



Daily PIB Summary

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1. INDIA'S MAKHANA SECTOR: TRADITIONAL CROP TO GLOBAL SUPERFOOD



- India is a major global producer of makhana, with **Bihar as the leading producing state**.
- Makhana cultivation is closely associated with **wetlands, ponds and water bodies**, providing livelihood opportunities to small farmers.
- Rising demand for healthy and nutritious foods has increased makhana's potential as a **global superfood and export commodity**.
- Value addition through processing, packaging and branding can significantly improve farmers' returns.
- The sector has potential to generate rural employment and strengthen **agricultural diversification and exports**.
- Better technology, organised markets, storage and processing infrastructure are essential to move from raw production to a competitive global value chain.

BACKGROUND / CONTEXT

Makhana

- Makhana is the edible seed of ***Euryale ferox***, commonly known as fox nut or gorgon nut.
- It is an aquatic crop traditionally cultivated in ponds and wetlands.
- The seeds are generally roasted and popped before consumption.

Nutritional Significance

- I. Makhana is valued for its:
 - A. Protein
 - B. Carbohydrates

- C. Minerals
- D. Low-fat profile

- II. It is increasingly marketed as a healthy snack and functional food.

Production & Value Chain

- **Bihar** is India's major makhana-producing region.
- Other producing areas include parts of **West Bengal, Assam, Odisha and Manipur**.
- The value chain includes cultivation → harvesting → seed extraction → processing/popping → grading → packaging → domestic/export marketing.

KEY HIGHLIGHTS

- **Crop:** Makhana / Fox nut / Gorgon nut.
- **Scientific Name:** *Euryale ferox*.
- **Production Hub:** Bihar.
- **Economic Potential:** High-value crop with growing domestic and international demand.
- **Livelihood Impact:** Supports farmers and workers involved in cultivation and processing.
- **Export Potential:** Branding, quality certification and modern processing can expand global markets.
- **Challenges:** Labour-intensive cultivation, low mechanisation, fragmented value chains and limited processing infrastructure.
- **Way Forward:** Mechanisation, farmer-producer organisations, better processing facilities, branding, GI-based promotion and export support.

PRELIMS BOOSTER BOX

- **Makhana:** Commonly called fox nut/gorgon nut.
- **Scientific Name:** *Euryale ferox*.
- **Family:** Nymphaeaceae.
- **Nature:** Aquatic flowering plant.
- **Major Producing State:** Bihar.
- **Cultivation:** Primarily in ponds, wetlands and other water bodies.
- **GI Tag:** **Mithila Makhana** has a Geographical Indication (GI) tag.
- **Key Value Addition:** Popping, roasting, grading, flavouring and packaged-food production.

- **Significance:** Nutrition + livelihood + agricultural diversification + export potential.

PadhAI-GENERATED UPSC MCQ

Consider the following statements regarding Makhana:

1. Makhana is the edible seed of *Euryale ferox*.
2. It is primarily an aquatic crop cultivated in ponds and wetlands.
3. Mithila Makhana has been granted a Geographical Indication tag.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 1 and 2 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

Answer: (d)

2. DEVELOPMENT AND CONSERVATION CAN GO HAND IN HAND: VICE PRESIDENT

Balancing Conservation and Development



- Sustainable development requires economic progress without compromising ecological security.
- Environmental conservation should be integrated into **development planning and infrastructure decisions**, rather than treated as a separate objective.

- Technology and innovation can help reduce the environmental footprint of economic activities.
- Conservation of forests, biodiversity, water and other natural resources is essential for long-term economic resilience.
- Community participation can strengthen conservation outcomes while supporting local livelihoods.
- The approach aligns with India's broader commitment to **climate action, sustainable resource use and inclusive development**.
- Effective governance requires balancing present developmental needs with the interests of future generations.

BACKGROUND / CONTEXT

Sustainable Development

- I. Sustainable development seeks to meet present needs without compromising the ability of future generations to meet their own needs.
- II. It integrates three broad dimensions:
 - A. **Economic development**
 - B. **Social inclusion**
 - C. **Environmental protection**

Development–Conservation Balance

- I. Conventional development can create pressures through:
 - A. Deforestation
 - B. Habitat fragmentation
 - C. Pollution
 - D. Resource depletion
 - E. Climate change
- II. Sustainable approaches include:
 - A. Green infrastructure
 - B. Renewable energy
 - C. Circular economy
 - D. Ecosystem restoration
 - E. Resource-efficient technologies

Indian Policy Framework

- **Environment (Protection) Act, 1986**
- **Wildlife (Protection) Act, 1972**
- **Forest (Conservation) Act, 1980**, now renamed the **Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980**
- **Biological Diversity Act, 2002**

- Environmental Impact Assessment (EIA) framework

KEY HIGHLIGHTS

- **Core Principle:** Economic growth and conservation need not be mutually exclusive.
- **Governance:** Environmental considerations should be mainstreamed into development planning.
- **Technology:** Clean technologies can reduce resource consumption and ecological damage.
- **Biodiversity:** Ecosystem conservation strengthens long-term ecological and economic resilience.
- **Community Role:** Local communities are important stakeholders in sustainable resource management.
- **Climate Linkage:** Sustainable development supports India's climate mitigation and adaptation objectives.
- **Challenge:** Infrastructure expansion, livelihood needs and ecological protection can generate competing priorities.
- **Way Forward:** Strengthen green planning, cumulative environmental assessment, nature-based solutions and community participation.

PRELIMS BOOSTER BOX

- **Sustainable Development:** Development balancing economic, social and environmental objectives.
- **SDGs:** 17 Sustainable Development Goals adopted under the **UN 2030 Agenda**.
- **SDG 13:** Climate Action.
- **SDG 15:** Life on Land.
- **SDG 6:** Clean Water and Sanitation.
- **EIA:** Environmental Impact Assessment evaluates likely environmental consequences of proposed projects.
- **Intergenerational Equity:** Natural resources and environmental quality should be protected for future generations.
- **Polluter Pays Principle:** Polluter bears the cost of preventing and remedying environmental damage.

- **Precautionary Principle:** Lack of full scientific certainty should not be a reason to postpone measures against serious environmental risks.

PadhAI-GENERATED UPSC MCQ

Consider the following statements regarding sustainable development:

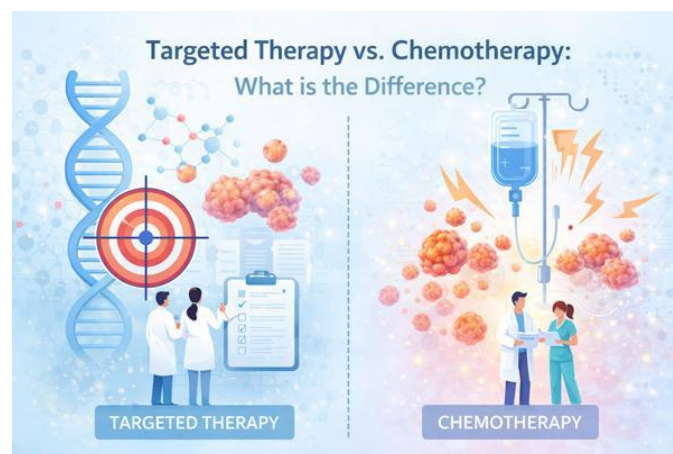
1. Sustainable development seeks to balance economic development, social well-being and environmental protection.
2. The precautionary principle implies that environmental action can be delayed until complete scientific certainty is available.
3. Environmental Impact Assessment can help integrate ecological considerations into development planning.

Which of the statements given above is/are correct?

- (a) 1 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (b)

3. SMART CANCER DRUG ACTIVATING PRIMARILY IN CANCER CELLS COULD OFFER AN ALTERNATIVE TO CHEMOTHERAPY



- Conventional chemotherapy can affect both cancerous and rapidly dividing healthy cells, causing significant side effects.
- The new approach seeks to **activate the drug preferentially within cancer cells**, improving therapeutic selectivity.



- Such strategies can potentially increase the concentration of the active drug at the tumour site while reducing systemic toxicity.
- The approach represents the broader shift towards **precision oncology**, where treatment is tailored to tumour-specific biological characteristics.
- If successfully translated into clinical use, it could improve treatment effectiveness and patients' quality of life.
- However, laboratory or early-stage research does not establish that a drug can already replace chemotherapy in clinical practice.
- Clinical trials are required to establish safety, efficacy, optimal dosage and long-term outcomes.

BACKGROUND / CONTEXT

Conventional Chemotherapy

- I. Chemotherapy uses cytotoxic drugs to destroy or inhibit rapidly dividing cancer cells.
- II. Because some healthy cells also divide rapidly, chemotherapy may cause:
 - A. Hair loss
 - B. Nausea
 - C. Fatigue
 - D. Reduced blood-cell production
 - E. Increased infection risk

Smart / Targeted Drug Activation

- I. A smart drug can be designed as a **prodrug**—an initially inactive or less-active compound that is converted into its active form under specific biological conditions.
- II. Cancer cells may possess distinctive characteristics such as:
 - A. Altered enzymes
 - B. Different pH conditions
 - C. Hypoxia
 - D. Specific molecular markers
- III. These differences can potentially be exploited to activate medicines preferentially in tumours.

Precision Oncology

- I. Precision oncology uses the **genetic, molecular and biological characteristics of a patient's tumour** to guide treatment.
- II. It includes:

- A. Targeted therapy
- B. Immunotherapy
- C. Biomarker-based treatment
- D. Personalised medicine

KEY HIGHLIGHTS

- **Innovation:** Drug activation is designed to occur preferentially in cancer cells.
- **Therapeutic Advantage:** Potentially greater tumour selectivity with reduced damage to healthy tissues.
- **Scientific Basis:** Exploits biological differences between cancerous and normal cells.
- **Healthcare Impact:** Could reduce treatment-related toxicity and improve patient quality of life.
- **Precision Medicine:** Represents movement from broadly cytotoxic treatment towards targeted cancer therapy.
- **Limitation:** Promising research does not automatically translate into an approved clinical treatment.
- **Challenge:** Tumour heterogeneity may limit effectiveness across different cancers or patients.
- **Way Forward:** Rigorous clinical trials, biomarker identification and long-term safety evaluation.

PRELIMS BOOSTER BOX

- **Cancer:** Uncontrolled growth and abnormal division of cells.
- **Chemotherapy:** Treatment using drugs that kill or inhibit cancer cells, often affecting rapidly dividing normal cells too.
- **Prodrug:** A compound converted inside the body into its pharmacologically active form.
- **Targeted Therapy:** Treatment designed to act on specific molecular targets associated with cancer.
- **Precision Oncology:** Uses tumour-specific molecular information to guide treatment.
- **Biomarker:** Measurable biological characteristic that can help detect disease or predict treatment response.
- **Tumour Microenvironment:** Cellular, molecular and biochemical environment surrounding a tumour.

- **Immunotherapy:** Treatment that stimulates or enhances the immune system's ability to fight cancer.

PadhAI-GENERATED UPSC MCQ

Consider the following statements regarding targeted cancer therapy:

1. A prodrug can be designed to become pharmacologically active after conversion within the body.
2. Precision oncology can use molecular characteristics of a tumour to guide treatment.
3. Conventional chemotherapy selectively affects only cancer cells and does not affect rapidly dividing healthy cells.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 1 and 2 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

Answer: (b)

4. HINDI ADVISORY COMMITTEE MEETING HELD AT MINISTRY OF RURAL DEVELOPMENT



- Hindi Advisory Committees assist Ministries in promoting the progressive use of Hindi in official work.
- The initiative aims to strengthen accessibility and effective communication between government institutions and citizens.
- Greater use of Hindi in administration can support **inclusive and citizen-centric**

governance, particularly in Hindi-speaking regions.

- The constitutional framework recognises Hindi in **Devanagari script as the Official Language of the Union**.
- The Official Languages Act, 1963 provides the legislative framework governing the use of Hindi and English for official purposes.
- Promotion of Indian languages is also linked with preserving linguistic heritage while improving public-service delivery.
- Effective implementation requires balancing Hindi's promotion with India's **multilingual and federal character**.

BACKGROUND / CONTEXT

Constitutional Framework

- **Article 343:** Hindi in Devanagari script is the Official Language of the Union.
- The Constitution permits continued use of English for official purposes as provided by law.
- **Eighth Schedule:** Recognises **22 languages**.

Official Languages Act, 1963

- Provides for continued use of **English**, in addition to Hindi, for specified official purposes of the Union.
- Provides the legislative basis for the bilingual functioning of Union administration.

Hindi Advisory Committees

- Constituted in Ministries/Departments to advise on:
 - A. Progressive use of Hindi
 - B. Implementation of Official Language policy
 - C. Hindi training and administrative usage
 - D. Promotion of Hindi in official communication

KEY HIGHLIGHTS

- **Institutional Mechanism:** Hindi Advisory Committees support implementation of the Official Language policy.
- **Governance:** Promotes communication in a language accessible to citizens.
- **Constitutional Basis:** Article 343 provides for Hindi as the Official Language of the Union.



- **Legislative Framework:** Official Languages Act, 1963 governs the use of Hindi and English.
- **Inclusivity:** Language accessibility can improve citizen engagement with government schemes.
- **Federal Dimension:** Language policy must respect India's multilingual character.
- **Challenge:** Ensuring Hindi promotion does not create linguistic barriers for non-Hindi-speaking regions.
- **Way Forward:** Promote Hindi alongside India's other scheduled languages and strengthen multilingual digital governance.

PRELIMS BOOSTER BOX

- **Official Language of Union:** Hindi in Devanagari script.
- **Article 343:** Official Language of the Union.
- **Article 344:** Commission and Committee of Parliament on Official Language.
- **Eighth Schedule:** 22 recognised languages.
- **Official Languages Act: 1963.**
- **Official Language Rules: 1976.**
- **Important Distinction:** The Constitution does **not** designate Hindi as India's "national language".
- **English:** Continues to be used for specified official purposes of the Union.
- **Ministry Concerned:** Ministry of Rural Development.

PadhAI-GENERATED UPSC MCQ

Consider the following statements regarding India's official language framework:

1. Hindi in Devanagari script is the Official Language of the Union under Article 343.
2. The Constitution declares Hindi to be the national language of India.
3. The Eighth Schedule of the Constitution contains 22 languages.

Which of the statements given above is/are correct?

- (a) 1 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (b)

5. RDI FUND: STRINGENT SAFEGUARDS TO PREVENT CONFLICT OF INTEREST



RDI

Research Development & Innovation

- The RDI Fund is aimed at accelerating **private-sector investment in research, development and innovation.**
- Conflict-of-interest safeguards are important because public funds may be channelled into projects involving private companies and investors.
- The framework seeks to ensure that funding decisions remain **transparent, objective and accountable.**
- Strong governance mechanisms can improve investor confidence while protecting public resources from misuse.
- The Fund can help bridge the gap between **research, technology development and commercialisation.**
- Greater private participation can strengthen India's innovation ecosystem and reduce dependence on imported technologies.
- Continuous stakeholder consultation can help identify new risks and strengthen the Fund's governance framework.

BACKGROUND / CONTEXT

RDI Fund

- The **Research, Development and Innovation (RDI) Fund** is designed to catalyse private-sector R&D and innovation.
- It seeks to encourage development of **deep-tech and high-impact technologies** that may require substantial capital and have longer gestation periods.

Why Conflict-of-Interest Safeguards Matter



- I. Conflict of interest can arise when individuals involved in funding decisions have:
 - A. Financial interests in beneficiaries
 - B. Professional or personal relationships with applicants
 - C. Institutional interests affecting impartiality
- II. Safeguards can include disclosure requirements, recusal, independent evaluation and audit mechanisms.

KEY HIGHLIGHTS

- **Objective:** Promote private investment in R&D and innovation.
- **Public Interest:** Protect taxpayers' money and ensure responsible allocation of public funds.
- **Governance:** Conflict-of-interest safeguards support transparent and impartial decision-making.
- **Innovation:** Encourages commercialisation of indigenous technologies and deep-tech solutions.
- **Private Capital:** Seeks to leverage public support to mobilise larger private investments.
- **Accountability:** Monitoring and independent scrutiny are essential for effective implementation.
- **Challenge:** Balancing faster funding decisions with rigorous due diligence.
- **Way Forward:** Periodic review, stronger disclosure norms, independent evaluation and stakeholder consultation.

PRELIMS BOOSTER BOX

- **RDİ:** Research, Development and Innovation.
- **Core Purpose:** Catalyse private-sector investment in R&D and innovation.
- **Focus:** Deep-tech, emerging technologies and commercialisation.
- **Conflict of Interest:** Situation where personal/private interests may compromise objective decision-making.
- **Key Safeguards:** Disclosure, recusal, independent evaluation, audit and monitoring.
- **Policy Linkage:** Innovation ecosystem, technology self-reliance and private-sector R&D.

- **Governance Principle:** Public funds require transparency, accountability and value-for-money.

PadhAI-GENERATED UPSC MCQ

Consider the following statements regarding conflict-of-interest safeguards in public funding:

1. Disclosure of relevant private interests can help identify potential conflicts of interest.
2. Recusal of a decision-maker with a relevant conflict can strengthen impartiality.
3. Conflict-of-interest safeguards are unnecessary when public funds are used to leverage private investment.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 1 and 2 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

Answer: (b)