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8.1 Impact of the WTO regulations on the industry level parameters of the sugar mills located in Belgaum district.

8.2 Impact of the WTO regulations on the firm level variables of the sugar mills located in Belgaum district.

8.3 Impact of the WTO regulations on certain characteristics of the Belgaum district sugar mills.

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8.6 Risk or negative fall out of the WTO regulations on the Belgaum district sugar industry.
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The impact of WTO regulations on the sugar industry in Belgaum district of North Karnataka has been assessed by taking into account the following impacts

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8.2 Impact of the WTO regulations on the firm level variables of the sugar mills located in Belgaum district.

8.3 Impact of the WTO regulations on certain characteristics of the Belgaum district sugar mills.

8.4 Assessing the impact of WTO regulations on the Belgaum district sugar mills on the basis of the measures initiated by the sugar mills in response to the changing global sugar trade scenario.

8.4.1 Assessing the impact of WTO regulations on the basis of measures initiated by the WTO-sensitive sugar mills of Belgaum district

8.5 Positive impact of WTO regulations on the Belgaum district sugar industry.

8.6 Risk or negative fall out of the WTO regulations on the Belgaum district sugar industry.
8.1 Impact of the WTO regulations on the industry level parameters of the sugar mills located in Belgaum district

i. Consolidation of the industry:
WTO regulations have facilitated increased global sugar trade, thus providing an opportunity for the Belgaum based sugar mills to export sugar. This has led to a need for increasing the existing capacity of sugar production so as to meet the global demand as well as the increasing domestic demand. Hence, the sugar mills which are performing well are acquiring the non-performing sugar mills. There are also instances of acquiring the non performing sugar mills on lease. Thus the fragmented sugar industry in Belgaum district is witnessing a phase of consolidation.
For example: Shree Renuka Sugars Limited acquired a green-field project at Athani, Belgaum district. It also relocated an acquired sugar mill from Sindhkheda to Havalga.

ii. Increase in existing capacities
In order to meet the increasing demand requirements as discussed above, the sugar industry has witnessed an increase in the production capacity, from 22600 TCD during the pre-implementation period of WTO to 40570 TCD during the post-implementation period, which represents an increase of 79.51 %.
iii. **Replication of the successful industry model:**

WTO regulations have ushered an era of competition which necessitates sugar mills to be prepared to play the volume game. Also, the present environment provides greater exposure to firms in knowing about the best practices being followed world-wide. Hence, in order to ensure the profitability of the sugar mills, the industry is moving towards replication of the model adopted in Brazil, where the sugar industry is completely integrated into a sugar-complex wherein the focus is on product diversification by undertaking the manufacturing of ethanol, different grades of alcohol, co-generation of electricity and bio-fertilizers.

iv. **Inclination towards international markets:**

The sugar industry is focusing on the opportunities in the global sugar market and hence is manufacturing raw sugar and refined EC II grade sugar of ICUMSA less than 45.

v. **Raw material shortage:**

The increase in the production capacity, necessitated by the need to export and meet the increasing domestic demand, and the induced cyclicity has led to shortage of cane during some sugar-seasons. Hence, the industry is slowly looking towards alternate source of raw material i.e. raw sugar imports to meet their raw material requirement.
8.2 Impact of the WTO regulations on the firm level variables of the sugar mills located in Belgaum district

As the impact at the industry level is more aggregate, hence an attempt is made to assess the firm level impact of the WTO regulations on the sugar industry of Belgaum district. The boxes which are tick- marked indicate the firm level variables which have been impacted upon by the WTO parameters.

<table>
<thead>
<tr>
<th>WTO Parameters</th>
<th>Sanitary &amp; Phyto-Sanitary (SPS) norms</th>
<th>Technical Barriers to Trade (TBT) norms</th>
<th>TRIPS (Patents)</th>
<th>Changes in technology due to globalisation</th>
<th>DSB's ruling on subsidised EU sugar exports</th>
<th>Shift in world sugar trade from refined to raw sugar</th>
<th>Market access provision</th>
<th>Reduction in domestic export subsidies</th>
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<td>Firm level variables</td>
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<td>Market (Customer)</td>
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<td>Position on the value chain</td>
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<td>Procurement requirement of buyer (importer)</td>
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**Processing:**

i. Technical Barriers to Trade (TBT) norms would require Codex Alimenatrius specified rules of hygiene to be followed in the entire processing- from cane to sugar.

ii. The changes in the technology due to globalisation have made available improved sugar processing technology viz. Phosphofloatation/ Phosphorisation method.

**Logistics:**

i. The shift in world sugar trade from refined to raw sugar has necessitated greater logistical support for movement of raw sugar from Brazil to the sugar mills for refining.

**Market (Customer):**

i. Sanitary and Phyto-Sanitary (SPS) norms may restrict the export of sugar to international markets as SPS provisions allow countries to set their own standards, which can be applied only to the extent necessary to protect human, animal or plant life or health. They can restrict import of commodities which do not meet their SPS norms.

ii. Technical Barriers to Trade (TBT) norms may restrict the export of sugar to international markets as TBT norms permit the assessment of a product to see if it meets the importing country's product standards, regulations and certification procedures.
iii. Dispute Settlement Body’s (DSB) ruling on subsidised EU sugar exports provides an opportunity for the Belgaum district sugar mills to increase their exports and gain foothold in the market vacated by the European Union.

iv. Shift in world sugar trade from refined to raw sugar provides an opportunity for the Belgaum district sugar mills to export raw sugar to the destination refineries, especially to the Indian Ocean rim countries and to the Middle East nations.

v. Market access provision is both a threat as well as an opportunity to the sugar mills as it opens up the Indian market for import of refined sugar by 3-5% of total demand and also gives scope to sugar mills to exploit similar export opportunities in other countries.

vi. Reduction in domestic export subsidies: A minimum 10% reduction in export subsidy per agricultural product (base level 1986-88) and an overall 24% reduction for all agricultural products from developing countries is envisaged in the WTO Agreement on Agriculture, which would reduce the price competitiveness of Belgaum based sugar mills in export markets.

**Position on the value chain:**

i. The sugar mills which are aware of the WTO regulations and its impact have graduated up in the value chain, from operating in a
cane to consumer chain to operating in a raw sugar to consumer chain.

ii. Dispute Settlement Body's ruling on subsidised EU sugar exports provides an opportunity for moving up the value chain by manufacturing different varieties of specialty sugar, which are in demand in international markets.

Production:

i. Trade Related aspects of Intellectual Property Rights (TRIPS), which has recognised patents as an intellectual property, will restrict the production of new varieties of sugar and use of a new process of manufacturing sugar if it has been patented by any other sugar mill. For example: US patent 6916381 granted to a Mexican sugar mill, which is valid till June 19, 2023, in connection with the production of invert liquid sugar, which will produce more sugar using the same amount of energy and cane compared with the traditional process, and also eliminates the production of molasses.

ii. Changes in technology and the facilitation of technology transfer as a result of globalisation may favour a change in the production technology from the present 'double desulphitation method' to the 'phosphofloation/ phosphorisation method'.

iii. Dispute Settlement Body's ruling on subsidised EU sugar exports will necessitate sugar mills to focus on manufacture of refined sugar.
having an ICUMSA value of less than 45 with no traces of sulphur, in order to exploit the opportunities thrown open by the reduction of subsidised EU sugar exports by 4.5 million MT.

iv. Shift in world sugar trade from refined to raw sugar provides an opportunity for the sugar mills to focus on the manufacture of raw sugar for export purpose. Also the sugar mills need to set up facilities to refine raw sugar, which will help them to improve the capacity utilisation and enhance the output capacity.

**Procurement requirements of the buyer (importer):**

i. SPS measures may require a change in the production process to incorporate the hygiene norms of the importing countries.

ii. TBT norms may require a change in the production, labeling and certification process to meet the importing country’s requirements.

**Export of sugar:**

i. The DSB’s ruling on the subsidised EU sugar exports and the increase in the raw sugar trade has led to an increase in the exports of the WTO sensitive sugar mills of Belgaum district. For example: Shree Renuka Sugars Limited exported 240,919 MT of sugar between 2000 and 2005 representing 8.32% of India’s sugar exports, ranking second in the overall exports of Indian sugar. They have also set up an international subsidiary ‘Renuka Commodities DMCC’ which is active in third country trade of sugar.
8.3 Impact of the WTO regulations on certain characteristics of the Belgaum district sugar mills.

The impact of the WTO regulations on the Belgaum district sugar mills can also be assessed in the context of the following characteristics of the sugar mills.

i. **Sugar mills with integrated production process**

Those sugar mills which are completely integrated in terms of their production process would be affected adversely in future as they do not have the facilities to refine the imported raw sugar. Hence they need to set up sugar refineries to refine raw sugar.

ii. **Sugar mills with de-integrated production process**

On the other hand those sugar mills which are de-integrated in terms of their production process are benefited by the increased global trade in raw sugar as they can import the raw sugar and refine it. This would help the sugar mills overcome the problem of lack of cane, enhance their capacity utilisation and thereby improve their profitability.

iii. **Impact on the co-operative sugar mills**

The changes being brought about in the global sugar trade due to the WTO regulations have little impact on the survival of the co-operative sugar mills of Belgaum district, as the co-operative sugar mills are part-
market and part-political. Hence, the political factors will prevail upon to ensure the survival of the co-operative sugar mills. However the profitability of these sugar mills would be eroded if they do not gear up to meet the competition in this era of WTO, with a likelihood that they would be acquired or taken on lease by a successful sugar mill.

iv. Impact on the private sugar mills

However, the impact on the private sugar mills is more as they are more exposed to competition, are more visible in the market and therefore will be acted upon by the changes being brought about by the WTO regulations. Hence, they need to react to the changes and need to initiate steps to minimize the adverse effects and exploit the opportunities thrown open. The issues discussed above indicate the steps taken by the WTO-sensitive private sector sugar mills in Belgaum district in response to the impact of the WTO regulations.
8.4 Assessing the impact of WTO regulations on the Belgaum district sugar mills on the basis of the measures initiated by the sugar mills in response to the changing global sugar trade scenario

For this purpose we have to first ascertain the awareness level, about the provisions of the WTO, among the sugar industrialists/ professionals employed in the sugar industry of Belgaum district

Awareness level among sugar mills about the provisions of WTO

83 percent of the sugar mills in Belgaum district are not aware about the various agreements of WTO and their provisions, are not aware about the provisions of Agreement on Agriculture that are concerned with the conduct of the global agri-trade and are not aware about the different rulings given by the WTO's dispute settlement body (DSB).

Only 17 percent of the sugar mills in Belgaum district are aware about the various agreements of WTO, their provisions and also their implications. These 17 percent sugar mills fall under the private sector.
8.4.1 Assessing the impact of WTO regulations on the basis of measures initiated by the WTO-sensitive sugar mills of Belgaum district

The measures initiated by the 17 percent sugar mills of Belgaum district, which belong to the private sector, that are aware about the WTO provisions and their implications (termed as WTO-sensitive sugar mills), are

a. Increase in capacity

The private sugar mills have responded to the changes in the global sugar regime, brought about by the WTO regulations, by increasing their capacity from 6500 TCD during the pre-implementation period to 19960 TCD during the post-implementation period of WTO regulations, an increase of 207%. This is in-order to benefit from the economies of scale and keep in pace with the increasing requirements of the domestic market, which otherwise would be flooded by imported sugar.

b. Preparedness to change

A noticeable desire to be prepared for the future changes is witnessed in two private sugar mills (40% of the private sugar mills). They have undertaken the following measures viz.

i. Acquisition of a majority control in an ethanol technology company.
ii. Acquiring on lease the non-performing sugar mills. This measure helped them to save the high acquisition costs and to leverage their turn-around capabilities.

iii. Increased focus on international markets.

iv. Setting up of integrated refineries to refine raw sugar, which has enabled them to function for 365 days a year.

v. Setting up of ethanol manufacturing units and signing of MoU with PSU oil companies for sale of ethanol.

vi. Setting up of distilleries to manufacture different grades of alcohol.

vii. Assisting farmers to enhance the yields by providing quality seeds, agri-inputs and fertilizer subsidies, educating farmers about advantages of growing cane over other crops. These measures have resulted in an increase in the cane drawal rate which is now close to 100%.

viii. Enlisting the bagasse based co-generation plants to be qualified as Clean Development mechanism (CDM) project and getting the eligibility certificates, which will help them to sell or trade the carbon credits.

ix. Setting up port based sugar refinery to leverage the location advantage to exploit the global sugar markets.

x. Plans to jointly develop bagasse based power co-generation with co-operative sugar mills on a Build-Operate-Own-Transfer basis.

xi. Increasing the existing crushing capacity of the sugar mill.
c. Changes that have taken place
The following changes have taken place in the private sugar mills

i. Conversion of stand alone sugar mill to a sugar-complex diversifying into manufacture of ethanol and co-generation of electricity.

ii. Tie-up with sugar mills abroad for product diversification.

iii. Tie-up with sugar mills abroad for technology transfer and technical support.

iv. Quality improvements in sugar as seen from the reduced ICUMSA levels (70 to 90 and less than 45 in case of one sugar mill).

d. Change in technology
Adoption of the ‘Phosphorisation’ method of sugar manufacturing, by one private sugar mill (20% of the private sugar mills), to manufacture sulphur-less EC II grade sugar, ICUMSA value being less than 45, for direct consumption and industrial usage in Europe and Africa.

e. Shift in focus from domestic markets to international markets
The private sugar mills are increasingly focusing on the international markets in terms of export of refined EC II grade white sugar, Indian plantation white sugar and raw sugar. One sugar mill (20% of the private sugar mills) has tapped the opportunity of exporting raw sugar to the destination refineries located in the middle-east Asia.
f. Procurement of inputs from international markets

Two private sugar mills (40% of the private sugar mills) import raw sugar from Brazil and refine it. One sugar mill (20% of the private sugar mills) has a tie-up with a leading Brazilian sugar mill for technical support.

g. Management profile and its impact on the change initiated

The management profile of the private sugar mills is one of high professional qualification, with graduation degree in technical field and post graduation in Management discipline. They are focused on growth and diversification of their sugar mills and in exploiting the export potentialities abroad, in light of the developments taken place in the global sugar industry due to the WTO regulations.

h. Measures taken in anticipation of reduction of subsidies on sugar in Europe

Shree Renuka Sugars Limited has focused on the manufacture of refined sugar with ICUMSA level of 45, which is consumed in the EU, in-order to tap the market left open by EU.

The Ugar Sugar Works Limited has diversified into the manufacture of sugar cubes in the shape of small boats, with the setting up of a 100% Export Oriented Unit, in collaboration with a German firm. These sugar cubes are in demand in Europe and are being exported.
8.5 Positive impact of the WTO regulations on the Belgaum district sugar industry

The positive impact is attributed to the ruling of the Dispute Settlement Body against the subsidized export of sugar from the European Union, as a result of which EU will have to reduce the export of subsidized sugar to the extent of 4.5 million MT. Thus there is an opportunity for the Belgaum district sugar industry to increase its exports and gain foothold in the market vacated by the EU, for which it will have to focus on the manufacture of refined sugar having an ICUMSA value of less than 45 with no traces of sulphur.

The liberalized global trade regime which is an offshoot of the WTO regulations has led to the setting up of the destination refineries in major sugar importing countries. This provides an opportunity for the Belgaum district sugar industry to export raw sugar to these destination refineries, for which it should focus on the manufacture of raw sugar for export purpose.

WTO regulations have facilitated greater investment opportunities abroad as can be seen from the investments of the EU sugar mills in Brazil and the Australian sugar mills in Brazil and Thailand. Hence there exists an opportunity for the Belgaum district sugar industry to explore the possibility of investing abroad to enhance their competitiveness and reach.
The impact of WTO regulations on the sugar industry in Belgaum district of North Karnataka can be gauged by the performance of the co-operative and private sugar mills during the pre-implementation period (1995-96 to 1999-2000) and the post-implementation period (2001-02 to 2005-06), on the criteria mentioned in the table below. The year 2000 has been considered as the implementation year as the member countries had to implement most of the WTO agreements during 2000.

Table 8.1: Performance of the co-operative and private sugar mills of Belgaum district during the pre-implementation period and the post-implementation period of WTO

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<tbody>
<tr>
<td></td>
<td>Co-operative sugar mills</td>
<td>Private sugar mills *</td>
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<tr>
<td>Capacity (TCD)</td>
<td>Average 2683</td>
<td>6500</td>
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<tr>
<td></td>
<td>Total 16100</td>
<td>6500</td>
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<tr>
<td>Sugar production (Quintals)</td>
<td>Average 562056</td>
<td>1444204</td>
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<tr>
<td></td>
<td>Total 3372338</td>
<td>1444204</td>
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<tr>
<td>Average cane crushed (Metric tonnes)</td>
<td>488411</td>
<td>1259222</td>
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<tr>
<td>Average recovery rate (%)</td>
<td>11.02</td>
<td>11.32</td>
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<tr>
<td>Average number of crushing days in a year</td>
<td>184.11</td>
<td>222</td>
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From the above table 8.1, the following observations can be made, when we compare the performance of the co-operative sector sugar factories during the pre-implementation period and post-implementation period.

There has been an increase in the average and total crushing capacity, increase in the production of bio fertilizers, spirit and also the total command area. However, there is a reduction in the average and total quantity of sugar produced, average cane crushed, average recovery rate, average number of

* There existed only one sugar factory in the private sector during the pre-implementation period.
crushing days in a year, average command area per sugar mill. There has been no production of ethanol and no co-generation of electricity during the pre-implementation period and post-implementation period.

The following observations can be made, when we compare the performance of the private sector sugar factories during the pre-implementation period and post-implementation period viz.:

There has been an increase in the total crushing capacity, total sugar production, total command area, ethanol production, power co-generation, total production of bio-fertilizers and sugar production by refining imported raw sugar.

However, there is a reduction in the average recovery rate and average number of crushing days in a year.

Hence, we can say that the performance of the private sugar factories has improved in the post implementation period of WTO regulations. This could also be attributed partly to the fact that 40% of private sugar factories were aware about the WTO regulations, different provisions of the Agreement on Agriculture, which specify the modalities for the conduct of global agricultural trade, and the rulings given by the WTO’s dispute settlement body, with respect to the sugar trade.

However, the performance of co-operative sugar factories has deteriorated in the post implementation period of WTO regulations. This could be attributed partly to the fact that 100% of co-operative sugar factories were unaware of WTO regulations and hence could not take appropriate measures to improve their performance.
8.6 Risk or negative fall out of the WTO regulations on the Belgaum district sugar industry

The threats, which the Belgaum district sugar industry will face from the developments arising due to the WTO regulations, are, threats of cheaper imports of sugar, due to the market access provision of WTO, especially from Brazil, which exports at marginal price. Also due to the opening up of the world markets there could be a surge in import of sugar if the domestic sugar manufacturers become non-competitive in terms of price, as the domestic sugar prices are no longer insulated from the global sugar prices, which have normally remained depressed.

The cost of production per tonne of plantation white sugar of Belgaum district is US$ 300.52, while the cost of production per tonne of white sugar in Brazil is US$ 210 (Export price is in the range of US$ 236 to US$ 244 per MT, FOB). Thus it is mainly the freight cost of about US$ 85 to 90 per tonne and the import duty of 60% on sugar that is shielding the domestic sugar industry from Brazilian sugar.

Though the sugar refineries set up in the middle-east hold prospects for Indian raw sugar exports, which the Belgaum sugar industry too could take advantage of, it is again the competitiveness in terms of price and quality that determine the ability to exploit the market opportunities. For example in 2008, Indian raw
sugar, which was offered at around US$ 260 FOB, was more attractive to buy than Brazilian sugar as the freight to Dubai from India was US$ 30-35 per tonne cheaper than from Brazil. However in 2009, owing to lower global freight charges which have fallen by almost half as compared to 2008 due to recession, the Dubai based Al-Khaleej sugar refinery, the largest in the world with a refining capacity of 1.5 million tonne per annum, has shunned Indian raw sugar exports and is importing from Brazil. Also the Al-Khaleej refinery would increase its export of refined sugar to the European Union in 2009. Thus the opportunity of garnering a share in the EU sugar market is seriously challenged. Also India is turning to a net importer of sugar in 2009 due to shortfall in domestic production. The government has removed the 60% import duty on up to one million tonnes of white sugar imported.