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Identifying the problems of production and marketing of major pulses in Rajnandgaon district of Chhattisgarh

Tripti Verma, Damor Joyal Rupsinh, Chanchal and Krishna

Abstract
The study is based on "An economic analysis of production and marketing of major pulses in Rajnandgaon district of Chhattisgarh". The selection of the required minimum of 100 respondents will be done via random proportionate sampling. Primary information will be gathered from a few key pulse growers. Utilizing pre-tested questionnaires, data will be gathered through the personal interview approach. Various government departments, including the Department of Agriculture, the Directorate of Economics and Statistics, the Government of Chhattisgarh, and other sources, will be used to gather the secondary data. For 2020–21, a thorough analysis was conducted. On average, it is discovered that the gross cost per hectare of gram is 22811.04 Rs. 10.54 qt of gram are produced on average per hectare. The gross cost per hectare of lentil is found to be 18733.34 Rs. per hectare on an average. Lentil yields per acre on average were 7.28 qt. The average projected production cost per qt is Rs. 2570.47. Rs. 30595.74 was the average production value per acre. The average net income for lentil is Rs. 11862.39. The average input-output ratio is estimated to be 2.02 and the average B-C ratio to be 1.63. The costs and returns in the production of lentils on the sample farm of various size groups based on the cost idea. For the sample farms, the average Cost A1, Cost A2, Cost A2+family labour, Cost B1, Cost B2, Cost C1, Cost C2, and Cost C3 per hectare are, in order, Rs. 13130.77, Rs. 13130.77, Rs. 15171.87, Rs. 13358.15, Rs. 16358.15, Rs. 13370.15, Rs. 18399.36, and Rs. 20239.30. The average income over different cost i.e. income over Cost A1, A2, A2+family labour, B1, B2, C1, C2 and C3 are Rs. 17464.96, Rs. 17464.96, Rs. 15423.86, Rs. 17237.58, Rs. 14237.58, Rs. 17225.58, Rs. 12196.37 and Rs. 10356.43 per hectare respectively. Lack of technical expertise or information on pulse crops, at 92 percent, followed by pest and disease issues at 83 percent and a lack of HYV seeds at 78 percent, were the main obstacles to the production of major pulses. Less crop price (88%) and a lack of market knowledge and intelligence (72%) were the two main obstacles to the commercialization of key pulses. Less crop price (88%) and a lack of market knowledge and intelligence (72%) were the two main obstacles to the commercialization of key pulses.

Keywords: Production and marketing of major pulses

Introduction
India is the largest producer and consumer of pulses. The demand for pulses in India is considerable for the global economy. About 24% of the world's production of pulses and 30% of imports come from India. In India, pulse production has doubled over the past 15 years after stagnating from the 1960s to the 1990s. India produced roughly 23 MT of pulses in 2017. Uttar Pradesh (2.40 MT), Rajasthan (3.68 MT), and Madhya Pradesh (7.81 MT) were the three additional developing states in India in 2019. Absolute pulse production in Chhattisgarh was 0.54 MT. The global production of pulse increased by more than 20 MT between 2001 and 2014, roughly. This increase was virtually a doubling of the production of beans, grains, cow peas, and maize. During the same time frame, the annual production of gram was 5 million tons, while the annual production of masoor was 1.6 million tons. South Asia and sub-Saharan Africa together account for around a share of the world's total production of pulses, although being present in all regions. Sub-Saharan Africa contributed 24% of the world's dry bean production in 2012–14, followed by Latin America and the Caribbean (24%), Southeast Asia (18%), and South Asia (17%). All pulses are environmentally friendly, a large source of protein, and also complement grains when consumed. Utilization will have a big job to do in the event. Pulses increase soil richness via production, requiring less water once cereals are developed, and their combination with grains helps to prevent diseases and pests. From the utilization side, pulses are economically wellspring of protein.

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Materials and Methods
Gram and lentil
India is the biggest maker of gram on the planet sharing 65% and 70% of complete worldwide region and production individually. Indian gram is assembled into two gatherings (a) Desi gram/earthy colored gram (*Cicer arietinum*) - Most broadly developed, great stretching, 2n=14 and 16.(b) Kabuli/white gram (*Cicer kabulium*) strong seed, yield poor, taller plant, 2n=16, b farming poor. Lentil (*Lens esculantum*) is known as masoor, and Turkey to South Iran is origin of lentil. It is commonly used for human nutrition's, animal feed and soil fertility. The important lentil-growing countries of the world are India, Canada, Turkey, Bangladesh and Nepal.

Objectives
1. To work out the cost and returns of major pulses in the study area.
2. To identify the constraints in production and marketing of major pulses and suggest some policy measures to overcome from them.

Analytical tools
The simple averages and percentage statistical tools were applied to represent the results of study.

Cost Concept
For estimation of cost and returns of major crops, the standard cost concepts given by the Commission of Agricultural Costs and Prices (CACP) has been used which are given below -
Cost A1 = All actual expenses in cash without family labour cost

Value of hired human labour.
Value of bullock labour (owned & hired).
Value of machine labour (owned & hired).
Value of seed (produced & purchased).
Value of manure, fertilizer and pesticide

Irrigation charges and land revenue.
Interest on working capital.
Cost A2= Cost A1 + rent paid for leased-in land.
Cost B1= A1 + interest on value of owned capital (excluding land).
Cost B2 = B1 + Rental value of owned land & rent paid for leased land.
Cost C1= B1 + Imputed value of family labour cost.
Cost C2 = B2 + Imputed value of family labour (human labour at market rate or statutory minimum wage rate whichever is higher).
Cost C3 = C2 + 10% of cost C2 as managerial cost

Income measures
- **Gross income:** Gross income = Net income + Gross cost
- **Net income:** Net income = Gross income – Gross cost
- **Input-output ratio:** Input-Output ratio =Gross income/Gross cost
- **B-C ratio:** B-C ratio = Present worth of gross return/ Present worth of cost

Result and Discussion
1. Cost of cultivation of gram on sampled farm
The total variable cost of gram on sampled farm (Rs/ha) presented in table and the total fixed cost of gram on sampled farm (Rs/ha) presented in table. The table indicates the gross cost per hectare in large farm was higher than in marginal farm. The overall gross cost of gram was found to be 22811.04 (Rs/ha). The cost of cultivation was found for marginal, small, medium and large farm which were 18845.79 (Rs/ha), 21906.8 (Rs/ha), 24309.25 (Rs/ha) and 27793.00 (Rs/ha) respectively. Cost of cultivation per hectare showed an upward trend with the rise in farm size. It was because the large farmers incurred more expenditure on modern farm inputs such as quality seed, fertilizer, machines, hired labour, etc.

Table 1: Total variable cost of gram on sampled farm (Rs/ha)

S. No.	Particular	Marginal	Small	Medium	Large	Overall
1	Family human labour	3120 (16.55)	2390.12 (10.91)	1896.52 (7.80)	918.16 (3.30)	2175.45 (9.53)
2	Hired human labour	1517.15 (8.05)	3085.85 (14.08)	3812.4 (15.68)	5248.5 (18.88)	3336.92 (14.62)
	Total human labour	4637.15 (24.60)	5475.97 (24.99)	5708.92 (23.48)	6166.6 (22.18)	5512.37 (24.16)
3	Bullock labour	872.12 (4.62)	750.15 (3.42)	650 (2.67)	320.15 (1.15)	682.18 (2.99)
4	Machine charges	3241 (17.19)	4213.15 (19.23)	4774.6 (19.64)	5847 (21.03)	4432.40 (19.43)
5	Seed cost	3440 (18.25)	3892.25 (17.76)	4130.1 (16.98)	4342 (15.6)	3941.09 17.27)
6	Plant protection	2124.12 (11.27)	2500.5 (11.41)	3007 (12.36)	3542 (12.74)	2694.18 (11.81)
7	Irrigation charges	612.1 (3.24)	913 (4.16)	1280.1 (5.26)	1790 (6.44)	1069.26 (4.68)
8	Interest on working capital	597.05 (3.16)	709.80 (3.24)	782.028 (3.21)	880.31 (3.16)	733.26 (3.21)
	Total variable Cost /TVC	15523.55 (82.37)	18454.8 (84.24)	20332.75 (83.64)	22888 (82.35)	19064.77 (83.57)

Note: Figure in the parentheses indicates the percentage.

Table 2: Total fixed cost of gram on sampled farm (Rs/ha)

S. No.	Particular	Marginal	Small	Medium	Large	Overall
1	Rental value on owned land	3000 (15.91)	3000 (13.69)	3000 (12.34)	3000 (10.7)	3000 (13.15)
2	Land revenue	12 (0.06)	12 (0.05)	12 (0.04)	12 (0.04)	12 (0.05)
3	Depreciation	142.12 (0.75)	168 (0.76)	372.5 (1.53)	906.5 (3.26)	313.470 (1.37)
4	Interest on fixed capital	168.12 (0.89)	272 (1.24)	592 (2.43)	986.4 (3.54)	420.79 (1.84)
	Total fixed cost/TFC	3322.24 (17.62)	3452 (15.75)	3976.5 (16.35)	4904.9 (17.64)	3746.27 (16.42)
	Total cost(TVC+TFC)	18845.79 (100.00)	21906.8 (100.00)	24309.25 (100.00)	27793 (100.00)	22811.04 (100.00)

Note: Figure in the parentheses indicates the percentage

Yield value of output and cost of production per quintal
The output of yield value per hectare and cost of production per qt. of gram on sample farms have been worked out in table. The table revealed that the overall yield of gram was 10.54 qt/ha. Overall cost of production was estimated 2157.28 Rs/qt. The cost of production for marginal, small, medium and large farms were found 1959.02 Rs/qt, 2106.42 Rs/qt, 2246.69 Rs/qt. and 2412.6 Rs/qt. respectively. The overall gross income was 40055.04 Rs/ha. The gross income were 36556 Rs/ha, 39520 Rs/ha, 41116 Rs/ha and 43776 Rs/ha for the marginal, small, medium and large farmers respectively. The gross income was associated with the higher yield on large farms.

Table 3: Per hectare yield, value of output and cost of production per quintal of gram

S. No	Particular	Marginal	Small	Medium	Large	Overall
1	Total cost	18845.79	21906.8	24309.25	27793	22811.03
2	Yield	9.62	10.4	10.82	11.52	10.54
3	Price	3800	3800	3800	3800	3800
4	Gross income	36556	39520	41116	43776	40055.04
5	Cost of production	1959.02	2106.42	2246.69	2412.6	2157.28

Measures of farm profit
Sample farms of different size groups have been worked out for net income, B-C ratio and Input- Output ratioper hectare

in table. Overall value of net income was 17244.01 Rs/ha. The overall input-output ratio and B-C ratio were 1.76 and 0.76 respectively.

Table 4: Cost and returns of gram on the sample farms for different group of farm (Rs/ha)

S. No	Particular	Marginal	Small	Medium	Large	Overall
1	Gross cost	18845.79	21906.8	24309.25	27793	22811.03
2	Gross income	36556	39520	41116	43776	40055.04
3	Net income	17710.21	17613.2	16806.75	15983	17244.01
4	B-C ratio	0.93	0.80	0.69	0.57	0.76
5	Input- Output ratio	1.93	1.80	1.69	1.57	1.76

Cost and returns on the basis of cost concept
The Cost and returns on the basis of cost concept in the production of gram on the sample farm of different size groups have been presented table. From the table overall Cost A1, Cost A2, Cost B1, Cost B2, Cost C1, Cost C2 and Cost 3 were Rs. 17202.79, Rs. 17202.79, Rs. 20202.72, Rs. 20635.52, Rs. 22378.17, Rs. 22810.97 and Rs. 25092.07 per hectare irrespectively for the sample farms. The overall income over different cost i.e. income over Cost A1, A2, B1, B2, C1, C2 and C3 were Rs. 22852.32, Rs. 22852.32, Rs. 19852.32, Rs. 19418.52, Rs. 17676.87, Rs. 17244.07 and Rs. 14962.97 per hectare respectively.

Table 4: Break-up of total cost, cost concept wise income over different cost in gram (Rs/ha)

| S. No.	Particular	Marginal	Small	Medium	Large	Overall
	Break-up cost					
1	Cost A1	12545.67	16232.7	18808.73	22876	17202.79
2	Cost A2	12545.67	16232.7	18808.73	22876	17202.79
3	Cost B1	15545.67	19232.7	21808.73	25876	20202.72
4	Cost B2	15725.79	19516.7	22412.73	26874	20635.52
5	Cost C1	18665.67	21622.8	23705.25	26794	22378.17
6	Cost C2	18845.79	21906.8	24309.25	27793	22810.97
7	Cost C3	20730.37	24097.5	26740.18	30572	25092.07
	Income over different cost					
1	Income over cost A1	24010.33	23287.3	22307.27	20900	22852.25
2	Income over cost A2	24010.33	23287.3	22307.27	20900	22852.32
3	Income over cost B1	21010.33	20287.3	19307.27	17900	19852.32
4	Income over cost B2	20830.21	20003.3	18703.27	16902	19419.52
5	Income over cost C1	17890.33	17897.2	17410.75	16982	17676.87
6	Income over cost C2	17710.21	17613.2	16806.75	15983	17244.07
7	Income over cost C3	15825.63	15422.5	14375.83	13204	14962.97
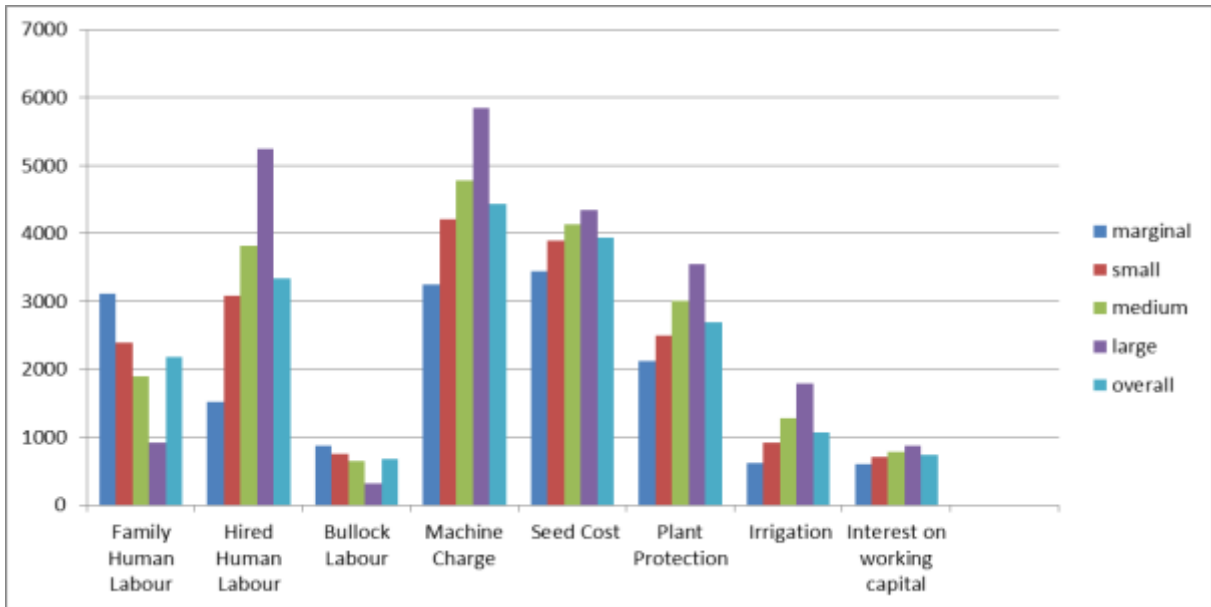
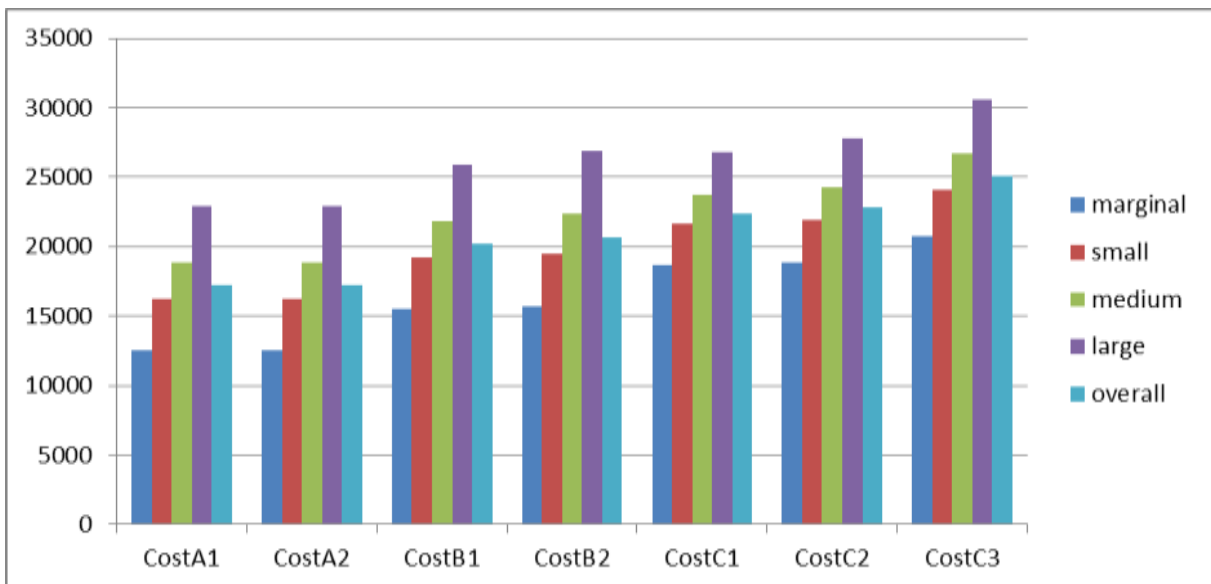**Fig 1:** Total variable cost of gram of different size of sample households

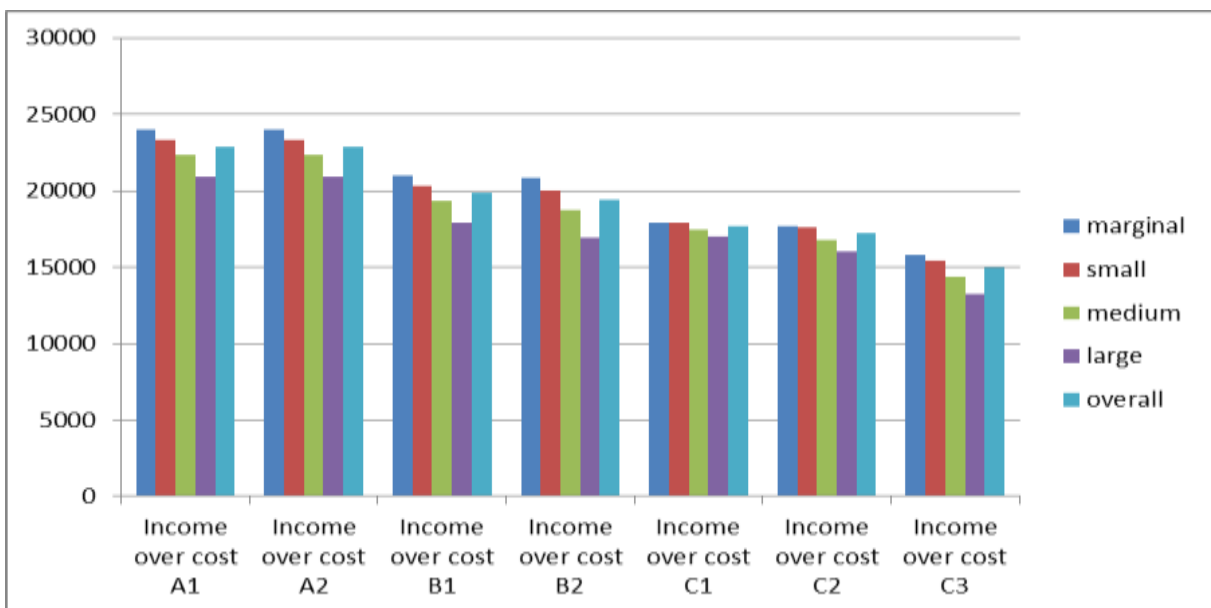**Fig 2:** Costioficultivation of gram of different size of sample households

Fig 3: Income over different costs of gram

Cost of cultivation of lentil on sampled farm

The total variable cost of lentil on sampled farm (Rs/ha) presented in table and the total fixed cost of lentil on sampled farm (Rs/ha) presented in table. The table indicates the gross cost per hectare in large farm was higher than in marginal farm. The overall gross cost of lentil was found to be 18733.34 (Rs/ha). The cost of cultivation was found for marginal, small, medium and large farm which were 15886.4 (Rs/ha), 18273.24 (Rs/ha), 19893.47 (Rs/ha) and 21568.80 (Rs/ha) respectively. Cost of cultivation per hectare showed an upward trend with the rise in farm size. It was because the large farmers incurred more expenditure on modern farm inputs such as quality seed, fertilizer, machines, hired labour, etc.

Table 5: Total variable cost of lentil on sampled farm (Rs/ha)

S. No	Particular	Marginal	Small	Medium	Large	Overall
1	Family human labour	2440 (15.35)	2480.3 (13.57)	1206.33 (6.06)	963.12 (4.46)	2041.21 (10.89)
2	Hired human labour	1232.6 (7.75)	1309.2 (7.16)	2922.12 (14.68)	3690.15 (17.10)	1922.13 (10.26)
	Total human labour	3672.6 (23.11)	3789.5 (20.73)	4128.45 (20.75)	4653.27 (21.57)	3963.34 (21.15)
3	Bullock labour	972.12 (6.11)	762.68 (4.17)	421.12 (2.11)	212.15 (0.98)	650.58 (3.47)
4	Machine charge	3362 (21.16)	3642 (19.93)	3816.62 (19.18)	4016.15 (18.62)	3691.65 (19.70)
5	Manure and fertilizer cost	2225 (14.00)	3132.12 (17.14)	3424 (17.21)	3812.16 (17.67)	3166.78 (16.90)
6	Seed cost	1612.5 (10.14)	1806.4 (9.88)	1842 (9.25)	1872 (8.67)	1797.02 (9.59)
7	Plant protection	312 (1.96)	1262.32 (6.90)	1573 (7.90)	1592.12 (7.38)	1238.14 (6.60)
8	Irrigation charges	0 (00.00)	0 (00.00)	230 (1.15)	290 (1.34)	80.9 (0.43)
9	Interest on working capital	486.24 (3.06)	575.80 (3.15)	617.40 (3.10)	657.91 (3.05)	583.53 (3.11)
	Total variable Cost /TVC	12642.46 (79.57)	14970.82 (81.92)	16052.59 (80.69)	17105.76 (79.30)	15171.99 (80.98)

Table 6: Total fixed cost of lentil on sampled farm (Rs/ha)

S. No	Particular	Marginal	Small	Medium	Large	Overall
1	Rental value on own land	3000 (18.88)	3000 (16.41)	3000 (15.08)	3000 (13.90)	3000 (16.01)
2	Land revenue	12 (0.07)	12 (0.06)	12 (0.06)	12 (0.05)	12 (0.06)
3	Depreciation	112 (0.70)	162 (0.88)	512.76 (2.57)	872.92 (4.04)	321.86 (1.71)
4	Interest on fixed capital	120.48 (0.75)	128.42 (0.70)	316.12 (1.58)	578.12 (2.68)	227.49 (1.21)
	Total fixed cost/TFC	3244.48 (20.42)	3302.42 (18.07)	3840.88 (19.30)	4463.04 (20.69)	3561.35 (19.01)
	Total cost(TVC+TFC)	15886.4 (100.00)	18273.24 (100.00)	19893.47 (100.00)	21568.80 (100.00)	18733.34 (100.00)

Yield value of output and cost of production per quintal

The output of yield value per hectare and cost of production per qt. of lentil on sample farms have been worked out in table. The table revealed that the overall yield of lentil was 7.28qt/ha. Overall cost of production was estimated 2570.47 Rs/qt. The cost of production for marginal, small, medium and large farms were found 2353.62 Rs/qt, 2606.73 Rs/qt, 2645.40 Rs/qt. and 2549.50 Rs/qt. respectively. The overall gross income was 30595.74 Rs/ha. The gross income were 28350 Rs/ha, 29442 Rs/ha, 31584 Rs/ha and 35532 Rs/ha for the marginal, small, medium and large farmers respectively. The gross income was associated with the higher yield on large farms.

Table 7: Per hectare yield, value of output and cost of production per quintal of lentil

S. No	Particular	Marginal	Small	Medium	Large	Overall
1	Total cost	15886.94	18273.24	19893.47	21568.80	18733.34
2	Yield	6.75	7.01	7.52	8.46	7.28
3	Price	4200	4200	4200	4200	4200
4	Gross income	28350	29442	31584	35532	30595.74
5	Cost of production	2353.62	2606.73	2645.40	2549.50	2570.47

Measures of farm profit

Sample farms of different size groups have been worked out for net income, B-C ratio and Input- Output ratio per hectare in table. Overall value of net income of lentil was 11862.39 Rs/ha. The overall input-output ratio and B-C ratio were 1.63 and 0.63 respectively.

Table 8: Cost and returns of lentil on the sample farms for different group of farm (Rs/ha)

| S. No	Particular	Marginal	Small	Medium	Large	Overall
1	Total cost	15886.94	18273.24	19893.47	21568.80	18733.34
2	Gross income	28350	29442	31584	35532	30595.74
3	Net income	12463.05	11168.75	11690.52	13963.19	11862.39
4	B-C ratio	0.78	0.61	0.58	0.64	0.63
5	Input- Output ratio	1.78	1.61	1.58	0.64	1.63

Cost and returns on the basis of cost concept
The cost and returns on the basis of cost concept in the production of lentil ion the sample farm of different size groups have been presented table. From the table overall Cost A1, Cost A2, Cost B1, Cost B2, Cost C1, Cost C2 and Cost C3 were Rs. 13452.63, Rs. 13452.63, Rs. 16452.63, Rs.

16692.13, Rs. 18493.85, Rs. 18733.34, and Rs. 20606.68 per hectare respectively for the sample farms. The overall income over different cost i.e. income over Cost A1, A2, B1, B2, C1, C2 and C3 were Rs. 17143.10, Rs. 17143.10, Rs. 14143.10, Rs. 13903.60, Rs. 12101.88, Rs. 11862.39, and Rs. 9989.05 per hectare respectively.

Table 9: Break-up of total cost, cost concept wise income over different cost in lentil (Rs/ha)

S. No.	Particular	Marginal	Small	Medium	Large	Overall
			Break-up cost			
1	Cost A1	10314.46	12652.52	15359.02	17015.56	13452.63
2	Cost A2	10314.46	12652.52	15359.02	17015.56	13452.63
3	Cost B1	13314.46	15652.52	18359.02	20015.56	16452.63
4	Cost B2	13446.94	15792.94	18687.14	20605.68	16692.13
5	Cost C1	15754.46	18132.82	19565.35	20978.68	18493.85
6	Cost C2	15886.94	18273.24	19893.47	21568.80	18733.34
7	Cost C3	17475.64	20100.56	21882.82	23725.68	20606.68
			Income over different cost			
1	Income over cost A1	18035.53	16789.47	16224.97	18516.43	17143.10
2	Income over cost A2	18035.53	16789.47	16224.97	18516.43	17143.10
3	Income over cost B1	15035.53	13789.47	13224.97	15516.43	14143.10
4	Income over cost B2	14903.05	13649.05	12896.85	14926.31	13903.60
5	Income over cost C1	12595.53	11309.17	12018.64	14553.31	12101.88
6	Income over cost C2	12463.05	11168.75	11690.52	13963.19	11862.39
7	Income over cost C3	10874.35	9341.43	9701.17	11806.31	9989.05
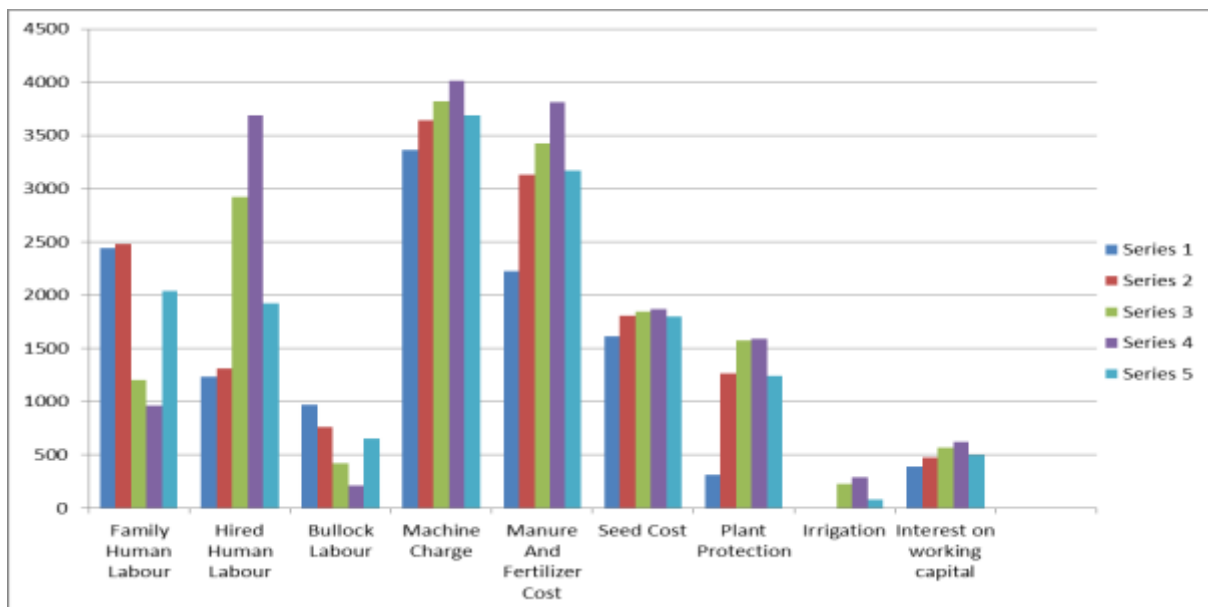
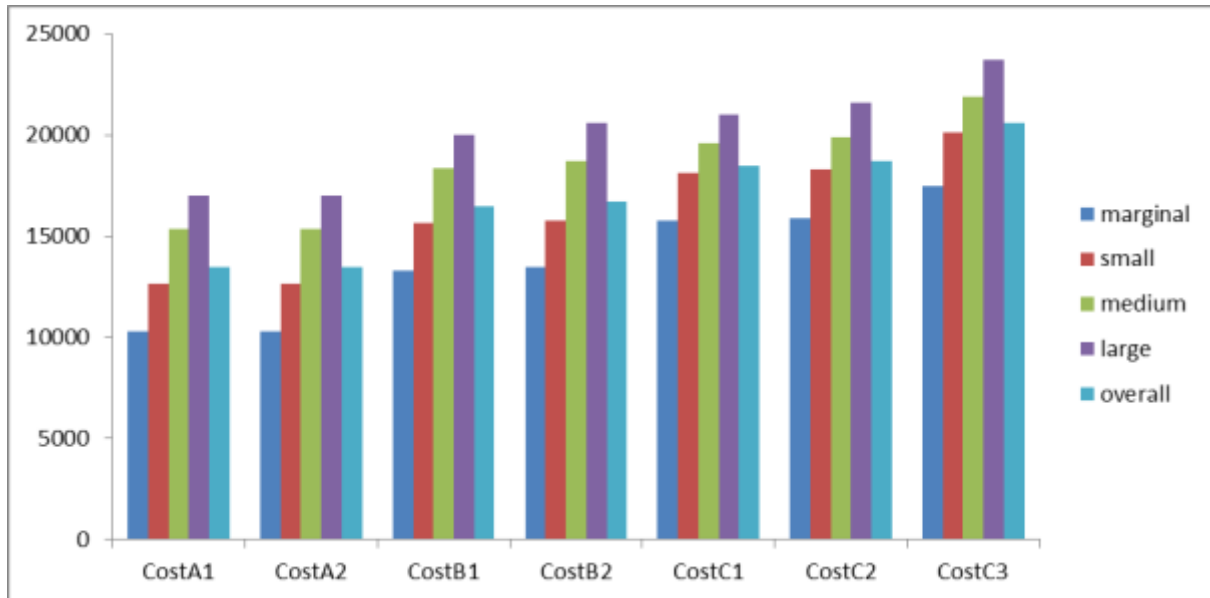**Fig 4:** Total invariable cost of lentil of different size of sample households

Fig 5: Cost of cultivation of lentil of different size of sample households
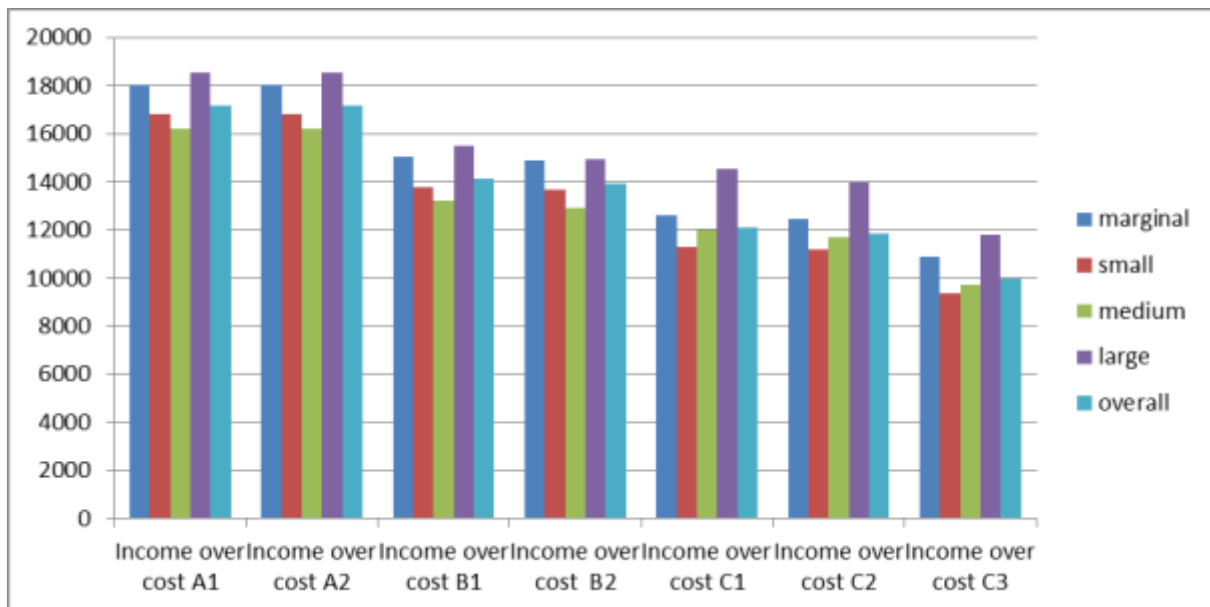

Fig 6: Income over different costs of lentil

To identify the constraints in production and marketing of major pulses

The production constraints faced by the respondents are represented in the table, reveals that major constraints on production of major pulses was lack of awareness for the replacement of seeds 91percent followed by problem of pests and diseases was 83percent and lack of recommended practices of crops 78%. Other constraints were lack of soil testing facilities, problem of monkey, grazing problem, lack of financing and Failure to invest at fair interest rate which percentage are70%, 65%, 60%, 52%, 39%respectively.

Constraints in marketing faced by the respondents of major pulses are presented in table. The major constraints in the marketing of major pulses was low price of crop 88percentfollowed by lack of awareness about market news and intelligence of 72percent.Other constraints in marketing of major pulses were lack of co-operative and regulated market and lack of storage facilities 53%, 45% respectively.

Table 10: Farmer's constraints on production of major pulses

S. No.	Constraints	No. of farmers	Percentage
1	Lack of awareness for the replacement of seeds	91	91
2	Problem of pests and diseases	83	83
3	Lack of recommended practices of crops	78	78
4	Lack of soil testing facilities	70	70
5	Problem of monkey	65	65
6	Grazing problem	60	60
7	Lack of financing	52	52
8	Failure to invest at fair interest rate	39	39

Note: figures in the parenthesis represent percent of overall farmers (N=100)

Table 11: Farmer's constraints on marketing of major pulses

S. No.	Constraints	No of farmers	Percentage
1	Low price of crop	88	88
2	Lack of awareness about market news and intelligence	72	72
3	Lack of co-operative and regulated market	53	53
4	Lack of storage facilities	45	45

Note: figures in the parenthesis represent percent of overall farmers (N=100)

Conclusion

100 farmers were randomly chosen from the study area and put into four subgroups according to their size: Marginal, small, medium, and big farmers. Marginal, small, medium, and large farmers fall under these groups 13, 56, 15 and 16. There were 5.62 family members on average. We were noted that the sample homes general age distribution was 22.77, 51.62, and 25.60% for the age groups of 15 to 60 and over, respectively.

The total fixed cost of grains on sampled farms (Rs/ha) as well as the total variable cost of grains on sampled farms are shown in the table. Large farms had greater gross costs per hectare than marginal farms.

The final figure for the gram's total cost was 22811.04 (Rs/ha). The cost of cultivation was determined to be 18845.79 (Rs/ha), 21906.8 (Rs/ha), 24309.25 (Rs/ha), and 27793.00 (Rs/ha), respectively, for marginal, It For marginal, small, medium, and big farms, the cost of cultivation was determined to be 18845.79 (Rs/ha), 21906.8 (Rs/ha), 24309.25 (Rs/ha), and 27793.00 (Rs/ha), respectively. With an increase in farm size, the cost of cultivation per hectare increased. Because they spent more money on modern farm inputs like high-quality seed, fertilizer, machinery, paid labour, etc., large farmers were to blame. The final figure for the gram's total cost was 22811.04 (Rs/ha). The cost of cultivation was determined to be 18845.79 (Rs/ha), 21906.8 (Rs/ha), 24309.25 (Rs/ha), and 27793.00 (Rs/ha), respectively, for marginal, It On sample farms, the yield value per hectare and production cost per qt. of gram have been calculated and are shown in the table. The data showed that 10.54 qt/ha was the overall yield of grams. Estimated production costs totalled 2157.28 Rs/qt. For marginal, small, medium, and big farms, the cost of production was found to be 1959.02 Rs/qt, 2106.42 Rs/qt, 2246.69 Rs/qt, and 2412.6 Rs/qt, respectively. The total gross income per hectare was 40055.04 Rs. The gross income were 36556 Rs/ha, 39520 Rs/ha, 41116 Rs/ha and 43776 Rs/ha for the marginal, small, medium and large farmers respectively. The gross income was associated with the higher yield on large farms.

Sample farms of different size groups have been worked out for net income, B-C ratio and Input- Output ratioper hectare in table. Overall value of net income was 17244.01 Rs/ha. The overall input-output ratio and B-C ratio were 1.76 and 0.76 respectively.

The Cost and returns on the basis of cost concept in the production of gram on the sample farm of different size groups have been presented table. From the table overall Cost A1, Cost A2, Cost B1, Cost B2, Cost C1, Cost C2 and Cost 3 were Rs. 17202.79, Rs. 17202.79, Rs. 20202.72, Rs. 20635.52, Rs. 22378.17, Rs. 22810.97 and Rs. 25092.07 per hectare irrespectively for the sample farms. The overall income over different cost i.e. income over Cost A1, A2, B1, B2, C1, C2 and C3 were Rs. 22852.32, Rs. 22852.32, Rs.

19852.32, Rs. 19418.52, Rs. 17676.87, Rs. 17244.07 and Rs. 14962.97 per hectare respectively.

The final result for the gram's total cost was 22811.04 (Rs/ha). The cost of cultivation was determined to be 18845.79 (Rs/ha), 21906.8 (Rs/ha), 24309.25 (Rs/ha), and 27793.00 (Rs/ha), respectively, for marginal, It Calculations were made to determine the total fixed cost and total variable cost of lentils on the sampled farm (both expressed in rupees per hectare). Large farms had greater gross costs per hectare than marginal farms. Lentil was determined to have an overall gross cost of 18733.34 (Rs/ha). The cost of cultivation was determined to be respectively 15886.4 (Rs/ha), 18273.24 (Rs/ha), 19893.47 (Rs/ha), and 21568.80 (Rs/ha) for marginal, small, medium, and big farms. With the expansion of farm size, the cost of cultivation per hectare exhibited an upward trend. It was because the large farmers incurred more expenditure on modern farm inputs such as quality seed, fertilizer, machines, hired labour, etc.

The output of yield value per hectare and cost of production per qt. of lentil on sample farms have been worked out in table. The table revealed that the overall yield of lentil was 7.28 qt/ha. Overall cost of production was estimated 2570.47 Rs/qt. The cost of production for marginal, small, medium and large farms were found 2353.62 Rs/qt, 2606.73 Rs/qt, 2645.40 Rs/qt. and 2549.50 Rs/qt. respectively. The overall gross income was 30595.74 Rs/ha. The gross income were 28350 Rs/ha, 29442 Rs/ha, 31584 Rs/ha and 35532 Rs/ha for the marginal, small, medium and large farmers respectively. The gross income was associated with the higher yield on large farms. Sample farms of different size groups have been worked out for net income, B-C ratio and Input- Output ratio per hectare in table. Overall value of net income of lentil was 11862.39 Rs/ha. The overall input-output ratio and B-C ratio were 1.63 and 0.63 respectively.

The cost and returns on the basis of cost concept in the production of lentil ion the sample farm of different size groups have been presented table. From the table overall Cost A1, Cost A2, Cost B1, Cost B2, Cost C1, Cost C2 and Cost C3 were Rs. 13452.63, Rs. 13452.63, Rs. 16452.63, Rs. 16692.13, Rs. 18493.85, Rs. 18733.34 and Rs. 20606.68 per hectare respectively for the sample farms. The overall income over different cost i.e. income over Cost A1, A2, B1, B2, C1, C2 and C3 were Rs. 17143.10, Rs. 17143.10, Rs. 14143.10, Rs. 13903.60, Rs. 12101.88, Rs. 11862.39, and Rs. 9989.05 per hectare respectively.

The production constraints faced by the respondents are represented in the table, reveals that major constraints on production of major pulses was lack of awareness for the replacement of seeds 91 percent followed by problem of pests and diseases was 83 percent and lack of recommended practices of crops 78%. Other constraints were lack of soil testing facilities, problem of monkey, grazing problem, lack of financing and Failure to invest at fair interest rate which percentage are70%, 65%, 60%, 52%, 39% respectively.

Constraints in marketing faced by the respondents of major pulses are presented in table. The major constraints in the marketing of major pulses was low price of crop 88 percent followed by lack of awareness about market news and intelligence of 72 percent. Other constraints in marketing of major pulses were lack of co-operative and regulated market and lack of storage facilities 53%, 45% respectively.

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