



Accelerating Crop Diversification in India

For Prelims: [Crop diversification](#), [Wheat cultivation](#), [Wheat blast disease](#), [Bananas](#), [Green Revolution in India](#), [Leguminous crops](#), [Biofuel](#), [MSP](#).

For Mains: Needs For Crop Diversification in India, Concerns Related to Crop Diversification.

Source: DTE

Why in News?

In recent years, West Bengal has been witnessing a significant transformation in its agricultural landscape through [crop diversification](#), particularly in districts bordering Bangladesh.

- This shift is characterised by **farmers moving away from traditional [wheat cultivation](#) towards alternatives** like bananas, lentils, maize, and other crops.

What are the Reasons Behind the Shift from Wheat Production?

- **Wheat Blast Disease:** The emergence of [wheat blast disease in Bangladesh in 2016](#) led to a two-year ban on wheat cultivation in border areas of West Bengal, including Murshidabad and Nadia districts, prompting farmers to explore alternative crops.
 - **Wheat blast disease is a fungal infection** caused by the fungus *Magnaporthe oryzae* **Triticum (MoT)** that primarily affects wheat crops.
 - It manifests as dark lesions on wheat spikes, leaves, and stems, leading to severe yield losses.
- **Economic Viability:** Farmers have highlighted the economic advantages of cultivating alternative crops such as [bananas](#).
 - The profitability of crops like bananas during peak seasons, coupled with stagnant wheat prices and concerns over water consumption, has contributed to the shift.
- **Shift to Higher Output Crops:** Maize cultivation has seen a significant uptick in the area as well, with production increasing eightfold from 2011 to 2023.
 - While **maize prices may be lower** per quintal compared to wheat, **higher per-hectare output and demand from poultry** and food processing industries make it a lucrative alternative.
 - [Pulses](#) and [oilseeds](#) production in this area has also surged.

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Type of diversification	Nature of diversification	Potential benefit
Improved structural diversity	Makes crops within the field more structurally diverse	Pest suppression
Genetic diversification in monoculture	Cultivation of mixture of varieties of same species in a monoculture	Disease suppression, Increased production stability
Diversify field with fodder grasses	Growing fodder grasses alongside of food/pulse/oilseed/ vegetable etc.	Pest suppression, opportunity to livestock farming
Crop rotations	Temporal diversity through crop rotations (Sequential cropping)	Disease suppression, Increased production stability
Polyculture	Spatial and temporal diversity of crops (Growing two or more crop species within the field)	Insect, pest disease suppression, climate change buffering and increased production
Agroforestry	Growing crops and trees together (Spatial and temporal diversity)	Pest suppression and climate change buffering
Mixed landscapes	Development of larger-scale diversified landscapes through mixture of crops and cropping system with multiple ecosystems	Pest suppression and climate change buffering
Micro-watershed based diversification	Integration of crop with other farming components for year round income and employment generation, besides sustaining soil and environmental health	Insect, pest and disease suppression, climate change buffering and increased production, employment and income

Why India Needs to Focus on Crop Diversification?

- **About:** Crop diversification refers to the **practice of growing a variety of crops** on a farm instead of focusing on a single crop.
 - The **Green Revolution in India**, through the introduction of **high-yielding rice** and wheat varieties, resulted in a substantial increase in food output, effectively reducing hunger and malnutrition.
 - However, the monoculture of these crops led to a decrease in crop variety, causing the **decline of traditional, region-specific strains** and a loss of genetic diversity.
 - For instance, India has **lost over 100,000 traditional rice varieties** since the 1970s due to the Green Revolution's impact.
 - Therefore, there is a need to shift towards crop diversification to promote sustainable agriculture.
- **Benefits of Crop Diversification:**
 - **Risk Reduction:** In regions prone to drought, farmers can diversify their crops by growing both **drought-tolerant varieties (like millets or sorghum)** and **water-intensive crops (like rice or vegetables)**.
 - If there's a water shortage, the drought-tolerant crops can still thrive, ensuring some level of harvest despite adverse conditions.

- **Soil Health Improvement:** Planting [leguminous crops](#) like [soybeans](#) or **peanuts** can fix nitrogen in the soil, benefiting subsequent crops such as **maize or wheat** that require nitrogen-rich soil for optimal growth.
 - **Market Opportunities:** Diversifying crops can help farmers tap into niche markets or emerging trends.
 - For example, the **rising demand for [organic produce](#)** presents an opportunity for farmers to diversify into organic farming, which often commands higher prices in the market compared to conventionally grown crops.
 - **Pest and Disease Management:** Intercropping or mixed cropping, a form of crop diversification, can help manage pests and diseases.
 - For instance, **planting marigold flowers** alongside vegetable crops can deter pests, **reducing the need for chemical pesticides** and promoting natural pest control mechanisms.
 - **Source of Biofuels:** Crops like **Jatropha and Pongamia** are potential sources for [biofuel production](#). This can offer farmers additional income opportunities and contribute to India's energy security.
- **Concerns:**
- **Market Risks and Limited Opportunities:** Farmers are often hesitant to switch from established crops like rice and wheat (**which have assured government support through MSP**) to lesser-known crops.
 - These alternatives may have fluctuating market prices or limited demand, leading to potential income loss.
 - **Financial Constraints:** Diversifying crops can require **additional investment in seeds, equipment**, and even acquiring new knowledge about cultivation practices.
 - **Smallholder farmers**, who make up a significant portion of India's agricultural sector, may not have the financial resources to readily adopt these changes.
 - Also, Millets like Jowar, Ragi, and Bajra are gaining traction due to their high nutritional value and ability to thrive in marginal lands.
 - However, creating a robust market for these requires investment in **processing facilities** to convert them into **consumer-friendly products** like ready-to-eat mixes or breakfast cereals.
 - **Lack of Infrastructure and Storage:** Perishable, diversified crops often require **specialised storage and transportation facilities** that may not be readily available in rural areas.
 - Without proper infrastructure, these crops can spoil quickly, leading to wasted produce and lost income.
 - **Clash With Dietary Habits:** Crop diversification in India, particularly in regions where **rice and wheat are staples** for a significant portion of the population, could potentially disrupt the established market dynamics and consumption patterns prevalent in these areas.

What are the Steps Taken by the Government Regarding Crop Diversification?

- **Crop Diversification Programme:** The Department of Agriculture & Farmers Welfare (DA&FW) has been implementing the **Crop Diversification Programme (CDP)** since 2013-14, as part of the [Rashtriya Krishi Vikas Yojana \(RKVY\)](#), specifically targeting the Original Green Revolution States- **Haryana, Punjab, and Western Uttar Pradesh**.
 - This initiative aims **to shift focus from water-intensive paddy cultivation to alternative crops** such as pulses, oilseeds, coarse cereals, nutri cereals, and cotton.
- [Mission for Integrated Development of Horticulture \(MIDH\)](#): It is a **Centrally Sponsored Scheme** for the holistic growth of the horticulture sector covering fruits, vegetables, root & tuber crops, mushrooms, spices, flowers, aromatic plants, coconut, cashew, cocoa and bamboo.
- **Increase in MSP for Kharif Crops:** The **Cabinet Committee on Economic Affairs (CCEA)** has approved an increase in the [Minimum Support Prices \(MSP\)](#) for all mandated Kharif crops for the Marketing Season 2023-24.
- **Mera Pani-Meri Virasat Scheme (Haryana):** It offers financial aid to farmers transitioning from paddy cultivation to water-saving alternatives like pulses, oilseeds, millets, and vegetables.

Way Forward

- **Agri-Tourism and 'U-Pick' Farms:** Experiential tourism is gaining popularity. Creating '**U-Pick farms**' where tourists can harvest their fruits and vegetables directly from the field can be a win-win for India.
 - This provides farmers with additional income, fosters a connection between consumers and agriculture, and promotes appreciation for diversified crops.
- **Biofortification through Gene Editing:** Gene editing techniques like **CRISPR** can be used to develop crops with enhanced nutritional value.
 - This can address malnutrition concerns and create new markets for biofortified crops.
 - However, **ethical considerations and stringent regulations** need to be addressed.
- **Regenerative Agriculture for Sustainable Diversification:** Regenerative agriculture practices like **cover cropping, composting, and no-till farming** can be integrated with diversified crop rotations to create a more sustainable and resilient agricultural system.
 - This not only benefits long-term crop yields but **also sequesters carbon, mitigating climate change.**

Drushti Mains Question:

Q. What are the key innovative strategies that India needs to expedite to accelerate crop diversification, ensuring sustainable agriculture, farmer livelihoods, and food security?

UPSC Civil Services Examination Previous Year Question (PYQ)

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)**

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