D-5580
[1-4]

RESEARCH ARTICLE Agricultural Science Digest, Volume Issue : ()

Cost and Return Analysis of Groundnut (*Arachis hypogaea*) Cultivation in Raigarh District of Chhattisgarh

Pradip Kumar Patel, M.R. Chandrakar

10.18805/ag.D-5580

ABSTRACT

Background: While Indian agriculture has achieved significant improvement in terms of major food crops, the performance of oilseed crops has lagged behind that of food grains. In the last 30 years, the acreage and production of oilseed crops have increased dramatically. Groundnut, soybean, sesame, rapeseed, mustard and castor seed are the six major oilseeds in India. In case of other oilseeds such as linseed, cottonseed, sunflower, safflower and Nigerseed are taken in, the total area occupied by oilseeds reaches roughly 20% of the net cultivated area.

Methods: The study was based on primary data sources. Raigarh district was selected purposively because it contributed highest area of groundnut. In the Raigarh district Baramkela block selected for further study. Respondent were selected according to proportionate sampling criteria (10 per cent) in the study area. For the analysis of the cost of cultivation, Commission for Agricultural Costs and Prices (CACP) method was used.

Result: The study was conducted for analysis of cost and return of groundnut in Raigarh district of Chhattisgarh. The study was found groundnut is major growing oilseed in the Raigarh district. The overall cost of cultivation was observed at 50374.09 Rs. per hectare. The total cost of cultivation shows increasing with farm size. The cost per quintal groundnut production was observed 3159.47 Rs. The overall gross return and net return of groundnut were estimated at 75451.38 Rs. per hectare and 28010.10 Rs. hectare. The overall input-output ratio for the above cost was found to be 1:1.50.

Key words: Cost, Gross return, Groundnut, Input-output ratio, Net return.

INTRODUCTION

India is the world's fourth-largest producer of oilseeds, accounting for roughly 20% of total land and 10% of total production. Oilseeds, on the other hand, have a low growth rate of area and output compared to cereals like rice and wheat, with vast diversity in yield across the country. Reduced yield gaps and the use of new technology can boost India's oilseed production and make the country Atmanirbhar (oilseed self-sufficient) (Rural Pulse, NABARD 2020). Because the production of oilseeds and oils is not keeping pace with the rising demand for edible oils, imports of edible oils have become necessary. India imports more than half of its total oilseed production, making it the world's top importer (Rathod *et al.,* 2018). Many oilseed crops are grown for extracting oil. Extracted oils are mainly used for cooking, processing, medicinal uses and other purposes like lubricants, paints, varnishing etc. Groundnut, soybean and mustard are the major oilseed crops of India.

Groundnut is India's most important edible oilseed, accounting for just over half of the country's major oilseed production. Groundnut kernels are rich in protein and vitamins, as well as calories. It includes 40-50 percent oil, which is mostly utilized as edible oil either in its pure or hydrogenated form. Its oil cake is a key source of protein for livestock. Because it produces atmospheric nitrogen and promotes soil fertility, it is an important rotation crop. Groundnut is the second-largest oil-producing crop in India. China, Nigeria, United States, Burma, Indonesia and Argentina are the major groundnut producing countries in the world. India shares 14 percent of groundnut production in the world. In India Gujarat (41.80 %), Rajasthan (15.08 %) and Andhra Pradesh (9.39 %) were the major groundnut producing states in the year 2016-17. In India, groundnut area and production were 5.34 million hectares and 7.56 tonnes in 2016-17, respectively (Pocket Book of Agricultural Statistics, 2017).

According to the Solvent Extractors Association of India (SEA), Gujarat produces about half of all groundnuts in India. Saurashtra regions districts like; Dwarka, Jamnagar Junagarh and Devbhumi are the major producing regions for groundnut in Gujarat. The SEA said the state groundnut production increased to 35.45 lakh tonnes, up from an estimate of 32.15 lakh tonnes for the previous Kharif

Department of Agricultural Economics, Indira Gandhi Krishi Vishwavidyalaya, Raipur-492 012, Chhattisgarh, India.

Corresponding Author: Pradip Kumar Patel, Department of Agricultural Economics, Indira Gandhi Krishi Vishwavidyalaya, Raipur-492 012, Chhattisgarh, India.
Email: pradippatel55555@gmail.com

How to cite this article: Patel, P.K. and Chandrakar, M.R. (2022). Cost and Return Analysis of Groundnut (*Arachis hypogaea)* Cultivation in Raigarh District of Chhattisgarh. Agricultural Science Digest. DOI: 10.18805/ag.D-5580.

Submitted: 04-03-2022 **Accepted:** 12-07-2022 **Online:** 22-07-2022

season. This is a 10% rise over the previous year's figure (Groundnut Crop Survey, 2019-20).

Chhattisgarh is also a protuberant producer of many oilseeds crops such as groundnut, soybean, Rai-mustard, sesame, Niger, sunflower and castor. Raigarh is one of the major cereals and oilseeds producing district in the state. The district occupies the maximum area, production and productivity of groundnut in comparison with other oilseeds. Raigarh district contributes 2.33 per cent in area and 23.30 percent of the production of groundnut in the state. According to the previous study the average cost of groundnut producing cultivation was around Rs. 18276.43 per hectare. The cost of seed observed 1877.45 Rs. per hectare or roughly 10.27 per cent of the overall cost of agriculture. The application of manure and fertilizer is also a costly procedure in groundnut production. The average yield of groundnut is 11.43 quintals per hectare. The net returns are increasing with the farm size. The input-output ratio was observed higher in large farms and lower in marginal farms (Kurrey and Jain, 2018). The studied in Sabarkantha district of Gujarat revealed that the average cost of cultivation of groundnut was estimated Rs. 43516 per ha. The gross income for the average farmer was Rs. 69347 ha^{-1} and net income were Rs. 25831 ha-1. B:C ratio is 1.6 total cost (Thakur *et al.*2015).

MATERIALS AND METHODS

The study was conducted in 2018-19 in Chhattisgarh state. The study was based on primary data sources. Primary data was collected from groundnut growers through well prepared questionnaire. The Raigarh district was selected purposively because it covered the highest area and production of groundnut in the state. Total 142 farmers were selected by randomly using the probability proportion method in the selected villages. The analytical tools for analysis of the cost of cultivation and returns are given below:

Analytical tools

Cost of cultivation

To estimation of cost of cultivation standard CACP method was adopted. According to the CACP method fixed and variable costs should be calculated to analyze the cost of cultivation. Fixed costs include depreciation, the rental value of land, land revenue and interest on fixed capital. While variable costs include all variable or operational expenses and other costs such as, costs A1, A2, B1, B2, C1, C2 and cost C3.

Where,

Cost A1: All actual expenses incurred in production.

Cost A2= Cost A1+Rent paid for Leased in Land.

Cost B1= Cost A1+Interest value of fixed capital assets (excluding land).

Cost B2= Cost B1+rental value of owned land (Net of land revenue) and rent paid for leased-in land.

Cost C1= Cost B1+Imputed value of family labour.

Cost C2= Cost B2+Imputed value of the family labour.

Cost C3= Cost C2+value of management input at 10% of cost C2.

Returns over costs

Returns are the reward of investment. The positive returns increase the profits while negative returns are the causes of loss. The returns can be depicted as gross or net. The returns analyze were follows:

Gross income (Rs/ha)= Income earn from main product (Rs/ha)+Income earn from by product (Rs/ha).

Net income (Rs/ha)= Gross income-Cost C2.

Input-output ratio= Total output/Total input.

RESULTS AND DISCUSSION

Economics of groundnut

The cost of cultivation of groundnut crop is presented in Table 1. The table shows that the cost of cultivation of groundnut was increasing with the farm size. Large farms occur on the highest cost (53066.54 Rs. per ha.) as compared to the medium farms (51759.54 Rs. per ha.), small farms (48921.48 Rs. per ha.) and marginal farms (46336.88 Rs. per ha.). The overall cost of cultivation was observed that 50374.09 Rs. per hectare.

The higher cost of production of groundnut was the reason for the use of higher numbers of human labours, improved plant protection materials and costly nutrients management in the cultivation.

The overall human labour cost incurred in groundnut was 13342.84 Rs. per ha. and is increasing with farm size such as labour cost for marginal, small, medium and large farm size is 12254.71 Rs. per ha., 12891.67 Rs. per ha., 13563.98 Rs. per ha. and 14249.02 Rs. per ha., respectively. The overall seed charge was 8136.42 Rs. per ha. followed by manures and fertilizer cost 4610.93 Rs per ha., bullock and machinery charge was 2724.56 Rs. per ha., plant protection cost 1434.48 Rs. per ha. and irrigation charge 379.36 Rs. per hectare. The overall fixed cost was observed that 18732.89 Rs. per ha. and it includes in rental value of owned land (16975 Rs. /ha.), depreciation (520.47 Rs. /ha.) and land revenue (11.90 Rs. /ha.).

Cost on the basis of cost concept

The cost on the basis of the cost concept is described in Table 2. The table is clearly shows that all costs were found in an increasing pattern. The table shows that the overall cost of Cost-A_1, Cost- A_2, Cost-A_2+FL, Cost-B_1, Cost-B_2, Cost-C_1, Cost-C_2 and Cost-C_3 was 26860.21 Rs. per ha., 26860.21 Rs. per ha., 32173.57 Rs. per ha., 28085.74 Rs. per ha.,45060.74 Rs. per ha., 33399.15 Rs. per ha., 50374.15 Rs. per ha. and 55411.56 Rs. per hectare, respectively. Cost-A_1 consists of all variable costs, land revenue and depreciation, if added the rent paid for lease in the land then is defined as Cost-A_2. The Cost-A_1 and Cost-A_2 were found the same because none of the sampled farmers used the land for lease.Cost-A_2+FL is the summation of Cost-A_2 and family labour cost. The table shows the increasing pattern Cost-A_2+FL with farm size. Cost-C_2 is observed on

Table 1: Input-wise cost of cultivation of Groundnut (Rs/ha).

Particulars	Marginal	Small	Medium	Large	Overall
A Input cost					
Human labour					
a) Family labour	8169.71 (17.63)	5957.14 (12.18)	4521.32 (08.74)	3562.25 (06.71)	5313.35 (10.55)
b) Hired labour	4085.00 (08.82)	6934.52 (14.17)	9042.66 (17.47)	10686.76 (20.14)	8029.49 (15.94)
Total human labour	12254.71 (26.45)	12891.67 (26.46)	13563.98 (26.48)	14249.02 (26.85)	13342.84 (26.49)
Bullock and machinery power					
a) Bullock	970.59 (02.09)	480.95 (00.98)	-	-	311.11 (00.62)
b) Machinery	1005.88 (02.17)	2023.81 (04.14)	3068.18 (05.93)	3107.84 (05.86)	2413.45 (04.79)
Total bullock and machinery	1976.47 (04.27)	2504.76 (05.12)	3068.18 (05.93)	3107.84 (05.86)	2724.56 (05.41)
Seed	7820.71 (16.88)	7920.33 (16.19)	8280.68 (16.00)	8400.39 (15.83)	8136.42 (16.15)
Manures and fertilizer	3705.88 (08.00)	4380.33 (08.95)	4975.00 (09.61)	5090.10 (09.59)	4610.93 (09.15)
Plant protection	1029.41 (02.22)	1333.33 (02.73)	1522.73 (02.94)	1711.70 (03.23)	1434.48 (02.85)
Irrigation charge	272.06 (00.59)	345.24 (00.71)	400.45 (00.77)	460.78 (00.87)	379.36 (00.75)
Interest on working capital(4%)	755.58 (01.63)	936.74 (01.91)	1091.59 (02.11)	1178.30 (02.22)	1012.61 (02.01)
Sub total	27814.82 (60.03)	30312.40 (61.96)	32902.61 (63.57)	34198.14 (64.44)	31641.20 (62.81)
B Fixed cost					
Land revenue	11.76 (00.03)	11.90 (00.02)	11.93 (00.02)	11.96 (00.02)	11.90 (00.02)
Depreciation	323.53 (00.70)	404.76 (00.83)	636.36 (01.23)	647.06 (01.22)	520.47 (01.03)
Rental value of owned land	16975.00 (36.63)	16975.00 (34.70)	16975.00 (32.80)	16975.00 (31.99)	16975.00 (33.70)
Interest on fixed capital (7%)	1211.76 (02.62)	1217.42 (02.49)	1233.64 (02.38)	1234.38 (02.33)	1225.53 (02.43)
Sub total	18522.06 (39.97)	18609.08 (38.04)	18856.93 (36.43)	18868.40 (35.56)	18732.89 (37.19))
Total cost (A+B)	46336.88 (100.00)	48921.48 (100.00)	51759.54 (100.00)	53066.54 (100.00)	50374.09 (100.00)

Note: Figures in parentheses indicate the percentage of the total cost of cultivation.

Table 2: Cost breakup on basis of cost concept of groundnut crop (Rs/ha).

Particulars	Marginal	Small	Medium	Large	Overall
Cost A_1	19980.41	24771.92	29029.59	31294.91	26860.21
Cost A_2	19980.41	24771.92	29029.59	31294.91	26860.21
Cost A_2+FL	28150.11	30729.06	33550.91	34857.16	32173.57
Cost B_1	21192.17	25989.34	30263.22	32529.29	28085.74
Cost B_2	38167.17	42964.34	47238.22	49504.29	45060.74
Cost C_1	29362.17	31946.48	34784.54	36091.54	33399.15
Cost C_2	46337.17	48921.48	51759.54	53066.54	50374.15
Cost C_3	50970.88	53813.63	56935.50	58373.20	55411.56

the imputed value of family labour and Cost-B_2. Cost-C_3 is estimated on a managerial cost of 10 percent of Cost-C_2 performed by farmers and Cost-C_2.

Yield, cost and returns of groundnut crop

Table 3 is presented the yield and cost of production per quintal of groundnut crop. The overall main yield and by-product yield of groundnut were 15.94 quintals per hectare and 18.34 quintals per hectare. The main yield increases with farm size such as 14.87 quintals per ha., 15.80 quintals per ha., 16.20 quintal per ha. and 16.56 quintal per hectare for marginal, small, medium and large farms, respectively. The overall cost of production of groundnut crop was Rs. 3159.47 per quintal. The cost of production of marginal farmers and medium farmers was estimated higher than small farmers. The overall cost of cultivation was Rs. 50374.15 per hectare and it increases with farm size.

The overall gross returns were observed to be Rs. 75451.38 per hectare. The gross and net income increase with farm size. The net income of marginal farms, small farms, medium farms and large farms was Rs. 24496 per ha., Rs. 26732.23 per ha., Rs. 29455.36 per ha. and Rs. 30158.30 per hectare respectively. The overall net income was Rs. 28010.10 per hectare. The overall input-output ratio observed as 1:1.50, varied from marginal farms 1:1.46, small farms 1:1.50, medium farms 1:1.51 and large farms 1:1.51.

Return over costs of groundnut crop

Return over costs is presented in Table 4. The return over cost A_1 and cost A_1 of medium farmers were higher than other farm sizes while return over cost C_2 (return over cost of cultivation) was observed increasing with the farm size. The return over cost C_2 per hectare of marginal, small, medium

Table 3: Yield, cost and returns of groundnut crop on sampled farms (Rs/ha).

Particulars	Marginal	Small	Medium	Large	Overall
Main yield (q/h.)	14.87	15.80	16.20	16.56	15.94
Price per quintal	4485.80	4566.75	4748.77	4750.00	4656.09
Income-1	66693.29	72154.65	76930.07	78654.41	74236.06
By product yield (q/ha)	16.85	17.45	18.68	19.78	18.34
Price per quintal	61.50	62.31	66.21	71.87	66.25
Income-2	1036.28	1087.31	1236.92	1421.48	1215.32
Gross return(Income1 + Income 2)	67729.57	73241.96	78167.00	80075.89	75451.38
Cost of cultivation (Cost-C_2)	46337.17	48921.48	51759.54	53066.54	50374.15
Net return	24496.00	26732.23	29455.36	30158.30	28010.10
Cost of production (RS/q)	3116.64	3096.30	3195.03	3204.73	3159.47
Input-output ratio	1:1.46	1:1.50	1:1.51	1:1.51	1:1.50

Table 4: Return over costs of groundnut growers (Rs/ha).

Return over different cost	Marginal	Small	Medium	Large	Overall
Return over cost A_1	47749.16	48470.04	49137.41	48780.98	48591.16
Return over cost A_2	47749.16	48470.04	49137.41	48780.98	48591.16
Return over cost A_2	39579.45	42512.90	44616.09	45218.73	43277.81
Return over cost B_1	46537.39	47252.62	47903.77	47546.60	47365.64
Return over cost B_2	29562.39	30277.62	30928.77	30571.60	30390.64
Return over cost C_1	38367.39	41295.48	43382.45	43984.35	42052.23
Return over cost C_2	21392.39	24320.48	26407.45	27009.35	25077.23
Return over cost C_3	16758.69	19428.33	21231.50	21702.69	20039.82

and large were Rs. 21392.39, Rs. 24320.48, 26407.45 and 27009.35, respectively.

CONCLUSION AND SUGGESTION

It should be emphasized, however, that oilseed production has always fallen short of our demand, necessitating the import of oilseeds or their products to meet the demands of our ever-increasing population. In India, 90 percent of edible oil is extracted from only three oilseed crops *i.e.* groundnut, soybean and mustard. With limited opportunities to bring more land under oilseeds, the increased output will have to rely on land-saving technologies that emphasize a mix of high-yield plant types, standard crop management practices and balanced crop nutrition. The present study was concluded the total cost of cultivation of groundnut shows increasing with farm size in the study area. The overall gross return and net return of groundnut were estimated as 75451.38 Rs. per ha. and 28010.10 Rs. per ha. It was also shown to increases with farm size. The overall input-output ratio was observed at 1:1.50. The marginal Farmers get the lowest returns and further increase the returns with farm holding, respectively. The main reason for obtaining lower returns by producers was lack of awareness about high-yielding varieties and marketing of farm produce, lack of technical knowledge for plant protection and nutrient management, lack of capital for future investment. To overcome the paucity of the above constraints it should be needed to increase the awareness of farmers about technical knowledge of cultivation, prices of farm produce (marketing news), financial assistance provided by State Government for crop production and other extension services provided by Government for farmers.

Conflict of interest: None.

REFERENCES

Groundnut Crop Survey, (2019-20). The Solvent Extractors Association of India, The Premier Association of Vegetable Oil and trade of India, Ministry of Agriculture, GOI.

Kurrey, Kumar, D., Jain, B.C.. (2018). Economics of Groundnut Crop in Raigarh District of Chhattisgarh State. International Journal of Pure and Applied Bioscience. 6(2): 2320-7051.

Pocket Book of Agricultural Statistics. (2017). Directorate of Economics and Statistics. Ministry of Agriculture and Farmers, New Delhi, GOI. p. 27.

Rathod, S., Singh, K.N., Patil, S.G., Naik, Ravindra Kumar, H., Ray, M. and Singh, Meena Vikram. (2018). Modeling and forecasting of oilseed production of India through artificial intelligence techniques, Indian Journal of Agricultural Science. 88(1): 22-27.

Rural Pulse, (2020). Publication of National Bank for Agricultural and Rural Development (NABARD), Department of Economic Analysis and Research (DEAR), Mumbai, GOI. p. 1-4.

Thakur, K.P., Rautvinay, Chaudhary, Dinesh, D. and Workneh Yigzaw, S. (2015). Cost of cultivation of Kharif groundnut in Sabarkantha district of Gujarat state. International Research. Journal of Agricultural Economics and Statistics. 6: 186-188.