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Economic analysis of Sunflower Enterprise in Western Odisha

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ABSTRACT

The present study was conducted to analyze the economics of sunflower crop. The study area was selected on the basis of highest area and production under this crop. The selected area was Kalahandi district of Odisha under sunflower crop. The present investigation was carried out to study the cost of cultivation and constraints in production confronted by farmer of selected Sunflower. The overall cost of production was Rs. 44346.05 on cost C_3 basis. The gross income per hectare in cultivation of sunflower was Rs. 90282.00. The net income was workout Rs. 37682.65. However, return on per rupee with rental value owned land was Rs. 2.03 and without rental value Rs. 2.13. The study of constraints in production of the sunflower crop revealed that all the production problems were common in the study area. The timely not availability of labour, irrigation supply, electricity, lack of storage facility at farm level, weeding problem, unawareness of the seed rate were the major constraints identified in production of oilseed crops. Sunflower has a bright future in India. In the last 2 to 3 years there is a growing interest in sunflower cultivation. It has made significant impact in bridging the edible oil shortage in the country. In the coming years after peanut and rapeseed mustard, sunflower would emerge as a potential oilseed crop of importance in the oilseeds economy of the country.

Key words: *Economic analysis, Bee keeping, Net return, Oilseed & BC ratio.*

INTRODUCTION

In the Asian continent, after China, India is the second largest sunflower growing country. In India, edible oilseeds are cultivated over an area of 19 million hectares with 17 million tonnes production. Peanut, rapeseed mustard, sunflower, sesame and safflower are the major edible oilseed crops. However, about 75 per cent of the total oilseed production is contributed by peanut and rapeseed mustard. Next only to these crops, in recent years sunflower has emerged as a potential oilseed crop in both rained and irrigated farming. Sunflower is one of the most important oil seed crop grown in temperate countries. It is a major source of vegetable oil in the world. In India it has gained popularity due to the national priority of vegetable oil production. India is one of the largest producers of oilseed crop in the world. Oilseeds occupy an important position in the Indian agricultural economy .Sunflower oil is considered as premium when compared to other vegetable oils.

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Sunflower is the oil of preference among the consumers the world over due to its health appeal and in India too, sunflower oil is the largest selling oil in the branded oil segment. Oilseed sector occupies a unique position in Indian agriculture. The country is one of the largest producers and exporters of oilseed in the world, 6-7 per cent of world's oilseed production. The production of oilseed during 2007-08 was 25.93 million tones and rose to 27.53 million tones in 2011-12. When we compared to 53.39 million tones of oilseed domestic demand in 2011-12, the deficit/shortage of oilseed in the country during the same period was almost 26 million tones. This gap is filled up by importing from other nations. The importance of oilseed arises from the fact that it is the chief source for supply of fat to the human beings and oil cake to the domesticated animals. Among the oilseed crops, sunflower, sunflower, safflower, rapeseed-mustard, sesame, niger and soybean are the major ones. India in the mid 1990s had almost attained self-sufficiency in the production of oilseeds to extract vegetable oil, which are essential in the Indian diet. In Odisha, the oilseed is being sold lower MSP set by the Union government. Yet, in terms of production, Odisha is fifth biggest producer in sunflower in India. It is grown primarily in Kalahandi and Boudh districts. Economic significance is reinforced by the fact that international trade in sunflower is one of the most successful. The sunflower is grown mainly for seeds from which is produced the most used vegetable oil in our country. Sunflower oil has a high nutritional value and good taste. It is composed mainly of unsaturated fatty acids - linoleic (50-65%) oleic (25-40%). These acids are found in minor amounts in animal fats and they are not synthesized in the human body. It is known that consumption of unsaturated fatty acids leads to formation of so-called "good" cholesterol, so that vegetable fats are the basis of diet in humans.

MATERIAL AND METHODS

The present study was conducted in the Odisha state. Multi-stage stratified sampling was used for the selection of primary data of the study. Sunflower was selected on the basis of highest area. For the present study, kalahandi district was selected purposefully. Two blocks were selected from the selected district. two villages from selected blocks were selected on the basis of highest area and 10 farmers were selected from each village (sample size is 40). A list of all farmers growing selected sunflower crop in selected villages was prepared and arranged in ascending order on the basis of area under Sunflower crop. The cumulative total method was used to categorize the farmers in different size groups *i.e*. small, medium and large. The forty farmers were selected randomly from selected blocks. Both primary as well as secondary data were used for the present study. Information regarding various cost components in production of sunflower crop *viz.*, costs of various inputs, quantity through personal interview method on pre-structured data schedule.

Analytical framework:

Cost of cultivation: The cost of cultivation of sunflower crop was worked out by using various cost concepts defined below[5].

Cost A1: It includes:

Value of hired human labour, value of hired and owned animal labour, value of hired and owned machine labour, value of seed (both farm seed and purchased), value of manures (owned and purchased) and fertilizers, depreciation on fixed assets, irrigation charges, land revenue, interest on working capital and miscellaneous expenses & additional cost involved bee hives.

Cost A2: Cost A1 + rent paid for leased in land.

Cost B1: Cost A1+ interest of fixed capital (excluding land)

Cost B2: Cost B1 + rental value of owned land + rent for

leased in land.

Cost C1: Cost B1 + imputed value of family labour.

Cost C2: Cost B2 + imputed value of family labour.

Cost C3: Cost C2 + 10 per cent of cost C2 as management cost.

Cost of production:

$$\text{Cost of production/qt} = \frac{\text{Cost of cultivation}}{\text{Quantity of main product /ha}}$$

Constraints in production:

The constraints in production of sunflower crop were studied by using simple tabular method in percentage term.

RESULT AND DISCUSSION

The experimental findings obtained from the present study have been discussed in following heads:

Cost concepts:

The Table 1 revealed that the cost A_1 which included the cost of various variable components and cost of depreciation on fixed assets, land revenue and amount of interest on working capital except imputed value of family labour and rent paid for leased land, interest on fixed capital and value was Rs. 32096.73 on overall basis. This cost was found increasing trend with the increase farm size. The cost A_2 which included rent paid for leased in with cost A_1 and this cost same as the cost A_1 which indicated that no leased land was operated by any selected farmers for cultivation of rapeseed-mustard in the area. The average value of cost B_1 was worked out Rs. 34481.58. This cost was also having positive correlation with the farm size[2]. However, rental value of owned land was the same for all farmers, but was found higher in large farms due to higher interest rest on fixed capital followed by medium farms. In cost B_2, rental value of owned land and rent paid for leased in land included with cost B1 and was estimated on an average about Rs. 36304.40. It was higher due to interest paid on fixed assets and was recorded increasing trend with increase the farm size[6]. In case of cost C_1, imputed value of family labour and value of cost B1 included with this cost, the average cost C_1 was worked out about Rs. 38491.78. Cost C_2 included the value of cost B2 plus imputed value of family labour and was estimated about Rs. 40314.59 of total cost. The cost C_2 indicated the contribution of family labour in the various operations performed on a cultivation of rapeseed-mustard crop. The cost C_3 included the total cost of production (cost C_2) plus 10 per cent of the cost C_2 as management cost. This cost showed the role of household played their role as a manager in cultivation of the crop.

Table 1: Cost of cultivation per hectare of sunflower on different farm size holdings (Rs/ha.)

Costs	Small (n-25)	Medium (n-25)	Large (n-15)	Mean
1	2	3	4	5
Cost A_1	30380.25	33114.47	33418.28	32096.73
Cost A_2	30380.25	33114.47	33418.28	32096.73
Cost B_1	32506.87	35544.89	36152.50	34481.58
Cost B_2	34329.68	37367.71	37975.31	36304.40
Cost C_1	37063.91	39190.52	39798.13	38491.78
Cost C_2	38886.72	41013.34	41620.94	40314.59
Cost C_3	42775.39	45114.67	45783.04	44346.05

Cost of production:

The cost of production per quintal of sunflower on different cost concepts basis is given in Table 2. It is evident from Table 2 that the overall cost of production per quintal of sunflower was Rs. 2172.76 on C_3 basis. The cost of production on C_3 per quintal small, medium and large farms was Rs. 2373.77, Rs. 2164.81and Rs. 2079.16 respectively.

Table 2: Cost of production of sunflower per quintal on different farm size holdings (Rs. /Qtl.)

Costs	Small	Medium	Large	Mean
1	2	3	4	5
Cost A_1	1685.92	1588.99	1517.63	1572.60
Cost A_2	1685.92	1588.99	1517.63	1572.60
Cost B_1	1803.93	1705.61	1641.80	1689.45
Cost B_2	1905.09	1793.08	1724.58	1778.76
Cost C_1	2056.82	1880.54	1807.36	1885.93
Cost C_2	2157.98	1968.01	1890.14	1975.24
Cost C_3	2373.77	2164.81	2079.16	2172.76

Profitability of sunflower:

Table 3: Profitability per hectare of sunflower cultivation on different size holdings

Size holding	Yield main (q/ha)	Gross income
Small	18.02	73882.00
Medium	20.84	85444.00
Large	22.02	90282.00
Average	20.01	82028.70

The productions per hectare of sunflower and gross returns on sample farms are given in Table 3. This table revealed that on an average, productivity of sunflower was 20.01 quintals per hectare. The yield was highest (22.02 quintals) on large farms, followed by medium farms (20.84 quintals) and small farmers (18.02 quintals) which indicated that the size of holding increased the productivity of sunflower in the study area. The gross returns increased with increase in the size of holding. On an average Rs. 82028.70 was worked out as a gross income from the crop in the sowing area.

Income from sunflower cultivation:

A comparison of various income measures from sunflower cultivation in Kalahandi district are given in Table 4. It is evident from Table 4 that on an overall basis, gross income per hectare of sunflower cultivation was Rs. 82028.70 on sample farms. It was Rs. 73882.00, Rs. 85444.00 and Rs. 90282.00, on small, medium and large farms, respectively. The gross income per hectare from sunflower cultivation was highest on large farms as compared to medium and small farms [1]. mainly because of higher productivity on large farms. Return over variable cost was worked out by deducting the cost A_1 from the gross income and found higher on large farms than the medium and small farms due to more productivity and proper utilization of input resources, which was Rs. 56863.73, Rs. 52329.53 and Rs. 43501.75 large, medium and small respectively. Farm business income represents returns over variable cost and rent paid for leased in land (Cost A2) as it was returns from variable cost because no leased in land was operated by farmers. In case of family labour income cost B_2 was deducted from the gross income, it was Rs. 39552.32, Rs. 48076.29 and Rs. 56863.73, respectively on small, medium and large farms. On an overall, family labour income was worked out Rs. 45724.30 per hectare. The overall net income from sunflower cultivation was Rs

41714.11 per hectare. Among different size groups, it was Rs. 34995.28, Rs. 44430.66 and Rs. 48661.06 per hectare on small, medium and large, farm size of holdings respectively. The net income increased with increase in size of holding. Returns to management were estimated Rs. 31106.61, Rs 40329.33 and Rs. 44498.96 on small, medium and large farms respectively. The overall basis return per rupee was Rs. 2.03. The return per rupee was highest on large farms followed by medium and small farms.

Table 4: Returns from cultivation of sunflower crop on different farm size holdings (Rs./ha.)

Particulars	Small	Medium	Large	Mean
1	2	3	4	5
Gross income	73882.00	85444.00	90282.00	82028.70
Returns over variable cost	43501.75	52329.53	56863.73	49931.97
Farm business income	43501.75	52329.53	56863.73	49931.97
Family labour income	39552.32	48076.29	52306.69	45724.30
Net income	34995.28	44430.66	48661.06	41714.11
Returns to mgt.	31106.61	40329.33	44498.96	37682.65
Returns per rupee	1.90	2.08	2.17	2.03
Returns per rupee without rental value of own land	1.99	2.18	2.27	2.13

Net returns per hectare on different cost concept basis:

The net return on different cost concept basis was worked out by deducting the respective cost from the gross income minus cost A_1, A_2 etc. and is presented in Table 5. An overall basis, returns from the cost A_1, and A_2, was same Rs. 49931.97 and on cost B1, B2, C1, C2 and C3 were Rs. 47547.12, Rs. 45724.30, Rs. 43536.92, Rs. 41714.11 and Rs. 37682.65 per hectare of sunflower cultivation, respectively. The net returns decreased with increase in size of holding mainly because of higher costs incurred on medium and large farms[3].

Table 5: Net returns per hectare from sunflower cultivation on different cost concepts basis

Costs	Small	Medium	Large	Mean
1	2	3	4	5
Cost A_1	43501.75	52329.53	56863.73	49931.97
Cost A_2	43501.75	52329.53	56863.73	49931.97
Cost B_1	41375.13	49899.11	54129.50	47547.12
Cost B_2	39552.32	48076.29	52306.69	45724.30
Cost C_1	36818.10	46253.48	50483.87	43536.92
Cost C_2	34995.28	44430.66	48661.06	41714.11
Cost C_3	31106.61	40329.33	44498.96	37682.65

Returns per rupee of investment:

Returns per rupee of investment from sunflower cultivation on the basis of different cost concept are given in Table 6. An average, the returns per rupee of investment on cost A_1, A_2, B_1, B_2, C_1, C_2 and C_3 were 2.56, 2.56, 2.38, 2.26, 2.31, 2.03 and 1.85 respectively. The return per rupee increased with increase in size of holding[4].

Table 6: Returns per rupee of investment from sunflower cultivation in Jaipur district

Particular	Small	Medium	Large	Mean
1	**2**	**3**	**4**	**5**
Cost A_1	2.43	2.58	2.70	2.56
Cost A_2	2.43	2.58	2.70	2.56
Cost B_1	2.27	2.40	2.50	2.38
Cost B_2	2.15	2.29	2.38	2.26
Cost C_1	1.99	2.18	2.27	2.13
Cost C_2	1.90	2.08	2.17	2.03
Cost C_3	1.73	1.89	1.97	1.85

Constraints in production of sunflower:

The analysis of production constraints revealed (Table 7) that all farmers faced the problems such as no availability of quality seed in time, recommended dose of seed rate problems in timely sowing due to availability of machine labour, seed, insecticides etc. Among the production constraints, majority of the farmers of study area facing the problem in non availability of hired labour during intercultural operations . About 67.28 per cent farmers reported that labour was the major problem especially during harvesting and weeding time. On an average 53.42 per cent farmers reported the problem of erratic electricity supply for operating tube well. About 30-50 per cent majority of the farmers faced the problems of seed availability, seed treatment, recommended seed rate etc. In the study area, 24.43 per cent farmers reported that they are not getting fertilizers in sufficient quantity timely.

Table 7: The constraints in production and marketing of sunflower crop confronted by farmers (%)

Particulars	Small	Medium	Large	Mean
Unaware about seed treatment	37.6	38.2	38.2	37.96
Unaware about recommended seed rate	48.2	50.8	50.9	49.79
Problems of timely sowing	18.8	20.2	22.2	20.14
Timely not availability of irrigation	26.9	27.8	30.4	28.09
Timely not availability of fertilizers	24.2	24	25.4	24.43
Timely not availability of insecticides and pesticides	11.4	12	14	12.26
Timely not availability of electricity	44.6	42.8	41.6	43.22
Timely not availability of labour	64.2	68.7	70.2	67.28
Timely not availability of credit	48.4	50.4	51.8	49.95
Selling below the MSP	32.4	34.8	33.8	33.59

Suggestions and policy implications:

1. Enterprise Backed by Beekeeping: Government and KVK functionaries should promote the farmers in study area to cultivate the sunflower backed with beekeeping as to get additional income which is revealed in Table-8.

Table 8 : Profitability per hectare of sunflower cultivation backed with beekeeping

Size holding	Yield main (q/ha)	Value of main product	Yield of honey (kg/ha)	Added cost for honey	Added return of honey	Net return of honey	Gross income (Rs/ha)
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Small	18.02	73882.00	80.00	10000.00	25600.00	15600.00	89482.00
Medium	20.84	85444.00	80.00	10000.00	25600.00	15600.00	101044.00
Large	22.02	90282.00	80.00	10000.00	25600.00	15600.00	105882.00
Average	20.01	82028.70	80.00	10000.00	25600.00	15600.00	97628.70

2. Government price policy: Government price policy should ensure better minimum support price by the Commission on Agricultural Costs and Prices (CACP) to the oilseeds growers for their produce, with a view to encourage the increase in area and production.
3. Electricity supply as per need should be made available to the farmers for adequate irrigation of oilseeds crops.
4. Agricultural credit: The central and state government should promote timely and adequate flow of agricultural credit, particularly to the small and medium farmers to adopt modern technology for increasing output and productivity and to avoid distress sale of their produce.
5. The seed certification system should be reformed to encourage seed producers with integrity. Seed laws should be upgraded to enhance the availability of quality seeds with variety of options to the farmers.
6. Government should provide recommended package of practices to the farmers at the grass root level. As of the policy implication, availability of appropriate seed and variety of seeds at the affordable price for the sunflower farmers would be one of the most important initiatives for further development of the sunflower crop. It does not mean that sunflower cultivation in the State was held up due to shortage of seed. Often, farmers were charged exorbitant price of seed in the open market during the peak season. Same holds true for the fertilizers.
7. Therefore, government should make available those most essential inputs of farmers at the affordable price with different varieties. Similarly, effective market regulation and remunerative price of the sunflower crop were also be streamlined, especially by the small farmers. As found the analysis above, the small and marginal farmers were not equally accessible to appropriate market information and effective price mechanism.

CONCLUSION

The present study was conducted in the Odisha, it is one of the major producing states of sunflower in India. Among the number of oilseeds crops grown in Rajasthan state, sunflower crop was selected on the basis of highest area under this crop is fifth biggest producer in sunflower in India. It is grown primarily in Kalahandi and Boudh districts. Economic significance is reinforced by the fact that international trade in sunflower is one of the most successful. The sunflower is grown mainly for seeds from which is produced the most used vegetable oil in our country. Sunflower oil has a high nutritional value and good taste. It is composed mainly of unsaturated fatty acids - linoleic (50-65%) oleic (25-40%). These acids are found in

minor amounts in animal fats and they are not synthesized in the human body. It is known that consumption of unsaturated fatty acids leads to formation of so-called "good" cholesterol, so that vegetable fats are the basis of diet in humans. Return on per rupee with rental value of owned land was 2.03 and without rental value 2.13 which indicates that cultivation of sunflower economically significant in study area. The study of constraints in production of sunflower crop revealed that the farmers of study areas faced the problems. Among the various production problems, the major problem was timely not availability of human labour especially during weeding and harvesting time. About 67.28 per cent farmers of the study area reported this problem. Erratic electricity supply was another major problem for which about 43.22 per cent farmers reported. Timely not availability of seed, fertilizers and irrigation were the common problems. Sunflower has a bright future in India. In the last 2 to 3 years there is a growing interest in sunflower cultivation. It has made significant impact in bridging the edible oil shortage in the country. In the coming years after peanut and rapeseed mustard, sunflower would emerge as a potential oilseed crop of importance in the oilseeds economy of the country.

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