Vital Statistics of Sugarcane and Jaggery in Muzaffarnagar District

Project Report
Submitted by

Dr. Ashfaq Ali
Assistant Professor
Shri Ram College
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funded by

Triveni Engineering and Industries Ltd.
Khatauli
Muzaffarnagar

Shri Ram College Muzaffarnagar

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Muzaffarnagar

Co-ordinator
IQAC, Shri Ram College
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ENGINEERING & INDUSTRIES LTD.

Ref:

Date: 13/07/2019

To
Dr. Ashfaq Ali
Dept of Commerce
Shri Ram College, Muzaffarnagar
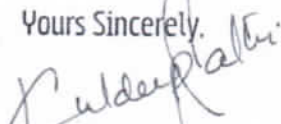
Project Approval

Dear Dr Ali,

I hope you are doing well.
I want to inform you that we have approved your project 'Vital Statistics of Sugarcane and Jaggery in Muzaffarnagar District'. We hope your project brings growth and development. We are enclosing a cheque worth Rs 49,000/- Cheque no. 232517 Date: 12/7/2019. A sum of Rs 1000/- has been deducted as Tax at Source.
The cheque has been made in favour of M/S Shri Ram Charitable Trust-PNB-2514009300013936.
You have mentioned that it will take 2 months to complete the project. We wish you all the best to accomplish the task. You will need to regularly submit reports regarding the project's progress and how it is being completed. We wish you all the best.

Yours Sincerely,

(Kuldeep Rathi)
General Manager (Sugarcane)

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GOEL RAKESH & CO.

CHARTERED ACCOUNTANTS

57-A, Agarwal Market, First Floor,
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Utilization Certificate

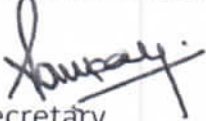| S.N.	Detail of sanction of Fund with Project name and Duration	Amount
1.	60-Day project on Vital Statistics of Sugarcane and Jaggery In Muzaffarnagar District , Date of Sanction of Fund- 13-07-2019 as per Sanction Letter	50000.00
	TOTAL	**50000.00**

It is Certified that out of Rs. 50000.00 (Rs. Fifty Thousand Only) of grants sanctioned by **Triveni Engineering & Industries Ltd, Khatauli** during the year 2019-20 in favor of **Shri Ram College, Muzaffarnagar,** a sum of Rs. 50000.00 has been utilized for the purpose of the project for which it was sanctioned and that the balance of Rs. **Nil** remaining unutilized at the end of the year has been surrendered. The Extra amount (If any) is met out by Shri Ram College.

2. Certified that we have satisfied our self that the conditions on which the grant was sanctioned have been duly fulfilled/are being fulfilled and that we have exercised the following checks to see that the money was actually utilized for the purpose for which it was sanctioned.

Kinds of checks exercise-

1. Checking of cash book
2. Checking of payment vouchers.
3. Checking of expenses bills.

For Shri Ram College

Secretary

Place: Muzaffarnagar
Date- 25-11-2019

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For Goel Rakesh & Co.
Chartered Accountants

Rakesh Kumar Goel
Proprietor
M. No. 071858
FRN : 003374C

Co-ordinator
IQAC, Shri Ram College,
Muzaffarnagar

Vital Statistics of Sugarcane and Jaggery in Muzaffarnagar District

Abstract

Sample sizes of hundred farmers (Marginal- 55, Small- 30, and Medium- 15) were interviewed from five villages of Sadar block of Muzaffarnagar district. Data was analyzed and found that average holding size was 1.18 hectares and cropping intensity was 239.90 per cent. On an average cost of cultivation was Rs. 95124.68 per hectare. The gross and net incomes on overall farms were found to be Rs. 146587 and Rs. 63156.54 per hectare, respectively. The input and output ratio was found to be 1:1.67 on cost C. Sugarcane cultivation in the study was characterized by decreasing returns to scale.

1. Introduction

Agriculture being the most important sector in Indian economy provides livelihood to more than 2/3rd of the population. In India agriculture occupies 43% of the total geographical area and contributes about 14% to India G.D.P (FAO, Stat, 2015). Among the many crops grown sugarcane is grown even before the Vedic period. In the present time, sugarcane is properly grown in various parts of Indonesia, Hawaii, Philippines, Indo-China, Thailand, Egypt, Africa and Australia etc.

Sugarcane is one of the world's largest cultivated crops as 2014, it was cultivated on about 26.2 million hectare area in more than 90 countries, with a world -wide harvest 175.1 million metric tones. Brazil topped the list as the world's largest producer of sugarcane followed by India, China, Thailand, Pakistan and Mexico.

Sugarcane has commercial importance and is a main source of sugar in Asia and Europe. It is the raw material for the production of Jaggery (Gur) and Khandsari. It is also consumed raw and juice is also extracted for beverage purpose. In India the sugarcane cultivation and sugar industry plays a vital role towards socio-economic development in rural areas. Depending on the suitability of agro-climatic conditions sugarcane is grown in almost 9 states of the country. The world's demand for sugar is the primary driver for sugarcane cultivation as it accounts for 80% of the sugar produce.

Talking about the statistics, In Uttar Pradesh sugarcane occupied an area of 2.23 million hectares giving a produce of 135.16 million tonnes in the year 2014-15. District Muzaffarnagar has best suited agro-climatic condition for sugarcane cultivation and thus in 2014-15 sugarcane occupied an area of 7037 hectare giving a produce of 341829 million tonnes with the productivity of 485.76quintals/hectare.

Keeping this in the view the present study entitled "A study on Resource Use Efficiency of Sugarcane Production in Muzaffarnagar District of Eastern Uttar Pradesh" assumes special significance.

1.1 The main objectives of the study were

1. To work out cost and return of sugarcane production on different size of sample farms.
2. To work out resource use efficiency in sugarcane production in different size of sample farms.

2. Materials and Methods

2.1 Selection of Sample Farmers

A separate list of sugarcane growers of five selected villages were prepared along with their size holding and classified into three categories i.e. (1) Marginal farmer (below 1 hectare), (2) Small farmer (1-2 hectare) and (3) Medium farmer (2-4 hectare).

Multistage stratified cum random sampling technique was used to select the district, block, village and farmers. Muzaffarnagar district was selected purposively. A list of all the blocks was prepared and Sadar block was selected purposively.

2.2 Method of enquiry

The primary data was collected by survey method through personal interview on well-structured and pre tested schedule, while secondary data were collected from books, journals, report and records of the district and block headquarters.

2.3 Analytical tools

Both the tabular and functional analysis was used. Weighted average was worked out for interpretation of data with the help of following formula.

$$WA = \frac{\sum W_i X_i}{\sum W_i}$$

Where
WA = Weighted Average X_i =Variable W_i = Weights of variable

2.4 Production function

To study the resource use efficiency in sugarcane production, Cobb-Douglas production function was used. The mathematical form of Cobb Douglas production function is:

$$Y = aX_1^{b1}X_2^{b2}X_3^{b3}X_4^{b4}$$

Where

Y = per hectare output (Rs./ha) $X1$ = seed (Rs./ha) $X2$ = Irrigation charge (Rs./ha)

$X3$ = Plant protection charges (Rs./ha) $X4$ = Manure and fertilizers (Rs./ha)
bi = Elasticity coefficient of the respective input variables e =
Error term or disturbance term μ = Random variables

3. Result and Discussion
3.1 Cost and Returns

The different cost concepts *viz.* Cost A_1/A_2, B_1, B_2, C_1, C_2 and C_3 were considered for analysis of the data. The cost of production of this sugarcane Rs./qt. and input output relationships were analyzed on the basis of different costs. It was found that the overall average total cost of cultivation on the basis of C_3 came to Rs.93290.38/ha which was maximum

i.e. Rs. 95124.68 on medium farms followed by small farms and marginal farms corresponding to Rs. 94820.23 and Rs.1956.74, respectively. It was also observed that cost of cultivation showed positive relationship with desired size farms.

The per hectare gross income was maximum to be Rs. 158324.00 on medium farms small and marginal farms, corresponding toRs.157334.40 and Rs.155452.00 respectively. In respect of all farms gross income came to Rs. 156447.50. Per quintal cost of production of sugarcane on the basis of cost C_3 was highest to Rs. 167.98 on small farms followed by medium and marginal farms corresponding values were Rs. 167.96 and Rs. 164.22 respectively, along with Rs. 65.91/quintal on overall average farms. Input-output analysis was examined on the basis of cost A_1 to C_3. It varied from 1:3.05 to 1:1.69 in case of marginal size group of farms, 1:2.73to 1:1.65 on small farms and 1:2.70 to 1:1.66 on medium farms. The overall average of input-output ratio on the basis of various costs varies from 1:2.89 to 1:1.67. Per hectare cost of return from the cultivation of sugarcane crop on different categories of farms have been presented in Table 1.

Table 1: Measures of Per Hectare Cost and Return of Sugarcane (Rs.)

S. No.	Particulars		Marginal	Small	Medium	Overall Average
			Size Group of Farms			
1	Cost A_1/A_2		50876.12	57507.05	58503.04	54009.44
2	Cost B_1		55765.65	62408.49	63585.87	58931.54
3	Cost B_2		73765.65	80408.49	81585.87	76931.54
4	Cost C_1		65597.04	68200.21	68476.99	66809.98
5	Cost C_2		83597.04	86200.21	86476.99	84809.98
6	Cost C_3		91956.74	94820.23	95124.68	93290.98
7	Yield (q/ha.)	a. Main Product	520.90	525.80	528.60	523.53
		b.By-product	120.00	126.38	128.95	123.26
8	Gross Income (Rs.)	a. Main Product	145852.00	147224.00	148008.00	146587.00
		b. By Product	9600.00	10110.40	10316.00	9860.52
		c. Total	155452.00	157334.40	158324.00	156447.50
9	Net Return over Cost C_3		63495.26	62514.17	63199.32	63156.54
10	Family Income		81686.35	76925.91	76738.13	59515.99
11	Farm Business Income		104575.88	99827.35	99820.96	102438.10
12	Farm Investment Income		22889.53	22901.44	23082.83	22922.10
13	Cost of Production (q/ha.)		164.22	167.98	167.96	165.91
14	Benefit Cost (B:C) Ratio	a. On the Basis of Cost A_1	1:3.05	1:2.73	1:2.70	1:2.89
		b. On the Basis of Cost B_1	1:2.78	1:2.52	1:2.48	1:2.65
		c. On the Basis of Cost B_2	1:2.10	1:1.95	1:1.94	1:2.03
		d. On the Basis of Cost C_1	1:2.36	1:2.30	1:2.31	1:2.34
		e. On the Basis of Cost C_2	1:1.85	1:1.82	1:1.83	1:1.84
		f. On the Basis of CostC₃	1:1.69	1:1.65	1:1.66	1:1.17

Resource Use Efficiency

The Cobb- Douglas's production function was applied to find out the efficiency of various resources use in production of sugarcane. It indicated that four variables *viz.* human labor, manure and fertilizer, irrigation and plant protection jointly explained 92.39, 95.12 and 96.50 percent variation accused in dependent variable on marginal, small and medium farms, respectively. The value of production, standard error, coefficient of multiple determination and returns to scale for sugarcane production on different size groups of farms are presented in Table 2.

Table 2: Resource use Efficiency in Sugarcane on Different Size of sample Farms

Size Group	X_1	X_2	X_3	X_4	Sum of Elasticity (Returns to Scale)	R2
	Production Elasticity					
Marginal	0.2341** (0.0745)	0.3867** (0.0349)	0.0662 (0.1549)	0.1218 (0.0830)	0.8089	0.9239
Small	0.1823* (0.0809)	0.3979** (0.0665)	0.1721 (0.7660)	0.0920 (0.1046)	0.8243	0.9282

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	0.2745	0.2531	0.2723	0.0670		
Medium	(0.3104)	(0.0641)	(0.1192)	(0.0762)	0.8389	0.9302

** Significant at 5% probability level

*Sighificant at 1% probability level

X_1, X_2, X_3 and X_4 stands for human labor, Manure & Fertilizer, Irrigation and Plant Protection, respectively.

Conclusion

Sugarcane is the main source of sugar in India as well as one of the main crops for earning foreign exchange. Sugar industries in India have importance after textile industry and provide gainful employment to large number of people. In the light of aforesaid importance of the crop studying the economics of production of sugarcane is vital.

According to the study conducted in the Muzaffarnagar district the average total cost of cultivation was found to be Rs. 93290.98/hectare. The cost of cultivation was maximum on medium sample farms and minimum on marginal farms. This is due to more expenditure occurred on human labour and seed charges by medium farms as compared to other categories of farms.

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