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PRODUCTION POTENTIALITY AND CAPACITY UTILISATION OF BY- PRODUCTS OF SUGAR CANE INDUSTRY: A CASE STUDY OF UGAR SUGAR WORKS LTD, BELAGAVI DISTRICT OF KARNATAKA

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ABSTRACT

There is a trend of product diversification of sugarcane by product in major sugar manufacturing countries including India. The major byproducts of sugarcane processing consist of bagasse and molasses which have been the major raw materials for producing extractive chemical and biochemical products apart from co-generation of electricity. The study unit of The Ugar Sugar Works Limited in Belgaum district of North Karnataka has been a pioneer in the co-generation of electricity using bagasse in this part of the country. The unit has been engaged in producing ethanol, rectified spirit, denatural spirit and alcohol. The unit has well established distillery. However the study has revealed that the unit has not been able to fully utilize its production capacity in the production of the chemicals and alcohol and to generate higher quality of electricity. The production of these chemical



products and the co-generation of electricity have indicated a substantial amount of idle capacity in those plants thus resulting in loss of supplementary income to the sugar unit despite vast potential existing in enhancing production and higher utilization of production capacity. The study has analyzed these aspects using the data obtained from the units Annual Reports.

biochemical products.

KEYWORDS :*Production Potentiality ,Capacity Utilisation , Sugar Cane Industry,*

INTRODUCTION :

Sugarcane is the world's largest crop. In 2010 Food and Agricultural Organization of the United Nations estimated that sugarcane covered about 23.8 million hectares in more than 90 countries with the worldwide harvest of 1.69 billion tones. Cane accounts for 80 percent of sugar produced and the rest is made from beets. Sugarcane harvesting and processing has the benefits of obtaining multiple products and by products which are potential raw materials for extractive chemical and bio chemical industry. The quantity of production of by products in each country is in line with the quantity of sugarcane produced. The quantity of sugarcane produced in turn is in line with the demand for sugar. Production of By-products and capacity utilization.

The quantity of production of By-products is related to the licensed and installed capacity of sugar units. The products based on the major by products like bagasse and molasses include rectified

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spirit de natural spirit, alcohol, ethanol and co-generation of electricity etc., Utilization of the existing production capacity of these products has a direct bearing on the quantity produced the turnover and earnings of the sugar manufacturing units. Capacity utilization has direct impact on the productivity of the investment in those plants related to the byproducts. Hence higher level of utilization of production capacity is vital for the sugar units.

The analysis relating to the production potential and capacity utilization of the byproducts of The Ugar Sugar Works has been made in this study.

2.OBJECTIVES OF THE STUDY

The following are the objectives of the study;

- ✦ To analyse the trends and growth of production and capacity utilisation of By Products in Ugar Sugar Works Ltd. in Belagavi district; and
- ✦ Offer policy suggestions for betterment of Ugar Sugar Works Ltd in Belagavi district.

3.TRENDS AND GROWTH OF PRODUCTION AND CAPACITY UTILISATION OF BY PRODUCTS OF UGAR SUGAR WORKS LTD.

3.1 Production of Bagasse by Ugar Sugar Works Ltd

Ugar Sugar Works Ltd has been producing large quality of Bagasse as its crushing of sugarcane has been increasing over the years. The sugar unit is using this by-product for Co-generation of electricity. The data relating to the production of this major by-product has indicated a sustained growth of production during the period from 2001 to 2014. The quantity of bagasse produced by the sugar unit rose from 304197.86 tonnes in 2001 to 466222.39 tonnes in 2005 and rose to maximum of 492369.86 tonnes in 2006. With some fluctuation the production of bagasse by the unit stood at 364197.86 tonnes in 2014.

The annual growth rate of production of bagasse was maximum at 14.23 in 2005 followed by 26.36 in 2009, 20.04 in 2014, 19.80 in 2013, 12.27 in 2003, 11.73 in 2010 and 5.60 in 2006. Table No - 1 provides the details.

Table 1: Production of Bagasse (in. tonnes)

Year	Quantity	Growth Rate
2001	364197.86	
2002	437217.74	20.04950825
2003	490883.04	12.27427323
2004	312411.42	-36.35725936
2005	466222.39	49.23346592
2006	492369.86	5.608368573
2007	474466.75	-3.636110058
2008	337717.75	-28.82161922
2009	426765.17	26.36740888
2010	476828.58	11.73090344
2011	391010.14	-17.99775508
2012	335861.20	-14.10422246
2013	402363.82	19.80062597
2014	364197.86	20.04950825

Source: Annual Reports of Ugar Sugar Works Ltd.

3.2 Production of Molasses by Ugar Sugar Works

Molasses is a major by-product of Sugar industry. It is used for production of other products of high value. The Ugar Sugar Works has been producing molasses ranging between a minimum of 44089.593 tonnes in 2004 and a maximum of 70627.240 tonnes in 2006. The production of molasses has been largely stable during the study period from 2001 to 2014 with some variations during the intervening period.

The annual growth rate of the production of molasses by the sugar unit was maximum at 49.83 in 2005 followed by 26.26 in 2001, 24.55 in 2009, 11.99 in 2013, 6.90 in 2006, 5.02 in 2010 and 0.26 in 2003. The annual growth rate of production of molasses has been negative during 2004, 2007, 2008, 2011 and 2012. Table .2 provides the details.

Table 2: Production of Molasses (in. tonnes)

Year	Quantity	Growth Rate
2001	52872.54	
2002	66757.00	26.26024776
2003	66935.218	0.266965262
2004	44089.593	-34.13094882
2005	66062.615	49.83720761
2006	70627.240	6.909543317
2007	64790.510	-8.264134348
2008	47696.760	-26.38310765
2009	59409.22	24.55609144
2010	62394.400	5.024775616
2011	53881.970	-13.64293911
2012	48944.930	-9.16269394
2013	54818.20	11.99975156
2014	52872.54	26.26024776

Source: Annual Reports of Ugar Sugar Works Ltd.

4. CAPACITY UTILIZATION IN UGAR SUGAR WORKS LTD

4.1 Capacity Utilization of Rectified Spirit by Ugar Sugar Works Ltd during 2001 to 2013

The data relating to the utilization of production capacity of Rectified Spirits indicate that the percentage of utilization of production capacity ranged from a minimum of 28.66 in 2007 to a maximum of 57.28 in 2008. The percentage of utilization of production capacity has gone up during the first six years from 34.70 percent in 2001 to 49.94 percent in 2006. With a steep decline to 28.66 percent in 2007 the percentage of utilization rose to a maximum of 57.28 percent in 2008. The utilization of production capacity has declined considerably during the subsequent period. The utilization of production capacity declined from 40.57 percent in 2009 to 35.26 percent in 2010. With a small rise to 38.60% in 2011. The utilization of production capacity of Rectified Spirit in the study unit has gone down to 34.70 percent in 2013. Low level of utilization of production capacity is generally caused by inadequate availability of inputs and lack of adequate demand. It is expedient on the part of the management of the Sugar unit to enhance the level of utilization of production capacity as the Rectified Spirit is a high value product earning additional income to the unit. Hence given the external factor of market demand the unit should try to maximize capacity utilization. The following Table.3 provides the

details

Table 3: Capacity of Utilization of Rectified Spirit

Year	Capacity	Production	Utilization
2001	24369000	8456933	34.70365
2002	24369000	8366307	34.33176
2003	24369000	8861772	36.36494
2004	24369000	9268889	38.03557
2005	24369000	9306586	38.19027
2006	24369000	12172000	49.94871
2007	24369000	6986000	28.66757
2008	24369000	13961000	57.28999
2009	24369000	9886333	40.57135
2010	24369000	8593550	35.26427
2011	24369000	9407878	38.60593
2012	24369000	8848000	36.30842
2013	24369000	8444000	34.70365

Source: Annual Reports of Ugar Sugar Works Ltd.

4.2 Capacity Utilization of Denatured Spirit by Ugar Sugar Works Ltd

The data relating to the utilization of capacity for manufacturing Denatured Spirit by Ugar Sugar Works Ltd indicate a general trend of low level of capacity utilization for major part of the study period from 2001 to 2014. However a very high level of capacity utilization in the manufacture of Denatured Spirit by the Sugar Works during 2003 and 2004 has been indicated when the utilization was 81.41% in 2003 and maximum of 227.33% in 2004. This position of low capacity utilization ranging between a minimum of 5.62% in 2007 and a maximum of 39.92% in 2009. There is therefore need for enhancing the average level of capacity utilization of the plant manufacturing this high valued chemical product by the Ugar Sugar Works Ltd. Table 4 provides the details.

Table 4: Capacity Utilization of Denatured Spirit by Ugar Sugar Works Ltd

Year	Capacity	Production	Utilization in %
2001	1200000	130000	10.83333
2002	1200000	131000	10.91667
2003	1200000	977000	81.41667
2004	1200000	2728000	227.3333
2005	7200000	921000	12.79167
2006	7400000	1417000	19.14865
2007	7400000	416000	5.621622
2008	9600000	2932000	30.54167
2009	9600000	3833000	39.92708
2010	9600000	1695000	10.83333
2011	9600000	3099000	32.28

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2012	NA	4626000	-
2013	NA	2383000	-
2014	NA	1545000	-

Source: Annual Reports of Ugar Sugar Works Ltd.

4.3 Capacity Utilization of Potable Alcohol by Ugar Sugar Works Ltd

Capacity Utilization of the alcohol plant of Ugar Sugar Works Ltd has been considerably low during the first four years from 2001 to 2004. It varied between a minimum of 7.59 percent and 11-19 percent. However there has been a substantial increase in the utilization of production capacity from 2005 to 2013. Utilization of production capacity rose to 55.30 percent in 2005 and reached a high of 98.92 percent in 2013 with some variations during the intervening period. Capacity utilization was more than 90 percent during the last three years from 2011 to 2013. Table.5 provides the details.

Table 5: Capacity of Utilization of Portable Alcohol & Arrack (in. tones)

Year	Capacity	Production	Utilization in %
2001	6030000	675327	11.19945
2002	6030000	529012	8.773002
2003	6030000	458267	7.599784
2004	6030000	1589839	26.36549
2005	8100000	4479449	55.30184
2006	8100000	5326000	65.75309
2007	8100000	2844000	35.11111
2008	8100000	6764000	83.50617
2009	8100000	5387045	66.50673
2010	9600000	8225107	85.6782
2011	9600000	8937992	93.10408
2012	9600000	9578000	99.77083
2013	9600000	9497000	98.92708

Source: Annual Reports of Ugar Sugar Works Ltd.

4.4 Capacity Utilization of Electricity

The Ugar Sugar Works has been generating electricity by using its major by product of bagasse. The unit has large built up production capacity for generating electricity. There has been a continuous increase in the production capacity for generating electricity during the study period from 2001 to 2013. Production capacity of the study unit remained stationary at 672000 KW during the first 3 years from 2001 to 2003. There has been a steep increase in the production capacity of electricity in the study unit to 1056000 in 2004. The capacity remained constant at this level till 2007. A further increase in the production capacity for generating electricity by the Ugar Sugar Works to 1416000 KW has been achieved and the same level of production capacity remained stable till 2013. Production of electricity by the study unit during the study period has indicated a trend of fluctuations. Similarly, with small decline in 2002, the production registered a good increase in 2003 but slumped to the lowest level in 2004. Production during the subsequent period has indicated trend of fluctuations in the subsequent

period.

The utilization of production capacity for electricity generation has varied between a minimum of 19.79 percent in 2004 and a maximum of 51.50 percent in 2003. The percent age of utilization of production capacity has been at a higher side during the first three years from 2001 to 2003. The utilization percentage has gone down considerably during the subsequent period. The rate of utilization of production capacity was better during 2006 and 2008 when the utilization was more than 30 percent of the installed production capacity compared to the other years between 2004 and 2013. The study unit needs to enhance its performance in achieving a higher performance in achieving a higher percentage of utilization of production capacity to meet its own power requirement and to export surplus power to the public sector Grid. Table.6 provides the details

Table 6: Capacity of Utilization of Electricity

Year	Capacity	Production	Utilization in %
2001	672000	119135590	48.57126
2002	672000	111893443	45.61866
2003	672000	126329804	51.50432
2004	1056000	76308955	19.79788
2005	1056000	92914514	24.10609
2006	1056000	134214000	34.82098
2007	1056000	86262000	22.38014
2008	1416000	182193000	35.25134
2009	1416000	124771470	24.14122
2010	1416000	135860687	26.2868
2011	1416000	147957916	28.62741
2012	1416000	137614000	26.62604
2013	1416000	127388000	24.64747

Source: Annual Reports of Ugar Sugar Works Ltd.

5.CONCLUSION

There is a growing trend of unutilized production capacity in the byproduct units related to co-generation of electricity from the byproduct of bagasse and also the molasses based chemical products like rectified spirit de-natural spirit and alcohol etc., The Ugar Sugar Works Ltd has been a pioneer sugar unit which has tried to diversify its by product manufacturing and particularly in the co-generation of electricity. In view of the vast potentials for increasing the co-generation through this non traditional method the sugar unit would be very much benefited by generating additional power for its own captive consumption and also for selling the surplus to the grid. Further the high valued chemical products like rectified and denatured spirit alcohol and the ethanol have increasing demand in the domestic market. Increased production and utilization of the existing capacity would enhance the sugar units earning substantially.

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