Working Paper 385

State Intervention: A Gift or Threat to India's Sugarcane Sector?

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ISBN 978-81-7791-241-8

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Working Paper Series Editor: **Marchang Reimeingam**

STATE INTERVENTION: A GIFT OR THREAT TO INDIA'S SUGARCANE SECTOR?

Abnave Vikas B* **and M Devendra Babu†**

Abstract

This paper examines the nature, changes and factors responsible for issues and problems faced by the sugarcane growers and sugar mills in India. This paper is based on the latest available secondary data and existing literature. The result reveals that the State's price policy and failure of regulatory mechanisms are the major factors responsible for the problems of sugarcane sector. Apart from these factors, the dominance of private mills, falling sugar prices in markets due to fall in global crude oil prices and Brazilian currency may also be factors responsible to some extent, but not as much as claimed by the sugar mills. This paper also found that the short-term measures initiated by the State are inadequate and ineffective to tackle the long-term problems in the sugarcane sector. Finally, this paper suggests that there is need to revise the role of State intervention and the State should take into consideration the needs and consequences before providing assistance or putting new regulations on the sugarcane sector.

Keywords: State Intervention, India's Sugarcane Sector, Price Policy, Decontrol & Delicensing

Introduction and Motivation

State intervention plays a crucial role in Indian's sugarcane sector, and therefore no discussion would be complete without considering the role of the State in sugarcane sector. The vital intervention of the State can take a number of forms such as the Sugar Industry (Protection) Act (1932), Essential Commodity Act (1955), Sugar Control Order (1966), State Advisory Prices (1970), Jute Packing Materials Act (1987), Delicensing Sugar Sector (1998), Ethanol Blending Programme (2012), Scheme for Extending Financial Assistance to Sugar Undertaking (2014) etc. The State intervention is essential in sugarcane sector to get the right market prices for sugar and sugarcane through regulations and controls. And, it is also inevitable in the sugarcane sector since the price elasticity of both sugar and sugarcane remains less comparatively as the industrial product prices are hedged to a maximum limit, whereas, agricultural products prices are hedged to minimum limit (Jugale, 2000). Along with this, the risks of yield and price unpredictability, changes in inputs cost, diseases, and also seasonal variations due to water shortage as well as changes in weather are other also important factors leading to State intervention in sugarcane sector.

In India, the State's intervention in sugarcane sector is a complex trap of contradictory policies, particularly in the sugarcane production and price policies. Despite many efforts by the State, India's sugarcane sector is reeling under contradictory situations. While on the one hand, the farmers are agitating for better prices and timely payment for their sugarcane produce, on the other, the sugar mills constantly oppose this demand. While the sugarcane growers and their organisations demand

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The present paper is a part of Abnave Vikas B's ongoing PhD thesis at ISEC. Author extends his gratitude to the supervisor, Doctoral Committee members, panel experts and the anonymous referees for their useful comments.

better sugarcane prices on the ground that the cost of inputs and price of sugarcane has not increased proportionately, the sugar mills argue that they are unable to pay the arrears due to falling international sugar prices and economic policies of the Central and State governments. With this background, this paper makes an attempt to look into some of the issues related to State's regulations and controls on sugarcane sector with the critical review of State's policies and programmes.

Objective

To examine the factors responsible for the problems involve in sugarcane sector in context of the State intervention.

Data

The present analysis is based on the review of existing literature and secondary data which was collected from the Directorate of Economics and Statistics (DES), Department of Agriculture and Co-operation, Ministry of Agriculture, Department of Food and Public Distribution, Ministry of Consumer Affairs, Ministry of Finance, Government of India and reports of different committees. This paper is organized into four sections. The first section briefly discusses how the State's intervention in sugarcane sector has changed over the years. The second section deals with critically view on sugarcane price policy and its methodological issues. Third section tells the consequences of different State's regulations and feasibility of efforts taken by the government for sugarcane sector. And, the final section summarizes and concludes the paper.

Discussions

State Efforts for India's Sugarcane Sector: A Brief Overview

During the British period, Sugar Industry (Protection) Act, 1932 and Sugarcane Act, 1934 was introduced by the Central Government to protect the interest of both sugar mills and sugarcane growers. Under the Sugar Factory Control Act (1938), it was mandatory for the mills to purchase sugarcane through co-operative societies, instead of purchasing sugarcane through middlemen. Due to the influence of co-operative societies, no middleman exists presently between sugar mill and sugarcane growers except officials of the sugar mills. Before independence, various State Governments set sugarcane prices which led to regional variations. As per the Sugarcane (Control) Order 1950, the Central Government started to fix uniform minimum prices. Under the Industries (Development and Regulation) Act 1951, Government of India took over the regulation of the sugar sector from the states in 1952. Sugarcane and Sugar falls under the Essential Commodities Act (1955). Under this Act, the Government was permitted to impose a levy quota at lower prices than the market rates. The rest of the sugar (free sale) quota was controlled by the State under Sugar (Control) order (1966) as 'monthly release mechanism'. Till mid 1960's, the sugar sector was fully controlled by the Central Government. Due to low Statutory Minimum Prices (SMP) for sugarcane, it was diverted to the Gur and Khandasari units. Therefore, the State adopted partial decontrol policy. Consequently from 1970, the State Advisory Prices (SAP) came into existence.

Sugarcane Development Fund (1982) was set up for research and development and to achieve overall development of sugar sector. Under the Sugar Cess Act (1982), a cess of ₹ 24 per quintal was collected from March 2008 on all sugar produced and sold by the sugar mills. To promote Jute industry, it was made mandatory that sugar be packed in only jute bags under the Jute Packing Materials Act (1987). A major decision of delicensing sugar sector was taken in 1998 when licensing requirement for new sugar mills was removed. The State has made an arrangement for Sugar Stabilization Fund to stabilize sugar prices and pay better sugarcane prices to the sugarcane growers when sugar prices in the market are low. Apart from these, the Central Government started to fix fair and remunerative price (FRP) from 2009-10 which is fix on cost of sugarcane production, inter-crop price parity, recovery, sugar prices, availability of sugar and margin, to provide reasonable margins to sugarcane growers on account of risk and profits. To get better prices from sugarcane by-products and reduce pollution, the Ethanol Blending Programme was started in 2012. The Central Government partially adopted Rangarajan Committee recommendation on April 2013 and announced partial decontrol of sugar sector. In order to facilitate clearance of sugarcane arrears and timely settlement of sugarcane prices, the Central Government introduced new soft / interest free loan scheme (Scheme for Extending Financial Assistance to Sugar Undertaking) to sugar mills in January 2014. In February 2014, the State also notified a Scheme for Marketing and Promotion of Raw Sugar Production and announced subsidies to promote sugar export and raise domestic sugar prices from Sugar Development Fund.

Table 1: Summary of Efforts Taken by the State

Government Effort	Year	Year of Modification	Objective	Outcome(s)
Sugar Industry (Protection) Act	1932	--	to protect interest of sugar mills.	--
Sugarcane Act	1934	--	to protect interest of sugarcane growers.	--
Sugar Factory Control Act	1938	--	to abolish middlemen.	No middlemen exist between sugar mill and sugarcane growers except sugar mills' officials.
Sugarcane (Control) Order	1950	2009-10	to fix uniform minimum prices.	Every year the Central government fixes FRP before sugar season start
Industries (Development and Regulation) Act	1951	--	to regulate the sugar sector by the Government of India	--
Essential Commodities Act	1955	1991;1996; 2013	to impose a levy quota at lower prices than the market price	Central Government has abolished levyon sugar produce after 1st October, 2012. Procurement for PDS operation is being made from the open market by the states/UTs and Government is providing a fixed subsidy at ₹ 18.50 per kg.
Sugar (Control) order	1966	2004-05; 2013	to control free sale sugar.	--
State Advisory Prices (SAP)	1970	--	to divert sugarcane from Gur and Khandasari units to sugar industry.	State Advisory price is always higher than FRP.

Sugarcane Development Fund	1982	--	to establish research and development and to achieve over all development of sugar sector.	During the period from 1982-83 to 2015-16 (up to 30.11.2015), a net cess of ₹ 8,785.75 crore was collected.
Jute Packing Materials Act	1987	2012	to promote Jute industry.	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.
Delicensing Sugar Sector	1998	--	to solve problem of surplus sugarcane production.	Major change in the sugar sector with the increase in installed capacity of sugar mills.
Fair and Remunerative Price	2009-10	--	to provide reasonable margins to the sugarcane growers.	So far only Karnataka & Maharashtra have passed state acts to implement this recommendation.
Ethanol Blending Programme	2012	2014	to get better prices from sugarcane by-products and reduce pollution and dependency of imports.	The State Governments have already been requested to reconsider the regulatory controls on movement of molasses which can be used for producing ethanol.
Scheme for Extending Financial Assistance to Sugar Undertaking	2014	--	to facilitate clearance of sugarcane arrears and timely settlement of sugarcane prices.	The Central Government announced ₹ 6000 crore interest-free loan for the sugar mills
Scheme for Marketing and Promotion of Raw Sugar Production	2014	--	to utilize incentive provided under the scheme by the sugar mills for making payment to the sugarcane growers.	About ₹ 183.87 crore was disbursed to sugar mills during Financial Year 2014-15 and about ₹ 99.67 crore was released during 2015-16 sugar season up to 31.12.2015.

Source: Authors' Compilation from various reports and literature.

As observed above, India's sugar sector is highly controlled by the State regulations and controls which are different from the other countries. As per the Mahajan Committee Report (1998), in other countries like Australia and Brazil which are largest producer of sugarcane and sugar, no license is required for new mill or to expand the installed capacity. In Australia, sugar sector receives no direct assistance or support from the State. In China, the Government follows the policy of self-sufficiency by providing various incentives to the sugarcane growers and controlling government sugar stock. Thailand, a low cost sugar producer, became a one of the major sugar exporters in the world market due to tax incentives, high domestic sugar prices and subsidized credit to sugar industry and sugar growers by the government. In case of Brazil, the sugarcane area reservation for each sugar mill is not legally determined and there is no state control on sugar prices. No part of sugar production is mandatory acquired for public distribution by the State. Ethanol blending proportion is also high at around 40 to 50 per cent in Brazil compared to India where only 10 per cent ethanol blending is targeted by the Indian government, which has not even achieved 5 per cent.

Impact of State Policies / Programmes on Sugarcane Production

There is no doubt that the area and production of sugarcane has increased (area effect), but the productivity (yield effect) has not increased significantly especially in Maharashtra. The State's support prices, subsidies on fertilizers and electricity and assured demand are encouraging sugarcane production relative to other crops. Therefore, the farmers are going for sugarcane area expansion. Moreover, the movement of sugarcane production shifted from sub-tropical region to tropical region in India (see appendix 1). Sugarcane was grown largely in sub-tropical states like Uttar Pradesh, Punjab and Bihar. Until the early fifties, these states had 80 per cent of area under sugarcane and accounted for 70 per cent of sugarcane production. This structural change is an outcome of State's policies and regulations in the tropical region like the fixing minimum prices for sugarcane was not mandatory and did not levy cess on purchase of sugarcane by the sugar mills (Sen Committee Report, 1965). Apart from these factors, the market in tropical region was large, facilitating entry of new sugar mills, emergence of cooperative movement and also the fact that tropical region is best suited for sugarcane cultivation, aided the growth of the sector.

Sugarcane pricing policy is also contributing to a shift from other crops to sugarcane. There are institutional factors including subsidy which drive area expansion of a particular crop as farmers read the market signal as well as incentives to shift. A lot of sugarcane cultivation is made possible due to the better support price and other support mechanism to the sugarcane farmers where the soil and climatic conditions does not support sugarcane cultivation. For example, out of total sugar mills in Maharashtra state, 40 per cent mills are in drought-prone districts that are more suited to growing oilseeds and pulses. The shift from other crops to sugarcane is mostly because sugarcane farmers enjoy much more subsidized inputs like fertilizers, electricity and water, especially in Maharashtra. The average fertilizer consumption for all crops is 136 kg per hector, whereas it is 208.4 kg per hectare for sugarcane (Fertilizer Statistics, 2010-11). The 13th Finance Commission noticed environmental degradation due to price policies, subsidies or incentives provided by the State in terms of free electricity and fertilizers which led to low productivity in India (GOI, 2009).

The State's licensing policy also favours establishment new sugar mills or to expand existing capacity of mills only in cooperative sector. Apart from licensing bias, the cooperative sugar mills gets large support from the State Governments, than the private mills which dominate Uttar Pradesh. These state policies led to a rapid expansion of sugar mills in Maharashtra, encouraged sugarcane production along with water exploitation in the state. The results of state intervention through policies in the sugar sector have seriously distorted regional production and cropping patterns, and misallocation of resources (World Bank, 1997; World Bank and GOI, 1998).

For solve water scarcity, CACP recommended bringing Maharashtra's sugarcane cultivation under drip irrigation. It is very difficult to differentiate the irrigation expenditure incurred by the government only for sugarcane. However, sugarcane is a large water consuming crop which means sugarcane consumes a large proportion of state subsidies for providing water. As per the Economic Survey of Maharashtra (2013-14), the expenditure incurred for sprinkler and drip irrigation was around ₹ 197 crore in 2008-09 and ₹ 574 crore in 2012-13. However, there is no so much impact of area under the drip irrigation on water situation and not much sugarcane under drip in the Maharashtra (Thakkar, 2013).

Key Constraints of Indian Sugarcane Sector

Dual Sugarcane Price Policy and Its Methodological Issues

The fixation of sugarcane price mechanism varied from country to country and state to state. In all the major sugarcane and sugar producing countries in the world like Australia, Brazil, Fiji, Mexico, South Africa and Thailand, there is a direct link between sugarcane and its by-products prices. Thailand and Fiji's sugarcane growers received more than 70 per cent share in the total sugar mills' revenue from sugar and its by-products as sugarcane price, whereas, farmers received around 65-61 per cent in Brazil and 62-63 per cent in South Africa (CACP Report, 2012). Therefore, the Rangarajan Committee identified a need to change existing price fixing mechanism in India.

The Sugar and Gur Control Order (1950) was enacted by the Central Government due to the variations in sugarcane prices. In India, the growers get sugarcane prices based on tonnage of the sugarcane which is given to the sugar mill rather than recovery of sugarcane. This price fixation mechanism gives more importance to quantity rather than quality of sugarcane. It is not viable for the sugar mills because the poor quality of sugarcane can lead to low output. Though the quantity-oriented pricing arrangement makes profit for short term, it is not sustainable. Unfortunately, even after the introduction of 1950's Sugar and Gur Control Order, the variations till exist in sugarcane prices. Inter-regional and inter-mill variation in sugarcane prices exist due non-linking of recovery properly with sugarcane weight. Baru (1990) identified some problems of linking sugarcane price with quality. First, the sugarcane growers are not adequately rewarded or penalized for the quality of sugarcane supplied to the mills, because the estimation procedures of sugarcane quality is highly aggregative and do not distinguish among the different growers of sugarcane. Second, the sucrose content is totally dependent on mill's extraction efficiency. If the sugar mill's extraction capacity is inefficient, then even if the sugarcane quality is good the recovery level would be lower.

Table 2: Extra Amount Paid by Sugar Mills to Sugarcane Growers

State	Year	Production of Sugarcane (million tonne)	Difference between FRP and SAP (₹ / Qtl)	Extra Amount Paid by Sugar Mills to Sugarcane Growers (₹ thousand crore)
Maharashtra	2010-11	81.89	55	4.50
	2011-12	86.73	35	3.03
	2012-13	69.64	20	1.39
	2013-14	76.90	37	2.84
Karnataka	2010-11	39.65	29	1.14
	2011-12	38.80	30	1.16
	2012-13	35.73	30	1.07
	2013-14	37.90	30	1.13
Uttar Pradesh	2010-11	120.54	60	7.23
	2011-12	128.81	70	9.01
	2012-13	132.42	70	9.26
	2013-14	134.68	60	8.08

Note: SAP- State Advisory Price; FRP- Fair and Remunerative Price.

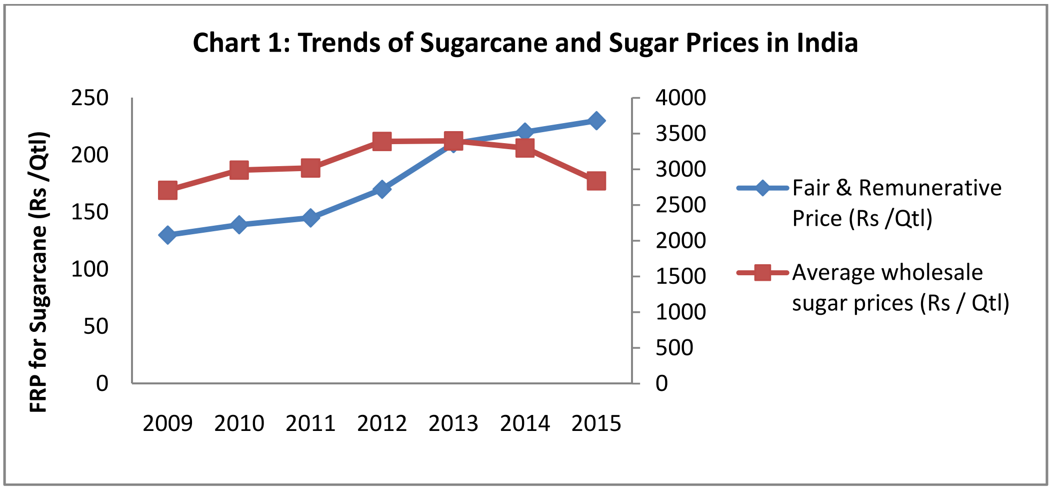
Source: Calculated based on Directorate of Economics and Statistics, GOI; Indian Sugar Mills Association and, Agriwatch database

The Essential Commodities Act (1955) is the main step towards sugar sector regulatory framework. According to the provisions of the Act, India follows the Central Government-fixed price (Fair and Remunerative Prices) of sugarcane based on recommendations of the CACP and after consultations with the State Governments and other stakeholders. State Advisory Price (SAP) came into existence in early 1970s. After announcement of FRP, every State Government has the autonomy to fix the State Advisory Price, which is always higher than Fair and Remunerative Price (FRP). The higher SAP by some State Governments compared to the Central Government fixed FRP has led to increasing sugarcane arrears (CACP, 2014). The huge sugarcane arrears would become unsustainable and ultimately destroy sugarcane cultivation and sugar mills (CACP, 2013). An attempt is made in Table 2 to compare state-wise difference between Fair and Remunerative Price and State Advisory Prices of Sugarcane for Karnataka, Maharashtra and Uttar Pradesh states. It is observed that the difference between SAP and FRP has declined over the years due to the replacement of SMP into FRP especially after 2009. The extra amount (calculated subsidy) paid by sugar mills to sugarcane growers in Uttar Pradesh is almost higher than Maharashtra and Karnataka due to high State Advised Prices (SAP) announced by the State Government. There are also other determining factors. The absorption capacity of the mills in the respective states and state's own production would indicate the shortfall and excess supply of sugarcane. It is also observed that with the decline in sugarcane production, the price difference is reduced.

There are also some methodological issues involved in price fixation in sugar sector system. First, the price for sugar takes ₹ 3100-3200 per quintal while fixing prices for sugarcane as base price. The problem with this mechanism is that actual or current sugar price is not directly linked to the fluctuations in sugar prices while fixing prices for sugarcane. There is no guarantee that the sugar price would be same in future or throughout the year. Apart from sugar price fluctuations, the sugarcane price is fixed by state based on average cost of cultivation, recovery and variety with higher sugar content. The cost of production is one of the major determinants of the price of sugarcane. However, there is no current cost of cultivation data available. Basically, the cost of cultivation survey data received by the Commission for Agricultural Costs and Prices (CACP) comes with a time lag of two-three years. This data used to project the cost of sugarcane cultivation in major sugarcane growing states of Maharashtra, Andhra Pradesh, Maharashtra, Karnataka, Haryana, Tamil Nadu and Uttar Pradesh which may not provide the correct picture of sugarcane cultivation costs. Beside these methodological issues, the SAP is generally fixed on the basis of sugarcane prices paid by the nearby mills, especially in Maharashtra. This mechanism of SAP fixation forces mills to pay a certain price to the sugarcane growers, whether the mills can afford it or not. For instance, Karnataka Government ordered all cooperative sugar mills to pay farmers ₹ 120 for a quintal of sugarcane in 2007. The Central government's Statutory Minimum Price (SMP) was fixed at ₹ 81.18 per quintal. The difference between the two prices was around ₹ 38-39 for a quintal. Most sugar mills paid only between ₹ 60 to 80 for a quintal, except two or three mills. Thus, this dual pricing mechanism of price fixation is unviable or unsustainable in India and it leads to uncertainty sugarcane prices.

The major incentive for state to intervene in sugar prices is to keep it at a reasonably affordable level for domestic household consumption. The state tries to do justice to the sugarcane growers, sugar mills and consumers simultaneously while fixing the prices for sugarcane and sugar. But the problem is most of the sugar is consumed (around 70 per cent) by the sugar-based industries like beverages, chemicals etc., whereas, only 30 per cent of sugar is consumed by household consumers. There is no differentiation in sugar prices for use of household purpose and commercial purpose. Sugar-consuming industries get more benefits out of low sugar prices than household sugar consumers. The state has not addressed this issue by putting two different prices for the household and commercial uses.

The values of main product and by-products are taken into consideration while fixing price of sugarcane in other countries, whereas, CACP does not consider the prices of other byproducts like molasses, ethanol, electricity etc., which influence sugarcane prices in India (Jugale, 2000). Therefore, the Rangarajan Committee (2012) has given a formula (70:30) to address the issue of sugarcane price fixation, based on revenue sharing. Revenue sharing is an important recommendation for sugarcane farmers which will help them get a better share of total revenue compared to earlier share, which was only 55-60 percent of the total revenue earned from sugar and its by-products. Unfortunately, almost majority of State Governments in India have not adopted it, except Karnataka. It is interesting to note that, despite adoption of Revenue Sharing formula by Karnataka state, the sugarcane growers are facing a crisis now in the sugarcane sector.



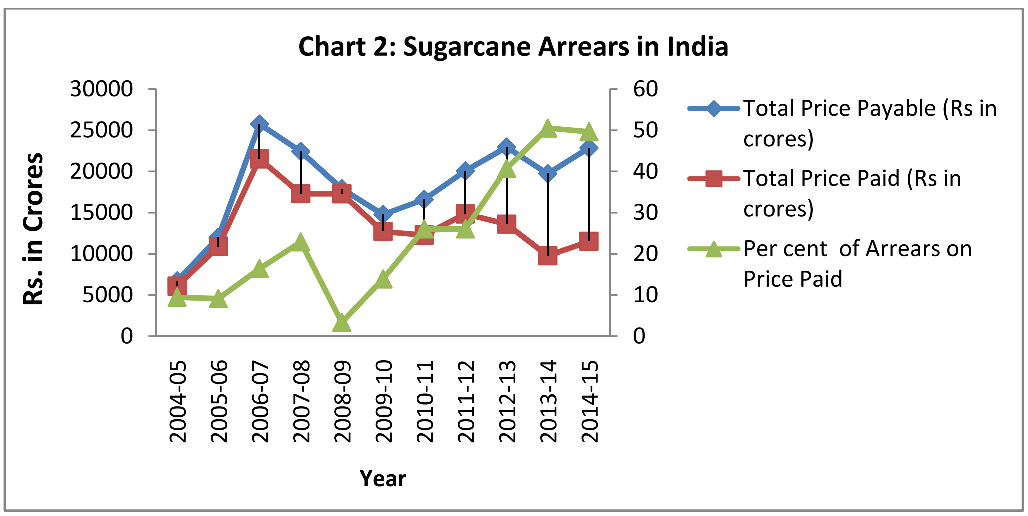
Source: Directorate of Economics and Statistics & Department of Consumer Affairs (Price Monitoring Cell)

Consistent rise in FRP of sugarcane and declining sugar prices have resulted in low margins from sugar production and delay in sugarcane payment (see chart 1). There is a mismatch between sugar prices and sugarcane prices in India, whereas in all the major sugar producing countries like Brazil, Thailand and Australia, there is direct linkages between sugarcane and sugar prices. Paying unscientific determined prices for sugarcane is not feasible for the sugar mills, which also leads to arrears in payment. It is also causing fluctuations in production and prices of sugar and sugarcane. The way out as recommended by the CACP in 2015-16 report, is that the Total Revenue Pot (TRP) should be generated from the sugarcane-sugar value chain and profits should be distributed between the farmers and sugar millers in the ratio of their relative production costs.

Sugarcane Arrears

Among the major sugarcane growing states from tropical and sub-tropical regions, Uttar Pradesh had about ₹ 2.29 thousand crore of total amount of cane arrears till December 2013, followed by Karnataka (₹ 1.53 thousand crore), Maharashtra (₹ 0.47 thousand crore), Andhra Pradesh (₹ 0.24 thousand crore), Tamil Nadu (₹ 0.20 thousand crore), Punjab (₹ 0.11 thousand crore) and Haryana (₹ 0.10 thousand crore). The sugarcane arrears suddenly increased to around ₹ 1.48 and ₹ 0.42 thousand crore in Karnataka and Maharashtra in 2013-14 respectively. Karnataka and Uttar Pradesh also had the highest position in total sugarcane arrears pending till December 2013. In both these states, the sector is dominated by private sugar mills which may explain the high unpaid arrears in these states. For instance, the total sugarcane arrears to be paid by the private sector mills was ₹ 27301 lakh (₹ 525.01 lakh per mill) followed by co-operative sugar mills at ₹ 6091 lakh (₹ 435.07 lakh per mill) and public sector mills at ₹ 539 lakh per mill during the 2012-13 sugar season in Karnataka state. A major reason for increased sugarcane arrears in Uttar Pradesh is the higher percentage share of actual sugarcane price in value of sugar paid to the sugarcane growers. During 20007-08 to 2012-13, the average of share of actual sugarcane price in value of sugar was around 60 per cent in Maharashtra, whereas, it was around 83 per cent in Uttar Pradesh.

The gap between total price payable and total price paid by the sugar mills to the sugarcane grower has been increasing over the years (see chart 2). It is not a healthy progress from the point of view of sugar mills as well as sugarcane growers. The increasing amount of unpaid sugarcane arrears is not a one day or one-year phenomenon. This problem started especially after the Central Government replaced the Statutory Minimum Price (SMP) with Fair and Remunerative Prices (FRP) for sugarcane in 2009-10. The pricing of sugarcane is fixed under the Sugarcane (Control) Order, 1966, issued under the Essential Commodities Act (1955). Before 2009-10 sugar season, the Central Government was fixing the Statutory Minimum Price (SMP) of sugarcane and farmers used to get their share on the criteria of 50:50.The concept of SMP was replaced by the Fair and Remunerative Price (FRP) of sugarcane, because the sharing of profits remained practically unimplemented. The main cause of this replacement was the reasonable margins for growers of sugarcane should get on account of risk and this was made effective from the 2009-10 sugar season. The following main criteria were considered while fixing the FRP (1) the sugarcane production cost (2) the margin to the sugarcane farmers (3) the availability of sugar to the consumers (4) the price of sugar (5) recovery (6) the prices of by-products and (7) reasonable margins for growers of sugarcane on account of risk and profits (inserted in October, 2009). The percentage of arrears on price payable to the sugarcane growers was around 3 per cent in 2008-09, which has gone up to around 50 per cent in 2014-15 (see chart 2).



Source: Directorate of Sugar, Department of Food and Public Distribution, GOI.

The sugar mills claimed that they could not pay the arrears due to declining sugar prices at national as well as international markets. However, one could not find logic in their claim as they did not pay the arrears even when the sugar prices were high at domestic as well as international markets. Extensive part of India's sugar imports (around 99.6 per cent) came from Brazil in 2014-15. India's import of sugar from USA, China, Germany and Italy was negligible for the same year. Out of total sugar availability, about 73 per cent sugar was used for internal consumption and less than 1 per cent sugar was used for export purpose with a closing stock of sugar about 27 per cent at the end of season in 2004-05. The internal consumption of sugar slightly declined to about 71 per cent and the share in total sugar export was 1 per cent in 2012-13. In India, the main requirement of sugarcane growing is the domestic sugar consumption. It is a fact that the world sugar prices have declined over the years. However, India's sugar sector depends more on domestic sugar prices. There are other determinants influencing sugar prices such as supply and demand, increasing population and income level, changes in government policies, availability of alternative sweeteners, increase in crude oil prices, diversions of sugarcane for the ethanol production and adverse climatic conditions. There is no doubt that the falling world sugar prices affects the domestic sugar prices in India, but not as much as claimed by the sugar mills. The price level of sugar was stable at normal level till 2007-08, after that again prices of sugar have increased till 2012-13. If we make a comparison between sugar prices before and after 2012-13, it can be found that before 2012-13, sugar prices were higher at national as well as international levels, compared to post 2012-13. During the same period, sugarcane price was less compared to the latest prices of sugarcane and, mills also could not pay sugarcane arrears to the sugarcane growers.

Problems with the State's Regulations and Controls

There are three major factors that prompted the State to keep some regulations and controls in sugarcane sector in India. First, to support the small and marginal sugarcane farmers, second, to protect sugar mills and consumer by putting regulations and controls on sugar prices and, finally the highly perishable nature of sugarcane which requires crushing within 24 hours after harvesting to retain sucrose content. Both the Central and State Governments have a number of ways to control sugarcane sector in India.

Sugarcane Area Reservation and Minimum Distance Criteria

The state has implemented sugarcane area reservation regulation for assured supply of sugarcane to the mills, encourage investment in agriculture, assure buyers for sugarcane growers, especially in surplus year, and avoid unhealthy competition among sugar mills. The Government gives permission to the new sugar factory on the basis of distance between two sugar mills' broilers. The states of India have been not done any assessment on the processing capacity of the mills and area under sugarcane. This mismatch leads to a crisis. The government should give permission to new sugar mills on the basis of availability of sugarcane and groundwater. According to Sugarcane (Control) order, (1966), the states have the power to allocate sugarcane reserve areas for individual mills. Under this regulation, it's mandatory for every sugar mill to purchase sugarcane from the farmers within the reservation area, and, conversely, the shareholder sugarcane growers also have a compulsion of sugar sale with a particular sugar mill. A minimum distance criterion came into existence to ensure adequate sugarcane supply to the mills. The minimum distance criteria is not uniform for all states. Currently only Maharashtra, Haryana and Punjab have 25 km prescribed distance criteria, whereas, other states have 15 km distance criteria. It is interesting to note that distance criterion is more where the sugarcane production is surplus like Maharashtra state. It creates the problem of delay in harvesting, which eventually affects the recovery. The less recovery is not economically viable for the sugar mills to give payment of sugarcane to the growers, because of the high sugar production cost. Due to sugarcane area reservation system, the sugar mills also lose out on augmented sugarcane supplies, especially when there is a shortage of sugarcane production in the mills' command areas. In addition to this, the sugar mills have to purchase sugarcane as it is, whether it is in good quality or not. This has resulted in inefficiencies, preventing sugar mills from enjoying economies of scale. It can be concluded that the existence of the cane reservation area and minimum distance criteria do not ensure better prices for sugarcane growers and force to existing mills to delay payments.

Payment Delivery System

As per the Sugarcane (Control) Order (1966), it is mandatory for all sugar mills to release payment of sugarcane in one installment, within 14 days of harvesting. However, the payment delivery system is found to be discriminatory and varies from state to state due to the time taken to complete the production process, reach market and get the return for a mill. Haryana, Punjab, Uttar Pradesh, Bihar and Madhya Pradesh have fixed uniform State Advisory Prices (SAP) for sugarcane in one installment.

Regulations Relating to Trade

The State uses the import and export controls as well as temporary bans to achieve stability in domestic sugar prices for consumers. Earlier, the Central Government regulated the release of non-levy sugar into the markets. Every mill had certain quota of sugar to be release into the market when monthly sugar release system existed. The government partially accepted Tuteja Committee (2004) recommendation and control shifted from monthly to quarterly. The problem with this system was that India's sugar industry was not able to take any advantage of large demand in world market for sugar (Ahmad and Rehman, 2014). In addition to this, the export-import policy of Indian government does not allow mills to have a long-term relation internationally (Rangarajan Committee, 2012). Though India is the second largest producer of sugar and has 15.8 per cent share in global market, its share in export was only 3.5 per cent in TE 2013-14. On the other hand, Brazil and Thailand, which contributes only 21.4 per cent and 6.1 per cent of the global sugarcane production respectively, holds 47.5 percent and 13.4 per cent share in total exports of sugar (CACP, 2014).

Since August 2009, the state had followed 'consumer-oriented sugar policy' with import of sugar from other countries at zero import duty, while export of sugar was highly controlled under the quarterly release mechanism. Jyothi (2014) pointed out the sugar exports and imports vary from time to time due to fluctuations in policies of the government and highly politicized sugar sector. This is creating problems for the sugar mills in formulating marketing strategies which affects the performance of the sugar mills, which in turn affects large sugarcane cultivation growers of the country. Adverse impacts of these regulations are more on co-operative sugar mills and a large number of small and medium farmers linked to them are trapped in laws and regulations. One of the major justifications for State regulation was to protect small and marginal farmers. Unfortunately, the State regulations have failed to help them. As per the Rangarajan Committee (2012) recommendation, the export duty and sugar release mechanism were abolished and import duty fixed at 15 per cent in April 2013. The pressure of sugarcane dues increased due to abolishment of regulated release mechanism and has resulted in declining sugar prices in the short run (CARE, 2013).

Regulations relating to By-products

Certain restrictions have also been imposed on sugar mills regarding by-products of sugarcane such as ethanol blending, sale of bagasse and molasses. Molasses is a major by-product and is used in the production of alcohol, chemicals and spirit. It is a very good source of income to sugar mills and sugarcane growers. It will fetch good prices for sugarcane growers if these product prices are attached to sugarcane prices. Though there is a constant watch by State Excise Authority on allocation and distribution of molasses, there are no uniform regulations on molasses across the states. The export of molasses is banned in Tamil Nadu and Karnataka, whereas, inter-state export and import of molasses is free in Maharashtra. Because of this unhealthy regulation on by-products, the sugar industry bears the cost of other industries by providing raw materials at cheaper rates. For example, the liquor industry in Uttar Pradesh, receives a large supply of molasses at low prices by the state government, allowing liquor industry to enjoy huge profits at the cost of sugar mills. Moreover, the stock of molasses and bagasse has to finish before new season starts due to insufficient storage facility. Such restrictions reduce the revenue realization of sugar mills from by-products and economic efficiency (Rangarajan Committee Report, 2012).

Ethanol is an agro-based product, mainly produced from molasses. It helps in reducing pollution, conserve foreign exchange and increase value addition in the sugar industry. The demand of ethanol has increased after the Cabinet Committee on Economic Affairs (CCEA) made ethanol blending with petrol compulsory in November 2012 to reduce greenhouse gas emission and reduce dependency on fuel imports. However, there are some restrictions on it. In India, ethanol can only be produced from molasses and cannot be produced directly from sugarcane. However, the sugar mills are not free to manufacture either ethanol or sugar from sugarcane like Brazil. In addition to the restrictions on mills, the government has decided that oil marketing companies shall sell ethanol blended petrol under the Ethanol Blending Programme. India has a targeted 20 per cent ethanol blending by 2017 year end. The government has given production subsidy at ₹ 4.50 per quintal to sugar mills to achieve the ethanol blending target. However, the inadequate production of ethanol is a major obstacle to the blending programme. Despite the decision to increase ethanol blending from 5 per cent to 10 per cent, only 3.5 percent was achieved due to absence of clear directive, procurement price issue and delay in settlement of tenders (Directorate of Sugar, 2014-15). The government has dismantled entire bidding process and introduced ex-depot price (₹ 48.50 to ₹ 49.50 / liter) for ethanol to address the ethanol price issue. But the government has imposed a tax on ethanol production from 10th August 2016, withdrawing the earlier tax exemption. As a result of this, ethanol prices have gone down by ₹ 5-6 per litre, which will ultimately affect the profit of ethanol-producing mills.

Delicensing and Decontrol Policy

Despite the several regulations introduced by the government in sugar sector, the decontrol of sugar sector began in 1998 when licensing requirement for new mills was abolished. Due to delicensing policy, the installed capacity of sugar mills has increased.

There are also a few consequences of delicensing of sugarcane sector. First, the delicensing has led to huge competition among new sugar mills and existing sugar mills. Due to this competition, some sick sugar mills have to pay higher sugarcane prices fixed by the government even though they are not in a position to pay. The result of this unhealthy competition is the increase in the number of non-working sugar mills from 119 in Triennium Ending (TE) 2005 to 162 in TE 2009 (Reddy, 2011). Second, the private sugar mills are totally dependent on farmers' behavior of selling sugarcane to a particular mill as the private mills have no assured supply of sugarcane. Third, the private sugar mills generally are run for profit, therefore their contribution in social infrastructure development is not much as compared to contribution of cooperative sugar mills. A problem with private sugar mills is that they will only be ready to purchase sugarcane when it is profitable for them otherwise, they may refuse to purchase sugarcane. Third, an important consequence of delicensing is the problem of capital formation to run the sugar mills. Although the number of sugar mills rose after delicensing, there is not much improvement found in sugarcane productivity, especially in Maharashtra state. Finally, the share of private mills in total arrears is higher compared to the cooperative sugar mills. The total sugarcane arrears to be paid by the private mills is ₹ 15206 crore, followed by co-operative sugar mills (₹ 6196 crore and public sector mills (₹ 434 crore) for the 2014-15 sugar season (Director of Sugar, 2015).

Politics in Sugarcane Sector

Maharashtra state's political economy is driven by the sugarcane lobby. It is a well-known fact that politician control sugar mills in India. From this link between politicians and sugar mills, the politicians may get benefits from sugar mills and vice versa (Sukhtankar, 2012). Sugarcane sector is an ideal platform for politicians. They are keen to control sugar mills, because they can easily influence the voters in the command area of sugar mill due to the involvement of more people in production, processing and consumption. Therefore, the ministerial committee always wants to keep sugar prices low to keep their vote bank intact.

Both Central and State Governments have made some efforts like, levy obligation, exemption from taxes, interest-free loans, compulsory ethanol blending, abolition of monthly release system and action against defaulter mills to promote the sugar sector. As we have seen, ballooning sugarcane arrears is a cause for conflict between sugar mills and sugarcane cultivators. As per the Sugarcane Control Act (2013), the State Government can take action against defaulter mills. Unfortunately, the Sugarcane Control Act provisions have not been utilized. It is a well-known fact that the State Governments have no enthusiasm to take action against defaulter mills due to the fact that most of the sugar mills are owned by the politicians.

As per the economic principle, the prices of commodities / products are fixed on the demand and supply conditions in the market. However, this statement is not applicable for sugarcane prices. In India, around 73 per cent of sugarcane is used for producing sugar. Therefore, the sugar prices have greater influence on sugarcane prices. But, the sugar prices are generally determined by supply and demand conditions, whereas, the sugarcane prices are determined by the State. The rationale for State Government intervention in setting prices for sugarcane is to protect the interest of sugarcane growers. The State Advisory Price (SAP) often reflects the power of the sugarcane growers lobby in various states. The Central Government tries to balance the interest of all stakeholders, whereas, the State Government is in favour of specific pressure groups. Due to the introduction of State Advised Price (SAP) by the State, the price of sugarcane has drastically increased and it initiated serious distortions in the sugarcane production (Baru, 1990). Moreover, the sugar mills cannot pay additional price for sugarcane directly, if they realized and ratoon crop bill also cannot pay without the permission of ministerial committee.

The almost every district in Maharashtra has water committees to distribute and recommend water requirement. But, the problem is that most of the politicians are a part of that committee and they own or control the sugar mills. Because of this, most of the water diverts to the sugarcane cultivation and sugar mills (Lalvani, 2008). This unequal water distribution creates regional inequality in terms of exploiting the large proportion of water by the sugarcane growing regions. To solve this problem, the government is thinking about a ban on sugarcane cultivation in areas facing water shortage. Such a ban would go a long way in tackling the powerful sugar lobby which is largely comprises of politicians from different political parties. For clear reasons, the previous governments did not even think about regulating the sugarcane economy. On the other hand, they enthusiastically promoted the sector. Around a third of the members of the state cabinets at one time had direct or indirect interest in sugar factories.

Feasibility of State’s Short Term Patchworks

There is no doubt that State’s recent efforts have provided some support to the sugar sector in the short term. However, the long-term impacts of these are doubtful since the State has not addressed the most important issues i.e., the prices of sugar and sugarcane. For long term sustainability of sugarcane sector, the Rangarajan Committee (2012) suggested that sugarcane and sugar prices should be inter-linked, but unfortunately this suggestion has not been implemented. Since the linking of sugarcane prices with the actual sugar prices and by-products has worked in several countries like Brazil, Thailand and Australia, a question arises as to why not in India. Though Thorat Committee (2009) recommended that the Government should withdraw from fixing the prices of sugarcane, it has been not implemented yet.

The Central Government on January 2014 has introduced a “Scheme for Extending Financial Assistance to Sugar Undertakings (SEFASU). In June 2015, the Central Government announced ₹ 6000-crore interest-free loan for the sugar mills, but this still does not address the basic problem of surplus of sugar production, resulting from increased sugarcane grown area, trade policies and ample last year’s carry forward stock of sugar and suitable mechanism related to the price fixation. Moreover, the State subsidy or financial assistance given directly to the sugar mills, does not reach the sugarcane growers. For instance, the Central Government is supposed to reimburse a fixed sugar subsidy for public distribution at 18.50 per kg limited to the quantity based on existing allocations directly to the state government. The production subsidy was also extended at ₹ 4.50 per quintal to sugar mills to compensate cost of sugarcane and make possible timely payment of cane price dues of farmers for the current sugar season 2015-16. The Maharashtra government recently exempted sugar mills from purchase tax which means a direct subsidy for the sugar mills. This benefit will not give any support to the sugarcane farmers.

State-wise variations exist in sanction of interest-free loans. The Uttar Pradesh state tops in terms of sugarcane arrears, but the percentage of loan sanctioned to total arrears is only 19.30 per cent during 2014-15. The percentage of loan sanctioned to total arrears is highest at around 72 per cent in Tamil Nadu. Among the states mentioned in Table 3, the percentage of loan sanctioned to total arrears is only 16.07 per cent and 65.94 per cent in Karnataka and Maharashtra respectively. It can be concluded that state wise allocation of assistance is not based on equity principle. This inequitable distribution of fund from State may create regional inequality. Giving assistance in terms of interest-free loans may not be a proper solution. The state has to solve price fixation and other related problems as a priority.

Table 3: Amount of Loan to Sugar Mills under SEFASU, 2014

State	Arrears 2014-15 (as on 31.03.15)* (₹ in crore)	Number of Sugar Mills in Operation**	Loan Sanctioned		Loan Disbursed		Percentage of Loan Sanctioned to total arrears
			No. of Mills	Amount (₹ in crore)	No. of Mills	Amount (₹ in crore)	
Punjab	682.28	18	18	151.30	7	69.22	22.17
Haryana	516.11	14	11	104.10	11	104.10	20.17
Uttar Pradesh	9715.69	124	74	1875.27	72	1764.86	19.30
Maharashtra	2864.50	170	107	1889.08	104	1724.99	65.94
Karnataka	2402.39	58	37	386.21	31	347.67	16.07
Andhra Pradesh	265.69	37	19	138.79	17	130.04	52.23
Tamil Nadu	842.56	43	37	606.38	37	550.50	71.96

Note: SEFASU- Scheme for Extending Financial Assistance to Sugar Undertakings

Source: * Ministry of Consumer Affairs, Food and Public Distribution, Lok Sabha Secretariat, New Delhi, 2015 (Starred Questioned No. 385) Annexure. Ministry of Consumer Affairs, Food and Public Distribution, Lok Sabha Secretariat, New Delhi, (unstarred Questioned No. 710) Annexure.

** Directorate of Economics and Statistics, Government of India

Madhav Chitale (water management expert) and Eknath Khadase (Minister of revenue and Agriculture) have recently made a statement that sugarcane cultivation should be banned in drought prone areas to solve problem of excess sugarcane and water shortage. Farmers would have grown other crops rather than sugarcane, if they get better prices. Despite the fact that Maharashtra was facing water scarcity, the State Government provided water to other industries which requires more water than sugar industry which is not a major contributor to the rural economy. Since August 2009, the state has followed zero import duty on sugar, while export of sugar is highly controlled. As a result of zero import duty, India's sugar import was highest in 2009-10. These kinds of state policies may lead to the import of large quantity sugar from other countries. The State pays higher prices for the imported sugar than the domestic sugar when domestic sugar production was less due to low prices. There is a provision of mandatory deduction from sugar mills by the state for a sugar stabilization fund to solve the problem of mismatch between sugar and sugarcane prices. However, this sugar stabilization fund tool is not found to be effective since sugarcane arrears and instability in sugar prices have increased. Similarly, there are no proper long-term solutions or mechanisms by the State to solve these problems related to sugarcane prices and water especially in Maharashtra.

Summary and Suggestions

Overall it appears that even though economic reform has happened in India, the sugar sector remains highly controlled by the State via various regulations today. There is no other agro-based sector which is heavily controlled by the state as much as sugar sector. The recent issue about announcement of the Fair and Remunerative Price and State Advisory Price is an example of the adverse effects of State intervention in sugarcane price fixation. Although many efforts have been made by the State to promote sugarcane cultivation, the productivity of sugarcane is stagnant in India. Due to the State's unhealthy control on by-products, the sugar industry is bearing the cost of other industries by providing raw materials at cheaper rates. The inequitable distribution of assistance or funds to the sugar mills by the State may also create regional inequality. The introduction of delicensing policy by the state led to some problems like unhealthy competitions, reduced contribution in social infrastructure development and increased number of sick sugar mills. There is no doubt that the recent state's efforts or measures may provide some support to the sugarcane sector in the short term, but it may not support in the long run. This is because the State has not addressed the most important issues which are causing the problem. To summarize, the State regulations and controls in sugarcane sector are unviable or unsustainable in India and leads to uncertainty in income of both sugarcane growers and sugar mills.

To address the problems associated with State intervention, this paper suggests the gap between Fair and Remunerative Price and State Advised Price need to be reduced. The State has to take an initiative to distinguish the prices of sugar for commercial and household uses. In order to reduce the State intervention, the Indian government should follow Brazil's example (minimum role of the state) which will benefit the sugarcane and sugar sector. Like banks, the state should make it compulsory for sugar mills to keep some proportion of fund from profits as reserves. If a sugar mill is unable to pay FRP, then this reserve fund can be used. Finally, this paper suggests that the there is a need to revise the role of State intervention. The State should be take into consideration needs and consequences before giving any kind of assistance and putting regulations on the sugarcane sector. Finally, the state has to look at the larger picture before imposing any tax on sugarcane by-products, which also help to ensure green development. A subsidy on ethanol could have been a welcome development.

References

Ahmad, M and F Rehman (2014). Changing Paradigms in Regulating and Deregulating the Sugar Pricing Mechanism in India. *RKG Journal of Management*, 5 (2): 77-86.

Baru, S (1990). *The Political Economy of Indian Sugar: State Intervention and Structural Change.* Delhi: Oxford University Press, 1-225.

Credit Analysis and Research Limited (CARE) (2013). *Sugar Industry Updates*. New Delhi: Care Rating, 1-8.

Commission for Agricultural Costs and Prices (2012). *Price Policy for Sugarcane: The 2013- 14, Sugar Season.* New Delhi: Department of Agriculture and Co-operation, Ministry of Agriculture (GOI), 1-107.

———— (2013). *Price Policy for Sugarcane: The 2014- 15, Sugar Season.* New Delhi: Department of Agriculture and Co-operation, Ministry of Agriculture (GOI), 1-48.

———— (2014). *Price Policy for Sugarcane: the 2015-16 Sugar Season.* MoA, GOI, 1-85.

Directorate of Economics and Statistics, Department of Agriculture, Co-operation and farmer welfare, Ministry of Agriculture and Farmer Welfare, Government of India. http://eands.dacnet.nic.in/APY_Normal_Estimates.htm accessed on 02.05.2016

Directorate of Sugar (2014-15). *Department of Food and Public Distribution, Ministry of Consumer Affairs Annual Report*. Government of India, 1- 35.

———— (2015). Department of Food and Public Distribution, Ministry of Consumer Affairs, GOI. Report No. 4. Fertilizer Association of India, Fertilizer Statistics, 2010-11, New Delhi.

Government of India (2009). The 13th Finance Commission Report. Ministry of Finance, Government of India, New Delhi: 1-476. http://www.prsindia.org/uploads/media/13financecommissionfullreport.pdf accessed on 12.08.2016

———— (2015). Ministry of Consumer Affairs, Food and Public Distribution, Lok Sabha Secretariat, New Delhi, (unstarred Questioned No. 710) Annexure.

———— (2015). Lok Sabha Starred Question No. 385. Ministry of Consumer Affairs, Food and Public Distribution, New Delhi http://164.100.47.132/Annexture_New/lsq16/4/as385.htm accessed on 10.08.2016

Government of Maharashtra (2014). *Economic Survey of Maharashtra, 2013-14*. Mumbai: Directorate of Economics and Statistics, 1-239

Jugale V (2000). *Sugarcane Pricing: Policy, Procedures and Operations.* New Delhi: Atlantic Publication, 1-203.

Jyothi K (2014). Impact of Policy of Government on Import and Export of Sugar from India. *IOSR Journal of Economics and Finance*, 3 (2): 40-42.

Lalvani M (2008). *Sugar Co-operative in Maharashtra: A Political Economy Perspective.* Ford Foundation Funded Project, 1-44.

Mahajan Committee Report (1998). *Report of the High Powered Committee on Sugar Industry,* Vol – I. New Delhi: Ministry of Food and Consumer Affairs, Government of India, 1-421.

Rangarajan Committee Report (2012). *Report of the Committee on the Regulation of Sugar Sector in India: the Way Forward.* Government of India, 1-42.

Reddy, A (2011). Sugar and Cane Pricing and Regulation in India. *International Sugar Journal,* 113 (1352): 548-56.

Sen Committee Report (1965). *Sugar Enquiry Commission.* New Delhi: Department of Food, Ministry of Food and Agriculture, 1-276.

Sukhtankar, S (2012). Sweetening the Deal? Political Connections and Sugar Mills in India. http://www.dartmouth.edu/~sandip/political_connections_sugar_mills.pdf accessed on 25.06.2016

Thakkar, H (2013). How Efficient is Maharashtra's Sugarcane Crop?. *South Asia Network on Dams, Rivers and People*, June 2013:1-3.

Thorat Committee Report (2009). *Report of the Group of Experts on Sugar*. New Delhi: Department of Food and Public Distribution, Government of India, 1-148.

Tuteja Committee Report (2004). *Report of the Committee on Revitalization of Sugar Industry.* New Delhi: Department of Food and Public Distribution, Government of India, 1-45.

World Bank (1997). India's Sugar Industry: Priorities and Reforms. Report No. 15678 –IN, South Asia Rural Development Unit., Washington D.C.

World Bank and Government of India (1998). *Inter-Sectoral Water Allocation, Planning and Management.* New Delhi: Allied Publishers Ltd, 1-165.

Appendix

Appendix 1: Share of Different States in Total Sugarcane Production in India (in per cent)

Year	Tropical Region States				Sub-tropical Region States			
	Andhra Pradesh	Tamil Nadu	Karnataka	Maharashtra	Punjab	Uttar Pradesh	Bihar	Haryana
1966-67	8.7	7.4	7.5	10.7	4.7	42.4	4.7	5.5
1967-68	10.4	9.3	7.7	11.0	4.8	39.7	4.2	4.9
1968-69	9.8	6.9	7.8	9.8	4.4	43.4	5.0	5.7
1969-70	8.2	7.6	5.7	10.7	4.6	44.9	4.9	5.9
1970-71	7.2	8.3	6.7	11.7	4.2	43.3	4.9	5.5
1971-72	9.3	8.5	7.7	10.1	3.5	43.5	3.9	4.5
1972-73	7.9	9.7	6.8	9.5	3.8	45.4	3.8	4.8
1973-74	7.7	13.0	6.1	9.2	4.1	43.2	3.7	4.2
1974-75	8.0	10.1	6.0	11.9	4.3	42.6	3.9	4.1
1975-76	7.3	8.5	6.9	13.4	4.4	41.5	3.5	4.9
1986-87	4.7	11.6	8.0	12.9	3.3	45.5	2.0	3.6
1987-88	4.8	10.6	9.0	12.8	3.0	47.5	2.3	2.2
1988-89	5.3	11.7	9.2	12.6	3.0	43.6	2.7	3.2
1989-90	4.9	10.4	9.4	15.1	2.9	43.2	3.0	3.0
1990-91	5.3	9.7	8.7	15.9	2.5	43.0	3.2	3.2
1991-92	5.9	9.8	9.5	14.2	2.7	43.7	2.8	3.5
1992-93	5.3	10.1	9.9	13.5	2.8	45.1	2.6	2.9
1993-94	5.9	11.3	11.6	12.1	2.1	45.3	1.9	2.8
1994-95	5.8	13.2	12.0	16.1	1.9	40.0	2.1	2.5
1995-96	5.4	11.7	8.9	16.6	3.1	42.6	2.0	2.9
1996-97	5.4	9.3	8.4	15.1	4.0	45.2	2.1	3.2
1997-98	5.0	10.8	10.1	13.7	2.6	46.2	1.8	2.7
1998-99	5.7	11.7	12.0	16.3	2.1	40.3	1.8	2.4
1999-2000	6.2	11.5	12.6	17.8	2.3	38.6	1.4	2.6
2000-01	6.0	11.2	14.5	16.8	2.6	35.8	1.3	2.8
2001-02	6.1	11.0	11.1	15.2	3.1	39.7	1.8	3.1
2002-03	5.4	8.4	11.3	14.8	3.2	42.1	1.6	3.7
2003-04	6.4	7.5	6.8	11.0	2.8	48.2	1.8	4.0
2004-05	6.6	9.9	6.0	8.6	2.2	50.1	1.7	3.4
2005-06	6.3	12.5	6.5	13.8	1.7	44.6	1.5	2.9
2006-07	6.1	11.6	8.1	22.1	1.7	37.7	1.7	2.7
2007-08	5.8	10.9	7.5	25.4	1.9	35.8	1.1	2.5
2008-09	5.4	11.5	8.2	21.3	1.6	38.3	1.7	1.8
2009-10	4.0	10.2	10.4	21.9	1.3	40.1	1.7	1.8
2010-11	4.4	10.0	11.6	23.9	1.2	35.2	3.7	1.8
2011-12	4.6	10.7	10.7	24.0	1.6	35.7	3.1	1.9

Source: Computed from Directorate of Economics and Statistics, Ministry of Agriculture and Farmer Welfare, GOI.

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Price: ₹ 30.00 ISBN 978-81-7791-241-8

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