



Looking Beyond Yield in Agriculture

For Prelims: [High Yielding](#), [National Family Health Survey \(NFHS-5\) 2019-2021](#), [Green Revolution](#), [Monoculture Farming](#), [Intercropping](#), [Crop Rotation](#), [Millets](#), [Precision Farming](#), [Organic Agriculture](#), [Agroforestry](#), [Conservation Tillage](#), [Climate-Resistant Crop Varieties](#), [Soil Fertility](#), [Micronutrient](#).

For Mains: Need for sustainable agriculture in face of diminishing agricultural output and climate change.

[Source: TH](#)

Why in News?

There is a need to **measure agricultural success** by its ability to **nourish people, sustain livelihoods**, and **protect our planet** for future generations and **not** merely emphasising on **Yield**.

Why are Issues Associated with Sole Focus on Yield in Agriculture?

- **Micronutrient Deficiencies:** The push for [high-yielding](#) rice and wheat varieties has reduced their **nutritional content**.
 - An [ICAR study](#) found **zinc levels** in rice dropped by **33%** and **iron by 27%**, worsening [micronutrient](#) deficiencies.
- **Public Health Concerns:** The decline in nutritional quality of foodgrains is linked to rising **health issues**.
 - The [NFHS-5 \(2019-2021\)](#) highlights that **35.5%** Indian children under five are **stunted**, **19.3%** are **wasted** and **67.1%** are [anaemic](#).
- **Fertiliser Dependency:** The response of crops to [fertilisers](#) has declined by **over 80% since the 1970s**.
 - Farmers have to use more fertilisers to achieve the same yield, raising **input costs** without a proportional increase in income.
- **Ignoring Crop Response Across Season:** A singular focus on **maximising yield** may help with seasonal outputs but may **not maximise output the whole year round**.
 - Little regard is paid to the **on-field symbiotic relations** between crops within and across seasons which compromises **overall nutritional output and profit** over the year.
- **Loss of Biodiversity:** Focusing solely on **yield** structurally promotes only a **few high-yielding varieties** of seeds everywhere, leading to [biodiversity loss](#).
 - For instance, India has lost about 1,04,000 varieties of rice since the [Green Revolution](#) and only **6,000** of the **older varieties survived**.
 - It makes the farming system more vulnerable to **pests, diseases**, and the impacts of [climate change](#).
- **Dwindling Agricultural Resilience:** [Monoculture farming](#) practices are vulnerable to events such as intensifying **floods, droughts, and heat waves** which has undermined agricultural resilience.
 - Many local varieties of crops have proven to be **more resilient** to extreme conditions.
 - Monoculture is the agricultural practice of growing a **single crop species** over a large

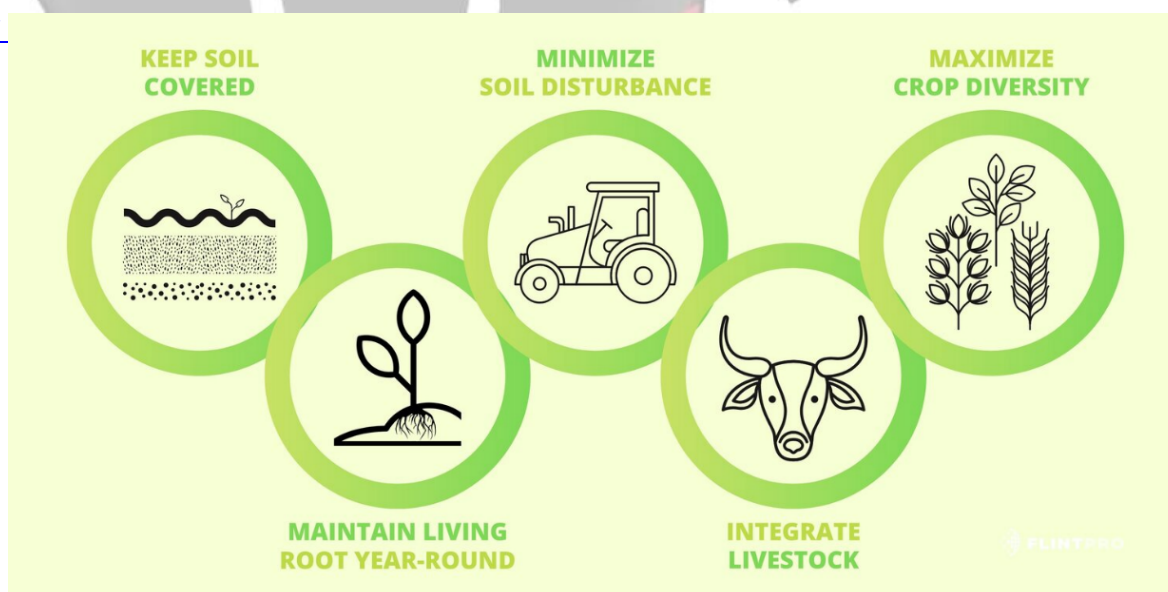
area for multiple seasons

- **Disruption of Ecological Balance:** Monocropping ignores the benefits of **intercropping** and **crop rotations** which can diminish long-term agricultural productivity and profitability.
 - Intercropping **sugarcane with vegetables** in Andhra Pradesh improved income stability throughout the year but monocropping ignores this.
- **Neglect of Nutritious Crops:** The prioritisation of high-yielding rice and wheat varieties has led to the decline of **resilient and nutritious crops**.
 - For instance, the area sown under **coarse cereals** such as **millets** has **dropped by 10 million hectares** since the 1950s, whereas the share of **rice and wheat** has gone up by **13 million hectares and 21 million hectares**, respectively.
- **Income Volatility:** The reliance on a **single crop** for high yields can result in **economic instability**, particularly when **crop prices fluctuate** or climate conditions reduce yields.

What are Agricultural Indicators?

- Agricultural indicators are **measurable variables** that provide insights into the **health, performance, and sustainability** of agricultural systems.
 - They help assess various aspects of agriculture, including **productivity, economic viability, environmental impact, and social factors**.
- **Some Key Agricultural Indicators:**
 - **Crop yield:** Crop yields refer to the amount of **harvested produce per unit of land** used for crops.
 - **Livestock Farming:** It is the practice of **raising animals** for their products. E.g, meat or eggs.
 - **Input Efficiency:** It implies production of **high quantity and quality of food**, from using only **finite resources** as inputs E.g., land, water, nutrients, energy etc.
 - **Soil Health:** It involves **nutrient availability**, oxygen availability to roots, **nutrient retention capacity** etc that determine how well the soil can function.
 - **Water Use Efficiency:** It refers to the amount of **carbon stored as biomass or grain produced** for each unit of water used by the crop.
 - **Nutrition:** Agriculture should focus on producing **healthy food** rich in micronutrients such as **iron, zinc, vitamin A, and folate**, which are vital for various bodily functions.
 - **Greenhouse Gas Emissions:** Techniques such as **precision farming, organic agriculture, agroforestry, and conservation tillage** should be adopted that help minimise inputs like fertilisers and fossil fuels, thereby reducing emissions.
 - **Resilience to Climate Change:** Adjusting planting dates, selecting **climate-resistant crop varieties** and agroforestry can increase agricultural resilience to climate change impacts.

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How Looking Beyond Yield Can Improve Agriculture?

- **Holistic Development:** Agriculture indicators should not be determined only by the **Ministry of Agriculture**, but collectively by the **Ministries of Health, Agriculture, Water, and Environment**.
 - It will ensure that agricultural policies account for diverse aspects like **public health, water management, and environmental conservation**.
- **Nutritional Security:** Transitioning from measuring output in terms of quantity (**kg/hectare**) to **nutritional output per hectare** ensures that food production contributes directly to **human well-being**.
 - This addresses critical issues like **malnutrition and micronutrient deficiencies** by prioritising the **quality of food**, not just the quantity.
- **Soil Health and Biological Activity:** Metrics such as **soil biological activity** and **soil organic carbon** are vital indicators of long-term **soil fertility**.
 - Maintaining healthy soil ensures sustained productivity without over-reliance on **chemical inputs**, which degrade **soil quality** over time. E.g., **Soil health cards**.
- **Water-Use Efficiency:** Improving **water efficiency** helps conserve a critical resource, making agriculture more **resilient** in the face of **climate change**.
 - Telangana's AI-powered '**Saagu Baagu**' pilot demonstrates how technology can **optimise irrigation** and improve water-use efficiency.
- **Crop Diversification:** Growing **more than one crop** in an area ensures that regions don't become overly dependent on a **single crop**, reducing vulnerability to pests, diseases, and price fluctuations.
 - **Landscape Diversity Score** should be developed to assess the **regional diversity of crops**.
- **Income Diversification:** Crop diversification, combined with **income diversification** like **livestock rearing and intercropping**, creates more economically resilient farming systems.

What are Government Initiatives for Sustainable Agriculture?

- [National Mission on Sustainable Agriculture](#)
- [Paramparagat Krishi Vikas Yojana \(PKVY\)](#)
- [Sub-mission on AgroForestry \(SMAF\)](#)
- [Rashtriya Krishi Vikas Yojana](#)
- [Mission Organic Value Chain Development for North Eastern Region \(MOVCDNER\)](#)

Conclusion

Shifting from a **yield-centric approach** to a broader agricultural framework fosters **nutritional security, enhances soil and water health, and promotes biodiversity**. By integrating diverse indicators and fostering collaboration among ministries, India can create a more resilient and sustainable agricultural system that nourishes people while protecting the environment for future generations.

Drishti Mains Question:

Discuss the consequences of prioritising yield over nutritional quality in Indian agriculture. How looking beyond yield can improve agriculture??

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 a 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)

Mains

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

Q. Mention the advantages of the cultivation of pulses because of which the year 2016 was declared as the International Year of Pulses by the United Nations. **(2017)**

PDF Refernece URL: <https://www.drishtias.com/printpdf/looking-beyond-yield-in-agriculture>