (A+B)	26267.91	27209.83	28168.07	29138.19	27696.00

Note: -Figure in parenthesis indicate percentage to total

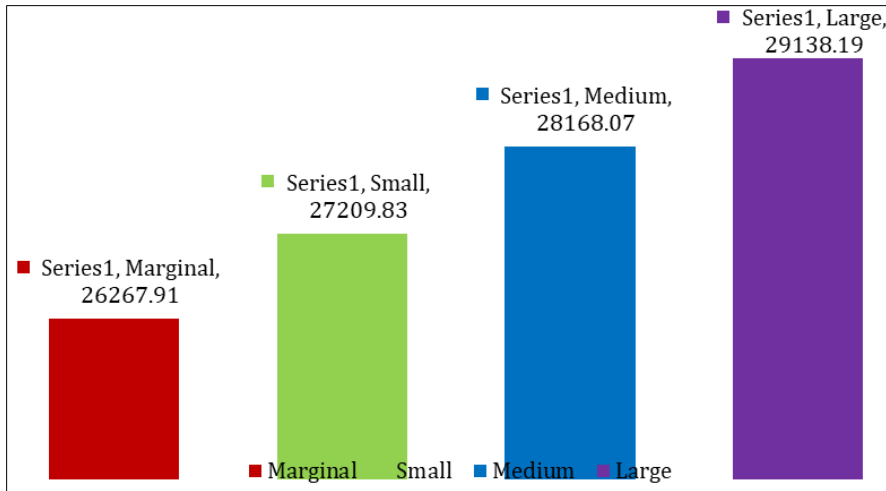


Fig 1: The Cost of cultivation red gram at (%) sampled households (Rs/ha.)

**3.2 Yield value of output and cost of cultivation red gram**

Table 2. and Fig.2 show the yield value of output per hectare and the production cost per quintal of maize, respectively. The average cost per hectare was estimated to be Rs. 27798.87, with marginal farms costing as little as Rs. 26608.66 and large farms costing as much as Rs. 28817.73. Overall, an average yield of 24.34 qtl per hectare was

observed (main and by-product yield). The gross return per hectare ranged from Rs. 86106.65 at marginal farms to Rs. 74743.80 at large farms, with an average of Rs. 97808.20. The net profit per hectare averaged Rs. 58307.78. The average production cost per quintal was estimated to be Rs. 1800.35. The average input to output ratio was 2.10, ranging from 1.81 at marginal farms to 2.39 at larger farms.

Table 2: Economic value and profit of red gram at selected farms (Rs. /Ha.)

S. No.	Particulars	Marginal	Small	Medium	Large	Overall
1	Main yield (qt /ha.)	13.50	14.60	16.46	17.68	15.56
	Price/qt.	5500.00	5500.00	5500.00	5500.00	5500.00
	Return (Rs./ha.)	74250.00	80300.00	90530.00	97240.00	85580.00
2	By product yield (qt /ha.)	8.23	8.48	8.93	9.47	8.78
	Price/qt.	60.00	60.00	60.00	60.00	60.00
	Return (Rs./ha.)	493.80	508.80	535.80	568.20	526.65
3	Gross Return (Rs./ha.)	74743.80	80808.80	91065.80	97808.20	86106.65
4	Cost of cultivation (Rs./ha.)	26608.66	27425.88	28343.22	28817.73	27798.87
5	Net Return (Rs./ha.)	48135.14	53382.92	62722.58	68990.47	58307.78
6	Cost of production (Rs./qt.)	1971.01	1878.48	1721.95	1629.96	1800.35
7	Input-output ratio	1:1.81	1:1.95	1:2.21	1:2.39	1:2.10

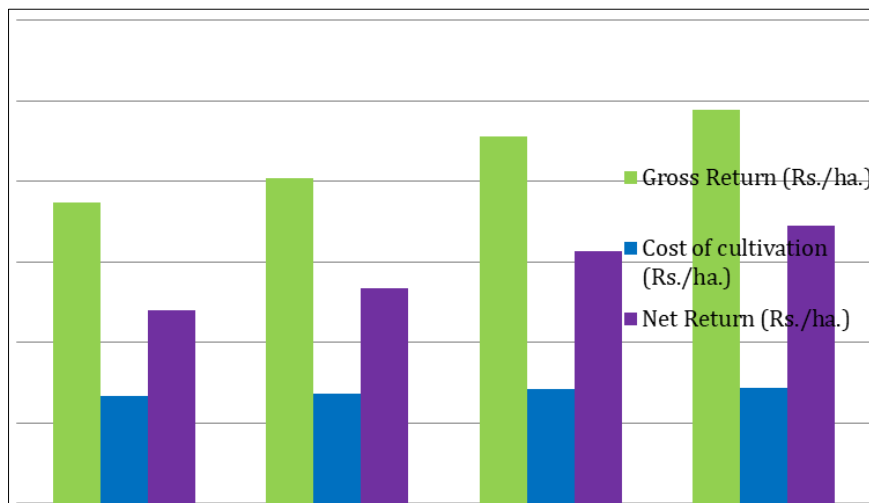


Fig 2: Economic value and profit of red gram at selected farms

### 3.3 Different cost concept in red gram cultivation

Table 3. shows the costs and returns based on the cost concept in red gram production. On average, Cost-A1, Cost-A2, Cost-B1, Cost-B2, Cost-C1, Cost-C2, and Cost-C3 were calculated to be Rs. 15509.07, Rs. 15680.12, Rs. 24680.12, Rs.

18157.82, 2157.82, and Rs.29873.60 per hectare on the sampled farms. The average net income over Cost-A1, Cost-A2, Cost-B1, Cost-B2, Cost-C1, Cost-2, and Cost-C3 was Rs. 70534.20, Rs. 70534.20, Rs. 69900.35, Rs. 60900.35, Rs.67422.65, Rs.58422.65 and Rs. 55654.25 respectively.

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

S. No.	Particular	Marginal	Small	Medium	Large	Overall
<b>A Break-up of cost</b>						
1	Cost A1	13813.98	15014.18	16121.55	17340.09	15509.07
2	Cost A2	13813.98	15014.18	16121.55	17340.09	15509.07
	Cost B1	14445.71	15647.53	16756.07	17975.89	15680.12
3	Cost B2	23445.71	24647.53	25756.07	26975.89	24680.12
4	A2+FL	16624.18	17564.48	18521.55	19490.39	17986.77
5	Cost C1	17255.91	18197.83	19156.07	20126.19	18157.82
6	Cost C2	26255.91	27197.83	28156.07	29126.19	27157.82
7	Cost C3	28881.50	29917.61	30971.68	32038.81	29873.60
<b>B Gross Income Over Different Cost</b>						
1	Income over cost A1	60929.82	65794.62	74944.25	80468.11	70534.20
2	Income over cost A2	60929.82	65794.62	74944.25	80468.11	70534.20
3	Income over cost B1	60298.09	65161.27	74309.73	79832.31	69900.35
4	Income over cost B2	51298.09	56161.27	65309.73	70832.31	60900.35
5	Income over cost C1	57487.89	62610.97	71909.73	77682.01	67422.65
6	Income over cost C2	48487.89	53610.97	62909.73	68682.01	58422.65
7	Income over cost C3	45862.30	50891.19	60094.12	65769.39	55654.25

### 3.4 Quantity sold of Red gram

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 Agent by Medium

and Small farmers about 54.55 percent and 48.57 percent respectively in the study area second large quantity sold through village traders about 44.44 percent and 38.56 percent by marginal and small farmers. Overall maximum farm product sold through direct village traders about 37.28 percent then second by the consumer 31.20 percent. There are no major difference between village traders and wholesalers.

**Table 4:** Quantity of red gram seeds sold by producer to different functionalities of sample household (Q /farm

S. No.	Particulars	Marginal		Small		Medium		Large		Overall	
		No.	Qty	No.	Qty	No.	Qty	No.	Qty	No.	Qty
1	Consumer	2.00	1.25	4.00	1.12	2.00	1.95	1.00	2.32	2.25	1.66
		(11.11)	(9.26)	(10.81)	(7.67)	(6.06)	(11.85)	(8.33)	(13.12)	(9.00)	(10.67)
2	Agent	6.00	3.56	15.00	4.25	16.00	5.48	3.00	6.13	10.00	4.86
		(33.33)	(26.37)	(40.54)	(29.11)	(48.48)	(33.29)	(25.00)	(34.67)	(40.00)	(31.20)
3	Village Traders	8.00	5.35	12.00	5.63	7.00	6.74	2.00	5.48	7.25	5.80
		(44.44)	(39.63)	(32.43)	(38.56)	(21.21)	(40.95)	(16.67)	(31.00)	(29.00)	(37.28)
4	Wholesaler	2.00	3.34	6.00	3.60	8.00	2.29	6.00	3.75	5.50	3.25
		(11.11)	(24.74)	(16.22)	(24.66)	(24.24)	(13.91)	(50.00)	(21.21)	(22.00)	(20.85)
	<b>Total</b>	18.00	13.50	37.00	14.60	33.00	16.46	12.00	17.68	25.00	15.56
		(100.00)	(100.00)	(100.00)	(100.00)	(100.000)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

**Note:** Figure in the parenthesis is quantity of Red gram seeds sold by producer to different functionalities of sample household.

**Table 5:** Marketable surplus of red gram of sample farms (Qt. /farm)

S. No.	Particulars	Marginal	Small	Medium	Large	Overall
<b>Red gram</b>						
1	Total quantity produced	<b>13.50</b>	<b>14.60</b>	<b>16.46</b>	<b>17.68</b>	<b>15.56</b>
		(100.00)	(100.00)	(100.00)	(100.00)	(100.00)
2	Quantity retained for seed	0.14	0.10	0.07	0.12	0.11
		(1.04)	(0.71)	(0.43)	(0.68)	(0.70)
3	Consumption	0.73	1.02	1.32	1.53	1.15
		(5.37)	(6.98)	(8.04)	(8.65)	(7.39)
4	Total quantity utilized	0.87	1.12	1.39	1.65	1.26
		(6.41)	(7.68)	(8.47)	(9.33)	(8.08)
5	Marketable surplus	12.64	13.48	15.07	16.03	14.30
		(93.59)	(92.32)	(91.53)	(90.67)	(91.92)

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

### 3.5 Constraints in production and marketing of Red gram crops

Table 6 shows the constraints described by the respondents' chosen practices. The lack of high-quality insecticides and pesticides (87 percent), higher input prices (72 percent), and

rising labour costs were among the 23 major constraints to maize cultivation (71 percent). Other constraints include a lack of good quality seeds (54 percent), a lack of financing (24 percent), and a lack of technical knowledge (24 percent).

**Table 6:** Constraints in production and marketing of Red gram crops

S. No.	Particulars	No of Farmers	Percentage
1	Lack of resource	10	16.00
2	Lack of technical knowledge	17	24.00
3	Lack of timely available of seed	23	32.00
4	Lack of soil testing facility	09	17.00
5	Lack of good quality of hybrid seeds	36	54.00
6	Lack of availability of human labours	34	46.00
7	Increasing wage rate of human labours	47	71.00
8	Lack of financing	16	24.00
9	Higher prices of inputs	52	72.00
10	Unavailability of good quality of insecticides and pesticides	54	87.00

### 4. Conclusion and suggestion

This finding suggests that policies aimed at lowering transaction costs, increasing access to productive assets, encouraging prudent credit use, and encouraging the use of well-organized farmer groups to gain access to appropriate technology and information could improve market access and better integrate small holder farmers into markets in the study areas. The quantity of Red gram sold per farm was very less which was mainly due to low productivity. Therefore, urgent attention must be paid towards enhancing the productivity of Red gram by improved and high yielding varieties, technology, irrigation, marketing, policy and price support and effective extension. Direct marketing without agents/middlemen will help in better marketing of oilseeds and increase profit of the producers and also encourage the farmers for retail sale of their produce. Prices of Red gram are not consistent. It varies from year to year which discourage farmers to cultivate Red gram. Government should take necessary steps for pricing and implementation of minimum support price in Red gram and major Pulses. Establishment of small scale processing units in the Red gram producing areas will not only increase the employment but will also improve the economic condition of farmers through value addition in the raw product.

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