



# Cloud Seeding

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## Why in news?

Delhi Environment Minister urged the Central government to intervene, requesting Prime Minister Narendra Modi's assistance in facilitating artificial rain.

## What is Cloud Seeding?

Cloud seeding, also known as artificial rain, is a weather modification technique used to enhance precipitation. It involves introducing substances into clouds to stimulate rainfall or snowfall, making it a tool to address water shortages or improve air quality.

## How Does Cloud Seeding Work?

- **Materials Used:** The process typically uses materials like **silver iodide**, **potassium iodide**, or **dry ice**. These particles act as **nuclei** (tiny particles) for water droplets to form around, eventually leading to precipitation.
- **Methods of Delivery:** Cloud seeding can be done using various methods:
- **Aircraft:** Planes fly through the clouds, releasing seeding materials.
- **Ground-based Generators:** These devices emit seeding particles into the atmosphere.
- **Rockets:** In some cases, rockets are used to disperse materials at higher altitudes.

The goal is to increase the size of cloud droplets so that they grow larger, and due to gravity, they fall as rain.

## Applications of Cloud Seeding:

1. **Increasing Precipitation:** The primary goal is to enhance rainfall or snowfall in areas suffering from drought or water shortages.
2. **Air Pollution Mitigation:** Cloud seeding can help "wash away" particulate matter and pollutants from the air by encouraging rainfall, which settles dust and other airborne particles, improving air quality, albeit temporarily.

## Challenges and Considerations:

- **Atmospheric Conditions:** For cloud seeding to be effective, certain atmospheric conditions are required, such as the presence of clouds with adequate moisture content. If clouds are too dry or lack sufficient moisture, seeding will not work effectively.
- **Environmental Concerns:** The long-term environmental impact of substances like silver iodide is still under research, as excessive introduction into ecosystems could have unknown effects.

While cloud seeding offers potential solutions for both water scarcity and air pollution control, its effectiveness depends on the specific weather conditions, and there are challenges in ensuring sustainable and safe application.