Challenges in Biofuel Susitainability

Why in news?

India has launched the Global Biofuel Alliance in G20 summit 2023, demonstrating its commitment to climate action with global cooperation.

To know about the key outcomes of G20 summit click here

Global Biofuels Alliance
• **About**- It is an initiative to develop an alliance of governments, international organisations and industry to facilitate the *adoption of biofuels*. • **Origin**- *India, Brazil, United States* will work together for the development of alliance • Brazil, India and the US contribute about *85%* of the world's biofuel production. • *19 countries and 12 international organisations* have joined the GBA • **Aim-** To facilitate cooperation and intensify the use of sustainable biofuels, including in the transportation sector. • It will place emphasis on - Strengthening markets, facilitating global biofuels trade and developing concrete policy lesson-sharing - The already implemented best practices and success cases. • It will work in collaboration with the relevant existing agencies as well as initiatives such as • The Clean Energy Ministerial Bio-future Platform, • The Mission Innovation Bioenergy initiatives, and • The Global Bioenergy Partnership (GBEP)

What is Biofuel?

- Biofuels are liquid fuels produced from *renewable* biological sources, including plants and algae.

Generation	Source	Example
First generation (1G)	Conventional source or food sources - Sugarcane, corn etc.,	Bioethanol, biodiesel, biogas
Second generation (2G)	Non-food sources and the waste left from the food resources- Municipal solid waste, wood chips etc.,	Cellulose ethanol, biodiesel
Third generation (3G)	Algae- It consists of 40% of lipids which can be converted to biodiesel or synthetic petroleum.	Butanol, Gasoline, Jet fuel
Fourth generation (4G)	Produced from genetically engineered bio algae	

What is the significance of Biofuel?

- **Eco-friendly-** It is alternative to the fossil fuel which is a non-renewable source.
- **Reduce emission-** It have gained worldwide popularity, contributing to meet *net zero carbon emission targets*.
    - Reports say that ethanol reduces Greenhouse Gas Emissions (GHG) up to 65%.
- **Reduce import bill**- It help in reducing energy imports, on which the country depends for a large part of its oil and natural gas requirements.
- **Fuel economy**- Vehicles that run on biodiesel get 30% better fuel economy than gasoline-powered vehicles.
- **Economic development-** International Food Policy Institute (IFPI) has said that ethanol made from a shrub called cassava can help reduce poverty in that West African nation where 80% of the labour force is farmers.
- **Sustainable biofuel**- They are produced from crop residues and other wastes, with low water and GHG footprint

What are the challenges faced by India?

- **Dependence on 1G-** The policy target in India of achieving 20% ethanol blending with petrol (E20) by 2025-26 is expected to be met almost entirely by 1G ethanol made from sugar cane and food grains.

- **Supply chain bottlenecks-** 2G is unlikely to contribute much to achieving E20 target due to several challenges related to feedstock supply chain and scaling up
- **Food security**- India's crop yields have already stagnated, and global warming is expected to reduce yields, India's strategy to meet blending targets cannot depend on surplus crop production.
- **Groundwater depletion**- Recent study led by the University of Michigan projected that the rates of groundwater depletion could triple during 2040-81 compared with the current rate.
- **Increase in GHG emissions**- Increasing GHG emission from the agriculture for fuel production is not sustainable option.
- **Reliance on sugarcane**- It is a remunerative crop that has more to do with government intervention than anything else.
- **Economies of scale**- Balancing economies of scale with the energy needs and costs of biomass collection and transportation across large distances is major challenge.

What lies ahead?

- **Prioritise Biomass**- The Energy Transitions Commission, in its report on 'Bio resources within a Net-Zero Emissions Economy', recommended that biomass should be prioritised for use in sectors where there are limited low-carbon alternatives.
- **Net zero emission**- According to the International Energy Agency, to achieve *net-zero emissions by 2050* globally, sustainable biofuel production needs to *triple by 2030* to fuel modes that have few other mitigation options.
- **Sustainable fuel**- Although 1G ethanol is unlikely to fit the bill, 2G ethanol could be counted as a sustainable fuel, especially if the production is decentralised, i.e., crop

residues do not have to be transported large distances to a central manufacturing plant.

- **Innovation-** The Global Biofuels Alliance could help drive innovation and technology development in establishing an *efficient biomass supply chain* and smaller-scale decentralised biofuel production units.

Steps taken by India to promote Biofuel Production
• **E5 program**- It was India's pilot project of 5% ethanol belnding. • **National Biodiesel Mission**- It was formulated in 2003 to achieve 20% biodiesel blend by 2011-12. • **National Policy on Biofuel-** It was launched in 2009, proposed a non-mandatory target of 20% blending of both biodiesel and bioethanol by 2017. • The policy is revised in 2018 to achieve 20% bioethanol blending and 5% biodiesel blending by 2030. • **GST**- Goods & Service Tax (GST) on ethanol meant for EBP Programme has been reduced from 18% to 5%. • **SATAT scheme**- Sustainable Alternative towards Affordable Transportation Initiative (SATAT) encourages entrepreneurs to set up CBG plants, produce & supply CBG to Oil Marketing Companies (OMCs) for sale as automotive & industrial fuels. • **PM JI-VAN Yojana**- It was launched in 2018 to provide Viable Gap Funding for 2G bioethanol.

References

1. The Hindu- Complex path of biofuel sustainability
2. PIB- Global Biofuels Alliance

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