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## Global Agricultural Productivity Report (GAP Report)

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### Why in News

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According to a new report, **Global agricultural productivity is not growing as fast as the demand for food**, amid the **impact of climate change**.

The report was released in conjunction with the **World Food Prize** Foundation's annual conference.

### Key Points

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#### Findings of the Report:

##### TFP Growth:

**Total Factor Productivity (TFP) is growing at an annual rate of 1.36%** (2020-2019).

This is **below the Global Agricultural Productivity Index** that has **set an annual target of 1.73% growth** to sustainably meet the needs of consumers for food and bioenergy in 2050.

#### Difference between TFP and Yield

- **Yield:**

Yield **measures output per unit of a single input**, for example, the amount of crops harvested on a hectare of land. Yields can increase through productivity growth, but they can also increase by applying more inputs, called input intensification. Therefore, an increase in yield **may or may not represent improvements in sustainability**.

- **TFP:**
  - Total factor productivity **captures the interaction between multiple agricultural inputs and outputs.**
  - TFP growth indicates that more farmers generate more crops, livestock, and aquaculture products with the same amount or less land, labor, fertilizer, feed, machinery, and livestock. As a result, TFP is **a powerful metric for evaluating and monitoring the sustainability of agricultural systems.**
- **Factors Responsible for Low TFP Growth:**

**TFP growth is influenced by** climate change, weather events, changes in fiscal policy, market conditions, investments in infrastructure and agricultural research and development.
- **Situation in Different Regions:**
  - **Drier Regions** (Africa and Latin America): Climate change has **slowed productivity growth by as much as 34%.**
  - **High-Income Countries** (in North America and Europe): **Modest TFP** growth.
  - **Middle Income Countries** (India, China, Brazil and erstwhile Soviet republics): **Strong TFP** growth rates.
  - **Low-Income Countries** (Sub-Saharan Africa): TFP is **contracting by an average of 0.31% per year.**
- **Significance of Productivity Growth:**
  - **Destruction of Forest Areas:** 36% of the world's land is used for agriculture. Forests and biodiverse areas will be destroyed for planting or pasture.
  - **Diet-Related Diseases: USD 2T in economic losses and 4 million deaths** are attributed to diet-related diseases each year.
  - **Soil Degradation:** 90% of the earth's soils could be degraded by erosion by 2050.
  - **Methane Emissions:** 37% of methane emissions from humans influenced activity come from cattle and other ruminants.
  - **Loss of Irrigation Water:** 40% of irrigation water is lost due to inefficient irrigation.
    - Water sources will be depleted, making prime agricultural land unusable.
- **Suggestions:**
  - Invest in agricultural research and development
  - Embrace science-and-information-based technologies
  - Improve infrastructure for transportation, information and finance
  - Cultivate partnerships for sustainable agriculture, economic growth and improved nutrition
  - Expand and improve local, regional and global trade
  - Reduce post-harvest loss and food waste

## Indian Scenario

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- **About:**
  - **Strong TFP Growth:**
    - India has seen strong TFP and output growth this century.
    - The most recent data shows **an average annual TFP growth rate of 2.81%** and output growth of 3.17% (2010–2019.)
  - **Impact of Climate Change:**
    - By the end of the century, the **mean summer temperature** in India **could increase by five degrees Celsius.**
    - This rapidly rising temperature, combined with changes in rainfall patterns, could **cut yields for India’s major food crops by 10% by 2035.**
  - **Other Challenges:**
    - In addition to the challenges for environmental sustainability, India’s small-scale farmers **face significant obstacles to economic and social sustainability.**
    - Of the 147 million landholdings in India, **100 million are less than two hectares in size.** Nearly 90% of farmers farming less than two hectares participate in a government food ration program.
- **Initiatives Taken:**
  - **Soil Health Card Scheme:** To create awareness for farmers about the appropriate amount of nutrients for the crop depending on the quality and strength of the soil.
  - **National Mission for Sustainable Agriculture (NMSA):** It is envisaged as one of the eight Missions outlined under **National Action Plan on Climate Change (NAPCC)**, which is aimed at promoting Sustainable Agriculture through climate change adaptation measures.
  - **Pradhan Mantri Krishi Sinchai Yojana (PMKSY):** It was launched during the year 2015-16 with the motto of ‘**Har Khet Ko Paani**’ for providing end-to-end solutions in irrigation supply chain, viz. water sources, distribution network and farm level applications.

**Source: DTE**