



Methane Management

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Context

- India is the **third-largest emitter of methane globally**, contributing ~9% of total global emissions.
- Around **15% of India's methane emissions** come from the **waste sector**.
- Other major sources:
- **Agriculture:** Enteric fermentation in livestock, manure management, rice cultivation
- **Energy:** Fossil fuel usage, coal mines, leakages from oil & natural gas systems

Unlike agriculture and energy, which require **long-term structural reforms**, the **waste sector offers quick mitigation opportunities** through targeted interventions.

About Methane

- **Potency:** ~84 times more potent than CO₂ over 20 years.
- **Climate Impact:** Second most significant anthropogenic warming agent after CO₂.
- **Short-Lived Climate Pollutant (SLCP):**
- Atmospheric lifespan ~12 years
- Major precursor to **ground-level ozone**
- **Significance:** Reducing methane can provide **rapid cooling benefits**, essential to limiting global warming to **1.5°C**.

Key Interventions for Methane Management from Waste

1 Monitoring & Identification

- **Satellite-based monitoring** tracks broad methane trends and identifies emission hotspots.
- ISRO 2023 study highlighted major emitters:

§Pirana (Gujarat)

§Deonar & KanjurMarg (Maharashtra)

§Ghazipur (Delhi)

2 Source Segregation

- Enforce segregation of **wet, dry, and hazardous waste** at source.
- Linked to **Swachh Bharat Mission (Urban & Gramin)**.
- Prevents methane generation from decomposing organic waste.

3 Waste-to-Energy & Bio-CNG

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- Expand **GOBARdhan programme**: convert wet waste into **biogas or Bio-CNG**.

- Captures methane productively and supplies clean energy.

4Scientific Landfills

- Replace open dumping with **engineered landfills** (as per **Solid Waste Management Rules, 2016**).

- Features:

- § Gas collection systems

- § Leachate management

- § Reduces uncontrolled methane release

5Alignment with Climate Goals

- Integrate methane mitigation measures into India's **Nationally Determined Contributions (NDCs)** under the Paris Agreement.

- Supports **short-term climate benefits** and long-term sustainability.