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PROFITABILITY AND EFFICIENCY OF SUGAR INDUSTRY IN INDIA

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ABSTRACT:

Sugar industry is the second largest industry among agro-based processing industries next to cotton & textile industry in India. It plays a crucial role in the Indian economy. It is important not only from the point of view of in actual output and investment but also from the point of view of its utility for the consumers of sugar, its importance to sugarcane (cane) growers, its contribution to the State exchequer and its role in providing employment opportunities. In an era of planned economic growth and development of India, sugar industry has been assigned an important role and has been accorded a place of pride in the scheme of priorities for development of industries in India in general and Haryana in particular.

India occupies the second position in sugar production followed by China and Mexico in the world sugar market next to Brazil with 26 Million tones sugar production in the year 2010-11 over 21 Million tones in 2005-06 with 27.3 percentage change. On the other hand, India is the largest consumer of sugar followed by EU-27, China and Brazil. The sugar consumption level which remained 25 Million tones in 2010 is estimated to be reached at 26 Million tones in Financial Year (FY) 2012. Export of sugar from India remained 44 thousand tones (value of ` 110.23 Crores) and import remained 2.4 Million tones (value of ` 5961.24 Crores) in FY 2010.

The review of literature done in Chapter two reveals that there are research gaps on economics of sugar industry in Haryana. Two organizations namely Indian Sugar Mills Association (ISMA), New Delhi and National Federation of Cooperative Sugar factories (NFCSF), New Delhi are making sincere efforts to publish the research findings on sugarcane and sugar industry at their own level in the form of journals and sugar year books having sugarcane and sugar related research work within these publications. But no such kind of study was found which can reveal the whole picture of economic analysis of sugar industry of Haryana after the post reform era. The overall objective of the present study is to analyze the profitability and efficiency of sugar industry in India with special reference to Haryana. For that purpose the present study is confined to ten sugar mills operating in co-operative sector in the State of Haryana.

SUGAR INDUSTRY AS AN AGRO-BASED INDUSTRY:

Shrivastava (2006)[1] symbolized the sugarcane and stated that 'Sugarcane has acquired the status of *Kalpavriksha* by virtue of its multifarious uses; and sugarcane based agro-industries have become a catalyst for socio-economic transformation of nearby areas'. *Kalpavriksha* means that tree of which each and every part can be utilized and not a single fraction of the tree goes in waste. Sugarcane is not only sweet in taste but it has been proved as sweet in nature also. It is a *Kalpavriksha* for sugar industry. No part of sugarcane is being wasted. Sugarcane is used in sugar industry, in Gur making and in Khandsari units for manufacturing purpose and its leaves are used as a better fodder for animals. In sugar industry not only sugar is manufactured; it has three main by-products also namely Bagasse, Press mud and Molasses.

Sugar industry holds a prominent place in the agro-based processing industries (ABPI) of India ('which includes sugar factories, oilseed units, cotton mills, tobacco manufacturing, fruit preserving and rice industries', as mentioned by Joshi (1980)[2]

in terms of its multiple contributions in the shape of employment and provision of raw material in the form of sugar by-products to other industries (like Bagasse is used as a fuel and as raw material in paper industry, Press mud is used in making of organic manure, Molasses is used mainly in alcohol-based industries and in making bio-fuel as ethanol in auto-mobile industry). Therefore, it would be in the larger interest of the economy to pave the way for its development through modernization, rehabilitation and reconstruction. An Agro-processing Industry (API) is defined as one which processes bio-mass that is agricultural raw-materials which include ground and tree crops as well as livestock and fisheries to create easily exportable forms, enhance nutritive value and extract chemicals for other uses. Agro-based industries (ABI) have contributed to the economic life of Indians in general and farmers in particular. They not only provide the base for the socio-economic development that can contribute to an all round growth of the economy but also operate more as catalytic agents for development of agriculture and help in bridging the gap between rural and urban economies. The role of agro-industries is significant both in respect of employment and value addition by manufacturing. It has been estimated that these industries registered nearly around half of the total income generated in the manufacturing sector in India and can bring the concept of 'Rural Industrialization'.

According to Huda (2007)[3] 'Although not all sugar factories in India are, situated in rural areas, yet it is known as 'Rural Industrialization'. Because the output of primary sector or agriculture sectors that is sugarcane are used as input in secondary sector or manufacturing sector that is in sugar mills. Here rural sector supporting the industry and gave enhancement to industrialization. More agricultural input will give more increment to industrialization and more employment generation for rural people so it becomes concept of rural industrialization. Sugar industry is an agro-based industry and has both forward and backward linkages. Backward linkages pertain to sugarcane development and sugarcane growers and contributed to their prosperity while the forward linkages include development of activities like education, health services, ancillary industries (by-product base), banking etc. and these transformed the rural areas into semi-urban area, by providing some of the amenities of rural areas'.

As earlier mentioned in the F.A.O. Report (1980)[4] 'The world community is facing the scourge of hunger and malnutrition that have been increasingly threatening the lives of millions of people in the developing countries. Agro-industries, of which the sugar industry is amongst the most important, can play an important role in the alleviation of this critical problem by creating employment and increasing production in areas where they are mostly needed'.

BRIEF HISTORY OF CANE SUGAR INDUSTRY:

Sugarcane is a crop of great industrial importance in the world and has long been in use with periodicals improvements in the cultivation of sugarcane and manufacturing of sugar. Toth and Rizzuto (1991)[5] highlighted that 'A thorough history of sugar has been very lengthy because it began million of years ago. The creation of sugar, which the chemist calls Sucrose, belongs to the infinite wisdom of nature. The sophisticated chain of reactions that first occurred millions of years ago still goes on in the majestic laboratories of Mother Nature where solar energy is captured in certain plants to form sugar. Its sweet flavor resulted from pure solar energy centuries ago as it does today, providing energy required by each living being to sustain life. The industrial production of sugar/sucrose is based exclusively on sugarcane and sugar beet processing. Sugarcane is tropical plant, while the sugar beet flourishes in cooler climates. Sugarcane is grown and cane sugar is

produced in tropical and sub-tropical countries'.

Das (2007)[6] identified that 'Sugarcane has been under cultivation from earlier times and India is considered its original home. Das quoted the Barmas (1953) which highlighted that the original home of sugarcane is an Island of Pacific region from where it spreads to India and other parts of the world and he also quoted Barber (1931) because he was of the opinion that thin Indian's sugarcane probably originated in most parts of the north eastern India. From some plants closely related to Saccharum Spontaneum (Kans). Tropical sugarcane might have been originated in some of the largest islands of Oceania, most probably in New Guinea. Brandes (1956) also concluded that it was originated in New Guinea, where various forms of thick, tall, tropical sugarcanes have been grown from ancient times'.

According to the Rao, Natarajan and Bhagyalakshimi (1985)[7] 'There is a mythological story relating to Raja Trisanku of Ikshvaku dynasty, which implies the origin of sugarcane in India. The Goddess Lalita is pictured as having sugarcane in her hand and mentioned that it is made in the versa in Lalitha Sahasranamam. The God of love, *Cupid*, is symbolized as having a bow made of sugarcane stalk. The institutes of Manu and Medical treatises of Charaka and Susruta make mention of sugarcane. Sharkara, a Sanskrit word from which all names west of India for sugar and sugarcane derived, is a linguistic evidence of Indian origin, meaning 'a new crop from the east'.

Das (2007)[8] mentioned different local names of sugarcane. 'It is called Ganna and Kamad in Hindi, Ikshu in Sanskrit, Eskh in Punjabi, Akh in Bengali, Kuhhia in Assamese, Akhu in Orriya, Karumpu in Tamil, Cheruku in Telegu, Ikshu in Malayalam, Oos in Marathi and Sherde in Gujarati.

Rao, Natarajan and Bhagyalakshimi (1985)[9] also identified that 'Sugarcane belongs to the grass family and classified in the tribe Andropogonae and Gramineae. The botanical name is Saccharum Officinarum, derived from the Sanskrit word Sharkara means 'Sugar''.

CHEMISTRY OF SUGAR

Sugar is really a great invention of men in the world of taste. It is not only taste making but also essential for human body. Sugar is the richer source of glucose that generates energy for body. It is used in most of our eatables at home and in confectionary industry. Nelson and Michael (2005)[10] revealed that 'Plants make sugar by Photosynthesis process. The plant take in Carbon dioxide (CO_2) from the air through pores in its leaves and absorbs water (H_2O) through its roots. These are combined to make sugar ($C_{12}H_{22}O_{11}$). This reaction can be written as the following chemical equation, when sucrose (sugar) is being made and can also be shown through a figure 1.1

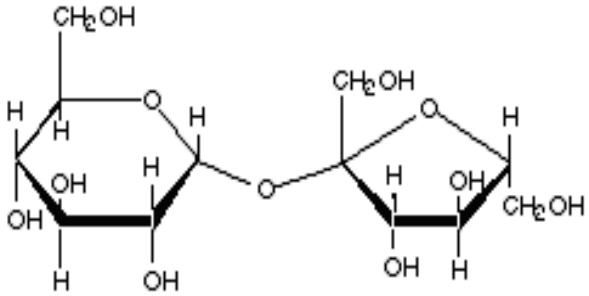
$$12\ CO_2 + 11\ H_2O \rightarrow C_{12}H_{22}O_{11} + 12\ O_2$$

Carbon dioxide + Water $\rightarrow$ Sucrose + Oxygen

This shows that oxygen (O_2) is given off during the process of photosynthesis, and sucrose that is a disaccharide of glucose (left) and fructose (right) that is important molecules in the body are shown below

FIGURE 1.1

Chemical Structure of Sucrose/Sugar Molecule



Saccharose

(glucose (α1-->2) fructose)

Since sucrose consists of glucose ($C_6H_{12}O_6$) unit bonded to a fructose ($C_6H_{12}O_6$) unit.

When it melted it will decompose into glucose and fructose and can be written as

$C_{12}H_{22}O_{11} + H_2O \rightarrow C_6H_{12}O_6 + C_6H_{12}O_6$
Sucrose + Water $\rightarrow$ Glucose + Fructose'

MAJOR CANE SUGAR PRODUCER COUNTRIES IN THE WORLD

India is presently a dominated player in the global sugar industry along with Brazil in terms of sugarcane production which is cyclical in nature. Hence the sugar production is also cyclical as it depends on the sugarcane production. Most cane sugar comes from countries with warm climate, such as Brazil, India, China and Australia. In 2001-02 there was over twice as a much sugar produced in developing countries as in developed countries.

SUGAR INDUSTRY IN INDIA: AT A GLANCE

India has been known as the original home of cane sugar and sugarcane. The sugar industry plays an eminent role in the socio-economic life of India especially in rural areas by mobilizing rural resources and generating higher income and employment opportunities. It is the most effective instruments for carrying progressing trends into the countryside. This industry affects agricultural sector fundamentally and also the persons of rural areas through backward and forward linkages significantly. The relation of sugar industry with the agricultural and industrial economy of India can not be denied. It is the backbone of industrial development of India. Therefore, the expansion of sugar industry in India is an indispensable factor for the upliftment of socio-economic life of India. The most outstanding feature of the industry is the vital link between the factory and cultivators whose interest and well being are interdependent. No other ABPI can compete with it in having great impact and close contact between the agriculturists and factory owners. It is the only industry that could be utilized for large-scale economic development of rural areas. For the above reasons the sugar industry can also be named as the process of *Rural Industrialization* (RI).

Kulkarni (1971)[12] revealed the importance of sugar industry for India, 'sugar is an important commodity of food and is used in sweets, puddings, jams, jellies, biscuits, chocolates, breads etc. and in tea and coffee that are consumed daily. Sugar plays an important part in our religious ceremonies and most of them cannot take place without sugar or it's impure from 'Gur'. Besides its use as a food, sugar has become an extremely important industrial chemical with different derivatives'.

SUGAR INDUSTREY- CYCLICAL IN NATURE

Sugarcane and sugar production is partly dependent upon monsoons. Higher cultivated under sugarcane in a season of normal monsoons and higher yields results in higher sugarcane and sugar production. Both area and production of sugarcane fluctuate considerably from year to year. This is due to variations in climatic conditions, the vulnerability of areas cultivated under rain fed conditions, fluctuations in prices of Gur and Khandsari (semi-white centrifugal sugar), and changes in returns from competing crops.

In a report prepared by Sustainable Industrial Networks and its Applications on Regional Environment Planning (SINET) on Indian Sugar Industry (2006)[13] it is clearly mentioned that 'The Indian sugar industry follows predictable cycle of at least 4 to 5 years. Shortage of sugar leads to an increase in prices. Sugar mills pay higher prices for sugarcane which tempts the farmers to switch from sugarcane crop to other commercial crops. This result in a glut in both sugarcane crop and sugar industry and this depresses the sugar prices. Sugarcane payments to farmers get dwindled and delayed as inventory buildup, farmers switch to other cash crops which leads to a fall in sugarcane production and sugar production. The consequent shortage of sugar results in an increase in sugar prices.

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