

# EDITORIAL

DATE : 5<sup>th</sup> November

## India's Path to Methane Mitigation: Strategic Considerations for COP29

General Studies Paper 3: Environment, Climate Change, and Science & Technology

### Introduction

- **COP29 Summit:** From **November 11 to 22, 2024**, the 29th Conference of the Parties (COP) will take place in **Baku, Azerbaijan**.
- **Primary Agendas:**
  - Establishing a new global **climate finance goal** known as the **new collective quantified goal (NCQG)**.
  - A strong focus on **methane diplomacy**, emphasizing methane reduction as a central climate action due to methane's potent impact on global warming.
- **Methane's Role in Climate Change:** Responsible for **30% of global warming** since the pre-industrial era, methane has become a priority in climate discussions.

### Background

1. **Methane's Environmental Impact:**
  - **High Warming Potential:** Methane's **global warming potential (GWP)** is **28 times that of CO<sub>2</sub>** over a 100-year period and **84 times** over a 20-year period.
  - **Immediate Impact:** Due to its potent short-term effect, methane reduction is seen as a quick win in curbing warming trends.
2. **Historical Global Cooperation:**
  - **COP28 Outcomes:** At COP28, **China and the U.S.** set a precedent for methane reduction collaboration, addressing non-CO<sub>2</sub> gases.
  - **China's Methane Plan:** China's release of a **national methane control plan** demonstrates a global shift towards concrete methane control strategies.
3. **India's Position in Global Methane Emissions:**
  - **Third-Largest Emitter:** India ranks third globally in methane emissions, giving it a significant role in methane diplomacy.

- **Economic and Agricultural Constraints:** India is cautious about adopting strict methane reduction targets due to **agriculture's dominant role** in its emissions profile, especially from **livestock** and **rice cultivation**.

## Present Status of Methane Emissions and Management in India

### 1. Global Context:

- **U.S.-China Partnership:** Following COP28, the U.S.-China collaboration emphasizes methane reduction, placing methane at the forefront of climate diplomacy and motivating other countries to strengthen methane mitigation.

### 2. India's Methane Emissions Profile:

- **Emissions Data:** In **2016**, India's methane emissions were reported at **409 million tons of CO<sub>2</sub>-equivalent**.
- **Sectoral Contributions:**
  - **Agriculture:** 74%, mainly from livestock and rice cultivation.
  - **Waste Management:** 14%.
  - **Energy Sector:** 11%.
  - **Industrial Processes:** 1%.

### 3. Local Challenges in Methane Emission Management:

- **Waste Fires:** Instances like the **Bhalswa landfill fire in Delhi (2022)** reveal severe environmental and health hazards tied to methane from waste.
- **Underreported Emissions:** Cities like **Delhi and Mumbai** often have methane emissions that are underestimated, complicating policy and action.

## Government Initiatives for Methane Reduction

### 1. Waste Management Efforts:

- **Regulatory Framework:** India has established **waste management regulations**, yet faces issues in **implementation** due to limited local governance and infrastructure.
- **Innovative City Models:**
  - **Indore:** The city developed an **organic waste sorting system** linked to a **biomethane plant** that supplies fuel for public transportation.
- **GOBARdhan Scheme:**
  - Part of **Swachh Bharat Mission-Urban 2.0**, GOBARdhan promotes **biogas production from cattle waste** in rural areas, aiming to reduce methane from animal husbandry.

### 2. Agricultural Sector Initiatives:

- **National Mission for Sustainable Agriculture (NMSA):**
  - NMSA promotes **climate-resilient farming** methods, aiming to reduce methane emissions, especially in rice cultivation.
- **National Livestock Mission:**
  - Focuses on **green fodder production** and **efficient feeding practices** to mitigate methane from livestock.

## International Best Practices in Methane Mitigation

### 1. United States:

- **Comprehensive Strategy:** The U.S. utilizes robust methane abatement strategies, including **regulations for oil and gas leaks** and investments in methane-reduction technologies.

### 2. European Union:

- **Strict Monitoring and Policies:** The EU enforces methane monitoring and reduction regulations across **agriculture and waste management**, setting an example for effective methane management.

### 3. China:

- **National Control Plan:** In 2023, China introduced a **national methane control plan** that prioritizes capacity building over specific reduction targets, indicating an evolving commitment to methane reduction.

## Challenges in India's Methane Mitigation Efforts

### 1. Agricultural Dependency:

- **High Methane Intensity:** Indian agriculture, especially **livestock and rice production**, is highly methane-intensive, making nationwide targets challenging and sensitive due to socio-economic impacts.

### 2. Data Gaps:

- **Inaccurate Emission Reporting:** Methane emission data is often unreliable, with satellite data indicating emissions from **urban waste sites** in cities like Mumbai are higher than reported.

### 3. Capacity Constraints:

- **Municipal Limitations:** Inadequate **infrastructure** and resources at the municipal level hamper effective waste management and methane mitigation.

### 4. Financing:

- **Limited Climate Finance:** India faces barriers in accessing **international climate finance** and technical assistance necessary for large-scale methane reduction initiatives.

## Opportunities and Strategic Leverage at COP29

### 1. Methane Diplomacy and U.S.-China Partnership:

- The **U.S.-China methane alliance** provides India an opportunity to seek **sector-specific international support** for methane mitigation in agriculture and waste.

### 2. Focus on Waste Management:

- By prioritizing **waste sector improvements**, India could secure **financing and technical assistance** for methane capture projects, crucial for urban methane control.

### 3. Agricultural Innovations:

- Targeted support can facilitate methane-reducing methods, such as **alternative wetting and drying** in rice cultivation, promoting climate-friendly practices.

## Way Forward for India

### 1. Building Local Capacity:

- **Strengthen Municipal Systems:** Enhance local capacity through **training programs** and **technological upgrades** to improve waste management and methane reduction.

### 2. Improving Data Collection:

- **Data Accuracy:** Invest in advanced data-gathering methods, including **satellite monitoring**, to enable accurate methane tracking and informed policymaking.

### 3. Scaling Successful Models:

- **Replicate Effective Models:** Expand **waste-to-energy models** like Indore's biogas plant to other urban areas, enhancing methane capture and utilization.

### 4. Active Participation in Methane Diplomacy:

- **COP29 Engagement:** Utilize COP29 as a platform to advocate for **sector-specific support** for methane reduction, leveraging the growing international methane diplomacy.

### 5. Investing in Research and Development:

- **Agricultural Research:** Promote R&D in methane-reduction technologies for agriculture, and incentivize **farmers to adopt sustainable practices**.

## Conclusion

Methane reduction is essential in global climate action. India, as a major methane emitter, has both **challenges and strategic opportunities** in methane diplomacy. Leveraging partnerships like the **U.S.-China alliance** and actively engaging at **COP29** will allow India to accelerate methane reduction while securing necessary support.

By **scaling proven solutions, improving data accuracy, and enhancing local capacities**, India can significantly contribute to **global climate stability** and align with broader climate goals.

Wisdom leads to success

## MAINS QUESTION

**Analyze the role of methane diplomacy in international climate negotiations. How can India leverage methane diplomacy to address its climate challenges while safeguarding its agricultural sector?**