

HEALTH AND EDUCATION GS PAPER II
'Education and Nutrition: Learn to Eat Well' Report

UNESCO released its global report "Education and Nutrition: Learn to Eat Well" in March, during the 'Nutrition for Growth' summit hosted by France.

Data & Statistics from UNESCO Report:

1. **Global Reach:** 418 million children globally benefit from school meals across 161 countries.
2. **Nutritional Gaps:** Over **1 in 2 school feeding programs globally lack sufficient fruit and vegetables**, with **one-third offering sugary drinks**.
3. **Obesity Rise:** Childhood overweight and obesity have **doubled in 100+ countries** over the past two decades.
4. **India Context:** The **PM-POSHAN scheme** feeds **118 million children** daily — one of the largest school feeding programs globally.
5. **Hidden Hunger:** Despite coverage, **micronutrient deficiencies** remain widespread due to poor dietary diversity.

E.g. Only 17 countries globally integrate **nutrition education** into school curricula with strong links to national food standards.

Interlink Between Education and Nutrition:

- **Improved Learning Outcomes:** Nutritious meals directly improve attention, memory, and classroom performance.
- **Equity and Access:** School meals act as an **incentive for enrolment**, especially for girls and low-income families.
- **Health Foundation:** Childhood nutrition shapes **lifelong cognitive and physical development**, impacting earning capacity.
- **Support for Local Economy:** When linked with local agriculture, school feeding creates **farm-to-table economies**.
- **Social Justice Tool:** Acts as a **safety net for vulnerable populations**, reducing inequality in access to food and education.

E.g. Countries with robust meal programs like **Brazil and Finland** report both **higher retention** and **better learning metrics**.

Key Challenges Highlighted:

- **Poor Food Quality:** Many school meals contain **ultra-processed, sugary, and nutrient-poor items**.
- **Lack of Nutrition Education:** Few countries link feeding with **curriculum-based nutrition literacy**.
- **Overdependence on Staples:** Programs overly rely on **rice, wheat, and maize**, lacking dietary diversity.
- **Urban vs Rural Divide:** Infrastructure, cold chains, and supply chains differ significantly, affecting consistency.
- **Monitoring Gaps:** Many nations lack **standard indicators** to evaluate meal impact on health and education.

E.g. Only 8% of countries track the **nutritional quality** of school meals against WHO standards.

Way Forward:

- **Integrated Curriculum:** Embed **nutrition education in school syllabi** across subjects and grades.
- **Standards & Guidelines:** Adopt **science-backed food standards** aligned with WHO dietary guidelines.
- **Localised Procurement:** Link school meals to **sustainable agriculture**, ensuring seasonal and diverse food.
- **Teacher & Staff Training:** Upskill teachers to deliver **food education effectively** in classrooms.

- **Monitoring Framework:** Establish **national benchmarks** and evaluation indicators for nutrition and educational gains.

E.g. UNESCO calls for every country to develop a **national strategy on school nutrition** with clear accountability measures.

Conclusion:

The UNESCO report underscores that quality education and quality nutrition must go hand-in-hand. Investing in well-balanced school meals is not merely a welfare gesture but a **strategic move for human capital development**. A nourished mind learns better — and a better-educated child builds a stronger nation.

NUCLEAR ENERGY GS PAPER II

India – USA Nuclear Deal 2025

The US Department of Energy has approved Holtec International to transfer Small Modular Reactor (SMR) technology to India marking a major milestone in operationalizing the Indo-US Civil Nuclear Deal (123 Agreement) signed in 2007.

Recent Indo-US Nuclear Deal Breakthrough:

1. **Technology Transfer Approved:** The US DoE has permitted Holtec International to share **unclassified SMR technology** with Indian firms under **10CFR810 regulations**.
 - The deal is under the restrictive regulation of the US, ‘10CFR810’, with the approval being **valid for 10 years** and will be **re-evaluated every five years**.
1. **Strategic Collaboration:** Indian partners include **L&T, Tata Consulting Engineers, and Holtec Asia**, with regulatory compliance to ensure **no retransfer** without US consent.
2. **Manufacturing within India:** For the first time, US-designed reactors can be **co-developed and manufactured** in India—previously prohibited.
3. **Linked to Energy Security Dialogue:** The move follows Modi-Trump discussions in Feb 2025 focused on energy resilience and decarbonisation goals.
4. **Scope for Expansion:** The government is exploring **amendments to the Atomic Energy Act, 1962** to allow more **private sector participation** in civil nuclear power.

E.g. The **Kovvada project in Andhra Pradesh** is planned with six 1208 MWe reactors under Indo-US collaboration.

Significance of Nuclear Energy in India

- **Clean Baseload Power:** Nuclear energy offers **low-carbon, reliable power** unaffected by weather like solar or wind.
- **Reduces Fossil Fuel Dependency:** Helps India reduce its **~70% fossil fuel dependence**, supporting energy sovereignty.
- **Supports Net-Zero Targets:** Critical for achieving **500 GW of non-fossil fuel energy** by 2030 and Net-Zero by 2070.
- **Promotes Industrial Decarbonisation:** BSRs and SMRs can be installed near industries for clean captive power.
- **Geostrategic Edge:** Enhances India’s global standing in clean energy tech and addresses **energy security**.

India’s Achievements in Nuclear Energy:

- **Installed Capacity Growth:** Nuclear capacity rose from **4,780 MW in 2014** to **8,180 MW in 2025**, across 24 reactors.
- **Indigenous Reactor Development:** Kakrapar Units 3 & 4 (**700 MWe PHWRs**) are fully Indian-designed and operational.
- **Fast Breeder Breakthrough:** The **Prototype Fast Breeder Reactor (PFBR)** achieved key commissioning milestones in 2024.
- **Joint Venture Models:** NPCIL and NTPC launched the **ASHVINI JV** to co-develop nuclear plants within the legal framework.
- **New Uranium Discovery:** The **Jaduguda mine** discovery adds 50+ years of life to India’s uranium supply.

E.g. RAPP-7 in Rajasthan reached criticality in 2024, showcasing indigenous reactor capability.

Challenges Associated with Nuclear Energy in India:

- **Legislative Constraints:** The Atomic Energy Act, 1962 restricts private investment and innovation in reactor development.
- **High Capital Costs:** Nuclear projects require long gestation periods and high upfront costs compared to renewables.
- **Public Perception and Safety Concerns:** Despite a good safety record, public resistance remains high post-Fukushima.
- **Limited Fuel Security:** India imports uranium and is yet to fully utilise its thorium potential.
- **Regulatory Delays:** Multi-layered clearances from AERB, MoEF, and local bodies delay project timelines.

E.g. The delay in initiating work at Kovvada due to regulatory complexities reflects procedural bottlenecks.

Way Ahead:

- **Amend Atomic Energy Laws:** Reforms to enable private sector and ease entry barriers for tech partnerships are essential.
- **Accelerate SMR and BSR Deployment:** Fast-track indigenous development of at least five SMRs by 2033 with ₹20,000 crore allocation.
- **Build Domestic Supply Chains:** Promote Make-in-India initiatives for nuclear component manufacturing and fuel supply.
- **Focus on Thorium Cycle R&D:** Strengthen India’s long-term energy security by unlocking Stage-3 of Homi Bhabha’s plan.
- **Improve Public Awareness and Transparency:** Boost confidence in nuclear safety protocols through education and community engagement.

E.g. The BARC-developed SMRs will repurpose retired coal plants, addressing land and infrastructure reuse.

Conclusion:

India’s nuclear energy push marks a bold step toward clean, secure, and scalable energy infrastructure. With global collaborations, indigenous innovation, and legal reforms, the sector is poised to become a cornerstone of India’s energy independence. Strategic execution will determine how swiftly India realises its 100 GW nuclear target by 2047.

PRELIM FACTS

1.National Gene Bank

The Government of India has announced the creation of a *Second National Gene Bank to conserve 10 lakh crop germplasm*. This initiative aligns with the “Investing in Innovations” theme of the *Union Budget 2025-26*.

Gene Bank

A Gene Bank is a specialized storage facility designed to preserve seeds, pollen, and plant tissues to safeguard plant species from extinction and ensure their availability for future needs.

These preserved samples play a vital role in crop breeding, scientific research, and biodiversity conservation.

India’s First National Gene Bank

- It was established in 1996 by the *Indian Council of Agricultural Research – National Bureau of Plant Genetic Resources (ICAR-NBPGR)* in New Delhi.
- **Current status:**
 - It is the *second-largest Gene Bank globally*, following the *Svalbard Global Seed Vault in Norway*.
 - It houses 4,71,561 accessions spanning 2,157 species.
 - It *supplies plant genetic resources to both public and private entities* engaged in crop improvement and genetic conservation.

National Bureau of Plant Genetic Resources (NBPGR)

- It is the apex institution under ICAR responsible for plant genetic resource management.

- **Objective:** Conservation, evaluation, and utilization of plant genetic resources to support sustainable agriculture and food security.

- **Headquarters:** New Delhi

2. Second Global Conference on Air Pollution and Health

The Second Global Conference on Air Pollution and Health was hosted by WHO and the Government of Colombia in Cartagena in March 2025.

- It aimed to build global support to halve deaths due to air pollution by 2040 from 2015 levels.

About the Second Global Conference on Air Pollution and Health:

- **What is it?**
 - A high-level international platform by the **World Health Organization** to address air pollution, energy poverty, and public health through multi-sectoral, evidence-based strategies.
- **Hosted at:** Cartagena, Colombia.
- **Organisations Involved:** WHO, UN partners, Global health institutions, and Civil society and research bodies
- **Key objectives:**
 - **Reduce Global Mortality:** Commit to halving **air pollution-related deaths by 2040** through science-based and coordinated policy action.
 - **Advance Health Research:** Share cutting-edge findings on air pollution's impact on brain development, mental health, and children's health to guide informed decisions.
 - **Promote Equity & Co-Benefits:** Highlight the **interlinked benefits** of clean air for **climate action, gender justice, and public health equity**.
 - **Support Just Energy Transition:** Address energy poverty by advocating for clean, affordable energy access, and empower cities to align with WHO Air Quality Guidelines.
 - **Inspire Global Action:** Showcase **successful policies** like London's ULEZ and push global stakeholders to **join the BreatheLife campaign** and commit to targets for 2030.

About First Global Conference on Air Pollution and Health:

- **Held:** 30 October – 1 November 2018
- **Venue:** WHO Headquarters, **Geneva, Switzerland**
- **Aim:** Launch a global agenda for air pollution mitigation as a public health imperative.

3. BIMSTEC Summit

The 6th BIMSTEC Summit will be held on April 4, 2025, in Bangkok, Thailand with the theme **“Prosperous, Resilient, and Open BIMSTEC.”**

- It aims to enhance regional cooperation on trade, security, connectivity, and endorse the Bangkok Vision 2030.

About BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation):

- **What is BIMSTEC?**
 - A regional grouping connecting **South Asia and Southeast Asia** to promote **technical and economic cooperation** among nations bordering the **Bay of Bengal**.
- **Established On:** 6 June 1997, via the Bangkok Declaration.
 - Originally named **BIST-EC** (Bangladesh, India, Sri Lanka, and Thailand Economic Cooperation).
 - On **22 December 1997** during a special Ministerial Meeting in Bangkok, the Group was renamed 'BIMST-EC' (Bangladesh, India, Myanmar, Sri Lanka and Thailand Economic Cooperation).
 - In 1998, Nepal became an observer.
 - In **February 2004**, Nepal and Bhutan became full members and renamed as **BIMSTEC** in **2004**.
- **Headquarters:** Dhaka, Bangladesh (Operational since 2014).

- **Members (7 Countries):** Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and Thailand.
- **Chairmanship Procedure:** Rotational leadership in alphabetical order of member states.
- **Objectives of BIMSTEC:**
 - **Promote economic cooperation** among countries bordering the Bay of Bengal.
 - Facilitate **sectoral collaboration** in trade, technology, energy, transport, and environment.
 - Address **shared regional challenges** including terrorism, poverty, and climate change.
 - Foster **regional connectivity** through cross-border infrastructure and digital links.
 - Enable **people-to-people ties**, cultural exchanges, and academic partnerships.
- **Key Features of BIMSTEC:**
 - **Bridge between SAARC and ASEAN:** Offers a unique geostrategic platform uniting South and Southeast Asia.
 - **Sector-led cooperation:** Began with six sectors in 1997, now streamlined to **seven core sectors** post-2021 reforms.
 - **Focus on Security and Trade:** Includes counter-terrorism, disaster management, and maritime cooperation.
 - **Vision-based Agenda:** 6th Summit to adopt **Bangkok Vision 2030** and **Maritime Transport Agreement**.
 - **Institutional Strengthening:** BIMSTEC Charter signed in 2022; Secretariat operational since 2014.

4. Nagarahole National Park

Concerns have been raised over the proposed land grants within the core area of Nagarahole National Park (Nagarahole Tiger Reserve), specifically in its ecologically sensitive swampy grasslands.

About Nagarahole National Park:

- **What it is:**
 - A notified **Tiger Reserve** and one of India's premier **Project Tiger** sites.
 - Officially known as **Rajiv Gandhi National Park**, named after the **Nagarahole stream** ("Nagara" – serpent, "Hole" – stream).
- **Location & Geography:**
 - Spans across **Kodagu and Mysuru districts** in Karnataka.
 - Covers **847.98 sq. km** (Core: 643.39 sq. km, Buffer: 204.59 sq. km).
 - **Contiguous with:** Bandipur Tiger Reserve, Wayanad Wildlife Sanctuary.
 - Situated between **Mysuru Plateau and Nilgiri Hills**.
- **Ecological History:**
 - Initially declared a wildlife sanctuary in **1955** and later upgraded to a National Park in **1988**.
 - Designated as a **Tiger Reserve** under **Project Tiger** in 1999.
- **Flora & Fauna:**
 - **Flora:** Tropical moist and dry deciduous forests, swampy grasslands (Hadlus), teak, rosewood, sandalwood.
 - **Fauna:** Tiger, Leopard, Wild Dog, Sloth Bear, Asiatic Elephant, Gaur, Sambar, Chital, Muntjac, Mouse Deer, and South-western Langur.
- **Rivers:**
 - **Nagarahole River:** Flows through the park.
 - **Kabini River:** Forms the **northern boundary** of the park.
 - **Taraka River:** Flows through the **southeastern parts** of the park.
- **Significance:**
 - Part of **Nilgiri Biosphere Reserve** and a key wildlife corridor in the **Western Ghats**.
 - Hosts **the world's largest herd of Asiatic elephants**.
 - Supports high **biodiversity** and is vital for **ecological connectivity and conservation**.

ANSWER WRITING

Q. "India is witnessing a paradox of educated unemployment alongside a shortage of skilled labour." Critically examine this statement in light of the emerging employment landscape and suggest measures to align education with market needs.

India's education system faces criticism for not aligning with the labor market's skill requirements, despite a surge in graduates. As of 2023-24, the unemployment rate for individuals aged 15 and above was reported at 3.2% by government estimates. This paradox of educated unemployment alongside a shortage of skilled labor emphasizes the disconnect between education and industry needs.

Paradox of Educated Unemployment and Skilled Labour Shortage

- **Oversupply of Graduates:** India produces 10 million graduates annually, but most are unemployable due to a lack of **practical skills**.
For example: A recent report showed that 263 law applicants for district judge posts in Odisha failed to pass the qualifying exam.
- **Mismatch in Skill Sets:** Graduates seek **white-collar jobs**, ignoring hands-on skills, which results in a lack of workers for practical roles.
For example: There is a shortage of electricians and carpenters, despite high demand, due to social stigma against blue-collar work.
- **Inefficient Education System:** The focus remains on academic credentials, neglecting industry-specific **practical training** and soft skills.
For example: Many college graduates lack the ability to apply theoretical knowledge to real-world situations, thus remaining unemployable.
- **Technological Displacement:** AI and automation threaten many **white-collar jobs**, but skilled labor is more resilient to such changes.
For example: The rise of AI in fields like coding and data analysis is making such jobs obsolete, while electricians and plumbers remain indispensable.
- **Underestimation of Informal Sector:** Many graduates overlook the informal **job market**, where skilled workers thrive and earn well.
For example: A cook who dropped out after school earns **Rs 30,000-40,000** monthly by working in multiple houses, far surpassing the earnings of many graduates.

Progress Made to Address the Paradox

- **Skill Development Initiatives:** The government launched schemes like **Pradhan Mantri Kaushal Vikas Yojana (PMKVY)** to provide training in skill-based jobs.
For example: PMKVY has trained millions in sectors like plumbing, electrician work, and IT, improving employability in blue-collar sectors.
- **Startups and Innovation:** A surge in niche job creation is allowing people to find unconventional, **well-paying** opportunities outside traditional sectors.
For example: Dog walkers, pigeon net makers, and dog groomers now have a place in the market, offering attractive incomes in urban areas.
- **Private Sector Collaboration:** Companies are increasingly partnering with educational institutions to design curricula that align with **industry needs**.
For example: TCS and Wipro offer **certification programs** in tech-related fields, directly addressing the skills gap in the IT industry.
- **Vocational Education:** More emphasis is being placed on vocational training, enabling individuals to acquire practical skills early on.
For example: The National Skills Development Corporation (NSDC) runs programs that focus on practical, hands-on training in sectors like construction, healthcare, and hospitality.
- **Rural Employment Schemes:** Government initiatives like **Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)** are addressing the shortage of skilled labor in rural areas.
For example: MGNREGA provides job security for unskilled workers and encourages skill development in construction and infrastructure.

Measures to Align Education with Market Needs

- **Industry-Oriented Curriculum:** Education systems must adopt a curriculum that emphasizes **practical skills** over theoretical knowledge.
For example: Integrating coding, digital literacy, and vocational subjects into school and college curriculums can make students more market-ready.
- **Entrepreneurial Encouragement:** Universities and colleges should promote an **entrepreneurial mindset** among students by offering support for startups.
For example: Many top universities now offer **entrepreneurship courses** and incubation centers to help students develop their business ideas.
- **Public-Private Partnerships:** Government should collaborate with the private sector to create **industry-relevant training** and placement opportunities.
For example: The tie-up between Siemens and the Skill Development Ministry to train students in **advanced manufacturing techniques** can bridge the skills gap.
- **Integration of Soft Skills:** Developing soft skills like communication, problem-solving, and teamwork alongside technical training is essential for employability.
For example: Companies like **Infosys** have introduced programs focused on leadership and communication skills to enhance the employability of graduates.
- **Focus on Lifelong Learning:** A system promoting **continuous education** and reskilling is needed to adapt to the rapidly changing job market.
For example: Platforms like **Coursera** and **Udemy** provide reskilling opportunities for professionals, ensuring they stay relevant in their fields.

India's paradox lies in a mismatch between **education output** and **market needs**. Reforming the **education system**, focusing on **vocational training, industry-academia linkages, and skill-based learning** will align youth with job requirements. Expanding **PMKVY, National Skill Development Missions, and entrepreneurship programs** will unlock immense potential, fueling sustainable economic growth.

MCQ

1. With reference to BIMSTEC consider the following statements:
 1. It was initially established as BISTEC in 1997 through the Bangkok declaration.
 2. The permanent secretariat of BIMSTEC is located in New Delhi, India.
 3. India leads the security sector, including counter terrorism and energy cooperation, under BIMSTEC's restructured framework.
 - a. 1 and 2 only
 - b. 1 and 3 only**
 - c. 2 and 3 only
 - d. 1, 2 and 3
 2. With reference to the second WHO global conference on Air pollution and Health, consider the following statements :
 1. Over 50 countries committed to reduce air pollution related health impacts by 50% by 2040
 2. The conference was held in New Delhi India
 3. The pledge includes a legally binding treaty enforceable by the world health organisation
- How many statements given above are correct ?
- a. Only one**
 - b. Only two
 - c. All three
 - d. None
3. Match the term with its correct description:

Term	Description
A. Xenotransplantation	1. A gene-editing tool for modifying animal DNA
B. Auxiliary transplant	2. Partial functional support without full replacement
C. CRISPR	3. Organ transplantation from one species to another

Select the correct answer code:
 a) A-1, B-2, C-3 b) A-2, B-1, C-3
 c) A-1, B-3, C-2 **d) A-3, B-2, C-1**
 4. Match the Indian disaster relief operations with their respective contexts:

Operation

A. Operation Brahma

B. Operation Maitri

C. Operation Dost

D. Operation Sahayata

Context

1. Nepal earthquake response, 2015

2. Earthquake relief in Myanmar, 2025

3. Flood and cyclone relief in Sri Lanka

4. Earthquake response in Turkey and Syria, 2023

Select the correct code:

a) A-1, B-2, C-3, D-4

b) A-2, B-1, C-4, D-3

c) A-1, B-3, C-2, D-4

d) A-4, B-1, C-3, D-2

5. Consider the following statements about heatwaves in India:

1. IMD defines a heatwave only when the maximum temperature exceeds 45°C, regardless of baseline averages.

2. The Wet Bulb Globe Temperature (WBGT) is unrelated to humidity and focuses only on solar radiation.

3. Heatwave-related mortality often disproportionately affects urban informal workers and elderly populations.

How many of the above statements is/are correct?

(a) **Only one** (b) Only two

(c) All three (d) None

6. Which of the following statements about judicial asset declaration and transparency in India are correct?

1. The RTI Act explicitly excludes judges from its definition of “public authority.”

2. The Judicial Standards and Accountability Bill proposed making asset declarations public and mandatory.

Select the correct answer code:

(a) 1 only (b) **2 only**

(c) Both 1 and 2 (d) Neither 1 nor 2

7. Consider the following statements:

1. India’s National Disaster Management Plan classifies heatwaves as a low-priority hazard.

2. Wet bulb temperatures below 30°C are considered dangerous for human survival.

3. All Indian states follow a uniform Heat Action Plan framework.

Which of the above statements is/are correct?

a) 1 and 2 only

b) 3 only

c) 1 and 3 only

d) None

8. Why is the Kasampatty Sacred Grove significant in the context of biodiversity governance in India?

a) It is the first private forest reserve in Tamil Nadu under the Forest Rights Act.

b) It is the first site declared under the Wildlife Protection Act exclusively for endemic species.

c) It is Tamil Nadu’s second Biodiversity Heritage Site declared under the Biological Diversity Act, 2002.

d) It is a UNESCO-recognized agroforestry landscape.

9. Which of the following best explains why Myanmar is prone to frequent and intense earthquakes?

a) It lies entirely on a stable continental shield.

b) It is located near the triple junction of the African, Eurasian, and Pacific plates.

c) It is traversed by an active strike-slip fault resulting from Indian-Eurasian plate interaction.

d) It experiences earthquakes due to extensive volcanic activity across its terrain.

10. Consider the following statements about Biodiversity Heritage Sites (BHS):

1. Once declared, BHS are governed under the Forest Rights Act by the Gram Sabha.

2. Sacred groves with spiritual value alone cannot qualify as BHS.

3. State Biodiversity Boards are key institutions involved in declaring BHS.

How many of the above statements is/are correct?

(a) **Only one** (b) Only two

(c) All three (d) None