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CONCLUSIONS:
Co-operative sugar factories in Maharashtra have become a catalyst for all-round development in the rural areas. Many of them have made greater contribution to the economic and social development of their areas according to the regional requirements. Some have been especially innovative in this respect. These factories are instrument at in establishing educational institutions, hospitals, dairy and poultry units, co-operative Banks, Consumers stores, Libraries, laboratories, recreation centers etc.

In fact, it would be no exaggeration to say that these sugar factories have undertaken virtually all the welfare functions of the state in their areas of operation. Without their initiative, these areas would have remained deprived of these facilities for many years. Hence, a study of sugar co-operatives in Maharashtra cannot be merely an extension of sugar industry but it is a micro dimensional socio-economic phenomenon. There are a number of success stories to explain the potentialities of co-operative sugar factories in solving the problems of rural economy.

To evaluate the co-operative movement as a way of social transformation, it seems necessary to review the experiences of many different kinds of movements grouped under the name of co-operatives right from the beginning, Indian co-operatives have been said to be dominated by Government bureaucrats and not to be real co-operatives. However, it is also said that India has some few co-operatives ruled by not the bureaucrats but the members themselves, and sugar co-operatives in Maharashtra are mentioned as an example of such co-operatives. There are now more than 100 sugar co-operatives in Maharashtra and they are now in an important position in the sugar industry, One of the most
important agro-based industries in India, they account for 70% of the total sugar production in Maharashtra and 30% of that in all India.

After the Vighnahar co-operative sugar factory Ltd. the sixth sugar co-operative in the Pune district established in 1981, the first crushing in 1984-85 showed its successful performance, several other sugar cooperatives were founded after 1985-86, mainly under the leadership of grassroots leaders. The number of sugar co-operatives kept increasing thereafter, and particularly in 1986 and after ‘sugar barons’ or politicians who lead the establishment and management of sugar co-operatives for their own political and economic interest came to play important role.

Although, until 1990 the locations of sugar co-operatives were concentrated mainly in Pune, Ahmednagar, Kolhapur and several other Western Maharashtra districts, since 1990 ‘sugar barons’ came to appear also in “backward” regions like Marathwada and Vidarbha & regional imbalance in co-operative sugar sector became an important issue. Sugar co-operatives in Maharashtra are sometimes called the bright star of Indian co-operative movement, as they said to be run economically viably & ruled democratically by the members.

Certainly, the fact that they have created huge economic impact on the local rural communities cannot be denied. However, at the same time there are many kinds of criticism against sugar co-operatives in Maharashtra and such criticism is connected with a notion that they are seeking only the selfish interest of cane growers though the co-operative movement is often said to be a moralistic movement seeking such values as mutual help, equity in distribution or democracy in decision-making process.

The credit must go to the cultivators from Pune district for their voluntary efforts for starting the co-operative sugar factory at Junnar. It was because of the early success of the venture that the government adopted the policy.
of confining, in future, the licensing all new sugar manufacturing establishments to the co-operative movement. The encouragement and financial assistance from the state government led to the emergence of network of co-operative sugar factories in the state of Maharashtra. The noteworthy feature of this development is the disappearance of sugar factories in the areas where mechanized processing had not reached earlier on such a scale.

The underdeveloped character of the rural areas covered by co-operative sugar factories is undergoing a change. The beneficiaries of all this development are the small and marginal farmers. The state is having the highest number of co-operative sugar factories in the country in 1994-95; there were 151 registered co-operative sugar factories in the state of which 104 were in operation. They have produced 35% of the total sugar in the country. The number of co-operative sugar factories in the Pune district is 12.

In the present study, Management of successful sugar co-operatives in Pune district-A case study of Vighnahar co-operative sugar factory Ltd. Junnar, situated in Junnar Taluka of Pune District, has been selected for analyzing its successful management. The factory is quite innovative in understanding various welfare activities in rural area. It may be regarded as a glaring example of what poor farmers can achieve by adopting the principles of co-operation. Hope that, this case study can give fairly good idea of all round development brought out in the long run by a co-operative sugar factory in its command area.

During 1981, cane cultivators from Junnar Taluka organized themselves under the leadership of local leaders to a co-operative sugar factory. As a consequence, the Vighnahar co-operative sugar factory Ltd. Nivruttinagar, Dhalewadi. Junnar. Was registered in 1981 under the Bombay co-operative societies Act. 1925. The plant with crushing
capacity of 1250 tones cane per day was erected during the next three years and went into production in 1984-85. That time the factory has 11,197-producer members who have pooled nearly 1109.16 hectors of their land under sugarcane and had subscribed 443.20 lacks to the share capital. The share capital of about 68% was raised locally, while the government provided 32%. Within a decade, the factory paid back almost all of its initial capital loans and was ready for expansion. It expanded crushing capacity from 1250 tones to 2500 tones in 1998-99 and then expanded crushing capacity 5000 tones in 2002-03. It ranks first in the district in terms of various awards.

From the past records, it was observed that the capacity utilization of the factory was also quite satisfactory and even maximum 194.80% in 1997-98 years. But due to its latest expansion in 2002-2003 up to 5000 tones per day, it needed more sugarcane for crushing. But inadequate cane supply resulted into lower capacity utilization up to 90.80% over the year, the members of the factory increase of from 11,119 in 1985-86 to 17,378 in 2003-04. In 1994-95 paid-up capital of the factory was of 443.20 lacks. The changes in the contribution are due to the increase share capital of the factory by various types of members over the period from 1985-86 to 2003-04.

As is evident from the initially the Government contribution accounted for 64.64% of the total share capital while the producer members had a contribution of 27.37% and ordinary Members (co-operative society) had a contribution of 07.99%. But over the years the percentage share of the Government contribution declined from 64.64% in 1985-86. While the producer member's contribution registered a rise from 27.37% to 89.2%. This shows that the cane growers essentially own the factory. The share of the ordinary members to the share capital is more or less constant. It indicates that the farmers essentially own that factory outright. The
factory has also accumulated a healthy supply of reserves and other funds. In comparison with its reserves and share capital its borrowings are not heavy.

In its first year production, the factory achieved a recovery rate of 10.16\% while in the subsequent years it ranged between 10 to 12.75. The factory had started production since the crushing 1984-85. In the first crushing season the factory produced 2,818 Quintals of sugar. In the period of 1985-86 there is increase in sugar production 86,745 quintals. The sugar production in 1986-87 was slightly lower as compared to that of the 1985-86. In the fourth crushing season 1987-88 the factory remained closed because of non-availability of sugarcane. During the period 1988-89 to 1992-93, there was continuous increase in the production and it reached up to 4,34,377 quintals. The sugar production in 1993-94 was lower as compared to that of the 1992-93 because of shortage of sugarcane. During 1994-95 to 1997-98, there was improvement in the production and it increased up to 5,33,460 quintals. It is desirable that the duration of crushing season should be around 160 days. This factory has crushed for more than 160 days in crushing season for last 20 Years.

The recovery percentage of sugar was studied for the period from 1984-85 to 2003-04. It was observed that during 1985-86, 1986-87, and 2003-04 recovery was 10.16\%, 9.83\%, & 10.82\% respectively. This was a low recovery as compared to the average for Maharashtra during these seasons, which stood at 11\%. For the remaining years the recovery was observed to be 12.4\% 12.75\% during the 2002-03, which compared fairly well with many high recovery sugar co-operatives in Maharashtra. This factory is recognized as one of the well-developed co-operative sugar factories in Maharashtra. It is most prominent in sugar recovery. The original crushing capacity of the machinery was 1250 M.T. per day,
which rose to 2500 M.T. per day from the season 1998-99. Then after 2002-03 crushing capacity expanded 5000 M.T. So far, it has completed twenty crushing seasons successfully, competing within the other well-developed sugar factories in the same region and has made tremendous progress in the last Twenty years.

In 1998-99, the factory had expanded its crushing capacity from 1250 to 2500 tons per day. Due to increase in crushing capacity and availability of adequate sugarcane, the production reached to 6,78,185 quintals in 1998-99 & 9,75,400 quintals in 1999-2000, Sugar production of 9,79,610 quintals in 2000-2001. In 2000-01 the factory achieved a record production of 9,79,610 quintals. This was the highest production in the life of the factory since its inception. The drought conditions of 2001-02 caused acute shortage of sugarcane and consequently sugar production declined to 7,34,060 quintals. In 2002-03, the factory had expanded crushing capacity from 2500 tons to 5000 tons per day. Due to the increase in crushing capacity and availability of adequate sugarcane, the production reached to 8,19,410 quintals. The sugar production in 2003-04 was slightly lower as compared to that of the previous year.

Following conclusions were drawn in regard to cost reduction & cost saving:

i) Interest of 4% P.A. under D.I.R. scheme from Bank of India has saved Rs. 4 to 5 lacks P.A. Vighnahar, is the only sugar factory in Maharashtra which has implemented this scheme so intensively.

ii) Assistance to landless labourers to purchase with tries bullock carts on 50% loan and 50% grants basis at Rs. 10 P.A. has enabled savings in interest to the tune of Rs. 3 to 4 Lacks P.A.

iii) Vighnahar employees only 625 workers to turn a sugar factory of 1250 T.C.D. & 1101 workers to run a sugar factory of 5000 T.C.D. this is the only sugar factory in Maharashtra run by lowest number
of workers. This has saved lacks of Rs. of the factory on the wage bill itself. But this only is not sufficient to say. The workers at Vighnahar are best-paid workers in the industry. This has resulted in increased worker efficiency and also labour turnover.

iv) It is clearly visible that a lesser labour turnover is the result of best wage structure, high morale that has increased the labour efficiency. This is one of the reasons behind the ‘efficient installed capacity utilization’.

v) Along with I.F.C.I., I.D.B.I., I.C.I.C.I. Vighnahar is also financed by the Maharashtra State Co-operative Bank Ltd. in order to pay lesser amount of interest to the M.S.C. Bank Ltd. the Chairman has instructed a scheme to the accounts office. It has become possible for the factory not to take draw on pledge account three months prior to the start of the crushing season and two months after the start of the crushing season. Thus it was possible for the factory not take draw on pledge account for five months. It has saved Rs. 40 Lacks P.A. on interest account.

Even without expansion, the factory of 1250 T.C.D. capacity was able to make 194.80 of the capacity utilization in the year of 1997-98. But as the expansion proposal of 2500 TCD was sanctioned, the conventional expansion programme would have cost 15 to 16 cores. But with the technical advise from Mr. J.T. Jadhav, modernization and expansion programme for the existing machinery was successfully implemented.

In this case study, an attempt is made to analyze the technical efficiency of Vighnahar co-operative sugar factory, Junnar, Dist Pune. This factory is deliberately selected because it has received national and state level awards for overall efficiency, repayment of long-term loans before maturity and implementation of the projects
within the shortest possible period, which created a new record in the country.

For analyzing the technical efficiency, the concept ‘**HEALTH INDEX**’ developed by the committee appointed by the Government of Maharashtra for studying the problems of sick co-operative sugar factories in Maharashtra state under the chairmanship of Shri. Gulabrao Patil is followed.

For the calculation of health index of any sugar factory committee developed formula

Health Index = \sqrt{F1 \times F2 \times F3} Upon Recovery of Subzone.

Health Index of Vighnahar co-operative sugar factories Ltd. is always above 90% in the year of 1990-91 to 2003-04. This means the technical health of the factory is very good throughout the study period of 1994-95 to 2003-04.

The management should make an attempt to maintain this health in the future by giving maximum attention towards increasing the sugarcane from the operational area, maximum capacity utilization by avoiding the stoppages due to various reasons and by increasing the recovery percentage by supplying improved quality sugarcane seed to the members and non-members in the operational area.

For the outstanding performance in sugar production, the factory received the transworld Trade fare Selection Award from the Institute of Self Defense and National Character, New Delhi. Over the years it has paid due attention to the diversification of production to utilize by product by establishing a distillery plant & co-generation plant in 2004-2005.
The finding regarding the performance of the factory in comparison with factories in Pune District in all respects is that Vighnahar co-operative sugar factory performs well. The imaginative foresight and ceaseless efforts of the local leaders, loyalty of members and workers, people participation etc. has contributed to the successful growth of this rural co-operative complex. Many prominent leaders visited factory and have appreciated its efforts.

Thus it can be concluded that the management of a Vighnahar co-operative sugar factory has made far reaching impact on the agriculture, trade and Commerce, rural employment and income, transport, communication and also on social welfare activities like education, health, irrigation in the rural areas. A co-operative sugar factory may emerge as a center of socio economic and cultural development of the area. We, therefore observe that there is a remarkable difference in the degree of economic growth between the regions where the successful sugar co-operatives are in existence and in other regions. Where they are not in existence. Vighnahar co-operative sugar factory Ltd. stands as a role model for all co-operative sugar factories in Pune District and Maharashtra. The efficient management practices followed consistently by Vighnahar co-operative sugar factory needs to be followed by all other sugar co-operatives for their success.
SUGGESTIONS:

After proposal conducting the said research the following suggestions are made.

a) Conversion Cost:

It has been observed that the conversion cost has shown an increasing trend in all the ten years under observation. For controlling this cost, urgent step should be taken by the factories. It is suggested that standard cost of conversion according to the stages of the production should be fixed and constant comparison of the actual with the standard should be made. Difference between the standard cost and the actual cost should be worked out and corrective action should be taken when it is found that the actual cost is more than the standard. Thus standard cost should be fixed for the crushing stage, clarification stage and the crystallization stage, which are the three main stages in the sugar production.

b) Borrowings:

There has been substantial increase in the interest burden of the sugar co-operatives. The incidence of this interest burden is so much that the existence of the sugar co-operatives is in danger. Immediate steps should be taken for reducing the burden of the interest. It is suggested that the burden of inventory should be liquidated, as it is responsible for the indebtedness. For this, more incentives should be offered for export of sugar. Factories should be encouraged to export the sugar in the world market. It is also suggested that new licenses should not be given without careful study of the projected demand of the sugar. Uneconomic and sick units be allowed to be closed down and encouragement should be given for mergers and acquisitions of the factories.
c) Profitability:
The profitability of the sugar co-operatives has been very low. There is no doubt that the profit motive is absent in the co-operative organizations, but for survival some amount of surplus is absolutely necessary. It is therefore suggested that the sugar co-operatives should adopt more professional approach in cost control and cost reduction because there is no possibility of sugar prices becoming more remunerative in the future. They will have to concentrate on the efficient utilization of the by-products, which will generate profits. For example, the bagasse can be used effectively for co-operation while the molasses can be utilized for manufacturing ethanol, which can be blended with petrol for use as a fuel. According to experts in the field if air separation plant is installed, nitrogen can be separated and the nitrogen has a huge demand in the market. The play back period of this project is of one year only. Similarly ice plant can also be installed. Thus there is a need to develop innovative and profitable units based on the by-products.

d) Technical Parameters:
There are technical parameters for evaluating the technical performance of the sugar factories. It is suggested that there should be qualification of the technical norms and how much loss is incurred by a factory by non-fulfilling a norm, should be worked out and shown in the annual reports. For example, if a factory is not able to satisfy the norm regarding the Reduced Mill Extraction, how much loss is incurred should be worked out and shown in the annual reports.
e) **Cost Accounting Records:**

The Government of Maharashtra has made it compulsory for all the sugar factories in the State to maintain Cost Accounting Records and conduct a Cost and Performance Audit every year from 2002-03. It should be ensured that there is a compliance of this provision. The Cost Accounting Record is going to help the sugar co-operatives to find out the cost of production in scientific manner.

f) **Energy Audit:**

The electricity Regulatory commission has declared that the rate of electricity generated through the co-generation projects based on the bagasse will be Rs. 3.05 per unit, which is a very attractive rate. The sugar factories should take full advantage of this and come forward to invest in a co-generation project. For this they will have to use the bagasse effectively. The bagasse, which comes out of the milling station, contents moisture as water is imbibed in the stage of primary extraction. If the moisture content in the bagasse is increased, the calorific value of the same is reduced. Therefore it is necessary that there should be pre-drying of bagasse and then it should be utilized for the co-generation that will ensure proper calorific value of the same. It is necessary to conduct the energy audit that will help to identify such losses in the generation and transmission of the power and will ensure more cost effectiveness.

g) **Time Between Harvesting And Crushing:**

During this study, it has been observed that there is no system to monitor the time lost between the harvesting and crushing of the sugarcane. If the time gap is more than 24 hours, the recovery is reduced due to reduction of sugar content in the sugarcane. Therefore it is suggested that the factories should have a system
that will record the time lost between the harvesting and crushing of the sugarcane. Similarly the factories should strengthen their logistics arrangements so that the time lost in transportation is minimum.

h) Apportionment Of Common Cost:
It has been observed that there is no apportionment of common cost to the by-products. It is suggested that there should be apportionment of common costs for the by-products on scientific basis so that the correct cost of production of the by-products can be worked out.

i) Revival of Sick Units:
According to the report of the commissioner of sugar, Maharashtra at present 56 sugar Co-operatives are sick units with huge accumulated losses. It is suggested that a rehabilitation plan should be prepared and implemented for these units. The preparation and monitoring of the plan should be entrusted to a professional Institution. These units should be given a period of ten years showing improvement in the results. If these units cannot achieve this they should be allowed to liquidate or merge with other profitable units.

j) Logistics Study:
In order to reduce the time lost between harvesting and crushing, it is suggested that there should be a logistics study of the transportation arrangements made by the factories, in many cases the transport arrangements are made by the factories themselves, but in few cases the transportation is made either by the sugarcane growers themselves or by the transporters’ co-operative societies. A study can be conducted to find out the possible reduction in the
transport cost due to proper transportation arrangements and also its impact on the time lost between the harvesting and crushing.

k) **Inventory Control:**

One of the important aspects of cost control and cost reduction is the inventory control. It has been observed that large quantity of inventory is piled up with the sugar co-operatives, both in case of the finished goods and the case of the consumables. A study in this aspect is necessary to implement the cost reduction programmed in the sugar co-operatives.

l) **Mechanization of Various Operations:**

It has been observed that at present loading of the sugar on the trucks, transporting the sugar bags to the godown etc. are being done manually. It is necessary that a detailed study of the various equipments that can be installed should be made for selecting the most suitable system for the implementation. A detailed feasibility study of the same should be done so that the programme of mechanization and automation can be implemented in a phased manner.

m) **Utilization of the By-Product**

It has been realized that the sugar sale prices are not going to be more remunerative in the feature. For the survival in the long run, it is necessary for the sugar factories to make efficient use of the by-products and their feasibility should be worked out. In the future it is expected that the sugar will be a by-product and the products like the molasses, alcohol will become the main products. It is therefore suggested that a detailed research should be conducted in all aspects of the use of the by-products, from technical feasibility to the financial and marketing feasibility. It is felt that perhaps by adopting this way, the sugar co-operatives will be able to survive.
The sugar co-operatives should take urgent steps to liquidate the large inventory of sugar lying with them. More diversified uses of the by-products should be developed which will contribute to the profitability of the sugar co-operatives. Steps should be taken to control the conversion cost which has been showing an increasing trend in all the ten years under observation.

The sugar co-operatives are resorting to heavy borrowings for working capital and this has resulted an increase in the interest burden. It is suggested that for reducing the indebtedness, they are allowed to export sugar in the international market. More incentives should be offered to the exporting units.

It has been observed that the sugar industry has come in trouble due to excess capacity being built up due to proliferation of factories as a result of the liberalization policy of the Government. There is a need to look into the licensing policy followed by the Government and new permission should be given after careful study of availability of the sugar cane in the area and also the projected demand and supply position of the sugar.