ujiyari

UPSC & STATE PCS CURRENT AFFAIRS · UJIYARI.COM

DAILY CURRENT AFFAIRS

India's Paddy Fields Emerge as Global Methane Hotspots

24 July 2026 · ENVIRONMENT · GS3

CURATED & WRITTEN BY

Bharat Choudhary

UPSC Educator & Content Creator

linkedin.com/in/epicbharat

India's Paddy Fields Emerge as Global Methane Hotspots

24 July 2026 · 4 min read ·

Every fact web-verified against primary sources

> *A global assessment published in the journal in 2026, and highlighted again in current reporting, found that India's flooded, irrigated* **paddy (rice) fields**, *together with declining soil-carbon storage, are among the world's largest* **methane emission hotspots**. *The finding sharpens a difficult policy question for India: how to safeguard food security from its staple crop while curbing one of the most potent drivers of near-term global warming.*

WHY RICE AND METHANE ARE LINKED

Paddy is not like other crops. To control weeds and stabilise yields, farmers keep fields **continuously flooded** for much of the season. That standing water starves the soil of oxygen, creating anaerobic conditions in which **methanogenic bacteria** thrive, breaking down organic matter and releasing **methane (CH_4)** into the atmosphere. The longer the field stays flooded and the richer it is in organic residue, the more methane it emits.

The Scale of the Problem

INDICATOR	FIGURE
India's annual methane from irrigated paddy	About **3 to 4 million tonnes**
Growth in global paddy greenhouse-gas emissions since the 1960s	**Nearly doubled**
Global paddy emissions (2011-2020)	About **1.1 billion tonnes of CO_2-equivalent**
Projected rise by 2050	About **26 per cent**
Methane's warming potential vs CO_2 (100-year)	Around **28 to 34 times**

Methane is a **short-lived climate pollutant**. It persists in the atmosphere for only about a decade, far shorter than carbon dioxide, but it traps heat far more aggressively while it lasts. That makes it both the **second-largest contributor to warming after CO_2** and, crucially, a lever for **fast climate action**: cutting methane now buys time by slowing warming within a human generation.

WHY INDIA SITS AT THE CENTRE

India is among the world's largest rice producers and consumers, and rice underpins the food security of hundreds of millions. The study's warning about **declining soil-carbon storage** compounds the concern, because healthy soils that lock away carbon are being depleted even as emissions rise. The result is a double penalty: more greenhouse gas released and less carbon retained in the ground.

MITIGATION: DOING MORE RICE WITH LESS WATER AND LESS METHANE

The encouraging news is that proven, field-tested techniques can cut methane sharply without sacrificing yield.

Alternate Wetting and Drying (AWD)

Instead of keeping fields permanently flooded, farmers let the water level fall and periodically re-flood. These intermittent dry spells reintroduce oxygen, suppressing methanogenic activity. AWD can cut methane substantially while also **saving irrigation water**, a co-benefit in water-stressed states.

Direct Seeded Rice (DSR)

Seeds are sown directly into the field rather than raised in nurseries and transplanted into standing water. DSR reduces the flooded period, lowers water and labour use, and shrinks the methane window.

System of Rice Intensification (SRI)

SRI uses younger seedlings, wider spacing and controlled, non-continuous irrigation, boosting yields per plant while keeping soils largely aerobic.

THE POLICY TRADE-OFF

The core tension is between **food security and emissions**. Farmers flood fields because it is a reliable, low-risk way to protect their harvest, so any transition must **incentivise water-saving methods** rather than penalise cultivators. This aligns with the **Global Methane Pledge**, under which signatory countries aim to cut collective methane emissions **30 per cent by 2030 from 2020 levels**. For India, the pathway lies in **climate-smart agriculture**: linking AWD, DSR and SRI adoption to credit, procurement incentives and extension support, while protecting yields and farmer incomes.

UPSC RELEVANCE

GS Paper 3: Conservation, environmental pollution and degradation; climate change; agriculture, cropping patterns and issues of food security.

Prelims pointers:

- **Methane (CH_4)** is a **short-lived climate pollutant** with a global warming potential around **28 to 34 times** that of CO_2 over 100 years.
- India's irrigated paddy emits roughly **3 to 4 million tonnes** of methane annually.
- **Alternate Wetting and Drying (AWD), Direct Seeded Rice (DSR)** and the **System of Rice Intensification (SRI)** are key methane-mitigation methods.
- The **Global Methane Pledge** targets a **30 per cent cut** in methane by 2030 from 2020 levels.
- The study appeared in **Nature Food**.

📌 FACTS CORNER, KNOWLEDGEPEDIA

Methane is generated in paddy fields by methanogenic bacteria under anaerobic (oxygen-starved) flooded conditions.

Agriculture and paddy are major sources of India's methane, alongside enteric fermentation in livestock and waste.

The Global Methane Pledge was launched at the COP26 climate summit in Glasgow (2021).

Because methane is short-lived, cutting it delivers rapid climate benefit compared with long-lived CO_2.

India also runs schemes such as Per Drop More Crop under PMKSY that support water-efficient farming, complementing methane-reduction goals.

Sources: Nature Food, global paddy emissions assessment, Down To Earth, India paddy methane hotspots, Global Methane Pledge

RELATED EDITORIALS

DOWN TO EARTH

The Heat That Deepens Poverty: When a Hot Day Costs a Wage

25 Jul

DOWN TO EARTH

No Severe Heatwave, Yet 45 Degrees: The Classification Gap

25 Jul

DOWN TO EARTH

The Human Hand on Island Life: Rethinking Conservation Baselines

24 Jul

DOWN TO EARTH

Thirsty Mines: Water Risk and the Critical-Minerals Supply Chain

24 Jul

RELATED KEY TERMS

KEY TERM

Access and Benefit Sharing (ABS)

The framework for the fair and equitable sharing of benefits arising...

KEY TERM

Agasthyamalai BR

A UNESCO-designated biosphere reserve in the southern Western Ghats...

KEY TERM

Agri-Photovoltaic

A dual land-use technology that integrates elevated solar panels with...

KEY TERM

Agroforestry

A land-use system that deliberately integrates trees and shrubs with...

CURATED & WRITTEN BY

Bharat Choudhary

UPSC Educator & Content Creator

linkedin.com/in/epicbharat

📖 Read Full Article on Ujiyari →

https://ujiyari.com/daily/2026/07/24/india-paddy-methane-hotspots-2026/