Study on Economic Viability/Sustainability of the Sugar Industry in U.P.

Final Report

Submitted By

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Acronyms

BEP: Break Even point

BPL: Below Poverty Line

CACP: Commission on Agricultural Cost and Prices

CAGR: Compound Annual Growth Rate

ECA: Essential Commodities Act

FGD: Focus Group Discussion

FRP: fair and Remunerative Price

GST: Goods and Service Tax

ISMA: Indian Sugar Mills Association

MSP: Minimum Support Price

NCDEX: National Commodity and Derivative Exchange

RSF: Revenue Sharing Formula

SAP: State Advised Price

SDF: Sugar Development Fund

SEFASU: Scheme for Extending Financial Assistance to Sugar Units

SPSF: Sugar Price Stabilization Fund

SS: Sugar Season

TCD: Tonnes Crushed Per Day

U.P: Uttar Pradesh

UPSEB: U.P State Electricity Board

UPSMA: U.P Sugar Mills Association

Executive Summary

1. Sugar industry is one of the few industries that have contributed significantly in the agricultural growth in the state of Uttar Pradesh (U.P). Uttar Pradesh is the leading producer of sugarcane in the country contributing around 45% to the country total sugarcane production. However, U.P is fast losing its status as one of the key sugar producing states due to various cost disadvantages as compared to other sugar producing states.

2. Although sugarcane is a thriving cash crop in the farm portfolio of U.P on the one hand, and the significant economic contribution of the sugar mills for the State, on the other, the disturbing point is that sugar mills in the State are struggling economically over the time. This is reflected in the mounting cane arrears to be paid to the farmers by the sugar mills (estimated around Rs. 11,000 crores as on 29.6.2018). The non-payment of complete cane price to farmers by sugar mills, has become a crucial social, economic and political issue in the State.

3. The private sugar mills occupy the key position in the sugar industry in U.P as out of 119 sugar mills in U.P., 94 mills (79%) are under private sector, followed by 24 mills (20%) in cooperative, and only 1 under corporation. Similarly, out of total crushing capacity of 765065 TCD, private mills have 697440 TCD (91.16%). Given the socio-economic contribution of sugar industry in U.P, private sugar mills must be economically viable.

4. The trend in area and production of sugarcane in U.P during the period 2001 to 2017-18 indicate that both sugarcane area and production used to have a sharp cyclical behaviour causing uncertainty to farmers as well as the sugar millers till 2013-14. The production cycle had three years upswing and two- or three-years downswing. However, from 2014-15, the trend has become smoother, where both sugarcane area and production are at the increasing trend.

5. The cyclicality in sugarcane area and production was not due to high or low sugarcane prices (contrary to normal cob-web phenomenon in agricultural commodities), but primarily due to inability of mills to pay the farmers (creation of payment arrears) due to low sugar prices. Post 2013-14, this cyclicality has been removed not by any policy action but due to the increased profitability of cane cultivation (SAP and yield of cane have increased sharply). The trend indicates that fluctuation in sugar prices has no impact on area under sugarcane. So, even the accumulation of cane payment arrear by the sugar mills in a year does not demotivate the farmers to reduce the area under cane in the next year. In fact, the arrears become bonus to the farmers to receive at a later point of time, as they have a firm believe that sugar mills would make the full payment in future.

6. The net returns over cost C2 arrived from sugarcane cultivation in U.P for 2017-18 show that there is huge profit of about Rs. 66,000 per acre from sugarcane cultivation. The profit per quintal of cane turns out to be Rs. 173 at current SAP.

7. The huge sugar payment arrears (due to artificially high SAP and low price of sugar) have not demotivated the farmers to take cane in their limited and scarce

resource of land. Our field survey shows that on average the farmers are taking sugarcane in 75% of their land, and it is going to increase in future too. On the other hand, increased profitability of cane due to very high SAP has distorted the inter-crop profitability parity vis-à-vis its competing crops like wheat and paddy.

8. The average recovery of sugar in U.P has increased over time (from 9.54 % in 2014-15 to 10.61% in 2016-17), but it is still less than that in Maharashtra. The private sugar mills have extensively promoted the use of early variety (such as 0238) among the farmers. This varietal replacement on a wide-scale has improved recovery rate in U.P. One of the reasons for high recovery rate in Maharashtra is that sugar mills themselves arrange harvesting and transportation of cane. The mills prepare a harvesting schedule as per maturity of cane and requirement in the mill. On the other hand, in U.P the farmers arrange harvesting of cane on their own. The farmers hire labours to harvest the entire sugarcane field as it becomes economical for them. Moreover, they want to make land available for sowing wheat crop. Thus, many times the surplus harvested cane remains in the fields for an extended period, resulting in loss of sucrose content.

9. Within the State, the sugar recovery rate is highest (10.96 %) among the private sugar mills as compared to that in cooperative (9.80%) and corporation mills (10.0%). Thus, the private mills are more efficient as compared to their counterparts in cooperative and corporation sectors.

10. Sugar has been classified as an essential commodity and therefore, sugar industry has been regulated across the value chain in all the States of the country, albeit in different scale and magnitude. In U.P, the state govt. announces a State Advisory Price (SAP) for sugarcane, which is mandatory for the mills to pay. The SAP is higher than FRP, and neither linked with recovery rate nor the ex-mill sugar prices. The supply of cane is controlled through command area regulation coupled with minimum distance between sugar mills. There are state specific restrictions on the movement and sale of molasses. In U.P, 12% of molasses produced is reserved for country liquor for the sugar season 2017-18.

11. The sugar sector is regulated both at the central and state levels in different magnitudes. As a result, the sector faces conflicts which deny a level playing field for all the actors in the value chain of sugarcane on the one hand, and in between the sugar mills located at different states. Since cane is primarily produced in 5 major states, but sugar is consumed across the country with no inter-state restrictions on its supply, it is mandatory that the sector should be regulated in a homogenous and unified manner. There should be a common regulator for the sugar industry across the states.

12. The SAP in U.P is not only the highest amongst the leading sugarcane producing states in India, but also the highest among the leading sugarcane producing countries in the world. As a result, the sugar season 2017-18 became the worst for the sugar mills when a whopping amount of more than Rs. 12,000 crores became the cane arrears in the state. In terms of arrears as percentage of cane price payable, it turned around 42 and 35 percent for cooperative mills and private mills, respectively.

13. The cane price has been increasing over the years particularly after the sugar season 2015-16. However, the sugar price, which is driven by market forces of supply and demand of sugar, is highly fluctuating with a cyclical trend of 2 to 3 years. The data show that sugar prices declined continuously during 2012-13 to 2014-15, increased after that till 2016-17, but again reduced drastically in 2017-18. It corelates why the three seasons of 2012-13 to 2014-15 were particularly bad for the sugar mills in U.P and further why the situation has become worst in 2017-18?

14. With increasing SAP, the arrears fluctuate in the same trend of fluctuations in the sugar prices. Arrears are created as mills are unable to pay high cane prices, which is about 90 percent of ex-mill realization during 2017-18. This substantiates the need for an alignment between cane and sugar prices to ensure that arrears are minimum or eliminated completely. It would improve the financial viability of mills and reduce the need for govt. support at the time of crisis. In the absence of the parity between cane and sugar prices, the sustainability of the sector will continue to be at risk impacting both large number of farmers and mills.

15. The cost of production of sugar has exceeded the ex-mill prices of sugar, leading to non-viability for sugar mills to produce sugar. The sugar mills in U.P. are making a loss of Rs. 659.60 for every quintal of sugar production. Under this situation, how can the mills survive to meet other corporate expenditures and servicing of loans, forget the returns to shareholders?

16. At the current ex-factory price of sugar, the breakeven price of cane turns out to be Rs. 267 per quintal, whereas the current SAP is Rs. 315. Given the current sugar prices, SAP is Rs. 48 per quintal (18 %) higher than that at breakeven point for sugar mills. The current SAP in U.P. would be equal to FRP at 11.74 % recovery rate, whereas the current average recovery in U.P. stands at 10.61 %. On the other hand, at a recovery of 10.61 %, the FRP comes to be Rs. 285 per quintal. Thus, SAP is more than FRP by Rs. 30 per quintal. So, whether one compares SAP with sugar price or FRP of cane, SAP is substantially higher than what it should be. This is the root cause of un-viability of sugar mills in U.P.

17. The entire business roadmap including regulatory environment must fulfil the aspirations cutting across the stakeholders in a win-win situation. The objectives of stakeholders are dependent on some critical business drivers, which in some cases involve a trade-off between stakeholders' objectives. The conflicts arise when the business policy and environment are tilted extremely in favour of one or another stakeholder. This is where the sugar industry in U.P is struggling as the entire business drivers have been deliberately transformed more in favour of cane farmers at the cost of millers. This requires corrections so that the needs and aspirations of different stakeholders become shared vision for the industry rather than isolated and individual.

18. If sugar mills and farmers are to develop mutual business relationship, the sugar industry needs to be gradually free from strenuous regulatory regime as regulations restrict the business decision making ability of individual stakeholders. Simultaneously, there is a need to re-evaluate the inclusion of sugar and sugarcane in the Essential Commodity Act. As, sugar has been classified as an essential commodity and therefore, sugar industry has been regulated across the value chain.

19. U.P. follows the SAP model with a fixed price of cane mandated by the state government. The entire risk of sugar prices is borne by the mills. SAP is a non-market driven incentive for cane cultivation in the state. An artificially higher SAP for cane does not promote a level playing field between farmers and the mills in the state. It also puts mills in U.P at a comparative dis-advantageous position in front of other mills located in major sugar producing states. With a higher cane price and subsequently higher cost of sugar production, how can and how long the mills in U.P can stand in front of mills located in Maharashtra and Karnataka? A higher SAP for cane has distorted the inter-crop profit parity in U.P. Therefore, it is a discrimination among the farmers cultivating sugarcane v/s wheat or paddy. How can the state policy discriminate among the farmers when the state must ensure the social and economic upliftment of all the farmers, and not merely the cane farmers?

20. It is proposed that either the cane price should be mutually set between the farmers and the miller (usually happens in contract farming), or cane price is linked to price of sugar and other primary by-products, and recovery rate (formula-based pricing). Under the current GST regime, no sugar mill can manipulate the sugar and other by-product prices, and therefore, transparency and reliability in revenue generated at mill level would be automatically ensured.

21. In a scenario where the state government does not agree cane pricing mechanism based either on mutual consent between farmers and millers or RSF, and still decides to announce SAP, then the difference between SAP and FRP should be paid directly to farmers by the state. Let state govt. should not force the mills to pay for a state announced subsidy to cane farmers by paying a very high price of cane.

22. Instead of providing post arrear subsidy or rehabilitation package to mills, with the help of central government, state government should ensure that large amount of cane price arrear to farmers should not occur. Thus, the state should play pro-active role rather than working in a reactive mode as far as cane pricing is concerned. In the era of de-regulation and ease of doing business, the sugar industry should also be free from state sponsored clutches. It would increase the morale of the millers to invest in the mill to increase the efficiency and to diversify the operations into other high valued products from primary by-products.

23. If the current state of affair continues for some time in the state of U.P, the entire sugar industry may collapse due to lack of investment, huge build of cane arrears and insufficient bank finance. The business interests of the millers are continuously being ignored by the policy makers in U.P. The private millers have made huge amount of investments in industry and its other pollution related measures. The millers are under compulsion to operate even at a loss due to political sensitivity attached with the sugarcane crop.

24. The state should start consultation with millers or their association to find out the best possible cane price method suitable to all.

25. Let the state govt. should concentrate its resources to augment the cane productivity at farm level, and sugar recovery at mill level, rather than developing stringent regulatory regime for the sugar industry.

26. Sugarcane is water intensive crop, and water is the scarcest natural resource. So, cane productivity per unit of water has to increase to make sugarcane as sustainable crop in U.P. State Govt. should partner the mills to promote drip irrigation in sugarcane to save the water and increase water use efficiency in cane.

27. Let U.P government should take the lead role in developing a national consensus on removing sugar from ECA.

28. De-regulate the sale of molasses by withdrawing the reservation policy to country liquor. It would promote the production of ethanol, which can be used in fuel, thus lowering the burden of fuel imports in the country.

Section 1: Introduction

1.1 Sugar industry is one of the few industries that have contributed significantly in the agricultural growth in the state of Uttar Pradesh (U.P). During the period between 2000-01 and 2013-14, value of agriculture and allied activities in U.P grew at an average annual rate of 4.32 percent at 2015-16 constant prices, where the largest contribution (39.4 percent) came from the livestock sector, followed by the sugar sector (13.8 percent)[1]. Sugar industry provides livelihood to about 4 million rural households in U.P, besides generating direct and indirect employment to approximately 56 lacs people.

1.2 From the country perspective, Uttar Pradesh is the leading producer of sugarcane in the country contributing around 45% to the country total sugarcane production (Table 1). The total area under sugarcane in the State stands around 22 lakh hectares, U.P is also the second largest producer of sugar in the country (31.33 %), after Maharashtra (37.39%) (Figure 1). However, U.P is fast losing its status as one of the key sugar producing state due to various cost disadvantages as compared to other sugar producing states.

Table 1: State-wise production of sugarcane (2016-2017) and sugar (2017-2018, up to 28.02.2018)

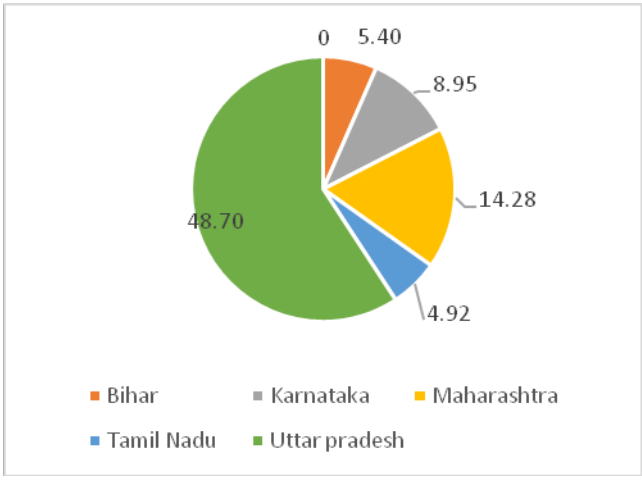
State	Sugarcane Production ('000 Tonne)	Sugar Production (Lakh MT)
Bihar	13036 (4.26)	4.38 (2.08)
Karnataka	27378 (8.95)	30.66 (14.55)
Maharashtra	52262.45 (17.08)	78.76 (37.39)
Tamil Nadu	18987.56 (6.20)	3.60 (1.71)
Uttar Pradesh	140169.2 (45.80)	66.01 (31.33)
India	306069	210.67

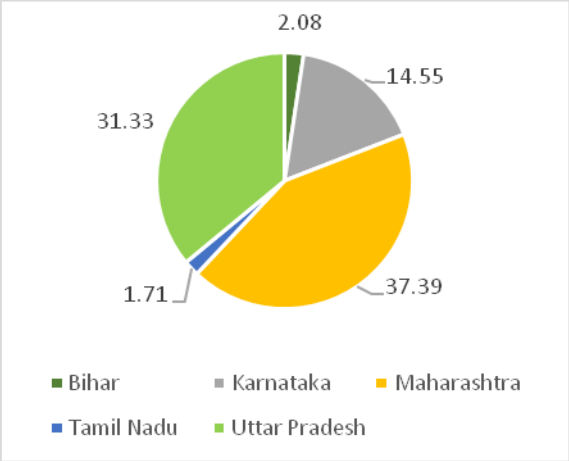
Note: Figures in parentheses indicate percent of India.

Sources: Ministry of Agriculture and Farmers Welfare, Govt. of India
Lok Sabha Unstarred Question No. 5287, dated on 27.03.2018.

[1] Source: Verma, et.al., (2017), "Doubling Agricultural Growth in Uttar Pradesh: Sources and Drivers of Agricultural Growth and Policy Lessons", Working Paper 335, Indian Council for Research on International Economic Relations, New Delhi.

Figure 1: Share of different states in sugarcane and sugar production

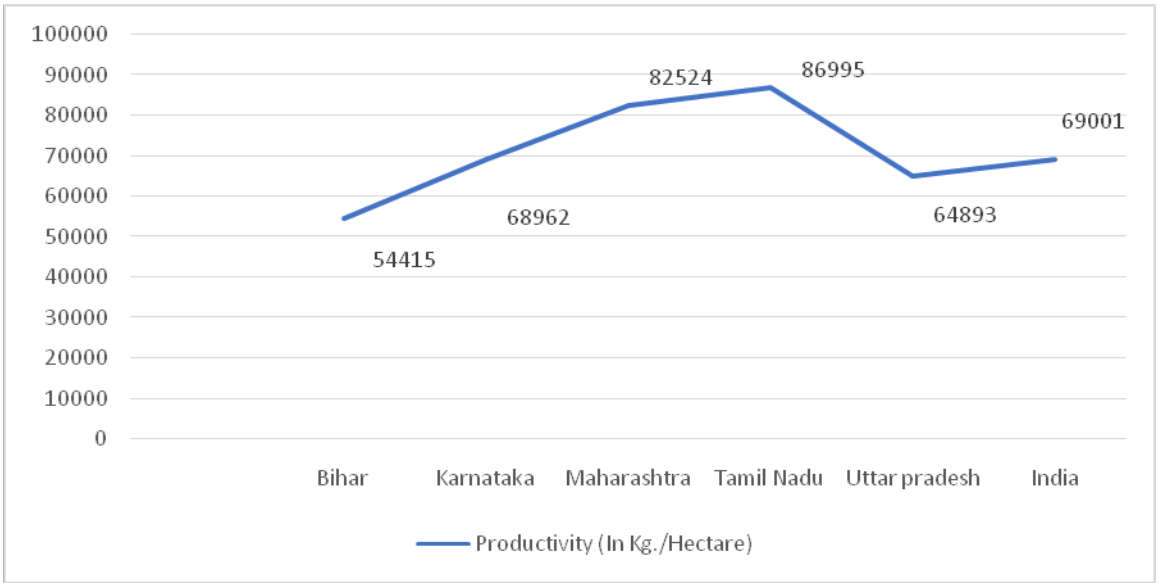




Source: data given in Table 1

1.3 The yield of sugarcane in U.P is around 64 tons/ ha, which is considerably less as compared to that in the states of Maharashtra (82 ton/ha), Tamil Nadu (87 ton/ ha), and Karnataka (69 ton/ ha) (Figure 2).

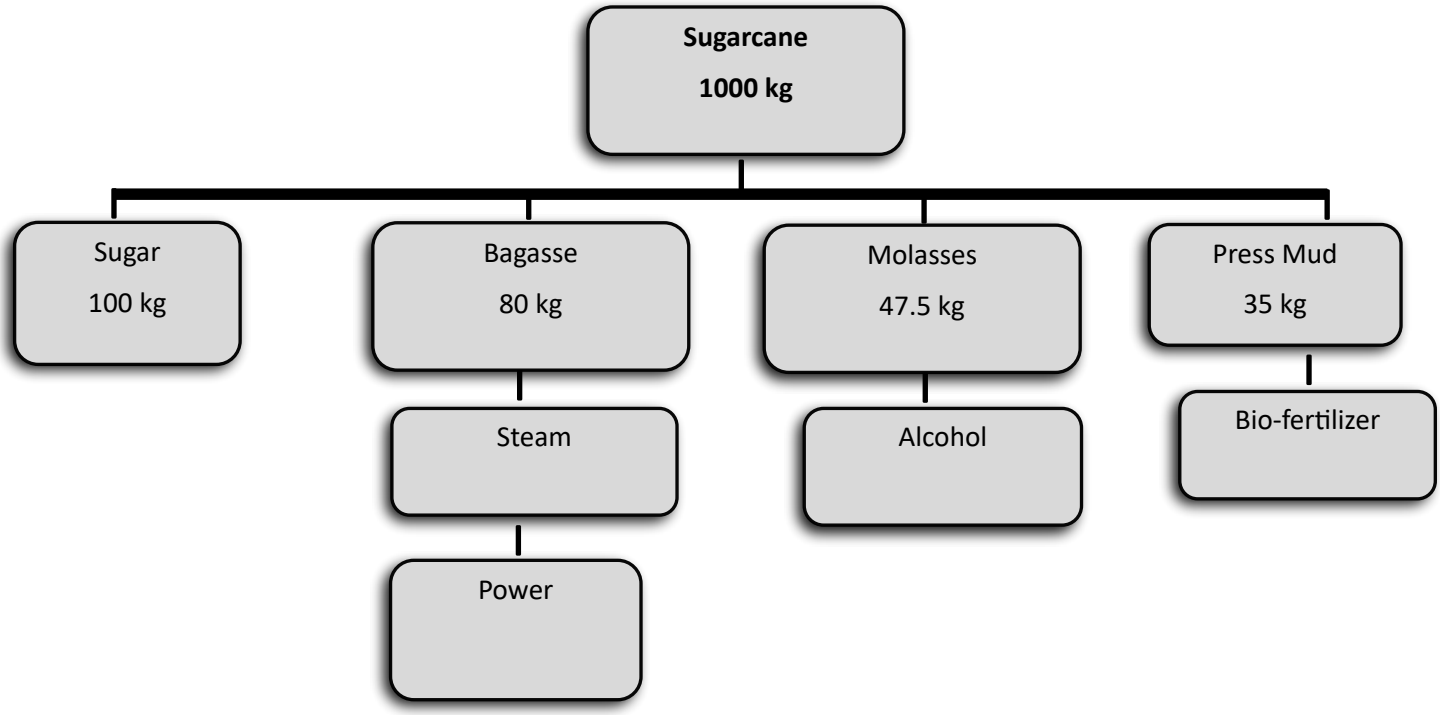
Figure 2: Yield of sugarcane in major sugar producing states



Source: ISMA, New Delhi

1.4 The sugar mills in U.P produce not only quality sugar but also valuable primary by-products, namely, Molasses, Bagasse and Press Mud. Molasses is the raw material used in the production of industrial and potable alcohol, while bagasse is used to generate steam and power. Press mud is utilized as bio-fertilizer in the fields. Figure 3 shows the possible value addition for every ton of cane crushed.

Figure 3: Value addition for every ton of cane crushed



Source: Sugar Industry

1.5 The economic importance of U.P sugar mills can be gauged by the quantum of the production of sugar and its primary by-products during 2017-18 (Table 2)

Table 2: Production of sugar and its primary by-products by sugar mills in U.P during 2017-18

Sl.	Particulars	Quantity
1.	Cane crushed (lac quintal)	11119.0
2.	Sugar production (lac quintal)	1205.0
3.	Molasses production (lac quintal)	537.20
4.	Bagasse production (lac quintal)	881.84
5.	Press mud production (lac quintal)	385.80
6.	Ethanol production (crore litres)	56.00

7.	Exportable power (Mw)	1562.24

Sources: Rows 1-3: Cane department, Govt. of U.P
Rows 4-6: Industry norms
Row 7: Installed capacity

1.6 The sugar industry in U.P contributes to the state and central govt. exchequer through several taxes on sugar and other by-products, as shown in Table 3.

Table 3: Taxes on sugar and other by-products in U.P

S. No.	Products	Taxes/ Duty / Charges		
		GST	Other - 1	Other - 2
1	Sugarcane	..	..	..
2	Sugar	5%	..	..
3	Molasses	28%	Admin. charges Import- Rs. 11/ qt. Export- Rs. 15/ qt.	..
4	Bagasse	5%	..	..
5	Ethanol	5%	Re. 0.15 p. ltr- denatured fee Re. 0.15 Lic. Fee	Rs.1/- export pass fee (for export to out of U.P)

Source: UPSMA, Lucknow

1.7 The direct revenue from sugar mills, thus generated through various taxes in U.P, amounted to be Rs. 2049.10 crores during the year 2018 (Table 4). Besides, sugar mills supply molasses to country liquor units which contribute about 8000 crores to state revenue through excise duty. Thus, sugar industry contributes more than Rs. 10,000 crores to U.P state exchequer, taken its both direct and indirect contributions.

Table 4: Revenue from taxes on sugar and other by-products in U.P during 2018

Sl.	Products		Approx. Revenue (in Rs. Cr.)
1	Sugar 5% GST @ Rs. 3100 p. qtl.		1856
2	Molasses @ 40% captive use =Zero duty		0
3	Molasses @ 60% of 28% GST @ 10/= per qtl. @ 5% of crush		9

4	Bagasse @ 50% of production on 8% crush @ 1200 P. MT. @ 5 %		26
5	Ethanol- 56 Crore Litres @ 40.85/ ltr. @ 5% GST +DN fee+ RS. 1/-ltr. As export pass fee	Rs. 40.75 p. ltr. Of 5% GST	114.10
		Denature Fee @ Re. 0.15 p. Litre	8
		Lic. Fee Re.0.15 p. Litre	8
		Export pass fee @ Re.1 (Export 40%)	22
		GST on freight	15
6		Total	2049.10

Source: Calculation based on data given in Table 3

Section 2: Objectives

2.1 Although sugarcane is a thriving cash crop in the farm portfolio of U.P on the one hand, and the significant economic contribution of the sugar mills for the State, on the other, the disturbing point is that sugar mills in the State are struggling economically over the time. This is reflected in the mounting cane arrears to be paid to the farmers by the sugar mills (estimated around Rs. 11,000 crores as on 29.6.2018). The non-payment of complete cane price to farmers by sugar mills, has become a crucial social, economic and political issue in the State. The entire value chain of the sugar and its by-products is confronted by significant business and regulatory issues. These issues need to be analysed in detail to reap the high potential of sugar industry in U.P. on a sustainable basis. Accordingly, the present study was undertaken to find out the best possible business models so that both the farmers and sugar mills are at a win-win situation. The specific objectives of the study are:

(a) Undertaking a diagnostic analysis of U.P sugar industry and identification of key challenges faced by the industry;

(b) Calculating the economic viability of U.P sugar mills

(c) Suggest the possible business models to economically revive the sugar mills in U.P

Section 3: Methodology

3.1 The study uses both primary and secondary data to fulfil its objectives. There are three approaches used in the present study:

(a) Interactions with stakeholders:

3.2 Extensive interactions were conducted with farmers, sugar mills, and sugar mills associations. These interactions have been used to identifying the critical issues faced by the sugar industry in U.P and the possible alternative business models to make this sector economically viable. 6 Focused Group Discussion (FGD) were conducted with approximately 300 farmers. The guide for focused group discussion with farmers is given in Appendix 1.

(b) Primary survey:

3.3 A suitable sample of farmers (100) from different parts of U.P was taken to understand the economics of sugarcane production from the farmers' point of view. Similarly, data were also calculated from 30 sugar mills to calculate the economic viability of sugar processing operations. Questionnaires for collecting the data from farmers and sugar mills are given in Appendices 2 and 3, respectively.

(c) Secondary research:

3.4 The key publications and reports on sugar industry were referred. A detailed review was made on the recommendations of various committees constituted by the Govt. of India on sugarcane pricing and other regulatory issues. The business models of non-U.P. based sugar companies were taken to draw the possible lessons for U.P.

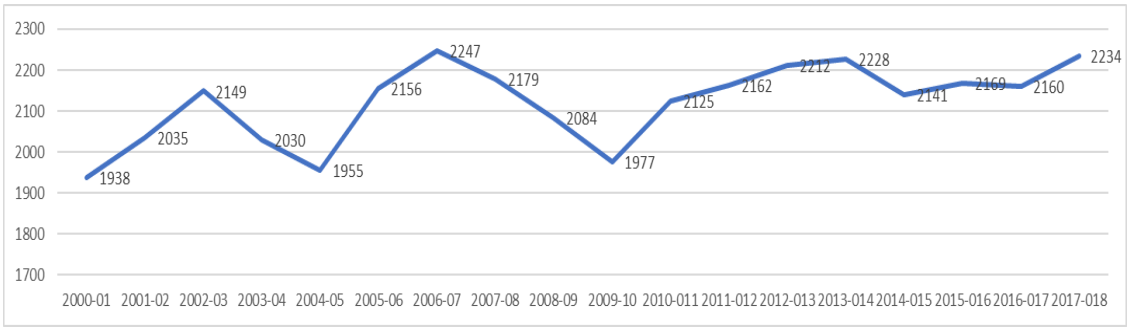
Section 4: U.P Sugar Industry – Sector Profile

4.1 Area, Production and Productivity of Sugarcane

4.1.1 As mentioned earlier, Uttar Pradesh is the leading producer of sugarcane in the country contributing around 45% to the country total sugarcane production. The sugarcane area in the state has grown at a CAGR of 0.79 percent over the last 17 years, whereas the sugarcane production grew at CAGR of 2.39 percent during the same period. The trend in area and production of sugarcane in U.P during the period 2001 to 2017-18 indicate that both sugarcane area and production used to have a sharp cyclical behaviour causing uncertainty to farmers as well as the sugar millers till 2013-14 (Figures 4 and 5). The production cycle had three years upswing and

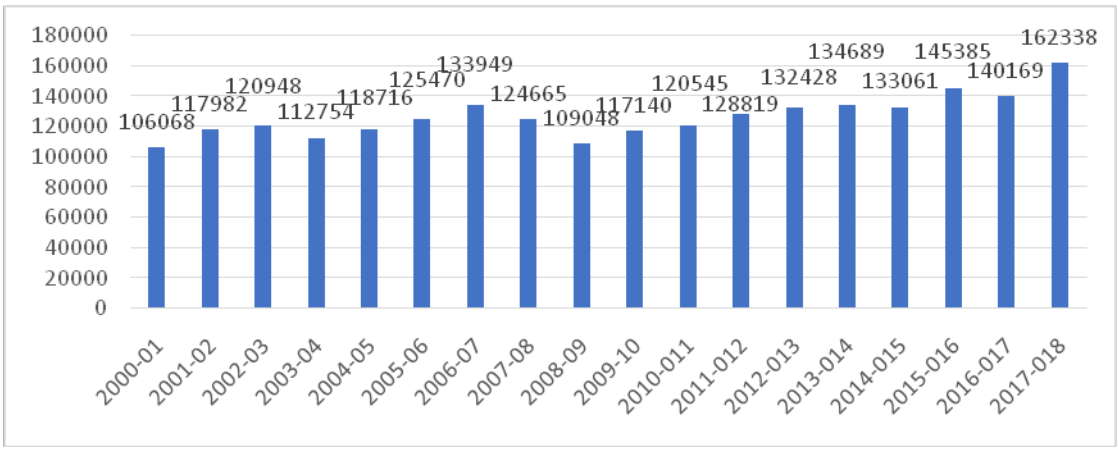
two- or three-years downswing. However, from 2014-15, the trend has become smoother, where both sugarcane area and production are at the increasing trend.

Figure 4: Trend in sugarcane area in U.P



Source: CACP, Govt. of India, 2017-18

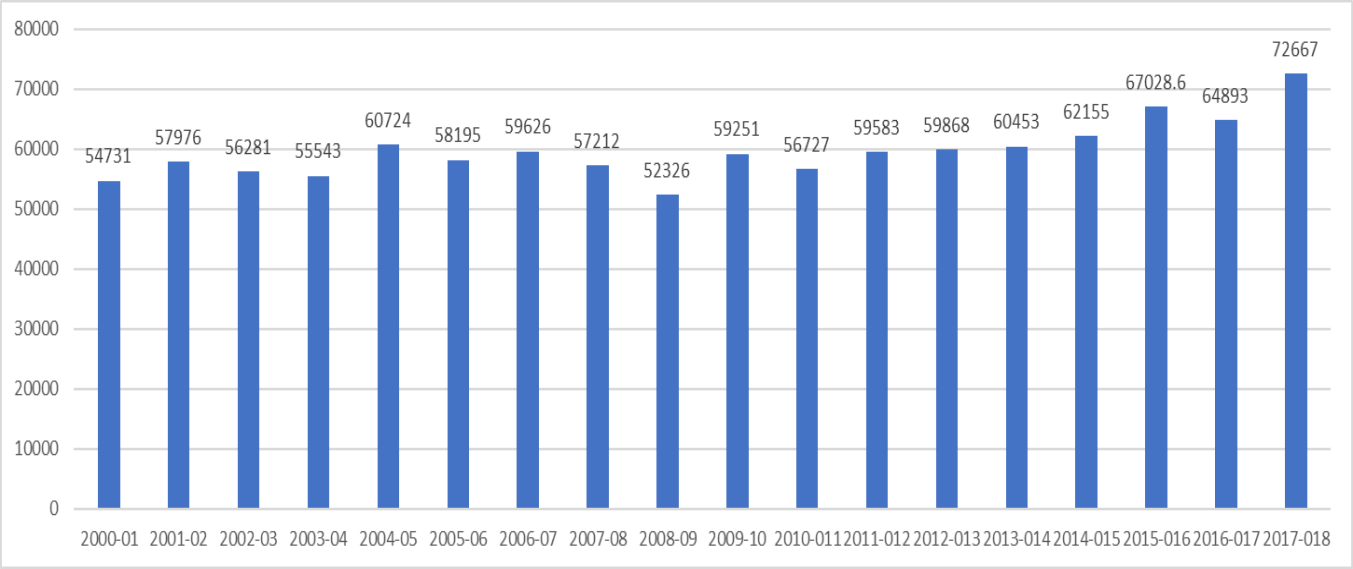
Figure 5: Trend in sugarcane production in U.P



Source: CACP, Govt. of India, 2017-18

4.1.2 The yield of cane had remained constant till 2013-14 but increased after that reaching as high as 72667 kilograms/hectare in 2017-18 (Figure 6). This increase in yield is due to large scale adoption of newer varieties like Co 0238 which are early maturing and give a higher yield (125-150 tonnes/hectare). As a result, the yield of cane increased by CAGR of 1.59 percent over the last 17 years. This spectacular increase in yield has taken place in U.P because the private sugar mills have spent huge amount of money and human resources for conducting on-farm extension services and making the seeds of new varieties available to farmers.

Figure 6: Trend in yield of sugarcane in U.P



4.1.3 A care full analysis of the trend in area, production and productivity of cane in U.P reveals that till 2013-14, the impact of area was more in sugarcane production (CAGR of area, production and productivity being 1.00, 1.72, and 0.71 percent, respectively during this period). However, between 2014-15 to 2016-17, the increased production of cane can be largely attributed to increased yield. Interestingly, during 2017-18, both area and yield of cane increased sharply resulting in a quantum jump in production of cane in the state (CAGR of area, production and productivity being 1.07, 5.10, and 3.98 percent, respectively during 2014-15 to 2017-18) (Table 5). It is expected that the production of cane would further increase in 2018-19 as revealed by majority of the farmers during the interaction the study team had with them in the field. A very high sugarcane price in the recent years has made the sugarcane crop most profitable leading to increased production of sugarcane at the cost of other crops.

Table 5: Compound annual growth rate in area, production and productivity of sugarcane in U.P.

(%)

	2000-01 to 2013-14	2014-15 to 2017-18
Area	1.00	1.07
Production	1.72	5.10
Productivity	0.71	3.98

Source: Calculated based on data given in Figures 4 to 6.

4.1.4 The data on area, production and yield of cane in U.P display that the sugar sector in the state was impacted by induced cyclicality till 2013-14 due to fluctuation in sugar prices. This cyclicality was not due to high or low sugarcane prices (contrary to normal cob-web phenomenon in agricultural commodities), but primarily due to inability of mills to pay the farmers (creation of payment arrears) due to low sugar prices. Post 2013-14, this cyclicality has been removed not by any policy action but due to the increased profitability of cane cultivation (SAP and yield of cane have increased sharply). The trend indicates that fluctuation in sugar prices has no impact on area under sugarcane. So, even the accumulation of cane payment arrear by the sugar mills in a year does not demotivate the farmers to reduce the area under cane in the next year. In fact, the arrears become bonus to the farmers to receive at a later point of time, as they have a firm believe that sugar mills would make the full payment in future.

4.2 Profitability of Sugarcane Cultivation

4.2.1 The net returns from sugarcane cultivation has been calculated based on the cost concept C_2. Cost C_2 is the most comprehensive concept which includes all expenses in cash and kind because of hired labour including human, bullock, machine, seed, insecticides, pesticides, manure, fertilizers, irrigation charges and miscellaneous expenses, imputed value of family labour, rental value of owned land, depreciation on machinery and interest on owned fixed capital. The net returns so arrived from sugarcane cultivation in U.P for 2017-18 has been presented in Table 6. The figures show that there is huge profit of about Rs. 66,000 per acre from sugarcane cultivation. The profit per quintal of cane turns out to be Rs. 173 at current SAP.

Table 6: Cost of cultivation and net returns from sugarcane in U.P for 2017-18

(Rs/acre)

Sl.no	Cost Items	Cost
1	Human labour	
A	Family labour	587
B	Hired labour	1949
2	Bullock labour	4850

3	Machine labour	9371
4	Seed	10545
5	Fertilizer & Manure	3379
6	Irrigation	979
7	Pesticide	2181
8	Total operational cost	29022
9	Interest on working capital @12%	3482
10	Rental value of owned land	16250
11	Depreciation on equipment	3806
12	Total fixed cost (10 + 11)	54341
13	Interest on fixed cost@12%	23275
14	Total cost (8+9+12+13)	54341.36
15	Average productivity (quintal/acre)	381.77
16	Gross return (productivity*315)	120257.55
17	Net Profit per acre (gross return – total cost)	65916.19
18	Net profit per quintal (Rs/quintal)	172.66

Source: based on data collected from field work

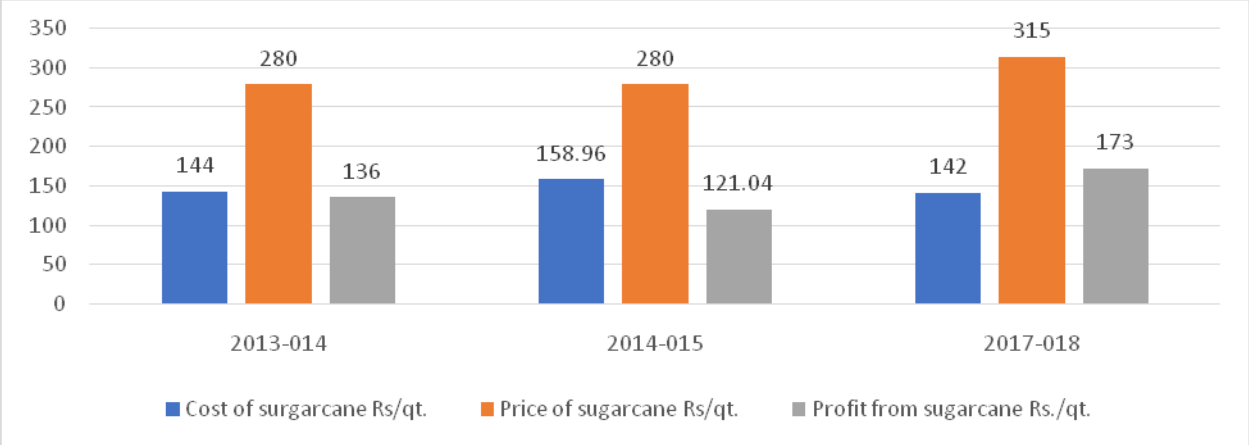
4.2.2 The cost and price of cane over three years are presented in Table 7 and Figure 7. The per quintal cost of cane has come down in 2017-18 primarily because of step rise in productivity. The per quintal price of cane was little less than 200 percent of its cost in 2013-14, has become more than 220 percent during 2017-18. This is due to very high SAP of cane declared by state govt. The central govt. is trying to make sure that the farmers should get 150 % more on the cost of cultivation from different crops from this year (2018-19). As a result, recently there has been a steep rise in MSP of different crops declared by the govt. However, the prices of cane are already so high that it need to be rationalized at this point. Moreover, it became very clear in our discussion with large number of farmers that the MSP of different crops are notional as majority of them do not get the govt. declared MSP for wheat and Paddy. For sugarcane, although all the farmers in our survey have arrear payment, but given their faith and confidence on sugar mills, they feel that they would get it sooner or later.

Table 7: Cost and price of cane over years in U.P

Year	Cost of sugarcane Rs/qt.	Price of sugarcane Rs/qt.	Net return from sugarcane Rs/qt.
2013-14	144	280 (194.44)	136
2014-15	158.96	280 (177.21)	121.04
2017-18	142	315 (221.83)	173

Source: *For 2013-14, 2014-015, Calculation are based on CACP, 2016*
For 2017-018, Calculation are based on field survey
Note: *Figure in parentheses indicate percent of column 2*

Figure 7: Comparison of cost and price of cane over years in U.P



Source: Data given in Table 7

4.2.3 The huge sugar payment arrears (due to artificially high SAP and low price of sugar) have not demotivated the farmers to take cane in their limited and scarce resource of land. Our field survey shows that on average the farmers are taking sugarcane in 75% of their land, and it is going to increase in future too. On the other hand, increased profitability of cane due to very high SAP has distorted the inter-crop profitability parity vis-à-vis its competing crops like wheat and paddy. In report for 2018-19 FRP, CACP has also stated that net returns of sugarcane worked out to be 245% higher than paddy + wheat taken together and 252% higher than cotton + wheat. The cropping pattern should not be distorted based on artificial high price of cane as it would also pose a danger to food security in the state and the country as well.

4.2.4 Given the fact that sugarcane is 10 months' crop in U.P as compared to paddy as well as wheat are about 4- months' duration. So, the net returns from sugarcane must be normalized for time duration by calculating net returns per month. Thus, net returns over cost C2 per acre per month from sugarcane turns out to be Rs. 6592 against the same figure from paddy and wheat as 2407 and 2608, respectively. It needs to be kept in mind the following situations (although we have not taken in our calculations):

- In sugarcane, there is ratoon crop in second year, where the cost of cultivation is much less as compared to the main crop (seed cost is zero in ratoon as compared to about 19% in the main crop). So, the profit from sugarcane from two years crop cycle would be much higher.
- Some farmers also do inter-cropping of moong and other crops along with sugarcane. The net return from inter-crop should be added with the net return from sugarcane.
- Farmers can take one wheat crop with sugarcane in a two years crop cycle.

4.3 Private Sugar Mills holds the Key Place in U.P

4.3.1 The U.P sugar sector is composed of three distinct categories – private mills, cooperative mills and corporation mills. The private sugar mills occupy the key position in the sugar industry in U.P as out of 119 sugar mills in U.P., 94 mills (79%) are under private sector, followed by 24 mills (20%) in cooperative, and only 1 under corporation. Similarly, out of total crushing capacity of 765065 TCD, private mills have 697440 TCD (91.16%). During the sugar season 2017-18, private sugar mills crushed 10037.89 lac quintals of sugarcane (91%) out of total 11036.57 lac quintal cane crushed in U.P (Table 8). The figures show that the sugar sector in U.P is completely dependent on private sugar mills. Given the socio-economic contribution of sugar industry in U.P, private sugar mills must be economically viable.

Table 8: Comparative position of sugar mills in U.P during 2017-18 (as on 29.06.2018)

S. No.	Sector	Crushing Capacity (TCD)	Cane Crushed (Lac Quintals)	Sugar Production (Lac Tonnes)

1	Corporation	3500 (0.46)	44.46 (0.40)	4.45 (0.37)
2	Co-	64125 (8.38)	959.54 (8.64)	93.34 (7.75)
3	Private	697440 (91.16)	10099.29 (90.96)	1107.23 (91.88)
4	Total	765065	11103.29	1205.02

Note: Figures in parentheses indicate percent of total.

Source: Cane Department, Govt. of U.P

4.3.2 There are about 40 lac farmers and families involved in sugarcane production who supply sugarcane to 119 sugar mills in U.P. Thus, on an average, each mill procures cane from more than 33000 farmers, which is highest in the country. This in turn pose serious complexities in managing cane procurement, quality control and cane development activities taken by the mills in U.P. Moreover, majority of the farmers cultivating sugarcane are small and medium, thereby limiting the scope of mechanization to increase the farm productivity, on one hand, and possibility of mechanical harvesting of cane, on the other.

4.4 Sugar Recovery

4.4.1 The average recovery of sugar in U.P has increased over time (from 9.54% in 2014-15 to 10.61% in 2016-17), but it is still less than that in Maharashtra (Table 9). The sugar recovery stands at 10.61 % in U.P as compared to that of 11.33 % in Maharashtra during the sugar season 2016-17. The private sugar mills have extensively promoted the use of early variety (such as 0238) among the farmers. This varietal replacement on a wide-scale has improved recovery rate in U.P. One of the reasons for high recovery rate in Maharashtra is that sugar mills themselves arrange harvesting and transportation of cane. The mills prepare a harvesting schedule as per maturity of cane and requirement in the mill. On the other hand, in U.P the farmers arrange harvesting of cane on their own. The farmers hire labours to harvest the entire sugarcane field as it becomes economical for them. Moreover, they want to make land available for sowing wheat crop. Thus, many times the surplus harvested cane remains in the fields for an extended period, resulting in loss of sucrose content.

Table 9: Average recovery of sugar in India

(Percent)

S. No.	State	2014-15	2015-16	2016-17

1	Maharashtra	11.29	11.33	11.25
2	Andhra Pradesh	9.38	9.35	9.37
3	Uttar Pradesh	9.54	10.62	10.61
4	North Bihar	9.18	9.77	9.21
5	Telangana	10.51	10.85	10.38

Sources: Cane Department, Govt. of U.P and ISMA, New Delhi

4.4.2 Within the State, the sugar recovery rate is highest (10.96 %) among the private sugar mills as compared to that in cooperative (9.80%) and corporation mills (10.0%). Thus, the private mills are more efficient as compared to their counterparts in cooperative and corporation sectors. With a difference of 1.16% in recovery between private and cooperative mills, and cooperative mill crushed 954.22 lac quintal of cane during 2017-18, there was a national loss of more than 11 lac quintal of sugar (equivalent to more than Rs. 350 crores @ Rs.3200 per quintal).

4.5 Capacity Utilization

4.5.1 Uttar Pradesh has around 158 installed sugar mills out of which 119 (75%) are operational (as on 13.06.2018). UP Central has greater number of mills as compared to the other two regions of UP East and UP West. The sugar mills in U.P have a crushing capacity of 765065 TCD. The capacity utilization of the mills for the sugar season 2017-18 was 90.16%. The private sugar mills had a capacity utilization of about 89.96 %, while the cooperative mills worked with 93% capacity utilization.

4.6 Regulatory Environment

4.6.1 Sugar has been classified as an essential commodity and therefore, sugar industry has been regulated across the value chain in all the States of the country, albeit in different scale and magnitude. The following two factors have contributed to regulations in the sugar industry:

- The perishable nature of cane restricts to store or transport cane for long durations. It is therefore, necessary that the price guarantee and cane offtake in the feasible delivery area is assured to farmers before sowing and harvesting of the cane. On the other hand, mills should be assured of cane

supplies at affordable prices before they make investment decisions. The crushing schedule must be aligned with cane deliveries.

- To maintain steady availability of sugar in the domestic market, given the seasonal nature of sugar production.

4.6.2 On raw material side, the pricing of cane is regulated by the mandatory cane price determined by the central and state govts. The Fair and Remunerative Price (FRP) for an average recovery rate of sugarcane is recommended by the Commission for Agricultural Costs and Prices (CACP), Govt. of India. The FRP is based on economic principles and linked with recovery rate with gradual increase in FRP with 0.1 percentage increase in recovery rate. In U.P, the state govt. also announces a State Advisory Price (SAP) for sugarcane, which is mandatory for the mills to pay. The SAP is higher than FRP, and neither linked with recovery rate nor the ex-mill sugar prices. The supply of cane is controlled through command area regulation coupled with minimum distance between sugar mills. On the market side, the monthly release quota system restricts mills from quantity of sugar to be sold at a point of time, leading to high inventory holding costs. There are tariff and non-tariff restrictions on international trade of sugar. There are state specific restrictions on the movement and sale of molasses. The variation in different state govt. regulations, leads to state level distortions in the operation and functioning of mills (Table 10).

Table 10: Regulatory environment for sugar industry

Sl.	Area of Regulation	State level conflicts	Impact
1.	Cane price	Individual States announce own cane price policy. Some states follow FRP, whereas some states announce SAP. The SAP declared by different states is also not uniform.	The cost of sugar production is high with higher SAP, as cane contribute about 80% in cost of sugar. The mills in U.P are worst sufferer as SAP in U.P. is maximum among all the states who follow SAP.

2.	Utilization and sale of molasses	Individual States restrict utilization and sale of molasses, although Union Government with effect from 10th June 1993 repealed the Molasses Control Order. In U.P, 12% of molasses produced is reserved for country liquor for the sugar season 2017-18. On the other hand, there is no restriction or control either on use or on movement of molasses in Maharashtra and Karnataka.	The price at which molasses is sold to country liquor producers is less than that of open market price. Distortion of the level playing field across the States.
3.	Cogeneration	Individual states have their own power purchasing agreements with sugar mills.	There is difference in the revenue from sale of power across the states. There is acute problem of overdues from state electricity boards. The sugar mills in U.P. had a mounting overdue of Rs. 833 crores from UPSEB as on 12.06.2018 (dues as reported by only UPSMA members).
4.	Cane cooperative Societies Commission	Variation in commission across the states. Some states do not have cane cooperative societies between the farmers and mills. The commission to cane cooperative societies is substantially higher in U.P. (3% on FRP), as compared to other states (0.5% on FRP).	It increases the cost of sugar production in U.P. The cane cooperative societies do not exist in Maharashtra and Karnataka.

Source: Literature review

4.6.3 In U.P, 12% of molasses produced is reserved for country liquor for the sugar season 2017-18. It makes sale of molasses, and its intra-unit transfers complicated. Country liquor manufacturers who are limited in number, influence the molasses prices. The molasses reservation policy requires detailed and extensive permissions of different nature from state departments resulting in unnecessary paper works to sugar mills. It also causes delays in intra-unit transfer of molasses from own sugar mill.

4.6.4 It is clear from the above description that sugar sector is regulated both at the central and state levels in different magnitudes. As a result, the sector faces conflicts which deny a level playing field for all the actors in the value chain of sugarcane on the one hand, and in between the sugar mills located at different states. Since cane is

primarily produced in 5 major states, but sugar is consumed across the country with no inter-state restrictions on its supply, it is mandatory that the sector should be regulated in a homogenous and unified manner. There should be a common regulator for the sugar industry across the states.

Section 5: Issues Confronted before Sugar Mills in U.P

5.1 Higher cane prices

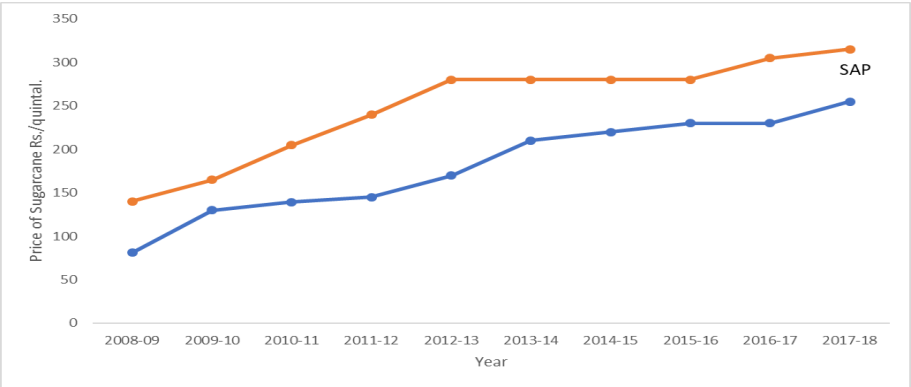
5.1.1 The state govt. in U.P forces the mills to pay SAP which is neither linked with recovery rate, nor the ex-mill sugar prices. Ideally, for any processing industry, the raw material is priced based on its quality. In sugar, the millers have no mechanism to judge the quality of cane based on sucrose content before buying. Rather, mills are required to purchase rejected variety of cane at SAP and millers have no control over dry cane and extraneous materials. The quality of cane hampers the quantity of sugar, reducing the recovery rate. As a result, when sugar prices are low, mills fail to pay the SAP to farmers on time, resulting in accumulation of cane payment arrears. There exists wide gap between SAP and FRP @ 9.5% recovery. However, the difference between the two prices has reduced over the time, especially from the year 2013-14 (Table 11 and Figure 8).

Table 11: Difference between SAP and FRP during 2008-09 to 2017-18 (Rs/quintal)

Year	FRP	SAP	Difference
2008-09	81.18	140	58.82
2009-10	129.84	165	35.16
2010-11	139.12	205	65.88
2011-12	145	240	95
2012-13	170	280	110
2013-14	210	280	70
2014-15	220	280	60
2015-16	230	280	50
2016-17	230	305	75
2017-18	255	315	60

Source: Government Notifications

Figure 8: Difference between SAP and FRP during 2008-09 to 2017-18



Source: Data given in Table 11

5.1.2 The SAP in U.P is the highest amongst the leading sugarcane producing states in India (Table 12). It is also the highest among the leading sugarcane producing countries in the world (Figure 9).

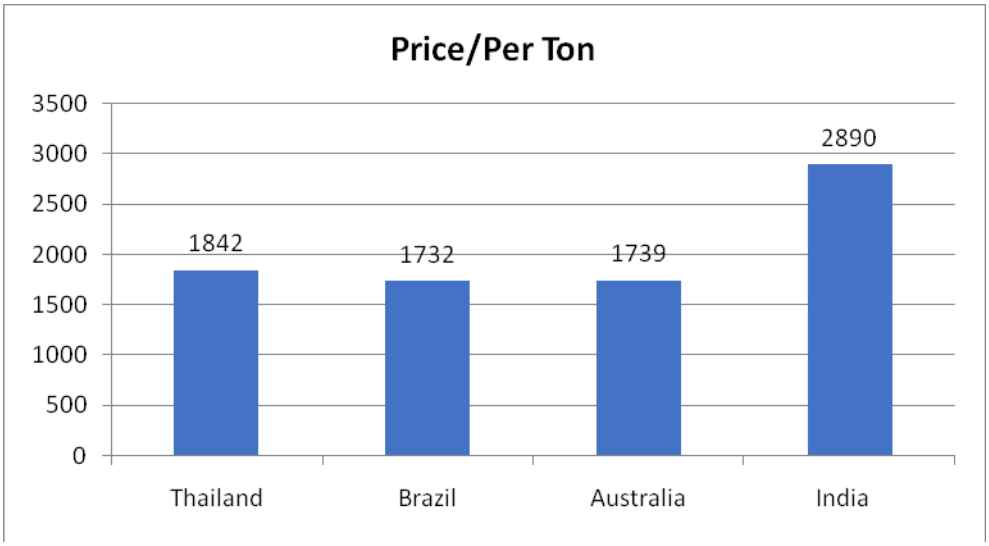
Table 12: Cane price in different states (ex-gate) – General variety

(Rs/quintal)

State	2017-18	2016-17	2015-16	2014-15	2013-14
Punjab	305	290	290	290	280
U.P.	315	305	280	280	280
Tamil Nadu	275+10	275+10	275+10	275+10	240
Andhra Pradesh	300	290	N.A.	260	251
Bihar	293	280	260	255	255
Maharashtra	302	230 (FRP in 1st instalment)	230 (FRP in 1st instalment)	220 (FRP in 1st instalment)	255
Karnataka	274	230 (FRP in 1st instalment	230 (FRP in 1st instalment	220 (FRP in 1st instalment)	250

Source: ISMA, New Delhi

Figure 9: Cane price in major sugar producing countries during 2017-18 season



Note: Prices include cost of harvesting & transportation.
India-Average FRP at all India average recovery of 10.77%.
Source: ISMA, New Delhi

5.2 Accumulation of cane price arrears

5.2.1 The moot issue before the sugar mills in U.P is the accumulation of cane payment arrears. Table 13 provides status of sugarcane arrears in U.P during the sugar season 2007-08 to 2017-18. In the cooperative mills, the cane price is implicitly linked to sugar price and paid based on realization of mills, the arrears are low as compared to private mills. Moreover, the state govt. aids cooperative mills in the form of loans which are never recovered and finally get converted into state share, to clear cane arrears to farmers. From the data given in Table 13, it is clear that, the three seasons of 2012-13 to 2014-15 were particularly bad for the sugar mills in U.P. This was due to cane price increased at the rate of Rs. 40 per quintal between SS – 2011 – 12 and 2012 – 13. To help the industry in crisis, the State and the Central Governments extended financial help to the sugar mills in the following manner:

- Government of India through Scheme for Extending Financial Assistance to Sugar Units (SEFASU), provided soft loan equal to two years of excise duty, at maximum interest subvention of 12% on actual whichever is lower.

- State Govt paid off and reduced cane society commission and purchase tax payable by the mills on cane and entry tax on sugar.

- Interest on delayed cane price was waived off during SS – 2012 – 13, 2013 – 14, & 2014 – 15.
- A Cash assistance of Rs. 28.60 per quintal of cane was given to the mills by transferring money directly to the farmers for SS – 2014 – 15.

The sugar season 2017-18 again became the worst for the sugar mills when a whopping amount of more than Rs. 12,000 crores became the cane arrears in the state. In terms of arrears as percentage of cane price payable, it turned around 42 and 35 percent for cooperative mills and private mills, respectively (Table 14 and Figure 10).

Table 13: Sugarcane price arrears in U.P over the last 10 years

(Rs. Cr.)

S. No.	Status as on	Sugar season	Co-operative	Private	Total State
1	24.09.2008	2007-08	235.19	1057.18	1347.38
2	19.06.2009	2008-09	0	49.62	49.62
3	15.09.2010	2009-10	0	143.20	143.20
4	19.09.2011	2010-11	144.69	14.38	159.07
5	28.09.2012	2011-12	0	296.60	296.60
6	30.09.2013	2012-13	74.88	2404.45	2479.33
7	30.09.2014	2013-14	0	3054.86	3054.86
8	30.09.2015	2014-15	47.04	3849.55	3896.59
9	30.09.2016	2015-16	0	1538.96	1538.96
10	28.09.2017	2016-17	189.14	945.59	1134.73
11	29.06.2018	2017-18	1239.53	10947.68	12238.60

Source: Cane Department, Govt. of U.P

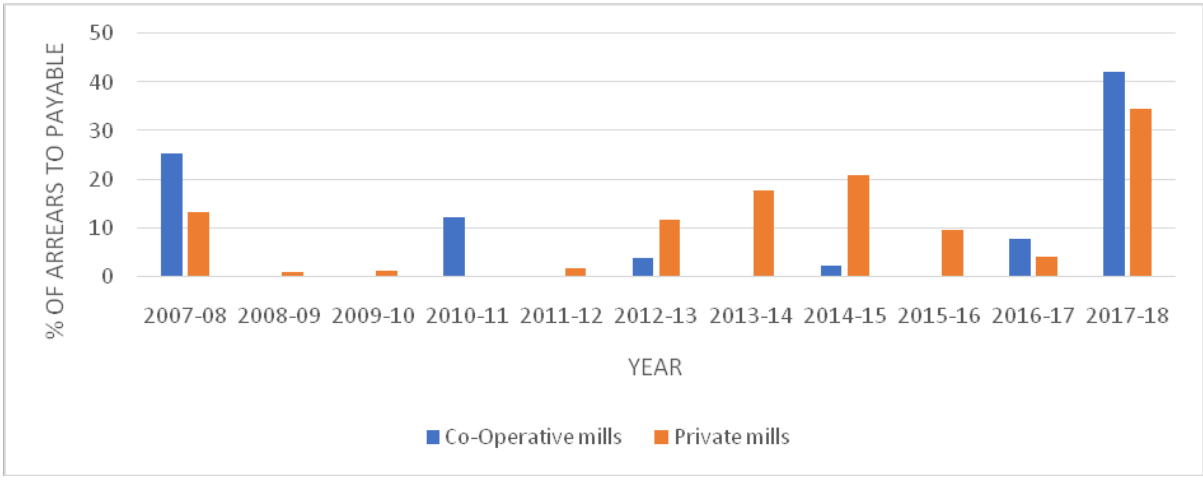
Table 14: Sugarcane price arrears as % of price payable in U.P over the Last 10 years

Year	Co-Operative mills	Private mills
2007-08	25.39	13.24
2008-09	0	0.9
2009-10	0	1.18
2010-11	12.35	0.12
2011-12	0	1.78

2012-13	3.89	11.71
2013-14	0	17.59
2014-15	2.24	20.86
2015-16	0	9.56
2016-17	7.77	4.14
2017-18	42.07	34.58

Source: cane Department, Govt. of U.P

Figure 10: Sugarcane price arrears as % of price payable in U.P

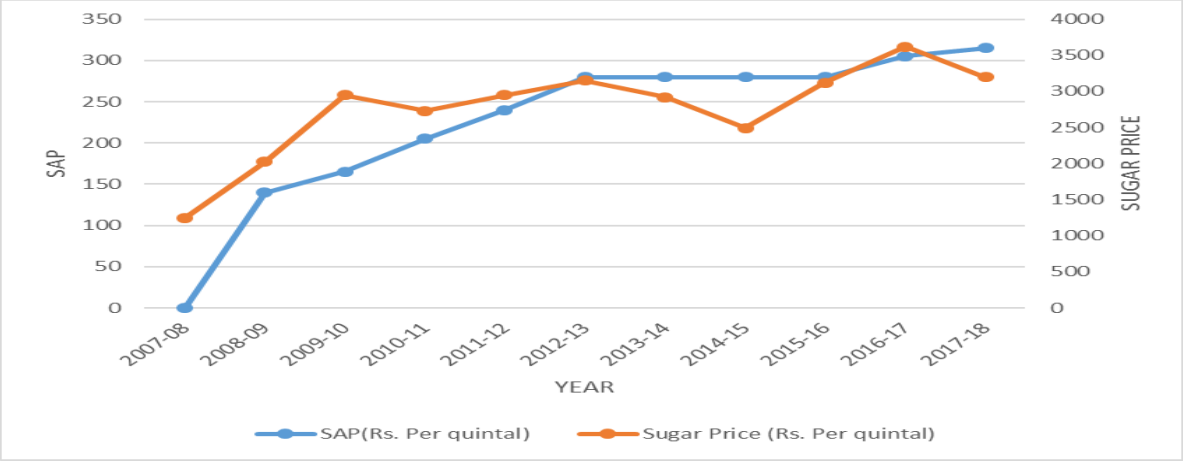


Source: data given in Table 14

5.3 High cane prices and low sugar prices lead to arrears

5.3.1 The cane price has been increasing over the years particularly after the sugar season 2015-16. However, the sugar price, which is driven by market forces of supply and demand of sugar, is highly fluctuating with a cyclical trend of 2 to 3 years. Figure 11 shows that sugar prices declined continuously during 2012-13 to 2014-15, increased after that till 2016-17, but again reduced drastically in 2017-18. It corelates why the three seasons of 2012-13 to 2014-15 were particularly bad for the sugar mills in U.P and further why the situation has become worst in 2017-18?

Figure 11: Cane and sugar prices in U.P

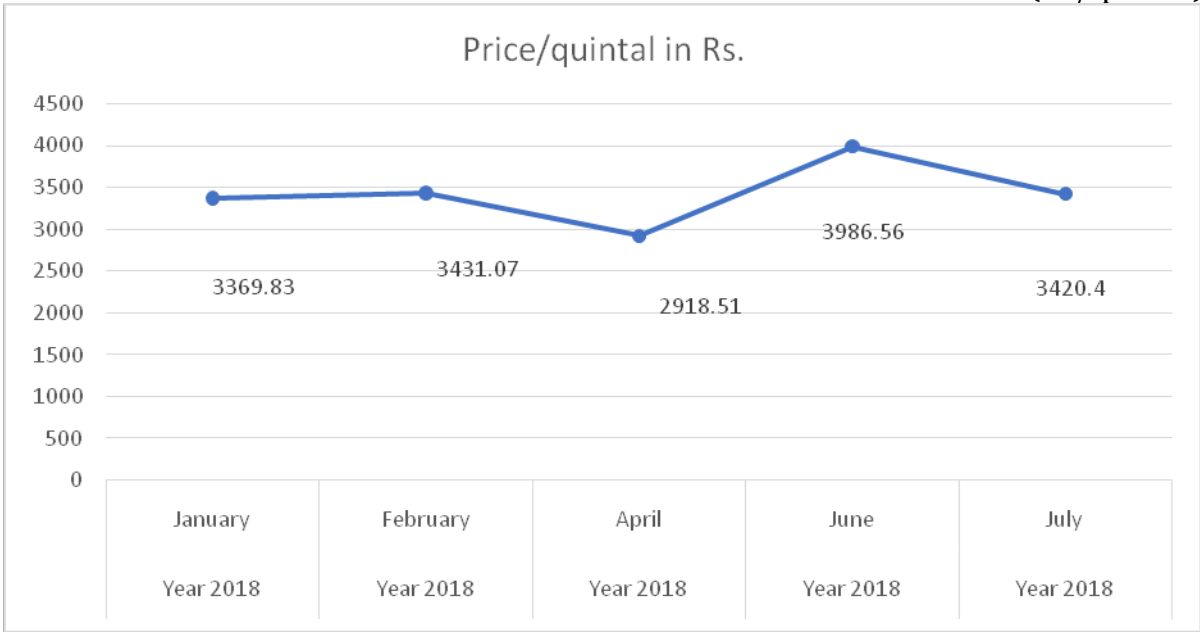


Source: Based on data available from UPSMA, Lucknow

5.3.2 The sugar prices also exhibited the monthly variations (with coefficient of variation at 12%) in the different years, which has added fuel in the fire of sugarcane arrears (Figures 12 and 13).

Figure 12: NCDEX market price of sugar at (2:30 PM to 3:00 PM) of sugar M Grade at Kanpur during 2018

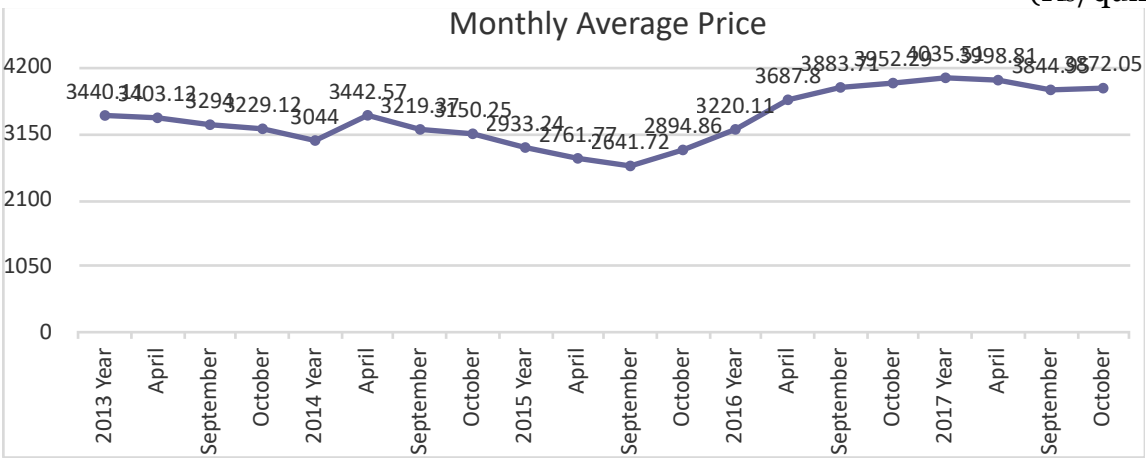
(Rs/quintal)



Source: NCDEX

Figure 13: NCDEX market price of sugar at (2:30 PM to 3:00 PM) of sugar M Grade at Kanpur during 2013-17

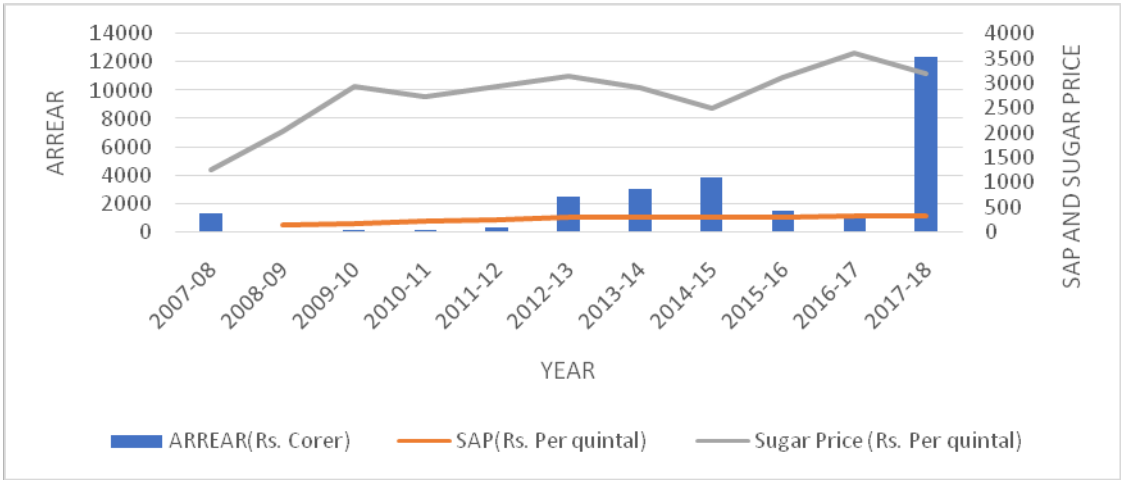
(Rs/quintal)



Source: NCDEX

5.3.3 Thus, with increasing SAP, the arrears fluctuate in the same trend of fluctuations in the sugar prices (Figure 14). Arrears are created as mills are unable to pay high cane prices, which is about 90 percent of ex-mill realization during 2017-18. This substantiates the need for an alignment between cane and sugar prices to ensure that arrears are minimum or eliminated completely. It would improve the financial viability of mills and reduce the need for govt. support at the time of crisis. In the absence of the parity between cane and sugar prices, the sustainability of the sector will continue to be at risk impacting both large number of farmers and mills. Given the highly fluctuating sugar prices, the cane prices have to be determined rationally keeping in mind the conversion cost.

Figure 14: Trend in SAP, sugar prices and arrears in U.P



Sources: Based on data collected from Cane Department, Govt. of U.P and NCDEX

5.4 Increased production cost of sugar leads to loss to sugar mills

5.4.1 The per quintal cost of sugar production in U.P for 2017-18 has been presented in Table 15, whereas the average ex-mill realisation from sugar has been given in Table 16. The cost of production of sugar has exceeded the ex-mill prices of sugar, leading to non-viability for sugar mills to produce sugar. The sugar mills in U.P. are making a loss of Rs. 659.60 for every quintal of sugar production (Table 17). Under this situation, how can the mills survive to meet other corporate expenditures and servicing of loans, forget the returns to shareholders?

Table 15: Estimated cost of sugar production in U.P

(Rs. /quintal)

Cost component	%	Rate	Cost
Sugarcane			
(a) Early variety	70	325	227.50
(b) General variety	20	315	63.00
(c) Rejected variety	10	310	31.00
Total cane cost			321.50
Cane development cost			2.00
Transport charge for centre cane*	50	16	8.00
Society commission (2% of FRP)		255	5.10
Cost of sugarcane to mill			336.60
Average recovery	10.61		

Cost component	%	Rate	Cost
Cane cost for production of 1 quintal of sugar			3172.00
Cash conversion cost**			465.00
Depreciation			50.00
Interest on term loan and working capital			170.00
Total conversion cost			685.00
Less credit for by-products			
Molasses	4.75	5.00	2.20
Bagasse	8.00	150.00	111.11
Press mud	3.50	25.00	8.10
Net conversion cost			563.59
Cost of sugar production			3735.60

*after adjusting rebate of cane transport @ Rs. 8.35 per quintal
**Includes expenses on repair and maintenance, salary and wages, power and chemicals, administrative expenses, marketing expenses, insurance etc.
Source: Data collected from private sugar mills

Table 16: Average ex-mill realisation of sugar in U.P

Month	Realisation (Rs per quintal)
December - 2017	3397
January - 2018	3257
February - 2018	3188
March - 2018	3088
April - 2018	2842
May - 2018	2683
Average (December 2017 to May 2018)	3076

Source: Data collected from private sugar mills

Table 17: Economic viability of sugar mills in U.P during 2017-18

Sl.	Particulars	Amount (Rs.)
1.	Cost of sugar production (Rs. per quintal)	3735.60
2.	Return from sugar (Rs. per quintal)	3076.00
3.	Loss from sugar production (Rs. per quintal) (1-2)	659.60

Source: Based on data given in Table 15 and 16.

5.4.2 The break-even point is one of the most commonly used concepts of financial analysis and ensuring economic viability of any business. The break-even point (BEP) or break-even level represents the sales amount—in either unit (quantity) or revenue (sales) terms—that is required to cover total costs, consisting of both fixed and variable costs to the business. Total profit at the break-even point is zero. It is only possible for a firm to pass the break-even point if the value of sales is higher than the variable cost per unit. This means that the selling price of the good must be higher than what the company paid for the good or its components for them to cover the initial price they paid (variable costs). Once they surpass the break-even price, the business can start making a profit. Break-even point analysis is a measurement system that calculates the margin of safety by comparing the amount of revenues to cover fixed and variable costs associated with making the sales.

5.4.3 Current SAP is much higher than that required for breakeven point for mills in U.P.

Percent cane cost in 1 quintal sugar production cost = 85%

Cane cost in per quintal sugar production = Rs. 3172

Return from sugar:

Desirable cane cost after removing loss = 3172-659.60 = Rs. 2512.40

Amount of cane required to produce 1 quintal of sugar = 9.42 quintal (average recovery rate = 10.61%)

Cost of sugarcane for breakeven = 2512.40/9.42= Rs. 266.70 or Rs 267/quintal

5.4.4 Thus, at the current ex-factory price of sugar, the breakeven price of cane turns out to be Rs. 267 per quintal, whereas the current SAP is Rs. 315. Given the

current sugar prices, SAP is Rs. 48 per quintal (18 %) higher than that at breakeven point for sugar mills. The current SAP in U.P. would be equal to FRP at 11.74 % recovery rate, whereas the current average recovery in U.P. stands at 10.61 %. On the other hand, at a recovery of 10.61 %, the FRP comes to be Rs. 285 per quintal. Thus, SAP is more than FRP by Rs. 30 per quintal. So, whether one compares SAP with sugar price or FRP of cane, SAP is substantially higher than what it should be. This is the root cause of un-viability of sugar mills in U.P.

5.4.5 The Rangarajan Committee on Sugar (2012) had recommended that cane prices must be rationalized based on a minimum guaranteed price (FRP) and a Revenue Sharing Formula (RSF). The committee suggested that either 70 percent of revenue generated from sugar (ex-mill price of sugar) and primary by-products in the sugar production process (molasses, bagasse, and press mud), or 75 percent of the revenue from sugar (ex-mill) alone be fixed as the cane price payable to the farmers. However, in all circumstances, the farmers must be paid up-front the FRP as minimum. It is quite evident from the Table 18 that there is a wide gap between SAP announced by the state government and RSF recommended by Rangarajan Committee. The SAP was 29% higher compared with RSF payment.

Table 18: Cane price payable to farmers as percentage of value of sugar in U.P

Sl. No.	Sugar season	2017-18
1	Ex-mill sugar prices (Rs/quintal)	3076
2	SAP (Rs/quintal)	315
3	FRP (Rs/quintal)	285
4	State recovery rate	10.61
5	Total sugar value from 1 quintal of cane (Rs/quintal) at recovery rate 10.61 % (Rs/quintal)	326
6	Cane price payable to farmers under RSF at recovery rat 10.61 % (Rs/quintal)	244
7	Cost of sugarcane (Rs/quintal)	142

Note: Row 5 = Row 1*10.61; Row 6 = Row 5*0.75

Source: calculation based on the data given in different tables in this report

5.5 U.P. losing out in competition with other leading sugar producers

5.5.1 The sugar mills in U.P are in dis-advantageous position in front of mills located in Maharashtra and Karnataka on the following grounds:

Low sugar realization

- Low sugar recovery rate as compared to other leading sugar producing states like Maharashtra and Karnataka
- Low yield as compared to other leading sugarcane producing states
- Highest SAP/cane price payable to farmers among the leading sugar producers

Highest Cost of sugar production

- The cost of production of sugar is higher in U.P. as compared to Maharashtra and Karnataka
- More penetration from non-U.P. millers in the existing market of sugar in U.P.
- UP millers cannot compete with sugar produced from relatively low-cost producers like Maharashtra and Karnataka

Higher losses

- The working capital requirements have increased
- Mounting cane arrears
- The industry is struggling for its survival

Low realization from molasses

- No other major sugar producing state has molasses reservation policy for country liquor

Section 6: Stakeholder analysis

6.1 In any sector, stakeholders are those who can influence the sector or can be influenced by the sector. Thus, in sugar sector, the main stakeholders are: sugarcane farmers, millers, consumers, and central and state govts. Their aspirations and present status are outline below in Table 19.

Table 19: Stakeholders in sugar sector and their aspirations

Sl.	Stakeholder Aspirations and Needs	Present Status
1.	Sugarcane farmers	
	Increased yield of cane	Yes, increasing over the years
	Assured higher cane prices	Yes, SAP increasing over the years

	Timely payment of cane prices	No, accumulation of huge arrears
	Minimum crop production risk	Yes, negligible production risk in sugarcane
	Assured sale of cane	Yes, mills have to buy the entire cane production from their allocated area
	Ease of harvesting of cane	No, the mills do not provide harvesting facilities
	Availability of crop advisory services	Yes, available primarily from the mills
2.	Millers	
	Availability of required quantity of cane	Yes, minimum sugarcane area limit exists
	Affordable cost price of cane	No, SAP is very high
	Higher recovery though higher sucrose content in cane	No, recovery increasing but still less as compared to other sugar producing states
	Better and stable realization of sugar prices in domestic and export markets	No, sugar price is low and highly fluctuating. Possibilities of export is very limited as India is not competitive in international sugar market
	Higher value addition from by-products	Limited as all the mills do not have distillery and cogeneration facilities. Realization from molasses is negative.
	Non-existence of distorting policy interventions	No, a large number of state regulatory/policy interventions exists.
3.	Consumers	
	Availability of quality sugar at affordable prices	Yes, India is self-sufficient in sugar. Price of sugar is low in the market.
4.	Central/State Govts.	
	Self-sufficiency in meeting domestic demand of sugar	Yes
	Social welfare of farmers	Yes, assured price of cane to farmers through FRP and SAP and assured sale of cane to mills

	Increased contribution to state exchequer	Yes, GST realization from increased sugar production
	Meeting the growing energy requirement of the country	Yes, sugar mills are generating power and selling to state electricity board
	Making the sugar industry economically viable	No, mills in U.P. are running in loss and struggling to survive.

Source: Based on discussion with farmers and sugar mills, and literature review

6.2 The entire business roadmap including regulatory environment must fulfil the above aspirations cutting across the stakeholders in a win-win situation. These objectives of stakeholders are dependent on some critical business drivers, which in some cases involve a trade-off between stakeholders' objectives. The conflicts arise when the business policy and environment are tilted extremely in favour of one or another stakeholder. This is where the sugar industry in U.P is struggling as the entire business drivers have been deliberately transformed more in favour of cane farmers at the cost of millers. This requires corrections so that the needs and aspirations of different stakeholders become shared vision for the industry as a whole rather than isolated and individual.

6.3 There are trade-offs between farmer and miller business drivers. A high cane price is welcomed by farmers but leads to loss for mills for a given sugar price. Cane and sugar price, if not aligned, result in arrears impacting negatively both the mills and farmers. A higher sugar price benefits the miller, but consumers would cry. Under these situations, a higher cane productivity and better sugar recovery with a reasonable assured cane price would be beneficial both to farmers and mills, without affecting consumers. The benefits can be shared between all the stakeholders. Here, the farmers-miller business relationship would be a key driver to be leveraged by the sector so as to achieve shared objectives for all. At present, mills are primarily responsible for motivating and educating the farmers to adopt advanced farm practices and good seed varieties of cane in their respective command area. The off-take risk for farmers can be addressed through assured cane off take by the mill under an agreement, and mills would be assured of cane supplies. The farmer-miller relationship should enable the farmers to access credit from banks based on off-take guarantee provided by the mills under agribusiness value chain finance. The

relationship would incentivize the mill to spend in rural development, over and above the cane development activities, which are presently taken by the mills.

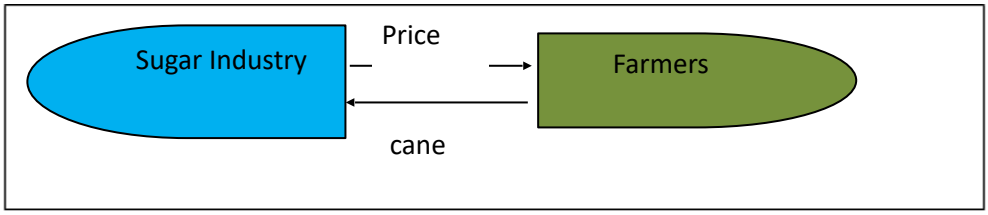
Section 7: The Road Ahead

7.1 From purchase to procurement

7.1.1 Like any other agro-industry, sugar industry too needs supplies and suppliers. As cost of cane is a significant component of production of sugar, it is important that the cane cost is reasonable and not exorbitant high as in the present times. Purchase becomes more important for sugar industry because of some specific and unique nature of raw materials like, seasonality, perishability, variability etc., and also because of the spread, and number of producers of the raw materials. Although, sugar (the main output) is consumed across the year and geographical areas, the production of raw-material is seasonal and area specific. This makes task of a purchase-manager difficult to ensure enough quantity of raw material which will not only keep processing plant running at its economic capacity, but the industry will also be able to produce so much to meet the year-long demand of sugar in the economy.

7.1.2 Traditionally, purchasing has been considered subordinated to the production and marketing functions of sugar industry. It is a common understanding that purchase functions can be performed by anyone as it simply means 'acquiring' the cane at minimum possible cost as per the request of production team. The relationship between sugar mills and the farmers becomes time specific and temporary basis. Both buyers and sellers maintain their distinct self-identity and self-interest and keep themselves distanced from each other. This form of purchase relationship between buyers and sellers is known as 'transactional' (Figure 15).

Figure 15: Transactional relationship between sugar mill and farmers



7.1.3 Time has come when sugar mills have to move (although some are moving) from traditional definition of purchase to more 'timely' and 'professional' and 'practical' definition which aims and facilitates acquiring and maintaining flow of cane in such a way that it meets organisation needs, at most reasonable cost by selecting and nurturing and negotiating ethically with farmers in such a way that mill is able to maintain good and sustainable relationship with farmers (Table 20). This new definition, which considers the purchase function as one of strategic functions of the sugar industry and widens the scope of purchase and brings many responsibilities under its ambit, has been termed as "Procurement". Based on the recent developments in supply chain concept, and fast-growing importance of the role of suppliers in business and doing the business together, the distance between buyer and seller is diminishing. Now focus has shifted from maintaining distinct identity and interest to develop common interest with distinct identity (without encroaching each other's core business). The same holds true for sugar industry and mills and farmers are now expected to bridge the distance and be together by sharing ideas and learning from each other. There are reasons to collaborate on various issues of common interest to create a win-win situation. To start with both mills and farmers need to believe that both can add value for each other and start having confidence in each other. Such business relationship is called 'mutual' (Figure 16).

Figure 16: Mutual relationship between sugar mill and farmers

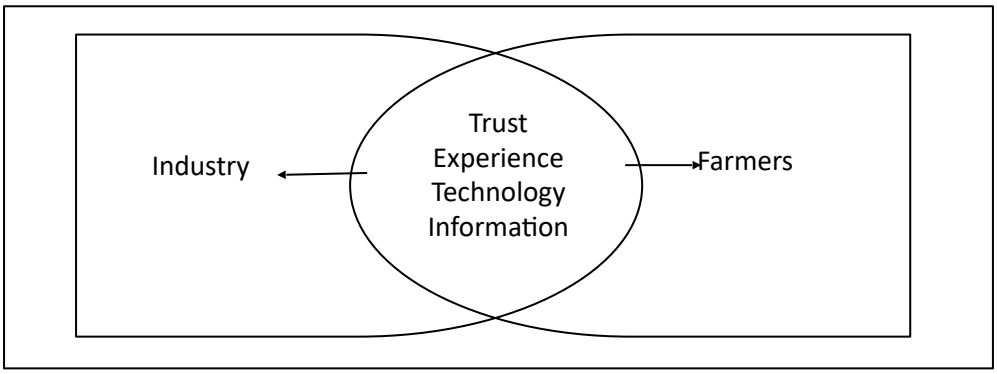


Table 20: Paradigm shift from purchase to procurement

Purchase	Procurement
a. A support function	a. One of the main functions
b. A cost function	b. A value addition function
c. Purchase reject defective materials	c. Procurement support suppliers fo quality material
d. Price of raw material is importan factor	d. Price is one of the factors an contribution of raw material in over all value of final product is a important factor
e. Planning is on day to day or on seaso basis	e. Long term planning, to hav sustainable supply.
f. Negotiation – both party work a competitors	f. Both parties work as collaborator
g. Will keep large supplier base t minimize risk	g. Will manage optimum supplier so tha long term engagement is possible
h. Will have more suppliers to ensur maximum capacity utilization o processing	h. Adequate quantity to ensure these i no loss.
i. Relationship – Adversary, no sharin of information, technology and profit	i. Relationship is of collaborator sharin of information, technology, profit etc.

7.2 Prerequisite for mutual relationship

7.2.1 If sugar mills and farmers are to develop mutual business relationship, the sugar industry needs to be gradually free from strenuous regulatory regime as regulations restrict the business decision making ability of individual stakeholders. Simultaneously, there is a need to re-evaluate the inclusion of sugar and sugarcane in the Essential Commodity Act. As, sugar has been classified as an essential commodity and therefore, sugar industry has been regulated across the value chain. The following two factors have contributed to regulations in the sugar industry:

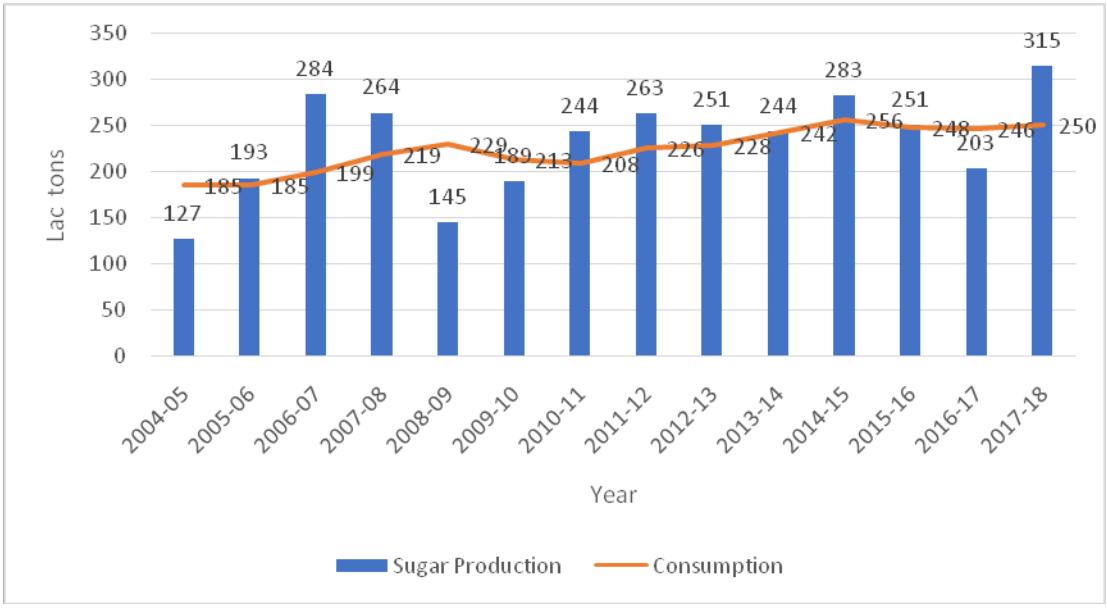
- To maintain steady availability of sugar at affordable price in the domestic market for the consumers, given the seasonal nature of sugar production (consumer protection).

- The price guarantee and cane offtake in the feasible delivery area is assured to farmers before sowing and harvesting of the cane (farmer protection).

7.2.2 The need for consumer protection becomes more important if the commodity is essential to meet the nutritional requirements of the population, and there is substantial risk to consumers due to non-availability of the commodity at affordable price. In case of sugar, both these aspects have decreased over the years in India. Levy sugar, which used to ensure the availability of sugar at affordable price to BPL households, is still made available to that class. In fact, the estimates indicate that about 75-80 % of sugar consumption in India goes to industrial consumption (sweet and beverage). Thus, the need for ensuring availability of sugar at low prices has become limited.

7.2.3 From the sugar season 2010-11 onwards, the production of sugar has been surplus over the domestic requirements in the country (Figure 17). It appears that the cyclicity in sugar production has reduced (Department of Food and Public Distribution, Ministry of Consumer Affairs, Food and Public Distribution, Govt. of India). The Indian sugar balance sheet for SS 2018-19 has been reproduced in Table 18. Given the growth in sugar production, India is expected to remain self-sufficient in sugar in future. Thus, based on the consumer protection plea, the sugar should not be brought under essential commodity.

Figure 17: Production and consumption of sugar in India



Source: ISMA, new Delhi

Table 21: Indian sugar balance sheet for SS 2017-18

(Amount in lac tons)

Sl.	Particulars	Amount
1.	Opening stock as on 1st October, 2017	38.75
2.	Production	322
3.	Imports	1.84
4.	Total availability	362.60
5.	Internal consumption	255.00
6.	Exports	5.00
7.	Total off take	260
8.	Closing stock as on 30th September, 2018	102.60

Source: ISMA, New Delhi

7.2.4 Farmers' protection will be automatically taken care under a strategic mill and farmers partnership. Both mill and cane farmers are dependent on each other for their survival. It is a common apprehension that without any regulation, farmers may be exploited by mills both in terms of offtake and price of cane. The farmers have more flexibility in their operations as they may change the crop after one year, if the mills do not pay them remunerative prices. On the other hand, if the farmers do not cultivate cane, where the mills would go when they have already made an investment of crores of rupees in their plant and machinery? In this sense, the mills do not enjoy the flexibility of changing their operations. Sugar mills are bound to partner with farmers as no mill would like to keep the plant idle as cost of keeping the plant idle would be much more than paying a remunerative price of cane to farmers.

7.2.5 In contrast to sugarcane, milk is more perishable commodity, where majority of rural poor households are engaged in milk production and selling for their livelihood. Milk is also an important constituent of nutritional standard of population, whereas sugar is not included in nutritional diet. Like sugarcane, there is a lot of scope of value addition in milk. If milk is not included in ECA, the justification of sugar being included in ECA does not hold valid. Thus, policy

intervention for the future would require reconsidering the need to include sugar as essential commodity. This would enable the greater degree of freedom for the industry with protecting farmers' interest to a reasonable extent.

7.3 Policy environment for sugar industry in U.P

7.3.1 The key objectives of regulatory environment should be:

- As the economic viability of both farmer and mill are inter-dependent, ensuring mill viability should be a key objective for policy environment.
- The regulatory environment should promote level playing field for all stakeholders within the sector without any distortions related to cane pricing, sugar marketing, or restrictions on movement of molasses.
- The regulatory policy should strengthen and incentivize the farmer-mill relationship for achieving inclusive growth of the farmers and millers.

7.3.2 U.P. follows the SAP model with a fixed price of cane mandated by the state government. The SAP is higher than FRP declared by central government, and not linked to recovery percentage and sugar price. In this case, the entire risk of sugar prices is borne by the mills. SAP is a non-market driven incentive for cane cultivation in the state. An artificially higher SAP for cane does not promote a level playing field between farmers and the mills in the state. It also puts mills in U.P at a comparative dis-advantageous position in front of other mills located in major sugar producing states. With a higher cane price and subsequently higher cost of sugar production, how can and how long the mills in U.P can stand in front of mills located in Maharashtra and Karnataka? A higher SAP for cane has distorted the inter-crop profit parity in U.P. Therefore, it is a discrimination among the farmers cultivating sugarcane v/s wheat or paddy. How can the state policy discriminate among the farmers when the state has to ensure the social and economic upliftment of all the farmers, and not merely the cane farmers?

7.3.3 The mechanism of cane pricing based on SAP should be scrapped as it leads to economic unviability of sugar mills in the state, resulting in accumulation of cane arrears. It also causes distortion in the level playing field for all the mills at national

level. CACP also recommends that "*the system of announcing SAPs by the States should be done away with as it has lost its relevance and resulted in inefficient price policy*" (CACP, Price Policy for Sugarcane, 2017-18 season, August 2016).

7.3.4 We propose that either the cane price should be mutually set between the farmers and the miller (usually happens in contract farming), or cane price is linked to price of sugar and other primary by-products, and recovery rate (formula-based pricing). If cane price is set with joint consent of both farmers and mill, the availability of cane for a particular mill, would be dependent on the mill's ability to pay, and more importantly, mill's capacity to invest in developing farmers' relationship. The cane price would be an effective signal to farmers to adjust their cropping pattern (usually happens in all crops). In order to safeguard the interest of farmers, the minimum distance criteria between two mills has to abolish. Under this scenario, millers would enter into mutually acceptable contract with farmers, which would ensure assured offtake for farmers and assured supply of cane to mills. Millers would invest in increasing farm productivity and in developing long term relationship with farmers. There would be competition among the mills, resulting into more efficiency in the entire sector. The entry barrier for new mills or increasing the capacity of existing mills, would be less as farmers can renew the contract after the contract duration and can switch to other mill, if desire. Thus, there would be no need to government to allocate command area for each mill. This entire business model can work, if and only if there is sustained trust and confidence between farmers and mill. For this purpose, the sugar mills have to do a lot of relationship building activities with farmers, and even the mills have to invest a lot of money in this exercise initially. There is no room for taking opportunistic behaviour by any of the two parties.

7.3.5 The formula-based pricing can enable equitable distribution of profits and risk sharing between the farmers and millers. Since cane price is linked to sugar prices, it would give necessary signal to farmers to decide the cropping pattern. This cane pricing mechanism as suggested by Rangarajan Committee should be implemented in U.P. In this context, CACP has cautioned that "*transparency and reliability of ex-mill sugar and by-products prices is essential for implementing revenue sharing formula (RSF) and gain confidence of farmers"* (CACP, Price Policy for Sugarcane,

2017-18 season, August 2016). Under the current GST regime, no sugar mill can manipulate the sugar and other by-product prices, and therefore, transparency and reliability in revenue generated at mill level would be automatically ensured. Maharashtra and Karnataka, the two states producing half of country sugar, have already adopted RFS by enacting the law in 2013.

7.3.6 Another issue raised in implementation of RSF is how to compensate the farmers or mills, when in an extreme downward year, cane price based on RSF is lower than FRP (any way farmers have to be paid a minimum FRP). Here the CACP recommends that in order to meet the expenditure, when the actual payment to farmers based on RSF is lower than FRP, either a separate Sugar Price Stabilization Fund (SPSF) within the SDF could be created or Sugar Development Fund (SDF) could be used for the purpose. To support the SPSF or SDF, the mechanism of dual pricing of sugar can be introduced, where a higher price of sugar can be charged from corporate buyers/industry (sweet and beverage). For this purpose, a compulsory amount, as decided by the govt., in the form of contribution in SDF can be charged from the corporate buyers based on the amount and value of sugar used by them. Quantity and value of sugar used by the corporate buyers is again transparent based on GST returns filed by these buyers under the GST regime.

7.3.7 In a scenario where the state government does not agree cane pricing mechanism based either on mutual consent between farmers and millers or RSF, and still decides to announce SAP, then the difference between SAP and FRP should be paid directly to farmers by the state. Let state govt. should not force the mills to pay for a state announced subsidy to cane farmers by paying a very high price of cane.

7.4 Action points for state government

7.4.1 The state government in U.P should work on the following agenda, if the vibrant sugar industry has to be saved:

- Instead of providing post arrear subsidy or rehabilitation package to mills, with the help of central government, state government should ensure that large amount of cane price arrear to farmers should not occur. Thus, the state

should play pro-active role rather than working in a reactive mode as far as cane pricing is concerned.

- SAP of cane should be removed immediately.
- The state should start consultation with millers or their association to find out the best possible cane price method suitable to all.
- Let the state govt. should concentrate its resources to augment the cane productivity at farm level, and sugar recovery at mill level, rather than developing stringent regulatory regime for the sugar industry.
- Sugarcane is water intensive crop, and water is the scarcest natural resource. So, cane productivity per unit of water has to increase to make sugarcane as sustainable crop in U.P. State Govt. should partner the mills to promote drip irrigation in sugarcane to save the water and increase water use efficiency in cane.
- Let U.P government should take the lead role in developing a national consensus on removing sugar from ECA.
- In the era of de-regulation and ease of doing business, the sugar industry should also be free from state sponsored clutches. It would increase the morale of the millers to invest in the mill to increase the efficiency and also to diversify the operations into other high valued products from primary by-products.
- If state government is adamant to have SAP, then the difference between SAP and FRP should be paid directly to farmers by the state. Further, all sugar mills either cooperative or private, should be provided the assistance without any discrimination. Any bias in support system from state government would encourage inefficient units to continue operations, whereas the profitability of efficient mills would be hampered which sustain themselves on their own.
- The cane cooperative societies working in between mills and cane farmers must be professionalized to perform their expected role. This year, these societies are involved in measuring the cane area of the individual farmer. Majority of the farmers stated during our discussion that this work is being done in a very unscientific and primitive manner. It would create difficulties and commotion in preparing the cane calendar for individual farmer next

year. In fact, the farmers do not see any utility of these societies and would be happy if these are ceased.

- De-regulate the sale of molasses by withdrawing the reservation policy to country liquor. It would promote the production of ethanol, which can be used in fuel, thus lowering the burden of fuel imports in the country.

Appendix -1: Focus Group Discussion Guide for farmers

Welcome

Good morning/afternoon. My name is _____. I am talking to you on behalf of *India Institute of Management*, Lucknow which is an academic Institute. We are doing a research t understand the cultivation of sugarcane. The details of this discussions and your names will be kep confidential. Your participation in this study will not adversely affect you in any way, – so please fe free to express your opinions. This discussion will take about 30 to 40 minutes. I hope that you wi take part in this study.

Participant Details								
S. No.	**Name**	**Age**	**Education**	**Primary Source of Income**	**Alternative source of income**	**Source of Irrigation**	**Land holding**	**Average yield**
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Questions	**Probes**

Warm-up Questions	
1. How many crops do you grow in a year?	• Probe on crops, season and their yield. • Probe on utilisation of yield (Self- consumption, sell to trader, local mandi). If multiple responses, probe about the percentage that goes to each of the mentioned option. • Probe about prices fetched. • How critically you are dependent on sugarcane? (Share of income from sugarcane in the total agricultural income in a year?) • Reason for growing this crop; which are the competitive crops in the sense that if you don't grow this crop, what other options you have during the same season? • Probe in detail about reasons for cultivating this crop. The reason may be more profit, or low risk, or less cost of cultivation, in this crop as compared to competitive crop or not aware about cultivation practices of competitive crop. • Do you cultivate sugarcane in total land area or in partial area? Reasons?? • Are you aware about recommended practices of cultivation (quantity of seed, fertilizers, pesticides, row to row and plant to plant distance, method of application of fertilizers, seed treatment, irrigation timings, etc?) • Probe the level of gap between recommended practices and currently used by the farmers. Reasons for the gap in adoption of recommended practices (awareness, financial constraints, non-availability of inputs etc.) • What are the post-harvest losses? Try to estimate the same. • What are the risks in cultivating the sugarcane crop? (Weather, price, market or input). Prioritization of these risks in terms of their frequency of occurrence and impact on crop. • Where do you sell this produce and generally at what price?

Core Questions	
Input and supplies 1. What are your major needs/ opportunities in the areas of input cost, quality, and availability?	• Who are your most important suppliers and where are they located? • What do you buy from each of them and what quantity for an acre of farm? • In cropping season, how frequently do you buy these inputs? • Since how long are you associated with them? The reason for going to particular supplier- cheaper, more accessible, can be paid for later credit facility, better quality • Are there problems in obtaining some important inputs? Explain.
Market access and trends 1. Describe the relationships you have with these buyers.	• To whom do you sell your produce and why? Probe on location of buyers, reason for selling it to the person (Credit, relationship, accessibility) • Probe about the prices they give farmers for the yield. • Are there any product specifications? • How are the payments made? Probe about promptness of the payments. • What has been the demand of the crop for last 2-3 years? • Probe about the trends they see.
2. What do you see as your main needs/opportunities in accessing markets? 3. How strong is the market for your products/services right now?	
Finance 1. Where do you go when you need money for your business?	• What are your primary sources of finances and why you opt for particular source? Do you have need for additional unaddressed financing need? If so, what would it be used for? • Probe about repayment rates in the sector, risk management, amount etc.
Investment decisions	

Appendix - 2

Questionnaire for Farmer

A. Basic Profile:

1- Name: _____

1. (a) Village: _____ (b) Block: _____
   (c) Tehsil: _____ (d)District: _____
2. Education: _____ *(Illiterate-1, Primary-2, Upper Primary-3, High School-4, Intermediate-5, Graduate-6, Post Graduate-7, Technical Education-8)*
3. How long you are cultivating sugarcane: _____
4. (a) Have you ever taken sugarcane related training? _____ *(Yes-1, No-2)*
   (b) If yes, which type of training you have taken: ____
   (production related-1, waste minimization-2, post-harvest management-3, marketing-4)
   (c) Training period _____ *(1day-1, 2day -2, one week-3)*
   (d) Organizing agency: _____
   (KVK-1, Cooperative society-2, NGO-3, Sugar mills-4, other govt. organization-5)

5.

Sl.no.	**Land**	**Area *(in acre)***
	Own land holding	
	Lease in land	
	Total Cultivated land (a+b)	

6.

6. Source of irrigation: _____*(canal-1, tube wells/ pump set-2, tank-3, other sources-4)*

B. Cropping pattern

1. Area under different crops

Sl. no.	Crops grown	Area *(acres)*		
		2015-16	**2016-17**	**2017-18**
	Kharif crops			
	Rabi/winter/cold season crops			
	Zaid crop			
	Annual crop (Sugarcane)			

2. Do you take intercropping with sugarcane (yes/no)
3. If yes,

Sl.	Crop	Area (acre)

C. Cost of production of Sugarcane (Rs./acre)

C1. Seed preparation cost

1.1 Labour cost

Sl. no	Labour	Number	Amount
1	Family		
2	Outside		

1.2 Pesticide cost_____ (Rs.)
1.3 Transportation cost (if bought seed form outside) _____ (Rs.)
1.4 Cost of Sugarcane _____ (Rs.)

C2. Land preparation cost

2.1 Labour

Sl.no	Labour	No.	Amount
1	Family		
2	Outside		

2.2 Machinery cost

Sl. No.	Nature	Amount
1	Rent	
2	Fuel	

C3. Sowing & after sowing operation (Land Labelling) cost

3.1 Machinery cost

Sl. No.	Nature	Amount
1	Rent	
2	Fuel	

C4. Irrigation cost

1. No. of Irrigation _____
2. Labour (per irrigation)

Sl.no	Labour	Number	Amount
1	Family		
2	Outside		

3.

3. Pump set (per irrigation)

Sl. No.	Nature	Amount
1	Rent	
2	Fuel	

4.

C5. Fertilizer &Manure cost

Sl. No.	Name	Quantity	Amount
1	Urea		
2	DAP		
3	Potash		
4	Other (compost)		

C6. Pesticides cost

Sl. No.	Name	Quantity	Amount
1			
2			
3			
4			

C7. Inter – cultural operation

7.1No. of times _____
7.2 Labour (per time)

Sl.no	Labour	Number	Amount
1	Family		
2	Outside		

C8. Harvesting & Loading cost

Sl.no	Labour	Number	Amount
1	Family		
2	Outside		

3	Harvester rent (if harvesting through machine)	

C9. Transportation cost

Sl. No.	Nature	Amount
1	Vehicle Rent	
2	Fuel	
3	Bullock cart	

C10. Rent paid for lease – in land_____ (Rs. /acre)
C11. Land Revenue & Tax_____ (Rs. /acre)

D. Assets

Sl. No.	Asset name	Purchase year	Purchase value
1	Tractor		
2	Trolley		
3	Cultivator		
4	Harrow		
5	Pump set		

E. Sale of Sugarcane

1. Total Production_____ (qt.)
2. Total sale

Sl. No.	Place of sale	Quantity (qt.)	Rate (Rs./qt.)
1	Sugar mill		
2	Private trader		
3	Gur making unit		

1.4 Payment detail

Sl. No.	Payment	Amount (Rs.)
1	Payment received from sugar mill	
2	Arrear	

1.5 Arrear accumulated since last 3 years. _____
1.6 Would you be interested to increase area under sugarcane?

- If yes, why_____
- If no, why_____

F. Variety

1.1 Name of variety_____
1.2 How long you are cultivating this variety _____ (in year)
1.3 Reason for cultivation this variety

Sl. No.	Reason	Please tick
1	High production	
2	High sugar recovery	
3	Disease resistance	

1.4 Would you like to shift another verity (Yes-1, No-2)
1.5 If yes

a) Which variety _____

b) Reason _____

G. Borrowings

1. Loan taken for sugarcane cultivation. _____ (Yes-1, No-2)
2. If yes

Sl. No.	Amount	Source	Interest rate
1			
2			
3			

Appendix – 3
Questionnaire for Sugar Mill

(A)Basic Profile:

1. Name of the Mill: ----------
2. Address: ----------
3. Year of establishment:----------
4. Private / Cooperative / Corporation
5. Products : Sugar ( ), Distillery ( ), Power ( ), Molasses ( ), Bagasse ( )

(B) Cane procurement:

1. Place of procurement: A) at Mill, (B) Center (C) Farmers fields.
2. Plant Capacity:----------
3. No of days in operation: ---------- (Days) during the last three years.
4. Duration (period):
5. Cane purchased (Quantity)----------
6. Catchment area: ----------
7. No of farmers: ----------
8. Payment to farmers:

(Amount in crores Rs)

Year	Cane price payable	Cane price paid	Cane price Arrears
2013-14			
2014-15			
2015-16			
2016-17			

2017-18			

(C)Recovery rate:

1. Average recovery rate (%): --------

2. Month-wise recovery rate (%)

Sl.	M Month	Recovery rate (%)

(D) Cost of sugar manufacturing:

(Amount in crores Rs)

Sl.	**Particulars**	**2015-16**	**2016-17**	**2017-18**
1	Cane (raw material)			
2	Manufacturing material			
3	Power and fuel			
4	Packing material			
5	Repair and maintenance			
6	Salary and wages			
7	Administrative expenses			

8	Selling and Distribution			
9	Other expenses			
10	Interest on working capital			
11	Depreciation			
12	Taxes			
13	Total cost			

(E) Sugar Production:

(ton)

Sl.	**Particulars**	**2015-16**	**2016-17**	**2017-18**
1	Opening stock			
2	Production			
3	Sale			
	Domestic			
	Export			
4	Closing stock			

(F) Price of Sugar:

Grade	**Production (ton)**			**Price (Rs./ton)**		
	2015-16	2016-17	2017-18	2015-16	2016-17	2017-18

(G) Cost of Production of Power (please fill if applicable)

(Amount in crores Rs)

Sl.	**Particulars**	**2015-16**	**2016-17**	**2017-18**

1	Raw material			
2	Manufacturing material			
3	Power and fuel			
4	Repair and maintenance			
5	Salary and wages			
6	Administrative expenses			
7	Selling and Distribution			
8	Other expenses			
9	Interest on working capital			
10	Depreciation			
11	Taxes			
12	Total cost			

(H) Realization from Power

Sl.	**Particulars**	**2015-16**	**2016-17**	**2017-18**
1	Production (MW)			
2	Self-consumption (MW)			
3	Quantity sold (MW)			
4	Amount receivable (Rs. Crores)			
5	Amount received (Rs. Crores)			
6	Arrear amount (Rs. Crores)			

(I) Realization from Bagasse (please fill if applicable)

Sl.	**Particulars**	**2015-16**	**2016-17**	**2017-18**
1	Quantity sold (quintals)			
2	Amount received (Rs. Crores)			

(K) Realization from Molasses/Ethanol/Alcohol (please fill whatever is applicable)

Sl.	Particulars	2015-16	2016-17	2017-18
1	Quantity sold (KL)			
2	Amount received (Rs. Crores)			

(L) Value of Assets (Rs. Crores) :

(a) Machinery cost (when purchased) :

(b) Land cost (when purchased) :

(M) CSR Activities

(Amount in Rs. Crores)

Sl.	Particulars	2015-16	2016-17	2017-18
1				
2				
3				
4				

(N) Cane Development Activities

(Amount in Rs. Crores)

Sl.	Particulars	2015-16	2016-17	2017-18
1				
2				
3				
4				

Name and Signature of authorized person Seal of the company