

### **3. Reusable Launch Vehicle (RLV)**

#### **Why in News?**

- Indian Space Research Organisation (ISRO) and its partners successfully demonstrated a precise landing experiment for a Reusable Launch Vehicle (RLV) at the Aeronautical Test Range (ATR), Chitradurga, Karnataka.

#### **Highlights**

- An Indian Air Forces (IAF) Chinook helicopter was used to drop the RLV-TD from a 4.5 km altitude and ISRO executed the landing experiment of the RLV-TD as planned.
- According to ISRO, the series of experiments with the winged Reusable Launch Vehicle-Technology Demonstration (RLV-TD) are part of efforts at “developing essential technologies for a fully reusable launch vehicle to enable low-cost access to space”.
- In the future, this vehicle will be scaled up to become the first stage of India’s reusable two-stage orbital (TSTO) launch vehicle.
- ISRO’s RLV-TD looks like an aircraft. It consists of a fuselage, a nose cap, double delta wings, and twin vertical tails.
- The RLV-TD will be used to develop technologies like hypersonic flight (HEX), autonomous landing (LEX), return flight experiment (REX), powered cruise flight, and Scramjet Propulsion Experiment (SPEX).
- With the costs acting as a major deterrent to space exploration, a reusable launch vehicle is considered a low-cost, reliable, and on-demand mode of accessing space.
- By using RLVs the cost of a launch can be reduced by nearly 80% of the present cost.
- ISRO had earlier demonstrated the re-entry of its winged vehicle RLV-TD in the HEX mission in May 2016.
- In HEX, the vehicle landed on a hypothetical runway over the Bay of Bengal. Precise landing on a runway was an aspect not included in the HEX mission.
- The LEX mission achieved the final approach phase that coincided with the re-entry return flight path exhibiting an autonomous, high speed (350 kmph) landing.