



PadhAI



Down to *Earth*

SUMMARY FOR UPSC

MAGAZINE

16-31TH JULY 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:

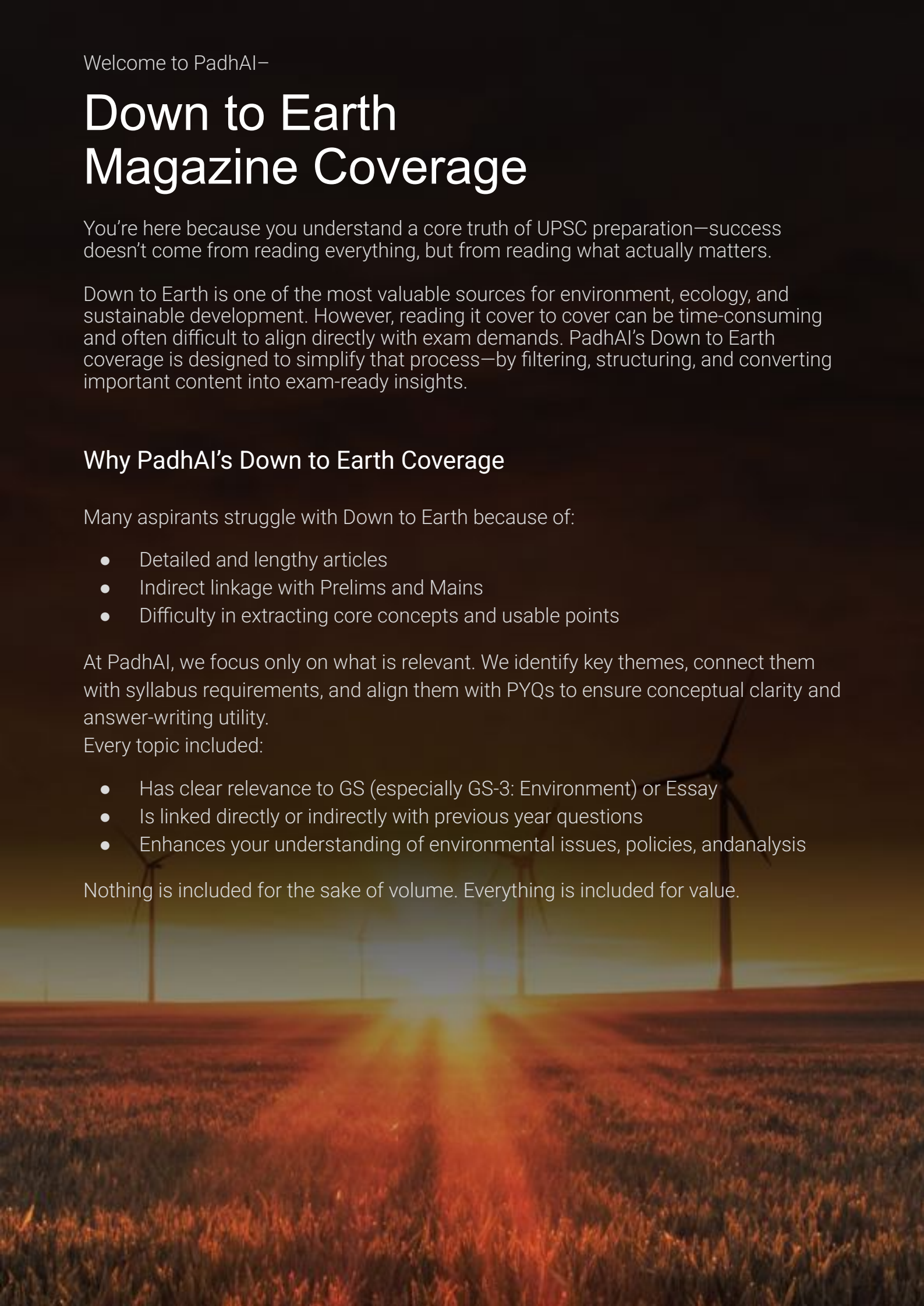
- Detailed and lengthy articles
- Indirect linkage with Prelims and Mains
- Difficulty in extracting core concepts and usable points

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

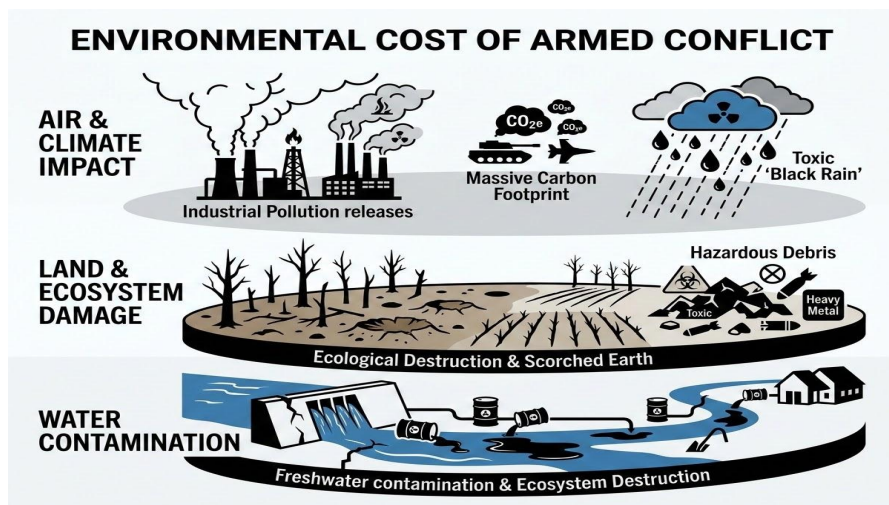
At PadhAI, everything is built on three principles:

- 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: Environment in Armed Conflicts: Silent Victim of War



Summary: Recent reports from the UNEP and WHO highlight the severe ecological destruction caused by modern conflicts like the Russia–Ukraine and Israel–Gaza wars. These conflicts lead to long-term environmental degradation, affecting air, water, and soil, while often escaping international climate accountability.

Background: Historically, military operations have been shielded from environmental scrutiny, with emissions largely excluded from major treaties like the Kyoto Protocol and Paris Agreement. Existing frameworks like the 1976 ENMOD Convention prohibit the deliberate manipulation of the environment as a weapon, yet enforcement remains weak.

Key Points:

- **Multi-Dimensional Pollution:** Bombings of petrochemical plants and oil depots release toxic gases, leading to "black rain" and acid rain, while the destruction of dams, such as the Kakhovka Dam in Ukraine, contaminates freshwater ecosystems.
- **Massive Carbon Footprint:** Militaries account for approximately 5.5% of global greenhouse gas emissions; for instance, the first three years of the Russia–Ukraine war generated 230 million tonnes of CO₂ equivalent.
- **Long-Term Ecosystem Damage:** In Gaza, UNEP estimates show that 97% of tree crops and 82% of annual crops have been destroyed, while hazardous debris (61 million tonnes in Gaza) creates a toxic legacy of heavy metals and asbestos.

Prelims Facts (One Liners):

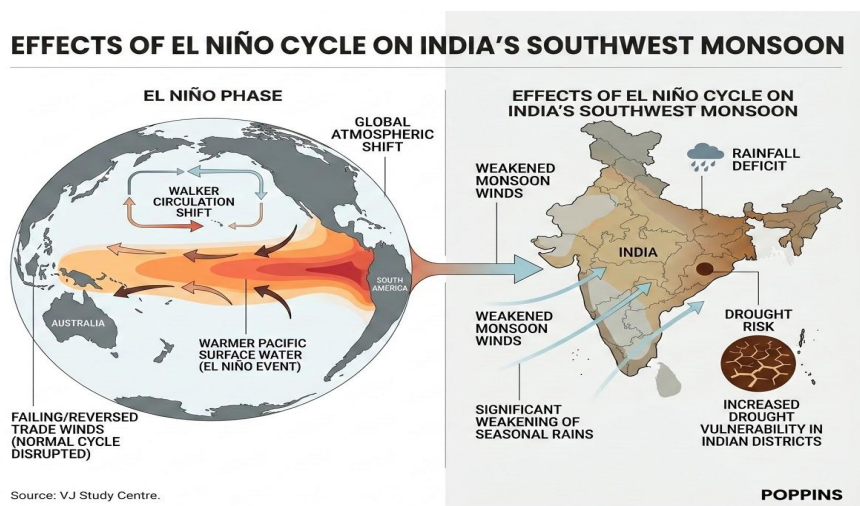


- **ENMOD Convention (1976):** Prohibits military use of environmental modification techniques as weapons.
- **International Day (5 November):** Designated as the day for preventing environmental exploitation in war.

MCQ Practice: Q. Which international protocol specifically prohibits warfare methods expected to cause widespread, long-term, and severe damage to the natural environment? A) Kyoto Protocol B) Additional Protocol I to the Geneva Conventions C) Paris Agreement D) Montreal Protocol

Answer: B (The 1977 Additional Protocol I to the Geneva Conventions contains this specific prohibition.)

Topic 2: El Niño and Southwest Monsoon



Summary: Concerns are rising that a developing "Super El Niño" could significantly weaken the 2026 Southwest Monsoon, placing hundreds of Indian districts at risk of drought. Initial data shows a 40% rainfall deficit in June, making it one of the driest Junes in over 125 years.

Background: El Niño is the warm phase of the ENSO cycle, typically weakening the Indian monsoon and increasing drought likelihood. The 2026 event is particularly concerning as global warming may amplify its impacts.

Key Points:

- **Agricultural Vulnerability:** Nearly 52% of India's net sown area is rain-fed, and kharif sowing has already reported a 23% decline compared to the previous year.



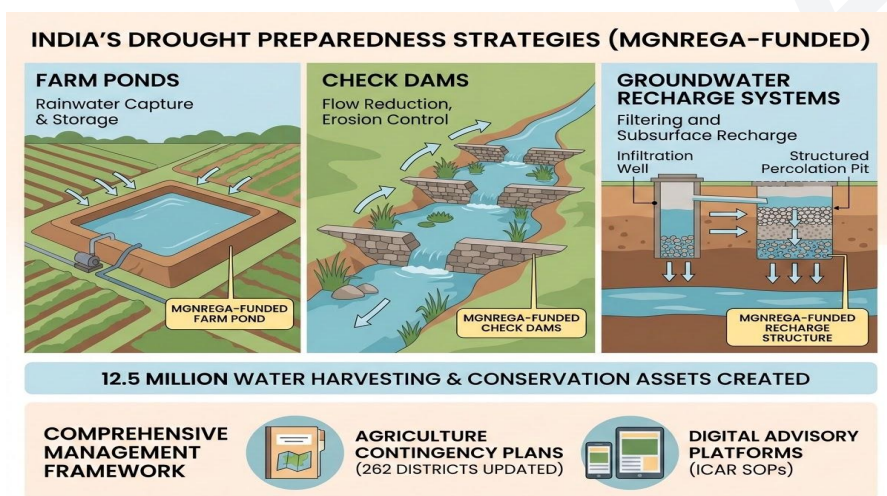
- **Economic Impact:** The FAO expects over 80% of drought-related agricultural losses to occur in low- and middle-income countries, with India being highly susceptible to food inflation and declining farm incomes.
- **Strategic Adaptation:** India is focusing on expanding micro-irrigation under PMKSY and diversifying towards less water-intensive crops to build climate resilience.

Prelims Facts (One Liners):

- **June 2026 Rainfall:** Witnessed a 40% below-normal rainfall deficit according to the IMD.
- **Irrigation Coverage:** 111 of the 315 identified vulnerable districts have less than 25% irrigation coverage.

MCQ Practice: Q. What percentage of India's net sown area depends primarily on rainfall? A) 35% B) 52% C) 67% D) 75% **Answer: B** (Approximately 52% of India's net sown area remains rain-fed and vulnerable to El Niño.)

Topic 3: India's Drought Preparedness



Summary: With one-third of India chronically drought-prone, the government has initiated high-level reviews and updated contingency plans for 262 districts. Drought remains a significant challenge as two-fifths of India's cultivable land lies in high-risk zones.

Background: Historical drought years like 2009 and 2014 show that weak July rainfall substantially increases the risk of crop failure. This necessitates a robust institutional response involving multiple ministries and digital advisory platforms.



Key Points:

- **Institutional Framework:** The ICAR has issued specific SOPs for managing El Niño risks, while 262 districts have updated their Agriculture Contingency Plans.
- **MGNREGA's Role:** MGNREGA has become a vital drought-proofing tool, creating millions of farm ponds, check dams, and groundwater recharge structures that improve soil quality.
- **Socio-Economic Stress:** Studies indicate that poor farmers can take 3–4 years to recover from a single severe drought, with estimated crop losses in states like Odisha and Jharkhand reaching \$400 million in bad years.

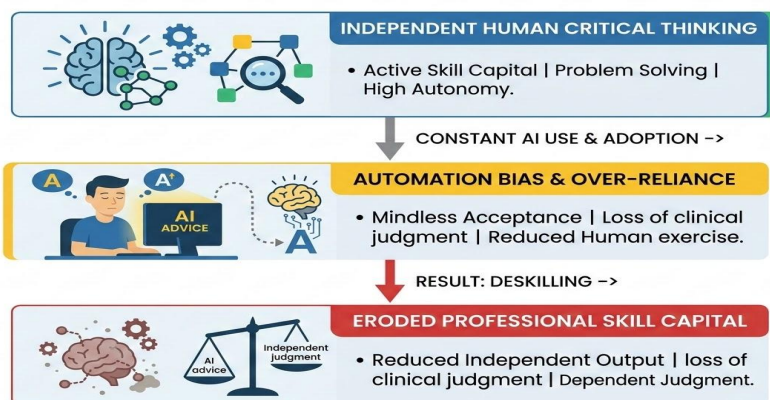
Prelims Facts (One Liners):

- **High Risk Districts:** 279 districts in India are classified under "High" or "Very High" drought risk by the DST.
- **July Rainfall:** Contributes nearly 30% of India's total seasonal rainfall.

MCQ Practice: Q. According to the source, how many water harvesting and conservation assets have been created under MGNREGA? A) 5 million B) 8.5 million C) 10 million D) 12.5 million **Answer:** D (MGNREGA has contributed to creating 12.5 million such assets to aid drought-proofing.)

Topic 4: AI and the Erosion of Professional Skill Capital

VISUALIZING THE DESKILLING PHENOMENON



Summary: New research in *The Lancet* suggests that heavy reliance on AI tools can lead to the erosion of "skill capital"—the knowledge and expertise professionals gain over decades. Prolonged dependence on AI can reduce independent decision-making and critical thinking.



Background: Skill capital is built through continuous practice; however, studies in healthcare show that when AI assistance is removed, even experienced professionals may perform worse than they did before AI adoption.

Key Points:

- **The Deskilling Phenomenon:** In a Polish study, physicians with over 2,000 colonoscopies saw their independent diagnostic rate drop to 22.4% after using AI diagnostic tools for three months.
- **Automation Bias:** Professionals may accept AI recommendations without critical evaluation, leading to a loss of responsibility and clinical judgment.
- **Human-in-the-Loop (HITL):** India's National Strategy for AI emphasizes using AI to assist rather than replace human expertise, promoting ethical governance.

Prelims Facts (One Liners):

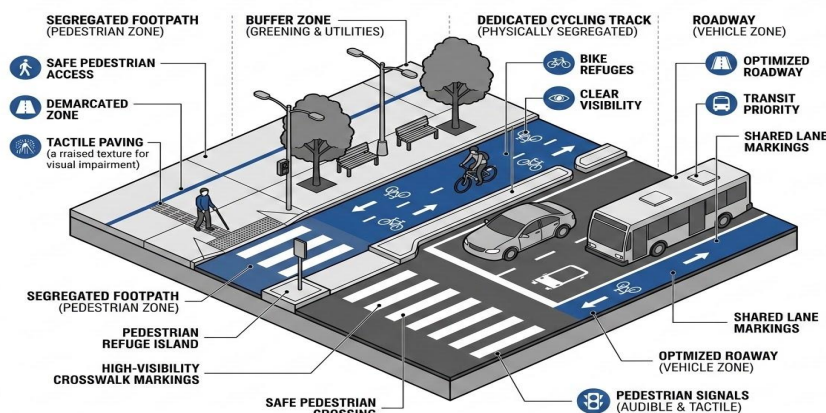
- **Skill Capital Definition:** Refers to expertise acquired through education, training, and continuous practice.
- **IndiaAI Mission:** A government initiative focused on human-centric AI and capacity building.

MCQ Practice: Q. The term 'Automation Bias' refers to: A) Using AI to automate mechanical tasks B) The tendency of professionals to accept AI recommendations without critical evaluation C) A preference for human labor over AI D) The physical degradation of AI hardware **Answer: B** (It refers to the risk of professionals over-relying on AI output without sufficient scrutiny.)



Topic 5: Safe Footpaths as a Fundamental Right

TECHNICAL INFOGRAPHIC: 'COMPLETE STREET' DESIGN PRINCIPLES



Summary: The Supreme Court of India recently held that the right to walk on safe, demarcated footpaths is a Fundamental Right under Articles 21 and 19(1)(d). The Court has initiated a *suo motu* case to establish a comprehensive legal framework for pedestrian safety.

Background: This ruling follows the case of *Maniyar Iliyaz v. P. Ayyappan*, where a child was killed by a vehicle while walking on the road due to the lack of a footpath. Current urban planning in India is often vehicle-centric, neglecting vulnerable road users.

Key Points:

- **Constitutional Basis:** Safe walking is viewed as essential for a dignified life (Art. 21) and the freedom of movement (Art. 19).
- **Road Fatality Crisis:** In 2024, 36,526 pedestrians lost their lives in India, accounting for over 20% of all road deaths.
- **Need for Statutory Framework:** While IRC guidelines exist, they are advisory; the Court is pushing for mandatory engineering standards and walkability audits for all road projects.

Prelims Facts (One Liners):

- **Chennai NMT Policy (2014):** Committed 60% of the transport budget to walking and cycling infrastructure.
- **30 km/h Limit:** International practice shows this speed limit significantly reduces pedestrian fatalities.



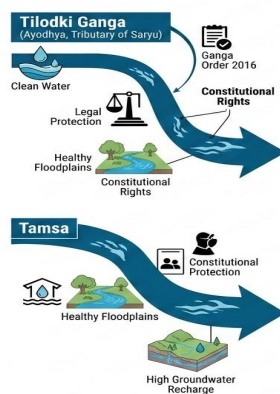
MCQ Practice: Q. In which case did the Supreme Court recognize the right to walk on safe footpaths as a Fundamental Right? A) Maniyar Iliyaz v. P. Ayyappan B) Kesavananda Bharati case C) Vishaka v. State of Rajasthan D) MC Mehta v. Union of India **Answer: A** (The Court established this right in the Maniyar Iliyaz case.)

Topic 6: When Rivers Become Drains

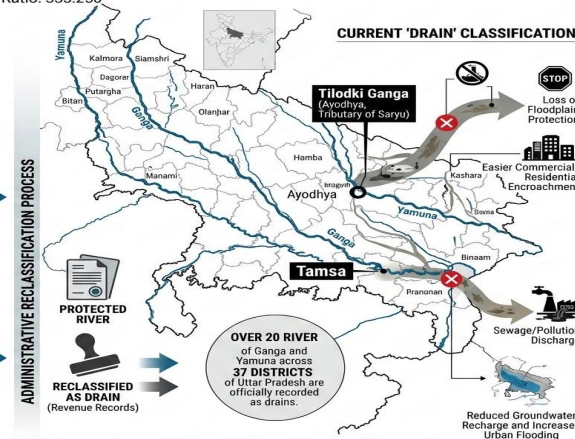
UTTAR PRADESH-FROI RIVER TO DRAIN

Professional infographic map | Aspect Ratio: 333:250

HISTORICAL RIVER STATUS



CURRENT 'DRAIN' CLASSIFICATION



Summary: More than 20 tributaries of the Ganga and Yamuna across 37 districts of Uttar Pradesh have been officially reclassified as "drains" in revenue records. This administrative reclassification strips them of legal protection and makes restoration difficult.

Background: Rivers lose their identity gradually due to pollution, encroachment, and sewage discharge. Administrative records often transition them from "rivers" to "channels" or "public drains" during land consolidation exercises.

Key Points:

- **Legal Disappearance:** Once classified as a drain, a river loses floodplain protection, making it easier for commercial and residential encroachment.
- **Hydrological Impact:** Reclassification leads to reduced groundwater recharge and increased urban flooding, as natural drainage channels are compromised.
- **Ganga Order 2016:** This order mandates that all streams and tributaries of the Ganga, whether seasonal or perennial, must be protected as part of the river system.

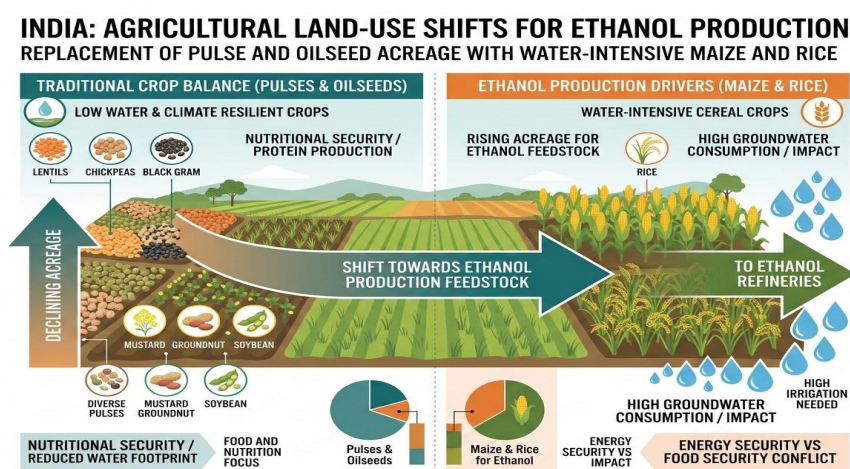
Prelims Facts (One Liners):



- **Tilodki Ganga:** A seasonal tributary of the Saryu in Ayodhya, currently reduced to a narrow sewage-carrying channel.
- **Sahibi River:** A historical river in Delhi now widely known as the Najafgarh Drain.

MCQ Practice: Q. The River Ganga Authorities Order 2016 was constituted under which Act? A) Water Act, 1974 B) Environment (Protection) Act, 1986 C) Wildlife Protection Act, 1972 D) National Green Tribunal Act, 2010 **Answer: B** (It was constituted under the Environment (Protection) Act, 1986.)

Topic 7: Ethanol Blending: Energy Security vs Food Security



Summary: India has achieved a 20% ethanol blending target, saving ₹1.91 lakh crore in foreign exchange. However, the shift toward grain-based ethanol (maize and rice) is creating a conflict with nutritional food security and depleting groundwater.

Background: Initially, ethanol came from sugarcane molasses (1G), but production has shifted to maize and surplus rice. This has led to the displacement of essential crops like pulses and soybeans.

Key Points:

- **Crop Displacement:** In Madhya Pradesh alone, soybean acreage declined by 1.2 million hectares as farmers shifted to maize for ethanol.
- **Water Intensity:** Producing 1 litre of rice-based ethanol requires 9,854 litres of water, posing a severe threat to water-stressed regions.



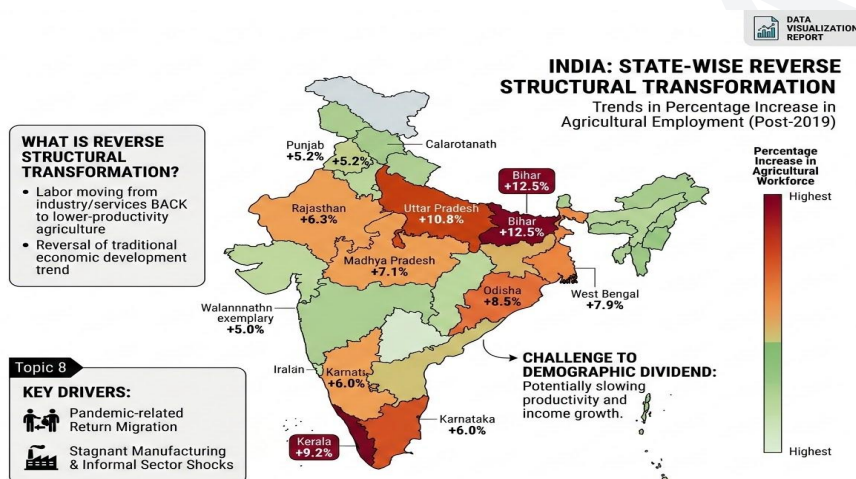
- **The 2G Alternative:** Second-generation (2G) ethanol uses agricultural waste (like paddy straw), but high production costs (₹120/litre) and technological complexity hinder its scaling.

Prelims Facts (One Liners):

- **Pradhan Mantri JI-VAN Yojana:** A scheme promoting commercial-scale 2G ethanol plants.
- **Foreign Exchange Savings:** India saved ₹1.91 lakh crore through the Ethanol Blending Programme.

MCQ Practice: Q. Which feedstock is considered the most water-intensive for producing 1 litre of ethanol? A) Sugarcane B) Maize C) Rice D) Bamboo **Answer: C** (Rice requires nearly 9,854 litres of water per litre of ethanol produced.)

Topic 8: Reverse Structural Transformation in Indian Agriculture



Summary: Post-2019, India has witnessed "Reverse Structural Transformation," where the share of the workforce in agriculture has increased instead of declining. Agricultural employment rose to 46% in 2023-24, largely due to pandemic-related return migration and stagnant manufacturing.

Background: Traditional economic growth involves labor moving from low-productivity agriculture to high-productivity industry. In India, the informal sector shocks of demonetization, GST, and COVID-19 reversed this trend.

Key Points:



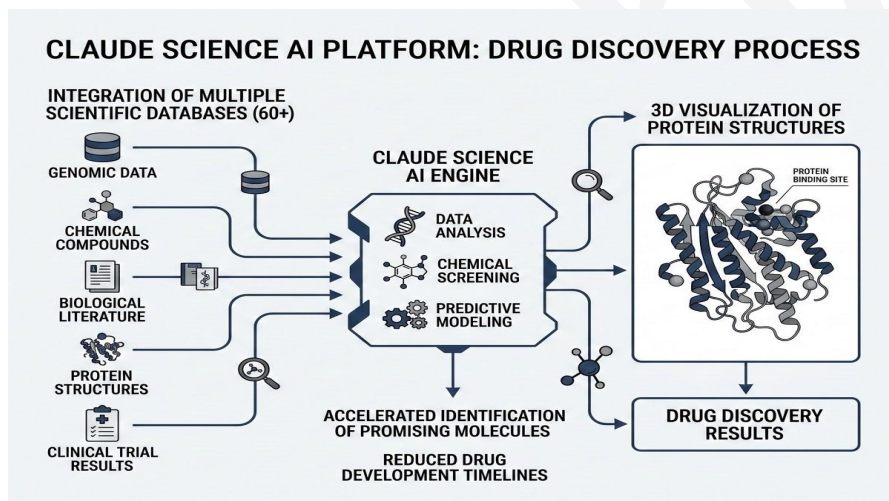
- **Youth Employment:** After 2019, youth employment in agriculture increased by 5.6 percentage points, potentially weakening India's demographic dividend.
- **Productivity Gap:** While agriculture employs 45% of the workforce, it contributes only 18% to the GVA, indicating high levels of disguised unemployment.
- **Women's Participation:** Much of the growth in rural employment has come from women entering agriculture as unpaid family workers or self-employed farmers.

Prelims Facts (One Liners):

- **PLFS 2023-24:** Reported that agricultural employment reached 46% of the total workforce.
- **Manufacturing Stagnation:** Manufacturing employment has remained stagnant at around 12-14%.

MCQ Practice: Q. 'Reverse Structural Transformation' in the Indian context refers to: A) Rapid growth in the IT sector B) Movement of labor from manufacturing back to agriculture C) A decline in rural population D) Complete mechanization of farming **Answer: B** (It refers to the unusual trend of labor returning to agriculture from other sectors.)

Topic 9: AI-Driven Drug Discovery and the Pharma Sector



Summary: AI-powered platforms like Claude Science are transforming pharmaceutical research, potentially reducing the drug discovery timeline from 15 years to 2-5 years. For India, this offers a path to reduce its 70-90% dependence on Chinese raw materials (APIs).



Background: India is the "Pharmacy of the World" but relies heavily on China for Key Starting Materials (KSMs) and APIs. The PLI scheme was introduced to boost domestic API production, but progress has been limited.

Key Points:

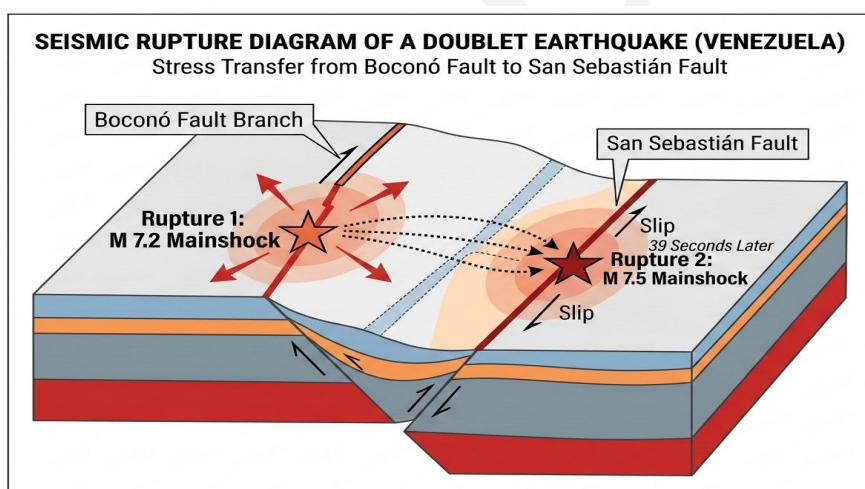
- **Strategic Autonomy:** AI can help Indian firms move beyond generics to discover new molecules, reducing the vulnerability of the pharmaceutical supply chain.
- **Research Efficiency:** AI-driven screening reduces costs and failures in clinical trials by identifying promising candidates through genomic and chemical data analysis.
- **Workforce Integration:** While AI streamlines research, it requires a skilled workforce trained in both data science and pharmacology to validate results.

Prelims Facts (One Liners):

- **Vaccine Supply:** India provides 65–70% of global vaccine demand for WHO immunization programs.
- **Pharma Exports:** Reached approximately \$31 billion in the 2025–26 fiscal year.

MCQ Practice: Q. Approximately what percentage of India's API requirements for critical antibiotics is imported from China? A) 30% B) 50% C) 70% D) 90% **Answer: D** (For critical antibiotics, dependence on Chinese imports rises to nearly 90%.)

Topic 10: Doublet Earthquakes in Venezuela



Summary: Venezuela recently experienced a rare "doublet earthquake"—two independent mainshocks of comparable magnitude (7.2 and 7.5) occurring just 39 seconds apart. This event claimed over 1,700 lives and is the first recorded doublet in the country's history.

Background: Doublet earthquakes are distinct from mainshock-aftershock sequences because both ruptures release significant seismic energy independently. Globally, only 37 such events of magnitude 6 or above have been recorded since 1907.

Key Points:

- **Mechanism of Rupture:** The first quake transferred tectonic stress to an adjacent fault segment, triggering a second massive rupture almost immediately.
- **Early Warning Challenges:** The 39-second interval—the third shortest ever recorded for a doublet—leaves virtually no time for effective public warning or evacuation.
- **Global Rarity:** Doublet earthquakes occur roughly once every three years on average, though improved monitoring has increased recent detection.

Prelims Facts (One Liners):

- **Venezuela Doublet:** The most powerful earthquake sequence in the country in about 125 years.
- **Detection:** 21 of the 37 recorded global doublets have occurred in the last 20 years.

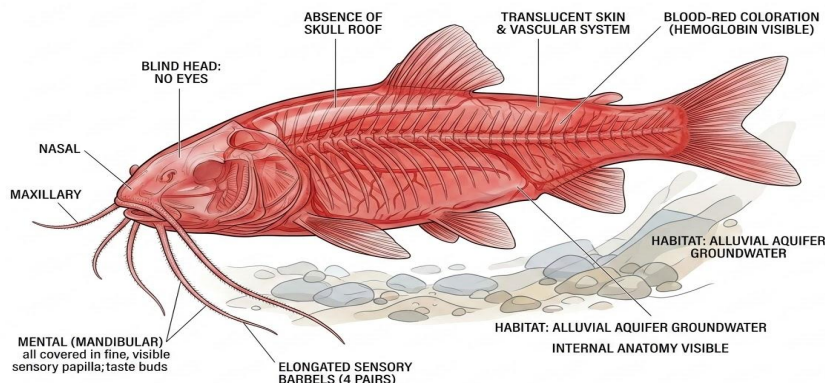
MCQ Practice: Q. A 'Doublet Earthquake' is characterized by: A) A mainshock followed by a smaller aftershock B) Two independent mainshocks of comparable magnitude C) An earthquake occurring underwater D) Two earthquakes in different hemispheres simultaneously **Answer: B** (It consists of two separate main seismic ruptures of similar magnitude.)



Topic 11: Gitchak Nakana: Assam's First Subterranean Fish

SCIENTIFIC ILLUSTRATION: GITCHAK NAKANA (SUBTERRANEAN FISH)

Gitchak Nakana (Garo words 'Na-tok' (Fish) and 'Kana' (Blind)), a subterranean fish species from Assam.



Summary: Researchers have discovered *Gitchak Nakana*, the first subterranean fish species from Assam, in the alluvial aquifers of the Brahmaputra basin. This tiny, blind fish is adapted to life in complete darkness beneath the Earth's surface.

Background: Subterranean fish typically lose eyes and pigmentation to survive in food-scarce, dark environments. India ranks fourth globally in the diversity of these unique species.

Key Points:

- **Unique Adaptations:** *Gitchak Nakana* lacks eyes and a skull roof, instead possessing four pairs of long barbels rich in taste buds to locate food.
- **Rare Habitat:** Only 23 of the 272 known subterranean fish species worldwide live in groundwater aquifers, making this discovery scientifically significant.
- **Conservation Threats:** Massive groundwater extraction (247 billion cubic metres annually in India) and pollution from agricultural chemicals threaten these sensitive habitats.

Prelims Facts (One Liners):

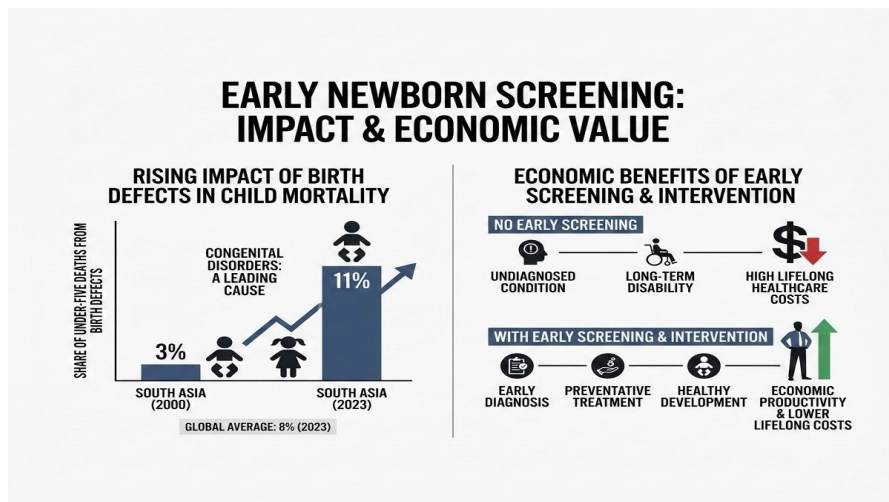
- **Meaning of Name:** Derived from Garo words 'Na-tok' (Fish) and 'Kana' (Blind).
- **Hotspots:** Kerala and Meghalaya are the other major hotspots for subterranean fish in India.

MCQ Practice: Q. With reference to 'Gitchak Nakana', which statement is correct? A) It was discovered in the Himalayan glaciers B) It possesses a thick, protective skull roof C) It is the first

subterranean fish recorded from Assam D) It has highly developed vision for dark environments

Answer: C (It is indeed the first such species recorded from Assam and it lacks both eyes and a skull roof.)

Topic 12: WHO Urges Expansion of Newborn Screening



Summary: The WHO has urged countries to expand newborn screening for birth defects, which affect 8 million babies annually. As deaths from infectious diseases decline, congenital disorders are becoming a leading cause of child mortality.

Background: Nearly 90% of children with serious birth defects are born in low- and middle-income countries (LMICs), where many remain undiagnosed until it is too late for effective treatment.

Key Points:

- **Rising Mortality Share:** In South Asia, the share of under-five deaths caused by birth defects rose from 3% in 2000 to 11% in 2023.
- **India's Success:** India's national programme has screened over 28 million newborns in three years, identifying 900,000 children with defects for early intervention.
- **Economic Benefit:** Early diagnosis through screening prevents long-term disability and developmental delays, significantly reducing lifelong healthcare costs.

Prelims Facts (One Liners):



- **Global Burden:** Birth defects account for 8% of all deaths among children under five globally.
- **Philippines Model:** Mandatory by law and covers 29 different conditions under national health insurance.

MCQ Practice: Q. According to the WHO, what percentage of serious birth defects occur in low- and middle-income countries (LMICs)? A) 50% B) 65% C) 75% D) 90% **Answer: D** (Nearly 90% of these serious conditions occur in LMICs.)

