CHAPTER - 1

INTRODUCTION

This study aims to analyze the impact of a few policy decisions taken by Government of India (GOI)with regards to the sugar sector during April, 2013. The introductory chapter of the study comprises seven Sections. The Section 1.1provides brief glimpse of the sector. Section 1.2 touches upon the major issues in the sector. Section 1.3 discusses the dynamics of sugar sector policies. Section 1.4 provides the rationale for the study. Section 1.5 frames up the hypotheses for the study. Section 1.6 indicates the Methodology followed and the design restrictions. Section 1.7 provides the Chapterization Scheme.

1.1 Brief of the Sugar Sector

1.1.1 Sugar is a commodity of mass consumption in India and is entirely manufactured from sugarcane crop, which is also the case with the tropical countries, the world over. The temperate part of the world manufactures sugar mainly from sugar-beet crop and the dynamics of sugar sectors, therefore, differ in tropical and temperate countries. India is world's second largest producer of sugar and world's largest consumer of sugar.

1.1.2 The Indian sugar industry is more or less domestic market centric owing to plentiful domestic demand (the country consumes around 95% of domestic production). In comparison, the sugar industry in Brazil (also a tropical country) which is world's largest producer of sugar is mostly export oriented(the domestic market in that country consumes only about 30% of domestic production).

1.1.3 In addition to the entire Indian population being **sugar consumer**and therefore a major stake holder in the sector, the other key stake holders are the **sugarcane cultivators** and the **sugar industry**. The sugar season in the country is from October to September, for accounting purposes and aligns with the International accounting calendar for sugar.The annual turnover of the sugar industry in India is estimated to be of around Rs.80000/- crores and the sugar mills are source of substantial employment in rural / semi-urban areas of the country.

1.1.4 The sugarcane farmers and families, mostly with small and marginal land holdings; the agricultural laborers especially those engaged in cane harvesting; the cane transport machinery; the ancillary units, mostly small scale, supporting industrial operations of sugar mills and the technical/ administrative workforce of the sugar mills constitutes the major population groups earning livelihood and populating the microcosm of the sugar manufacturing plants.

1.1.5 In tandem with the technological advancements, the sugar plants in the country are gradually developing into multi-product industrial complexes which manufacture not only sugar but also industrial grade alcohol, potable alcohol, fuel ethanol as well as cogenerate electricity. While, production of industrial / potable alcohol and electricity is now a well-established activity in the sugar mills in our country, the manufacture of fuel ethanol is gradually picking up. Though the contribution of bye-products to the turnover of the industry at the moment is only around Rs.10000-12000 crore, over long term the sugar industry has the potential to meet up to 20-25% of the total motor-fuel (Petrol) requirements of the country, and can therefore become a substantial contributor in reducing the foreign exchange outgo and attaining energy security, apart from continuing to meet the traditional requirements of potable and alcohol based chemical industry. Similarly, the sugar mills are estimated to have potential for supplying around

8000-9000 MW of electricity per annum to the grids, after meeting all in-house requirements against the present supply of around 3500 MW.

1.1.6 A recent GOI report[1] captures the working of the sugar sector in India as follows:

Socio-Economic Significance

The sugar industry, sustains the livelihood of 6 million agricultural and 0.5 million skilled and semi-skilled industrial worker families as well as generate significant employment in ancillary and allied activities. The area under sugarcane hovers around 5 million ha. which is around 3% of the gross cultivable area in the country. In fact, sugar manufacturing is one of the largest agro based industry in the hinterlands of the country. The turnover of the sugarcane & sugar related economic activities is in the range of Rs. 80-85 thousand crores per annum, out of which around Rs. 55-60 thousand crores accrues to the sugarcane farmers of the country.

Significant part of global production and consumption

The Indian share in global sugar production has risen from 5% to 15% in the last five decades. In the same period India's share in global sugar consumption has gone up from 5% to 13%. Country is now the second largest sugar producer in the world and despite the largest consumption base in the world, is self-sufficient and is also able to generate exportable surpluses. Country has produced sugar in the range of 24 – 26 mln MT the last 3 sugar seasons, has met the domestic sugar consumption requirements estimated to be in the range of 23 million MT for the ongoing 2012-13-sugar season and has exported surplus production.

The estimated Compounded Annual Growth Rate (CAGR) for domestic consumption of sugar is 3.5 %, which is more than the global average and is attributable not only to the lower initial base but also to the ever increasing disposable incomes (2.1% - contribution on this account is comparable to world standards of per capita consumption growth of sugar) as well as population growth (1.4% - contribution). As per estimates, the share of bulk consumers in the sugar consumption basket ranges from 60% - 65 %. And the rest of the consumption is by individual households. The per-capita consumption of sugar in the country is estimated at 18 Kg./annum for 2011-12 sugar season. Another

[1] "Report of the Working Group on Sugarcane Productivity and Sugar Recovery in the Country", Department of Food and Public Distribution, Government of India, 2013".

5kg/capita per annum sweetner consumption in the country is by the way of Gur/ Khandsari products. The still lower consumption base of sugar in the country is indicative of huge opportunities for the domestic industry and as the country grows, the domestic sugar consumption may match the world standards (the world sugar per capita consumption is around 24Kg annually and the per capita consumption in Europe and American Continents is around 35-40 kg/annum).

Emerging role as Renewable Energy Source

Gradually, the sugar industry is also emerging as a substantial source for meeting a part of the ever increasing energy needs of the country through the co-generation of electricity and the Ethanol, which are renewable/green sources of energy and these developments hold the potential of converting Sugar mills into huge Energy Complexes with passage of time. Though the contribution of these activities to the turnover of the industry at the moment is only around Rs. 10-12000 crore, over long term, the sugar industry has the potential to meet upto 20-25% of the total motor-fuel (Petrol) requirements of the country, and can therefore become a substantial partner in reducing the foreign exchange outgo and attaining energy security, apart from meeting the traditional requirements of potable and alcohol based chemical industry.

Profile of Industry

The sugar manufacturing activity in the country is widely spread out among 10 states/ UTs, out of which 5 states are in sub-tropical belt (Punjab, Haryana, Uttarakhand, Uttar Pradesh, Bihar) and the other 5 states are in tropical part of the country (Gujarat, Maharashtra, Karnataka, Andhra Pradesh and Tamil Nadu). The states of Chhattisgarh and Madhya Pradesh, in Central India as well as Odisha (Eastern India) and the Union Territory of Puducherry (Tropical India) also contribute to the domestic sugar production to some extent. There are units of every size, but mostly in 2500 TCD- 5000 TCD bracket, but increasingly, expanding and going even beyond 10000 TCD. Based on the existing levels of sugarcane availability and sugar recovery, the tropical and sub-tropical belts have the potential to produce around 16 million MT and 12 million MT of white sugar, respectively every sugar season.

Two standalone sugar refineries have also been established in the country in the coastal belt of Gujarat and West Bengal which produce refined sugar from imported raw sugar and also from indigenously produced raw sugar. Though, these refineries are export oriented, the sugar produced therein has also scope of augmenting the white/refined sugar stocks in the country particularly during the years of low production and can radically improve the sugar security in the

country. The daily sugar production capacity of these two refineries is around 5000 MT, which translates to production capacity of 1.5 million MT. In addition, raw sugar refining capacities have come up within the existing sugar mills also.

The gradual liberalization of the sector and increasing linkages to the global sugar markets are bringing transformational changes in the Sugar sector whereby the efficiencies are taking place from the inefficient operators. As such, though there are 690 registered sugar mills, 93 sugar mills are on the verge of permanent closure and have not done any production during last five sugar seasons, leaving 597 number of operational sugar mills. Moreover, out of the operational mills, all the mills have not worked in all the years and the maximum number of sugar mills, which have worked in a single year, has been 529 (during 2011-12 sugar season). A further churn out can be expected corroborated by the fact that 136 new sugar mills are in various stages of establishment and can be expected to go to production stage in 2-4 years time horizon. Most of the new projects are integrated with inbuilt planning for cogeneration and distillation facilities. The upcoming capacities are mostly in the tropical belt of Maharashtra and Karnataka.

The industrial capacity is majorly under ownership of private sector units and co-operative sector, though there are a few public sector units owned by State Governments. In fact, the sugar industry has been in the vanguard of the establishment of co-operative movement in the states of Maharashtra and Gujarat. While the total number of operational sugar mills in the cooperative sector (286) exceed the number of operational sugar mills in the private sector (282), the size of the mills is in general bigger in the private sector. In the process, the crushing capacity wise split up between cooperative and private sector is loaded in the favour of private sector. Out of the operational per day cane crushing capacity of 22.24 Lac TCD, the private sector owns 13.74 Lac TCD, the cooperative sector owns 7.77 Lac TCD with the rest being with the public sector undertakings (29 sugar mills - 0.73 Lac TCD). Most of the upcoming projects are in the private sector. The sickness levels are also higher in the cooperative sector.

(The appendices I & II, reproduced from report[i] summarize the sugar manufacturing base as well as capacity profile of the sugar mills in the country)

---

[i] "Report of the Working Group on Sugarcane Productivity and Sugar Recovery in the Country", Department of Food and Public Distribution, Government of India, 2013".

1.2 Issues in the sugar sector

1.2.1 The report[i] further indicates the following:

Persistent Problem Areas

The cyclicity of production has been the bane of Indian sugar sector. The peak of sugar production achieved in the country has been the figure of 28.2 million tonnes, during 2006-07, the graph has not been uni-directional and steady and there have been wide swings. Due to raw material shortage, sugar mills in Sub-tropical belt generally work for not more than 100-130 days. The working days in Tropical belt have been in the range of 140-180 days except Tamil Nadu where industry is able to get the working days stretched even upto 200-210.

(The working duration records for the various states as indicated in the report[i], have been reproduced vide Appendix-III)

The industry, therefore, mostly has been working below capacity, a handicap which adds to the production costs, apart from raw material costing issues, and therefore, generally, out - placed in the world trade. In the process, in the years of surplus production, there are gluts leading to crash of domestic prices, as the higher cost structure generally makes Indian exports non-competitive and country finds difficult to push the surplus sugar out of country. In the year of shortages, the fixed costs affect the balance sheets of the industry. The payment to the farmers on account of sugarcane supplies, therefore, consistently gets affected leading to fluctuating cycles of planting and the infamous "sugar cycle" of India.

Accentuating the poor economics of sugar production in the country has been the stagnant %age sugar recovery levels. The %age sugar recovery from the crop has been far below standards achieved by major sugarcane based sugar producers with comparable agro-climate, like Brazil and Australia. The sugar recovery in different states has been hovering around 9.5% to 11.5%, with all India figures of around 10% while the potential is at least 11% in Sub-tropical part and 13% in the Tropical part of the country.

(The historical sugar recovery figures in various states of the country, year-to-year sugar production trends and the contributing factors and sugar

production trends each major state wise, as taken from the report[i], are at Appendix-IV, Appendix-V and Appendix-VI respectively).

The story gets further complicated by the drawal of significant part of sugarcane (15-20%) by the unorganized sector manufacturing Gur and Khandsari in the Country. As per estimations by various agencies, the share of Indian Gur/Khandsari production at about 6 million tonnes annually is 50-55 % of world production of similar products (10-11 million tonnes). About 60% of Indian production of Gur/Khandsari is in Uttar Pradesh, Maharashtra produces around 11% of domestic production with balance spread out among other sugarcane growing states. A reverse relation between Gur and Sugar production has been seen by the experience of last three decades. As such, the drawal of the sugarcane for alternate uses is more at the times of anticipated downswings in the sugar production.

In general, the farmers tend to shift to the alternate crops due to sectoral imbalances caused by sugar glut situations. In subsequent years, once due to downfall in sugar production the prices firm up, farmers tend to shift back to the sugarcane crop. The variations in the yield have been mainly climate afflicted, even though the sugarcane crop in major belts is 80-90 % irrigated, indicating inadequacies of scientific management practices.

Significant gaps in Potential and Achievement

Country is far off-the-mark in realizing the full potential of the human and capital invested in the sector. While Brazil has become the largest producer of sugar in a short span of 3-4 decades and currently produces around 33 to 35 million tonnes of sugar annually, apart from huge quantities of ethanol as motor-fuel alternative and its sugar economy is majorly export oriented, Indian sugar despite having the cushion of huge domestic captive market has not been able to create a permanent niche in the international trade. Even the major neighborhood import markets – Indonesia / Middle Asia / Africa have been majorly dominated by Brazilian/Thai sugar. Out of 48 million tonnes of Imports in South Asia / Middle Asia / Africa, India's export share stood at meager 27.70 % in the last 7 years against the Brazilian / Thai share of 70%.

Country has not been able to tap the potential of sugar industry in meeting at least a part of the energy sector needs. In Brazil, around 50% of the motor fuel requirements are met by ethanol (mainly produced by sugar industry) and

[i] "Report of the Working Group on Sugarcane Productivity and Sugar Recovery in the Country", Department of Food and Public Distribution, Government of India, 2013".

vehicles run on flexi-fuels (E20 – E25 / 100% anhydrous alcohol/ 100% petrol), saving the country valuable amount of foreign exchange outgo on import of Petro-products, whereas we have been grappling with the situation whereby even E5 blending programme is just gaining momentum.

1.2.2 Following excerpts from another GOI Report[ii] vividly explains the reasons for cyclicityof sugar production in India:

Area under sugarcane has risen from 39.29 lakh hectares in 1997-98 to 49.44 lakh hectares in 2010-11. Over the same period, sugarcane production has increased from 279.59 million tonnes to 339.17 million tonnes. After a steady rise in sugarcane production in the years subsequent to 1997-98, it fell to 233.86 million tonnes in 2003-04. Increase in sugarcane production thereafter was again followed by a decline in 2008-09 to 285.09 million tonnes. Production of sugar is closely linked to sugarcane production. The cyclical nature of the sugarcane – and hence of sugar – production is quite evident.

During the years of high production of sugar, prices of sugar in the market are low. As a result sugar mill owners delay payment to farmers for the sugarcane supplied and this leads to accumulation of "cane arrears". Thus, arrears payable are inevitably higher in the years of higher production. Accumulation of cane arrears prompts sugarcane farmers to shift to cultivation of alternate crops, thereby reducing the area under sugarcane cultivation. In addition, sugarcane farmers may supply to the alternate industry of gur and khandsari where payments are made immediately and in cash. Diversion of sugarcane to gur and khandsari decreases during the years of abundant availability of sugarcane and increases during the years of shortfall in production.

The cyclicality of sugarcane production causes large swings in the area under cultivation of sugarcane and hence its availability to the sugar industry. Sugarcane production falls during the years of reduced acreage leading to less availability of the raw material for the sugar industry and hence the sugar prices go up. This sets in motion the next phase of the cycle in which sugar production falls leading to high prices. Due to higher revenues, mills are then able to liquidate part of the cane arrears. This signal to the farmer makes them shift back to cane cultivation. Over a period of time there is overproduction and the prices fall again. Thus, the infamous 'Indian Sugar Cycle' is set in motion again.

---

ii "Report of the Committee on the Regulation of Sugar Sector in India: The Way Forward" by a high powered committee, under Chairmanship of Dr. C. Rangarajan, Chairman, Economic Advisory Council to Prime Minister, October, 2012.

1.2.3 The sugarcane as a raw material for manufacturing sugar and by-products constitute anywhere between 70-75% of the inputs costs. As such out of the total turnover of the sugar industry, around Rs.60,000/- crores (at current costs) annually is towards cane farmers' payments. The payment to sugarcane farmers by sugar mills, though statutorily supported by various statutes and enforced by State Governments, get affected by the dynamics of domestic market price as well as international situation related to export possibilities. The position of cane price payments and arrears for the past few sugar seasons(on a similar cut-off date) was as mentioned in Table-1.1.

Table-1.1

Season-Wise Cane Price Arrears Position

(In Crores ₹)

SEASON	POSITION AS ON	TOTAL PRICE PAYABLE	TOTAL PRICE PAID	ARREARS	% OF ARREARS ON PRICE PAYABLE
2013-14	31/09/2014	58130.24	52173.04	5957.20	10.25
2012-13	31/09/2013	60008.57	56807.64	3200.93	5.33
2011-12	31/09/2012	51917.00	50949.67	967.33	1.86
2010-11	31/09/2011	45012.62	44376.20	637.42	1.41
2009-10	31/09/2010	39301.03	38911.60	389.43	0.99
2008-09	31/09/2009	20016.65	19894.15	122.50	0.61

Source: Department of Food and Public Distribution, GOI

1.2.4 *Other Issues*[ii]

Regulations relating to by-products

The Indian sugar industry crushes about 70-80 per cent of the sugarcane for sugar production, with the remaining cane accounted for by the production of

[ii] "Report of the Committee on the Regulation of Sugar Sector in India: The Way Forward" by a high powered committee, under Chairmanship of Dr. C. Rangarajan, Chairman, Economic Advisory Council to Prime Minister, October, 2012.

local sweeteners (khandsari and gur), seed, feed, cane juice, chewing and waste. Some by-products, such as molasses, bagasse and press mud, are produced in the first stage of processing of sugarcane. The markets for these by-products are tightly regulated so that their true market value is not realized by the mills, leading to loss of potential revenue.

Molasses

Molasses are produced in the final stage of manufacture of sugar by the vacuum pan process from sugarcane or gur. .....It has some unrecoverable sugar, which is utilized to produce rectified spirit or alcohol of 94.5% purity. Almost the entire quantity of alcohol in the county is produced from sugarcane molasses.

Alcohol produced from molasses is primarily used for the following purposes:

(i) Use as potable liquor by diluting and blending;

(ii) Industrial use for production of various chemicals like acetic acid, acetic anhydride, ethyl acetate, acetone, mono-ethylene glycol (MEG) etc. These chemicals provide feedstock for a variety of industries such as synthetic fibres, pesticides, pharmaceuticals, paints, adhesives etc.

(iii) Blending with motor spirit (petrol) and use as a fuel as part of the Ethanol Blending programme (EBP).

There is no control by the Union Government on production, pricing and distribution of molasses. There is no price control on the molasses in any State. However, the allocation and movement of molasses is controlled by the State Excise authorities. Any quantity exported or sold from sugar factory is recorded on a daily basis. Selling of any molasses requires a permit NOC from the State Excise Department, against which any quantity can be sold or purchased. It is obtained by the purchaser from the excise authority of the exporting State.

There are substantial variations in excise regulations on molasses across states. In Uttar Pradesh, the policy has been to reserve a certain proportion of molasses for production of country liquor. This proportion has typically been in the range of 25-30%.

Export of molasses to other states is generally not allowed. However, permission is granted on a case to case basis. A stable excise duty @ Rs. 110/- per M.T. is charged by the Excise Department for sale within U.P. and Rs. 150/-

per M.T. for sale outside U.P. In Maharashtra, inter-state export and import of molasses is free, subject to state export fees @ Rs. 50/- per M.T. Export of molasses has been banned in Tamil Nadu. In Karnataka too, the Excise Department has stopped giving permission for the export from the state. Most states also charge an import fee on the molasses imported into the state. .....

.....

Current regulatory arrangements of regulations relating to by-products impede development of a national market and consequently reduce economic efficiency

The Way Forward

Sale of molasses is an important revenue stream for sugar mills. Most state governments exercise control on its allocation and/or movement. This places mills in a disadvantageous position and distorts a market which has the potential to be truly competitive and efficient. The committee is of the view that there should be no quota imposed (quantitative restrictions) on the mills for sale of molasses. All user industries, viz., potable alcohol, chemicals and petroleum product industries should compete for molasses, and the market should determine its price.

Bagasse

Bagasse (surpluses of requirement for boilers in the mill itself) was traditionally, used in the paper industry, but is now largely being used as fuel feedstock for cogeneration of electricity. As against a total country-wide estimated potential of 5,000 MW based on this feed stock, about 2,000 MW of capacity has already been created. Given the capital costs involved, private sugar mills have accounted for the major proportion, as many cooperative and public sector mills are in the red. However, even the latter have begun developing their cogeneration capacities through competitive bidding. At present, cost of generation is about Rs. 3 to 3.50 per unit, whereas preferential power tariffs set by State Electricity Regulatory Commissions (SERCs) are in excess of Rs. 4.25 per unit. Thus, cogeneration is ecologically and financially a viable proposition and is growing rapidly.

The regulatory regime for cogeneration is part and parcel of the regulatory regime for renewable energy. The provisions constituting the renewable energy regulatory regime are in the Electricity Act, 2003, and the National Electricity Policy, 2005 and Tariff Policy, 2006 framed thereunder.

Industry representatives have apprised that certain states, like Tamil Nadu & Karnataka, have invoked Electricity Act provisions that empower state government to impose restrictions on sale of power, are not allowing open access sale during the months of greater power shortfall. This has been challenged in court. Some states, like Karnataka, are yet to give effect to the guidelines issued by the Central Electricity Regulatory Commission in 2010 for issue of Renewable Energy Certificates, which can be sold outside the state. Industry has represented that the imposition of restrictions on sale to users other than the local power utility and the non-implementation of the Renewable Energy Certificate arrangement for sale in other state are affecting revenue realization from cogeneration in some states.

The Ministry of New & Renewable Energy, in its Annual Report 2010-11, has observed that although the existing regulatory framework for renewable power has created a momentum for harnessing renewable energy based power potential, there appears to be a need for mid-course corrections for rapid growth of renewable power in the country

The Way Forward

From the above, it is evident that issues relating to cogeneration pertain to implementation of Electricity Act provisions and regulations framed there under for all forms of renewable energy. The committee feels that this fall within the domain of States and SERCs. Policy reform requires legislative and regulatory changes at the central level as part of the overall regulatory reform for renewable energy, and a joint exercise of the Ministries concerned is already under way. This should be expedited to harness the true potential of power generation and make the sugar mills energy complexes. However, the committee feels that there should be no quantitative or movement restrictions on the movements of the by-products and prices should be market determined. There should be no regulatory hurdles preventing sugar mills from selling their surplus power to any consumer.

Press Mud

Press mud, is a solid waste by-product of the sugar industry. It is rich in organic compounds like nitrogen, phosphorus, magnesium and potassium. It is being utilized to produce bio-compost by treating it with spent wash, a liquid waste from the distillery, which is rich in potash, on a stack of press mud called windrows. Over a cycle time of 40-50 days, spent wash mixed with press mud gets composted and forms organic manure.

Concerns have been raised by the Ministry of Environment & Forests on the use of spent wash in bio-composting as spent wash is highly acidic in nature and chemicals leach into the ground. It has been instructed that spent wash should be incinerated in the mill itself. However, the process of incineration has an adverse impact on the life of the boilers, and also contributes to air pollution. The committee strongly recommends further research in this area so that a sustainable solution can be found to enable utilization of the press mud / spent wash without environmental overload.

1.3 Dynamics of Sugar Sector Policies

1.3.1 Industry's bodies ascribe the major reason for the problems and the issues in the sugar sector to the Governmental regulations in the sector, which it is argued have prevented industry from attaining economies of scale, technological up-gradations and diversification on one side and at the same time have dis-incentivized the investments in the crop improvement programs by the industry. The **statutory / regulatory controls** to which sugar sector in the country has been subjected at various points of time can be broadly categorized into – **"controls on the sugar as a commodity", "controls on the sugarcane as the raw material for the industry"** and **"controls on the by-products of sugar manufacture"**.

1.3.2 The sugar industry being one of the first industries to have gained foot-hold during the course of industrialization in the country, during pre-independence times, and the sugar being a sensitive commodity of mass consumption, the sugar sector has been subjected to various statutory / regulatory controls, both at the level of Central Government as well as by various State level statues/ rules. The commodity has been retained as an "Essential Commodity" under The Essential Commodities Act, 1955 (EC Act) since the inception of this Act. The EC Act is basically a national legislation providing for Governmental control and supervision on the various facets of the concerned sector, in view of the perceived importance of the concerned sector for public welfare, at large. In the process, there have been rules governing the purchase

price of raw material i.e. sugarcane as well as rules regulating the disposal of finished products i.e. sugar was well as by-products of the industry. The sugar industry in the country was also subjected to pre-establishment licensing requirements under Industrial Development Regulation Act, 1956 (IDRA, 1956), a huge Governmental control. The sector was also subjected to various controls for international trade through Export / Import Policies (EXIM) in the past which included exports-imports only by Government agencies and necessity of obtaining release orders (a sort of licenses) for exports etc. Then there are State level Statutes / Rules governing the movement/ disposal of by-products of the sugar industry, especially the Molasses / Alcohol.

1.3.4 With the gradual opening up of the Indian economy, a major part of the statutory / regulatory controls on the sugar sector, which were mostly at the level of Central Government, have been removed, in the last few decades. The industry was de-licensed i.e. the requirement for obtaining Government of India Licenses for establishing sugar mill were dispensed away in 1998. The effect of which was seen in subsequent decades whereby the Indian sugar manufacturing capacity increased exponentially and helped country to keep pace with the burgeoning domestic consumption requirements. At present, the entrepreneurs are free to set up new sugar mills in any part of the country, subject only to the distance criterion. Following excerpts from Report[ii] are noteworthy:

.....Till 1997-98, growth in sugar industry was at a much lower level, and took-off on a high growth trajectory in the post delicensing period. During the pre-delicensing period (1990-91 to 1997-98), the sugar industry, in terms of installed capacity, grew at an annual average growth of 3.3 per cent, which more than doubled to 6.9 per cent thereafter(1998-99 to 2011-12). And this came increasingly from the private sector. The installed capacity in the private sector grew at an annual average rate of 11.2 per cent in the post-delicensing period as compared to only 4.8 per cent earlier. In comparison, cooperative sector's

[ii] "Report of the Committee on the Regulation of Sugar Sector in India: The Way Forward" by a high powered committee, under Chairmanship of Dr. C. Rangarajan, Chairman, Economic Advisory Council to Prime Minister, October, 2012.

capacity grew by only 2.7 per cent in the pre-delicensing period and 3.7 per cent in the post-delicensing period. Public sector's capacity growth has been negative, at (-) 1.7 per cent, even in the post-delicensing period.

Delicensing also contributed significantly to a structural transformation in sugar industry, from being dominated by sugar co-operatives to private sector sugar mills…. Till 1997-98, sugar cooperatives dominated the sugar industry with an installed capacity of 51.5 per cent of total installed capacity in the country, followed by the private sector (38.2%) and public sector (10.3%). By 2011-12, this had changed significantly with the private sector contributing the largest share of 63.3 per cent to total installed capacity, followed by cooperatives (33.6%),with the public sector (3.2%) trailing well behind.

There is also evidence that private sector mills, existing ones as well as new ones that are coming on stream, are of much higher capacity than the cooperatives or public sector mills. Normally, larger mills enjoy scale economies and greater efficiency in sugar production. Based on an analysis of 84 sugar mills in Maharashtra, it is found that there exist strong economies of scale in the sugar industry, i.e., with increasing scale of operations, the cost of conversion of sugarcane into sugar decreases substantially…….

1.3.5 The sugar export / import was de-canalized in 1997 which meant that anybody could export or import sugar, subject to tariff controls and release order (licensing) requirements. In the next phase of liberalization, the release order requirements for export were also dispensed with in May, 2012 and in effect both the sugar exports as well as sugar imports are free now, except for some amount of duty on imports. However, the export tariff on sugar has been nil and therefore the Indian Sugar Mills have complete freedom to export their product now. Now, Export of sugar is free subject to prior registration of quantity with Directorate General of Foreign Trade (DGFT).

1.3.6 In the latest phase of deregulation, the Government of India, vide a major decision taken in April, 2013 has removed all controls on sugar sale (G.S.R.282(E) dated 2nd May, 2013) and has also dispensed away with the mandatory levy imposition policy (G.S.R. 281 (E) dated 2nd May, 2013).The de-regulation of the sugar sector was expected to improve the financial health of the

sugar mills, increase the cash flow, reduce their inventory cost and also result in timely and better payment of cane price to sugarcane farmers in the country.The sale and disposal of sugar is completely free now. Therecommendations ofthe Report[ii] based on which the latest de-regulation decisions were taken and the status of other recommendationsis summarized in Table-1.2.

Table - 1.2

Implementation Status of Recommendations of Dr. Rangarajan Committee

Issues	*Gist of Recommendations*	*Action Taken*
Cane Area Reservation:	*Over a period of time, states should encourage development of such market-based long-term contractual arrangements, and phase out cane reservation area and bonding. In the interim, the current system may continue.*	*The recommendation has been referred to the concerned State Governments for adoption and implementation, as considered appropriate by them.*
Minimum Distance Criteria:	*It is not in the interest of development of sugarcane farmers or the sugar sector, and may be dispensed with as and when a state does away with cane reservation area and bonding.*	*The recommendation has been referred to the concerned State Governments for adoption and implementation, as considered appropriate by them.*
Sugarcane Price : Revenue Sharing	*Based on an analysis of the data available for the by-products (molasses and bagasse / cogeneration), the revenue-sharing ratio has been estimated to amount to roughly 75 per cent of the ex-mill sugar price alone.*	*The recommendation has been referred to the concerned State Governments for adoption and implementation, as considered appropriate by them.*

[ii] "Report of the Committee on the Regulation of Sugar Sector in India: The Way Forward" by a high powered committee, under Chairmanship of Dr. C. Rangarajan, Chairman, Economic Advisory Council to Prime Minister, October, 2012.

Issues	Gist of Recommendations	Action Taken
Levy Sugar	*Levy sugar may be dispensed with. The states which want to provide sugar under PDS may henceforth procure it from the market directly according to their requirement and may also fix the issue price. However, since currently there is an implicit cross-subsidy on account of the levy, some level of Central support to help states meet the cost to be incurred on this account may be provided for a transitory period.*	*Central Government has abolished levy on sugar produce after 1st October, 2012. Procurement for PDS operation is being made from the open market and the Central Government is giving a fixed subsidy @ Rs. 18.50 per k.g.to make sugar available at Retail Issue price of Rs. 13.50 per k.g.*
Regulated Release Mechanism	*This mechanism is not serving any useful purpose, and may be dispensed with.*	*Regulated release mechanism for open market sale of sugar has been dispensed with.*
Trade Policy	*As per the committee, trade policies on sugar should be stable. Appropriate tariff instruments like a moderate export duty not exceeding 5 per cent ordinarily, as opposed to quantitative restrictions, should be used to meet domestic requirements of sugar in an economically efficient manner.*	*No export duty on sugar. Import duty stands at 15%.*
By-products	*There should be no quantitative or movement restrictions on by products like molasses and ethanol. The prices of the by-products should be market-determined with no earmarked end-use allocations. There should be no regulatory hurdles preventing sugar mills from selling their surplus power to any consumer.*	*In order to harness the full socio-economic potential of the sugar sector, State Governments have to take appropriate step to enhance the productivity of sugarcane and the recovery of sugar. In addition, the effective utilization of its by-products, i.e., bagasse, molasses and press-cakes are necessary to make the industry globally competitive. The State Governments have been requested to reconsider the regulatory controls on movement of molasses which can be used for producing ethanol.*
Compulsory Jute Packing:	*May be dispensed with.*	*The compulsory packaging of sugar in jute bags has been relaxed further and only 20% of the production is to be mandatorily packed in jute bags.*

Source: Department of Food and Public Distribution, GOI

1.4 Rationale for the Study

1.4.1 The Governmental policy for any sector, at any point of time, is the result of complex interplay of various factors including various thought processes, key stake holder requirements, etc. The dynamics of any sector change whenever fine tuning / amendments to the policy prescripts for any sector occur.

1.4.2 Considerable turmoil is being witnessed in the sugar sector, which has been partially unshackled due to removal of Governmental controls on the disposal of sugar, by April, 2013 decision of the Government. Previously, the Governmental controls were cited as the major reasons for the handicaps afflicting the sector i.e. the cyclic upswing / downswing in the sugarcane cultivation and corresponding sugar production (at times insufficient to meet requirements of domestic consumption which is huge and almost twice of the next highest global consumer, in gross terms); the delay in the cane payments to the farmers, the financial bad health of the industry, the in-competitiveness of the Indian sugar in the global market due to high costing, etc. It was expected that the removal of controls on sugar disposal would provide commercial flexibility to the sugar mills and would improve their performance and the welfare of sugarcane farmers at large. It was also anticipated that the price of sugar for the end consumers will not rise, since the cross subsidization of the levy sugar prices by the open market prices as well as linking of Indian sugar sector with the global market would neutralize the inflationary tendencies, if any, in this sector.

1.4.3 The Governmental level controls / regulations on the raw material i.e. sugarcane supply related aspects as well as on the market driven disposal of by-products, which are mostly in the domain of State Governments have not been, majorly touched, in the existing scheme of things. The natural question, which comes to mind of any keen observer of the sugar sector, is - whether the equilibrium which was obtainable in the sector, before the current wave of

deregulation, has been hampered? It also raises the questions as to whether the industry was happy doing its business under the maze of Governmental controls and is inapt to adjust to the open market realities or whether, the controls which still exist on the sugarcane pricing as well as by-products disposal have a role to play in the scene obtainable at the moment, in this sector?

1.4.4 The proposed study, which targets to look into the conditions of the sector through key parameters relevant for various stake holders, post-deregulation, would offer valuable clues for further evolution of sugar sector related policy framework as well as might be useful for the policy makers involved in policy making for similar sectors in the country.

1.5 Hypotheses

1.5.1 The 2013 deregulation decision of Government of India, whereby complete freedom was given to the sugar mills with regards to disposal of its primary product i.e. sugar,was expected to be a win-win situation for the consumers, sugarcane farmers and sugar millers. The study has attempted to look into the conditions / performance of the key stake holders in the sugar sector i.e. consumers, farmers and the sugar mills, post – 2013 deregulation decisions with the hypotheses that the condition of the stake holders remain static and the post deregulation phase has not improved their situation.

1.6 Methodology&Design Restrictions

Methodology

1.6.1 The sugarcane and the sugar season in the country is taken from October to September (not concomitant with the financial / calendar year). As such, data gathering and analysis is on sugar season basis in this study. The deregulation

decisions regarding the sugar sector were implemented from May-June, 2013 which was the fag end of 2012-13 sugar season. As such, the sugar season 2012-13, has been taken as the benchmark year for pre-deregulation phase and the sugar season 2013-14 as the post-deregulation reference point in the study. The data gathering on every parameter indicated below is therefore for the sugar season 2012-13 and 2013-14. Further the data has been gathered/compiled/ analyzed for the 10 largest sugar producing states in the country, which contribute to the bulk of country's sugar production.

1.6.2 To the extent possible, the data collection relies on the Central Government Departments of – "Food and Public Distribution", "Consumer Affairs" and "Agriculture" as well as the state cane departments with regards to data related to for the cane payment, cane cultivation extent, sugar prices, sugar production, cane prices, cane payment situation, the performance of the sugar mills, ētc. In addition, the sugar mills specific data, available from the sugar industry representative bodies i.e. Indian Sugar Mills Association (ISMA) and National Federation of Cooperative Sugar Factories (NFCSF), has also been utilized for the purpose of this study. Certain primary inputs related to sugar consumption have also been obtained from diverse market sources.

1.6.3 The parameters covered,to justify the gamut of the study, are:

1.6.3.1Consumer Prices

For a Consumer, the price points and the availability of sugar are the prime concerns and in this context the prices and availability have been captured through:

- Trend of Consumer and Wholesale Prices.

- Variation levels (monthly) of sugar Retail and Wholesale Prices.
- Monthly differences between Retail and Wholesale prices in order to understand the price spread along the marketing chain.
- Sugar procurement pattern of institutional buyers.

1.6.3.2Condition of sugarcane farmers

For a sugarcane farmer the most important factors are the cane prices and timely payment of the same. The parameters studied with this objective are:

- Per Unit Cane Price received / receivable
- Year end Cane Payment situation
- Month-wise Cane arrears

1.6.3.3Performance of sugar mills

Since a Complete financial / technical analysis of the sugar mills performance was beyond the limits of this study due to time and resources constraint, an attempt has been made to study the sugar disposal (through various forms of sale operations) and cash flow pattern discernable fromthe sugar sale operations of the sugar mills in the two situations i.e. controlled sales as per Govt. directions and sales purely as per cash flow requirements in the pre and post de-regulation phases. The parametersstudied with this objective are:

- Sugar Balance Sheet
- Trend of Gross Realization from Sugar Sale
- Cost of Production Vs. Realization

- Trend of Monthly Cash Flow
- Sugar Stocks Use Ratio

Design Restrictions

1.6.4 Since the import / export policy for sugar in the country is quiet liberal now and has been so during the study period, the domestic scenario cannot be entirely insulated from the impact of global sugar situation. However, since the world over, the situation has been towards the surplus sugar stocks all through study period, the impact, whatsoever, should be same on the sugar prices. The global sugar prices have fallen during entire study period, because of which export parity of Indian origin sugar has been almost nil. The import possibilities have been moderated by imposition of import duty of 15% from July, 2012 and 25% from August, 2014.

1.6.5 In order to reduce complexity of analysis and interpretation, the price data analysis has been restricted to the 4 major metros and the All India level, though the data was available for 67 centers of the country. The same basis, it is understood, is also used by Government for broad policy studies. There is also a set pattern in sugar prices whereby the prices are generally low during production months and tend to rise during the culminating months of a sugar season. Since, this is a set pattern; it was expected to be in-consequential for the purpose of data comparison over two periods.

1.6.6 Working performance of the sugar mills through the analysis of sugar sale operations ignores the cash flow dynamics of the by-product sales i.e. bagasse/ cogeneration, molasses/ alcohol, press mud, etc. Further, the situation each sugar mill wise might be different than the overall situation of the sugar mills of a state.As such, the results at best could be broad indicators for the sector.

1.7 Chapterization

1.7.1 The subsequent parts of this dissertation carry the review of the literature in Chapter 2, the analysis of the consumer behavior in Chapter 3, the analysis of the sugarcane farmers situation in Chapter 4, the analysis of sugar mill's performance in Chapter 5 and the Chapter 6 presents the conclusions of the study, analyses them in the backdrop of global sugar situation as well as diversification possibilities for the sector and provides certain recommendations.

****