Ethanol Production

Why in News?

The Ministry of Environment and Forests announced that mills would not require separate environmental clearance to produce additional ethanol from B-heavy molasses.

Why was this decision taken?

- The decision comes at a time when the country is looking at heavy oversupply of sugar, and a host of measures have been launched by the central government to address the systemic issue.
- The ministry clarified that the proposals to undertake additional ethanol production from B-heavy molasses/sugarcane juice/sugar syrup/sugar would be considered.
- It will be considered under the provisions of the EIA (Environmental Impact Assessment) notification, 2006, by an expert appraisal committee for granting environmental clearance.

What are ethanol and molasses?

- Ethanol, or ethyl alcohol, is a liquid that has several uses.
- At 95% purity, it is called rectified spirit and is used as the intoxicating ingredient in alcoholic beverages.
- At 99%-plus purity, ethanol is used for blending with petrol.
- Both products are made from molasses, a by-product of sugar manufacturing.
- For making sugar, mills crush sugarcane which typically has a total fermentable sugars (TFS) content of 14%.
- The TFS component consists of sucrose along with the reducing sugars glucose and fructose.
- Most of this TFS component gets crystallised into sugar, and the remaining part is called molasses.

What are the Molasses stages?

- The molasses go through three stages - **A, B, and C**, the last one being where the molasses are most un-crystallised and non-recoverable.
- The ‘C’ molasses roughly constitute 4.5% of the cane, and have a remaining

TFS of 40%.
- After C-molasses are sent to the distillery, ethanol is extracted from them. Every 100 kg of TFS yields 60 litres of ethanol.
- Thus, from one tonne of cane, mills can produce 115 kg of sugar (at 11.5% recovery) and 45 kg of molasses (18 kg TFS) that gives 10.8 litres of ethanol.

How more ethanol can be produced?

- Mills can also produce only ethanol from sugarcane, without producing sugar at all.
- In this case, the entire 14% TFS in the cane is fermented. Here, a mill can make 84 litres of ethanol and zero kg of sugar.
- In between the two extreme cases, there are intermediate options as well, where the cane juice does not have to be crystallised right till the final 'C' molasses stage.
- The molasses can, instead, be diverted after the earlier 'A' and 'B' stages of sugar crystal formation.
- Mills, then, would produce some sugar, as opposed to fermenting the whole sugarcane juice into ethanol.
- If ethanol is manufactured using 'B' heavy molasses (7.25% of cane with TFS of 50%), around 21.75 litres will get produced along with 95 kg of sugar from every 1 tonne of cane.
- The latest move by the government is to waive the environmental clearance required to produce ethanol at this stage.
- In the press release, it has been explained that this was done since this process does not contribute to the pollution load.

Why focus on more ethanol?

- **Mills** currently have all-time-high stocks of sugar, and they have been at **loggerheads with farmers over non-payment of dues**.
- Mill owners insist that the reason behind their woes is excess production of sugar and fall in its price.
- Under the circumstances, ethanol is the only real saviour - both for mills and cane growers.
- In September 2019, the government approved an increase in the price of ethanol to be procured by public sector oil marketing companies from sugar mills for blending with petrol for the 2019-20 supply year.
- The Cabinet Committee on Economic Affairs also allowed conversion of old sugar into ethanol.
- This again is expected to help mills deal with the **current overproduction** in the sweetener and make timely payments to farmers for the cane delivered by them.

- Ethanol production has been additionally facilitated with the government mandating 10% blending of petrol with ethanol.

Source: the Indian Express

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