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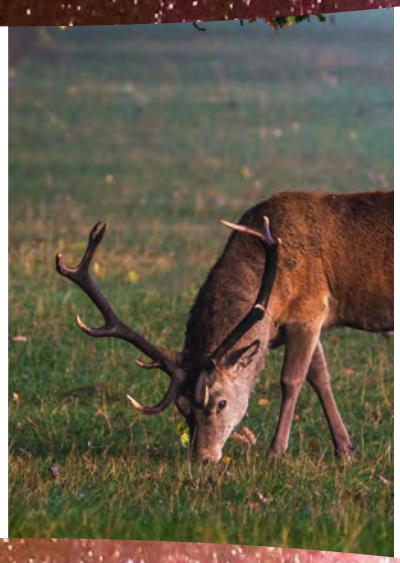


Down to *Earth*

SUMMARY FOR UPSC — MAGAZINE

1-15TH MAY 2026

Welcome to PadhAI–

Down to Earth Magazine Coverage

You're here because you understand a core truth of UPSC preparation—success doesn't come from reading everything, but from reading what actually matters.

Down to Earth is one of the most valuable sources for environment, ecology, and sustainable development. However, reading it cover to cover can be time-consuming and often difficult to align directly with exam demands. PadhAI's Down to Earth coverage is designed to simplify that process—by filtering, structuring, and converting important content into exam-ready insights.

Why PadhAI's Down to Earth Coverage

Many aspirants struggle with Down to Earth because of:

- Detailed and lengthy articles
- Indirect linkage with Prelims and Mains
- Difficulty in extracting core concepts and usable points

At PadhAI, we focus only on what is relevant. We identify key themes, connect them with syllabus requirements, and align them with PYQs to ensure conceptual clarity and answer-writing utility.

Every topic included:

- Has clear relevance to GS (especially GS-3: Environment) or Essay
- Is linked directly or indirectly with previous year questions
- Enhances your understanding of environmental issues, policies, and analysis

Nothing is included for the sake of volume. Everything is included for value.

Part of the PadhAI Preparation Ecosystem

This Down to Earth coverage is integrated with a broader system that includes:

- **Fast and concise magazines (published early)**
- **Daily PIB summaries (filtered and exam-focused)**
- **Monthly compliance coverage**
- **Complete Prelims & Mains PYQs with structured answers**
- **News summaries from relevant sources**
- **Personal tutor chat support for continuous guidance**

The goal is simple:
One reliable system instead of multiple scattered sources.

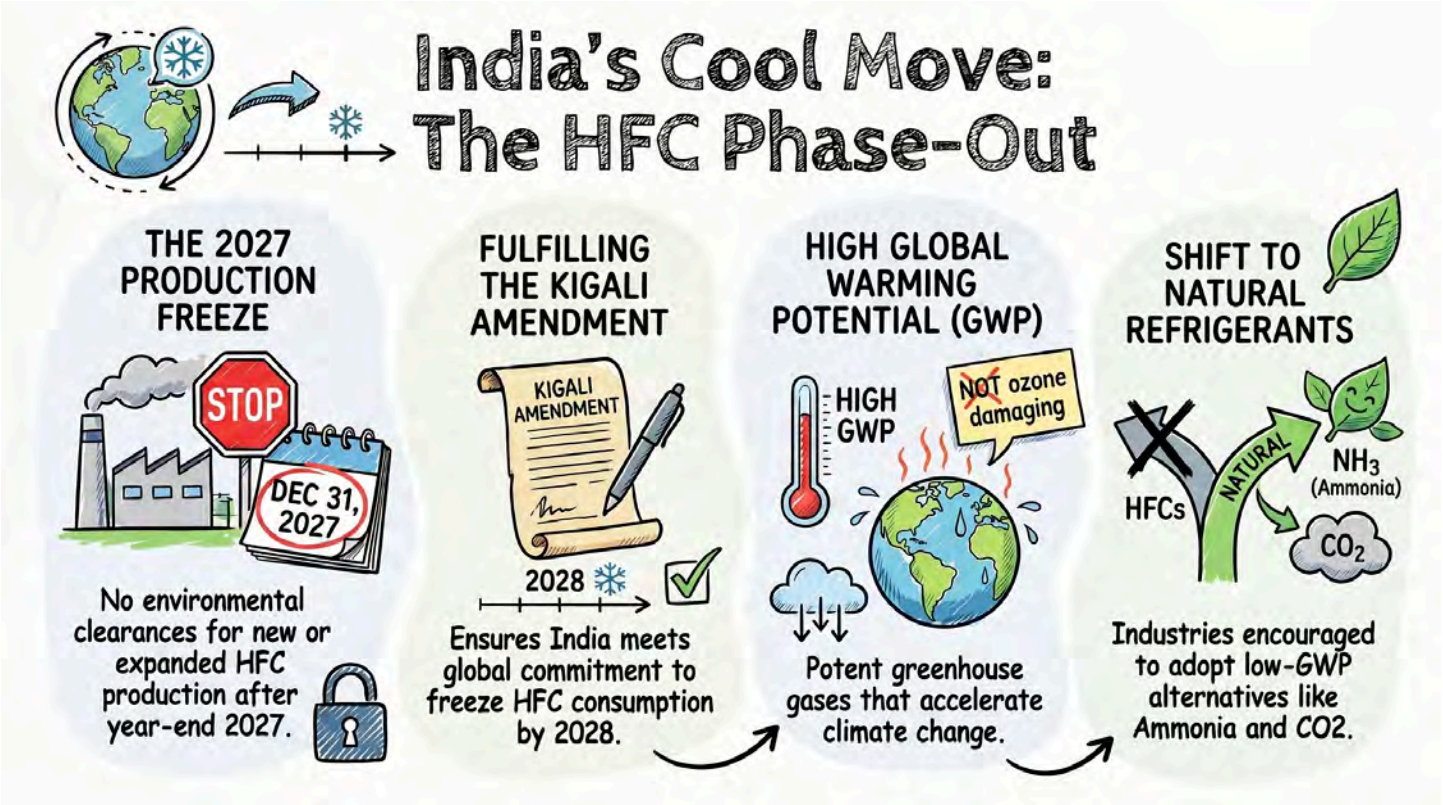
Our Guiding Philosophy

At PadhAI, everything is built on three principles:

- **Learn only what matters**
- **Learn it the right way**
- **Learn it at the right time**

That's how preparation becomes focused, efficient, and effective.

Topic 1: Hydrofluorocarbons (HFCs) & India's Commitment



Summary: The Ministry of Environment, Forest and Climate Change (MoEFCC) has directed that no new or expanded environmental clearances for **Hydrofluorocarbon (HFC)** production will be granted after December 31, 2027. This move is a critical step in fulfilling India's obligations under the **Kigali Amendment** to freeze HFC consumption by 2028.

Background: HFCs are man-made greenhouse gases used in refrigeration and air-conditioning. While they do not directly damage the ozone layer, they have high **Global Warming Potential (GWP)**. The 2016 Kigali Amendment to the Montreal Protocol mandates a global phase-down of these substances to combat climate change.

Key Points:

- **International Alignment:** The directive ensures India remains compliant with its 2021 ratification of the Kigali Amendment and global climate goals.
- **Industrial Shift:** By providing a clear deadline, the policy encourages industries to invest in **green cooling technologies** and low-GWP alternatives.

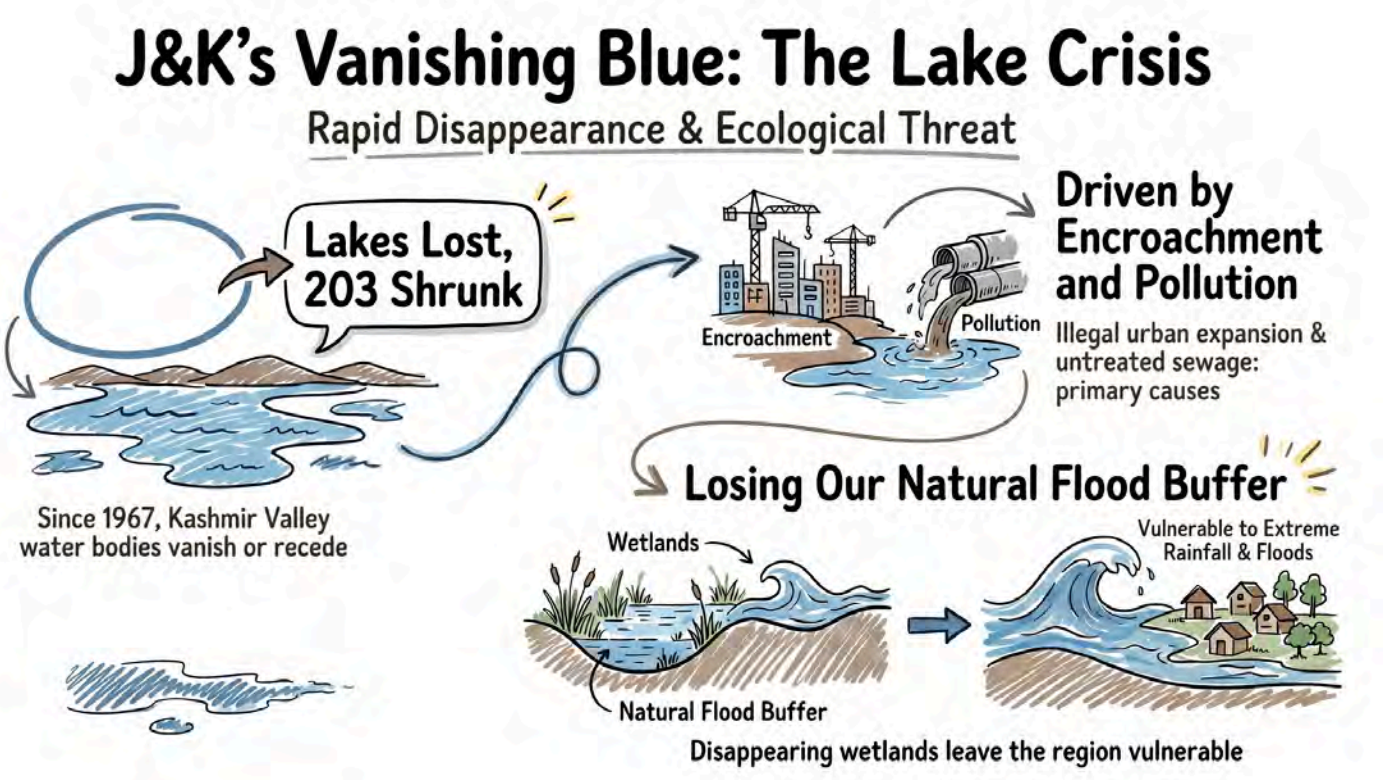
- **Transition Challenges:** MSMEs may face hurdles regarding technology access and the high costs of replacing existing systems with natural refrigerants like **Ammonia or CO2**.

Prelims Facts (One Liners):

- India ratified the **Kigali Amendment** in 2021 and must freeze HFC consumption starting January 1, 2028.
- **Natural refrigerants** such as ammonia and hydrocarbons are primary alternatives to HFCs.

MCQ Practice: Q. Which international agreement specifically mandates the phase-down of Hydrofluorocarbons (HFCs)? A) Kyoto Protocol B) Paris Agreement C) Kigali Amendment D) Nagoya Protocol **Answer: C** ()

Topic 2: Disappearing Lakes of Jammu & Kashmir



Summary: A recent report by the **Comptroller and Auditor General (CAG)** revealed that nearly 315 lakes in Jammu & Kashmir have disappeared since 1967, and 203 others have significantly

shrunk. This degradation poses a severe threat to regional biodiversity, water security, and disaster resilience.

Background: Lakes in J&K are vital for groundwater recharge, tourism, and **disaster mitigation**, acting as buffers during flood events like those seen in 2014. However, weak governance and poor implementation of conservation schemes have led to their decline.

Key Points:

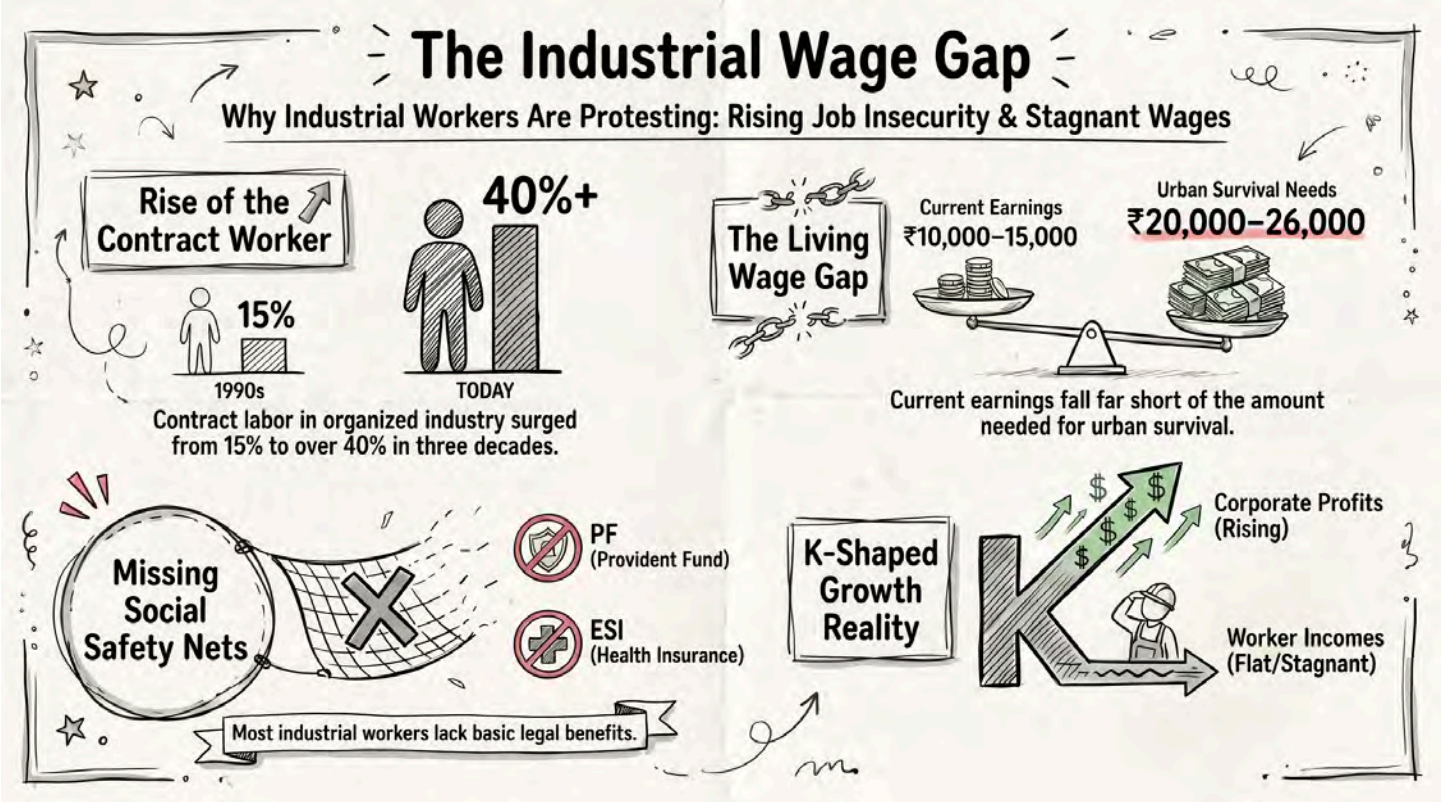
- **Anthropogenic Pressures:** Illegal encroachment for urban expansion and the conversion of wetlands into agricultural or residential land are primary drivers of loss.
- **Pollution Crisis:** Untreated sewage and agricultural runoff have caused widespread **eutrophication**, deteriorating water quality and killing aquatic life.
- **Ecological Resilience:** The loss of these wetlands reduces the region's ability to cope with **climate variability** and extreme rainfall events.

Prelims Facts (One Liners):

- The **National Plan for Conservation of Aquatic Ecosystems (NPCA)** is the primary central scheme for lake restoration.
- The **Lake Conservation and Management Authority (LCMA)** is the local body responsible for Dal Lake restoration.

MCQ Practice: Q. According to the CAG report, how many lakes have disappeared in Jammu & Kashmir since 1967? A) 105 B) 203 C) 315 D) 697 **Answer: C** ()

Topic 3: Labour Unrest in Industrial Belts



Summary: Recent labour unrest in the **Gurugram-Noida industrial belt** has exposed deep structural issues, including wage stagnation and the rapid informalization of the workforce. Workers are increasingly protesting against the lack of social security and deteriorating working conditions in formal sectors.

Background: Since 2016, a series of shocks—including demonetisation, GST implementation, and COVID-19—have disrupted MSMEs and slowed GDP growth. This has led to **K-shaped growth**, where corporate profits rise while worker incomes remain flat.

Key Points:

- **Informalization Trend:** The share of **contract workers** in the organised industry has jumped from 15% to over 40% in three decades.
- **Wage Gap:** While workers demand minimum wages between **₹20,000–26,000**, current earnings of ₹10,000–15,000 are often insufficient for urban survival.

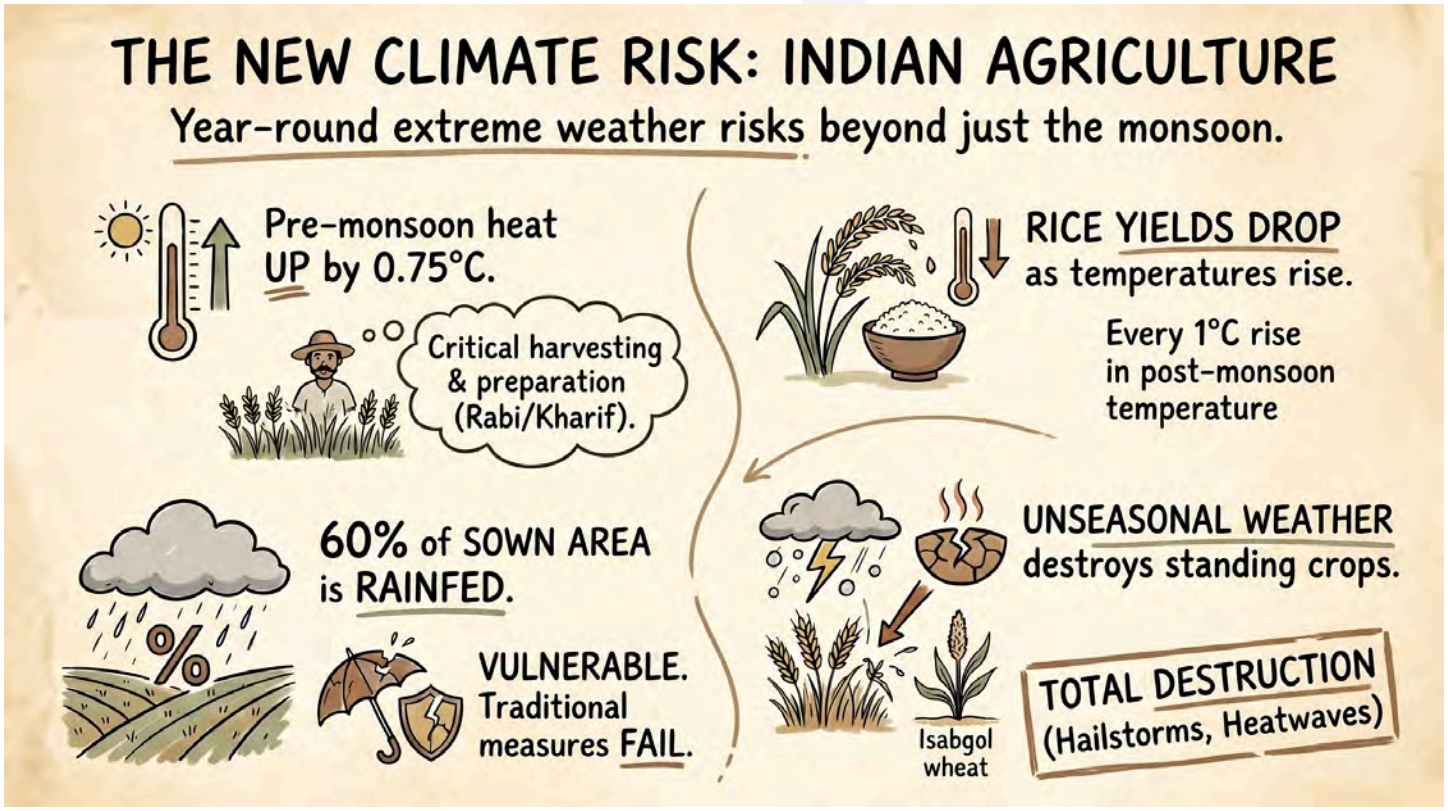
- **Social Security Deficit:** Many workers lack basic benefits such as **Provident Fund (PF)** and Employees' State Insurance (ESI), despite legal requirements.

Prelims Facts (One Liners):

- The **Annual Survey of Industries** indicates that contract labour now exceeds 40% of the organised workforce.
- India's investment-to-GDP ratio declined from a peak of 38% (2004-14) to around 32% more recently.

MCQ Practice: Q. What is the primary characteristic of "K-shaped growth" mentioned in the context of labour unrest? A) Uniform growth across all sectors B) Corporate profits rising while worker wages stagnate C) Rapid growth in agriculture D) Decline in all economic activity **Answer: B** ()

Topic 4: Climate Change and Indian Agriculture



Summary: Indian agriculture is facing a new paradigm of **year-round risk**, with extreme weather events now frequently hitting during pre- and post-monsoon months. These shifts, including unseasonal hailstorms and heatwaves, are undermining traditional agricultural wisdom and farmer livelihoods.

Background: While the southwest monsoon was traditionally the main risk factor, pre-monsoon temperatures have now risen by over **0.75°C** across India. This period is critical for harvesting rabi crops and preparing for the kharif season.

Key Points:

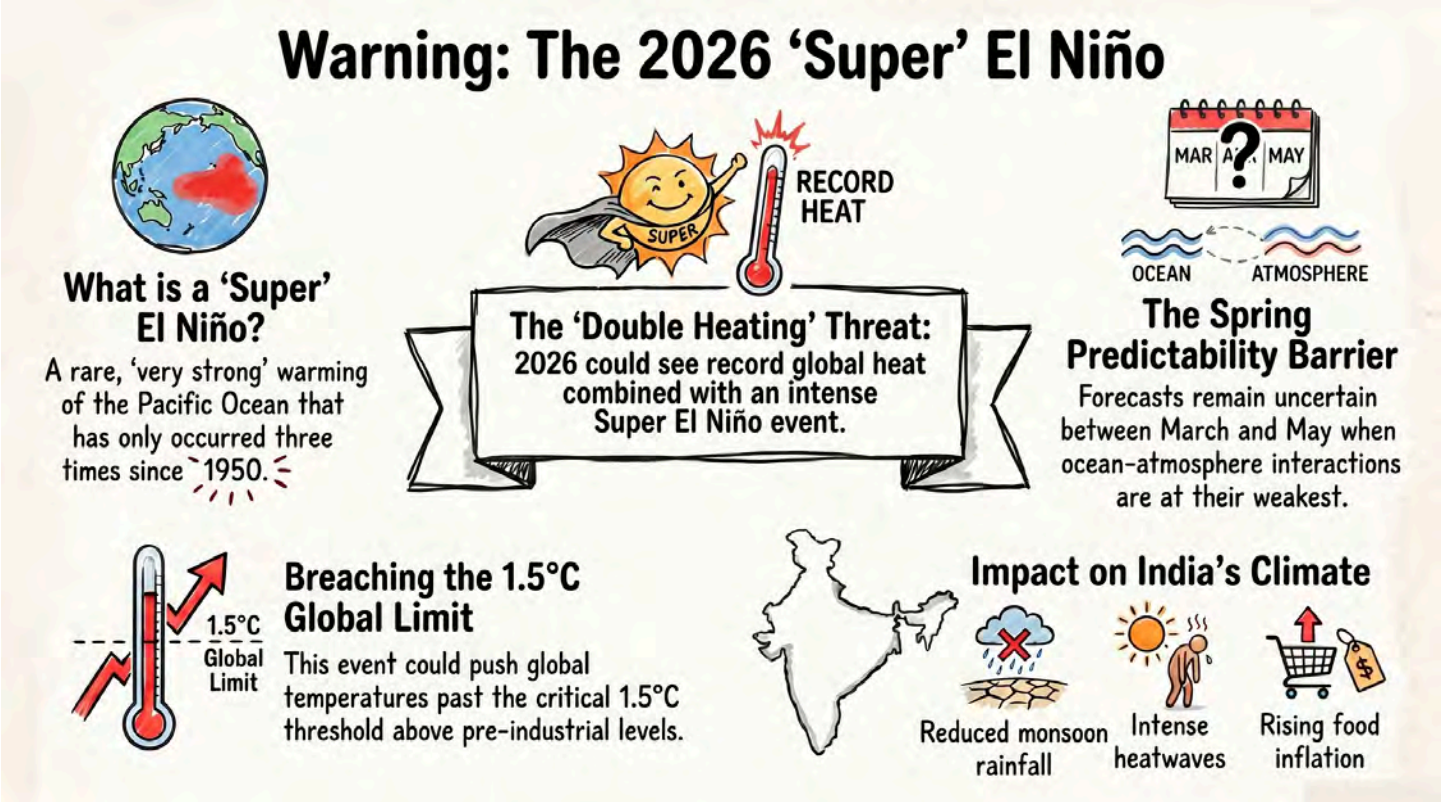
- **Heat Stress Impacts:** Every **1°C rise** in post-monsoon temperatures is linked to a **9.1% reduction in rice yields**.
- **Pre-Monsoon Instability:** Unseasonal rain and hailstorms in states like Rajasthan and Maharashtra have caused complete destruction of crops like wheat and **isabgol** near harvest.
- **Systemic Vulnerability:** Rainfed regions, comprising **60% of India's sown area**, are most at risk, as adaptation measures like shifting to low-water crops are failing against extreme events.

Prelims Facts (One Liners):

- The **NICRA** (National Innovations in Climate Resilient Agriculture) initiative is led by ICAR to develop resilient crop varieties.
- **60%** of India's net sown area is currently rainfed.

MCQ Practice: Q. By what percentage does rice yield typically decline for every 1°C rise in post-monsoon temperatures? A) 2% B) 5.5% C) 9.1% D) 22% **Answer: C** ()

Topic 5: Forecasting of a 'Super' El Niño



Summary: Climate agencies are warning of a possible **'Super' El Niño** in late 2026, which could coincide with already record-high global temperatures. This "double heating effect" poses a severe threat to global weather patterns and India's monsoon stability.

Background: El Niño is the warm phase of the **ENSO** cycle in the equatorial Pacific, characterized by weakened trade winds and high sea-surface temperatures. Since 1950, only three "very strong" events have occurred.

Key Points:

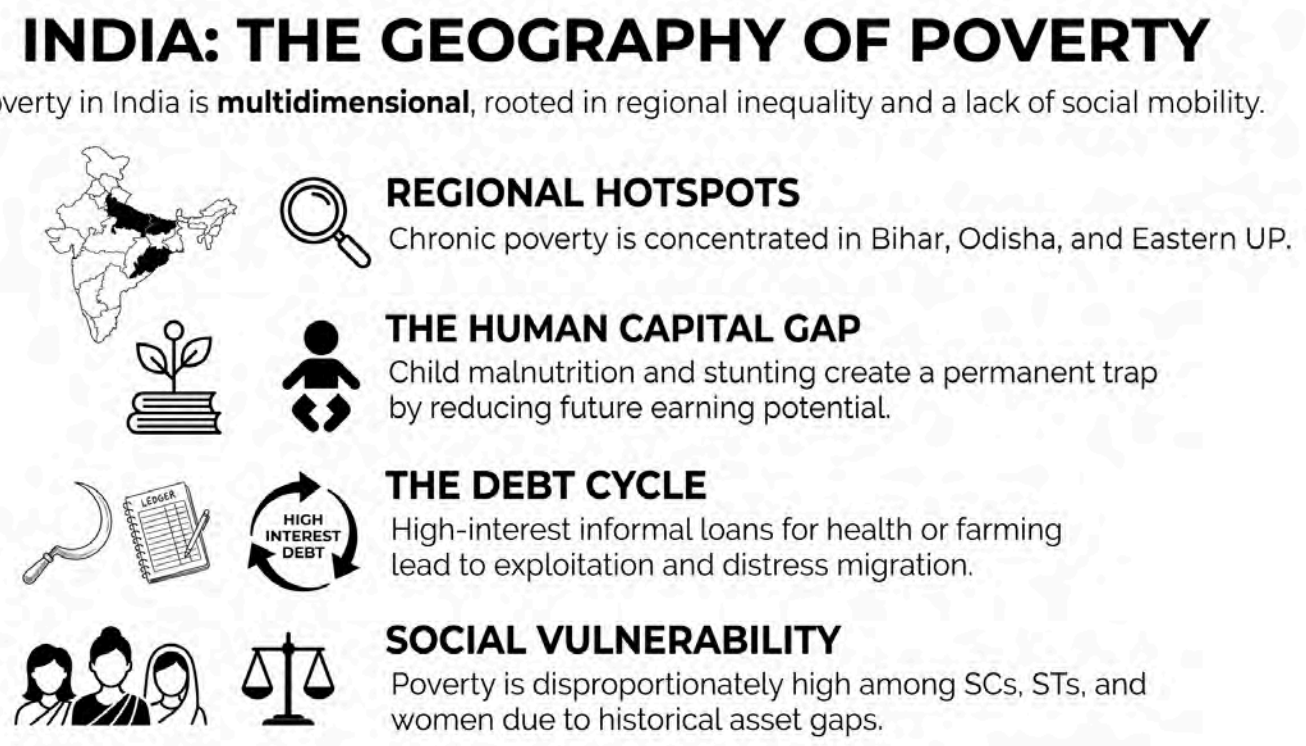
- **Predictability Barrier:** Forecasting remains uncertain during the March–May period (the **Spring Predictability Barrier**) when ocean-atmosphere interactions are weak.
- **Global Consequences:** A super event could push global temperatures past **1.5°C above pre-industrial levels** and trigger long-term climate-regime shifts.
- **Indian Impact:** El Niño is strongly associated with **reduced monsoon rainfall**, intense heatwaves, and increased food inflation due to agricultural stress.

Prelims Facts (One Liners):

- The **Oceanic Niño Index (ONI)** is the primary metric used to classify El Niño events.
- The last three 'Super' El Niño events occurred in **1982–83, 1997–98, and 2015–16**.

MCQ Practice: Q. What is the "Spring Predictability Barrier" in ENSO forecasting? A) A physical wall in the ocean B) A period (March-May) where climate models struggle with accuracy C) A government policy D) A specific type of trade wind **Answer: B** ()

Topic 6: India's Geography of Poverty



Summary: Despite rapid economic growth, structural and **geographical poverty** persists in regions like Bihar, Odisha, and Eastern UP. This chronic poverty is driven by a lack of social mobility, landlessness, and high vulnerability to environmental shocks.

Background: India has shifted focus toward **multidimensional poverty**, recognizing that meeting basic needs involves more than just income, including health, sanitation, and electricity.

Key Points:

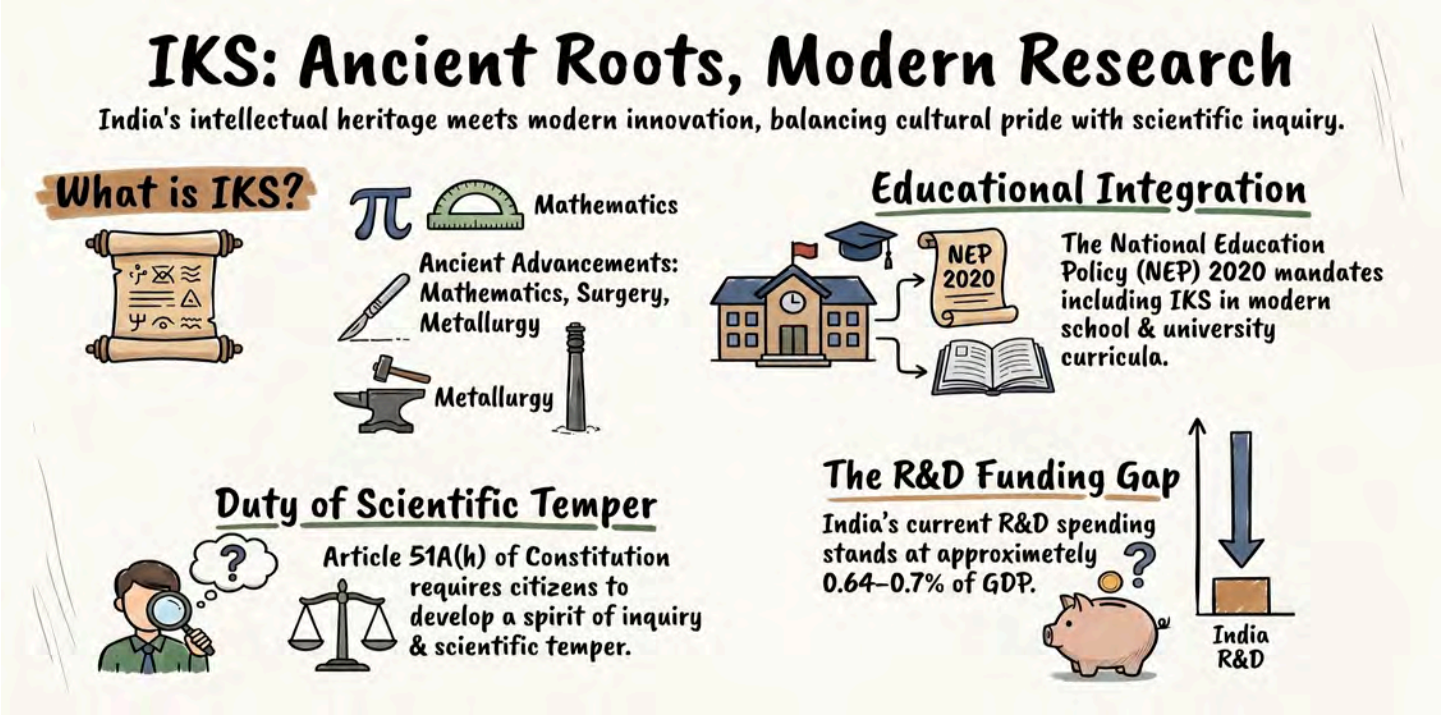
- **Human Capital Gaps:** Poor nutrition in childhood leads to **stunting and wasting**, which reduces future earning potential and continues the cycle.
- **Debt Traps:** High-interest informal loans for healthcare or agriculture often trap families, leading to **distress migration** and exploitation.
- **Social Dimensions:** Poverty is disproportionately high among **Scheduled Castes (SCs), Scheduled Tribes (STs)**, and women due to historical discrimination and limited asset ownership.

Prelims Facts (One Liners):

- **MGNREGA and NFSA** are India's primary legislative tools for rural employment and food security.
- The **Aspirational Districts Programme** focuses on improving governance in India's most backward regions.

MCQ Practice: Q. Which of the following is considered a core indicator of "multidimensional poverty" in India? A) Luxury car ownership B) School attendance C) International travel D) Stock market investment **Answer: B** ()

Topic 7: Indian Knowledge Systems (IKS) and Research



Summary: The integration of **Indian Knowledge Systems (IKS)** into premier scientific institutions has sparked a debate over balancing cultural heritage with scientific rigor. While IKS offers insights into sustainable practices, concerns remain regarding the potential for pseudoscience to gain legitimacy.

Background: IKS encompasses traditional Indian wisdom in fields like mathematics (Aryabhata), surgery (Sushruta), and metallurgy. The **NEP 2020** encourages its inclusion in modern curricula.

Key Points:

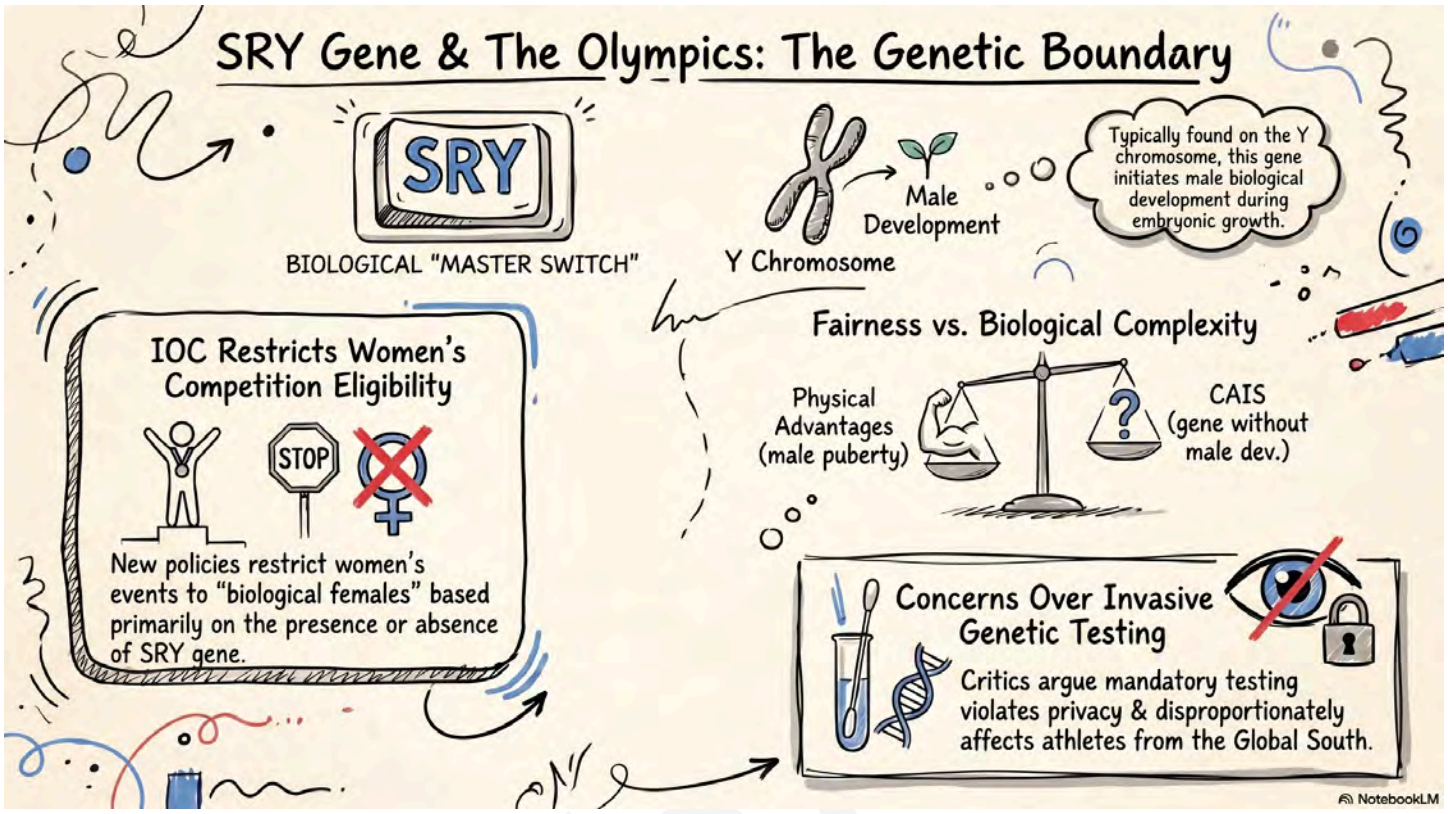
- **Historical Contributions:** Ancient India developed the **decimal system**, concepts of zero, and early surgical techniques centuries before their global adoption.
- **Scientific Temper:** Critics argue that funding IKS projects that lack empirical methodology may undermine the **constitutional duty** to develop a scientific temper.
- **Resource Allocation:** India's R&D spending remains low at **0.64–0.7% of GDP**, prompting calls to prioritize frontier technologies like AI and semiconductors.

Prelims Facts (One Liners):

- **Article 51A(h)** of the Constitution mandates the development of scientific temper and the spirit of inquiry.
- **Sushruta** is traditionally known as the father of Indian surgery.

MCQ Practice: Q. Which Indian Constitutional provision mandates the development of "scientific temper"? A) Article 21 B) Article 44 C) Article 51A(h) D) Article 370 **Answer: C** ()

Topic 8: SRY Gene Policy and the IOC



Summary: The **International Olympic Committee (IOC)** has updated its policy to restrict women's events to "biological females," primarily based on the presence of the **SRY gene**. This decision seeks to ensure fairness but has faced criticism for ignoring biological complexity and human rights.

Background: The SRY gene, active from the sixth week of embryonic development, initiates the formation of testes and testosterone production. It is often used as a biological marker for male development.

Key Points:

- **Fairness Argument:** Proponents argue that male puberty provides lasting physical advantages in **muscle mass and bone density**.
- **DSD Conditions:** Critics point out that individuals with **Disorders of Sex Development (DSD)** may have the SRY gene but develop as females, such as in Complete Androgen Insensitivity Syndrome (CAIS).

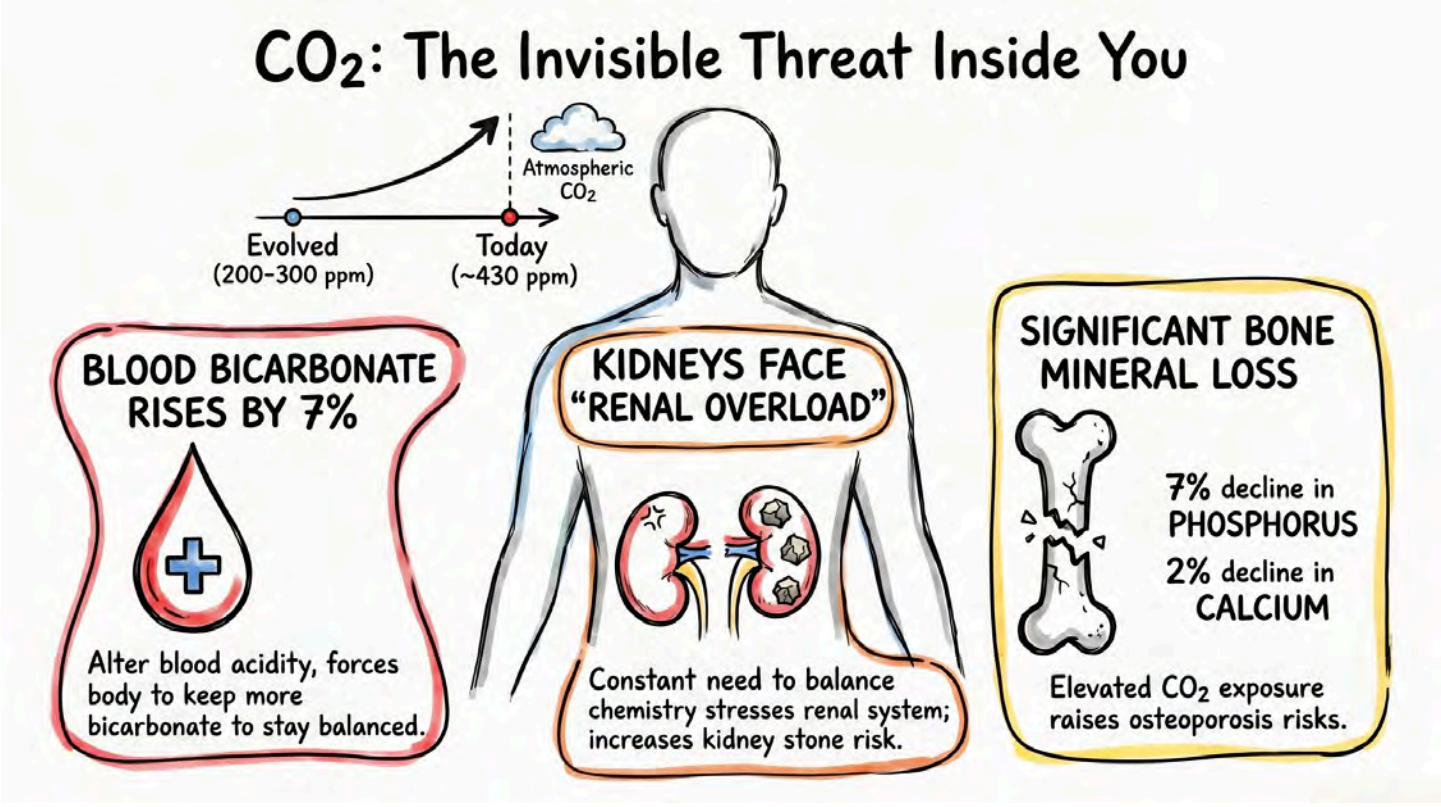
- **Human Rights Concerns:** Mandatory genetic testing is seen by some as an invasive violation of privacy that disproportionately affects women from the **Global South**.

Prelims Facts (One Liners):

- The **SRY gene** is typically located on the Y chromosome and initiates male biological development.
- **CAIS** stands for Complete Androgen Insensitivity Syndrome.

MCQ Practice: Q. The SRY gene is generally responsible for which biological process? A) Determining eye colour B) Initiating male sex development C) Regulating blood sugar D) Enhancing lung capacity **Answer: B** ()

Topic 9: Rising Atmospheric CO2 and Human Health



Summary: A study reveals that current atmospheric CO2 levels (~430 ppm) are high enough to alter **human blood chemistry**. This chronic exposure leads to higher bicarbonate levels, which can stress the renal system and cause **bone mineral loss**.

Background: Humans evolved in an atmosphere with 200–300 ppm of CO2. Current levels are primarily driven by fossil fuel combustion and industrial activity.

Key Points:

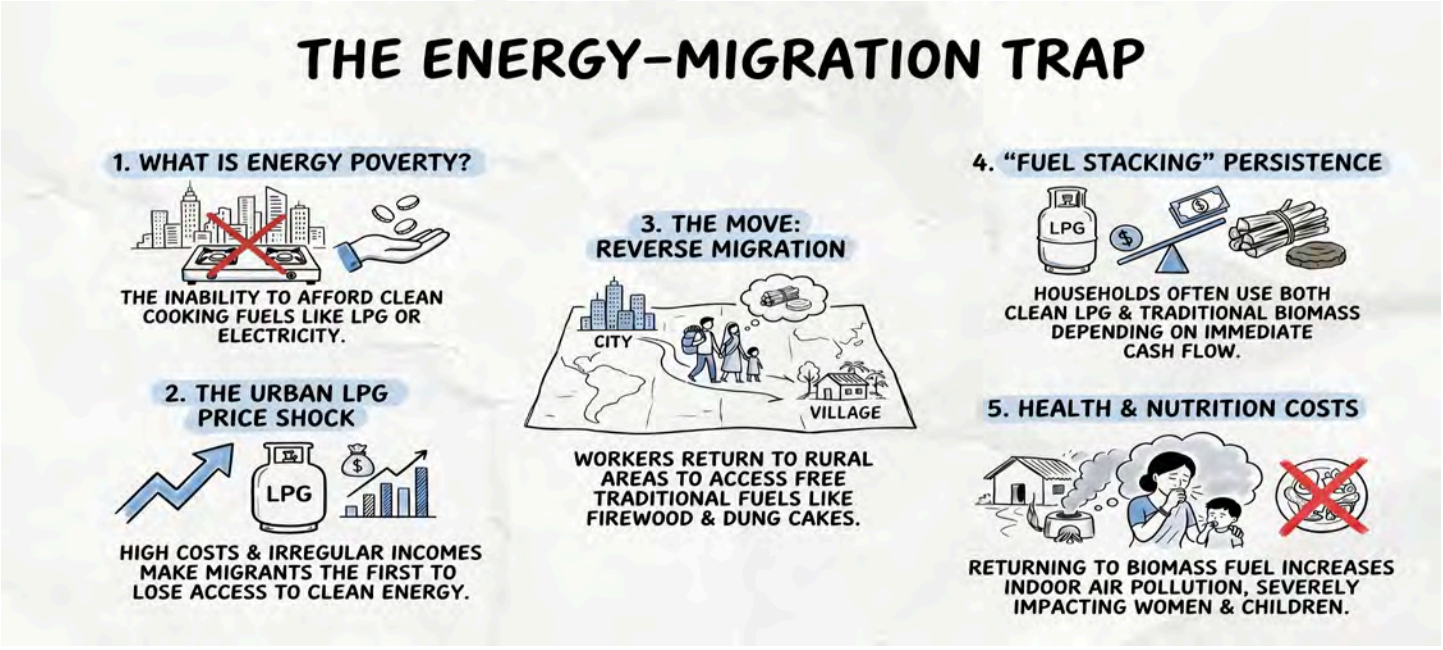
- **Renal Overload:** To balance rising blood acidity, kidneys must retain more bicarbonate, potentially leading to **chronic kidney stones**.
- **Musculoskeletal Impact:** Elevated CO2 is linked to a **2% decline in calcium** and a 7% decline in phosphorus, increasing the risk of osteoporosis.
- **Genetic Priming:** There is an emerging hypothesis that persistent acidic stress could lead to "pre-stressed" offspring with higher susceptibility to autoimmune diseases.

Prelims Facts (One Liners):

- Atmospheric CO2 levels have recently reached approximately **430 ppm**.
- **Respiratory acidosis** is a short-term effect of high CO2 exposure.

MCQ Practice: Q. What electrolyte shift was observed in the blood as a result of rising atmospheric CO2? A) Increase in Calcium B) 7% decline in Phosphorus C) Decline in Sodium D) Rise in Glucose
Answer: B ()

Topic 10: Energy Poverty and Reverse Migration



Summary: Rising LPG prices, exacerbated by global geopolitical tensions, are pushing urban migrant workers into **energy poverty**. This economic distress is a major driver of **reverse migration**, as workers return to villages where they can access traditional fuels for free.

Background: Energy poverty is the inability to afford clean cooking fuels or electricity. Despite the **Ujjwala Yojana**, many households stack fuels, using traditional biomass alongside LPG due to refill costs.

Key Points:

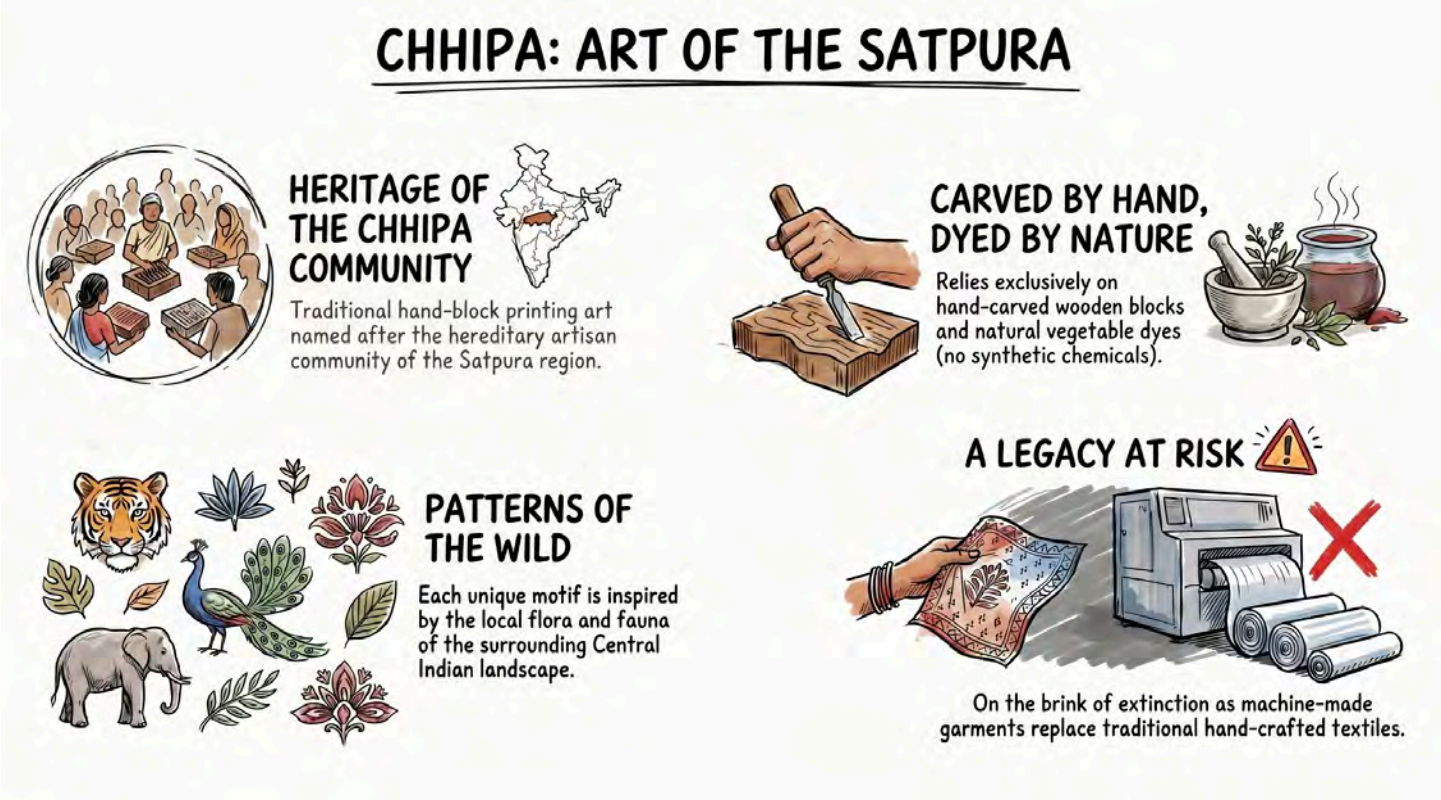
- **Urban Vulnerability:** Migrants in cities face high living costs and irregular incomes, making them the first to be affected by **fuel price shocks**.
- **Health and Nutrition:** Dependence on traditional biomass leads to **indoor air pollution**, disproportionately affecting the health of women and children.
- **Policy Solutions:** Ensuring the **portability of welfare benefits** through schemes like One Nation One Ration Card (ONORC) is critical for supporting mobile workforces.

Prelims Facts (One Liners):

- **PMUY 2.0** specifically targets migrant workers with simplified documentation for LPG connections.
- India's urban population is projected to reach **630 million by 2030**.

MCQ Practice: Q. What does "fuel stacking" refer to in the context of energy poverty? A) Using only renewable energy B) Storing firewood for winter C) Using both clean LPG and traditional biomass depending on cash flow D) Exporting fuel to other countries **Answer: C** ()

Topic 11: Chhipa Blockprint Art



Summary: Chhipa printing, a traditional textile art from the Satpura region, is on the brink of extinction due to the rise of machine-made garments. This craft relies on natural dyes and hand-carved blocks to create unique cultural motifs.

Background: Historically practiced in regions like **Madhya Pradesh and Maharashtra**, the art form has struggled to compete with mass-produced textiles over the last five decades.

Key Points:

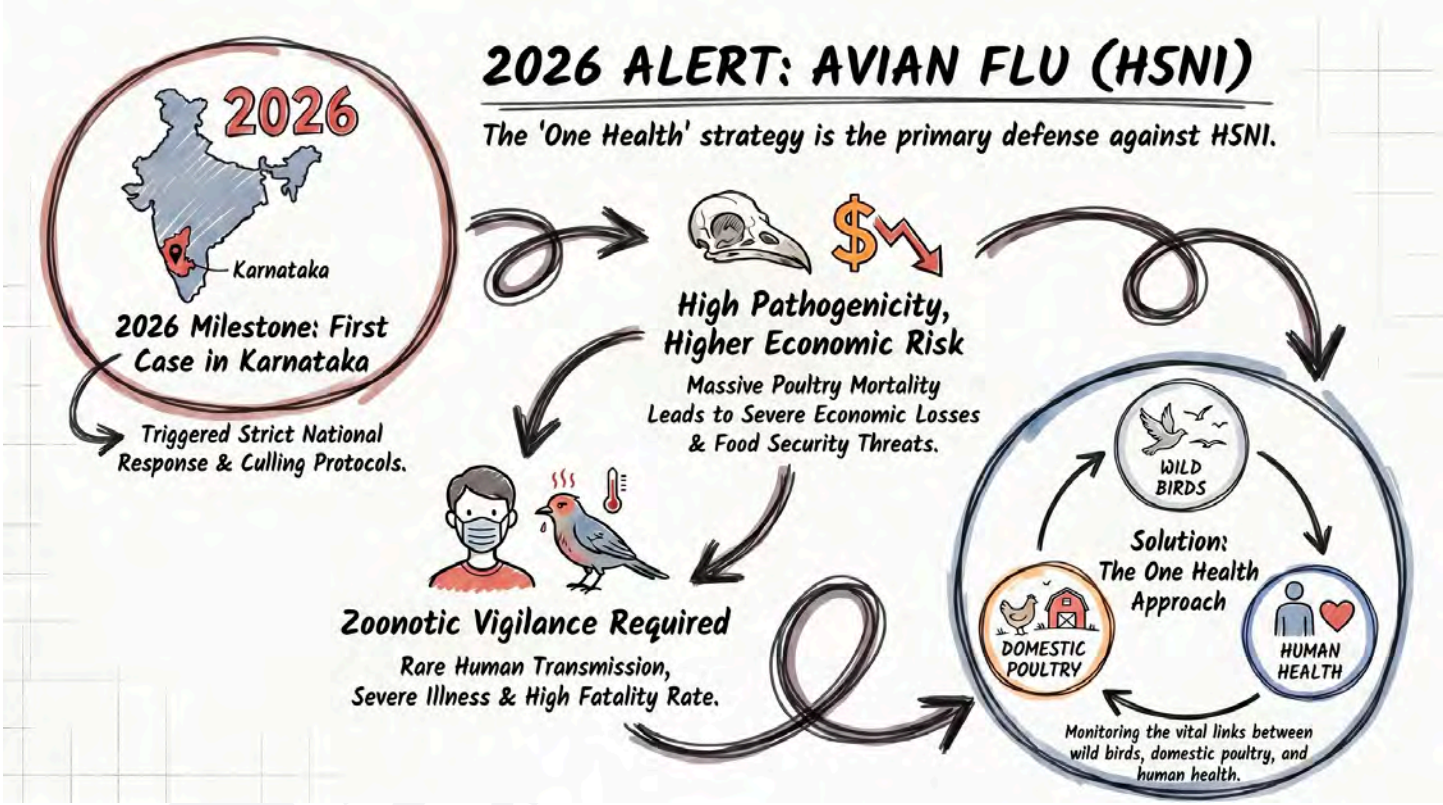
- **Natural Techniques:** The craft uses **natural dyeing** methods and intricate motifs inspired by local flora and fauna.
- **Cultural Identity:** The term 'Chhipa' is derived from the community name, and the art is deeply linked to their hereditary identity.
- **Decline:** The Satpura region has seen a sharp drop in practicing artisans as younger generations move toward more stable occupations.

Prelims Facts (One Liners):

- Chhipa art is a traditional form of **hand block printing** from Central India.
- The craft utilizes **natural dyes** rather than synthetic chemicals.

MCQ Practice: Q. The Chhipa blockprint art is traditionally associated with which geographic region of India? A) Kashmir Valley B) Satpura/Central India C) Coromandel Coast D) Rann of Kutch **Answer: B** ()

Topic 12: Avian Influenza (H5N1) in 2026



Summary: Karnataka confirmed India's first case of **H5N1 avian influenza** for 2026, triggering strict response protocols to protect the poultry industry. While human transmission is rare, the **zoonotic potential** of the virus necessitates constant vigilance.

Background: H5N1 is a highly pathogenic strain that can cause large-scale mortality in poultry, threatening rural livelihoods and food security.

Key Points:

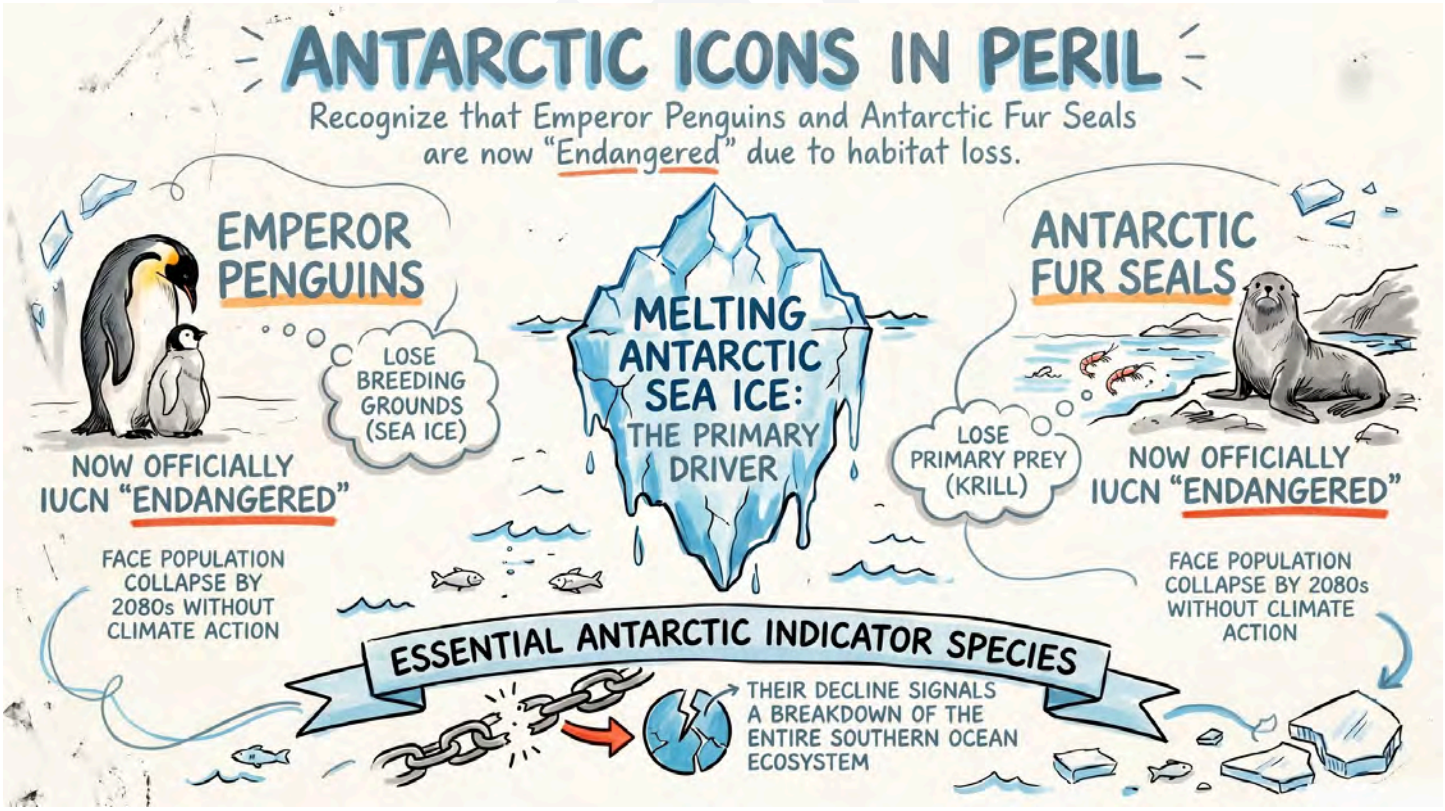
- **Economic Impact:** Outbreaks often lead to massive economic losses due to **culling operations** and trade restrictions.
- **Surveillance:** The **One Health Approach** is used to monitor the interface between wild birds, domestic poultry, and humans to prevent potential pandemics.
- **Public Health:** Infection in humans, though rare, can cause severe respiratory illness and has a **high fatality rate**.

Prelims Facts (One Liners):

- **H5N1** is a Highly Pathogenic Avian Influenza (HPAI) strain.
- The **Department of Animal Husbandry** leads the National Action Plan for Avian Influenza.

MCQ Practice: Q. What is the primary focus of the "One Health Approach" in managing diseases like H5N1? A) Only human medicine B) Only animal vaccines C) The interconnectedness of human, animal, and environmental health D) Only wild bird conservation **Answer: C** ()

Topic 13: Emperor Penguins and Antarctic Fur Seals



Summary: The IUCN has reclassified **Emperor Penguins** and **Antarctic Fur Seals** as 'Endangered' due to the rapid loss of Antarctic sea ice. Scientists warn that without significant climate action, these populations could face major collapses by the 2080s.

Background: Emperor penguins are the largest penguin species and rely on stable sea ice for breeding during the harsh Antarctic winter. Antarctic fur seals are important predators in the Southern Ocean food web.

Key Points:

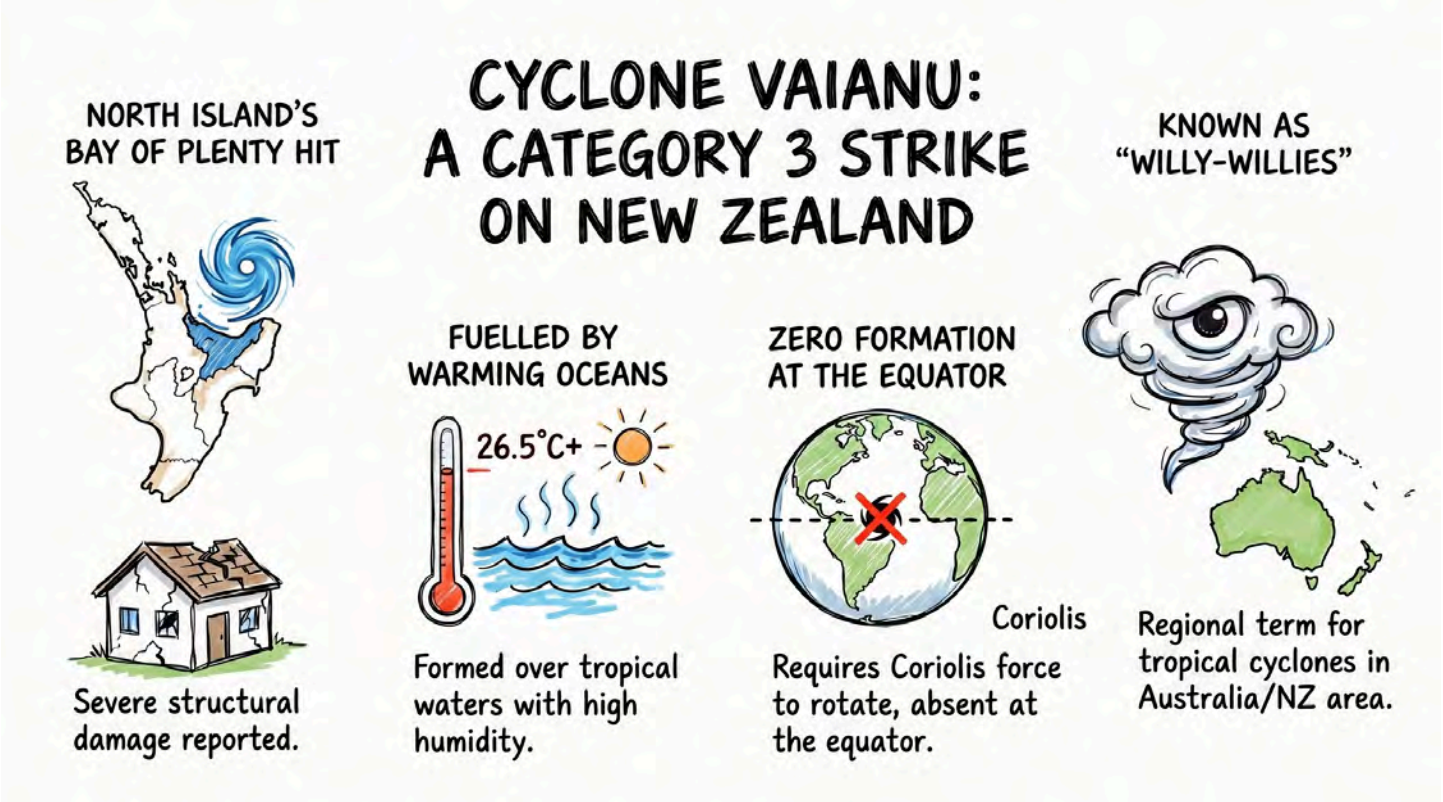
- **Polar Adaptations:** Penguins conserve heat through **"huddling" behaviour** and a thick layer of blubber, but these cannot protect them from habitat loss.
- **Indicator Species:** Their decline serves as a critical indicator of the health of the **Antarctic marine ecosystem**.
- **Food Web Impact:** Fur seals, which feed mainly on **krill and squid**, are facing food shortages as warming oceans disrupt primary productivity.

Prelims Facts (One Liners):

- The scientific name for the Emperor Penguin is ***Aptenodytes forsteri***.
- Unlike "true" seals, Antarctic Fur Seals have **external ear flaps**.

MCQ Practice: Q. What is the current IUCN Red List status of Emperor Penguins as of May 2026? A) Least Concern B) Vulnerable C) Endangered D) Extinct **Answer: C** ()

Topic 14: Cyclone Vaianu hits New Zealand



Summary: New Zealand's North Island was struck by **Category 3 Cyclone Vaianu**, causing severe structural damage in the Bay of Plenty region. The event underscores the increasing intensity of tropical cyclones due to warming ocean temperatures.

Background: Cyclones are low-pressure systems that form over warm tropical waters exceeding **26.5°C**. They require the **Coriolis force** for rotation, which is why they do not form near the equator.

Key Points:

- **Formation Conditions:** High humidity and **low vertical wind shear** are essential to keep the cyclone's structure intact.
- **Classification Scales:** While the Atlantic uses the **Saffir–Simpson scale**, India uses the **IMD classification**, ranging from 'Depression' to 'Super Cyclonic Storm'.
- **Vulnerability:** India's **East Coast** is historically more prone to cyclones due to the unique characteristics of the Bay of Bengal.

Prelims Facts (One Liners):

- **Coriolis force** is a mandatory prerequisite for the rotation of cyclonic winds.
- Tropical cyclones are known as **"Willy-Willies"** in the Australia region.

MCQ Practice: Q. Why do cyclones NOT form at the Equator? A) Waters are too cold B) Lack of humidity C) Absence of the Coriolis force D) Too much vertical wind shear **Answer: C** ()