

INDIA'S ETHANOL CONUNDRUM

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Sugar mill workers load harvested sugar cane in a tractor trolley in Sangli district, Maharashtra on December 3, 2022. | Photo Credit: Reuters

As more than 100 countries at COP28 in Dubai [pledged the tripling of global renewable energy capacity by 2030](#), India faces a tightrope walk with regard to its ethanol blending target. While ethanol blended petrol (EBP) increased from 1.6% in 2013-14 to 11.8% in 2022-23, the 20% target by 2025 has run into trouble with low sugar stocks in 2022-23 and the impending shortfall in sugarcane production this year. As evident from Minister of Consumer Affairs Piyush Goyal's statement in May, the government is looking at a major transition towards grains-based ethanol for meeting the target. The recent authorisation of the National Agricultural Cooperative Marketing Federation of India (NAFED) and the National Cooperative Consumers' Federation of India (NCCF) to procure maize (corn) for supplying ethanol distilleries indicates emphasis on this transition and will boost an organised maize-feed supply chain for ethanol. This, however, risks creating more challenges for the economy.

The two major feedstock for ethanol production are sugarcane (Brazil) and corn (the U.S.). Ethanol production in both these countries boomed from 2000 when crude oil prices started rising and remained above a certain threshold for a decade. (At low crude prices, ethanol blending is not competitive; it is a slow process driven by heavy subsidies.) A crucial difference between the use of sugarcane and corn for producing ethanol is the degree of food-fuel conflict that emerges. In the case of sugarcane, ethanol is produced by processing the molasses (C-heavy/B-heavy) and constitutes minimal trade-off with the sugar output. The B-heavy molasses path produces less sugar compared to the C-heavy one, but both produce sugar and ethanol simultaneously from sugarcane. But using corn for producing ethanol directly reduces its use as food or livestock feed. It not only diverts grain to fuel use, but also links food prices directly with crude oil prices through the demand side. The very high crude prices that prevailed for a decade in 2004-14 pulled up ethanol and corn prices to historical highs. More importantly, the high corn prices were quickly transmitted to other grain markets as soft grains, such as wheat/barley, started getting redirected into the livestock industry as corn substitutes. Though only 5-7% of the world's corn output was used for ethanol production at the peak of the U.S.'s corn-based ethanol programme, the price effect was widespread and remained the most important contributor to the 2006-14 global food crisis. This was primarily due to the relatively easy substitutability in grain use across food, feed, and fuel.

Also read | [Govt. move allowing cane juice use for ethanol to offer 'partial relief'](#)

This strong link between crude and food prices in the era of agro fuels is re-emphasised by the fact that the food prices remained high even after the 2008 financial crisis caused most commodity prices to plummet. The Food and Agriculture Organization food price index softened only after 2014, when global crude prices fell below \$80 per barrel, which also slowed down the U.S. ethanol blending trajectory. The post-pandemic recovery of oil prices has again pushed up food prices. In 2021, the food price index breached the previous record levels attained in 2011.

Unlike in the U.S., sugarcane is the more obvious choice for tropical countries such as Brazil or India where cane yields are higher. This is not to argue that using sugarcane for ethanol does not have adverse impacts on environment or hunger. More land under water-intensive sugarcane cultivation can displace food production as well as degrade water tables, but these can be regulated by appropriate land-use policies. It is far more difficult to control the market dynamics, driven by easily interchangeable grain use, as illustrated by the U.S.'s corn-based ethanol experience.

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In India though, differential pricing introduced in 2017-18 incentivised the use of cane juice directly to produce ethanol and exacerbated the food versus fuel binary, which is otherwise relatively subdued in the case of cane-based ethanol. When price incentives were given for ethanol produced from cane juice without the extraction of sugar, a process which gives a substantially higher yield of ethanol, mills abandoned the more sustainable molasses route. This was driven by the urge to hasten the journey towards the 2025 EBP target, which it achieved. The success generated challenges in the form of reduced sugar stocks. The December 7, 2023 order by the Ministry of Consumer Affairs banning the use of cane juice for ethanol production is a timely, corrective step. But by adopting a transition to grains-based ethanol to fast-track the 2025 target achievement (maize is expected to supply around half of the ethanol feed in 2023-24 and beyond), is the government hurtling towards a looming spectre of uncontrollable food inflation? For this path to meet the EBP target by 2025, India needs 16.5 million tonnes of grains annually (government estimates). This is a sufficiently high quantity to trigger a short-run price spiral in grain markets.

The future of India's renewables strategy hangs on a delicate food-fuel trade-off; and a choice between intensifying hunger and reducing fossil fuel use. On the one hand, the government can reconsider its EBP target and stagger it to contain the contradictions. On the other hand, we need more investment in public infrastructure, urban design to contain the fuel demand for automobiles, and in renewables such as solar power.

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