Ensuring Agricultural Sustainability in India

For Prelims: National Mission for Sustainable Agriculture (NMSA), Soil Degradation, Sequester Carbon, National Action Plan on Climate Change (NAPCC), Disease-resistant Crops.

For Mains: Need of sustainable agriculture for prevention of environmental degradation.

Source: BL

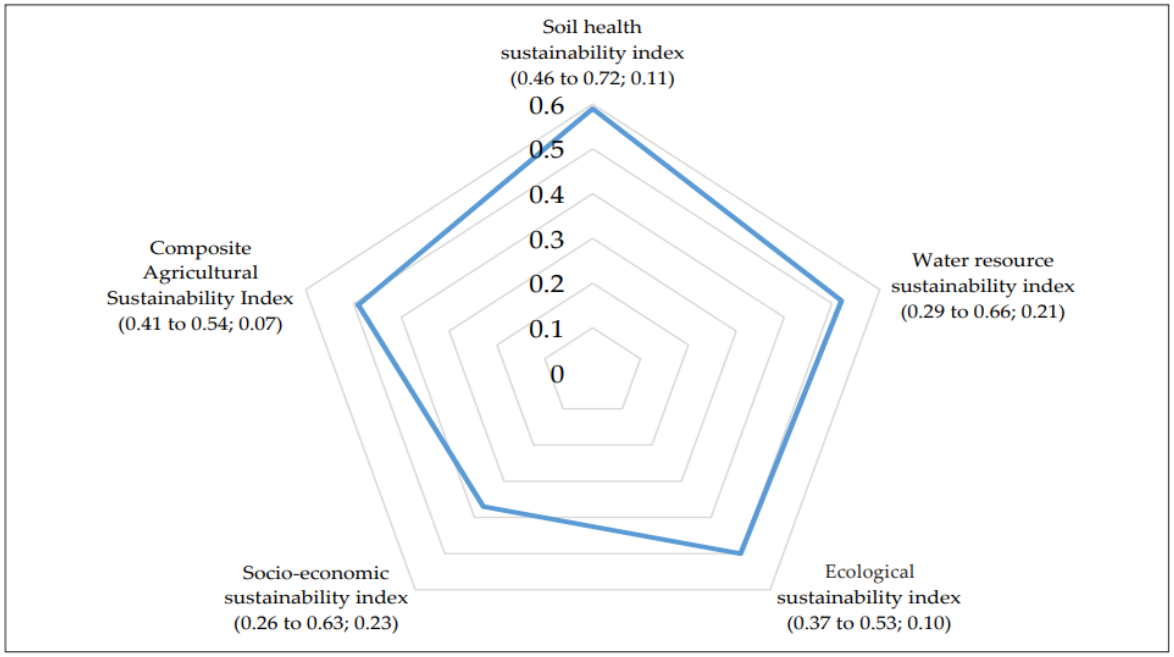
Why in News?

Union Minister for Agriculture and Farmers' Welfare highlighted the policy paper released by ICAR titled **'A spatial assessment of sustainability in Indian agriculture'** and emphasised on the importance of **National Mission for Sustainable Agriculture (NMSA).**

- It found that sustainability of India's agriculture is **under severe threat** due to **water scarcity, soil degradation,** and socio-economic vulnerabilities.

What are the Key Findings of the ICAR's Policy Paper?

- **Composite Index:** The national average sustainability index is **0.49**, indicating a **moderate level of sustainability**.
  - The index is based on **51 indicators** covering **environmental health, soil and water quality, and socio-economic development**.



- **Performance of States: Mizoram, Kerala, MP,** Andhra Pradesh, Manipur, West Bengal, and Uttarakhand outperform the national average due to **crop diversification, infrastructure, credit access, and sustainable inputs**.
    - **Rajasthan, Uttar Pradesh, Punjab**, Bihar, Haryana, Jharkhand, and Assam face **high risks** due to arid conditions, climate change, and **intensive farming practices.**
- **Major Threats to Agriculture:**
    - **Water Scarcity:** Groundwater depletion has become a serious concern in **Punjab, Rajasthan, and Haryana**, where the **extraction rate has exceeded the recharge rate** by 66, 51, and 34%, respectively.
        - **Water salinity** is rising, majorly affecting **aquifers** in West Bengal, Andhra Pradesh, and Gujarat.
    - **Soil Erosion:** Soil erosion from croplands is projected to reach **10 tonnes per hectare annually by 2050.**
        - Salinity-affected areas are projected to increase from **6.7 million hectares to 11 million hectares by 2030.**
    - **Crop Yield Reductions:** Climate change may cut rainfed **rice yields by 20% by 2050 and 47% by 2080**. Wheat may drop **19.3% by 2050 and 40% by 2080**.
    - **Erratic Rainfall:** 80% of India's rainfall falls between June and September, causing **floods and droughts**, while monsoon dry spells are rising in rainfed areas.
        - Kharif and rabi rainfall is projected to increase by **2050** leading to **waterlogging, lodging (plant collapse), and pest and disease** outbreaks.

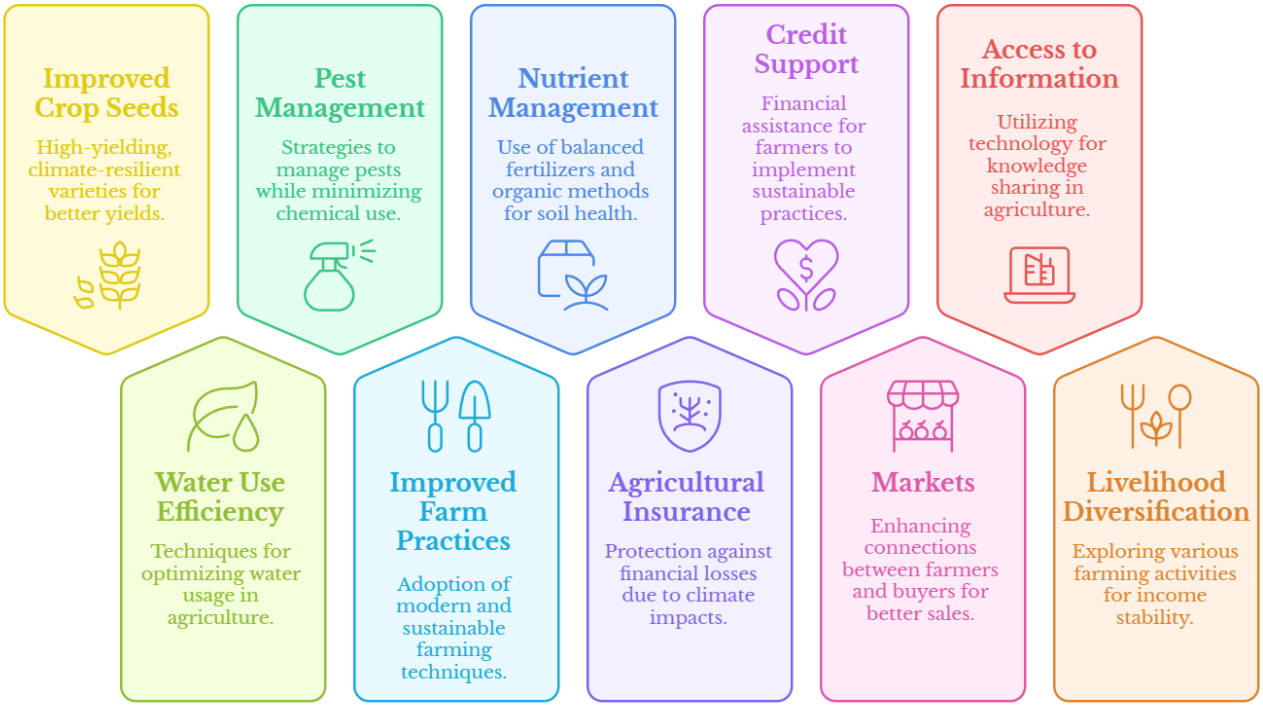
What is Sustainable Agriculture?

- **About:** It is a **holistic farming approach** that meets current **food and fiber needs** while preserving resources for **future generations**.
    - It includes practices like **crop rotation, organic farming**, and community-supported agriculture, ensuring **environmental health, economic viability, and social equity.**
- **Benefits:**
    - **Environmental Benefits**: Improves **soil health**, conserves **water**, protects **biodiversity**, and reduces the **carbon footprint**.
    - **Economic Benefits**: Ensures **long-term productivity**, lowers **costs**, creates **market opportunities**, and enhances **climate resilience**.
    - **Social Benefits**: Produces **healthier food**, generates **employment**, and strengthens **food security.**
    - **Resilience to Climate Change: Organic farming, conservation tillage**, and agroforestry **sequester carbon, reduce emissions**, and boost climate resilience.

What is the National Mission for Sustainable Agriculture (NMSA)?

- **About:** NMSA is a flagship initiative under the **National Action Plan on Climate Change (NAPCC)** aimed at promoting **sustainable agricultural practices** in India.
- **Objectives:**
    - **Enhance Agricultural Productivity**: Improve productivity in rainfed areas, which account for **60% of India's net sown area** and **40% of total food production**.
    - **Promote Sustainable Practices**: Encourage the **conservation and sustainable use** of natural resources like **soil and water**.
    - **Climate Change Adaptation**: Implement adaptation measures to make agriculture **resilient to climate change** impacts.
    - **Livelihood Diversification**: Support farmers in **diversifying** their income sources through integrated farming systems
- **Programmes of Action (POA):** NMSA addresses ten key dimensions of Indian agriculture:

10 Dimensions



- **Alignment with SDGs:** NMSA contributes to **SDG 2 (Zero Hunger) and SDG 13 (Climate Action)** by promoting sustainable farming practices and resilience to climate change.

Way Forward

- **Financial Incentives for Farmers:** Offer financial rewards to farmers adopting sustainable practices like **organic farming, crop rotation, and agroforestry and subsidies** for organic fertilizers, biopesticides, and other eco-friendly inputs.
- **Invest in Research and Development (R&D):** Invest in R&D for **drought, pest, and disease-resistant crops**, and develop affordable organic inputs for small farmers.
- **Market Access for Sustainable Produce:** Improve **storage, transport, and processing** to cut post-harvest losses, and enable direct farmer-to-consumer sales for sustainable produce.
- **Strengthen Environmental Regulations:** Enforce strict regulations on **water use, fertilizers, and pesticides** to prevent overuse and pollution, with strong monitoring for compliance.

Drishti Mains Question:

Groundwater depletion and soil degradation pose serious risks to Indian agriculture. Discuss the role of the National Mission for Sustainable Agriculture (NMSA) in mitigating these challenges.

UPSC Civil Services Examination Previous Year Question (PYQ)

Prelims

Q. With reference to 'Initiative for Nutritional Security through Intensive Millets Promotion', which of the following statements is/are correct? (2016)

1. This initiative aims to demonstrate the improved production and post-harvest technologies, and to

demonstrate value addition techniques, in an integrated manner, with cluster approach.
2. Poor, small, marginal and tribal farmers have larger stake in this scheme.
3. An important objective of the scheme is to encourage farmers of commercial crops to shift to millet cultivation by offering them free kits of critical inputs of nutrients and micro irrigation equipment.

Select the correct answer using the code given below:

(a) 1 only

(b) 2 and 3 only

(c) 1 and 2 only

(d) 1, 2 and 3

Ans: (c)

Q. Consider the following international agreements: (2014)

1. The International Treaty on Plant Genetic Resources for Food and Agriculture
2. The United Nations Convention to Combat Desertification
3. The World Heritage Convention

Which of the above has/have a bearing on biodiversity?

(a) 1 and 2 only

(b) 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

Ans: (d)

Mains

Q. How far is the Integrated Farming System (IFS) helpful in sustaining agricultural production? (2019)