



## Mains Practice Question

**Q.** 'In India, the agriculture and allied sector is the third largest emitter of greenhouse gas after energy and manufacturing sectors.' What changes should India make to achieve Carbon-efficient agriculture?

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### Approach

- Start with discussing the link between agriculture & allied sector and greenhouse gas emission.
- Discuss the changes India should make to achieve carbon-efficient agriculture?
- Conclude suitably.

### Answer

#### India: Climate Change and Agriculture

- **Greenhouse Gas Emissions:** Globally, India is the third largest emitter of greenhouse gas after China and the US, emitting around 2.6 billion tonnes CO<sub>2</sub> equivalent annually.
  - However, India's per capita emissions is just 1.8 tonnes, significantly lower than the world average of 4.4 tonnes per capita.
  - India, in its Nationally Determined Contributions (NDCs), has committed to "reduce emission intensity of its GDP by 33 to 35% by 2030 from 2005 level."
- **India's Sector-wise Emissions:** At global level, electricity and heat production, agriculture, forestry and other land use make up 50% of the emissions.
  - However, India owes its largest chunk of emissions to the energy sector (44%), manufacturing and construction sector (18%), and agriculture, forestry and land use sectors (14%).
    - The remaining is shared by transport, industrial processes and waste sectors.
- **Agriculture and Climate Change:**
  - **Total GHG Emissions:** The share of agriculture in total emissions has gradually declined from 28% in 1994 to 14% in 2016.
    - However, in absolute terms, emissions from agriculture have increased to about 650 Mt CO<sub>2</sub> in 2018.
  - **Emission Classification:** Agricultural emissions in India are primarily from the livestock sector (54.6%) and the use of nitrogenous fertilisers (19%).
    - Rice cultivation in anaerobic conditions accounts for a major portion of agricultural emissions (17.5%).
    - Agricultural soils are the largest single source of nitrous oxide (N<sub>2</sub>O) emissions.
      - N<sub>2</sub>O emissions from use of nitrogen-fertiliser increased by ~358% during 1980-81 to 2014-15.

## Achieving Carbon-Efficient Agriculture

- **Providing Legal Support to the Idea:** A carbon policy for agriculture must be framed with the aim to reduce its emissions and reward farmers through carbon credits which should be globally tradable.
  - Also, India shall clearly spell out in its policy how it would adjust carbon credits when it sells to polluting industries abroad so that emission reductions are not double counted in India and the country buying carbon credits.
- **Changing Feeding Practices:** With the world's largest livestock population (537 million), India needs better feeding practices with smaller numbers of cattle by raising their productivity.
- **Promoting Water-Efficient Crops:** Besides livestock, rice cultivation is another culprit for methane emissions, especially in the irrigated tracts of north-west India.
  - While direct seeded rice and alternative wet and dry practices can reduce the carbon footprint in rice fields, the real solution lies in switching areas from rice to maize or other less water-guzzling crops.
  - Also, devising a system for rewarding farmers for switching to corn will make it more profitable than paddy, it can be a win-win situation.
- **Promoting Biofuels:** Encouraging the use of water-saving crops, such as maize, to produce ethanol, and production of ethanol from non-food feedstock.
  - It will help not only reduce India's huge dependence on crude oil imports but also reduce the carbon footprint.
- **Encouraging Fertigation:** An alternative for better and efficient fertiliser use would be to promote fertigation (injection of fertilizers) and subsidise soluble fertilisers.
  - The government should incentivise and give subsidies on drips for fertigation, switching away from rice to corn or less water-intensive crops, and promoting soluble fertilisers at the same rate of subsidy as granular urea.
- **Sustainable Dairy Practices:** There is a need to proactively ramp up sustainable dairy practices, which may include:
  - Realising the existing potentials for GHG emission reduction through technological and farm best practices interventions and solutions.
  - Reducing its demand for resources by better integrating livestock into the circular bio-economy.
    - This can be achieved by recycling and recovering nutrients and energy from animal waste.
    - Closer integration of livestock with crops and agro-industries at various scales to make use of low value and low-emission biomass.