World Bioproduct Day 2025 and BioE3 Policy

Source: PIB

Why in News?

The Department of Science & Technology **(DST), along with BIRAC and iBRIC+, organized World Bioproduct Day 2025**, focusing on **Equity, Environment, and Economy** to highlight the importance of inclusive public participation in biotechnology.

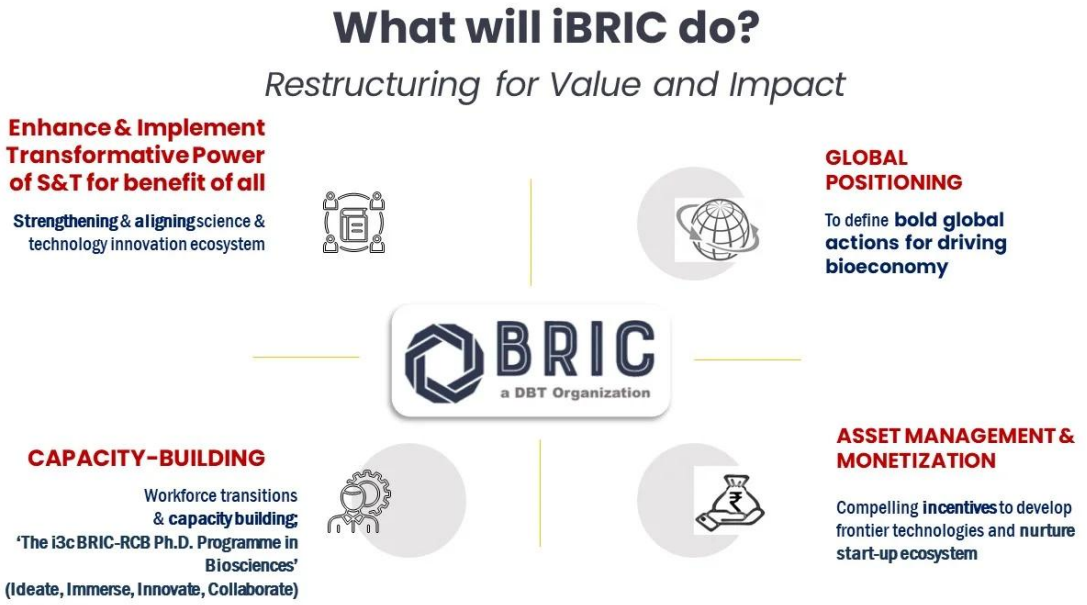
- The event also reiterated the government's **goal of achieving a USD 300 billion bioeconomy by 2030 under the BioE3 framework.**

World Bioproduct Day

- Launched in **2021** by the **World Bioeconomy Forum,** the day aims to promote awareness about the potential of **bio-based products** in advancing **environmental sustainability**, **climate action**, and **green innovation** by reducing dependence on fossil fuels.

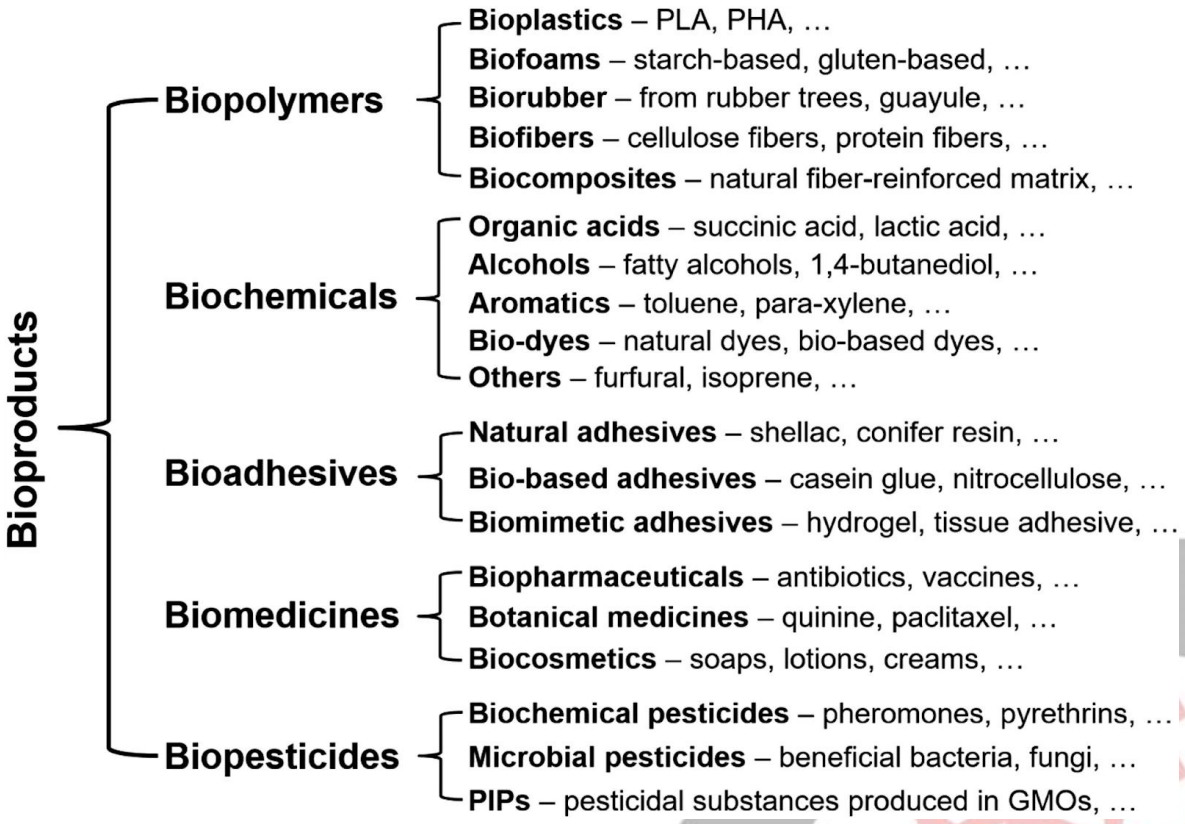
iBRIC+

- **iBRIC+ (Indian Bioeconomy Research and Innovation Consortium Plus)** is a strategic initiative by the **Department of Biotechnology (DBT)** aimed at accelerating India’s **bioeconomy** through a **collaborative, multi-stakeholder platform**.
- Building on the iBRIC foundation, it expands focus to strengthen **regional innovation ecosystems** and support a **sustainable, high-performing bioeconomy**.
- It complements **BRIC**, which integrates **13 DBT institutions** under one framework to improve **governance**, ensure **HR parity**, promote **NEP-aligned research**, enable **interdisciplinary collaboration**, and align R&D with **national missions** for enhanced **socio-economic impact**.



What are Bioproducts?

- **About: Bioproducts** are **fuels, materials, and chemicals** made from **renewable biomass** like **crops, trees, algae, and agricultural waste**.
    - **Eg**: **Biofuels** (ethanol, biogas), **bioplastics**, **bio-based cosmetics**, and **plant-derived medicines**.
- **Significance:** Bioproducts **reduce reliance on fossil fuels**, thereby addressing **air pollution, deforestation**, and **biodiversity loss**.
    - Through **biotechnological innovation**, they promote **climate-resilient development** without compromising product quality or performance.
- **Categories of Bioproducts:**



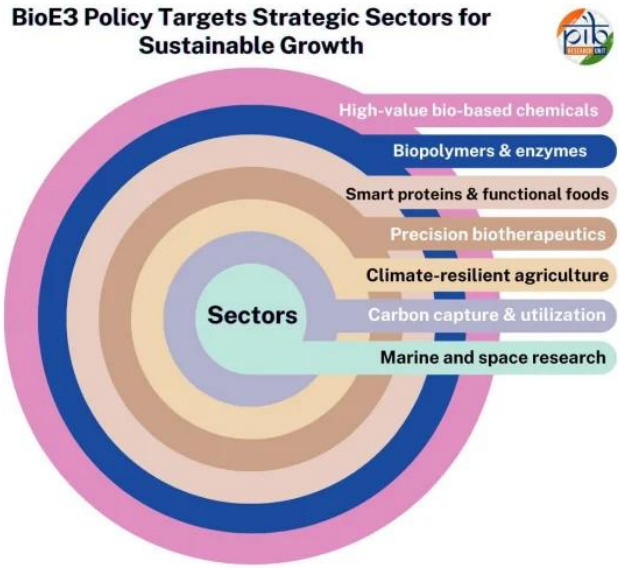
- **Production Methods:** Bioproducts are produced using methods such as **fermentation**, **pyrolysis**, **enzymatic conversion**, and **chemical synthesis.**
- **Biodegradability:** Not all bioproducts are **biodegradable** and it depends on the intended use (e.g., bio-based paint is not biodegradable).
- **Feedstocks & Sustainability:** Common sources include **soybeans, corn, sugarcane, sunflowers, flax, potatoes, algae**, and **mycelium**.
    - Many bioproducts use **agricultural or forestry waste**, minimizing pressure on food supply. For example, sunflower residue after seed removal can be converted into **biofuel**.

What is the BioE3 Policy?

- **About:** The **BioE3 Policy** (**Biotechnology for Economy, Environment, and Employment**), launched by the **Department of Biotechnology** in 2024 to promote **high-performance biomanufacturing** by integrating **advanced biotechnological processes** across key sectors.
    - It aims to strengthen India's **bioeconomy** through **sustainable practices, innovation, and employment generation.**
    - It supports India's broader goals of achieving a **'Net Zero' carbon economy** and promoting sustainable growth through a **circular bioeconomy.**
- **Key Features:**
    - **Biomanufacturing Infrastructure**: The policy focuses on boosting **research and development (R&D)**, **entrepreneurship**, and the creation of **Biomanufacturing & Bio-AI hubs** and **Biofoundries**.
    - **Supports Sustainable Biomanufacturing:** Aligned with the **'Lifestyle for Environment' (LiFE)** initiative, the policy supports the development of **regenerative bioeconomy models** that are sustainable and resource-efficient.
        - It also emphasizes **ethical biosafety and global regulatory alignment** to boost India's global competitiveness while ensuring **responsible biotechnology development.**
    - **Workforce Expansion**: Focuses on building a **skilled biotechnology workforce**, especially in **Tier-II and Tier-III cities**, to create new jobs and drive **inclusive regional growth** using **local biomass**.
- **Core Themes of BioE3 Policy:**

- **Bio-Based Chemicals & Enzymes**: Promote eco-friendly alternatives to petrochemicals.
- **Functional Foods & Smart Proteins**: Develop nutrient-rich, sustainable food sources.
- **Precision Biotherapeutics**: Advance targeted medical treatments and diagnostics.
- **Climate-Resilient Agriculture**: Support farming techniques adapted to climate change.
- **Carbon Capture & Utilization (CCU)**: Encourage technologies to capture and reuse carbon.
- **Futuristic Marine & Space Research**: Explore marine and space biotech for novel solutions in biomanufacturing.

The policy's scope is broad and ambitious, encompassing several strategic sectors:



Government Initiatives Related to Biotechnology

- **National Biotechnology Development Strategy 2020-25**
- **National Biopharma Mission**
- **Atal Jai Anusandhan Biotech Mission**
- **One Health Consortium**
- **Biotech Parks**
- **Biotechnology Industry Research Assistance Council (BIRAC)**
- **Genome India Project**

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims

Q. Other than resistance to pests, what are the prospects for which genetically engineered plants have been created? (2012)

1. To enable them to withstand drought
2. To increase the nutritive value of the produce
3. To enable them to grow and do photosynthesis in spaceships and space stations
4. To increase their shelf life

Select the correct answer using the codes given below:

(a) 1 and 2 only

(b) 3 and 4 only

(c) 1, 2 and 4 only

(d) 1, 2, 3 and 4

Ans: (c)