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Research Article

Economic Analysis of Major Oilseeds Production in Kurnool District of Andhra Pradesh

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ABSTRACT

Economics of oilseeds production in the study area stated that the per hectare cost of cultivation of groundnut, sunflower and castor were estimated to be Rs.43233.88, Rs.27386.18and Rs.18986.23, respectively. Productivities of these oilseeds were found to be 14.82, 11.75 and 14.03 quintals per hectare, respectively. Net returns per hectare were calculated to be Rs.19925.33 in groundnut, Rs.5180.33 in sunflower and Rs.33256.90 in castor cultivation. Maximum gross return was observed in case of groundnut; however maximum net return was obtained in castor cultivation. So far as the output-input ratio is concerned, maximum was obtained in case of castor i.e. 2.75, followed by groundnut (1.46) and sunflower (1.19).

Keywords: Oilseeds, Cost of cultivation, Gross return, Net return, Output-input ratio

INTRODUCTION

Oilseed crops have been considered as the backbone of the agricultural economy of India since the time immemorial. India is the fifth largest oil economy of the world, which accounted for 10.49% of world's oilseeds area and 6.1% of production next only to USA, Brazil, Argentina and China in 2016 (www.fas.usda.gov). India is the only country in the world having largest number of commercial varieties of oilseeds *viz*, groundnut, rapeseed-mustard, sesame, sunflower, castor, safflower, niger, soybean, cotton seed, linseed and several other oilseeds

of tree origin. Andhra Pradesh is one of the major oil seed cultivating state.

Several studies pointed out that the profitability of almost all oilseed crops increased tremendously during TMO (Technology Mission on Oilseeds) period. More specifically, the profitability of rapeseed and groundnut was found to be noteworthy. The studies have also observed that the improved profitability of the rapeseed and groundnut was very much responsible for the overall expansion in oilseeds area in the country (Sonnad, 2011; Paroda, 2013).

The per hectare cost of cultivation and benefit-cost ratio for kharif groundnut was Rs.50,434.33 and 1.12, respectively in Porbandar district of Gujarat (Choudhary et al., 2017). There is no doubt that area under oilseeds has expanded during TMO period, however, a deceleration in the area under oilseeds is observed both at the national level and across the states during the post-TMO period, which is upsetting. Hence, it is necessary to probe into the reasons why the area under oilseeds is declined (Hegde & Singh, 2017). One aspect is to check whether there is alarming rise in the cost of cultivation of oilseeds and the income from these crops is very meagre. Therefore, the present study was undertaken to study the cost of cultivation and returns from major oilseed crops in Kurnool district of Andhra Pradesh.

MATERIALS AND METHODS

Two major oilseed cultivating blocks from out of the leading oilseed growing blocks of Kurnool district of Andhra Pradesh were selected. The list of all the farmers of the randomly selected villages according to the size groups was prepared. Using Probability Proportional to Size sampling, 50 farmers from each block were randomly selected and thus, the total sample size consisted of 100 respondents. Among 100 sample farmers, 53 were groundnut farmers, 19 were sunflower farmers and 28 were castor farmers. Farms were grouped into different farm size categories *viz,* marginal (<1ha), small (1-2ha), medium (2-4ha) and large (>4ha). Each sample respondent was interviewed personally by survey method using a well-structured schedule.

Analytical tools

The cost of cultivation is an important indicator not only for judging optimization of the profit, but also for understanding the share of different inputs and income of the farmers. Any agricultural production process involves operational cost (variable or working cost) and overhead cost (fixed cost). Operational cost comprised of seed, manures, fertilizers, irrigation, plant protection measures, human,

bullock and machine labour, interest on working capital, etc., whereas fixed cost included rental value of owned land, land revenue, depreciation and interest on fixed capital.

Cost of oilseed production

The cost of oilseed production was worked out as follows:

$$CP = \frac{TFC+TVC}{QP}$$

Where, CP is the cost of oilseed production (Rs/quintal), TFC is total fixed cost and TVC is total variable cost and QP is quantity of oilseed produced (quintal/ha).

Output-input analysis was applied to evaluate the cost of oilseed production. The cost and benefit were separately computed, and the benefit side was divided by the cost side to compute the output-input ratio. Gross return was calculated by multiplying the total volume of output of an enterprise by the average price of the product. It consisted of sum of the volume of main product and by-product.

RESULTS AND DISCUSSION

Economics of groundnut production

Table 1 reveals that in case of groundnut, on an average, total cost was estimated to be Rs. 43232.88, out of which operational cost accounted for Rs. 27497.19 and overhead cost Rs. 15735.69, which was nearly 63.60 percent and 36.40 percent of the total cost, respectively.

Input wise analysis showed that human labour cost was the most important item of expenditure among various components of operational costs being 16.50 percent (Rs. 7133.42). Of the various overhead cost items, rental value of owned land was found higher, that is, 25.91 percent. Further, the share of human labour (20.23%) was observed higher on marginal farm, while the percent share of machine power was found higher on large farm (6.85%). It is pertinent to mention here that the percent share of human labour decreased as the share of machine power increased with the increase in farm size.

The higher productivity on the large farms was observed which may probably be due to the adoption of improved method of cultivation and availability of irrigation during critical stages of the crop. Table 2 shows that the per hectare gross returns in groundnut was, on an average, Rs. 63158.21. Large farmers showed higher gross returns of Rs. 86392.13 as they possessed stronger input resource base as compared to other farmers. The cost of production of groundnut was, on an average, estimated to be Rs. 2917.20, whereas, size group wise analysis revealed that the cost of production per quintal of groundnut showed a negative relationship with the increase in the size of holding. The probable reason for this may be higher production per hectare on the large size of the farms than that of lower size groups of the farms. In this context, it is worth mentioning that per hectare cost of cultivation, yield, value of output, net returns have increased with increase in the size of the holding, while the situation was just reverse in case of the cost of production per quintal, which declined with the increase in the size of holding. The output-input ratio was computed, on an average, it was 1.46 which indicates that one-rupee investment in groundnut cultivation provided Rs.1.46.

Table 1: Break-up of cost of cultivation of groundnut on different sample farm size groups

(Rs. per hectare)

Items	Marginal	Small	Medium	Large	Overall
1.Operational cost					
a) Human labour	8721.80 (20.23)	7817.39 (17.68)	6910.17 (15.31)	6463.48 (13.96)	7133.43 (16.50)
b) Bullock labour	2496.25 (5.79)	2263.86 (5.12)	1859.56 (4.12)	1101.94 (2.38)	2083.82 (4.82)
c) Machine power	340.59 (0.79)	508.48 (1.15)	1670.00 (3.70)	3171.55 (6.85)	1305.63 (3.02)
d) Seeds	6505.78 (15.09)	6769.47 (15.31)	6860.52 (15.20)	6954.26 (15.02)	6744.33 (15.02)
e) Fertilizers and manures	5854.77 (13.58)	6358.26 (14.38)	6995.93 (15.50)	7181.13 (15.51)	6160.69 (14.25)
f) Plant protection measures	331.97 (0.77)	610.18 (1.38)	726.67 (1.61)	838.03 (1.81)	602.02 (1.39)
g) Irrigation	2142.73 (4.97)	2219.64 (5.02)	2283.83 (5.06)	2254.81 (4.87)	2153.00 (4.98)
h) Interest on working capital	1237.35 (2.87)	1322.06 (2.99)	1363.08 (3.02)	1560.31 (3.37)	1314.28 (3.04)
i) Total operational cost	**27631.26 (64.09)**	**27869.34 (63.03)**	**28669.75 (63.52)**	**29525.51 (63.77)**	**27497.19 (63.60)**
2. Overhead cost					
a) Land revenue	125.03 (0.29)	123.80 (0.28)	121.86 (0.27)	120.38 (0.26)	118.89 (0.28)
b) Rental value of owned land	11334.46 (26.29)	11575.75 (26.18)	11509.43 (25.50)	11875.95 (25.65)	11199.48 (25.91)
c) Depreciation	694.12 (1.61)	950.64 (2.15)	997.48 (2.21)	1037.12 (2.24)	887.35 (2.05)
d) Interest on fixed capital	3328.34 (7.72)	3696.46 (8.36)	3836.48 (8.50)	3741.04 (8.08)	3529.96 (8.17)
e) Total overhead cost	**15481.95 (35.91)**	**16346.66 (36.97)**	**16465.25 (36.48)**	**16774.49 (36.23)**	**15735.69 (36.40)**
Total cost	**43113.21 (100.00)**	**44216.00 (100.00)**	**45135.00 (100.00)**	**46300.00 (100.00)**	**43232.88 (100.00)**

(Figures in parentheses indicate percent values)

Table 2: Cost and returns in groundnut production on different sample farm size-groups

Particulars	Category	Marginal	Small	Medium	Large	Overall
Cost of cultivation (Rs/ha)		43113.21	44216.00	45135.00	46300.00	43232.88
Yield (quintal/ha)	Main product	13.34	14.75	15.50	16.75	14.82
	By-product	10.00	10.00	10.00	10.00	10.00
Price per quintal (Rs)	Main product	4185.35	4275.75	4500.00	5125.50	4225.25
	By-product	54.00	54.00	54.00	54.00	54.00
Returns (Rs/ha)	Main product	55832.57	63067.31	69750.00	85852.13	62618.21
	By-product	540.00	540.00	540.00	540.00	540.00
Cost of production (Rs/quintal)		3231.87	2997.69	2911.94	2764.18	2917.20
Gross return (Rs/ha)		56372.57	63607.31	70290.00	86392.13	63158.21
Net return (Rs/ha)		13259.36	19391.31	25155.00	40092.13	19925.33
Output : input ratio		1.31	1.44	1.56	1.87	1.46

Economics of sunflower production

Perusal of the Table 3 revealed that in case of sunflower, on an average, total cost was estimated to be Rs. 27386.18, out of which operational cost accounted for Rs. 17509.35 and overhead cost Rs.9876.83, which were nearly 63.83 percent and 36.18 percent of the total cost, respectively. Input wise analysis showed that human labour cost was the most important item of expenditure among various components of operational costs being 19.11 percent (Rs. 5233.50). Percent share of human labour decreased, and the share of machine power increased with the increase in farm size. The percentage share of seeds, plant protection measures, fertilizers and manures in total cost were registered comparatively more in case of large farms as compared to marginal and small since large farmers tended to use high quality inputs which were more expensive.

It was also observed from the Table 4 that, on an average, productivity of sunflower was 11.75 quintals per hectare. The higher productivity on large farms might have been due to the adoption of improved methods of cultivation and usage of good quality seeds and other inputs. Large farmers recorded comparatively high gross return of Rs. 40643.41 which may be due to the fact that large farmers had good communication with the extension workers and access to market which made them well aware of the market prices fetching them good returns.

It is important to mention here that the relation between cost of production and farm size as well as net return and farm size turned out to be positive in general. The output-input ratio was on an average, was estimated to be 1.19 which indicates that one-rupee investment in sunflower cultivation provided Rs.1.19.

Table 3: Break-up of cost of cultivation of sunflower on different sample farm size groups

(Rs. per hectare)

Items	Marginal	Small	Medium	Large	Overall
1.Operational cost					
a) Human labour	5031.97 (19.70)	5258.75 (19.32)	5527.57 (18.97)	5330.14 (17.98)	5233.50 (19.11)
b) Bullock labour	1379.32 (5.40)	1257.53 (4.62)	1252.96 (4.30)	1215.44 (4.10)	1320.01 (4.82)
c) Machine power	155.81 (0.61)	353.85 (1.30)	437.08 (1.50)	533.61 (1.80)	361.50 (1.32)
d) Seed	3200.54 (12.53)	3462.28 (12.72)	3793.83 (13.02)	3990.20 (13.46)	3510.91 (12.82)
e) Fertilizers and manures	4025.58 (15.76)	4344.19 (15.96)	4653.42 (15.97)	4758.00 (16.05)	4448.93 (15.88)
f) Plant protection measures	689.66 (2.70)	762.14 (2.80)	856.67 (2.94)	948.64 (3.20)	794.20 (2.90)

g) Irrigation	1190.30 (4.66)	1265.69 (4.65)	1357.85 (4.66)	1458.53 (4.92)	1276.20 (4.66)
h) Interest on working capital	664.12 (2.60)	734.92 (2.70)	670.19 (2.30)	622.54 (2.10)	664.11 (2.43)
i) Total operational cost	**16337.30 (63.96)**	**17439.35 (64.07)**	**18549.57 (63.66)**	**18857.09 (63.61)**	**17509.35 (63.83)**
2. Overhead cost					
a) Land revenue	74.07 (0.29)	70.77 (0.26)	75.76 (0.26)	74.11 (0.25)	71.20 (0.26)
b) Rental value of owned land	6452.16 (25.26)	6704.09 (24.63)	7074.83 (24.28)	7067.33 (23.84)	6710.30 (24.50)
c) Depreciation	528.74 (2.07)	683.20 (2.51)	827.53 (2.84)	886.38 (2.99)	712.73 (2.60)
d) Interest on fixed capital	2150.72 (8.42)	2321.80 (8.53)	2610.81 (8.96)	2759.94 (9.31)	2382.60 (8.70)
e) Total overhead cost	**9205.70 (36.04)**	**9779.86 (35.93)**	**10588.93 (36.34)**	**10787.76 (36.39)**	**9876.83 (36.18)**
Total cost	**25543.00 (100.00)**	**27219.21 (100.00)**	**29138.50 (100.00)**	**29644.85 (100.00)**	**27386.18 (100.00)**

(Figures in parentheses indicate percent values)

Table 4: Cost and returns in sunflower production on different sample farm size groups

Particulars	Category	Marginal	Small	Medium	Large	Overall
Cost of cultivation (Rs/ha)		25543.00	27219.21	29138.50	29644.85	27386.18
Yield (quintal/ha)	Main product	11.25	11.83	12.25	12.63	11.75
	By-product	10.00	10.00	10.00	10.00	10.00
Price per quintal (Rs)	Main product	2648.50	2715.45	3123.83	3175.25	2725.66
	By-product	54.00	54.00	54.00	54.00	54.00
Returns (Rs/ha)	Main product	29795.63	32123.77	38266.92	40103.41	32026.51
	By-product	540.00	540.00	540.00	540.00	540.00
Cost of production (Rs/quintal)		2270.49	2300.86	2378.65	2347.18	2330.74
Gross return (Rs/ha)		30335.63	32663.77	38806.92	40643.41	32566.51
Net return (Rs/ha)		4792.63	5444.56	9668.42	10998.56	5180.33
Output : input ratio		1.19	1.20	1.33	1.37	1.19

Economics of castor production

Table 5 revealed that in case of castor, on an average, total cost was estimated to be Rs.18986.23, out of which operational cost accounted for Rs.10915.18 and overhead cost (Rs.8071.11), whose share was found nearly 57.49 percent and 42.96 percent of the total cost, respectively. Castor crop was not cultivated by the large farmers since they possess costly input resources; hence they opt for other comparatively more profitable crops.

Unlike other oilseeds, the share of seed cost was very low in case of castor i.e. only 5.70 percent (Rs.1082.22) It is pertinent to explain here that on account of growing needs for commercial and industrial usage of castor products, government started providing incentives in the forms of subsidies on castor seeds to encourage the farmers towards cultivation of castor. Further study of the Table 6 indicated that the overall productivity of castor was ascertained 14.03 quintals per

hectare The higher productivity of castor on the medium farms (14.25 quintals/ha) might be probably due to the adoption of improved methods of cultivation and availability of irrigation during critical stages. The overall output-input ratio was computed as 2.75 which indicates that one-rupee investment in the cultivation of castor provided returns of Rs.2.75.

Table 5: Break-up of cost of cultivation of castor on different sample farm size groups

(Rs. per hectare)

Items	Marginal	Small	Medium	Overall
1.Operational cost				
a) Human labour	3819.49 (20.37)	3704.87 (19.37)	3399.98 (17.13)	3599.16 (18.96)
b) Bullock labour	1481.29 (7.90)	1013.72 (5.30)	952.71 (4.80)	1139.17 (6.00)
c) Machine power	131.25 (0.70)	229.52 (1.20)	416.81 (2.10)	253.15 (1.33)
d) Seeds	1001.28 (5.34)	1097.88 (5.74)	1194.86 (6.02)	1082.22 (5.70)
e) Fertilizers and manures	3202.59 (17.08)	3448.57 (18.03)	3743.36 (18.86)	3415.62 (17.99)
f) Plant protection measures	174.38 (0.93)	443.74 (2.32)	605.37 (3.05)	398.71 (2.10)
g) Irrigation	656.27 (3.50)	726.82 (3.80)	853.47 (4.30)	734.13 (3.87)
h) Interest on working capital	320.63 (1.71)	300.29 (1.57)	267.95 (1.35)	293.02 (1.54)
i) Total operational cost	**10787.19 (57.53)**	**10965.41 (57.33)**	**11434.50 (57.61)**	**10915.18 (57.49)**
2. Overhead cost				
a) Land revenue	54.38 (0.29)	51.64 (0.27)	49.62 (0.25)	51.26 (0.27)
b) Rental value of owned land	5477.04 (29.21)	5433.93 (28.41)	5482.05 (27.62)	5394.62 (28.41)
c) Depreciation	515.64 (2.75)	592.93 (3.10)	694.68 (3.50)	591.74 (3.12)
d) Interest on fixed capital	1916.31 (10.22)	2083.10 (10.89)	2187.26 (11.02)	2033.49 (10.71)
e) Total overhead cost	**8214.62 (43.81)**	**8161.41 (42.67)**	**8413.62 (42.39)**	**8071.11 (42.96)**
Total cost	**18750.55 (100.00)**	**19126.82 (100.00)**	**19848.12 (100.00)**	**18986.23 (100.00)**

(Figures in parentheses indicate percent values)

Table 6: Cost and returns in castor production on different sample farm size groups

Particulars	Category	Marginal	Small	Medium	Overall
Cost of cultivation (Rs/ha)		18750.55	19126.82	19848.12	18986.23
Yield (quintal/ha)	Main product	13.15	14.05	14.25	14.03
	By-product	0.00	0.00	0.00	0.00
Price per quintal (Rs)	Main product	3545.42	3850.00	3915.32	3725.00
	By-product	0.00	0.00	0.00	0.00
Returns (Rs/ha)	Main product	46622.27	54092.50	55793.31	52243.13
	By-product	0.00	0.00	0.00	0.00
Cost of production (Rs/quintal)		1425.90	1361.34	1392.85	1353.74
Gross return (Rs/ha)		46622.27	54092.50	55793.31	52243.13
Net return (Rs/ha)		27871.72	34965.68	35945.19	33256.90
Output : input ratio		2.49	2.83	2.81	2.75

CONCLUSION

The percentage share of seeds, fertilizers and manures in total cost of oil seeds production was found more on all categories of farms. It is also due to the fact that reasonable amount of subsidies on inputs are made available especially to the marginal and small farmers by the government. One of the major components in the total cost of oilseed cultivation was observed as the seed. Government and agricultural universities should come forward to ensure that the HYV seeds of oilseeds are made accessible to the farmers at reasonable prices. The larger prolific output-input ratio guides the oilseed cultivators farmers the rational decision in the continuing the oilseed cultivation in the study area. However, the cultivation of castor fetched comparatively more net returns to the farmers because castor being a hardy crop withstood in the situation of low rainfall, disease and pest incidence. It is grown on marginal lands with least attention given to it during cultivation, so the cost of cultivation was observed comparatively low and also it garnered good returns due to the commanded stable prices in the market. Hence, Government should create awareness regarding the industrial and commercial uses of castor so as to encourage the cultivators to put more area under castor. It is also heartening that enhancing mechanization of oilseed cultivation converts it into more profitable and attractive to farmers.

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