Sustainable Aviation Fuel

For Prelims: Sustainable Aviation Fuel, ICAO, UNCCC, **Paris Agreement,** Net-Zero, GHG Emissions, CORSIA.

For Mains: Sustainable Aviation Fuel, its Significance and Challenges.

Why in News?

Recently, India has expressed its reservations regarding the global mandates for Sustainable Aviation Fuel (SAF) **with a target year of 2050**, asserting that it is "too early."

- The 41st **ICAO (International Civil Aviation Organisation)** Assembly in South Korea adopted a **Long-Term Global Aspirational Goal (LTAG)** for international aviation of net-zero carbon emissions by 2050 in support of the **UNFCCC Paris Agreement.**

What is India's Stance on SAF Mandates?

- India believes that each country should be allowed **to develop its strategy according to its national plans.**
- India has sought support from the **ICAO** in achieving its carbon net-zero goals, while also addressing other priorities in the aviation sector, **such as meeting the growing aspirations of passengers.**
- It is important to ensure **SAF production, certification, and availability before imposing volumetric mandates,** to align with the ideology of LTAG.
    - India intends to participate in **ICAO's** Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) and the LTAG from 2027.

What is Sustainable Aviation Fuel?

- **About:**
    - SAF, also referred to as **Bio-Jet Fuel**, is created using **domestically developed methods** using cooking oil and **oil-rich seeds from plants.**
    - The SAF samples produced by the institutes are undergoing strict testing at the US Federal Aviation Administration Clearinghouse to meet the standards required for the **ASTM (American Society for Testing and Materials) D4054 certification** from ASTM International.
    - ASTM certification is a process by which a **product or material is tested and evaluated against** relevant ASTM standards. ASTM International develops **technical standards for products and processes.**
    - ASTM standards are used by industry, governments, and other organizations to ensure **quality, safety and reliability** in products and processes.
- **Sources of Production:**
    - The **CSIR (Council of Scientific and Industrial Research)-IIP (Indian Institute of Petroleum)** has created **fuel using different materials**, such as **non-edible and** edible

oils**,** as well as used cooking oil.
    - They used various sources, including palm **stearin, sapium oil, palm fatty acid** distillates, algae oil, karanja, and jatropha.
- **Significance of SAF Scaling in India:**
    - Scaling up the production and use of SAF in India can **bring several benefits, including reducing** GHG emissions, improving air quality, enhancing energy security, creating jobs in the renewable energy sector, and **promoting** sustainable development.
    - It can also help the **aviation industry** meet its environmental targets and contribute to global efforts to combat climate change.
    - **Biofuel for aviation** can be mixed with regular jet fuel and used together. Compared to traditional fuel, it has **lower sulfur content**, which can decrease air pollution and support India's goal of achieving **Net Zero emissions.**

What are the Challenges Pertaining to SAF?

- **High Cost:**
    - The production processes for SAF, such as the conversion of biomass or waste oils into fuel, **are currently more expensive**. This cost differential makes it economically **challenging for airlines to invest in SAF production** and use, particularly given the margin-sensitive nature of the aviation industry.
- **Limited Resource Availability:**
    - The aviation industry requires **a robust supply chain to ensure an adequate and reliable supply of SAF**. However, the current infrastructure is not well-developed, which hinders the scaling up of SAF production and its availability in the market.
- **Feedstock Availability:**
    - SAF production **heavily relies on the availability of sustainable feedstocks**, such as agricultural residues, algae, and waste oils.
    - However, there is **limited availability of these feedstocks,** and there is competition for resources with **other industries like food and agriculture. Balancing the demand for sustainable feedstocks** while ensuring food security and other essential needs poses a significant challenge.
- **Certification Process:**
    - The certification process for SAF involves **stringent quality and sustainability criteria**, which can be complex and time-consuming.
    - The lack of globally **recognized standards further complicates** the certification process.

What are India’s Climate Commitments and Global Efforts?

- **India’s Commitments Net-Zero:**
    - India has pledged to achieve net-zero emissions by 2070 and reduce the carbon intensity of its **economy by less than 45% by 2030.**
    - Additionally, India has urged developed countries **to provide climate finance of USD 1 trillion at** the earliest, since India needs support and resources from developed nations to achieve these ambitious targets.
        - In April 2023, the European Union reached an agreement to set binding targets for airlines within Europe, requiring **increased usage of SAF.**
            - The deal mandates that 2% of fuel supplies at EU airports be SAF by 2025, reaching 6% in 2030, 20% in 2035, and 70% in 2050.
- **Indian Initiatives:**
    - **Biodiesel**
    - **Ethanol blending in conventional fuel**
    - **Hydrogen Fuel Cell**
- **Global Efforts:**
    - **Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)**
    - Clean Skies for Tomorrow Initiative
    - Sustainable Skies Act and SAF Production Incentives

What is International Civil Aviation Organisation?

- ICAO is a **United Nations (UN) specialized agency**, established in 1944, which laid the foundation for the standards and procedures for peaceful global air navigation.
    - The Convention on International Civil Aviation was signed on 7th December 1944 in Chicago commonly as the **'Chicago Convention'.**
    - It established the core principles permitting international transport by air, and also led to the creation of the ICAO.
- Its one of the objectives is to foster the planning and development of international air transport so as to ensure the safe and orderly growth of international civil aviation throughout the world.
- **India is among its 193 members.**
- It is headquartered in **Montreal, Canada.**

Way Forward

- India's stance on global SAF mandates highlights its commitment to addressing climate change while **also considering its national plans and special circumstances**.
- India seeks support from ICAO in balancing sustainability goals with other priorities in the aviation sector. As the world moves **towards decarbonizing aviation, it becomes crucial to find common ground** and work together to achieve a sustainable future for air travel.
- Collaboration between stakeholders, including airlines, fuel producers, and research institutions, **can help to build a more integrated and efficient SAF supply chain.**
- Investing in research to develop new **feedstock sources for SAF production,** such as municipal solid waste and agricultural waste, can help to increase feedstock availability and reduce competition with other industries.

Source: TH