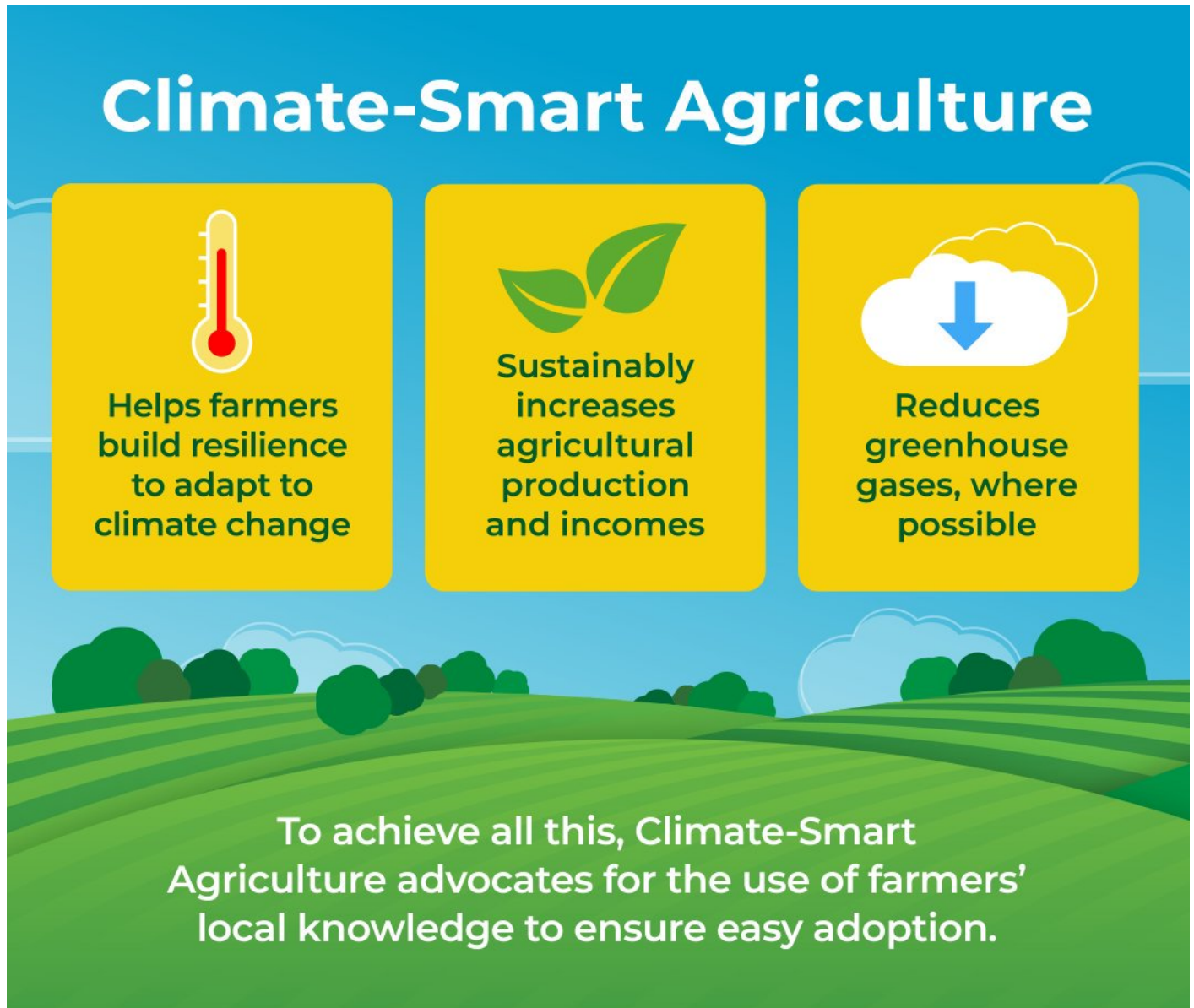


Green Harvest: Towards climate-smart farming

(GS Paper 3, Environment)

Context:

- Climate change has a **bifold relationship with agriculture**—it is a result of farm emissions and, of course, affects farming.
- **Consumerism, population growth, and rising buying power of certain sections** globally are beginning to **threaten the food security** of many nations at an accelerated pace.



Severe damage due to Climate change:

- Over the past couple of years, the severe damage has been caused by climate change to agriculture; the hit to farms has been to such an extent **that global prices of many crops have shot up**, putting them out of range for many.
- For a planet bedevilled by uncertainties **like droughts, floods, and erratic weather conditions** due to ever-rising temperatures—and facing challenges when it comes to energy demand, a **transformation from the conventional, industrial food system** to sustainable agriculture can be quite promising, especially in the long run.

- The **groundwater depletion and worsening of soil health** have been significantly accelerated by industrial agriculture. The top 6-8 inches of soil decide the survival of humanity, and it is time to take a serious view on saving the soil.

GHG emissions from Agriculture:

- According to the Intergovernmental Panel on Climate Change (IPCC), **agricultural activities account for around a fifth of the greenhouse gases emitted** because of human action.
- Today, the amount of CO₂ in the Earth's atmosphere is almost 412 parts per million (ppm), and it is constantly rising. This is a 47% increase since the dawn of the industrial period when the concentration was around 280 ppm, and an 11% increase since 2000, when it was 370 ppm.
- Agricultural activities like **rice farming, cattle rearing and biomass burning account for 22-46% of worldwide methane emissions. Paddy fields are the most significant source of methane** emissions, accounting for 15-20% of global emissions generated as a direct result of human activity.
- These numbers further reflect an urgent need to develop **climate-conscious alternatives** and substitutes for existing agricultural practices that add to GHG emissions, with the aim to ensure economic activity does not take place at the expense of the environment and eventually account for mankind's doom.

Climate Smart Agriculture (CSA):

- With this very intent, the **Food and Agriculture Organization of the United Nations** created the concept of **Climate Smart Agriculture (CSA)** 12 years ago, to manage farming, livestock, forests, and fisheries holistically. CSA is now being increasingly accepted globally, in countries rich and poor.
- In India as well, especially in **states like Odisha and Tamil Nadu**, there has been a growing list of initiatives to champion renewable energy, develop sustainable and resilient infrastructure for agriculture, build smart-cities so as to adapt to climate-change impacts with greater resilience and, at the same time reduce, the collateral damage to the ecology.
- In fact, since 2014-15, India has had a **National Mission for Sustainable Agriculture (NMSA)** to promote climate-friendly agriculture.

Support by Private Sector in CSA in India:

- On the **private sector front, companies like ITC, Mahindra** and a few others have spearheaded the CSA approach in rural India and this has been largely successful.

Example of ITC & Mahindra:

- ITC chairman has been a vocal supporter and champion, ensuring that ITC implements a Climate-Smart Sustainable Agriculture programme that aims to protect farmers from erratic weather events by disseminating a relevant package of practices that focus on **reduced water use (more crop per drop), yield-improvement and climate-resilient varieties, adoption of appropriate mechanisation**, reduced stubble-burning, and provision of institutional services.
- The programme is closely associated with India's NMSA, which aims to make agriculture regenerative, productive, sustainable, profitable, and climate-resilient. Over 15 lakh acres and 4.5 lakh farmers are currently covered by the scheme.
- Mahindra, has also been working with farmers and helping them **transition from chemical-intensive farming to chemical-free biodynamic farming** that helps nurture the soil and also reduces the financial burden on farmers.

Climate Smart Villages (CSVs):

- ITC has been trying to transform villages chosen by ITC in its key catchments into **Climate Smart Villages (CSVs)** as part of its CSA programme, with the **goal of reducing farmer vulnerability** and improving resilience while cutting emissions and promoting food security. The programme, which has shown promising results in a short while, is now being significantly scaled up.
- In 600 villages in Madhya Pradesh, Rajasthan, and Maharashtra, the **CSV programme has covered seven key crops—soybean, paddy, wheat, sugarcane, onion, mango, and gram.**
- Assessing **climate risks and identifying climate-smart, no-regrets technologies** are among the key interventions, as are adopting practices and services to improve production and reduce climatic risks, and

prioritising technological options based on stakeholder preferences (farmers, local governments, and research institutions).

- **Yield-improving and climate-risk-reduction technology** are among the approaches that have been marketed to farmers.

Outcomes:

- The outcomes have been notable and encouraging, and this intervention in MP increased soybean and wheat yields by 38% and 15% above the baseline, respectively.
- In addition to lower farming costs, this has led to an average increase of 93% in net income for soybean and 46% for wheat over the baseline.
- Also, average GHG emissions have fallen by 66% for soybean and 13% for wheat crops as compared to the baseline.

Way Forward:

- Various green initiatives by these companies have proven that it is possible to work in harmony with nature and achieve significant and encouraging results of sustainable agriculture. After all, the benefits are immeasurable, ranging from **better soil-nourishment to significant energy and water saving**, in addition to a better structured food-supply.
- The results yielded by ITC and Mahindra are not just a step towards greater penetration of sustainable-agriculture activities at the pan-India level, but also a motivation to other corporates to consider agriculture as part of their corporate-social-responsibility initiatives.