

## Climate Smart Agriculture (CSA)

### Why in news?

Climate resilient agriculture has the potential to assure food security, empower farmers, and protect our delicate ecosystems.

### What is Climate Smart Agriculture (CSA)?

- It is a comprehensive strategy for managing farmlands, crops, livestock, and forests that *counteracts the negative impacts of climate change* on agricultural productivity.
- FAO in 2019 said that CSA is an approach for transforming food and agriculture systems to support sustainable development and safeguard food security under climate change.

#### Main Objective of CSA

##### Productivity

- It enhances crop and livestock production and farm profitability.
- It works to raise overall agricultural productivity and provide greater food security.

##### Adaptation

- CSA aims to fortify agricultural infrastructure against the destructive effects of global warming
- This entails taking measures to minimize susceptibility to climate related threats like floods, drought or extreme heat.

##### Mitigation

- One of the primary goals of CSA is to reduce the amount of greenhouse gases released into the atmosphere because of farming activities.
- It includes methane emissions from livestock, paddy rice cultivation, and synthetic fertilizer use.

### Why India needs Climate Smart Agriculture (CSA)?

- **Climate change**- The world's southern continent are reportedly experiencing *severe drought* due to climate change, which negatively impacts agricultural production and farmers' livelihoods.
- **Low crop yield**- In India, crop yield is declining due to climate change. Between 2010 and 2039 it could be as high as 9%.
- **Climate disparity**- The ongoing effects of climate change such as heat waves, flash floods, droughts and cyclones are negatively influencing lives and livelihoods.
- **Pressure on land**- India has a large and growing population, but limited land area

thereby putting pressure on the small and marginal farmers, who produce most of the country's food and are vulnerable to climate shocks.

- **Impetus to Paris Agreement-** The goal of limiting global warming by reducing GHG emissions is tied directly to the success of the CSA.
- **High GHG emission-** Agricultural sector produces a large amount of Green House Gas (GHG) emissions which is around 17% in 2018.
- **Food insecurity-** Both population expansion and dietary changes are contributing to increase in demand for food.
- **Radical reform-** The farming industry needs a major reform to deal with global warming and improve food output and revenue in an eco-friendly manner.
- **Innovative approach-** It charts development pathways that can make the agriculture sectors more productive and sustainable and to contribute to climate change adaptation and mitigation.

*The study of Northwest Indo-Gangetic Plain for wheat production shows that site-specific no-tillage is advantageous for fertilizer management and can boost yield, nutrient usage efficiency, and profitability while lowering GHG emissions.*

### **What are the challenges in adopting CSA?**

- **High cost-** CSA may adopt expensive agricultural technology or infrastructure which are out of reach for marginal farmers.
- **Market barriers-** The market for CSA products is still small, which makes it unprofitable.
- **Policy paralysis-** Farmers find it challenging to embrace CSA strategies due to governmental and regulatory obstacles.
- **Lack of awareness-** Farmers may not be aware of the information and access to established approaches of CSA.
- **Cultural resistance-** Inexperience or conflicts with the established farming norms acts as a barrier.
- **Lack of definition-** CSA does not have a clear and agreed-upon definition, which allows for different interpretations and applications of the concept.
- **Monopoly-** CSA is influenced by the interests of the fertilizer industry ([Greenwashing](#)), which is a major source of GHG emissions and environmental degradation.

### **Steps taken by India to promote CSA**

- **National Adaptation Fund on Climate Change**- It was launched in 2015 to support concrete adaptation activities which mitigate the adverse effects of climate change.
- **National Innovation on Climate Resilient Agriculture**- It is a network project of *Indian Council of Agricultural Research* (ICAR) that aims to enhance the resilience of Indian agriculture to climate change and climate vulnerability through strategic research and technology demonstration
- **National Action Plan on Climate Change**- It was launched in 2008 to mitigate and adapt to the adverse impact of climate change.
- It contains *8 national missions* that cover various sectors and objectives related to climate change.
- **Soil Health Mission**- It was launched in 2015 that provides *soil health cards* to farmers, which contain information on soil nutrient status and fertilizer recommendations.
- **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)** - It was launched in 2015 to *enhance water use efficiency* and irrigation coverage in agriculture.
- **Paramparagat Krishi Vikas Yojana**- It is a sub scheme under PMKSY that promotes *organic farming* and certification.
- **Biotech KISAN**- It was launched in 2017 as a farmer-centric scheme that empowers small and marginal farmers through biotechnology
- **Climate Smart Village**- It was launched in 2011 as an approach that integrates various *climate-smart interventions* and practices at the village level to enhance farm productivity.

### What lies ahead?

- CSA has the potential to assure food security, empower farmers, and protect our delicate ecosystems by merging innovation, resilience, and sustainability.
- In the face of a changing climate, the path of CSA stands out as a source of inspiration and transformation for a world working to ensure a sustainable future.

### References

1. [The Hindu- Need for climate smart agriculture in India](#)
2. [IBEF- India's smart agriculture practices](#)
3. [World Bank- Climate Smart Agriculture](#)