

Cloud seeding

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Why in news?

The three-month-long cloud seeding project aimed at augmenting rainfall in North Karnataka was launched.

What is cloud seeding?

- Cloud seeding is a way to artificially tweak rain.
- The technology sprays particles of salts like silver iodide and chloride on clouds using a special aircraft, rockets or from dispersion devices located on the ground.
- The most **common chemicals used for cloud seeding include silver iodide, potassium iodide and dry ice (solid carbon dioxide) and Liquid propane.**
- These salt particles act as a core (cloud condensation nuclei or ice-nucleating particles) which draw water vapour within the cloud towards them.
- The moisture latches on, condensing into water droplets leading to the formation of raindrops.
- The **goal of cloud seeding** is to *alter the natural development of the cloud to enhance precipitation, suppress hail, dissipate fog or reduce lightning.*



History of cloud seeding:

- Rainmaking has its roots in **1946** when **American scientists Vincent Schaefer and Bernard Vonnegu at General Electric (GE)** successfully seeded a cloud with dry ice and got the world's first artificial snowfall.
- **Tata firms** also took stabs at cloud seeding in the Western Ghats region in 1951 using ground-based silver iodide generators.

- In 1952, late climatologist **K. Banerji**, the first Indian director-general of Indian Meteorological Department (IMD) experimented with cloud seeding with salt and silver iodide through hydrogen-filled balloons released from the ground.
- The Rain and Cloud Physics Research (RCPR) unit of Indian Institute of Tropical Meteorology (IITM) in Pune carried out randomized warm cloud modification experiments through salt seeding during 1957-1966 in north India.
- Over the next three decades, India experimented in this direction in Maharashtra, Karnataka and Uttar Pradesh.
- Research on cloud seeding in India received a boost since 2018 with the Union Ministry of Earth Sciences investing in data collection and experiments.

Cloud seeding methods:

- **Static cloud seeding:** It involves spreading a chemical like silver iodide into clouds. The silver iodide provides a crystal around which moisture can condense.
- **Dynamic cloud seeding:** It aims to boost vertical air currents, which encourages more water to pass through the clouds, translating into more rain. Up to 100 times more ice crystals are used in dynamic cloud seeding than in the static method.
- **Hygroscopic cloud seeding:** It disperses salts through flares or explosives in the lower portions of clouds. The salts grow in size as water joins with them.