

Agriculture

1. Direct Seeded Rice (DSR):

- **Technique:** Rice seeds directly sown in the field, replacing transplanting.
- **Advantages:** Saves water and labour, eco-friendly, used extensively during COVID-19 labour shortages.
- **Herbicide-Tolerant (Ht) Basmati Rice:**
 - Developed by ICAR, non-GM variety tolerating Imazethapyr herbicide due to a mutated ALS gene.
 - Risks: Evolution of herbicide-resistant weeds, ecological concerns.
- **Innovation:** "TAR-VATTAR" technology by IARI Karnal reduces costs and saves water.

2. Bt-Cotton:

- Genetically modified crop producing an insecticidal protein from *Bacillus thuringiensis*.
 - Effective against bollworms and other pests.
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Science & Technology

1. Stromatolites:

- **Formation:** Accretionary structures by cyanobacteria trapping and binding sediment.
- **Historical Importance:** Records of life over 3.5 billion years, instrumental in the Great Oxygenation Event.
- **Locations:** Shark Bay, Western Australia; Sheybarah Island, Red Sea.

2. Phenome India Project:

- **By:** CSIR, launched December 2023.
 - **Objective:** Develop India-specific risk prediction models for cardio-metabolic diseases.
 - **Participants:** 10,000 samples from 17 states.
 - **Significance:** P4 healthcare (Predictive, Personalized, Participatory, Preventive) for Indian genetics and lifestyle.
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International Relations

1. UN Global Supply Chain Forum (2024):

- **Host:** Barbados, organized by UNCTAD.
- **Key Outcomes:**
 - "Manifesto for Low-Carbon Freight Transport and Logistics."
 - Focus on decarbonization, renewable energy, and green technologies.
 - Launched UN Trade and Development Trade-and-Transport Dataset with World Bank.
- **Next Edition:** Saudi Arabia, 2026.

Indian Economy

1. Preston Curve:

- **Definition:** Empirical relationship between per capita income and life expectancy.
- **Observation:** Higher income leads to improved life expectancy initially but plateaus after a point.

2. Exchange-Traded Funds (ETFs):

- **Features:** Track market indices, traded like stocks, lower fees than mutual funds.
 - **Types:** Equity, Debt, Commodity, Sectoral, International.
 - **EPFO Investment:** Over ₹2.5 trillion in ETFs as of 2024.
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History & Culture

1. Ahilyabai Holkar:

- **Reign:** Queen of Malwa (28 years), renowned for justice, administration, and promoting dharma.
- **Contributions:** Rebuilt Kashi Vishwanath Temple, Maheshwari textile industry.
- **Notable Decision:** Justice to all, including sentencing her son for a capital offense.