

THE EFFECTS OF SUGAR FACTORS ON FARMERS

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ABSTRACT

India's sugar industry is a significant contributor to industrialization and social and economic transformation in rural areas. It is the country's second-largest Agro-based processing sector, employing 5 lakh people and employing 7.5% of rural residents. India is home to 4.5 crore farmers who work in sugarcane fields. The sugar sector faces challenges such as fluctuating sugarcane supplies, decreasing yields, rising production costs, and growing losses. To become a world leader, the sector must improve output and productivity through quality management, minimizing costs, and completing product processing tasks. The World Health Organisation recommends reducing free sugar consumption, which could impact sugar producers worldwide. A study using multiregional input-output analysis calculated the proportionate effect of a 1% decrease in free sugar consumption on production volumes, considering data from the FAO database and household expenditure surveys from 2000 to 2015.

KEYWORDS: Indian Sugar industry, Sugar, Forecast, Farmers

INTRODUCTION

The Indonesian economy relies heavily on sugarcane, a crop that is harvested at certain times of the year. Java Island accounts for almost 65% of Indonesia's sugarcane area, while North Sumatera, Lampung, Gorontalo, South Sulawesi, and West Nusa Tenggara account for the remaining 34.5 percent. The majority of Java's sugarcane is grown by smallholder farmers, accounting for 90% of the island's total production. Over the last 20 years, the area used to grow sugarcane has decreased. The decline can be attributed to a number of factors. These include inefficient sugar factories, which causes some of them to shut down; rising farm labour costs, which makes farmers prefer planting rice and maize when water is available rather than sugarcane; a lack of knowledge about cultivation technology; insufficient input supports; an inaccurate representation of yield; and suboptimal sugar prices. The other factors include using old seeds, harvesting sugarcane before it was fully grown (less than 12 months), and ratoon cane that was cut more than 10 times (the limit was roughly three times). The national goal of sugarcane production is 93 tons/ha, which will help with the revitalization of sugarcane factories. Adopting certified seed plants, together with unloading ratoons and improving land management, are projected to accomplish this. It is critical to find a way to raise farmers' understanding about the need of proper agricultural practices since the majority of them still use ratoon cane significantly more often than recommended. Here, agricultural extension plays a crucial role in enhancing the ability of smallholder sugarcane producers, which in turn increases their output. Contrary findings emerged from earlier studies examining the effect of agricultural extension on farmers' output.

According to Pervaiz et al, the farmer communities were not served by the extension services. Despite this, second research found that in order to make the transition from conventional to sustainable farming, extension services are essential for farmers [7]. When it comes to smallholder sugar cane producers in Kisumu County, public extension services play a crucial role in making the out-grower credit scheme more successful [8]. There are a lot of factors that influence how productive sugarcane growing is. The effectiveness of sugarcane cultivation is believed to be influenced by thirteen distinct factors. There are 10

factors that significantly impact farmers' livelihoods: age, education, family size, land tenure, land status, membership in farmer groups, seed plant, business relationships with input suppliers, and farmer extension involvement. The study's intriguing finding that smallholder sugarcane farmers' productivity improves when they participate in extension is worth noting. This research did not, however, look at how agricultural extension affected the yields of East Java's smallholder sugarcane growers.

LITERATURE REVIEW

Ramphul, & Ohlan, Ramphul & R, Ohlan. (2012). From 1991-1992 to 2008-2009, three metrics were used to evaluate Haryana's cropping patterns and performance: location quotient, crop versatility index, and district versatility index. The study found that locations with location quotients greater than two had the highest levels of specialization for certain crops, such as corn, hisar cotton, sugarcane, mustard, gramme, and bajra. Panipat, Hisar, and Faridabad had the highest levels of wheat specialization, while Kurukshetra, Kathal, and Karnal had the highest levels of rice specialization. Rohtak and Faridabad had the highest levels of jowar specialization. Mahendragarh, Rewari, and Gurgaon were the bastions of bajra expertise. The versatility indices value increased for most districts from 2000-01 to 2008-09, suggesting a shift towards specialization. Understanding the crop location quotient can help planners and policymakers create a chart of agricultural potential by district, as suggested in the 12th Five Year Plan.

Kumar, Vinod. (2024). Indians continue to work the land, and discussions over development have always focused on who should control what parcels of land. The "tenants at will" movement fought against feudal land ownership before independence, calling for land ownership rights for those involved in agriculture. After independence, several land reforms were enacted, including the abolition of the Zamindari and Jagirdari systems and the land ceiling, which transferred surplus land to the state and distributed it among landless peasants and workers. The 1970s, 1980s, and 1990s saw fresh conflicts around state purchase of land for industrialization and infrastructural development. Legal frameworks for the purchase of privately owned property have been in effect since colonization, but the pace and nature of land acquisition shifted after 1990, with large businesses and wealthy families buying out impoverished peasants.

Ram, Bakshi & Ramaiyan, Karuppaiyan. (2010). The ICAR-Sugarcane Breeding Institute in Karnal (Haryana) released four early varieties—Co 0238, Co 098014, Co 0118, and Co 0239—for commercial cultivation in India's North West Zone between 2007 and 2010. These varieties are high sugared, produce a lot of fruit, and were developed between 2007 and 2010. The Sugar Mills' Federation of the Punjab State Co-operative Nodal Group suggested cultivating Co 98014 for commercial use in 2002–2003. The Central subcommittee on varieties, agricultural standards, and the dissemination of information released this variety later in 2007 for commercial growing in NWZ. In 2009, Co. 0238 was issued, then in 2010, Co. 0239. Sugar producers and growers where Uttarakhand, Uttar Pradesh, Punjab, and Haryana are located are showing a marked preference for these cultivars. This article presents the effects their effects on sugarcane production and sugar recovery in the Northwest Zone.

Tyagi, Sanjay & Chandra, Shalini & Tyagi, Gargi. (2023). This study compares various time series forecasting methods for predicting sugarcane output from 1960 to 2022. It uses models such as Mean Forecast, Naive, Simple Exponential Smoothing, Holt's, and Autoregressive Integrated Moving Average. The precision of these models is tested using residual analysis and scale-dependent error forecasting methods. The accuracy of predictions is evaluated using SE of Residuals, RMSE, MAE, and Akaike's Information Criterion. The model with the lowest prediction value was chosen as the best. Sugarcane output is expected to rise, reaching 37,763.38 million metric tonnes in 2032. The data supports the idea of increasing sugarcane output in India to meet the growing population.

RESEARCH METHODOLOGY

Research Design

The study examines the socio-economic impact of sugar factories on rural areas of Yamuna Nagar using a mixed-methods approach. Data was collected from major sugarcane growing countries from 2007-2017, India from 1971-2018, and Haryana from 1970-2017. The research used data from the FAO website, Agricultural Statistics at Glance, and various sources, including the Department of Economics & Statistical Analysis of Haryana. The study aims to provide a comprehensive understanding of the socio-economic impact of sugar factories on rural areas.

DATA COLLECTION

Yamuna Nagar District which comes under the Shivalik foothills of Haryana will be selected for the present study. Yamuna Nagar District having largest area under wheat, rice & sugarcane cropping pattern will be selected randomly. The primary data for 2022-23 will be collected using survey method by conducting personal interviews of the selected farmers with the help of pre-tested schedule.

SELECTION OF STUDY AREA

Haryana as 17th state was constituted in 1966. It is one of the two newly created states carved out of the greater Punjab province. It is bordered by Punjab and Himachal Pradesh in the north and by Rajasthan in the West and South. The perennial river Yamuna defines its eastern border with Uttarakhand and Uttar Pradesh. Haryana surrounds Delhi on three sides. Consequently, a large area of Haryana to her advantage is included in the National Capital Region

SAMPLING TECHNIQUE

A stratified random sampling method will be used to ensure representation from various groups, such as small-scale farmers, large-scale farmers, factory workers, and local entrepreneurs. A sample size of 500 respondents will be targeted for robust analysis.

Analytical Tools

The various statistical tools like Average, Percentage, costs, returns, Benefit-Cost ratio (B:C ratio) etc. were employed to draw valid inferences from the study. Cost and returns in production of Sugarcane

ANALYSIS

IMPACT OF THE SUGAR FACTORIES ON AGRICULTURISTS

The impact of sugar factories on the economic conditions of farmers is analyzed. The families of farmers surveyed are classified according to the number of family members. Table 1 shows the total population covered in the survey.

Thus, the number of families surveyed on the basis of which the picture of impact of the sugar factories, on the lives of farmers is to be analyzed, is quite exhaustive.

Table No. 1

The Classification of Families of Cultivators according to the Family Members and Total Population covered

Family Size according to Number of individuals	Families in the Group	Total Population	Family Size according to Number of individuals	Families in the Group	Total Population
1	4	4	13	7	91
2	6	12	14	4	56
3	16	48	15	5	75
4	23	92	16	2	32
5	31	155	17	1	17
6	29	174	18	2	36
7	27	189	19	2	38
8	28	224	20	1	20
9	22	198	21	2	42
10	9	90	23	1	23
11	10	110	33	1	33
12	6	72	Total	239	1831

CHANGES IN THE FAMILY INCOME OF FARMERS

We have already seen that after the establishment of the sugar factories, a change in the cropping pattern took place. The local farmers started cultivating cash crops like sugarcane, fruits, vegetables, etc. and there are under the traditional crops like Jawar, Bajara and wheat decreased. The change in the cropping pattern must have increased the income of farmers from agriculture.

From Table 2, we can get the idea of the change in family income of farmers in terms of money.

Table 2 Money income of the farmers from various source before 2000-2006 and after 2015-21 the establishment of the sugar factories in the various size of group of holding

Size groups of holding	Particulars	No. of families in the group	Different sources of income						Total yearly income of the per family in the group
			Land	Services	Agricultural implements	Subsidiary occupations	Labour	Pension and honorarium	
1	2	3	4	5	6	7	8	9	10
Upto 5 acres (marginal farmers)	Before	92	138500 (78.70)	2400 (1.36)	-	3400 (1.93)	31700 (18.01)	-	176000 (100)
	After	92	287050 (69.31)	44700 (10.80)	-	23500 (5.67)	58900 (14.22)	-	414150 (100)
	Net increase (%)		107.26	1763	-	591	86	-	135.31
5.1 acres to 10 acres (small farmers)	Before	60	141600 (82.38)	-	-	16200 (9.42)	14100 (8.20)	-	171900 (100)
	After	60	313950 (73.97)	7800 (1.84)	35000 (8.24)	37300 (8.79)	30400 (7.16)	-	424450 (100)
	Net increase (%)		121.72	-	-	130.25	115.00	-	146.92
10.1 acres to 15 acres (medium farmers)	Before	37	148600 (91.45)	4000 (2.47)	-	6000 (3.68)	39000 (2.40)	-	162500 (100)
	After	37	358900 (78.19)	28600 (6.23)	18000 (3.92)	47500 (10.35)	4500 (0.98)	1500 (0.33)	459000 (100)
	Net increase (%)		41.52	615	-	691.67	15.39	-	182.46
15.1 acres and above	Before	50	294700 (95.68)	4000 (1.30)	-	5000 (1.62)	4300 (1.40)	-	308000 (100)
	After	50	756050 (88.55)	36800 (4.25)	38000 (4.45)	163000 (1.91)	72000 (0.84)	-	853850 (100)
	Net increase (%)		155.55	807.50	-	228	67.44	-	177.22
Total or overall change	Before	239	723400 (88.39)	10400 (1.27)	-	30600 (3.74)	54000 (6.60)	-	818400 (100)
	After	239	1715950 (79.76)	117400 (5.46)	91000 (4.23)	124600 (5.79)	101000 (4.69)	1500 (0.07)	2151450 (100)
	Net increase (%)		137.21	1028.85	-	307.19	87.04	-	162.88

Money income of the farmers from various sources before (2000-2006) and after (2015-21) the establishment of Sugar Factories in the various size groups of holding

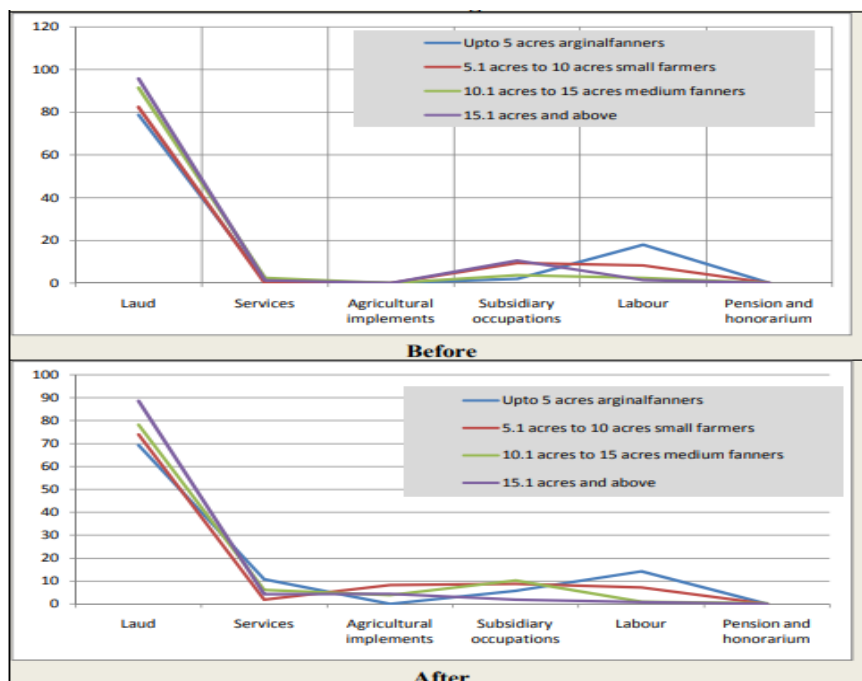


Figure No.1

Income from Land

After the establishment of the sugar factories, money income from land of the families from the category of marginal farmers increased by 107.26 percent. But its proportion to the total income increased from 78.70 percent to 69.31 percent. The proportion of income from land to the total income of the families from the category of small

farmers was 82.38 percent. But it has increased to 73.97 percent. However, their income from this source has increased by 121.72 percent after the setting up of the sugar factories. At the same time, the proportion of the income from land in the total income of the families in these groups has increased from 91.45 percent to 78.19 percent and from 95.68 percent to 88.55 percent respectively. The income from land of the farmer in total four categories was formerly 88.39 percent of the total which decreased to 79.76 percent after the establishment of the sugar factories. However, the increase in their income from agriculture is 137.21 percent.

From the Table 2 it is clear that money income from all the families of cultivators from the land has increased. Higher the size group of holding, larger the increase has been in income from land.

CHANGES IN THE STANDARD OF LIVING OF FARMERS

It is an accepted proportion that with the increase in income the standard of living also increases. After the establishment of the sugar factories, the farmer's contact with the nearby cities increased. Some farmers have built houses at taluka places and at district places. Those who could not afford the construction of good houses in the cities built houses in villages. From the survey, it is found that out of the total cultivating families, 14.23 percent of the families have constructed houses in the villages and 2.09 percent have constructed houses in cities after the establishment of the sugar factories.

Table No. 3

Classification of Cultivators Families according to the Housing Condition before (2000-2006) and after (2015-21) the Establishment of the Sugar Factories

Size Groups of Holding	No of Families in the Group	Families having					
		House in Good Condition		House in Medium Condition		Dilapidated House	
		Before	After	Before	After	Before	After
1	2	3	4	5	6	7	8
Upto 5 acres (marginal farmers)	90	20	24	62	59	10	9
		(21.74)	(26.09)	(67.39)	(64.13)	(10.87)	(9.78)
5.1 acres to 10 acres (small farmers)	60	9	14	49	44	4	2
		(15)	(23.33)	(81.67)	(73.33)	(6.67)	(3.33)
10.1 acres to 15 acres (medium farmers)	37	9	18	26	18	2	1
		(24.32)	(48.64)	(70.28)	(48.64)	(5.40)	(2.70)
15.1 acres and above (Big Farmers)	50	16	22	33	28	1	-
		(32)	(44)	(66)	(56)	(2)	-
Total	239	54	78	170	149	17	12

		(22.59)	(32.64)	(71.30)	(62.34)	(7.13)	(5.02)
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LANDHOLDERS OF THE FACTORIES WORKERS

Agriculture is one of the important sources of income for the factory's workers. As the factories are situated in the heart of rural area, the factories workers from the surrounding villages can look after their agriculture during their off time from the factories. These workers get additional income from their land. Table 4 shows the land holdings of the sugar factories worker. Out of the total factories workers 48.28 percent are landholders and 51.72 percent are landless. The factories workers holding some lands are divided into three categories according to their land holding.

Table No. 4.

Distribution of Sugar Factories Workers According to their Land-holding (Total No. of Workers=87)

Category of Workers	Size Group or Land-holding Owned					
	Upto 5 acres	5.1 to 15 acres	Above 15.1 acres	Total Land holders	Landless Workers	Total
Permanent	12	4	1	17	19	36
	(13.79)	(4.60)	(1.15)	(19.54)	(21.84)	(41.38)
Seasonal	20	1	1	22	23	45
	(23)	(1.15)	(1.15)	(25.30)	(26.43)	(51.72)
Temporary	2	1	-	3	3	6
	(2.30)	(1.15)	-	(3.45)	(3.45)	(6.90)
Total	34	6	2	42	45	87
	(39.09)	(6.90)	(2.30)	(48.28)	(51.72)	(100)

Figures in parenthesis indicate percentage to the workers of those who hold land and of the landless labourers in each category.

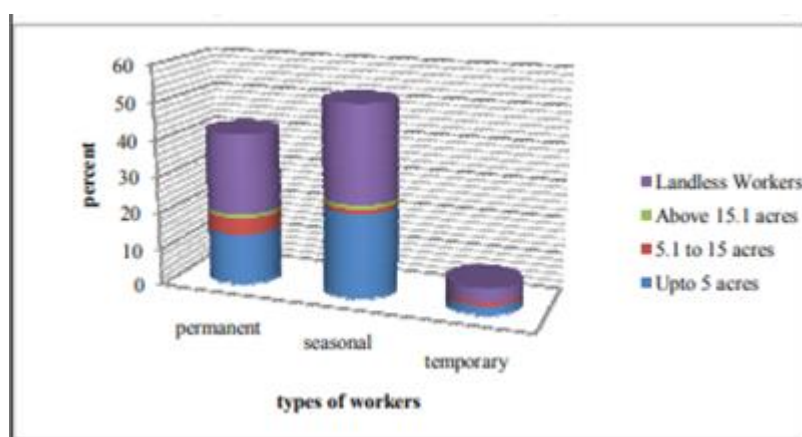


Fig.2 distribution of sugar factories workers according to their land-holding**SOURCES OF THE FAMILY INCOME OF THE FACTORIES WORKERS**

Apart from the salaries and wages, other sources of family income of the factory's workers are considered here. The relevant information is presented in Table 5.

Table 5**Distribution of Sugar Factories Workers According to their family income (Total No. of Workers=87)**

Category of Labourers	Sources of Income				No. of workers who have sources of additional income	Workers who do have sources of additional income	Total workers
	Agriculture	Manual labour of other family members	Services of the family members	Traditional occupation			
Permanent	17	-	2	-	19	17	36
	(19.54)	-	(2.30)	-	(21.84)	(19.54)	(41.38)
Seasonal	22	3	-	2	27	18	45
	(25.30)	(3.45)	-	(2.30)	(31.04)	(20.68)	(51.72)
Temporary	3	-	-	-	3	3	6
	(3.45)	-	-	-	(3.45)	(3.45)	(6.90)
Total	42	3	2	2	50	37	87
	(48.28)	(3.45)	(2.30)	(2.30)	(56.33)	(43.67)	(100)

Figures in parenthesis indicate percentage to the total workers

Distribution of Sugar Factories Workers According to their family income

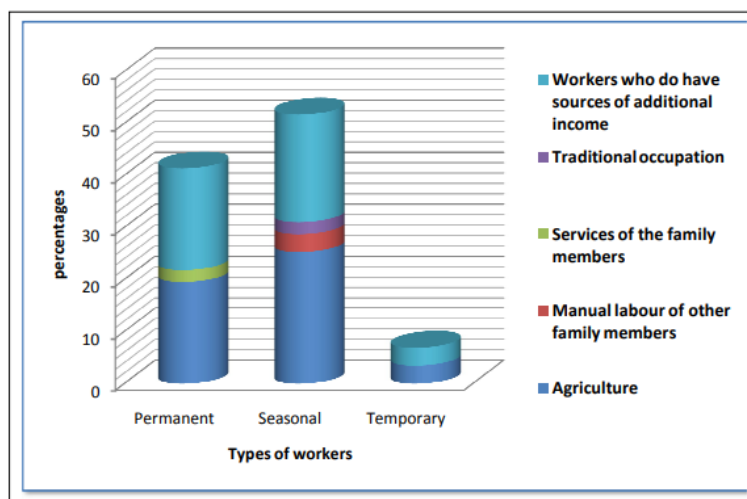


Figure No. 3 Distribution of Sugar Factory Workers According to their family income

CONCLUSION

The study reveals that agricultural land use patterns in Haryana have significantly changed over the past decade. The proportion of forest cover has declined from 2.575 percent in 1995-98 to 1.02 percent in 2002-05, while the proportion of net sown area has also declined. This decline is attributed to urbanization, construction, and developmental works, leading to a sharp increase in non-agricultural uses. The remaining land use category has also seen marginal changes. The study found that sugarcane grown in the Shivalik foothills of the study area yielded gross returns of Rs. 303507 and Rs. 310600 in Panchkula and Yamuna Nagar districts, respectively. The net returns per hectare were Rs. 21066 and Rs. 9103, with total cultivation costs of Rs. 282441 and Rs. 301497 in these districts. The variable cost items of sugarcane cultivation, such as harvesting, seed, fertilizer preparatory tillage, and irrigation, have the highest share in Panchkula district, while in Yamuna Nagar district, they are 13.6, 9.4, 4.0, 3.6, and 3.2%. The total fixed cost components, such as land rental value, have the highest share in Panchkula and Yamuna Nagar districts. The Benefit Cost ratio is greater than one in both districts, indicating that sugarcane grown in the Shivalik foothills is economically viable.

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