



# CURRENT AFFAIRS



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## CLOUD SEEDING

*This article covers "Daily Current Affairs" and the topic details "Cloud Seeding". This topic has relevance in the Science and Technology section of the UPSC CSE exam.*

*GS 3: Science and Technology*

### Why in the news?

Delhi is considering the implementation of artificial rain techniques as a measure to address the escalating air pollution levels.

### Overview of Cloud Formation:

- Comprised of minuscule water droplets or ice crystals.
- Form when atmospheric water vapor cools and condenses around particles like dust or salt.
- Water droplets or ice crystals require condensation or ice nuclei.
- Without these particles, precipitation in the form of raindrops or snowflakes cannot occur.

### Cloud Seeding:

- Artificial method to boost rainfall by introducing specific substances into clouds.
- Aircraft release chemicals (e.g., silver iodide, potassium iodide, dry ice) into the atmosphere.
- Attracts water vapor, leading to the formation of rain clouds.
- Takes approximately half an hour for cloud seeding to induce rainfall.

### Cloud Seeding Techniques:

- **Hygroscopic Cloud Seeding:**
  - Objective: Accelerate droplet coalescence in liquid clouds.
  - Seeding agents act as efficient cloud condensation nuclei (CCN) or Giant Cloud Condensation Nuclei (GCCN).
  - Strengthens condensation and collision-coalescence process, increasing precipitation efficiency.
- **Glaciogenic Cloud Seeding:**
  - Centers on prompting the generation of ice in clouds that exist in a supercooled state.
  - Involves dispersing efficient ice nuclei (e.g., silver iodide, dry ice) into the cloud.
  - Enhances ice particle production, leading to increased rainfall.

## Utility of Cloud Seeding:

- Reducing drought impact.
- Forest fire prevention.
- Augmenting precipitation levels.
- Improving air quality.



**CLOUD SEEDING**

**Silver Release from Aircraft:**

- Aircraft releases silver into the atmosphere.
- The silver serves as a seeding agent.

**Targeted Cloud Interaction:**

- Silver iodide particles introduced into the targeted clouds.
- Specific cloud types are the focus of the seeding process.

**Ice Crystal Formation Assistance:**

- Silver iodide aids in the initiation of ice crystal formation within the cloud.

**Increased Particle Weight:**

- Ice crystals grow heavier, making them too weighty to remain suspended in the air.

**Precipitation Initiation:**

- Ice crystals fall from the cloud, often melting on their descent.
- This process contributes to the formation of rain.

## Success Story: Cloud Seeding Experiment in Solapur:

- Location: Solapur city, known for low rainfall on the leeward side of the Western Ghats.
- Outcome: Achieved an 18% relative enhancement in rainfall through a cloud seeding experiment.

**SOURCE:**

<https://indianexpress.com/article/explained/explained-sci-tech/delhi-rain-cloud-seeding-pollution-explained-9021286/>

**Q.1 In the context of which of the following scenarios do some scientists propose the utilization of cirrus cloud thinning technique and the introduction of sulfate aerosol into the stratosphere? (2019)**

- (a) Initiating artificial rains in specific regions.
- (b) Mitigating the frequency and severity of tropical cyclones.
- (c) Alleviating the detrimental impacts of solar wind on Earth.
- (d) Mitigating global warming.

**ANSWER: D**

**Q.2 Regarding cloud seeding or artificial rain techniques, evaluate the following statements:**

1. It is a synthetic method aimed at diminishing condensation nuclei in the atmosphere.
2. Utilizes substances such as silver iodide, potassium iodide, and sulfate aerosols.
3. It amplifies the collision-coalescence mechanism of droplets, thereby promoting increased precipitation.

**How many of the above statement/s is/are correct?**

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

**ANSWER: A**

**Q.3 Discuss the role and ethical considerations associated with implementing large-scale geoengineering projects as a strategy to mitigate the effects of climate change.**

**Rishabh**

## LOSS AND DAMAGES (L&D) FUND

*This article covers "Daily Current Affairs" and the topic details "Loss and Damages (L&D) Fund". This topic has relevance in the "Ecology and Environment" section of the UPSC CSE exam.*

**For Prelims:**

*What is Loss and Damages (L&D) Fund?*

*What is COP?*

**For Mains:**

*GS3: Ecology and Environment*

## Why in the news?

As the climate crisis escalates, attention is centred on two critical terms: adaptation and 'loss and damage' (L&D). Adaptation involves proactive responses and deliberate choices made by communities and countries to prepare for and cope with climate-related challenges.

## Understanding Loss and Damage

- Loss and damage encompass negative consequences from unavoidable climate change risks such as rising sea levels, prolonged heatwaves, desertification, sea acidification, and extreme events like bushfires, species extinction, and crop failures.
- With the climate crisis escalating, these events are expected to occur more frequently, leading to increasingly severe consequences.

## Loss and Damages (L&D) Fund

- In 2013, at the **19th Conference of the Parties (COP 19) to the United Nations Framework Convention on Climate Change (UNFCCC)** in Warsaw, Poland, representatives of member countries formally agreed to establish the **Loss and Damage (L&D) fund**.
- The Loss and Damage Fund aims to provide financial assistance to nations most vulnerable and significantly impacted by the effects of climate change.
- It targets filling gaps left by existing climate finance institutions, including the Green Climate Fund, which fell short by at least US\$17 billion in 2020 against the pledged US\$100 billion for developing countries.

## Key Developments related to Loss and Damages (L&D) Fund

<b>COP 19</b>	2013	Warsaw, Poland	Representatives agreed to establish the Warsaw International Mechanism for Loss and Damage (WIM) fund for financial and technical assistance to developing nations facing climate-induced Loss and Damage.
<b>COP 25</b>	2019	Santiago, Chile	Santiago Network for Loss and Damage was set up, but no fund commitments were made.
<b>COP 26</b>	2021	Glasgow, United Kingdom	Glasgow Dialogue on finance for Loss and Damage initiated for ongoing discussions.
<b>COP 27</b>	2022	Sharm el-Sheikh, Egypt	UNFCCC member states agreed to set up the Loss and Damage Fund and a Transitional Committee (TC) for new funding mechanisms. TC will provide recommendations for consideration at COP 28.

## Challenges and Prerequisites for Effectiveness

- To be effective, the **fund must address the root cause of climate change**, which involves reducing emissions.
- Without a drastic reduction in emissions, more countries will experience the devastating effects of climate change.

- **Urgent action is needed to allocate resources** for mitigation, adaptation, and loss and damage, ensuring climate change does not undermine efforts to achieve the Sustainable Development Goals.

### **UN Framework Convention on Climate Change (UNFCCC)**

- The UN Framework Convention on Climate Change (UNFCCC), initiated in 1994, lays down broad principles guiding the global effort to combat climate change.
- It explicitly acknowledges the **differentiated responsibility** of nations, emphasising that **affluent countries have an obligation to provide both financial assistance and technological support** to developing nations in their climate change mitigation and adaptation endeavours.

### **Financial Commitments and Technological Support**

- In 2009, a significant commitment was made by developed countries to contribute US\$100 billion annually from 2020 onwards.
- This commitment aimed to assist developing nations in combatting climate change, recognising their financial challenges.

### **Warsaw International Mechanism (WIM)**

- The Warsaw International Mechanism (WIM) for Loss and Damages was established in 2013.
- It represents the first formal acknowledgement of the need to compensate developing countries struck by climate disasters.
- The mechanism recognises the unique challenges faced by these nations and underscores the importance of addressing loss and damages resulting from climate-related disasters.

**Sources:**

['Loss and damage' fund talks leave developing nations at new disadvantage | Explained - The Hindu](#)

### **Q1. With reference to Loss and Damages Fund, consider the following statements:**

1. The Loss and Damages Fund was agreed to establish under the Warsaw International Mechanism.
2. The Fund aims to provide financial assistance to all nations impacted by the effects of climate change.

### **Which of the statements given above is/are correct?**

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) None

**Answer: (a)**

### **Q2. Consider the following:**

1. UN Framework Convention on Climate Change (UNFCCC) has near universal membership (198 Parties) and is the parent treaty of the Cartagena Protocol and Nagoya Protocol.
2. UNFCCC was established in the 1992 United Nations Conference on Environment and Development (UNCED), also known as the Rio Earth Summit.
3. The Convention acknowledges the differentiated responsibility of nations.

**How many of the abovementioned statements are correct?**

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

**Answer: (b)**

**Q3. Evaluate the significance of the Loss and Damage (L&D) Fund and its role in providing financial assistance to vulnerable nations.**

**Gaurav**

