

**12– 12 – 2023**

**News:** Ban on Sugarcane Juice for Ethanol

- The Centre's recent ban on using sugarcane juice and sugar syrup for ethanol production in the 2023-24 supply year aims to maintain adequate sugar availability for domestic consumption and stabilize prices. However, the government has permitted the use of B-molasses for ethanol production.

**Biofuels**

- Any **hydrocarbon fuel that is produced from an organic matter** (living or once lived) **in a short period of time** (days, weeks or within months) is considered a Biofuel.
- It may be **solid** (Wood, Dried plant material & manure), **liquid** (Bioethanol & Biodiesel) or **gaseous** (Biogas) in nature.
- It can be **used as a replacement or used in addition to fossil fuels** for transportation, or generation of heat & electricity.
- Some reasons to shifting towards biofuel are the **rise in oil price, Global warming** caused by fossil fuels & **for the increase in income of farmers** (Doubling Farmers Income by 2022).

# Categories of Biofuels

## First generation

- Made from food sources such as sugar, starch, vegetable oil using conventional technology.
- Common first-gen biofuels include Bio-alcohols, Biodiesel, and Vegetable Oils & Biogas.
- Though the process of conversion from source to biofuel is easy, it creates an imbalance in food supply chain & may leads to food shortage & hunger.

## Second generation

- These are fuels made up of non-edible portions of crops such as stems, husks, fruit skins & peelings.
- Thermochemical & Biochemical conversion process is used in producing such fuels.
- Examples include ethanol & biodiesel.
- GHG emission of 2<sup>nd</sup> generation biofuel is less than that of 1<sup>st</sup> generation.

## Third generation

- These are produced from micro-organisms like algae.
- They can be grown in land & water unusable for food production, thereby reducing the stress on agricultural land.

- The **fertilizers used in the production cause environmental pollution.**
- Example of 3<sup>rd</sup> generation biofuels is Butanol.

#### **Fourth generation**

- In the production of these fuels, **crops that are genetically engineered take in high amounts of carbon & harvested as biomass.**
- Crops are then **converted to fuel using 2<sup>nd</sup> generation techniques.**
- The fuel is pre-combusted, and the **carbon is captured.** Then the carbon is geo-sequestered, meaning that the carbon is stored in depleted oil or gas fields or in unmineable coal seams.
- Some of **these fuels are considered carbon negative** as their production pulls out carbon from environment.
  
- Recently, **National Biofuel Coordination Committee** chaired by Union minister of Petroleum & Natural gas decided to use “surplus” rice available with Food Corporation of India (FCI) for conversion to ethanol.
- The objective of this decision is to **make alcohol-based hand-sanitizers and blend ethanol with petrol.**
- The decision will **affect millions of people who are already striving off Food insecurity.**

## National Policy on Biofuels

- The National Policy on Biofuels categorises biofuels as "Basic Biofuels" viz. First Generation (1G) bioethanol & biodiesel and "Advanced Biofuels" - Second Generation (2G) ethanol, Municipal Solid Waste (MSW) to drop-in fuels, Third Generation (3G) biofuels, bio-CNG etc. to enable extension of appropriate financial and fiscal incentives under each category.
- The Policy expands the scope of raw material for ethanol production by allowing use of Sugarcane Juice, Sugar containing materials like Sugar Beet, Sweet Sorghum, Starch containing materials like Corn, Cassava, Damaged food grains like wheat, broken rice, Rotten Potatoes, unfit for human consumption for ethanol production.
- Farmers are at a risk of not getting an appropriate price for their produce during the surplus production phase. Taking this into account, the Policy allows use of surplus food grains for production of ethanol for blending with petrol with the approval of National Biofuel Coordination Committee.
- With a thrust on Advanced Biofuels, the Policy indicates a viability gap funding scheme for 2G ethanol Bio refineries of Rs.5000 crore in 6 years in addition to additional tax incentives, higher purchase price as compared to 1G biofuels.
- The Policy encourages setting up of supply chain mechanisms for biodiesel production from non-edible oilseeds, Used Cooking Oil, short gestation crops.

- The roles and responsibilities of all the concerned Ministries/Departments with respect to biofuels have been captured in the Policy document to synergize efforts.

### **Advantages**

- Reducing import dependency.
- Cleaner environment
- Health benefits
- Employment Generation & DFI initiative.
  
- The policy envisages an indicative **target of 20% blending of ethanol in petrol & 5% blending of biodiesel in diesel by 2030** (Recently, government of India advanced this to 2025 from 2030). Currently the percentage stands at 2% for petrol & 0.1% for diesel.

### **Sugarcane**

- Sugarcane is a **low-land tropical, plantation, and cash crop** which are grown in the regions having **high temperature and heavy rainfall**.
- This crop is usually grown in **regions that have monsoonal type of climate**. Some major producers include India, Java, Formosa, Cuba, Jamaica, Trinidad, and Barbados.

- India is the top country with sugar cane production in the world beating Brazil in 2022. However, Brazil is the largest exporter of Sugar in the world. India is also the largest consumer of sugar in the world.
- India accounts for about 19 percent of the world's production of sugarcane. But it occupies only 2.4 percent of the total cropped area in the country.
- This industry provides employment for more than 4 lakh persons directly and many farmers indirectly.
- The sugar industry is a seasonal industry because of the seasonality of raw materials.
- The development of the industry on modern lines dates to 1903 when a sugar mill was started in Bihar. Subsequently, sugar mills were started in other parts of Bihar and Uttar Pradesh.
- In 1950-51, 139 factories were in operation. The number of sugar factories rose to 662 in 2010-11.
- Sugarcane is a weight-losing crop. The ratio of sugar to sugarcane varies between 9 to 12 percent depending on its variety.
- Its sucrose content begins to dry during haulage after it has been harvested from the field.
- Better recovery of sugar is dependent upon its being crushed within 24 hours of its harvesting.
- Sugar factories hence are located within the cane producing regions.

- **Maharashtra has emerged as a leading sugar producer** in the country and produces more than one-third of the total production of the sugar in the country.
- **Uttar Pradesh is the second-largest producer** of sugar. The sugar factories are concentrated in two belts – the Ganga-Yamuna doab and the Tarai region.
- The major sugar-producing centers in the Ganga -Yamuna doab are Saharanpur, Muzaffarnagar, Meerut, Ghaziabad, Baghpat, and Bulandshahr districts; while Kheri Lakhimpur, Basti, Gonda, Gorakhpur, Bahraich are important sugar-producing districts in the Tarai region.
- The **crop yield is low in Northern India than in Southern India**. Uttar Pradesh's yield is low, but in Maharashtra, Karnataka, and Tamil Nadu the yield is high.
- Area under sugarcane is expected to be almost 54.55 lakh hectare in 2021-2022 sugar season (October to September) or 3% higher than the current season's area, according to the Indian Sugar Mills' Association (ISMA). (15 – 07 – 2021)

### **Advantages of increasing Sugarcane production**

- Sugar production generates **several by-products, such as molasses, bagasse, and press mud, which can be used to produce other products such as ethanol, paper, and Bio-Fertilizers.**

- Sugar mills can divert excess sugarcane to ethanol, which is blended with petrol, which not only serves as a green fuel but also saves foreign exchange on account of crude oil import.
- The government of India has fixed a target of 10% blending of fuel grade ethanol with petrol by 2022 & 20% blending by 2025.
- India achieved its target of an average of 10% blending across the country five months ahead of the targeted timelines of November 2022.
- Cultivating sugarcane provides farmers with an opportunity to diversify their agricultural activities and increase their income.
- Sugarcane cultivation can be integrated with other crops such as vegetables, fruits, and spices to promote crop diversification. This can lead to better soil health, reduced pest and disease pressure, and improved crop yields.

## **Challenges Associated with Growing Sugarcane**

### **Longer Duration to Harvest**

- Sugarcane takes a long time to grow and be ready for harvest (around 10 to 12 months). Growing sugarcane is not an easy task as it requires the farmer to plant and harvest two more crops before they can finally harvest sugarcane.
- This means that growing sugarcane demands a lot of hard work over a period of about three years.



## Higher Investment

- Growing sugarcane requires farmers to invest more money because they must prepare the fields properly before planting. This involves tilling the soil to a greater depth, followed by harrowing, and levelling it to make it suitable for sugarcane.
- Moreover, buying sugarcane seedlings is expensive, and before planting, farmers need to add manure and fertilizers to the soil, which also comes at a high cost.

## High Labor Cost

- The labour for cutting sugarcane costs huge and if the cutting season is dry without rain, it gravely affects the total weight of the cane and if it rains, there will be slush on the path resulting in lorries/trucks not being able to come near the field.
- Farmers must spend a lot to transport the sugarcane from their fields to the main road by employing labour.

## Unviability Sugar Exports

- India is finding it difficult to export sugar as the cost of producing it is higher compared to the international market price, mainly due to the high cost of sugarcane.

- To help bridge this gap, the government has been providing export subsidies, but other countries have raised objections with the World Trade Organization (WTO).
- Although India is currently allowed to continue with these subsidies until December 2023, there is uncertainty about what will happen after that.

### **Problem with India's Ethanol Programme**

- Blending ethanol with petrol to use as auto fuel was first announced in 2003, but this initiative has not been very successful due to several challenges. One of the key challenges is the poor pricing of ethanol supplied for blending.
- Since the price of ethanol is often higher than the price of petrol, blending ethanol with petrol becomes less economically viable. This can discourage ethanol producers from supplying ethanol for blending.

### **Price Determination of Sugarcane in India**

- The Prices of Sugarcane are determined by the Central Government and the State Governments.

### **Central Government: Fair and Remunerative Price (FRP)**

- The Central Government announces FRP which are determined on the recommendation of the Commission for Agricultural Costs and Prices

(CACP) and announced by the Cabinet Committee on Economic Affairs (CCEA).

- CCEA is chaired by the Prime Minister of India.
- The FRP is based on the Rangarajan Committee report on reorganising the sugarcane industry.

### **State Government: State Advised Prices (SAP)**

- The SAP is announced by the Governments of key sugarcane producing states.
- SAP is generally higher than FRP.
- The price is calculated by the experts, who calculate the entire economics of the crop by taking input cost and then suggest to the government, which may agree or not.