Small Satellite Launch Vehicle

For Prelims: Types of Launch Vehicles, Types of Orbits.

For Mains: Significance of small launch vehicles in India's space sector.

Why in News

Recently, the **Indian Space Research Organisation (ISRO) chairman** has mentioned the launch of an **"SSLV-D1 Micro SAT** in April 2022".

- The **SSLV (Small Satellite Launch Vehicle)** aims to cater to the market for the launch of small satellites into **Earth's low orbits** that has emerged in recent years to cater to the needs of developing countries, universities for small satellites, and private corporations.

Key Points

- **About:**
  - It is the **smallest vehicle weighing only 110-tonne**. It will take only 72 hours to integrate, unlike the 70 days taken now for a launch vehicle.
  - It can **carry satellites weighing up to 500 kg** to a low earth orbit while the tried and tested **Polar Satellite Launch Vehicle (PSLV)** can launch satellites weighing in the range of 1000 kg.
    - SSLV is **a three-stage all solid vehicle** and has a capability to launch up to 500 kg satellite mass into 500 km Low Earth Orbit (LEO) and 300 kg to Sun Synchronous Orbit (SSO).
  - It is **perfectly suited for launching multiple microsatellites** at a time and supports multiple orbital drop-offs.
  - The key features of SSLV are **low cost, with low turn-around time, flexibility in accommodating multiple satellites, launch on demand feasibility**, minimal launch infrastructure requirements, etc.
  - The Government has sanctioned a total cost of **Rs. 169 Crores for the development project** including the development & qualification of the vehicle systems and the flight demonstration through three development flights (SSLV-D1, SSLV-D2 & SSLV-D3).
  - **ISRO's new chairman Dr Somanath is credited with designing and developing the SSLV** during his tenure as director of the Vikram Sarabhai Space Centre in Thiruvananthapuram since 2018.
    - The maiden flight of the SSLV was scheduled to launch in July 2019 but that has since been delayed due to setbacks from Covid-19 and other issues.
- **Significance of SSLV:**
  - The development and manufacture of the SSLV are **expected to create greater synergy between the space sector and private Indian industries** – a key aim of the space ministry.
    - Indian industry has a consortium for the production of PSLV and should come together to produce the SSLV as well once it is tested.

- One of the mandates of the newly-created ISRO commercial arm, **New Space India Limited (NSIL)** is to **mass-produce and manufacture the SSLV and the more powerful PSLV** in partnership with the private sector in India through technology transfers.
    - Its aim is to **use research and development carried out by ISRO** over the years for commercial purposes through Indian industry partners.
- Small satellite launches have **so far depended on 'piggy-back' rides with big satellite launches on the Polar Satellite Launch Vehicle (PSLV)** — ISRO's work-horse with more than 50 successful launches. As a result, small satellite launches have relied on ISRO finalising launch contracts for larger satellites.

Source: IE