

How efficient is Maharashtra's Sugarcane crop?

That question may sound slightly irreverent and irrelevant.

Maharashtra is the highest sugar producing state of India. Its sugarcane yield in 2011-12 was 80.1 t/ha, compared to the yield of 59.6 t/ha for the second highest sugar producing state Uttar Pradesh and national average of 70.3 t/ha. The average sugar recovery rate of the four sugarcane cultivation methods in Maharashtra was 11.32% in 2011-12, the recovery rate of Adsali sugarcane was even higher at 12.3%. The Maharashtra average was way above that of UP at 9.16% and all India rate of 10.2%. In fact the land productivity adjusted for recovery rate is even higher for Maharashtra at 98.8 t/ha (161.14 t/ha for Adsali) compared to 61.04 t/ha for UP. The yield per month when adjusted for recovery rate is 7.56 t/ha/month compared to 6.33 t/ha/month for UP.

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So with the highest production, high yield and high recovery rate, there should be no question of efficiency of Maharashtra sugarcane crop.

Indeed.

Methods of Sugarcane cultivation in Maharashtra Let us understand the basic parameters of how sugarcane crop is grown in Maharashtra, see the table below.

Basic parameters of sugarcane crop in Maharashtra in 2011-12

Method	% share	Production (lakh T)	Yield (t/ha)	No of std irrigations (7.5 cms)	Water requirement, '000 m ³ /ha	% recovery rate	Yield adjusted for recovery rate t/ha	Crop duration, months	Yield t/month adjusted for recovery rate
Adsali	10	122.64	120	32.5	24.38	12.30	161.14	17.00	9.48
Pre-seasonal	30	275.94	90	27.5	20.63	12.00	117.9	14.50	8.13
Suru	20	143.08	70	22.5	16.88	11.45	87.50	12.00	7.29
Ratoon	40	276.94	65	22.5	16.88	10.50	74.51	11.00	6.77
Total/ weighted average	100	818.60	80	25	18.75	11.32	98.79	12.85	7.56

Source: Price Policy for Sugarcane: the 2013-14 Sugar season, Commission for Agricultural Costs and Prices, Ministry of Agriculture, Government of India, Aug 2012, Table 5.1

Of the four sugarcane cultivation methods prevalent in Maharashtra, Ratoon is most popular with 40% cane area under it, possibly since it has shortest duration at 11 months, fitting almost perfectly with the annual Oct to March cane crushing season. Same can be said about Suru method, having duration of 12 months and coverage of 20%, both methods requiring 22.5 irrigations, each of 7.5 cm depth. Adsali method has the highest yield and recovery rate, but only 10% of the sugarcane area is under this method, possibly since it has the longest duration at 17 months. It is most water intensive, requiring 32.5 irrigations. Pre-seasonal method, as the name suggests, is planted about 2.5 months before the season, and stands between Ratoon and Adsali in terms of duration, yield and recovery rate.

Water Productivity [The latest report from CACP](#) from which the above figures are taken, however states that land productivity alone does not give correct picture, "...as land and water are increasingly becoming scarce in India with high opportunity costs. Therefore, the real resource cost of growing sugarcane in different regions cannot be correctly compared unless land productivity is normalised for the time duration of crop, its water intake, and its recovery rate." To make such a comparison, CACP made a table, a part of which is given above in Table 1.

However, CACP has gone a step further than the figures in Table 1 (though there is an error in CACP calculations here, we have pointed this out to CACP). CACP has calculated water productivity of different sugarcane methods in Maharashtra and compared them with the water productivity in UP. The average water productivity of sugarcane in Maharashtra comes to 0.403 T/ha/month/000 m³ water, compared to 1.11 for UP. This means that while UP seemed inefficient in sugarcane productivity in everyway, Maharashtra is inefficient by 175.43% when productivity per unit of water consumption is considered.

How is this possible? The reason why sugarcane productivity of UP in terms of water is higher is simple: UP sugarcane crop is of shorter 9-10 months duration and requires only 7-8 irrigations, approximately less than once a month. As against this, Maharashtra sugarcane crop requires irrigation every 15 days and that too for longer duration. To put it another way, while on average Maharashtra needs 25 irrigations for sugarcane crop, UP needs 7.6.

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Water required per kg of sugar The CACP report further calculates that in Maharashtra every kilogram of sugar needs 2068 litres of water, where as in UP the requirement is almost half, at 1044 litres. This is indeed a telling figure. Add to it, as CACP report puts it, "real cost of water in Maharashtra is at least 2 to 3 times higher than that in UP".

In response to a specific question, CACP chairman Dr Ashok Gulati wrote to me that this water calculation does not include the water used by sugar mills, nor the water losses from the source to the farm. If water used by sugar mills and water used in further downstream processing and water losses from the source to the farm are included, the water consumption in sugar production is will go up substantially.

This analysis is very relevant for a state like Maharashtra that has much lower rainfall and per capita water availability compared to northern states like UP and Bihar. It is even more relevant when [79.5% of Maharashtra's sugarcane is grown in drought prone districts as we showed in another blog](#).

How sugar mills lock up Maharashtra's water future Considering water consumption becomes even more important, looking at the kind of impact sugarcane cultivation is having in Maharashtra this drought season. Here it may be recalled that sugarcane is a long duration trans-season crop that has implications for water consumption beyond the point where decision for planting is taken. So even if the rainfall is normal or above when the crop is planted, the same crop will continue to have high water demand in the following year when it may be drought year. This creates really serious implications for water availability in the drought year particularly in drought prone, low rainfall areas. The impact on water available becomes even more serious in a state like Maharashtra where sugar mills are set up irrespective of water availability, violating the norms of distances, where sugar factories operate at way beyond their sanctioned capacity, where they violate the norms of no more than 5% of cultivable land under sugarcane, they dump untreated effluents into water bodies, thus polluting the water in such water bodies and so on. The lock in becomes even more stronger with the setting up of sugar mills, since their owners would like to get maximum cane every year, irrespective of water availability situation.

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The CACP report says Maharashtra is further worse off in terms of cost of providing water for sugarcane, "If this costing is included in calculating water productivity, the difference in sugarcane yields will be so high that, Uttar Pradesh and presumably Bihar, would turn out to be the most efficient producers of sugar per unit cost of water, adjusted for time duration and recovery." CACP goes on to say that Maharashtra sugarcane grown on 3% of the total cropped area of the state, takes away 60% of irrigation water in the state, "leading to massive inequity in the use of water within the state". These figures might be slightly outdated considering the expansion of sugar factories and sugarcane cultivation in recent years.

Band aid solutions won't help One recommendation CACP report makes for Maharashtra is that much of sugarcane in the state must be brought under drip. Even the Chief Minister of State and the Union Agricultural Minister has made same recommendation. We are not sure if this is really a solution since this is unlikely to curb the unsustainable levels of sugarcane in drought prone districts of Maharashtra, considering the politics involved in the issue with large number of politicians owning sugar factories.

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As per the Maharashtra Economic Survey figures for last two years, Maharashtra has provided subsidy for drip irrigation in 5.68 lakh ha and for sprinkler irrigation in 2.33 lakh ha between 2005-06 and 2011-12, thus providing subsidy for covering 8.01 lakh ha for these two techniques in these seven years. However, we see no impact of so much area under the drip and sprinkler irrigation on water situation in the state, nor do we see much of sugarcane under drip. State institute like the Vasantdada Sugar Institute does not even know how much sugarcane is under drip even though it has a section just for drip irrigation. More investment in drip for sugarcane is likely to give reasons for expansion of sugarcane empire in drought prone districts, in addition to opening the doors for more corruption.

Another method called [Sustainable Sugarcane Initiative](#) can help the farmers to produce at least 20 per cent more sugarcane, and that too with 30 per cent of reduced water consumption and 20 per cent less chemical inputs. CACP report though, is silent on this.

However, options like drip irrigation and sustainable sugarcane initiative should be explored for sugarcane cultivation in relatively water rich areas. However, in immediate future, Maharashtra needs to cancel all new licenses for sugar mills and put a halt to new mills and expansion of existing sugar mills in drought prone districts. For existing sugar factories, it needs to decide the level of sustainable sugarcane cultivation in each drought prone district through a transparent, independent process. Immediately in this drought year, no more water should be allowed to be used for sugarcane cultivation in drought prone districts.

Maharashtra has very challenging water future even if all these steps are implemented. Its water future is very bleak if no serious move is made in this direction.

Himanshu Thakkar (ht.sandrp@gmail.com)

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