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Research Article

ECONOMIC STUDY OF SUGARCANE CULTIVATION IN EASTERN UTTAR PRADESH: BY USING CACP COSTS CONCEPTS

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Abstract: To have sustainable livelihood security and improved standards of living, the farm families need to generate additional income from sugarcane cultivation. So that, present study was conducted to estimate the cost and return of sugarcane cultivation in the Deoria district in the agricultural year 2015-16. The study was based on primary data as well as secondary data and multi-stage random sampling method was used to select 100 farmers. The CACP (Commission for Agricultural Costs and Prices) cost concepts were used to estimate cost and return of sugarcane cultivation. The cost of cultivation of sugarcane was more at the field of large farmers followed by medium farmers and small farmers. The cost of cultivation of sugarcane per hectare in the small, medium and large farmers categories were Rs. 53998.40, Rs. 54442.39 and Rs. 57649.61 respectively.

Keywords: *Livelihood, Random sampling, Cost of cultivation, Cost concepts, Return*

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Introduction

About 80% of global sugar production is come from sugarcane. It has been clearly established that sugarcane is the cheapest source of sugar because cost of sugar production from sugarcane can be as low as 40% of that of sugar from the sugar beet route. European Union is one of the major producers of sugar through the sugarbeet but it has already begun cutting down on production realizing the futility of competing with sugarcane. Sugar production in India is concentrated in six states namely Maharashtra, Uttar Pradesh, Gujarat, Tamil Nadu, Karnataka and Andhra Pradesh with 85-90% sugar production of the country [1]. The Indian sugar industry is highly fragmented with over 450 mills and no single player having market share more than 5 per cent. Out of it, 60% mills are in the cooperative sector, 35% in the private and rest are in public sector [2]. The Indian Sugar Industry is a key driver of rural development because it supports more than 55 million sugarcane farmers and 7.5% rural population depends on sugarcane cultivation, harvesting, machine manufacturing etc. [3]. The average land holding of sugarcane producing farmers is very small and fragmented. In Indian, sugarcane productivity ranges from 70 tonnes per hectare to 110 tonnes per hectare whereas global average production is 64 tonnes per hectare [4]. Sugarcane is one of the most important cash crops grown by farmers in the Deoria district because sugarcane is one of the best sources of food, energy and income. Sugarcane cultivation occupies a predominant position in the crop cultivation in Deoria district. The ecological and agro-climatic conditions required for the cultivation of sugarcane are available in the district [5]. The production of sugarcane will be highly profitable and the producers can get high return. The adequate and timely availability of input is the most crucial one among the basic factors of sugarcane production and non-availability of input becomes a limiting factor in adaptation of improved production practices in its cultivation [6]. The question, how to make judicious use of input will be crucial for the sugarcane cultivation? To have sustainable livelihood security and improved standards of living, the farm families need to generate additional income from sugarcane cultivation [7]. It is vital importance to study the cost of cultivation and profitability of sugarcane to understand the expense incurred by the farmers. So that, present study was conducted to estimate the cost and return of sugarcane cultivation in the Deoria district in the agricultural year 2015-16.

Material and Methods

The study was based on primary data as well as secondary data and multi-stage random sampling method was used to select farmers. Bhaluani block was selected randomly form 16 blocks of Deoria district. The agro-climatic condition of the block is suitable for the sugarcane cultivation and farmers of this block have been growing sugarcane on very large area. A list of 170 villages of Bhaluani along with area under sugarcane was prepared and arranged in descending order on the basis of cultivated area under sugarcane. Five villages were selected randomly with the help of random number table. The sugarcane farmers of these five villages were listed according to their sugarcane cultivated area and categorized into three categories *viz*; small (1-2 ha), medium (2-4 ha) and large (>4 ha). The sample farmers were selected by the probability proportion to sample and made the sample of 100 sugarcane farmers. The CACP (Commission for Agricultural Costs and Prices) cost concepts were used to estimate cost and return of sugarcane cultivation [8, 9].

CACP cost concepts

Cost A1= wages of hired human labour (in Rs.) + value of bullock labour (in Rs.) + value of tractor labour (in Rs.) + value of seeds (in Rs.) + value of manures and fertilizers (in Rs.) + value of plant protection chemicals (in Rs.) +value of irrigation charges (in Rs.) + value of land revenue (in Rs.) + value of depreciation on fixed capital assets (in Rs.) + value of interest on working capital (in Rs.)
Cost A2=Cost A1 + rent paid for leased in land
Cost B=Cost A2 + rental value of owned land + interest on fixed capital
Cost C=Cost B + imputed value of family labour

Farm Business income

Farm Business Income (FBI) = Gross Income (GI)-Cost A1 (cost A2 in case of tenant operation land)

Table-1 *Cost of cultivation of sugarcane among small, medium and large farmers (in Rs. /ha)*

SN	Particulars	Size group of farmers			Total
		Small	Medium	Large	
1	Human labour				
a)	Family labour	9872.68(18.28)	5080.98(9.33)	3460.85(6.00)	6138.17(10.13)
b)	Hired labour	2430.45(4.50)	6720.64(12.34)	12010.6(20.83)	7053.89(11.64)
2	Bullock labour	1903.75(3.52)	1313.05(2.41)	-	1608.4(2.65)
3	Tractor labour	1977.94(3.66)	3390.62(6.22)	5036.24(8.37)	3468.26(5.72)
4	Cost of seeds (Stalk)	9347.7(17.31)	8990.54(16.51)	8729.68(15.14)	9022.64(14.89)
5	Manure and fertilizer	7288.65(13.49)	7133.88(13.10)	6351.39(11.01)	6924.64(11.43)
6	Irrigation	4261.68(7.89)	4137.27(7.59)	3856.95(6.69)	4085.3(6.74)
7	Plant protection	2013.48(3.72)	2217.54(4.07)	2612.43(4.53)	6843.45(11.29)
8	Interest on working capital	3323.18(6.15)	3888.45(7.14)	4205.81(7.21)	3805.81(6.28)
9	Depreciation	1076.96(1.99)	947.72(1.74)	911.6(1.58)	978.76(1.61)
10	Interest on fixed capital	3001.93	2921.70	2874.06	2932.56
11	Revenue	-	300(0.55)	300(0.52)	300(0.49)
12	Rental value of owned land	7500(13.88)	7400(13.59)	7300(12.66)	7400(12.21)
Total		53998.40(100)	54442.39(100)	57649.61(100)	60561.88(100)

Table-3 *Yield and income of sample farmers*

Farmers category	Main product			By Product						Gross Income (Rs.)	Cost of cultivation (Rs.)	Net income (Rs.)
	Yield (Q/ha)	Rate (Rs. /Q)	Amount (Rs.)	Green leaves (Fodder)			Dry leaves					
				Yield (Q/ha)	Rate (Rs./Q)	Amount (Rs.)	Yield (Q/ha)	Rate (Rs./Q)	Amount (Rs.)			
Sample	442.78	250.00	11095.00	122.08	50.00	6104.00	16.31	55.00	897.05	117696.05	53998.40	63697.65
Medium	468.60	250.00	117150.00	146.31	50.00	7315.50	19.27	55.00	1059.85	125525.35	54442.39	71082.96
Large	490.73	250.00	122682.50	170.65	50.00	8532.50	22.08	55.00	1214.40	132429.40	57649.61	74779.79
Average	460.63	250.00	116842.50	139.54	50.00	7317.00	18.41	55.00	1057.10	125216.60	60561.88	64654.72

Family Labour Income

Family Labour Income (FLI)= Gross Income (GI)-Cost B

Farm Net Income

It is the expenses of gross income over cost and gives and overall figures and farms business.

Result and Discussions

The cost of cultivation of planted sugarcane for the different size groups were estimated per hectare which is shown in [Table-1]. The cost of cultivation of sugarcane was more at the field of large farmers followed by medium farmers and small farmers. The cost of cultivation of sugarcane per hectare in the small, medium and large farmers categories were Rs. 53998.40, Rs. 54442.39 and Rs. 57649.61 respectively. The expenses on seeds were Rs. 9347.70, Rs.8990.54, Rs. 8729.68 for small farmers, medium farmers and large farmers which contributed 17.31%, 16.51% and 15.14% respectively whereas average of sample farmers was 9022.64 which was 14.89% of total expenses. The cost of manure and fertilizer was Rs. 7288.65, Rs. 7133.88 and Rs. 6351.39 in small, medium and large size farmers respectively which contributed 13.49%, 13.10% and 11.01%, respectively whereas average of all the farmers was 6924.64 which was contributed 11.43% to the total cost and irrigation charge was Rs. 4261.68, Rs. 4137.27, and Rs. 3856.95 in the small, medium and large farmers categories respectively which contributed 7.89%, 7.59% and 6.69%. The average of all farmers was Rs. 4085.3 which contributed 6.74% to the total cost of cultivation. The cost of plant protection was 3.72%, 4.07%, 4.53% and 11.29% in small, medium, large and alii sample farmers respectively. The hired and family laboure cost was accounted 4.50% and 20.83% in small farmers, 12.34% and 9.33% in medium farmers and 6% and 18.28% for large farmers of total cost.

Cost of cultivation of sample farmers by using CACP formula

The total cost of cultivation has been split up according to cost concept. There was no leased in land for sugarcane with any of the farmer. The cost A1 and cost A2 are same for all sample farmers in [Table-2]. It is clear from the above table the cost C was higher in the large farmers followed by medium category and small category respectively. The cost C of average of sample farmers was Rs. 60561.88. The per hectare cost of cultivation of sugarcane according to the cost concepts have been depicted diagrammatically.

Table-2 *Cost of concept of the sample farmers in the study area (Rs. /ha)*

Farmer Category	Cost A_1	Cost A_2	Cost B	Cost C
Small	33263.79	33263.79	44125.72	53998.40
Medium	38739.41	38739.41	49061.41	54442.39
Large	43714.70	43714.70	53888.76	57649.61
Average	43791.15	43791.15	54123.71	60561.88

Yield and income

The yield, income and net income per hectare of sugarcane is given in [Table-3]. The income and yield were found more in large farmers followed by medium and small farmers. The table shows that the average gross income of sugarcane was Rs. 125216.60 and average net income from sugarcane was Rs. 64654.72 of all the sample farmers.

Measures of farm profit

The profitability of farming was measured by net income, family labour income, farm business income and farm investment income. It was seen that large farmers got higher net income, family labour income and farm investment income, followed by medium and small farmers, respectively. The highest income was in the large farmers category due to the size of holding and better resource management. The per hectare net income, family income, farm investment income and farm business income was shown in [Table-4].

Table-4 *Measures of farm profit*

Size group	Farm business income (Rs.)	Family labour income (Rs.)	Farm net income (Rs.)
Small	74520.83	73570.33	63697.65
Medium	82371.41	76163.64	71082.96
Large	86285.60	78240.64	74779.79
Average	75860.53	70792.89	64654.72

Summary and Conclusion

It is most important part of price policy of sugarcane to understand the expense incurred by the farmers on sugarcane cultivation. So that, present study was conducted to estimate the cost and return of sugarcane cultivation according to different size group of farmers. The cost of cultivation of sugarcane was more at the field of large farmers followed by medium farmers and small farmers as well as income was also more in comparison to other category of farmers due to the size of holding and better resource management.

Application of Research: The cost and return important part of income estimation of sugarcane farmers. Sugarcane is a cash crop which involved more input and get return after one to two years. So that this research is helpful in making input marketing policy and price policy.

Research Category: Farm management and production economics

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Cultivar / Variety / Breed name: Nil

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