



Sulphur Dioxide Emissions from Caribbean Volcano

Why in News

The **Sulphur Dioxide (SO₂) emissions** from a **volcanic eruption in the Caribbean (La Soufriere Volcano)** have reached India, sparking fear of **increased pollution levels** in the northern parts of the country and **acid rain**.

- The **Caribbean is the region** roughly south of the United States, east of Mexico and north of Central and South America, consisting of the Caribbean Sea and its islands.

Key Points

▪ About La Soufriere Volcano:

- It is **an active stratovolcano** on the **Caribbean island of Saint Vincent** in Saint Vincent and the Grenadines.
 - A **stratovolcano** is a tall, conical volcano composed of one layer of hardened lava, tephra, and volcanic ash. These volcanoes are characterized by a steep profile and periodic, explosive eruptions.
 - Saint Vincent and the Grenadines, **located in the southern Caribbean**, consists of more than 30 islands and cays, nine of which are inhabited.
- It is the **highest peak in Saint Vincent** and has had five recorded explosive eruptions since 1718, most recently in April 2021.
 - The last time the volcano had **erupted was in 1979**.

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▪ Impact of the Eruption on Global Temperatures:

- **Volcanic emissions** reaching the stratosphere **can have a cooling effect on global temperatures.**
- The most significant climate impacts from volcanic injections into the stratosphere come from the **conversion of sulphur dioxide to sulphuric acid**, which condenses rapidly in the stratosphere to form **fine sulphate aerosols.**
 - The **aerosols increase** the **reflection of radiation** from the Sun back into space, **cooling the Earth's** lower atmosphere or troposphere.
 - Bigger eruptions during the past century have caused a decrease in temperature of **0.27 degree Celsius** or more on the Earth's surface for up to three years.

▪ Sulphur Dioxide and Pollution:

- SO₂ emissions that lead to high concentrations of SO₂ in the air generally also lead to the formation of other sulfur oxides (SO_x). SO_x can react with other compounds in the atmosphere to form small particles. These particles contribute to [Particulate Matter \(PM\) pollution](#).
- Small particles may penetrate deeply into the lungs and in sufficient quantities can contribute to health problems.

▪ Sulphur Dioxide and Acid Rain:

- Acid rain results **when sulphur dioxide (SO₂) and nitrogen oxides (NO_x) are emitted into the atmosphere** and transported by wind and air currents.
- The **SO₂ and NO_x react with water, oxygen and other chemicals** to form sulfuric and nitric acids. These then mix with water and other materials before falling to the ground.

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