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Evaluation of Appropriateness of Sugar Cane Purchase Rate Given by Sugar Factories to Sugar Cane Growers in Kolhapur District, Maharashtra (A Case Study of Shri. Chhatrapati Shahu Sahakari Sakhar Karkhana Ltd., Kagal, Tehsil-Kagal)

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Abstract
Sugarcane occupies an area of 20.42 million ha with a total production of 1333 million metric tons worldwide. Now, in India sugar industries are categorized as a co-operative, private and public sectors. Now few crises were come up in case of co-operative sugar factories in Kolhapur district particularly associated with sugar cane purchase rate given to the sugar cane growers by sugar cane factory. For in-depth analysis out of 14 efficiently working co-operative sugar factories in Kolhapur district shri Chhatrapati Shahu Sahakari Sakar Karkhana Ltd, Kagal is selected for a case study. For a present investigation 11 years data (2002-203 to 2012-13) of sugar factory was obtained and analyzed. Besides that present study is also associated with study of initiatives those were undertaken by selected sugar factory for the betterment of sugar cane growers. Thereafter, correlation between each variable was calculated and their level of dependences was also analyzed.
Keywords: Correlation analysis, White sugar production, Sugar cane purchase rate, etc

1. INTRODUCTION

Sugarcane area and productivity are differing widely from country to country. Brazil has the highest area (5.343 million ha), while Australia has the highest productivity (85.1 tons/ha). Out of 121 sugarcane producing countries, fifteen countries (Brazil, India, China, Thailand, Pakistan, Mexico, Cuba, Columbia, Australia, USA, Philippines, South Africa, Argentina, Myanmar and Bangladesh) present 86% of the area and 87% of production. Out of the total white crystal sugar production, approximately 70% comes from sugarcane and 30% from sugar beet (http://www.sugarcanecrops.com/introduction/). Sugar processing firms in India take on two distinct organizational forms: farmers' cooperatives and joint stock companies. These organizational forms differ not only in their ownership structure, but also in their ability to coordinate their own activities with those of the farmers who supply them with cane to be processed (Sen, A., 1995).

After independence, industry has witnessed a locational shift. The sugar industry was localized quite some time in Uttar Pradesh and Bihar. For instant in 1960-61 about 60 % of sugar production comes from these two states. The southern or tropical states like Maharashtra, Tamil Nadu and Karnataka emerged as leading states in sugar production (www.articlesbase.com). Kolhapur is considered as the home of the co-operative movement in Maharashtra. In 1912- 1913, when the seeds of the co-operative movement were sown in Maharashtra and India, Shahu Maharaji brought into force the act for co-operative institutions in the princely state of Kolhapur (www.manase.org.).

According to the survey, those sugar factories which are having more recovery rate (more than 12 %) are able to give more than Rs. 2600/- sugar cane purchase rate to the farmers. These factories in Kolhapur district are well organized and have maximum income from the by-products of sugar cane. One of them is shri. Chhatrapati Shahu Sahakari Sakar Karkhana Ltd, Kagal. Hence, shri. Chhatrapati Shahu Sahakari Sakhar Karkhana is selected for a case study. For a present investigation 11 years data (2002-203 to 2012-13) of sugar factory was obtained and analyzed. Besides that present study is also associated with the study of initiatives, which were undertaken by selected sugar factory for the betterment of sugar cane growers. Thereafter, correlation between each variable was calculated and their level of dependences was also analyzed.

2. OBJECTIVE

1. To analyze the correlation between selected variables.
2. To evaluate the appropriateness of sugar cane purchase rate.

3. DATABASE and METHODOLOGY

Present investigation is based on secondary sources of data. Secondary data was collected from production, technical and harvesting departments of sugar industries, Annual Reports of Sugar Industries, District Census Handbook, Statistical Abstracts, Tehsil Offices, News Papers, Internet, etc.

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4. A CASE STUDY OF SHRI. CHHATRAPATI SHAHU SAHAKARI SAKHAR KARKHANA LTD., KAGAL

4.1 Few Initiatives by Selected Sugar Factory for the Betterment of Sugar Cane Growers

4.1.1 Sugar Cane Production in Factory Area during Year 2012-13

In year 2012-13, total 7,21,594/- M.Tons sugar cane was crushed at selected sugar factory. The selected sugar factory is much focuses over sugar development planning in order to obtain maximum sugar cane production per acre and tried to increase the recovery rate. Accordingly, factory through the various schemes provided shahu vermin fertilizers, shahu phospo fertilizers, etc. to the sugar cane growers in its study area. The factory is working on per acre sugar cane output since 2003-04, first of all they identified the farmers, which have less than 20 M. Tons/acre sugar production in their influence area. Then the study was carried out by factory to find out the causes behind low production. And after the detailed research, experts in sugar factory organize the proper the counseling sessions for the farmers. During such a project they guided near about 4621 farmers and due to that production of sugar cane raised by 15 M.Tons/Acre.

4.1.2 Research on Sugar Crop Varieties

In assessment years (2002-03 to 2012-13), 13 new sugar crops were analyzed and about five new were implanted in factory area for observation and analysis purpose. Sugar factory also made awareness among the farmers regarding the varieties that give maximum recovery and maximum per acre production. Sugar cane crop verities introduced to the farmers by factory are Kosi-651, K.-86032, K.M.-254, K.-94012, K.-92005 and K.V.S.I-03102.

4.1.3 Drip Irrigation for Sugar Cane

Generally, sugar cane crop required more quantity of water as compared to other crops in study area. The study area is well drained by various tributaries of "Krishna-Panchaganaga basin"; therefore, water is easily available for irrigation. But, most of the farmers are not aware about proper irrigation practices; hence, in the study area proportion of waste water is high. Thus, sugar cane factory focuses over the making of awareness among the farmers about the use of drip irrigation in their agricultural fields.

4.1.4 Production of Fertilizers

By the process of decomposition, at sugar cane factory site, factory converts the press mud into fertilizer. During the year 2012-13, about 18366.010 M.Tons decomposed fertilizers were provided to the sugar cane growers at negligible rate.

4.1.5 Irrigation

In the factory area, under the co-operative system, new schemes of water supply were adopted. Under these 16 schemes of water supply from Dudhganaga-Vedhaganga and Chikkotra River were activated by factory for the cane growers in their influence area.

4.1.6 Section Development Fund

The fund collected from factories' "Section Development Fund" was utilized for development of societies in factories' influence area by the organizing social, cultural and sport programs. In year 2012-13, Rs. 40,92,831/- were utilized for the section development activities.

4.1.7 Monthly Magazine

"Shahu Sugar Warta" is the magazine started by sugar factory, which provided the complete information about new technology used in sugar cane areas, articles about sugar cane production by agricultural scientist, etc. This magazine was monthly distributed to the shareholder's (sugar cane grower's) house.

5. ANALYSIS OF YEAR-WISE RECOVERY RATE OF SUGAR FACTORY

The average recovery rate of (12.89 %) Kagal sugar factory is very good as compare to other surveyed factories. As per the survey total average seasonal production of sugar cane in 2012-13 is 3088.86 Tons. Hence, from 3088.86 Tons of sugar cane 394.58 Tons of sugar was produced in year 2012-13. So, the average recovery rate of factory is good enough to convert maximum quantity of sugar cane into white sugar (Table 1).

This factory having more than 13 % of recovery rates in most of surveyed years indicates that there is increase in sugar production per year and factory obtained good economic returns in each year.

6. CORRELATION ANALYSIS

For the selected sugar cane factory (as a case study) correlation between the total sugar cane crushed (M. Tons) (for last 11 years) and sugar production (M.Tons), total sugar cane crushed (M. Tons) and sugar cane purchase rate, total sugar production (M. Tons) and sugar purchase rate was determined (Table 2,3,4).

The correlation analysis between sugar cane crushed and white sugar production represents (R= 0.98)

high limited degree positive correlation. So, in simplified case, the direct proportional relationship is observed between them. Sugar cane crushing is directly and strongly influencing the sugar production. While, the correlation between sugar cane crushed and sugar cane purchase rate is (R= 0.41) moderate degree positive.

7. CONCLUSION

An investigation reveals that even if there is increase into the sugar cane crushing then also sugar factory is not that much interested/ready to increase the sugar cane purchase rate (which is given to sugar cane growers by sugar factory). Even increased sugar cane production, by using high yielding verities, is also not much related to sugar cane purchase rate. Therefore, it creates economic and simultaneously social gaps between sugar cane growers and factory owners/ members.

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www.manase. org.

Table 1
Year-wise Recovery Rate of Selected Sugar factory

Years	Recovery Rate (%)
2002-03	13.45
2003-04	12.58
2004-05	12.82
2005-06	13.42
2006-07	13.17
2007-08	13.1
2008-09	12.83
2009-10	12.1
2010-11	12.41
2011-12	12.83
2012-13	13.11
Average	**12.89**

Source: Based on Annual Sugar Factory Reports (2002-03 to 2012-13)

Table 2
Year-wise Total Sugar Cane Crushed in Sugar Factory (2002-03 to 2012-13)

Years	Total Sugar Cane Crushed (M. Tons)
2002-03	652030
2003-04	474963
2004-05	572529
2005-06	649357
2006-07	697258
2007-08	775247
2008-09	705753
2009-10	725505
2010-11	698802
2011-12	663416
2012-13	721595
Average	666950.4545

Source: Based on Annual Sugar Factory Reports
(2002-03 to 2012-13)

Table 3
Year-wise Total White Sugar Production (2002-03 to 2012-13)

Years	White Sugar Production (M.Tons)
2002-03	87710
2003-04	59725
2004-05	73314
2005-06	87215
2006-07	91855
2007-08	101579
2008-09	90566.9
2009-10	94998
2010-11	86675
2011-12	85173
2012-13	94693
Average	Sum=953504

Source: Based on Annual Sugar Factory Reports
(2002-03 to 2012-13)

Table 4
Year-wise Sugar Cane Purchase Rate (2002-03 to 2012-13)

Years	Sugar Cane Purchase Rate Rs.(per ton)
2002-03	945
2003-04	1021
2004-05	1400
2005-06	1700
2006-07	1280
2007-08	1100
2008-09	1800
2009-10	2700
2010-11	2290
2011-12	2340
2012-13	2600

Source: Based on Annual Sugar Factory Reports
(2002-03 to 2012-13)

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