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RE-VISITING AGRICULTURAL POLICIES IN THE LIGHT OF GLOBALISATION EXPERIENCE: THE INDIAN CONTEXT

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Is Farm Profitability Declining in India?: The Case of Sugarcane Crop

I

INTRODUCTION

The major aim of this paper is to find out the real status of profitability in sugarcane cultivation in India and not to suggest increased sugar prices for better remuneration from its cultivation. India has been witnessing an unprecedented unrest among the sugarcane farmers of the major growing areas. There have been instances wherein agricultural labourers went on strikes demanding for enhanced wages and farmers agitating in an organised manner for higher output prices (see, Oommen, 1971; Swamy and Gulati, 1986). However, when the news of the suicide of sugarcane crop growers of Tamil Nadu hit the country's headlines in 2012, the entire farming community was driven to a state of shock. And when a sugarcane farmer in Maharashtra was shot dead in a police firing during the same year, the entire country was clueless as to what is happening in the fields of the country's most viable crop (Narayanamoorthy and Alli, 2013). Compounding to the distressed scenario, the sugarcane farmers of Andhra Pradesh unanimously contemplated to go in for a crop holiday. Although the issue of profitability in crop cultivation has been intensively discussed in the context of agrarian crisis in the recent years (Deshpande, 2002; Government of India, 2007; Narayanamoorthy, 2007; Reddy and Mishra, 2009; Deshpande and Arora, 2010; Mahendra dev and Rao, 2010), this unique and unprecedented incidents are never heard in the history of Indian farming. Why are the sugarcane farmers in these states which are incidentally the major sugarcane growing regions of the country in an unparalleled turmoil? What is wrong with the sugarcane crop which is universally claimed to substantially augment the farmers' income? Under what circumstances were the sugarcane farmers prompted to commit suicide or agitate? Is it due to the perpetual erosion of their income from sugarcane crop cultivation? Could paucity of water and absence of assured irrigation in these water stressed regions be the reason behind such turmoil? In the recent years, these factors have been silently creating turbulences in the Indian farming sector, but the likelihood that any of these factors being pivotal towards the ongoing depressing scenario can be known only by a thorough investigation which is attempted in this study. But before that it becomes pertinent to know as to what is the genesis of this

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abominable scenario? Let us have a look at how the events unfolded before the issue assumed serious propositions.

The sugarcane farmers from the major sugarcane producing states have been relentlessly lamenting that after spending about 40 per cent of their cultivation cost on harvesting, they seldom get adequate returns from the mills. They have been making repeated requests to increase the procurement price for the crop. During the sugar season 2012-13, in the state of Maharashtra which is one of the largest sugarcane growing regions of the country, the sugarcane farmers demanded about Rs. 4,500 per tonne from sugar factories. The latter reportedly resisted to the formers' demands and were ready to buy sugarcane only between Rs. 2,100 and Rs. 2,300 per tonne. In response to such a distressed situation, the Centre came forward with a hike in FRP for the season 2013-14 to the tune of about Rs. 40 per quintal over the last year's price of sugarcane. However, various farmers' organisations expressed their discontentment over such a hike as they stated that the final payments which comes to around Rs. 2100 per tonne is arrived at by deducting the cost of transportation and harvesting, barely enough to cover their cost of cultivation. At the backdrop of this situation, does it eventually mean that the rising cost of cultivation is afflicting these farmers? Is the cost of cultivation of sugarcane rising over a period of years? What is the trend in the cost of cultivation across the major producing states in India? Is sugarcane cultivation not remunerative to the cultivators across different states?

Quite a few studies have analysed the economic aspects of sugarcane cultivation in India using both primary and secondary data. While Dhawan (1968) found that greater irrigation coverage has rendered sugarcane crop remunerative in Uttar Pradesh, Ramasamy and Kumar (2011) have identified increased demand for human labour and high wage rate[1] have escalated the cost of cultivation of sugarcane crop in its major growing areas resulting in negative returns. Utilising farm level data from Maharashtra, Narayanamoorthy (2004) found that sugarcane cultivated under drip method of irrigation was highly profitable as compared to the same crop cultivated under flood method of irrigation. While studying the agricultural growth in the context of technology fatigue, a study based on cost of cultivation data specific to Maharashtra state showed drastic reduction in profitability of sugarcane between 1975-76 and 2001-02 (Narayanamoorthy, 2007). Despite the fact that the pattern of cultivation of sugarcane varies from one state to another, Vishandass and Lukka (2013), by taking the average data of various states from the cost of cultivation survey for the period from 2000-01 to 2010-11 asserted that "Gross returns per hectare as percentage of paid out cost plus family labour, i.e., (A2+FL) was the highest in case of sugarcane" (p.9). Although the sugarcane cultivation has been in intensive discussion for various reasons including its profitability in the recent years, there seem to be not many studies available utilising cost of cultivation data of various states covering longer period with a specific focus on its returns.[2] Cost of cultivation survey data published by the Commission for Agricultural Costs and Prices (CACP) contains rich information on the cost and output on various crops on a

temporal basis, which can throw bright signals on the trends in income and expenditures of crops cultivation over a period (see; Rao, 2001; Sen and Bhatia, 2004).[3] Keeping this in view, an attempt is made in this study to find out the trends in profitability of sugarcane crop cultivated in six different states utilising the cost of cultivation survey data published by the Commission for Agricultural Costs and Prices (CACP) from 1973-74 to 2010-11.

This study is organised into four sections. Following the introductory section, data sources and methodology followed for this study are presented in section two. Utilising the data on cost of cultivation survey, the profitability of sugarcane crop in high, medium and low productivity states are analysed in section three. The last section presents the findings and policy pointers.

II

DATA AND METHODOLOGY

Secondary data covering period from 1950-51 to 2010-11 has been entirely used for carrying out this study. Although the main objective of the study is to find out the profitability of sugarcane crop cultivation, it also studies the overall state of sugarcane crop cultivation in India. The data utilised for this study has been compiled from various government sources. For studying the state of sugarcane cultivation in India, related data has been culled and compiled mainly from publications such as *Agricultural Statistics at a Glance* and the *Area and Production of Principal Crops*, both published by the Ministry of Agriculture (MOA), Government of India and *Handbook of Statistics on Indian Economy*, published by Reserve Bank of India. For studying the profitability of sugarcane crop, all the cost and income related data on sugarcane cultivation has been compiled from the CACP's publication on *Report on Price Policy for Sugarcane* of different years and also from its website. Our major objective of the study is to find out whether the profitability of sugarcane varies with the states having high and low productivity of the crop. Therefore, based on the productivity data of TE 2010-11[4], a total of six states belonging to the category of high area with low productivity (Uttar Pradesh), medium area with high productivity (Maharashtra, Tamil Nadu and Karnataka) and low area with medium productivity (Haryana and Andhra Pradesh) have been considered for studying the aspect of profitability. CACP has been using nine different cost concepts (A1, A2, A2+FL, B1, B2, C1, C2, C2* and C3) for measuring the economics of various crops cultivation. For this study, cost C2 has been considered for computing the profitability of sugarcane as it covers all the variable and fixed costs needed for crop cultivation. In order to study whether the profitability of sugarcane cultivated in different states is increased or not, all the cost and income related data of the crop have been converted into constant prices using CPIAL deflator at 1986-87 prices. Profit level of the crop is computed by deducting the cost C2 from the value of output.

III

TRENDS IN PROFITABILITY IN SUGARCANE

The farmers from the traditionally sugarcane growing states of Maharashtra and Uttar Pradesh have been vehemently demanding for a higher price for the sugarcane crop in the recent years. The sugarcane farmers of Tamil Nadu, Andhra Pradesh and Haryana also followed the suit. For quite some time now, the sugarcane farmers from different parts of the country have also been urging their respective state governments to raise the sugarcane price as suggested by the National Commission on Farmers headed by M.S. Swaminathan, which recommended a price of 50 per cent more than the cost of cultivation (cost C2). Because of such repeated demands of the sugarcane farmers, the government hiked the Fair and Remunerative Price (FRP) from Rs. 170 per quintal in 2012-13 to Rs. 210 per quintal for the sugar year 2013-14. However, it was reported that the sugarcane farmers were not satisfied with such a hike and their agitation saw no respite. Why all of a sudden the country's sugarcane farmers have come about with such demands? Why such a hike in FRP could not contain the agitation of the sugarcane farmers? The sugarcane farmers of these states argued that the steep escalation in the cost of cultivation demands a higher price for the sugarcane crop. Is this claim genuine? Has the sugarcane crop been profitable to the farmers as has been widely believed? Or are profits squeezed similar to their foodgrains counterparts? All these can be examined only by studying as to whether or not the farmers have reaped profits over the years, which forms the central focus of this paper. In order to answer these questions, cost and income related data on sugarcane crop have been used from the cost of cultivation survey published by the CACP covering period from 1973-74 to 2010-11, which are presented in the following sections.

IV

RETURNS FROM SUGARCANE IN HALP STATES

The statistics on cost C2, value of output (VOP) and profit (all at 1986-87 prices) for sugarcane cultivation belonging to HALP state of Uttar Pradesh from 1973-74 to 2010-11 is presented in Table 1. Uttar Pradesh state which accounts for 43.64 per cent of the total area under sugarcane in 2010-11 is by far the largest sugarcane growing state of the country (see, Government of India, 2012a). Uttar Pradesh forms the focus of our study of analysing the profitability of sugarcane crop which is characterised as the largest sugarcane acreage with low crop yield. The state has irrigation coverage of 93 per cent in 2009-10 which eventually indicates the state's discrimination in favour of sugarcane crop in allocating this scarce vital input among crops. Irrigation is one such vital input that can bring about a substantial difference in crop returns, which is also proved by many credible studies. And for a crop such as sugarcane which is an extremely thirsty crop, a greater irrigation coverage enhances

the prospects of a noticeable increase in the net income per hectare. Studies by Rao (1965) and Dhawan (1968) have clearly demonstrated that the largely irrigated sugarcane crop is remunerative in Uttar Pradesh. In our study, by employing an entirely newer data set from CACP, let us now analyse as to whether the sugarcane crop continues to be remunerative to the farmers of Uttar Pradesh or not. The results reveal that the sugarcane farmers of Uttar Pradesh are reaping profits (value of output minus cost C2) from sugarcane cultivation in most time points (period) considered for analysis. Although cost C2 has sharply increased from Rs. 7255/ha in 1973-74 to Rs. 11844/ha in 2010-11, the VOP from sugarcane crop has moved at a relatively faster pace from Rs. 9853/ha to Rs. 17859/ha during this period, outstripping the increase in cost C2. This has enabled the farmers to reap decent profits from sugarcane (see, Table 1). The profits from sugarcane crop cultivation is found to have risen from Rs. 2598/ha in 1973-74 to Rs. 6016/ha in 2010-11. This finding then begs to question as to why then the sugarcane farmers of the state are making noise of not getting adequate profits from the crop? When the data was put to keen observation, it was indeed worrisome to note that the profits realised by the sugarcane farmers of Uttar Pradesh were not consistent throughout the period of analysis. In each of the time periods with although the value of agriculture output is found to have outstripped the cost C2 considerably, yet profits from sugarcane crop fluctuated every alternate year.

TABLE 1. PROFITABILITY IN SUGARCANE CULTIVATION IN HALP STATE, 1973-74 TO 2010-11

(*Rs./ha at 1986-87 prices*)

	High Area with Low Productivity (HALP) state		
	Uttar Pradesh		
Year	Cost C2	VOP	Profit (VOP-C2)
(1)	(2)	(3)	(4)
1973-74	7255	9854	2598
1977-78	5861	7134	1272
1982-83	5301	8679	3378
1987-88	6797	10544	3747
1991-92	6766	9895	3129
1995-96	8843	11565	2722
1999-2000	8982	11936	2954
2004-05	10608	15770	5162
2009-10	10971	24983	14011
2010-11	11844	17859	6016

Sources: Computed using data from CACP (various years).

Notes: VOP – value of output; Due to non-availability of data for some specified years, data from the nearest point is used for the analysis.

The fluctuation in profit was in the nature of a rise in one year and a fall in the following year. For instance, profits from sugarcane during 1991-92 was Rs. 3129/ha but fell to Rs. 2722/ha in 1995-96 and again rose to Rs. 2954/ha during 1999-2000. This depressing inconsistency in profits marks the onset of the ACP (1995-96 to 2010-11). Fluctuation in profit of such a scale does have a serious ramification on farmers' income, because an erosion of cultivators' profit margin every alternate year

almost wipes out whatever profit margins they enjoyed in the previous time period. It can be noted that the fluctuation in profits is more pronounced in the post-1990s than in pre-1990s. Fluctuating cost C2 could be one reason for such a trend. It is observed that from 1991-92 onwards the cost C2 is found to be rising consistently without showing any signs of respite in any of the time periods. The cost C2 which was Rs. 6766/ha in 1991-92 rose unimaginably to Rs. 11844/ha in 2010-11, an increase of Rs. 5111/ha. It is astonishing to note that the profits from sugarcane crop which were hovering between Rs. 2954 – 5160/ha between 1999-2000 and 2004-05, jumped all of a sudden to a record high of Rs. 14011/ha in 2009-10. Have the profits from sugarcane really improved during 2009-10 or is it an inflated bubble? The following year that is, during 2010-11, the profits declined sharply to Rs. 6016/ha, sparking off speculation about the validity of CACP data.[5]

V

RETURNS FROM SUGARCANE IN MAHP STATES

As mentioned earlier, states like Maharashtra, Karnataka and Tamil Nadu are considered as medium area with high productivity states (MAHP) in this study. These states together accounted for 35.04 per cent of total area of sugarcane of which Maharashtra state alone accounted for about 20 per cent of the total area in 2010-11 (see, Government of India, 2012a). The yield from sugarcane crop is found to be higher in each of these three states in spite of allocating a relatively lesser area for sugarcane crop cultivation. Hence studying the profitability of sugarcane crop in states with medium area and high productivity forms our next task. Although caught in the midst of a severe regional hydro-politics, the sugarcane crop in each of these three states has an irrigation coverage of 100 per cent in 2009-10. Albeit the sugarcane crop is not a principal crop in any of these three states, yet a cent per cent irrigation coverage for the crop indicates that the sugarcane crop is given a preferential treatment in the allocation of the scarce water resource in relation to other competing crops. From the point of view of acreage although these states have allocated a lesser area for the sugarcane crop and are far behind Uttar Pradesh, yet the per hectare yield is found to be robust in these states (Government of India, 2012a). If greater irrigation coverage has been a determining factor for the higher yields in these three states, then the obvious question is as to whether higher yields resulted in augmenting the income of these sugarcane farmers?

An impressive picture emerges from Table 2 which illustrates that the sugarcane farmers of Maharashtra are enjoying a positive return over cost C2 in all the time points taken up for the study. However, an intense observation into the profitability trend unravels the genuineness of this impressive picture. The profit over cost C2 is found to have fluctuated devastatingly throughout the period of analysis and more particularly between 1995-96 and 1999-2000 where the profits are observed to be hovering between Rs. 2650/ha and Rs. 1600/ha. The prime cause behind this sharp

fluctuation is the plummeting of VOP from sugarcane crop cultivation from Rs. 17507/ha to Rs. 16906/ha with a steep rise in cost C2 from Rs. 14856/ha to Rs. 15306/ha. The period 2009-10 is subject to astonishing trend. The profit from sugarcane was Rs. 8071/ha during 2004-05 which zoomed to Rs. 16596/ha during 2009-10 and then it declined drastically to Rs. 8678/ha during 2010-11.

TABLE 2. PROFITABILITY IN SUGARCANE CULTIVATION IN MAHP STATES, 1973-74 TO 2010-11

(*Rs./ha at 1986-87 prices*)

	Medium Area with High Productivity States (MAHP)								
	Cost C2			VOP			Profit (VOP-C2)		
Year	MAH	KAR	TN	MAH	KAR	TN	MAH	KAR	TN
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1973-74	13171	DNA	DNA	22752	DNA	DNA	9580	DNA	DNA
1977-78	12142	DNA	DNA	16866	DNA	DNA	4725	DNA	DNA
1982-83	14940	7698	12347	15081	17402	17925	141	9704	5578
1987-88	13296	11014	12004	17757	18673	19410	4461	7659	7406
1991-92	12588	DNA	DNA	15688	DNA	DNA	3100	DNA	DNA
1995-96	14856	14206	13748	17507	27935	26125	2650	13729	12378
1999-2000	15306	14224	21654	16906	22138	29192	1600	7914	7538
2004-05	21095	17461	18270	29166	27318	22836	8071	9857	4566
2009-10	24816	17969	18974	41412	40104	31860	16596	22135	12886
2010-11	22872	15297	20046	31549	30559	33856	8678	15261	13810

Sources: Same as in Table 3.

Notes: MAH – Maharashtra; KAR – Karnataka; TN – Tamil Nadu; VOP – value of output; DNA – data not available; Due to non-availability of data for some specified years, data from the nearest point is used for the analysis.

Further, our in-depth analysis deciphered that Maharashtra is the only state in our study that has recorded negative returns during the agrarian crisis period. Why only the farmers of Maharashtra are found to be incurring continuous negative returns from 2000-01 to 2003-04?[6] The CACP data explicitly reveals that although the cost of cultivation of sugarcane has been rising for all the states during the period of analysis, it is found to have risen at an alarming rate in case of Maharashtra state. It is observed that during the period of continuous negative returns from sugarcane cultivation, the cost C2 has risen by about 25 per cent while the VOP has risen only by merely about 14 per cent. Another plausible reason for the negative returns from sugarcane crop in Maharashtra is the dwindling yield from the crop that was observed during the aforementioned period. Leaving no room for a steady flow of income, an unanimous resentment among the sugarcane cultivators across the state is indeed obvious.

Shifting our focus from Maharashtra, let us now be exploring the costs and profitability trends emerging from the sugarcane fields of Karnataka and Tamil Nadu. Table 2 shows that unlike the Maharashtra's farmers, sugarcane farmers of Karnataka and Tamil Nadu were able to reap relatively higher profits in all the seven time points for which the data was available. What is disappointing to note is that these profits are not at all increasing steadily the over the years (see, Acharya, 1992). The profits from the sugarcane crop are observed to be extremely fluctuating for the farmers of Karnataka when the returns over cost C2 fluctuated between Rs. 13729/ha in 1995-96

to Rs. 7914 in 1999-2000. Similar to Maharashtra state, the period 2009-10 stands out with a spectacular yet surprising rise in profit by Rs. 12278/ha over its preceding time period.

The profits are equally fluctuating for sugarcane farmers of Tamil Nadu where it declined sharply from Rs. 12378/ha in 1995-96 to Rs. 7538/ha in 1999-2000. Although the VOP from sugarcane increased at a faster pace than cost C2, yet a persistent increase in cost eluded the sugarcane farmers of these three states of a steady flow of profits from sugarcane crop. A very crucial issue comes out from this analysis on MAHP states is that the sugarcane farmers of Maharashtra, Karnataka and Tamil Nadu have suffered sharp decline in profits from the crop between 1995-96 and 1999-2000 in spite of a cent percentage coverage of irrigation. This sends out a clear signal that water is a supplementary farm input and not the only farm input that can contribute to enhance farm profit. It also suggests that if escalating price of farm inputs are not contained, then even the complete irrigation coverage will fail to provide the desired profitability to farmers in the future.

VI

RETURNS FROM SUGARCANE IN LAMP STATES

So far in this study we have analysed the profitability trends of states that have a higher and medium productivity of sugarcane. While the results of the profitability analysis till now seem to be not very encouraging, we will now proceed further with our analysis to the states of Haryana and Andhra Pradesh which have been selected as the states having a relatively lower area with medium productivity of sugarcane crop. These two states together account for 5.73 per cent of total area under sugarcane in 2010-11 and possess an irrigation coverage of 92 to 99 per cent (see, Government of India, 2012a). Similar to the high and medium productivity states, a continuous rise in cost C2 resulting in fluctuating profits has scarred the face of the sugarcane economy of Haryana and Andhra Pradesh. Table 3 reveals that the sugarcane crop is profitable to the farmers of Haryana in all eight time points, whereas the farmers from AP have reaped profit in 8 out of 9 time points. However, as was observed in case of the other states that were taken up for study, the profits reaped by the sugarcane farmers of these states also did not move in a definite path. Profits proved to have widely fluctuated to sugarcane farmers of Haryana between 1991-92 and 1999-2000, where it varied from Rs. 6020/ha to Rs. 5397/ha. It is observed that during this period the cost C2 sharply escalated from Rs. 9030/ha in to Rs. 15373/ha.

Fluctuating profits did not spare the sugarcane farmers of Andhra Pradesh too where one notices a marked variation in profits of Rs. 4004/ha in 1995-96 and Rs. 1634/ha in 1999-2000. Although there occurred a marginal slump in cost C2 from Rs. 16367/ha in 1995-96 to Rs. 15501 in 1999-2000, a drastic decline in the VOP from Rs. 20371/ha to Rs. 17135/ha during the same period proved to be pivotal for such damaging profits. A sharp escalation in cost C2 and its detrimental effect on profits during 1995-96 and 1999-2000 forms the basic characteristic of all the six sugarcane

TABLE 3. PROFITABILITY IN SUGARCANE CULTIVATION IN LAMP STATES, 1973-74 TO 2010-11

(*Rs./ha at 1986-87 prices*)

	Low Area with Medium Productivity (LAMP) States					
	Cost C2		VOP		Profit (VOP-C2)	
Year	HAR	AP	HAR	AP	HAR	AP
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1973-74	DNA	DNA	DNA	DNA	DNA	DNA
1977-78	DNA	12825	DNA	12661	DNA	-164
1982-83	5251	12278	8449	13623	3198	1344
1987-88	5805	12849	11315	14636	5510	1787
1991-92	9030	13899	15050	16362	6020	2463
1995-96	12002	16367	17728	20371	5726	4004
1999-2000	15373	15501	20770	17135	5397	1634
2004-05	13990	15490	21382	18531	7391	3041
2009-10	17076	20109	34007	28461	16931	8353
2010-11	15376	22574	22030	29545	6654	6971

Source: Same as in Table 4.

Notes: HAR – Haryana; AP – Andhra Pradesh; others the same as in Table 4.

growing states taken up for study. Surprisingly, the profit realised by the sugarcane farmers has not increased consistently even during 2000s in any of the six states selected for the analysis. It becomes very much evident that the period 1995-96 marks the onset of the ACP when the grave issue of discontentment among the sugarcane farmers across the country began to rear its head. Were the sugarcane farmers across the country with their desperate loud and clear wake-up call trying to hint at this pitiable scenario of inconsistent profits?

VII

NUMBER OF YEARS PROFIT REAPED FROM 1973-74 TO 2010-11

Besides analysing the trends in profitability of sugarcane cultivation, we have looked at how many times (years) sugarcane cultivators are able to reap profit during the entire period of analysis from 1973-74 to 2010-11 in all the six states considered for the analysis. Some studies have pointed out that the profitability of foodgrains and non-foodgrains crops have been witnessing a depressing trend especially from the early 1990s (see, Narayanamoorthy, 2006; 2006a; 2007 and 2013). Therefore, attempt is also made to find out whether any wide difference exists in the profitability of sugarcane before and after 1990-91 among the selected states. As considered earlier, here too the VOP and cost C2 are considered for computing profitability in sugarcane cultivation. Table 4 shows the ratio of VOP to cost C2 for different time periods for high, medium and low productivity states. If the ratio is more than 1.30, it means that the farmers are reaping appreciable profit from sugarcane cultivation and if the ratio lies within the range of <1.30 to >1.00 then farmers are realising moderate profit. If the ratio is less than one, then it means that sugarcane farmers are not reaping profit or possibly the profit is squeezed considerably to the extent incurring losses.

TABLE 4. NUMBER OF YEARS PROFIT REAPED OR LOSS INCURRED BY THE SUGARCANE FARMERS FROM 1973-74 TO 2010-11

State's category	States	Green revolution period (1973-74 to 1990-91) Ratio VOP to C2			Agrarian crisis period (1991-92 to 2010-11) Ratio VOP to C2			Entire period of analysis (1973-74 to 2010-11) Ratio VOP to C2		
		> 1.30	< 1.30	<1.00	> 1.30	< 1.30	<1.00	> 1.30	< 1.30	<1.00
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
HALP	Uttar Pradesh	14/16 (87.50)	2/16 (12.50)	0/16 (0.00)	19/20 (95.00)	1/20 (5.00)	0/20 (0.00)	33/36 (91.66)	3/36 (8.33)	0/36 (0.00)
MAHP	Maharashtra	8/14 (57.14)	6/14 (42.85)	0/14 (0.00)	4/18 (22.22)	8/18 (44.44)	6/18 (33.33)	12/32 (37.50)	14/32 (43.75)	6/32 (18.75)
	Karnataka	9/9 (100.00)	0/9 (0.00)	0/9 (0.00)	16/16 (100.00)	0/16 (0.00)	0/16 (0.00)	25/25 (100.00)	0/25 (0.00)	0/25 (0.00)
	Tamil Nadu	4/4 (100.00)	0/4 (0.00)	0/4 (0.00)	10/14 (71.42)	4/14 (28.57)	0/14 (0.00)	14/18 (77.77)	4/18 (22.22)	0/18 (0.00)
LAMP	Haryana	6/7 (85.71)	1/7 (14.28)	0/7 (0.00)	13/16 (81.25)	3/16 (18.75)	0/16 (0.00)	19/23 (82.60)	4/23 (17.39)	0/23 (0.00)
	Andhra Pradesh	4/11 (36.36)	6/11 (54.54)	1/11 (9.09)	2/16 (12.50)	13/16 (81.25)	1/16 (6.25)	6/27 (22.22)	19/27 (70.37)	2/27 (7.41)

Source: Computed using data from CACP (various years).
Notes: Figures in brackets are percentage to total number of years.

As noted earlier in the profitability analysis, except in Maharashtra, the ratio of VOP to cost C2 is found to be more than one (>1.00) in more number of years in all the other five states including the medium and low productivity states. Of the total 32 years (from 1973-74 to 2010-11)[7] for which we have got data for Maharashtra, farmers were able to reap profit for 26 years (81.25 per cent). That is, of the total 32 years the farmers of Maharashtra have not reaped any appreciable profits in relation to cost C2 in six years (18.75 per cent); this has occurred mainly during the ACP. Such a reduced income is not observed in any of the remaining five states considered for the analysis. Farmers from Uttar Pradesh, which is considered as one of the low productivity states for the analysis, is found to have made profit in all the years taken up for study. For instance, out of 36 years considered for the analysis, the ratio of VOP to cost C2 turned out to be more than one (>1.00) in 36 years for Uttar Pradesh, which is 100 per cent of total number of years. In a similar fashion, the farmers in other states like Tamil Nadu, Karnataka and Haryana have also reaped profit of 100 per cent of time periods considered for the analysis. Has the profitability varied between the green revolution period (1973-74 and 1990-91) and agrarian crisis period (1991-92 to 2010-11)? We had hypothesised that the farmers would have reaped profit less number of years during the agrarian crisis period (ACP) owing to the increased cost of cultivation. However, as per our analysis except the farmers of Maharashtra and Andhra Pradesh, the farmers of all the other states have not suffered any losses in the ACP which is indeed contradictory to the relentless battle being waged by the sugarcane farmers with respect to rising cost of cultivation and dwindling price for their agricultural produce. The fact that needs to be reiterated here is that the ratio of VOP to cost C2 is no doubt expected to give a true picture of the profitability of the crop. But this is not the case in our analysis. This is because

although as per the analysis almost all the states exhibit a ratio that is greater than one, yet as mentioned previously a closer look at the data would reveal that the profits in each year for all the states has in fact fluctuated dramatically. A sharp fluctuation in profit across the study period does explicitly put forth the stark reality that sugarcane farmers across the major growing states are not getting consistent remunerative prices. On the whole, taking last decade data from 2000-01 to 2010-11, the fluctuations apart, there was a trend increase in profitability that shows a steep decline in 2010-11. But this seems to be largely the fudged data for 2009-10! If the spike in profits in 2009-10 is ignored, the trend increase in profits remains, leaving the question as to what explains the growing concern of sugarcane farmers' 'crisis'!

VIII

FINDINGS AND POLICY POINTERS

The study has been undertaken at the backdrop of an obvious query by the country's disgruntled sugarcane farmers as to why to cultivate sugarcane if they are denied a reasonable return for the crop. An analysis was undertaken to cross-check with the data from CACP as to whether the noise from the sugarcane belts of the country is justifiable or not. The ongoing fury among the country's sugarcane farmers is somewhat reflected in our analysis on the profitability. It shows that although the profit has been realised by the farmers across all states taken up for study at constant prices, yet the farmers were struggling to get consistent profits throughout the period of analysis. While the sugarcane farmers are fuming over the non-remunerativeness of the crop, our analysis reveals that the VOP from sugarcane cultivation in almost all the states has increased at much faster rate as compared to cost C2 implying that higher income has helped the farmers in reaping profits from sugarcane cultivation. A deeper analysis on the profitability across the states revealed that the situation is worrisome in the farming horizon of one of the country's leading sugar producing state namely Maharashtra. A scenario of negative returns for consecutive four years viz. from 2000-01 to 2003-04 and a vicious concoction of dwindling yield, soaring farm inputs and incessant drought has compelled the farmers of Maharashtra to echo in a distressed tone as to why should they continue to afford the recurring effects of financial and crop losses. Further, when we analysed as to how many times the sugarcane farmers were able to reap profits during the period of analysis, it was really surprising to see that except Maharashtra and Andhra Pradesh all other states have made profits in all the years taken up for study. More particularly, our analysis vividly shows that the sugarcane farmers of Uttar Pradesh, Karnataka, Tamil Nadu and Haryana have even reaped profits during the ACP. If as per the CACP data all is well with the sugarcane farmers of the major growing states then why should they agitate violently and commit suicide? Why are they intending to observe a Crop Holiday? Does it mean that the data compiled by CACP is deceptive and ambiguous?[8]

Besides, the catastrophe of rising cost of cultivation, an accumulation of sugarcane arrears[9] to the tune of Rs. 5495 crore for the sugar season 2011-12 is hammering the sugarcane farmers' income. Unlike wheat and paddy, sugarcane is an annual crop and farmers wait for a year to get a remunerative price. The one-time payment that they receive for their crop forms the sole source of their livelihood. If arrears to such an extent go on accumulating, the sugarcane farmers have got no option but to go in for alternate crops. Anticipating that this would further affect the fresh plantings in the forthcoming season, the Rangarajan (see, Government of India, 2012b) Committee on the Regulation of Sugar Sector in India proposed a series of recommendations, the vital one being the removal of the sale of sugar under levy quota thereby enabling the mills to pay their dues to farmers on time. While the recent budget proposals found no mention of these recommendations, it was only on April 4, 2013 that the government announced the scrapping of levy system. While the scrapping of the release mechanism is bound to help millers with better cash flows, will the millers give a commensurate share of profits to the sugarcane farmers is a million dollar question? In this context the government should have also approved the profit sharing formula recommended by the Rangarajan Committee. Unhappy with the announcement, various farmers' organisations seem to be skeptical over the millers passing on the gains to them. They continue to lament that instead of providing bailout to millers the government should have passed on the benefit directly to them.

Amidst such a perpetuating conundrum with no signs of respite, what can be done to put the sugarcane farmers back on the track? First and foremost is that more credible field level studies on the profitability of the sugarcane crop need to be undertaken by researchers to cross-check with data of CACP. Amidst the hue and cry over soaring input prices, studies need to be also undertaken towards identifying the basic reasons behind the sharp rise in the cost of cultivation of sugarcane crop in the recent years. Productivity of sugarcane during the last one decade or so has not increased in major growing states, which is one of the reasons for low profitability. Increased productivity of sugarcane can reduce the cost of production that will ultimately help increasing the profitability of sugarcane growers. While field level research studies (see, Narayanamoorthy, 2004; 2005) have proved that drip method of irrigation (DMI) can considerably increase the productivity of sugarcane with reduced cost of cultivation, a spectrum of researchers also feel that by the approach of Sustainable Sugarcane Initiative (SSI) farmers will be able to produce at least 20 per cent more sugarcane while reducing water consumption by 30 per cent and chemical inputs by 25 per cent (see, WWF, 2009). Besides popularising DMI and SSI among the sugarcane farmers, the centre and the respective state agencies need to take concerted efforts on a war footing in devising cost reduction measures so as to increase productivity of sugarcane and farm income.

NOTES

1. The guaranteed employment under MGNREGS has in the recent years come under the scanner. It is primarily accused of causing acute shortage of labour for agriculture especially during the peak and crucial time of harvesting. More particularly it is hurting the cultivation of labour-intensive crops like sugarcane. Ashok Gulati, then Chairman of the Commission for Agricultural Costs and Prices (CACP), pointed out that between 2008 and 2011, labour cost increased by about 74 per cent at the all-India level. In order to lure the labourers to the fields, the farmers are forced to pay double the rates prevailing during the previous seasons.

2. Quite a few studies are available for foodgrains crops especially for paddy and wheat utilising cost of cultivation survey data covering different states and long period of time. Recently, Mahendra Dev and Rao (2010) have brought out an excellent analysis on the returns over cost of cultivation in paddy and wheat utilising temporal data from cost of cultivation survey. Ironically, although sugarcane is an important commercial crop, it has not attracted the attention of the researchers in India.

3. Cost of cultivation survey data is generated through the cost of cultivation scheme controlled by the Directorate of Economics and Statistics, Ministry of Agriculture. It contains detailed information on costs and its components and the income for different crops. This data is collected annually from 9000 farmers covering different regions in India and is used for deciding minimum support prices for different crops. Unfortunately, not many scholars have analysed this rich source of information in the context of agrarian crisis. The importance of cost of cultivation survey data has also been highlighted by Acharya, 1992; Rao, 2001; Sen and Bhatia, 2004 and Mahendra Dev and Rao, 2010.

4. The average area and productivity of sugarcane pertaining to the six selected states for the period TE 2010-11 are presented below for the purpose of readers:

State	Category of State	Area ('000 ha)	Yield (kg/ha)
(1)	(2)	(3)	(4)
Uttar Pradesh	High Area with Low Productivity	2062	56102
Maharashtra	High Area with High Productivity	830	82900
Tamil Nadu	High Area with High Productivity	306	105347
Karnataka	High Area with High Productivity	347	89035
Haryana	Low Area with Medium Productivity	83	66726
Andhra Pradesh	Low Area with Medium Productivity	182	76836

5. The data for the year 2009-10 appears to be fudged. Despite no significant change in productivity of sugarcane, the profitability has jumped in most states we have taken for the analysis. Unfortunately, we have no option except using cost of cultivation survey data for analysing the issue we have addressed in the paper. For quite some time now, the farmers' organisations working in different parts of the country have been arguing that the cost of cultivation survey data of CACP is not reliable and largely underestimated. The problems about the cost of cultivation data have also been underlined in the reports of Farmers' Commission headed by M.S. Swaminathan. Recently, several farmers' organisations in Andhra Pradesh have also reported this problem to the Mohan Kanda Committee, which was appointed to look into the issue of unprecedented crop holiday. For more details on this issue see, GOAP (2011).

6. While a rapid increase in the area under sugarcane is observed in Maharashtra between 1990-91 and 2000-2001 as compared to the period of 2000-01 to 2011-12, its yield and profit are found to be dwindling dramatically from 2000-01 to 2003-04 as per the CACP data. For further clarification for the readers, we have given table below that gives detailed information on yield, cost C2, profit (at current prices) and ratio of profit.

Period	Yield (Quintal/ha)	Cost C2 (Rs/ha in current prices)	Profit (VOP-Cost C2) in Rs/ha in current prices	Ratio of Profit (VOP/Cost C2)
(1)	(2)	(3)	(4)	(5)
2000-01	775	48304	-5568	0.88
2001-02	761	52660	-3078	0.94
2002-03	946	70744	-8550	0.87
2003-04	715	60155	-11148	0.81

7. For this study, we have covered the period from 1973-74 to 2010-11. However, the data on cost and income of sugarcane crop were not available from CACP's publications consistently for all the years for any of the six selected

states. Only for those years where data were available considered for the analysis and therefore, the total number of years (data time points) considered for the analysis is varied considerably from one state to another.

8. The arrears to be paid to the sugarcane farmers by the sugar industry in different states are huge as on 31.05.2012. The details of the sugarcane arrears (in Rs. Crore) extracted from the "*Report of the Committee on the Regulation of Sugar Sector in India – The Way Forward*" are given below:

State	Cane price payable 2011-12	Cane price paid 2011-12	Cane price arrears 2011-12	Cane price arrears 2010-11	Cane price arrears 2009-10 and earlier periods	Total cane price arrears
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Punjab	967.32	870.58	96.74	0	0	96.74
Haryana	1221.06	1074.35	146.71	0	0	146.71
UP	18066.03	14904.5	3161.53	7.30	134.98	3303.81
Uttarakhand	905.46	669.34	236.12	17.97	6.30	260.39
MP	132.77	132.77	0	2.05	11.34	13.39
Gujarat	1586.41	1550.15	36.26	0	13.41	49.67
Maharashtra	13251.39	13080.82	170.57	32.54	17.37	220.48
Bihar	1054.80	956.78	98.02	1.67	31.94	131.63
AP	2366.50	2085.02	281.48	0	33.09	314.57
Karnataka	6257.50	5857.05	400.45	38.77	20.29	459.51
Tamil Nadu	3790.82	3342.77	448.05	0	2.15	450.2
India	4976.51	44636.64	5123.87	100.30	270.87	5495.04

9. It is worth mentioning here that during the so called crisis period, the overall area under sugarcane is on the increase across the states, with the exception of Punjab, Haryana and AP. We see no link between changes in productivity, cost or profitability with the changes in area. The two states, U.P and Maharashtra, which account for a little over 60 per cent of the total area under the crop and which show continued increase in the area, have polar opposite characteristics in terms of costs, yields and returns from this study. The state which shows decline or stagnation in the yield and also very high increase in the costs (Maharashtra) is also the state which shows steepest increase in the area under sugarcane during the last decade. Given that cane price is determined centrally by CACP (with marginal additions at the state level), the returns depend on the cost and yield levels. With more disaggregated data, it would be interesting to focus on Maharashtra and UP to find out the differences in the nature of costs and the factors that would make a difference to productivity.

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