

**CLIMATE CHANGE GS PAPER III**

**Global Warming and India**

The year 2024 has been declared the warmest year on record globally, surpassing the critical 1.5°C threshold above pre-industrial levels. While India also recorded its warmest year, the extent of warming was relatively lower compared to the global average.

**Global warming trends in 2024:**

- **Temperature Records:** Global temperatures in 2024 were 1.28°C higher than NASA's baseline (1951–1980), breaking previous records.
- **Warming Rates:** The temperature rise over land exceeded 1.6°C, while oceans warmed by approximately 0.9°C.
- **El Niño Impact:** A strong El Niño phenomenon further contributed to the temperature surge.
- **Decadal Warmth:** The past decade has been the warmest in recorded history, with every year exceeding previous temperature averages.
- **Regional Variations:** The Arctic and high-altitude regions saw the highest temperature increases due to polar amplification and the albedo effect.

**Factors leading to 2024 being the warmest year:**

- **Greenhouse Gas Emissions:** Record-high CO<sub>2</sub> and methane emissions from fossil fuel use intensified global warming.
- **El Niño Effect:** A strong El Niño event amplified ocean temperatures, pushing global averages upward.
- **Volcanic Eruption Impacts:** The 2022 Tonga eruption likely altered atmospheric circulation, contributing to warming in subsequent years.
- **Decreased Aerosol Pollution:** Reduced pollution led to lesser cloud cover, allowing more solar radiation to be absorbed by the Earth.
- **Loss of Arctic Ice:** Accelerated melting in the Arctic reduced albedo, causing more heat absorption and increasing temperatures.

**Why India experienced comparatively lower warming?**

- **Tropical Location:** India's proximity to the equator results in less variability in warming compared to polar and temperate regions.
- **Aerosols and Particulate Matter:** High concentrations of aerosols scatter sunlight, leading to a cooling effect over India.
- **Monsoon Dynamics:** The Indian monsoon system helps regulate surface temperatures through seasonal rainfall.
- **Ocean Influence:** Surrounding oceans moderate India's temperatures, acting as heat sinks.
- **Landmass Proportion:** India's smaller landmass compared to global land surfaces results in less pronounced warming.

**Challenges in controlling global warming:**

- **Rising Emissions:** Despite global efforts, fossil fuel consumption and greenhouse gas emissions remain high.
- **Economic Dependencies:** Many nations, including India, are heavily reliant on coal and oil for energy.
- **Global Inequity:** Disparities in responsibilities and capacities hinder unified climate action.
- **Insufficient Funding:** Climate adaptation and mitigation efforts face financial constraints in developing nations.
- **Climate Denial:** Resistance from interest groups and misinformation campaigns slow progress on international agreements.

**Solutions to control global warming:**

- **Renewable Energy Transition:** Accelerate the adoption of solar, wind, and hydropower to reduce fossil fuel dependency.
- **Afforestation:** Large-scale tree-planting initiatives can act as carbon sinks and combat deforestation.
- **Climate Policies:** Strengthen international agreements like the Paris Accord to enforce emissions reductions.
- **Technology Integration:** Invest in carbon capture, storage, and other green technologies.
- **Public Awareness:** Educate communities about climate change to drive grassroots action and policy support.

**Conclusion:**

The record-breaking temperatures of 2024 underline the urgency of addressing climate change. While India's relative warming is lower, its vulnerabilities demand focused mitigation and adaptation efforts. Global cooperation, backed by robust policies and public participation, remains key to combating this existential crisis.

**GS PAPER2- INTERNATIONAL RELATIONS-INDIA AND ITS NEIGHBOURHOOD- RELATIONS**

**Disputes between India and Bangladesh over border fencing**

The article discusses disputes between India and Bangladesh over border fencing. Bangladesh objects to fencing near the border citing a 1975 agreement. India defends the fencing to prevent crimes and secure borders. Negotiations and challenges continue, especially in sensitive areas.

**What is the issue between India and Bangladesh regarding border fencing?**

1. **Objection to Fencing Proximity:** Bangladesh opposes India's border fencing within 150 yards of the international boundary, citing the 1975 Joint India-Bangladesh Guidelines for Border Authorities. However, India argues that the fences are not defense structures but measures to control illegal activities and manage border security.

- Concerns Over Smart Fencing:** Bangladesh opposes smart fencing with surveillance systems, claiming it allows India to monitor Bangladeshi territory.
  - Local Disputes:** In Malda (West Bengal), the BGB tried to stop fencing near Kaliachak No. 3 block, while in Cooch Behar's Mekhliganj, they objected to fencing around the Dahagram-Angarpota enclave.
  - India's Argument:** India says fencing is vital to prevent trans-border crimes, as 60% occur in unfenced areas, and denies that single-row fencing (SRF) has defense potential.
  - Fencing Status:** India has fenced 3,141 km (76%) of the 4,096.7 km India-Bangladesh border. In West Bengal, 81.5% of the 2,217 km border is fenced. Riverine borders, covering 900 km, are guarded by the BSF water wing.
  - Challenges:** Unfenced areas face issues like difficult terrain, riverine borders, and local opposition.
- Why is border fencing important for India?
- Prevents Trans-Border Crimes:** 60% of crimes occur in unfenced areas. Fencing helps reduce smuggling and illegal crossings.
  - Controls Animal Movement:** Fencing in places like Mekhliganj prevents cattle from damaging crops.
  - Secures Sensitive Areas:** Dahagram-Angarpota, a Bangladeshi enclave in India, faces security challenges.

**GS PAPER2- GOVERNANCE-ISSUES RELATING TO DEVELOPMENT AND MANAGEMENT OF SOCIAL SECTOR/SERVICES RELATING TO HEALTH, HUMAN RESOURCES**

**Debating the Future of Workweek Hours**

The article discusses the evolving workweek, highlighting debates around shorter work hours versus longer workweeks. It explores trials of four-day workweeks, historical reductions in work hours, technological impacts on productivity, and contrasting views of wealthy individuals and economists on work-life balance.

**What Are the Differing Views on Work Hours?**

- Support for Shorter Workweeks**
- Over 90% of UK companies implemented a four-day workweek after a successful 2022 trial.
- John Maynard Keynes predicted a 15-hour workweek by 2030 due to rising living standards and technological advancements.
- Andrew Barnes' company, Perpetual Guardian, in New Zealand, showed that employees were happier and more productive with a four-day workweek at full pay.
- Jack Ma stated that technological advancements might allow people to work three days a week, four hours a day, in the next 20 years.
- John Maynard Keynes predicted in 1930 that improved living standards would lead to much shorter work hours by 2030.
- Support for Longer Workweeks**
- N.R. Narayana Murthy suggested young Indians work 70 hours per week to boost India's economy.
- L&T's chairman supports a 90-hour workweek.
- Elon Musk advised employees to prepare for 80-hour workweeks at Twitter in 2022.
- Jack Ma earlier defended China's 12-hour, six-day work culture in 2019.

**How Do Shorter Workweeks Impact Productivity and Well-being?**

- Improved Productivity:** Trials in the UK showed that more than 90% of businesses continued a four-day workweek due to its success in maintaining productivity.
- Enhanced Employee Happiness:** New Zealand's Perpetual Guardian employees experienced higher focus, happiness, and better personal engagement after adopting a four-day workweek.
- Better Work-Life Balance:** Portugal's gradual reduction of the workweek from 44 to 40 hours benefited women and employees with family responsibilities.
- Health Benefits:** Shorter workweeks reduce stress, as highlighted in Japan's efforts to address overwork deaths, where 54 cases occur annually.
- Economic and Environmental Advantages:** Rutger Bregman, in his 2016 article in *The Guardian*, argued that cutting back on work hours could improve worker safety and address **environmental issues, stress, inequality, happiness, and unemployment.**

**What Is the Future of Work Hours?**

Keynes and Jack Ma foresee AI enabling shorter workdays. The future might bring seismic workplace changes, possibly reducing workweeks to 90 hours monthly instead of weekly. The effectiveness of AI in achieving this remains to be seen. vulnerability and disaster management.

**GS PAPER3-CONSERVATION, ENVIRONMENTAL POLLUTION AND DEGRADATION, ENVIRONMENTAL IMPACT ASSESSMENT**

**India's Annual Groundwater Quality Report 2024**

The article discusses India's heavy reliance on groundwater for drinking and irrigation, highlighting severe contamination issues. It explains causes like industrial waste and fertilisers, impacts on health and crops, and suggests sustainable practices, local management, and better policies for improvement.

**What does the Annual Groundwater Quality Report 2024 reveal?**

- High Reliance on Groundwater:** Groundwater meets 85% of rural drinking water and 62% of irrigation needs in India.
- Widespread Contamination:**
  - 20% of groundwater samples exceeded the permissible nitrate limit.
  - 9.04% had unsafe fluoride levels.
  - 3.55% were contaminated with arsenic, especially in the Ganga-Brahmaputra floodplains.

**3. Regional Variations:**

- Arunachal Pradesh, Mizoram, and Meghalaya showed 100% compliance with water quality norms.
- Hotspots like Rajasthan, Punjab, Haryana, and Andhra Pradesh showed severe contamination.
- Punjab's nitrate pollution results from excessive fertiliser use.

**4. Urban Challenges:** Industrial effluents and untreated sewage worsen urban groundwater quality, leading to microbial contamination.

**5. Impact on Agriculture:** Salinity in coastal regions reduces crop productivity.

**What are the main causes of groundwater contamination?**

1. **Agricultural Chemicals:** Excessive use of fertilizers and pesticides leads to nitrate contamination. Punjab faces high nitrate levels due to agricultural runoff.
2. **Industrial Activities:** Unregulated industrial discharge pollutes aquifers.
3. **Natural Leaching:** Minerals naturally seep into groundwater, increasing contamination.
4. **Sewage and Effluents:** Urban areas suffer from untreated sewage and industrial effluents.
5. **Salinity and Seawater Intrusion:** Over-extraction causes salinity issues in coastal regions.

**What are the consequences of Contaminated Groundwater?**

1. **Public Health Risks:** Toxic substances like fluoride (9.04% samples), nitrate (20%), and arsenic (3.55%) cause serious health issues, especially in regions like the Ganga-Brahmaputra floodplains.
2. **Agricultural Impact:** Contaminated water reduces crop yields and introduces harmful chemicals into the food chain. For example, coastal farmers face reduced productivity due to salinity caused by seawater intrusion.
3. **Urban Challenges:** Microbial contamination from untreated sewage and industrial effluents affects urban groundwater quality.
4. **Regional Variations:** Punjab's high nitrate levels, due to fertilizer runoff, make groundwater unsafe for drinking

**What solutions can improve groundwater quality?**

1. **Sustainable Farming Practices:** Reduce nitrate contamination by minimizing chemical fertilizer use, as seen in Punjab.
2. **Affordable Water Filtration:** Provide low-cost filtration to poor households to tackle fluoride and arsenic contamination.
3. **Rainwater Harvesting:** Expand Tamil Nadu's successful rainwater harvesting model.
4. **Arsenic Mitigation:** Scale up programmes like West Bengal's arsenic-mitigation efforts.
5. **Aquifer Recharging:** Recharge groundwater using treated water.
6. **Local Management:** Empower gram panchayats to create water-security plans incorporating indigenous knowledge.
7. **Monitoring Systems:** Set up hydrogeological monitoring networks for better data collection.
8. **Legislation:** Enforce groundwater rights detached from land ownership to regulate use effectively.

**Intersection of Culture and Innovation**

Dr. Chintan Vaishnav, the former Mission Director of Atal Innovation Mission (AIM), highlighted the intersection of culture and innovation during his tenure.

**Relationship Between Culture and Innovation:**

- **Culture Boosts Innovation:**
  - **Encouraging Risk-Taking:** Societies that celebrate risk-taking foster creativity and entrepreneurial ventures. E.g. Countries like the USA thrive on a culture of innovation, where failure is seen as a stepping stone.
  - **Collaborative Mindset:** Cultures that encourage collaboration across academia, industries, and governments lead to breakthrough technologies. E.g. Silicon Valley thrives on academia-industry partnerships.
  - **Freedom to Experiment:** Environments that remove the fear of failure (e.g., Atal Tinkering Labs) promote grassroots innovation. E.g. Rural India producing more innovations than urban centres in AIM labs.
  - **Inclusivity:** Diverse cultural settings bring varied perspectives, driving innovation across sectors.
- **Culture Hinders Innovation:**
  - **Risk Aversion:** Indian families often prioritize secure jobs over entrepreneurship, discouraging innovative career paths. E.g. Students preparing for government jobs rather than starting ventures.
  - **Siloed Thinking:** Lack of trust and collaboration between academics, industries, and government slows innovation. E.g. Limited R&D investments by corporations due to profit-focused mindsets.
  - **Rigid Education Systems:** Exam-oriented systems limit students' exposure to problem-solving and creativity.
  - **Fear of Failure:** Societal stigma around failure discourages experimentation.

**PRELIM FACTS**

**1.National Turmeric Board**

Union Minister of Commerce and Industry has inaugurated the National Turmeric Board.

**About National Turmeric Board**

- The National Turmeric Board has been set up to focus on the *overall development and growth of the turmeric sector* in the country.
- **Headquarters:** Nizamabad, Telangana.
- The board will function under the *Ministry of Commerce and Industry*.

- **Functions:**
  - Focussing on the *welfare of the turmeric farmers* spread across 20 states, including Maharashtra, Tamil Nadu, Andhra Pradesh, Madhya Pradesh, Meghalaya and others.
  - Promoting *research and development* of new turmeric products and investigating the value addition of turmeric related products for marketing abroad.
  - *Creating awareness* on the essential and medical properties of turmeric
  - *Ensuring quality and safety standards* of turmeric production and exports.
  - *Facilitating coordination* with other Government Departments/Agencies in matters pertaining to the turmeric sector.
  - Making efforts for *increasing trade of turmeric* and its products, especially given the health and wellness benefits of turmeric.

**About Turmeric Sector in India**

Turmeric is also known as the Golden Spice.

India is the largest producer, consumer and exporter of turmeric in the world.

During 2023-24, India was responsible for over 70% of global turmeric production.

There are 30 varieties of turmeric produced in India.

**2. First Private Satellite Constellation**

India's space industry marked a historic milestone with the launch of its first private satellite constellation by Google-backed Pixxel, a Bengaluru-based space-tech startup.

**About India's First Private Satellite Constellation:**

- **What it is:** A private satellite constellation of **six hyperspectral imaging satellites** launched by **Pixxel**, backed by Google.
- **Organizations involved:** Developed by **Pixxel**, with collaboration from **SpaceX**, which facilitated the launch.
- **Launch location:** **Vandenberg Space Force Base**, California, USA.
- **Aim:** To provide **high-resolution hyperspectral imaging** to improve insights in agriculture, mining, environmental monitoring, defense, and resource management.
- **Features:**
  - **Hyperspectral Imaging Technology:** Captures detailed data across hundreds of light bands, enabling superior precision and insights compared to traditional satellite imaging.
  - Applications include improving **crop yields**, **tracking natural resources**, **monitoring oil spills**, and surveying geographic boundaries.
  - Part of a plan to launch **18 additional satellites** by 2029 to expand capabilities and meet growing demand.
  - Pixxel has secured **65 clients**, including British Petroleum, and India's Ministry of Agriculture, to utilize its cutting-edge data services.

**3. Atomic Energy Commission**

The Indian government recently reconstituted the Atomic Energy Commission (AEC) to include key figures such as T.V. Somanathan, Manoj Govil, and Pankaj Kumar Mishra, along with other eminent personalities from diverse fields.

**About Atomic Energy Commission (AEC):**

- **What it is:** The **Atomic Energy Commission (AEC)** is the apex policy-making body in India for atomic energy, nuclear research, and related applications.
- **Established in:** Initially set up in **August 1948** under the Department of Scientific Research, it was formally established in its current form on **March 1, 1958**, within the Department of Atomic Energy (DAE).
- **Ministry:** Functions directly under the **Department of Atomic Energy**, which is under the **Prime Minister's direct charge**.
- **Headquarters:** Located in **Mumbai**, Maharashtra.
- **Aim:** To advance nuclear science, research, and energy initiatives in India for peaceful and strategic applications.
- **Members:**
  - **Chairperson:** Secretary of the Department of Atomic Energy.
  - **Ex-officio Members:**
    - National Security Adviser
    - Principal Secretary to PM
    - Foreign Secretary
    - Cabinet Secretary
    - Expenditure Secretary
    - Eminent scientists and former chairpersons
- **Functions:**
  - **Policy Formulation:** Shapes India's nuclear energy and research policies.
  - **R&D Oversight:** Promotes research in nuclear science, including applications in energy, medicine, and agriculture.
  - **International Collaboration:** Engages in global nuclear agreements and partnerships.
  - **Energy Production:** Supports initiatives for nuclear power generation and clean energy.
  - **Regulation and Safety:** Ensures adherence to safety standards in nuclear facilities.

#### 4. Kumani Bank Mud Volcano

The Kumani Bank mud volcano, located off Azerbaijan's eastern coast, erupted in 2023, creating a short-lived island, popularly termed a "Ghost Island." By the end of 2024, this ephemeral island had largely eroded back into the sea.

**About Kumani Bank Mud Volcano:**

- **Located in:** Situated approximately **25 km (15 miles)** off the eastern coast of Azerbaijan in the Caspian Sea.
- **What is a Ghost Island?**
  - A **Ghost Island** refers to a temporary landmass created by volcanic activity, particularly mud volcanoes, that erodes back into the water over time.
- **Ephemeral Nature:**
  - The island formed in **2023**, measuring **400 meters (1,300 feet)** across.
  - By late 2024, it had nearly disappeared into the sea.
- **Significance:**
  - **Geological Insights:** Helps scientists understand **tectonic processes** and **subsurface pressure dynamics**.
  - **Martian Analogs:** Provides clues about similar features on **Mars**, aiding in planetary exploration studies.
  - **Environmental Impact:** Linked to the **South Caspian Basin's hydrocarbon system**, contributing to methane and gas emissions.
  - **Regional Importance:** Highlights Azerbaijan's unique geological landscape, which boasts **300+ mud volcanoes**, the largest concentration globally.

**About Caspian Sea:**

- **Located in:**
  - The **Caspian Sea** is the **world's largest inland body of water**, spanning approximately **386,400 sq. km**.
  - It is situated between **Asia and Europe**, east of the **Caucasus Mountains** and west of **Central Asia's steppe**.
- **Bordering countries:** Russia, Azerbaijan, Kazakhstan, Turkmenistan and Iran.
- **Rivers draining into Caspian Sea:**
  - **Volga River** (largest contributing river).
  - **Ural River**.
  - **Terek River**.

#### 5. Bharat Climate Forum

**Context:** The Bharat Climate Forum was **recently launched** to position India as a global leader in clean tech manufacturing.

**About Bharat Climate Forum**

- It is a **national platform** which is dedicated to **unifying stakeholders from policy, industry, finance, and research** to accelerate cleantech manufacturing in India.
- **Hosted By:** **The Centre for Indigenous Economic Understanding (CIEU)** and Dalberg Advisors
- **Supported By:** The Forum is supported by key institutions, including the **Ministry of New and Renewable Energy (MNRE)**, **NITI Aayog**, and the **International Solar Alliance (ISA)**.
- **Aim:** To position India as a **global leader in clean tech manufacturing**, fostering self-reliance towards a journey for a Net-Zero and Viksit Bharat.
- **Theme:** The forum will **focus on six foundational themes** that are critical to driving India's net-zero ambitions
  - **Clean energy generation** and storage
  - Manufacturing for Net-Zero
  - E-mobility and green transportation
  - Climate finance and investment mobilization
  - Industrial decarbonization and clean energy transition
  - Building partnerships for climate action and leadership

#### 6. Drishti 10 Starliner

**Context:** A **Drishti 10 Starliner** drone, developed by **Adani Defence and Aerospace**, crashed off the Porbandar coast, Gujarat.

**About Drishti 10 starliner**

- The Drishti 10 Starliner is an **advanced unmanned aerial vehicle (UAV)**.
- **Developed by:** Adani Defence and Aerospace in collaboration with the Israeli firm Elbit Systems.
- commonly known as **Hermes 900**,
- **The drone is a MALE** (Medium Altitude Long Endurance).
- **Indigenous Content:** **Approximately 70%** of the drone is made in India.
- **Payload Capacity:** Can carry a payload of up to 450 kg

**Features**

- **Intelligence, Surveillance, and Reconnaissance (ISR):** The drone is designed for advanced **ISR operations**.
- **Over-the-Horizon Capabilities:** Provides **persistent surveillance** over large maritime territories.

#### **Odisha: 34th State to Implement Ayushman Bharat PM-JAY**

Recently, The Odisha government signed a memorandum of understanding (MoU) with the National Health Authority (NHA) to implement Ayushman Bharat-Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) in the state.

**About AB PM-JAY Implementation in Odisha**

- **Convergence with GJAY:** PM-JAY will be integrated with the existing **Gopabandhu Jan Arogya Yojana (GJAY) in Odisha.**
- **Coverage:**
  - **Financial:** Provides a cover of **Rs 5 lakh per family per annum**, with an additional **Rs 5 lakh for women** members.
  - **Population:** Approximately 1.03 crore families will be covered, with 67.8 lakh families supported by the Union Government.

**Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana (AB PM-JAY)**

- **Ministry:** Ministry of Health & Family Welfare
- **Launched on:** 23rd September 2018
- **Objective:** To provide **Universal Health Coverage (UHC) and ensure affordable healthcare** for all.
- **Components of Ayushman Bharat**
  - **Health and Wellness Centres (HWCs):** Provide primary healthcare services such as prevention, promotion, and ambulatory care.
  - **Pradhan Mantri Jan Arogya Yojana (PM-JAY):** Offers **secondary and tertiary care hospitalization benefits** to eligible families.
- **Key Features of PM-JAY**
  - World’s largest health assurance scheme.
  - Health coverage of **₹5 lakh per family per year**.
  - Provides additional **Rs 5 lakh for women** members.
  - Targets 10.74 crore families (approximately 50 crore beneficiaries), forming the bottom 40% of the Indian population.
  - **No cap on family size or age of family members.**
  - Covers **pre-existing diseases from the first day of enrollment.**

**Gopabandhu Jan Arogya Yojana (GJAY)**

- It is a flagship healthcare scheme launched by the Government of Odisha.
- Named after **Gopabandhu Das**, a revered freedom fighter and social reformer from Odisha.
- **Objective:** Aims to provide free and quality healthcare to economically weaker sections of society.
- **Managed by:** the Health and Family Welfare Department, Odisha.
- **Comparison with Ayushman Bharat**
  - Similar to the **Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana (AB-PMJAY)** in objectives and scope.
  - GJAY is specific to **Odisha and provides higher financial coverage** for women beneficiaries.
- **Key features**
  - **Free Healthcare Services:**
    - Provides free medical care for secondary and tertiary-level treatments.
    - Covers both government and empanelled private hospitals.
  - **Eligibility Criteria:**
    - Covers families based on the Socio-Economic Caste Census (SECC) 2011.
    - Targets economically vulnerable groups, especially those below the poverty line.

**Bharat Ranbhoomi Darshan Project**

The Defence Minister launched the ‘**Bharat Ranbhoomi Darshan**’ on January 15 to mark the 77th Army Day.

**About The Bharat Ranbhoomi Darshan**

- It is an **initiative of the Indian Army to boost “battlefield tourism”** alongside the **forward sites across the country’s borders** which have witnessed some military action in the past.
- **Sites:** The Army has **shortlisted 77 sites** with most of sites falling along **India’s borders with China and Pakistan** including,
  - **Ladakh:** Galwan, Doklam, Dras, Kargil, Siachen base camp
  - **Rajasthan:** Longewala, Thar Desert
  - **Arunachal Pradesh:** Bum La and Kibithu
  - **Sikkim:** Nathu La
- **Ministry:** **The Defence Ministry in partnership with the Ministry of Tourism.**
- The sites will also be highlighted by the Tourism Ministry as **part of the Incredible India campaign.**
- **Aim:** It aims to **educate the public about the nation’s military history**
- To promote the **development of the Border Regions** focusing on the **pillars of, infrastructure, communication, tourism and education.**

**About Battlefield Tourism**

- Battlefield tourism is the **practice of visiting war-related sites for historical study or sightseeing.**
- These sites include **battlefields, cemeteries, memorials, and museums.**
- **Aim:** Battlefield Tourism is a way to learn **about history and experience the emotional impact** of the conflict.

- **Notable Examples:**
- **Gettysburg Battlefield and Pentagon** in the United States, **The Kargil War Memorial** in India and sites of the **World War II** (Gallipoli, Pearl Harbor, and Omaha Beach)

**ANSWER WRITING**

**Q. Critically assess the role of NITI Aayog in strengthening cooperative federalism and fostering innovation in policymaking since 2015. What reforms are required to ensure its continued relevance and effectiveness in addressing India's policy challenges?**

The NITI Aayog, established in 2015 as a successor to the Planning Commission, aims to strengthen cooperative federalism by promoting collaboration between the Centre and states. Through initiatives like the Aspirational Districts Programme and Atal Innovation Mission, it fosters innovation in policymaking. However, challenges like limited financial autonomy necessitate reforms to enhance its relevance and effectiveness in addressing India's evolving policy landscape.

**Positive Role of NITI Aayog in Strengthening Cooperative Federalism and Fostering Innovation**

**Promoting Competitive Federalism:** NITI Aayog introduced performance-based rankings (e.g., Aspirational Districts Programme) to encourage competition and improve governance among states.

**For example: Health Index Rankings** helped states like **Kerala** and **Tamil Nadu** improve healthcare outcomes by adopting targeted policies.

- **Facilitating Policy Coordination:** NITI Aayog created platforms for **dialogue** between the Centre and states, fostering better coordination on critical issues.  
**For example: Governing Council Meetings** provided a forum to align state priorities with national development goals.
- **Encouraging Data-Driven Policy:** It developed indices to track progress in areas like health, education, and agriculture, enabling evidence-based policymaking.  
**For example: The School Education Quality Index (SEQI)** improved educational outcomes in many states including Haryana.
- **Supporting State-Level Reforms:** NITI Aayog provided strategic advice and technical assistance to states for reforming key sectors.  
**For example:** It supported Gujarat's **renewable energy transition** with policy inputs on solar and wind energy.
- **Driving Innovation through Public-Private Partnerships:** By involving private players in policymaking, it introduced innovative solutions to policy challenges.  
**For example:** Collaboration with **McKinsey** for the **Aspirational Districts Programme** streamlined governance and execution.

**Shortcomings of NITI Aayog in Strengthening Cooperative Federalism and Fostering Innovation**

- **Perceived Centralization:** Its focus on rankings and indices led to criticisms of promoting central priorities over state-specific needs.  
**For example:** Aspirational Districts Programme was criticized for lacking state-specific customization in addressing disparities.
- **Limited State Engagement:** Despite its cooperative mandate, it failed to institutionalize robust mechanisms for Centre-state negotiation.  
**For example:** The absence of a budgetary role undermined its authority in facilitating fiscal coordination with states.
- **Dependence on Private Sector:** Excessive reliance on management consultants marginalized academics and civil society, limiting diverse perspectives in policymaking.  
**For example:** Use of consultants like **BCG** sidelined technical experts, raising concerns about independent analysis.
- **Weak Strategic Visioning:** Short-term action plans like **India@75** lacked comprehensive policy frameworks, reducing their long-term impact.  
**For example:** The **Three-Year Action Agenda (2017-2020)** had limited influence on major policy decisions.
- **Failure to Address Regional Disparities:** NITI Aayog has not effectively tackled growing regional inequalities, weakening its cooperative federalism mandate.

**Reforms to Ensure NITI Aayog's Continued Relevance and Effectiveness in Addressing India's Policy Challenges**

- **Grant Financial Powers for Strategic Planning:** Empower NITI Aayog with financial resources to implement coherent medium- and long-term strategies to address key challenges like regional disparities.  
**For example:** Restoring budgetary powers, similar to the **Planning Commission**, can enable resource allocation to bridge gaps in underdeveloped states like Bihar and Odisha.
- **Foster an Inclusive and Transparent Policymaking Framework:** Institutionalize democratic dialogue with diverse stakeholders, including states, academics, and civil society, to enhance policy credibility and inclusiveness.  
**For example:** A structured mechanism for public consultations during **India@100 strategic planning** can ensure policies address grassroots concerns and foster acceptance.
- **Promote Evidence-Based Policymaking:** Develop a credible knowledge system by collaborating with universities, research institutions, and think tanks to provide **data-driven** and **independent policy** advice.  
**For example:** Partnerships with institutes like **IISc Bengaluru** for climate policy formulation could improve the rigor and applicability of policies.
- **Strengthen Centre-State Bargaining Mechanisms:** Create institutionalized mechanisms for inter-ministerial and Centre-State negotiations to address development issues and minimize regional imbalances.

**For example:** A formalized Centre-State council under NITI Aayog can address richer states' concerns about fiscal devolution, as raised in **13th Finance Commission** debates.

- **Enhance Autonomy and Reduce Centralization:** Establish NITI Aayog as an independent body, limiting its susceptibility to Union government priorities, to make it a credible think tank for Team India.

**For example:** Empowering state-level think tanks aligned with NITI Aayog's agenda could enhance competitive federalism and allow decentralized policymaking.

To ensure NITI Aayog's continued relevance, India must focus on empowering states, fostering data-driven innovation, and promoting inclusive development. Strengthening decentralized planning, enhancing stakeholder collaboration, and aligning policies with global sustainability goals will enable NITI Aayog to drive transformative governance and address the evolving policy challenges of a dynamic India.

**MCQ**

- With reference to 'Turmeric cultivation', consider the following statements:
  - The leading export markets for Indian Turmeric are Bangladesh, UAE, USA and Malaysia.
  - Turmeric plant is native to the Indian subcontinent and Southeast Asia
  - Lakadong Turmeric from Meghalaya has received a Geographical Indication (GI) tag.
 How many of the statements given above are correct?
  - Only one
  - Only two
  - All three**
  - None
- With reference to Mission Mausam, consider the following statements:
  - The mission aims to enhance India's capacity for accurate weather forecasting, disaster management, and climate resilience.
  - Ministry of Science and Technology is responsible for implementing Mission Mausam.
  - It will enhance air quality forecasting in metro cities.
 Which of the statements given above are correct?
  - 1 and 2 only
  - 2 and 3 only
  - 1 and 3 only**
  - 1, 2 and 3
- Which one of the following correctly differentiates Small Language Models (SLM) with Large Language Models (LLM)?
  - SLMs require significantly more computational resources compared to LLMs for training and inference.
  - SLMs are designed for domain-specific tasks, while LLMs are general-purpose and trained on diverse datasets.**
  - SLMs outperform LLMs in natural language understanding tasks due to their focused architecture.
  - SLMs are based on traditional rule-based systems, while LLMs use neural network architectures.
- Recently, there was news about the launch of a missile featuring fire-and-forget technology. Which one of the following statements correctly describes this technology?
  - A missile guidance system that does not require further external intervention after launch and autonomously tracks and hits its target.**
  - A technology where a missile requires continuous guidance from the operator until it hits the target.
  - A system where the missile can only hit stationary targets due to pre-programmed trajectories.
  - A missile system that relies on wire-guidance to maintain accuracy during flight.
- Which of the following is a key feature of Mission Mausam?
  - Deployment of advanced weather observation radars and satellites**
  - Preservation of ancient maritime trade routes
  - Creation of a unified global climate change treaty
  - Establishment of an exclusive task force for disaster response
- Which of the following factors primarily contributes to the formation of sads landscapes?
  - Volcanic eruptions leading to basaltic layers
  - Erosion and weathering of lateritic soils over centuries**
  - Deposition of alluvial sediments during monsoons
  - Glacial activity in the past geological eras
- Consider the following statements about the PKC River Link Project:
  - It diverts water exclusively for drinking water supply.
  - It completely avoids any impact on wildlife habitats.
  - It is a transboundary project involving India and Bangladesh.
 How many of the above statements is/are correct?
  - Only one
  - Only two
  - All three**
  - None**
- Consider the following statements about rat-hole mining:
  - It is primarily conducted in the Western Ghats region of India.
  - Modern machinery is used extensively to improve efficiency.
  - It is considered a sustainable method of coal extraction.
 How many of the above statements is/are correct?
  - Only one
  - Only two
  - All three**
  - None**
- The restoration efforts by state officials at Pallikarai Marshland and Vettangudi Bird Sanctuary have recently led to a significant rise in the number of migratory birds visiting these locations. They are situated in:
  - Kerala
  - Tamil Nadu**
  - Andhra Pradesh
  - Karnataka
- The term 'blood money' often seen in news refers to:
  - Illicit money earned through money laundering.
  - Money paid by the perpetrator of the crime to the victim, or the victim's family if the latter has died.**
  - Money collected through crowd funding for charity purposes.
  - None of the above