Sustainable Aviation Fuel

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In news– Recently, Airlines under the Tata umbrella have signed a memorandum of understanding with the Council Of Scientific And Industrial Research–Indian Institute Of Petroleum(CSIR-IIP) to collaborate and work together on research, development and deployment of sustainable aviation fuels.

Key updates-

- The focus of the MoU is the exploration of Single Reactor HEFA (Hydroprocessed Esters and Fatty Acids) Technology for Drop-in liquid Sustainable Aviation and Automotive Fuel (DILSAAF), according to a joint statement by the airlines.
- The MoU was signed by Air India, AirAsia India and Vistara airlines with CSIR-IIP.
- The concept of sustainable aviation fuel among Indian airlines is still at a nascent stage. So far, there have been a handful of demonstration flights by SpiceJet and IndiGo on blended fuel for lower carbon emissions.
- In December last year, IndiGo partnered with CSIR-IIP on sustainable aviation fuel, including work on single Reactor HEFA Technology for Drop-in liquid Sustainable aviation and Automotive Fuel (DILSAAF).
- In 2016, the International Civil Aviation Organization (ICAO) adopted a global market-based mechanism, the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), to address CO2 emissions from international aviation.
- CORSIA aims to stabilise net carbon emissions from international civil aviation using offsetting programmes. Offsetting is an action by a company or individual to compensate for their emissions by financing a reduction in emissions elsewhere.

- Under this, from 2021 until 2026, only flights between states that volunteer to participate will be subject to offsetting requirements. The countries that have volunteered cover about 77% of all international aviation activity. Beginning 2027, virtually all international flights will be subject to mandatory offsetting requirements, representing more than 90% of all international aviation activity. Until September 2021,107 states have volunteered to join CORSIA for 2022.

What is sustainable aviation fuel(SAFs)?

- Sustainable aviation fuel is **made from sustainable resources, such as forestry,and agricultural waste and used cooking oil** and can be **blended with fossil jet fuel to reduce emissions**.
- SAFs are made using a variety of feedstocks and waste products. They are:
    - **Municipal solid waste:** Waste that comes from households and businesses.
    - **Cellulosic waste:** The excess wood, agricultural, and forestry residues. These residues can be processed into synthetic fuel.
    - **Used cooking oil:** This typically comes from plant or animal fat that has been used for cooking and is no longer usable.
    - **Camelina**: It is an energy crop, with high lipid oil content. The primary market for camelina oil is as a feedstock to produce renewable fuels. Camelina is often grown as a fast-growing rotational crop with wheat and other cereal crops.
    - **Jatropha:**It is a plant that produces seeds containing inedible lipid oil that can be used to produce fuel. Each seed produces 30 to 40% of its mass in oil.

    - **Halophytes:** Salt marsh grasses and other saline habitat species that can grow either in salt water or in areas affected by sea spray where plants would not normally be able to grow.
    - **Algae:** These microscopic plants can be grown in polluted or salt water, deserts and other inhospitable places.
- It is a '**drop-in' fuel,** meaning it can be added with no changes needed to the aircraft.
- Although supply is currently limited (0.01% of global jet fuel use), sustainable aviation fuels (SAFs), often known as 'next-generation biofuels' or 'advanced biofuels', are already in use today and are poised for growth.
- SAFs can be mixed with traditional kerosene and are already in use in many commercial flights.