# Enhancing Agricultural Diversification

**For Prelims**: **Rice**, **Wheat**, **Cotton**, **Soybean**, **Minimum Support Prices (MSP)**, **GM Crops**, **Public Distribution System**, **PM-KISAN**, **Malnutrition**, **Monoculture**, **Monsoon**, **Millets**, **Pulses**, **Oilseeds**, **Horticulture Crops**, **Price Deficiency Payment Scheme (PDPS)**, **Farmer Producer Organizations**, **National Millet Mission**, **Mission for Integrated Development of Horticulture (MIDH)**

**For Mains**: Concerns related to rice and wheat cultivation, Measures to be adopted to enhance agricultural diversification in India.

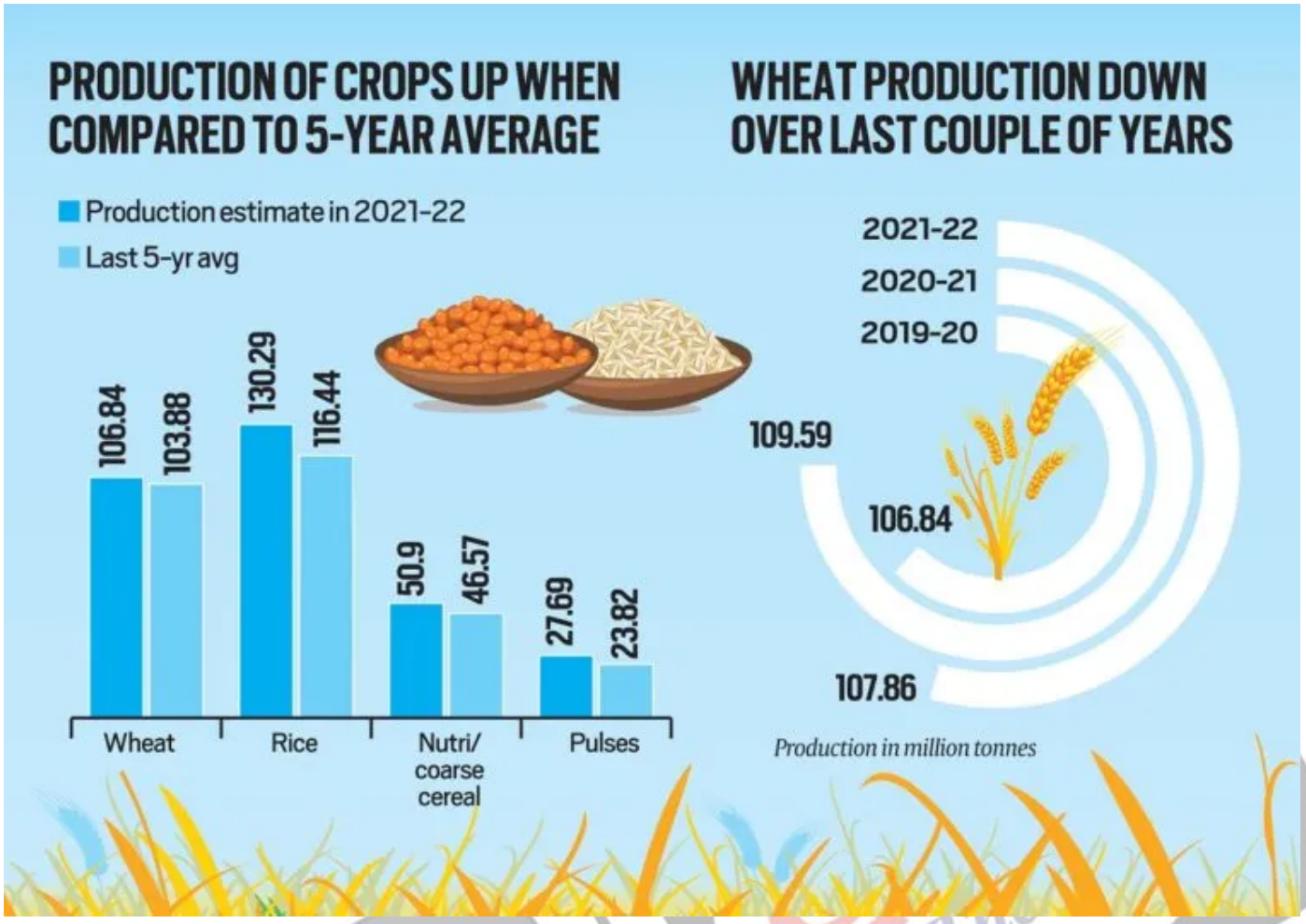
**Source: IE**

## Why in News?

**Agricultural trends** in India highlight a **consistent increase** in the **area planted with rice and wheat** cultivation, driven by **supportive policies, better breeding, and reliable yields**, while **other crops** see **fluctuating** acreages due to **lower returns and price instability**.

## What are the Trends in Crop Cultivation in India?

- **Wheat and Rice:** Rice cultivation has **increased significantly**, especially in Punjab, where the area under cultivation rose by around **9%, and in Telangana, where it surged by approximately 348%** between 2015–16 and 2024–25.
    - In Madhya Pradesh, the acreage under both wheat and rice has also grown notably, with **wheat** cultivation increasing by nearly **32%** and **rice** by around **92%** during the same period.
- **Cotton:** **Cotton** cultivation in **Punjab dropped by around 71%** from 2015 to 2025. In **Telangana**, the area under cotton **declined** by approximately **23%** from 2020 to 2025.
- **Chickpea (Chana):** The area under **chickpea** in Madhya Pradesh **declined** by approximately **34%**, from **30.2 lakh hectares** in 2015-16 to **20.1 lakh hectares** in 2024-25.
- **Soybean:** **Soybean** acreage in Madhya Pradesh **decreased by approximately 2.2%,** from **59.1 lakh hectares** in 2015-16 to **57.8 lakh hectares** in 2024-25, after peaking at 66.7 lakh hectares in 2020-21 due to high prices.




## Why are Rice and Wheat the Most Preferred Crops Among Farmers?

- **MSP Procurement:** The government ensures **near-guaranteed procurement** of **rice** and **wheat** at **Minimum Support Prices (MSP)**, offering **price stability** and **income assurance**, which makes them less risky than crops without such support.
- **Irrigation Support: Rice** and **wheat** are mainly grown with **irrigation**, reducing dependence on **rainfall** and lowering **yield risk**, as access to **canal** and **groundwater** makes cultivation more reliable.
- **Continuous Genetic Improvement:** Both crops benefit from **strong public research support**, leading to development of **high-yielding, disease-resistant, and climate-smart varieties.**
    - Indian Council of Agricultural Research (ICAR) used CRISPR-Cas to create **Kamala, a genetically edited Samba Mahsuri rice** that produces 450–500 grains per panicle (versus **200–250 in the parent**), yields 5.37–9 **tonnes/hectare,** matures in 130 days (15–20 days faster), and conserves water and fertilisers through enhanced root biomass.
    - ICAR scientists used **CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats)-Cas** to edit the **Drought and Salt Tolerance (DST) gene in the rice variety Cottondora Sannalu (MTU-1010)**, creating **Pusa DST Rice 1,** which is more tolerant to **heat, salinity, and water stress** by suppressing the gene that limits abiotic stress resistance.
    - In wheat, the Green Revolution varieties like **Kalyan Sona and Sonalika not only increased yields significantly (from 1-1.5 tonnes per hectare to 3.8 tonnes)** but also improved resistance to diseases and environmental stresses.
    - In contrast, crops like cotton, oilseeds, and pulses have seen limited R&D and no major GM breakthroughs since **Bt cotton (2002–06),** resulting in stagnant yields, unstable returns, and fluctuating cultivation.
- **High Demand & Stable Market: Rice** and **wheat**, staple foods with consistent **domestic** and **global demand**, are used in **Public Distribution System (PDS)**, **Mid-**

Day Meals, and **welfare schemes**, ensuring steady sales.
- **Policy & Infrastructure Bias: Procurement infrastructure** (such as **mandis** and **storage**) is better developed for **cereals** than for other crops, and **loan waivers** and **subsidies** often favor **staple crops.**
    - Government schemes like Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) and **fertilizer subsidies** support rice and wheat production.

## What are the Implications of Excessive Focus on Rice and Wheat?

- **Nutritional Deficiencies:** Excessive reliance on **rice** and **wheat** limits **nutritional diversity**, as they are mainly **carbohydrates** with fewer **proteins** and **micronutrients**, contributing to **malnutrition** (such as **protein** and **iron deficiencies**).
- **Soil Degradation**: Overuse of **water** for rice, combined with **chemical fertilizers**, contributes to soil salinity and **nutrient imbalance**, gradually reducing **soil health.**
    - Salinity-affected areas are projected to increase from **6.7 million hectares to 11 million hectares by 2030**.
- **Water Scarcity: Rice** cultivation's high **water consumption** and excessive **groundwater extraction** strain **water resources**, threatening **agriculture sustainability.**
    - 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**.
- **Market Distortions:** The **MSP system** can distort the market by promoting **monoculture farming** and neglect of more profitable or sustainable crops, resulting in **overproduction**, **price fluctuations**, and **unsustainable practices**.
    - E.g., Neglect of **pulses, oilseeds, and millets** leads to **import dependency** (e.g., 60% of edible oil is imported).
- **Regional Disparities:** Policy and procurement bias toward **rice and wheat benefits irrigated northwestern states**, leaving out rainfed and tribal regions with diverse cropping patterns.
- **Monoculture Risk:** Reduced crop diversity increases vulnerability to **pests, diseases, and climate shocks**, threatening food security.
    - E.g., **Wheat blast disease** is a **fungal infection** caused by the fungus Magnaporthe oryzae Triticum (MoT) that primarily affects wheat crops.

## What are India's Initiatives Regarding Crop Diversification?

- **Rashtriya Krishi Vikas Yojana (RKVY)**
- **Mission for Integrated Development of Horticulture (MIDH)**
- **Mission for Cotton Productivity**
- **Mission for Self-reliance in Pulses**
- **National Mission on High Yielding Seeds**

## What Measures can be Adopted to Enhance Agricultural Diversification in India?

- **Policy & Institutional Reforms: Expand MSP coverage** to include millets, pulses, oilseeds, **and** horticulture crops under assured procurement.
    - **Compensate farmers** under Price Deficiency Payment Scheme (PDPS) if prices fall below **MSP** and **strengthen** Farmer Producer Organizations (FPOs) and local **mandis** for non-cereal crops through **decentralized procurement.**
- **Promote Climate-Resilient Crops:** Incentivize **millets** (jowar, bajra, ragi) through the National Millet Mission, boost **pulses** and **oilseeds** production, and expand the Mission for Integrated Development of Horticulture (MIDH) for fruits, vegetables, and floriculture.
- **Strengthen Market Linkages:** Expanding National Agriculture Market (e-NAM) for better price discovery, promoting contract farming and **agri-startups** through corporate partnerships

(e.g., ITC's "e-Choupal"), and focusing on **export promotion** of high value products like **spices**, and **organic produce**.

- **Infrastructure & Technology Support:** Provide **post-harvest** support through **cold chains**, **warehouses**, and **food processing units** under the **PM Kisan SAMPADA Yojana** to increase shelf life of perishable products.
- **Financial Support Measures:** Expand **PM Fasal Bima Yojana (PMFBY)** to cover diversified crops, and offer lower interest rate loans for **non-cereal crops** and agro-processing.
    - Provide farmer training through **Skill India** and **Kisan Drones** for **modern farming techniques.**
- **Regional-Specific Strategies:** In **Punjab-Haryana**, shift to **cotton**, **maize**, and **agroforestry** to reduce **groundwater stress**; in **Eastern India**, promote **flood-resistant rice varieties** and **aquaculture**; and in **rainfed areas**, focus on **dryland farming** with **millets** and **pulses.**

## Conclusion

India's focus on **rice** and **wheat** cultivation, driven by **MSP** and **irrigation support**, is leading to **nutritional**, **environmental**, and **market imbalances**. **Diversifying agriculture** through **policy reforms**, **climate-resilient crops**, and improved **infrastructure** can help sustain agriculture and address these issues while enhancing **farm incomes** and **food security.**

*Drishti Mains Question:*

**Q**. What measures can be adopted to enhance agricultural diversification in India?

### UPSC Civil Services Examination Previous Year Question (PYQ)

***Prelims***

**Q. In the context of India's preparation for Climate -Smart Agriculture, consider the following statements:**

1. The 'Climate-Smart Village' approach in India is a part of a project led by the Climate Change, Agriculture and Food Security (CCAFS), an international research programme.
2. The project of CCAFS is carried out under Consultative Group on International Agricultural Research (CGIAR) headquartered in France.
3. The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in India is one of the CGIAR's research centres.

**Which of the statements given above are correct?**

(a) 1 and 2 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

**Ans: (d)**

**Q. With reference to the 'Global Alliance for ClimateSmart Agriculture (GACSA)', which of the following statements is/are correct? (2018)**

1. GACSA is an outcome of the Climate Summit held in Paris in 2015.
2. Membership of GACSA does not create any binding obligations.

3. India was instrumental in the creation of GACSA.

**Select the correct answer using the code given below:**

(a) 1 and 3 only

(b) 2 only

(c) 2 and 3 only

(d) 1, 2 and 3

**Ans: (b)**

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## ***Mains***

**Q.** How did India benefit from the contributions of Sir M. Visvesvaraya and Dr. M.S. Swaminathan in the fields of water engineering and agricultural science respectively? (2019)

**Q.** Explain various types of revolutions, took place in Agriculture after Independence in India. How have these revolutions helped in poverty alleviation and food security in India? (2017)