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**THE HINDU ANALYSIS – 15 JUNE 2023**



## **EDITORIAL 1: LIGHTNING, BLAMED FOR CANADA FIRES, WILL GET WORSE IN A WARMING WORLD**

### **CONTEXT**

- New York City's air quality was recently among the worst in the world due to smoke drifting from the wildfires in Canada. |

### **CAUSE OF THE WILDFIRES**

- According to a study published in Nature on February 10, 2023, **lightning is the main precursor** of natural wildfires. Laboratory experiments and field observations have together revealed that lightning electric currents that flow for more than some tens of milliseconds, the so-called **long-continuing currents (LCC)**, are likely to produce fires.
- The study indicated an increase in the total global lightning activity and global LCCs by the 2090s.
- The same study also found that LCC lightning activity increased by around 47% over land, implying a higher risk of lightning-ignited wildfires in the future.

### **WORKING OF THE LIGHTNING**

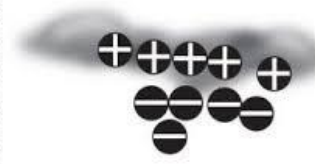
#### **How lightning strikes the Earth's surface**

Bottom of storm cloud becomes negatively electrically charged



Surface of the Earth gets positive charge

Charges alter air around cloud, creating potential lightning paths



Positive charge on surface extends towards negative charge

Lightning is the completion of these paths as nature tries to neutralize the extremes



Sources: Ariel Cohen, Tina Stall; Meteorologists NOAA National Weather Service @latimesgraphics

- During a storm, water droplets in warmer air and ice crystals that condensed in cooler air coalesce together to form thunderstorm clouds (usually cumulonimbus clouds).
- Contact between these droplets and crystals produces a static electrical charge in the clouds.
- The negative and positive charges in the clouds build up. Over time, the voltage difference becomes high enough to surmount the resistance presented by the air, leading to a rapid discharge of electric charge. This is what we see as a lightning flash.
- It can occur between oppositely charged surfaces within a thunderstorm cloud or between such surfaces in the cloud and on the ground.

### **LIGHTNING AS A CLIMATE INDICATOR**

- Long-term changes in lightning patterns reflect, at least in part, changes wrought by the climate crisis. The World Meteorological Organisation recognises lightning to be an essential climate variable that contributes critically to the way the earth's climate is characterised.
- This said, that It needs to be emphasised that lightning-climate relationship based on data for short periods, and different regions, in the present climate cannot always be used as a proxy for future global warming.
- According to a publication, lightning also produces nitrogen oxides, which react with oxygen in the air to form ozone, which is a strong greenhouse gas.

### **LIGHTNING STRIKES IN INDIA**

- Of late, lightning strikes have been the deadliest natural disaster in India. There were 18.5 million lightning strikes in the country between April 2020 and March 2021 – 34% higher than the previous year – according to the Climate Resilient Observing Systems Promotion Council.
- Per a report of the Lightning Resilient India Campaign, 90,632 people died by lightning between 1972 and 2019. According to the National Crime Records Bureau, India had 2,875 deaths due to lightning in 2019, rising marginally by 2021.
- The private weather-forecasting company Skymet has reported that Odisha recorded the most strikes among India's states in 2019.

- It also said that most such deaths in India happen because people living in villages seek shelter from lightning under tall trees, which are more likely to be struck.

### **ISSUES RELATED TO MITIGATION OF LIGHTNING RELATED CASUALTIES:**

- There is no national-level policy to tackle lightning fatalities except for providing a lump-sum ex-gratia to the kin of the deceased person.
- The Odisha government provides 4 lakh per deceased person to the next of kin from SDRF.
- Other State governments provide lump sum Ex-gratia to the deceased person's family.
- These policies are not adequate to minimise deaths due to lightning.

### **WAY FORWARD:**

- **Inclusion of lightning as a natural disaster:** The Centre should include lightning as a "natural disaster" to minimise lightning-related deaths.
- **Hazard Mapping and targeted public interventions:** In addition, some critical measures where public intervention is an absolute necessity include mapping vulnerable populations with potential lightning hotspots, improving early warning systems, and installing lightning detection systems in the local areas.
- **Frequency database of lightning strikes:** Moreover, the government should prepare a database related to the frequency of lightning strikes, gender-wise lightning deaths, and occupation-wise fatalities at the district, state and central levels for devising an action plan against lightning strikes.
- **Training and community awareness programs:** More than 70 percent of deaths from lightning occurred amongst people standing under tall trees; therefore, training and community awareness programs are essential measures to minimise deaths due to lightning.

## EDITORIAL 2: MUSINGS ON THE FRICTIONS IN INDIA-CANADA TIES

### INTRODUCTION

- Canada and India have long-standing bilateral relations built upon shared traditions of democracy, pluralism and strong interpersonal connections. The deep cultural and political ties between Canada and India are strengthened by a growing network of official dialogues, agreements, memoranda of understanding and working groups.

### INDIA-CANADA BILATERAL RELATIONS

- India established diplomatic relations with Canada in **1947**.
- **Bilateral Mechanisms:** Both sides pursue bilateral relations through the dialogue mechanisms such as Ministerial level- Strategic, Trade and Energy dialogues; Foreign Office Consultations; and other sector specific joint working groups (JWG).
- **Commercial relations:** Both sides are engaged in technical negotiations for a **Comprehensive Economic Partnership Agreement (CEPA)** including trade in goods, services, investment, trade facilitation etc.
- Major Items of **Indian Exports** are: Medicines, Garments, diamonds, chemicals, gems and jewellery, petroleum oils, made-up, sea food, engineering goods, marble and granite, knitted garments, rice, electric equipment, plastic products, etc.
- Major items of **Canada's export** to India are: Pulses, fertilizers, newsprint, aircrafts & aviation equipment, diamonds, copper ores and concentrates, bituminous coal, wood pulp, nickel, unwrought aluminum, asbestos, god, cameras, lumber, ferrous waste, etc.
- **Nuclear Cooperation:** Indo-Canadian relations deteriorated in the wake of India's Smiling Buddha nuclear test of May 1974. However, in June 2010, a Nuclear Cooperation Agreement (NCA) with Canada was signed and came into force in September 2013.
- **Indo-Canadian Science and Technology** cooperation:
- **Department of Biotechnology under IC-IMPACTS program** implements joint research projects in health care, agri-biotech and waste management.

- **The Department of Earth Science and Polar Canada** has started a programme for the exchange of knowledge and scientific research on Cold Climate (Arctic) Studies.
- **Space: ISRO and Canadian Space Agency (CSA)** signed two MOUs in the field of exploration and utilisation of outer space in October 1996 and March 2003.
- **ANTRIX**, the Commercial arm of ISRO, has launched several nanosatellites from Canada.
- **ISRO** in its 100th Satellite PSLV launched on 12 January 2018, also flew the **Canadian first LEO satellite**, from the Indian spaceport Sriharikota, Andhra Pradesh.
- **Security and Defence:** India and Canada collaborate closely in international fora, particularly through the UN, Commonwealth and G-20.
- **Agriculture:** The first meeting of the JWG set under this MoU was held in New Delhi in 2010, which led to the creation of three sub-groups on knowledge exchange in emerging technologies; animal development and agricultural marketing.
- **Education:** Education is a key area of mutual interest. Recently India became the top source of foreign students studying in Canada.
- **People-to-People ties:** Canada hosts one of the largest Indian diasporas in the world, numbering 1.6 million (PIOs and NRIs) which account for more than 4% of its total population.
- **Cultural Exchanges:** Canada was the Country of Focus at the 48th International Film Festival of India held in Goa in November 2017. There is also an India - Canada Coproduction Agreement in films.

## CHALLENGES

- **Sikh extremism:** Sikhs constitute a significant proportion of the Indian diaspora. The issue of Sikh separatist groups operating in Canada has become a growing source of tension between India and Canada.
- **India's structural impediments:** India still has to overcome structural impediments such as complex labour laws, market protectionism, and bureaucratic regulations.

- **Inadequate trade:** While India–Canada economic relations have made some progress, Canada remains an insignificant trading partner for India.

## WAY AHEAD

- India-Canada relations have struggled to prosper, despite the two countries sharing various complementarities such as their democratic character and association in the Commonwealth. India must foster a deeper understanding of Canada and the potential it holds for India.

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