METHANE EMISSIONS - ENVIRONMENT

News: Methane (CH_4) emissions are currently on the rise, posing a significant threat to achieving the global climate targets established by the Paris Agreement. Historically, carbon dioxide (CO_2) has been the primary focus of climate discussions; however, methane, which is a much more potent greenhouse gas (GHG), is now receiving increased attention. Addressing methane emissions is crucial because of its strong impact on global warming, and targeting reductions in methane could lead to swift and significant progress in global climate action efforts.

What's in the news?

Impact of Methane on Climate Change:

- **Methane Potency**:
  - Methane is **80 times more potent** than CO_2 as a greenhouse gas.
  - It has contributed to **30% of global warming** since the **Industrial Revolution**.
- **Atmospheric Lifespan**:
  - Methane stays in the atmosphere for only **7 to 12 years**.
  - Reducing emissions or increasing sinks of methane can provide a **short-term impact on climate** while allowing time to address long-term CO_2 reduction.
- **Climate Action Goals**:
  - Reducing methane emissions by **45% by 2030** could help meet the **Paris Agreement** target of limiting warming to **1.5°C**.

Benefits of Reducing Methane:

- **Immediate Climate Benefits**:
  - Methane reduction or removal can help mitigate global warming quickly, turning methane into an essential ally in maintaining **safe global temperatures**.
- **Air Quality Improvement**:
  - Lower methane emissions improve **air quality** by reducing the formation of **ground-level ozone**, which is harmful to respiratory health.

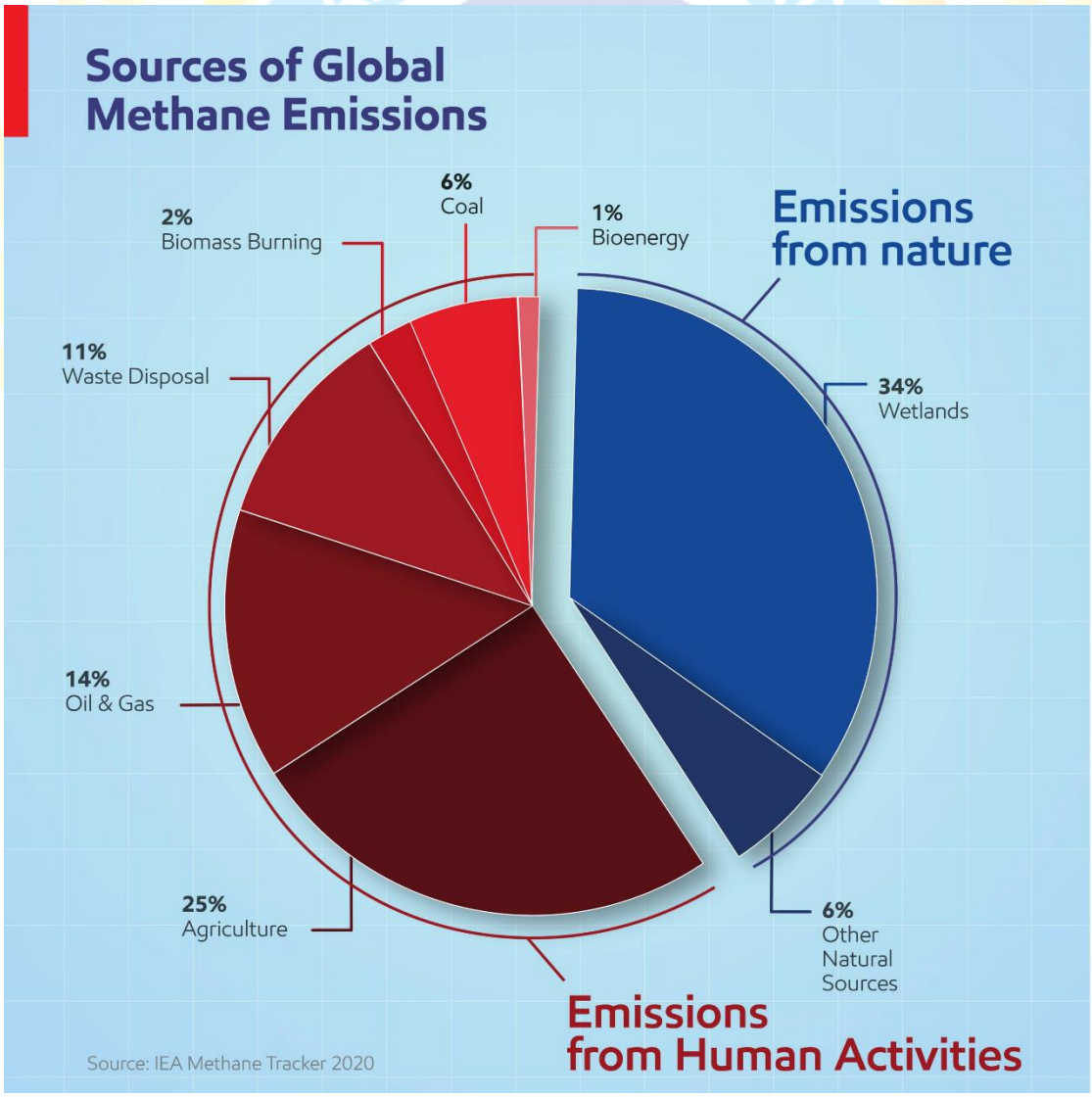
Methane Emission Sources:

- **Primary Sectors**:
  - **Energy Sector**: Oil, gas, and coal production.

- **Agriculture**: Primarily from **livestock** and **rice cultivation**.
- **Waste Management**: Emissions from **landfills**.

Global Methane Emission Statistics:

- **Annual Emissions**:
  - Global methane emissions are around **580 million tonnes** per year.
  - **40%** of these emissions come from **natural sources**, while **60%** are due to **human activities**.
- **Largest Sources**:
  - **Agriculture** is the largest human-induced source, responsible for **25%** of emissions.
  - The **energy sector** follows closely, with significant emissions from **coal, oil, natural gas**, and **biofuels**.



Initiatives to Tackle Methane Emissions

Indian Initiatives:

- **Harit Dhara (HD):**
    - Developed by the Indian Council of Agricultural Research (ICAR), it's an anti-methanogenic feed supplement.
    - Reduces cattle methane emissions by 17-20% and enhances milk production.
- **National Mission on Sustainable Agriculture (NMSA):**
    - Implemented by the Ministry of Agriculture and Farmers Welfare, it promotes climate-resilient practices, including methane reduction in rice cultivation.
- **National Innovations in Climate Resilient Agriculture (NICRA):**
    - Developed by ICAR under NICRA project.
    - Technologies to mitigate methane emissions from rice cultivation:
        - System for Rice Intensification: Increases rice yield by 36-49% with 22-35% less water.
        - Direct Seeded Rice: Reduces methane emissions by eliminating traditional methods.
        - Crop Diversification Programme: Shifts from paddy cultivation to alternative crops, minimizing methane emissions.
- **Bharat Stage-VI Norms:**
    - India transitioned from Bharat Stage-IV (BS-IV) to Bharat Stage-VI (BS-VI) emission norms to reduce vehicular methane emissions.

Global Initiatives:

- **Methane Alert and Response System (MARS):**
    - Integrates data from satellites to detect methane emission events worldwide and notifies stakeholders for action.
- **Global Methane Pledge:**
    - A voluntary commitment by nearly 100 countries, established at the Glasgow climate conference (UNFCCC COP 26) in 2021.
    - Aims to cut methane emissions by at least 30% by 2030 from 2020 levels.
    - India is not part of the Global Methane Pledge.
- **Global Methane Initiative (GMI):**

- An international public-private partnership focused on overcoming barriers to recovering and using methane as a clean energy source.

Why Did India Decline the Global Methane Pledge?

- **Main Methane Sources in India**:
  - India's methane emissions primarily come from **enteric fermentation** in livestock and **paddy cultivation**. These practices are essential for **small and marginal farmers**, forming the core of the nation's agricultural economy.
- **Survival Emissions**:
  - Methane emissions from agriculture are considered **"survival" emissions** as they directly impact **food production** and farmers' livelihoods, rather than being linked to luxury or excessive consumption.
- **Rice Cultivation and Food Security**:
  - India, as one of the **largest producers and exporters of rice**, argues that reducing methane emissions from rice fields could harm **food security**, affecting both **domestic supply** and **export potential**.
- **Impact on Farmers and Rural Economy**:
  - Any reduction in agricultural production, due to methane mitigation, could **threaten farmers' incomes** and subsequently **disrupt rural economies**.
- **CO_2 vs. Methane**:
  - India believes that **CO_2**, which has a **longer lifespan** (100-1000 years), is the main driver of climate change, while the Global Methane Pledge places undue emphasis on **methane reduction**, a gas with a **shorter lifespan**, potentially shifting the burden away from CO_2 mitigation.
- **Nationally Determined Contributions (NDCs)**:
  - India's climate actions under the **Paris Agreement** are not tied to **sector-specific emission reduction targets**, allowing the country flexibility to address emissions based on **national priorities**.
- **Alignment with National Interests**:
  - After evaluation, the Indian government concluded that signing the **Global Methane Pledge** would not be in alignment with the country's **national interests**.

Sources: https://www.iea.org/news/high-level-iea-cop29-event-on-turning-methane-pledges-into-action-focuses-on-how-to-achieve-meaningful-progress