

### **UPSC CURRENT AFFAIRS - 7 July 2025**

### GS Paper 3:

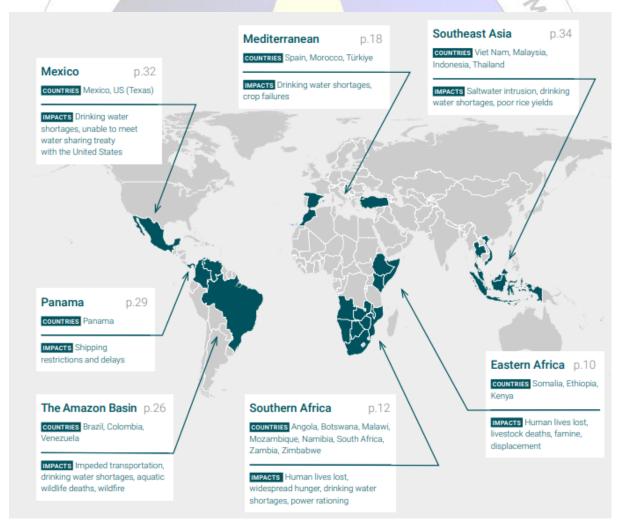
## **Operation** Drought Hotspots Around the World (2023–2025)

Syllabus: GS Paper 3 - Environment

**Source:** UN Convention to Combat Desertification (UNCCD)

### **Q** Context

The **UNCCD**, in collaboration with the **U.S. National Drought Mitigation Centre**, has released a critical report titled "Drought Hotspots Around the World 2023–2025." It highlights the intensifying nature of droughts across regions, underlining how climate change, poor water management, and weak governance are amplifying vulnerabilities across the globe.





### (iii) Global Drought Trends: Key Highlights

Rising Global Exposure: Droughts are intensifying across Africa, the Mediterranean,
 Latin America, and Asia — identified as "slow-moving catastrophes" due to their systemic, long-lasting effects.

#### • Africa's Hunger Crisis:

- Over 90 million people in Eastern and Southern Africa are facing acute food insecurity.
- In Zimbabwe, maize crop failure exceeded 70%, worsening poverty and malnutrition.

### • Energy Blackouts in Zambia:

- Flow of the Zambezi River dropped to just 20% of its historical average.
- Result: 21-hour daily power outages, impacting hospitals, schools, and critical services.

#### Spain's Agricultural Setback:

- Two consecutive years of drought cut Spain's olive oil production by 50%.
- Led to price hikes in Mediterranean nations and across Europe.

### Panama Canal Disruption:

 Drought conditions reduced daily ship transits from 38 to 24, affecting global trade logistics and food prices.

### Amazon River Emergency:

 Historic record-low water levels cut off transport routes, stranded communities, and resulted in the death of 200+ river dolphins.

### • Social Impact on Children and Women:

- In Ethiopia, drought-related poverty doubled child marriages.
- o Zimbabwe saw widespread school dropouts, especially among girls.

### Biodiversity Collapse:

- o In Zimbabwe, over **100 elephants died** due to water scarcity.
- In Amazonia, thousands of fish and 200+ dolphins perished from extreme heat and drying rivers.



#### IN India's Vulnerability to Drought

### · Rainfall Unpredictability:

o India faces increased intra-seasonal monsoon variability, making agriculture and water planning highly uncertain.

#### • Food Inflation Risk:

 As rice and sugar output drops across Asia, India experiences pressure on food prices and inflation, affecting both consumers and farmers.

### Hydrological Depletion:

 River basins like Godavari and Krishna frequently face drought due to excessive extraction and poor basin-level governance.

#### • Socioeconomic Consequences:

 Drought-prone states such as Maharashtra, Rajasthan, and Karnataka witness rising farmer distress, indebtedness, and seasonal migration.

### **M** Key Drivers Behind Intensifying Droughts

### • Climate Change:

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 Global warming increases evapotranspiration, resulting in longer dry spells and rainfall failure.

#### El Niño Effects:

o The **2023–24 El Niño** event worsened conditions across major agricultural zones, from Africa to Latin America and Asia.

### Ecological Overuse:

 Groundwater depletion, deforestation, and inefficient irrigation are accelerating hydrological imbalance in multiple regions.

### • Governance Deficits:

 Inadequate early warning systems, lack of long-term planning, and weak enforcement of land and water policies exacerbate drought impacts.

### Multifaceted Impacts of Drought

Food Insecurity:



- o Zambia saw 100% rise in maize prices.
- o Global staple crops like wheat, rice, and sugar are at risk.

### • Energy System Collapse:

 Hydropower shortages disrupted electricity in Zambia, Türkiye, and other nations, impacting hospitals and industries.

### • Ecosystem Degradation:

 Droughts triggered mass deaths in elephants, fish, and aquatic mammals, severely affecting biodiversity hotspots.

### • Displacement and Health Crises:

 Somalia and parts of the Amazon region saw mass migrations, with acute child malnutrition reaching emergency levels.

### Recommendations from the Report

### Early Warning Mechanisms:

 Implement real-time drought monitoring and impact assessment systems for proactive responses.

### Nature-Based Solutions (NbS):

 Promote watershed restoration, reforestation, and indigenous droughttolerant crops.

### Gender-Sensitive Strategies:

 Address women's vulnerabilities during droughts by ensuring access to education, health, and social protection.

### • International & Transboundary Cooperation:

 Collaborate across borders for river basin management, trade flow stability, and disaster mitigation.

#### Climate-Resilient Infrastructure:

 Invest in rainwater harvesting, off-grid energy systems, and sustainable agricultural technologies.

### • Financing Preparedness:

 Mobilize global platforms like IDRA (International Drought Resilience Alliance) to support developing nations in adaptation and risk reduction.



#### □ Conclusion

Droughts are no longer rare or localised—they are persistent, transboundary, and deeply systemic. The report serves as a warning and a call to action. In an era of climate uncertainty, droughts may become the new normal unless global cooperation, sustainable policies, and inclusive action plans are urgently adopted. The path to drought resilience lies in preparedness, equity, and ecological restoration.



### **Embracing Genetic Innovation for India's Agricultural Future**

Syllabus: GS Paper 3 – Agriculture, Biotechnology

**Source:** The Indian Express

### Q Context

India is facing growing global pressure to liberalize its agricultural biotechnology sector. However, domestic innovation remains heavily regulated. Currently, only Bt cotton is officially approved for commercial use, while other GM crops like Bt brinjal and GM mustard are stalled due to regulatory hurdles.





### Current Status of Indian Agriculture and GM Landscape

### • Declining Productivity:

Cotton yield has fallen from 566 kg/ha (2013–14) to 436 kg/ha (2023–24),
 while China and Brazil yield over 1,800–1,900 kg/ha.

### • Rising Import Dependency:

 India has shifted from a net exporter to a net importer of cotton, with imports valued at \$0.4 billion in 2024–25.

### Biotech Stagnation:

- o **Bt cotton** remains the only GM crop under legal cultivation.
- GM mustard, Bt brinjal, GM soy, and corn remain unapproved.

### Technology Lag:

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 While global GM acreage crossed 200 million hectares, India continues to lag due to political hesitation and regulatory paralysis.

### **a** Government Initiatives and Policy Milestones

- Bt Cotton Introduction (2002):
  - Approved under Vajpayee's government, resulting in a 193% increase in cotton production within a decade.
- Cotton Seed Price Control Order (2015):
  - Imposed trait fee caps, discouraging investment in agricultural biotech by reducing profit incentives.
- GM Mustard Clearance (2022):
  - The GEAC approved its environmental release, but commercial rollout remains delayed.
- Jai Anusandhan Initiative:
  - A ₹1 lakh crore RDI (Research-Development-Innovation) fund launched to strengthen the agricultural innovation ecosystem.
- Technology Transfer Mandates (2016):
  - Government rules imposed compulsory licensing and fee caps, further deterring private biotech investment.



### Key Challenges Facing Agricultural Biotechnology

### • Regulatory Gridlock:

 Bt brinjal has been under a moratorium since 2009; GM mustard faces continuous approval bottlenecks.

### Illegal Cultivation of HT-Bt Cotton:

 Despite a ban, herbicide-tolerant Bt cotton is illegally cultivated in five major states, covering up to 25% of total cotton area.

### Policy Disincentives:

 Strict regulations, fee controls, and delayed clearances discourage innovation by both public and private sectors.

### • Pest Infestation Threat:

 Farmers face severe yield losses due to pink bollworms and whiteflies, exacerbated by lack of new biotech solutions.

### Farmer Vulnerability:

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 Use of unregulated or illegal seeds exposes farmers to crop failure, without legal safeguards or compensation.

### **X** Key Arguments Against GM Crop Adoption

### Biodiversity Concerns:

 GM crops may cause genetic contamination of native species and threaten local biodiversity.

### • Health Uncertainties:

 Public opposition is fuelled by lack of long-term evidence on the safety of GM food.

### • Loss of Seed Sovereignty:

- GM seeds are protected by IP rights, requiring farmers to purchase seeds annually, weakening their autonomy.
- (Example: Monsanto-Mahyco Bt cotton legal battles)

#### Opaque Regulatory Process:



- The **GEAC lacks transparency** in field trials and public consultations.
- (Example: Bt brinjal moratorium followed widespread civil society protests in 2009)

### Risk of Monopolisation:

 High-cost GM seeds may exclude small and marginal farmers, creating technology access inequality.

### Role of Innovation in Agricultural Transformation

- Bt Cotton Success Story:
  - Yield increased by 87%, especially benefitting farmers in Gujarat.
  - Helped India become the largest cotton producer globally until recent declines.
- Global GM Adoption:
  - Over 76 countries cultivate GM crops on 200+ million hectares, leading to higher productivity and reduced pesticide use.
- Potential of GM Mustard & Brinjal:
  - Can reduce chemical pesticide dependence, improve yields, and enhance food and nutritional security.
- Policy Backing Required:
  - Programs like Jai Anusandhan must be supported by practical policy reforms,
    IP protection, and private participation.
- Biotech for Bharat Vision:
  - Former PM Vajpayee's statement "What IT is for India, BT is for Bharat" reflects the transformative potential of biotechnology for rural India.

### Conclusion

India's agriculture needs to shift from **protectionism to science-driven policies**. Embracing **tested GM technologies** is crucial for addressing declining productivity, increasing farmer income, and reducing environmental stress. For a resilient and competitive agricultural future, India must **bridge the gap between lab and land**, ensuring **innovation reaches farmers** while safeguarding **ecology and equity**.



### ☐ India Falls into the 'Moderately Low' Inequality Category

### **Syllabus Tags:**

**GS Paper II** – Welfare Schemes, Governance & Inclusive Development **GS Paper III** – Poverty, Inequality, Human Development Indicators **Essay** – Social Justice, Welfare State, Equity vs. Growth

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India has been ranked as the 4th most equal country globally, according to the World Bank's Spring 2025 Poverty and Equity Brief, reflecting significant progress in income equality and poverty reduction.

Country	Gini Index
Slovak Republic	24.1
Slovenia	24.3
Belarus	24.4
India	25.5
China	35.7
United States	41.8

### **M** Key Highlights of the Report

- **Source**: *World Bank Poverty and Equity Brief* covering **167 countries**.
- Gini Index (2023):



- India's score is 25.5, placing it in the "moderately low inequality" band (25–30 range).
- Improvement from 28.8 in 2011 to 25.5 in 2023 indicates rising income equality.

### Global Ranking:

- 4th most equal country, after Slovak Republic, Slovenia, and Belarus.
- Ranked ahead of China (35.7) and the USA (41.8).

### Poverty Reduction:

- 171 million people lifted out of extreme poverty.
- Reduction from 16.2% (2011) to 2.3% (2023), measured by the \$2.15/day threshold.

### **Representation** Progress Policy Drivers of Progress

- PM Jan Dhan Yojana:
  - Opened over 55 crore bank accounts, expanding financial inclusion.
- Aadhaar-Linked DBTs:
  - Saved **₹3.48 lakh crore** in leakages by targeting subsidies efficiently.
- Ayushman Bharat:
  - Over 41 crore health cards issued, ensuring ₹5 lakh coverage per family.
- PMGKAY (Food Security):
  - Free food grains to 80 crore citizens during COVID and beyond.
- Stand-Up India & PM Vishwakarma Yojana:
  - o Empowered SCs, STs, women, and artisans with credit and skill access.

#### **□** UPSC Relevance

- GS Paper II:
  - Welfare schemes' impact on inclusive development.
- GS Paper III:
  - o Progress on **poverty eradication and inequality** indicators.



### • Essay/Interview Use:

- o Illustrates India's journey toward a socially just and inclusive economy.
- o Reflects on the "growth with equity" model for sustainable development.

### UPSC CURRENT AFFAIRS – 7 July 2025 Facts for Prelims (FFP):

### ☐ India's First National Biobank

Source: PIB

**Syllabus**: GS III – Science & Technology (Biotechnology, Health)

#### Context:

Union Minister inaugurated India's first National Biobank and a Longitudinal Population Data Study at CSIR-IGIB, New Delhi, under the *Phenome India* initiative. This effort supports indigenous genomic research and personalised medicine.



#### **About the Biobank:**

- What: A centralised genomic and clinical repository collecting data on India's population diversity—ethnic, lifestyle, environmental, and health.
- **Purpose**: Track gene-environment interaction over time and aid preventive healthcare.



#### Developed by:

- CSIR Institute of Genomics and Integrative Biology (IGIB)
- Supported by the Ministry of Science and Technology

### **Objectives:**

- Build India's own population-specific health reference dataset
- Enable precision medicine and Al-based diagnostics
- Facilitate CRISPR-based low-cost gene therapies
- Strengthen research on:
  - Rare genetic diseases
  - Antimicrobial resistance (AMR)
  - Cancer, cardiovascular, and metabolic disorders

### **Key Features:**

- Inspired by the **UK Biobank**, but adapted to India's unique genetic, social, and geographic diversity.
- Will collect **genomic**, **clinical**, **and lifestyle data** from over 10,000 individuals across India.
- Enables long-term health tracking and response to disease susceptibility, treatment efficiency, and environmental triggers.

### Significance:

- A leap towards Atmanirbharta (self-reliance) in genomic infrastructure.
- Powers India's move toward personalised public healthcare systems.
- Supports digital health ecosystems under National Digital Health Mission.



# Pressurised Heavy Water Reactors (PHWRs) – Kakrapar Units 3

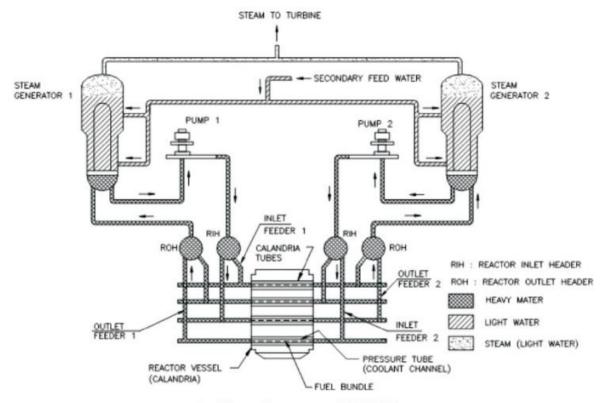
Source: Business Standard

**Syllabus**: GS III – Science & Technology (Nuclear Technology)

#### Context:

The Atomic Energy Regulatory Board (AERB) granted operational licences to NPCIL for two 700 MWe indigenous PHWRs at Kakrapar Atomic Power Station (KAPS), Gujarat.





### 1. Flow diagram of PHWR

### **About PHWRs:**

- **Definition**: Reactors using **natural uranium** as fuel and **heavy water (D₂O)** as coolant and moderator.
- Design: Allows online refuelling, sustaining uninterrupted power output.

### **Evolution in India:**

- First developed with Canadian support (RAPS-1, 1973).
- Post-Canada withdrawal, India developed indigenous capability via BARC & NPCIL.
- Progressed from 220 MWe → 540 MWe → 700 MWe entirely through domestic R&D.

#### **How It Works:**

- Heavy water slows neutrons to sustain fission.
- Pressurised tubes house uranium fuel rods.
- Generated heat is transferred to steam generators → drives turbines.

### **Key Safety and Efficiency Features:**

Online refuelling reduces downtime.



- Twin rapid shutdown systems, double containment, and passive heat removal systems.
- **Digital Instrumentation and Control (I&C)** ensures real-time monitoring and safety.

### Significance:

- Part of India's 10-reactor fleet mode strategy.
- Adds 7,000 MWe indigenous nuclear capacity.
- Reinforces India's self-reliance in nuclear energy, from fuel design to decommissioning.

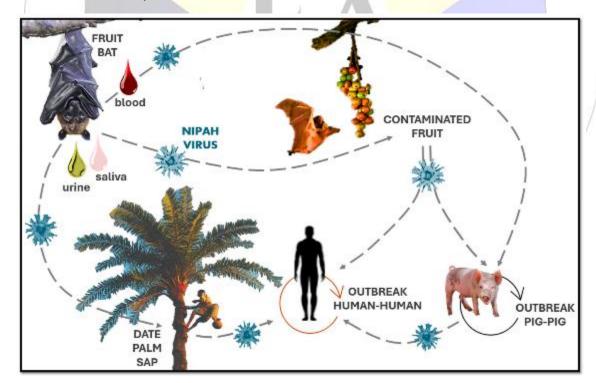
# ☐ Nipah Virus (NiV)

Source: NDTV

**Syllabus**: GS II – Health; GS III – Disease Surveillance

### Context:

Kerala launched a serological survey in high-risk zones to track recurring outbreaks of Nipah Virus—8 times in 8 years.



#### What is NiV?

• **Zoonotic virus**: Spreads from animals (mainly fruit bats) to humans.



• **Fatality Rate**: Ranges from **40%–75%** depending on healthcare response.

#### **Hosts and Transmission:**

- Natural Host: Fruit bats (*Pteropodidae* family, genus *Pteropus*)
- **Animal-Human**: Contaminated fruit, raw date palm sap, or livestock.
- Human-Human: Through bodily fluids, particularly in hospitals.

#### **Clinical Profile:**

- **Early**: Fever, headache, sore throat, vomiting.
- **Severe**: Encephalitis, seizures, altered consciousness.
- Long-term: 20% survivors may suffer neurological issues.
- Incubation: 4–14 days (can extend up to 45 days)

#### Diagnosis:

- RT-PCR: Detects viral RNA.
- ELISA: Detects antibodies.
- Virus Isolation: For advanced virology research.

### **Kerala's New Survey:**

- Uses pseudovirus neutralisation assays.
- Focus on both human and animal populations in Nipah hotspots.
- Aims to understand spillover dynamics and reservoir tracking.

# International Treaty on Plant Genetic Resources for Food and Agriculture

Source: The Hindu

Syllabus: GS II - International Agreements, GS III - Biodiversity

#### Context:

India objected to draft amendments to the Plant Treaty at a meeting in Peru, citing sovereignty concerns.





### **About the Treaty:**

- Adopted: 2001 by FAO; in force since 2004.
- India: A founding signatory.
- Linkage: Connected to Convention on Biological Diversity (CBD).

### **Key Provisions:**

 Multilateral System (MLS): Access to 64 key crops (Annex I) for research, breeding, and food security.

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- Standard Material Transfer Agreement (SMTA): For fair and equitable benefitsharing.
- Farmers' Rights (Article 9):
  - Save, exchange, sell seeds.
  - Recognize indigenous contributions.
  - Inclusion in policymaking.
- Global Information System (GIS): Shared data on plant genetics.

### India's Concern:

- Proposed amendments may **mandate sharing** of Indian germplasm under global terms, bypassing **domestic seed laws**.
- Could **erode traditional practices** and farmer autonomy over native varieties.



### nerview Penico: Newly Unearthed Ancient City in Peru

Source: BBC

Syllabus: GS I - World History & Culture

Context:

Archaeologists discovered Penico—an ancient urban trade hub from 1800–1500 BCE—in northern Peru.



### **Key Details:**

- **Location**: ~200 km north of Lima; Barranca province; 600m altitude.
- **Era**: Bronze Age equivalent; post-Caral Civilization.
- **Urban Features:** 
  - o Central circular plaza
  - 18 surrounding stone-mud structures
  - Temples and residential complexes
  - Decorative reliefs

### **Artifacts:**

• Ceremonial objects: Conch trumpets (pututus), clay figurines, necklaces.

### **Cultural Significance:**

**Post-Caral Transition**: Shows resilience post-climate-induced Caral decline.

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- Independent Urbanism: Developed without Old World influence.
- Trade Node: Linked Pacific, Andes, and Amazon economies.

# **17th BRICS Summit – Inclusion of Indonesia**

Source: LiveMint

**Syllabus**: GS II – International Groupings

### Context:

The 17th BRICS Summit was held in Brazil. Indonesia was welcomed as a full member, and the *Rio de Janeiro Declaration* was adopted.



#### **About BRICS:**

- Members: Brazil, Russia, India, China, South Africa
- New Members (2024–25): Egypt, Ethiopia, Iran, UAE, Indonesia
- **Objective**: Reform global governance; promote multipolarity.

### **Key Outcomes:**

- Governance Reform: Urged reforms in UNSC, IMF, WTO.
- **Security**: Condemned Pahalgam terror attack.
- Tech & AI:



- o Pushed for responsible AI.
- o Proposed BRICS Science Repository for Global South.
- Economic Cooperation:
  - Support for NDB reforms.
  - Strengthening critical mineral supply chains.
- Next Host: India to chair BRICS-18 in 2026.

# Seine River Reopened for Swimming – Paris Olympics Prep

Source: NDTV

**Syllabus**: GS I – Geography; Environment Mapping

#### Context:

France reopened the Seine for swimming after a 100-year ban, post-clean-up for Paris Olympics.



### **Key Facts:**

• **Length**: 780 km

• Origin: Mont Tasselot (Côte d'Or, Burgundy)

Mouth: English Channel (Le Havre)

### Flow Characteristics:



- Flows through Paris, Normandy
- Low gradient: only 80 feet above sea level in Paris
- Connects to Rhine, Loire, Saône-Rhône, Belgian canals

### **Economic Significance:**

- Major navigation and trade route
- Links Paris to Rouen and Le Havre ports

### **Ecological Restoration:**

- Extensive dredging, waste removal, water treatment.
- Aim: promote eco-tourism and public engagement with rivers.

