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Content

Active Empowerment Of Specially-Abled in India

This editorial is based on "Enabling legislation: on Tamil Nadu Bills, persons with disabilities" which was published in The Hindu on 21/04/2025. The article brings into picture Tamil Nadu's pioneering move to reserve posts for persons with disabilities in local bodies, highlighting a shift from tokenism to true inclusion.

Tag: GS Paper - 2, Government Policies & Interventions, Welfare Schemes

Tamil Nadu's landmark legislation guaranteeing positions for **persons with disabilities across local governing bodies** represents a revolutionary step in inclusive governance by elevating disabled citizens from **marginalized status to community leadership roles**. This first-of-its-kind policy in India creates pathways for dignity and participation that extend beyond **tokenistic inclusion**. In a broader Indian context, it sets a progressive precedent for other states to emulate, reinforcing the **constitutional vision of equality, empowerment, and grassroots democracy.**

What are the Key Provisions in India for the Active Development of Persons with Disabilities?

- 💡 **Key Constitutional Provisions:**
  - ✦ **Article 14 - Right to Equality:** Guarantees equality before the law and protection from discrimination for all, including PwDs, ensuring equal rights and opportunities.
  - ✦ **Article 15 - Prohibition of Discrimination:** Prohibits discrimination, allowing the state to make special provisions for PwDs' welfare.
  - ✦ **Article 16 - Equality of Opportunity in Employment:** Provides equal opportunity in public employment and supports job reservations for PwDs in government sectors.
  - ✦ **Article 41 - Right to Work and Education:** Directs the state to provide employment, education, and public assistance for PwDs, forming the basis for welfare schemes.

- 💡 **Other Provisions:**
  - ✦ **Rights of Persons with Disabilities (RPwD) Act, 2016:** The RPwD Act, 2016 is the cornerstone of legal provisions for PwDs in India.
    - 🖉 **It expanded the definition of disability to include 21 categories,** such as mental illness, autism, and cerebral palsy.
    - 🖉 It provides for a **4% reservation in government jobs for PwDs in all categories,** including government departments and public sector enterprises.
      - 👨‍🦽 Additionally, 5% reservation is provided for PwDs in government educational institutions.
  - ✦ **Accessible India Campaign (Sugamya Bharat Abhiyan):** The **Accessible India Campaign, launched in 2015**, focuses on creating accessible infrastructure, digital spaces, and services for PwDs.
    - 🖉 The campaign aims to make public transport, buildings, and government websites more accessible by introducing universal design principles.
  - ✦ **Deendayal Disabled Rehabilitation Scheme (DDRS):** The DDRS is a flagship scheme under the **Ministry of Social Justice and Empowerment** that provides grants to Non-Governmental Organizations (NGOs) working in the area of disability rehabilitation.
    - 🖉 This scheme supports activities related to the rehabilitation of PwDs, such as skill development, vocational training, and awareness programs
  - ✦ **National Trust for Welfare of Persons with Autism, Cerebral Palsy, Mental Retardation, and Multiple Disabilities:** The **National Trust Act, 1999,** aims to provide services for persons with specific disabilities, such as autism, cerebral palsy, and mental retardation.

What are the Key Issues Associated with Persons with Disabilities in India?

- 💡 **Barriers in Education and Skill Development:** Despite progressive policies like the <u>National Education Policy (NEP) 2020</u>, PwDs continue to face educational exclusion due to lack of accessible infrastructure, inadequate teacher training, and societal stigma.
  - ✦ A 2019 report stated that **more than one in four children with disabilities between ages 5 and 19 in India** have never attended any educational institution
    - 📎 This education gap contributes to their **exclusion from skilled employment,** perpetuating cycles of poverty and marginalization.
- 💡 **Lack of Adequate Employment Opportunities:** Despite legislative provisions like the **Rights of Persons with Disabilities (RPwD) Act, 2016**, there is still a marked gap in employment opportunities for PwDs.
  - ✦ **Discriminatory hiring practices, inadequate workplace accommodations**, and societal stigma hinder their participation in the labour market.
  - ✦ According to recent NSS data, **only 36% of PwDs are employed, with men (47%) having better chances than women (23%) in securing jobs**.
- 💡 **Inadequate Accessibility and Infrastructure:** The lack of accessible infrastructure—ranging from transportation to public buildings—remains a critical barrier to social participation for PwDs.
  - ✦ Even with the **Accessible India Campaign launched in 2015**, infrastructure remains largely inaccessible, especially in rural areas.
  - ✦ According to a 2018 report by the **Department of Empowerment of Persons with Disabilities, only 3% of buildings in India** were found to be fully accessible

- 📎 Even where they seek justice, persons with disabilities face exclusion, as **courts often lack wheelchairs, proper ramps, and accessible infrastructure,** as noted by the **Centre for Research and Planning.**
- 💡 **Healthcare and Rehabilitation Services:** Access to adequate healthcare services and rehabilitation for PwDs is another pressing issue.
  - ✦ While schemes like the **Deendayal Disabled Rehabilitation Scheme** aim to provide support, many PwDs, especially those with severe disabilities, face inadequate healthcare provisions.
  - ✦ Recent surveys indicate that **around one-fifth (20.32%) of the household's (having PwD) monthly consumption expenditure** was spent on out-of-pocket expenditure for disability in India.
- 💡 **Social Stigma and Discrimination:** Social stigma and negative societal attitudes towards PwDs are among the most pervasive challenges.
  - ✦ These attitudes manifest in discrimination in **workplaces, educational institutions, and public spaces.**
  - ✦ The widespread societal belief that **disability equates to incapacity fosters exclusionary practices.**
  - ✦ For example, the high unemployment rate among women with disabilities illustrates how gender biases, combined with disability, worsen their social and economic exclusion.
- 💡 **Unequal Social Security and Welfare Support:** Despite the existence of social security schemes such as the **National Disability Welfare Fund,** PwDs often do not benefit fully from these programs due to inadequate implementation and lack of awareness.
  - ✦ While the **RPwD Act mandates reservation in government jobs** and educational institutions, compliance remains inconsistent, especially in the private sector.

- According to the **NSS 76th round survey**, the percentage of persons with disabilities who received aid/help from Government was **just 21.8%** and another 1.8% received aid/help from organisations other than Government.

💡 **Barriers in Access to Technology and Assistive Devices:** The absence of affordable and accessible assistive technologies remains a significant issue for PwDs.

  - While technological innovations can enhance independence, their availability remains scarce, especially in rural areas.

  - As per the latest data, **less than 10% of PwDs have access to necessary assistive devices.** Moreover, in a country with over 2.68 crore PwDs, the lack of integration of technology in daily life for this **group restricts their ability to access education, work, and even social services**, deepening their exclusion from mainstream society.

💡 **Limited Participation in Political and Civic Life:** Despite recent strides in political inclusion—like the Tamil Nadu government's initiative to nominate persons with disabilities to local bodies—**PwDs remain underrepresented in decision-making processes.**

  - The lack of adequate political representation and participation in governance undermines the voices and concerns of this marginalized group.

  - Their limited participation in **civic and political spaces results in policies that often overlook their needs.**

What Measures can India Adopt for Active Empowerment and Inclusion of PwDs?

💡 **Enhanced Accessibility Infrastructure:** India must adopt a comprehensive and uniform approach to building accessible infrastructure across urban and rural areas, building upon the <u>UN Convention on the Rights of Persons with Disabilities (CRPD) (2006).</u>

  - This includes the **implementation of universal design standards for public transportation, schools**, government buildings, and workplaces.

  - The government must mandate the **construction of ramps, lifts, tactile pathways, and accessible toilets in all public spaces.**

    - Moreover, **regular accessibility audits** should be conducted to ensure compliance with accessibility laws.

💡 **Inclusive Education Systems:** To ensure that children with disabilities have equal educational opportunities, India must invest in **inclusive education at all levels, from primary to higher education, adhering to the Salamanca Statement.**

  - This entails **not only physical accessibility in schools but also curricular adaptations**, teacher training, and support services.

  - A national policy should be **established to provide financial incentives to schools for integrating assistive technologies** and specialized learning methods

💡 **Private Sector Engagement for Disability Inclusion:** India should establish stronger mandates for the private sector to hire PwDs, along with **clear incentives for companies that achieve disability-inclusive hiring practices.**

  - This can be achieved by incentivizing businesses **through tax breaks, subsidies, and recognition programs** for creating inclusive workplaces.

  - Additionally, employees who acquire disabilities during service must not be terminated and should be offered alternative employment, as mandated by Section 47 of the PwD Act and upheld by the **Supreme Court in *Bhagwan Dass v. Punjab State Electricity Board (2003).***

- **Vocational Training and Skill Development:** India must expand its vocational training programs to equip PwDs with the technical skills required in various industries, especially in the rapidly growing digital economy.
  - ✦ These programs should be **customized to cater to the diverse types of disabilities and should include online courses**, apprenticeship programs, and mentorship opportunities.
  - ✦ **Public-private partnerships** could be instrumental in designing inclusive vocational programs, ensuring that they are accessible, relevant, and geared toward both urban and rural PwDs.

- **Strengthening Legal and Policy Frameworks:** While India has made strides with the RPwD Act, **there is an urgent need for more robust enforcement mechanisms** to ensure that policies are effectively implemented at the ground level.
  - ✦ This includes creating a **dedicated disability commission** with the authority to **oversee the implementation of disability laws**, conduct investigations, and impose penalties for non-compliance.
  - ✦ Additionally**, government agencies must regularly update data on PwDs,** ensuring that policies are based on real-time, comprehensive information.

- **Support for PwD Entrepreneurs:** To foster economic independence and self-reliance, India should **establish dedicated entrepreneurship support programs for PwDs.**
  - ✦ These programs can include access t**o low-interest loans, business development workshops**, and mentorship from successful entrepreneurs with disabilities.
  - ✦ Furthermore, **government-backed platforms should be created for marketing products made by PwD entrepreneurs**, ensuring that their businesses gain visibility and recognition.

- ✦ Encouraging **self-help groups (SHGs) for PwD entrepreneurs** would also help in fostering community-driven business ventures.
  - 🖉 More role models like **Preethi Srinivasan (Former state-level cricketer turned disability rights activist and co-founder of Soulfree)**, should be brought into the spotlight.
  - 🖉 **Shark Tank India's "Divyang Special" Episode** was a significant step.

- **Social Awareness and Attitudinal Change Campaigns:** The government should launch a national campaign to change public attitudes towards disability, focusing on promoting the **capabilities of PwDs and combating stereotypes.**
  - ✦ Sensitization training should also be integrated into the curricula of schools and universities, with an emphasis on inclusion from a young age.
  - ✦ By fostering a **culture of empathy and understanding,** India can break down the stigma and discrimination that PwDs face in everyday life. More movies like **"Taare Zameen Par" and "Srikant"** should be promoted.

- **Improved Healthcare and Rehabilitation Services:** To enhance the overall quality of life for PwDs, India should create a more comprehensive healthcare and rehabilitation infrastructure that includes **access to specialized medical care, physical therapy, and mental health services.**
  - ✦ The government should ensure that **rehabilitation services are available at both the primary and tertiary levels of healthcare**, including mobile rehabilitation units for rural areas.
  - ✦ Additionally, **health insurance policies should be made inclusive of PwDs,** covering essential assistive devices and treatment costs, allowing for better healthcare access and reduced out-of-pocket expenses.

Conclusion:

Tamil Nadu's initiative marks a paradigm shift toward **inclusive democracy by empowering persons with disabilities at the grassroots level.** It reflects India's commitment to constitutional equality, the spirit of **"leave no one behind**." and **commitment to change the notion of disabled to specially abled.** Such steps directly advance **SDG 10 (Reduced Inequalities) and SDG 16 (Peace, Justice, and Strong Institutions**) by promoting participatory governance and social justice.

India'S Path to Global Health Leadership

This editorial is based on "[Landmark agreement: On the draft WHO Pandemic Agreement](#)" which was published in The Hindu on 22/04/2025. The article brings into picture the finalized WHO Pandemic Agreement, which ensures fair pathogen sharing and access to treatments.

Tag: GS Paper - 2, Health, Important International Institutions, GS Paper - 3, Government Policies & Interventions

The recent finalization of the proposal of **WHO Pandemic Agreement** marks a watershed moment in global health governance. While more limited than initially envisioned, the agreement establishes **crucial pathogen sharing and benefit systems** that guarantee **developing nations access to treatments derived from their shared samples.** India, with its robust pharmaceutical industry, diplomatic influence as a **voice for the Global South,** and **experience navigating health crises**, is uniquely positioned to play a pivotal role in implementing this agreement and shaping **more equitable global health architectures.**

What are the Key Health Challenges Confronting the Globe?

- 💡 **Inequitable Access to Vaccines and Medical Countermeasures:** A significant global health issue remains the **unequal distribution of vaccines,** diagnostics, and treatments, particularly between developed and developing countries.
  - ✦ Despite global efforts, **many low- and middle-income countries (LMICs)** still face delays in accessing essential health products.
  - ✦ During the Covid-19 pandemic, over 80% of the vaccines were administered in high-income countries (2021), while LMICs struggled with access.
- 💡 **Growing Threat of Antimicrobial Resistance:** **Antimicrobial resistance (AMR)** is rapidly becoming one of the most **pressing global health threats**, exacerbated by overuse and misuse of antibiotics.
  - ✦ AMR leads to the **development of "superbugs"** that cannot be treated by standard antibiotics, threatening the effectiveness of medical treatments globally.
  - ✦ By 2030, **antimicrobial resistance** could force up to **24 million people into extreme poverty.** Currently, at least 700,000 people die each year due to drug-resistant diseases
- 💡 **Non-Communicable Diseases and Lifestyle-Related Health Risks:** **Non-communicable diseases (NCDs)** like **heart disease, diabetes, and cancer continue to rise globally,** fueled by lifestyle factors such as **poor diet, lack of physical activity, and tobacco use.**
  - ✦ These diseases place a massive burden on **global health systems,** particularly in low- and middle-income countries that lack sufficient healthcare infrastructure to address prevention and treatment.
  - ✦ **According to WHO, NCDs account for 71% of global deaths annually**, with the majority of these deaths occurring in low- and middle-income countries.
    - 🖉 The Covid-19 pandemic further exacerbated **NCDs as lifestyle disruptions** led to an increase in mental health issues and unhealthy habits globally.

Antibiotic Resistance cycle:
- Antibiotics are given to patients, drug-resistant bacteria developing in the gut
- Patient attends hospital
- Drug-resistant bacteria spreads to other patients
- Drug-resistant bacteria spreads to the general public
- Drug-resistant bacteria reaches humans through food
- Animals develop drug-resistant bacteria
- Antibiotics are given to animals and crops
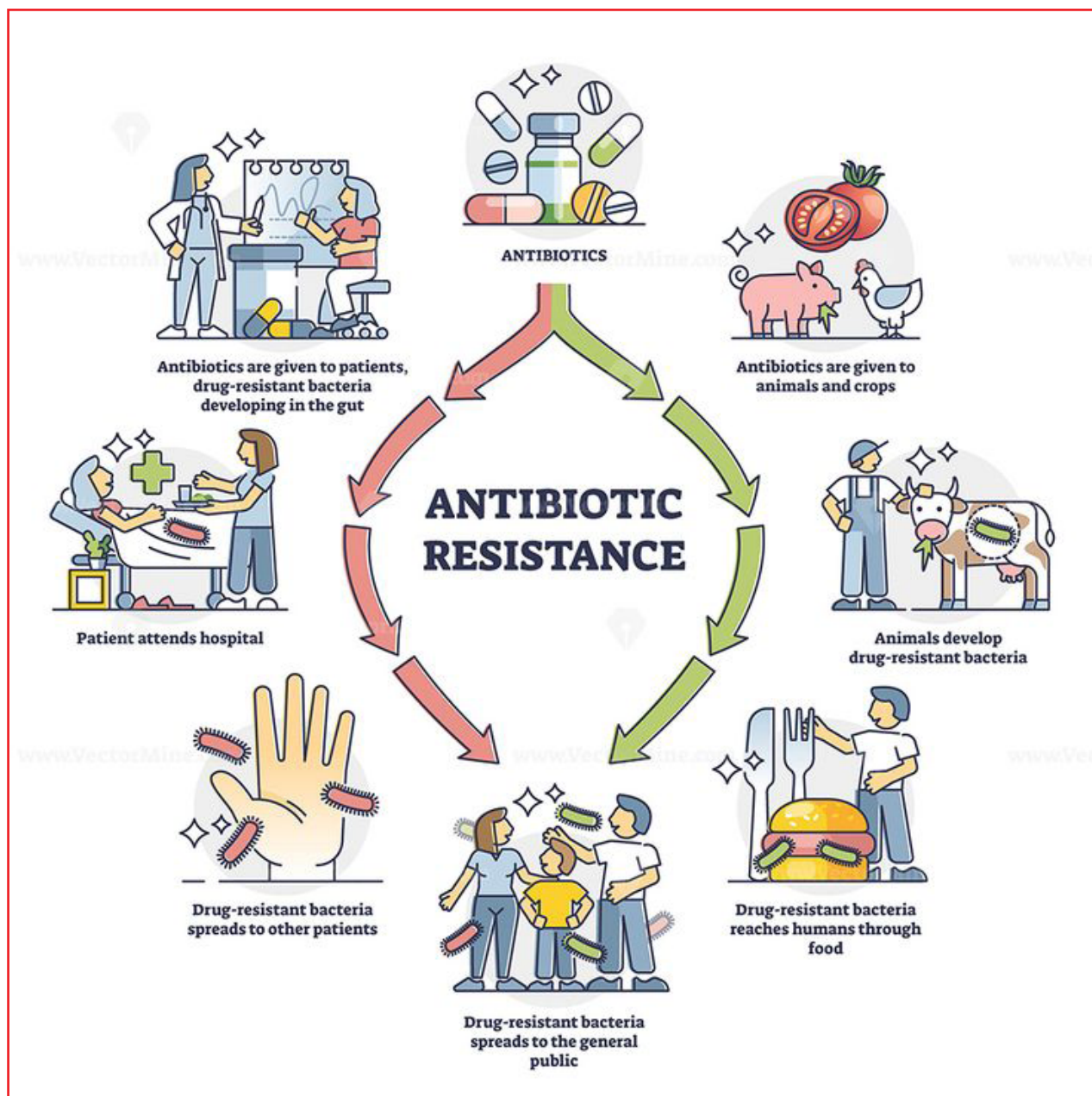
💡 **Climate Change and its Impact on Health:** <u>Climate change</u> is increasingly recognized as a major global health threat, with **rising temperatures, <u>extreme weather events,</u> and environmental degradation** affecting human health.

　✦ The direct effects include respiratory diseases due to pollution and heat-related illnesses, while the indirect effects **exacerbate food insecurity, water scarcity, and the spread of infectious diseases.**

　✦ Research shows that **3.6 billion people already live in areas highly susceptible to climate change.**

　　✐ Between 2030 and 2050, climate change is expected to cause approximately 250 000 additional deaths per year, **from undernutrition, malaria, diarrhoea and heat stress alone.**

CLIMATE CHANGE IMPACTS HEALTH

CLIMATE CHANGE	HAZARDS	IMPACTS
SHIFTING RAINFALL	FLOODS & DROUGHTS	INJURY
WARMING TEMPERATURES	VIOLENT STORMS	MENTAL ILLNESS
	EXTREME HEAT	HEAT STRESS
WILDFIRES	FIRE & SMOKE	INSECT-BORNE DISEASES
		LUNG DISEASE & ALLERGIES
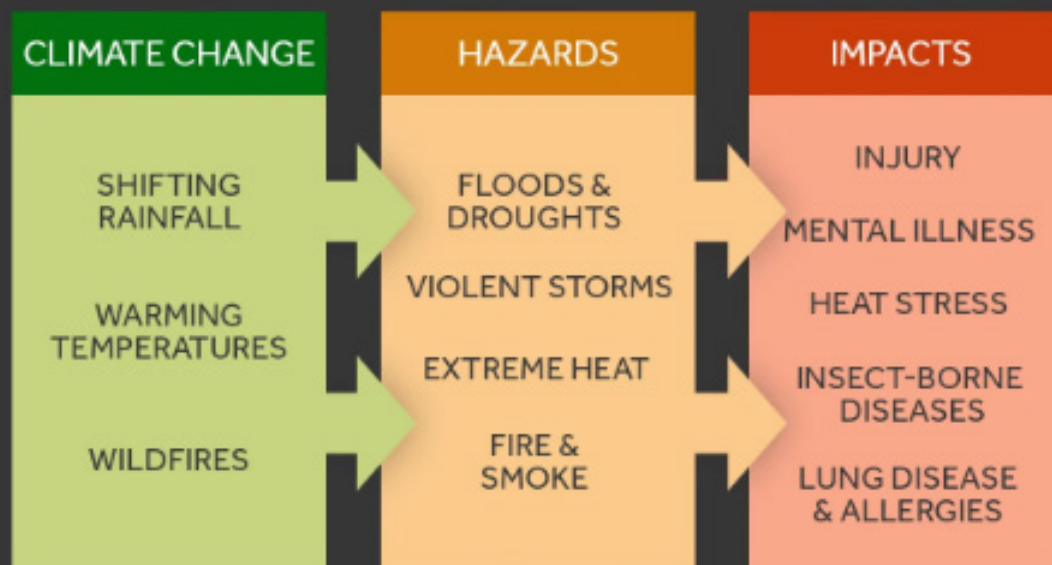
- **Mental Health Crisis:** The mental health crisis has escalated, worsened by the social and economic effects of the COVID-19 pandemic.
  - The global rise in **mental health disorders, including depression and anxiety,** has put a strain on healthcare systems worldwide, demanding more attention to mental health care as part of public health strategies.
  - For instance, the **WHO reported a 25% increase in anxiety and depression worldwide during the first year of the Covid-19 pandemic**.
    - In India, national studies **reveal that 15% of India's adult population experiences mental health issues** requiring intervention. Urban areas have a higher prevalence **(13.5%)** compared to rural **(6.9%)**.
- **Health Workforce Shortages and Migration:** A shortage of trained healthcare professionals is a major challenge in many parts of the world, **especially in rural and underserved regions.**
  - The **migration of healthcare workers from low-income to high-income countries** exacerbates this issue, highlighting the need for better workforce training, retention strategies, and international cooperation on healthcare labor policies.
  - A recent research estimated that in 2020, the global workforce stock was **29.1 million nurses, 12.7 million medical doctors, 3.7 million pharmacists.**
- **Rise of Infectious Diseases and Emerging Pathogens:** Emerging infectious diseases, such as the recent outbreak of **Monkeypox** and the continued threat of diseases like **Ebola and Zika,** underscore the vulnerability of the global health system.
  - Preparedness, rapid response, and international collaboration are crucial to preventing the spread of these diseases, which can have global implications.
  - For instance, the **World Health Organization declared Monkeypox a Public Health Emergency of International Concern (PHEIC) in 2022.**

- Similarly, the **resurgence of Ebola in West Africa in 2021** highlighted the need for stronger global surveillance and containment systems.

What is the Current Institutional Framework Governing Global Health Management?

- **World Health Organization (WHO) Framework:** The World Health Organization (WHO) is the cornerstone of global health management, guiding international health policies and providing leadership in coordinating health responses.
  - WHO's key functions includ**e setting international health standards, offering technical support to countries, and overseeing the implementation of health protocols.**
- **Global Health Security Agenda (GHSA):** The GHSA is a global initiative **(India is a member)** aimed at strengthening countries' capacities to **prevent, detect, and respond to infectious disease threats.**
  - The agenda focuses on improving national health systems, surveillance, and emergency response mechanisms to safeguard against pandemics.
- **International Health Regulations (IHR) 2005:** The International Health Regulations (IHR), governed by WHO, are a legally binding framework aimed at ensuring the global health response to public health emergencies is swift and coordinated.
  - IHR facilitates the **exchange of information regarding infectious disease outbreaks** and sets the standard for countries' preparedness and responses to public health risks.
- **Global Fund to Fight AIDS, Tuberculosis, and Malaria:** The Global Fund is a global financing initiative designed to combat the three major infectious diseases: AIDS, tuberculosis, and malaria.
  - The Fund partners with countries to strengthen health systems, promote disease prevention, and support treatment programs.
- **GAVI - The Vaccine Alliance:** GAVI, or the Global Alliance for Vaccines and Immunization, is a **public-private partnership** aimed at increasing access to immunization in low-income countries.

- Its mission is to provide life-saving vaccines to the most vulnerable populations, reducing disparities in vaccine access across the globe.
- **GAVI works with governments, the World Health Organization (WHO), UNICEF, the World Bank,** and other partners to improve immunization rates, particularly in low-resource settings.

What Role can India Assume in Shaping and Advancing Global Health Governance?

- **Leadership in Pandemic Preparedness and Response:** India can play a crucial role in **leading global health governanc**e by **strengthening pandemic preparedness and response mechanisms.**
  - As the Covid-19 pandemic highlighted gaps in global coordination, India's advocacy for a robust and coordinated response, through its leadership in the **G20** and SCO, positions **it as a key player in shaping international health strategies.**
- **Strengthening WHO and Global Health Diplomacy:** India has emerged as a prominent advocate for a more inclusive and reformed WHO, **underscoring the need for an agile, responsive health governance framework.**
  - The **country's support for the WHO's Pandemic Treaty** and its efforts to reform international health regulations highlight India's commitment to a multilateral, cooperative approach.
  - **India's nine-point reform proposal for the WHO**, post-COVID-19, emphasized the importance of enhancing global health governance processes.
- **Promoting Equitable Access to Medicines and Vaccines:** India's pharmaceutical prowess positions it as a c**ornerstone in ensuring global access to affordable medicines.**
  - By leveraging its **robust generics sector,** India has facilitated the global supply of life-saving medications, including vaccines, especially during the Covid-19 pandemic.

- ✦ India also accounts for 60 per cent of global vaccine production making it the largest vaccine producer in the world.
  - 📎 The **Serum Institute's production of the Oxford-AstraZeneca vaccine** was pivotal in making vaccines available to **low- and middle-income countries, especially in Africa and Asia.**
- 💡 **Integration of Traditional and Modern Medicine in Global Health:** India can bridge the gap between traditional and modern medicine, offering a holistic approach to health governance.
  - ✦ With its rich heritage in **Ayurveda, Yoga,** and other traditional practices, India has promoted the concept of "**One Health**"—recognizing the interconnectedness of human, animal, and environmental health.
    - 📎 This integration is particularly relevant in addressing **non-communicable diseases (NCDs)** and emerging health issues.
  - ✦ The **AYUSH guidelines,** along with traditional remedies for diseases like filariasis, underscore India's contribution to global health practices.

- 💡 **Facilitating Digital Health and Health Technology:** India's advancements in digital health infrastructure, particularly through initiatives like the **Ayushman Bharat Digital Mission,** provide a framework for global health innovation.
  - ✦ By sharing its **e-health solutions globally,** India can help other nations improve their health information exchange and telemedicine capabilities.
    - 📎 This integration of **digital health into public policy** makes India a leader in tech-enabled health governance.
  - ✦ India offered **CoWIN** as a **"digital public good" to the world**, asserting that it is committed to sharing its digital health expertise.
- 💡 **Expanding Health Cooperation through Global South Engagement:** India's role in the Global South enhances its **capacity to shape global health governance by promoting South-South cooperation.**
  - ✦ India fosters stronger diplomatic ties and positions itself as a champion of equitable health solutions.
  - ✦ **India's Vaccine Maitri initiative** provided millions of vaccine doses to South Asian and African countries, strengthening India's influence in these regions.

Conclusion:

Despite persistent challenges like inequity, AMR, and workforce gaps, the globe is finding ends to reshape health governance. India, with its (*Pharma Shakti*) pharmaceutical strength, **traditional wisdom (*Ayurveda*), and digital innovation, can emerge as a *Vishwa Mitra*** in building an inclusive, resilient, and just global health order. As the world reimagines health governance, India's role must be both strategic and compassionate.

Data Authenticity to Fight Air Pollution

This editorial is based on "Data dressing will not help in fight against pollution," which was published in the Hindustan Times on 26/04/2025. The article highlights the issue of data manipulation related to air pollution, which may mislead both policymakers and the general public. The article also emphasizes the need for accurate and comprehensive data in the fight against pollution.

Tag: GS Paper-3, Environmental Pollution & Degradation, Conservation, Sustainable Development, Climate Change

As India grapples with a worsening air pollution crisis, the strategic deployment of air quality monitoring infrastructure has come under scrutiny. The Delhi government's decision to install **six new Continuous Ambient Air Quality Monitoring Stations (CAAQMS) in relatively low-pollution, low-density areas like JNU and Delhi Cantonment,** rather than high-pollution zones like Anand Vihar, have raised concerns about data integrity. With air pollution causing 1.67 million premature deaths annually in India (Lancet, 2020), this editorial examines the significance of transparent monitoring for India's pollution control efforts and the challenges hindering progress.

What are the Critical Challenges in India's Air Quality Monitoring Framework?

- 💡 **Misplacement of Monitoring Infrastructure**: The placement of **CAAQMS in low-pollution areas,** creates a **skewed picture of air quality**, masking the severity of pollution in hotspots like Okhla (Noida).
  - ✤ This **"data dressing" not only misleads policymakers but also erodes public trust**, as citizens in polluted areas face unaddressed health risks.
  - ✤ For instance, **Anand Vihar's AQI reached 426 in November 2023, while Delhi Cantonment recorded 172, illustrating the disparity.**
- 💡 **Institutional and Technical Limitations**: India's air quality monitoring network, with over **1,000 stations, is extensive** (installation and operation of a CAAQMS can cost up to ₹1 crore) but faces operational challenges.
  - ✤ **Many CAAQMS suffer from downtime due to power outages or poor maintenance**, reducing data reliability.
  - ✤ The Delhi Pollution Control Committee **(DPCC), tasked with overseeing monitoring, is understaffed,** with only **few environmental engineers for a city of over 30 million people**, limiting enforcement and calibration efforts.
- 💡 **Lack of Public Engagement**: Public awareness of air quality data remains low, with limited efforts to educate citizens on interpreting AQI or adopting protective measures.
  - ✤ Without community involvement, initiatives like NCAP struggle to gain traction. The **absence of accessible, real-time data platforms** further disconnects citizens from the pollution crisis, reducing pressure on authorities to act decisively.
- 💡 **Geopolitical and Regional Factor**: **Air pollution in Delhi is exacerbated by regional factors**, such as **stubble burning in Punjab and Haryana,** which **contribute 24% of PM2.5** during winter (IIT-K, 2024).
  - ✤ Inadequate monitoring in rural and peri-urban areas limits the ability to address transboundary pollution, complicating coordinated action under the Commission for Air Quality Management (CAQM).

Air Pollution

💡 As per **the Air (Prevention and Control of Pollution) Act, 1981**, **"air pollution"** is the **presence in the atmosphere of any air pollutant**, which includes any **solid, liquid, or gaseous substance** (including noise) in such concentration as may be or tend to be **injurious to human beings**, other living creatures, plants, property, or the environment.
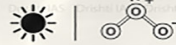
Air Pollutants

Sulphur Dioxide (SO₂)

It comes from the consumption of fossil fuels (oil, coal and natural gas). Reacts with water to form acid rain.

Impact: Causes respiratory problems.

Ozone (O₃)

Secondary pollutant formed from other pollutants (NOx and VOC) under the action of the sun.

Impact: Irritation of the eye and respiratory mucous membranes, asthma attacks.

Nitrogen Dioxide (NO₂)

Emissions from road transport, industry and energy production sectors. Contributes to Ozone and PM formation.

Impact: Chronic lung disease.

Carbon Monoxide (CO)

It is a product of the incomplete combustion of carbon-containing compounds.

Impact: Fatigue, confusion, and dizziness due to inadequate oxygen delivery to the brain.

Ammonia (NH₃)

Produced by the metabolism of amino acids and other compounds which contain nitrogen.

Impact: Immediate burning of the eyes, nose, throat and respiratory tract and can result in blindness, lung damage.

Lead (Pb)

Released as a waste product from extraction of metals such as silver, platinum, and iron from their respective ores.

Impact: Anemia, weakness, and kidney and brain damage.

Particulate Matter (PM)

PM10: Inhalable particles, with diameters that are generally 10 micrometers and smaller.
PM2.5: Fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller.
Source: Emitted from construction sites, unpaved roads, fields, fires.
Impact: Irregular heartbeat, aggravated asthma, decreased lung function.

Note: These major air pollutants are included in the Air quality index for which short-term National Ambient Air Quality Standards are prescribed.

Drishti IAS

Causes of Air Pollution

Agricultural Activities
- Pesticides
- Fertilizers
- Agricultural Waste

Use of Chemical and Synthetic Products
- Paints
- Cleaners
- Personal Care Items

Burning of Fossil Fuels
- CO
- Nitrogen Oxides
- Particulate Matter

Industrial Emission
- Particulate Matter
- NO2
- SO2

Air Pollution

Wildfires
- PM2.5
- Chemicals
- Smoke

Indoor Air Pollution
- VOCs
- Smoking
- Poor Ventilation

Transportation
- Carbon Monoxide
- Hydrocarbons
- Nitrogen Oxides

Open Burning of Garbage Waste
- Black Carbon
- Soot
- Carcinogens

Microbial Decaying Process
- Methane
- Toxic Gases
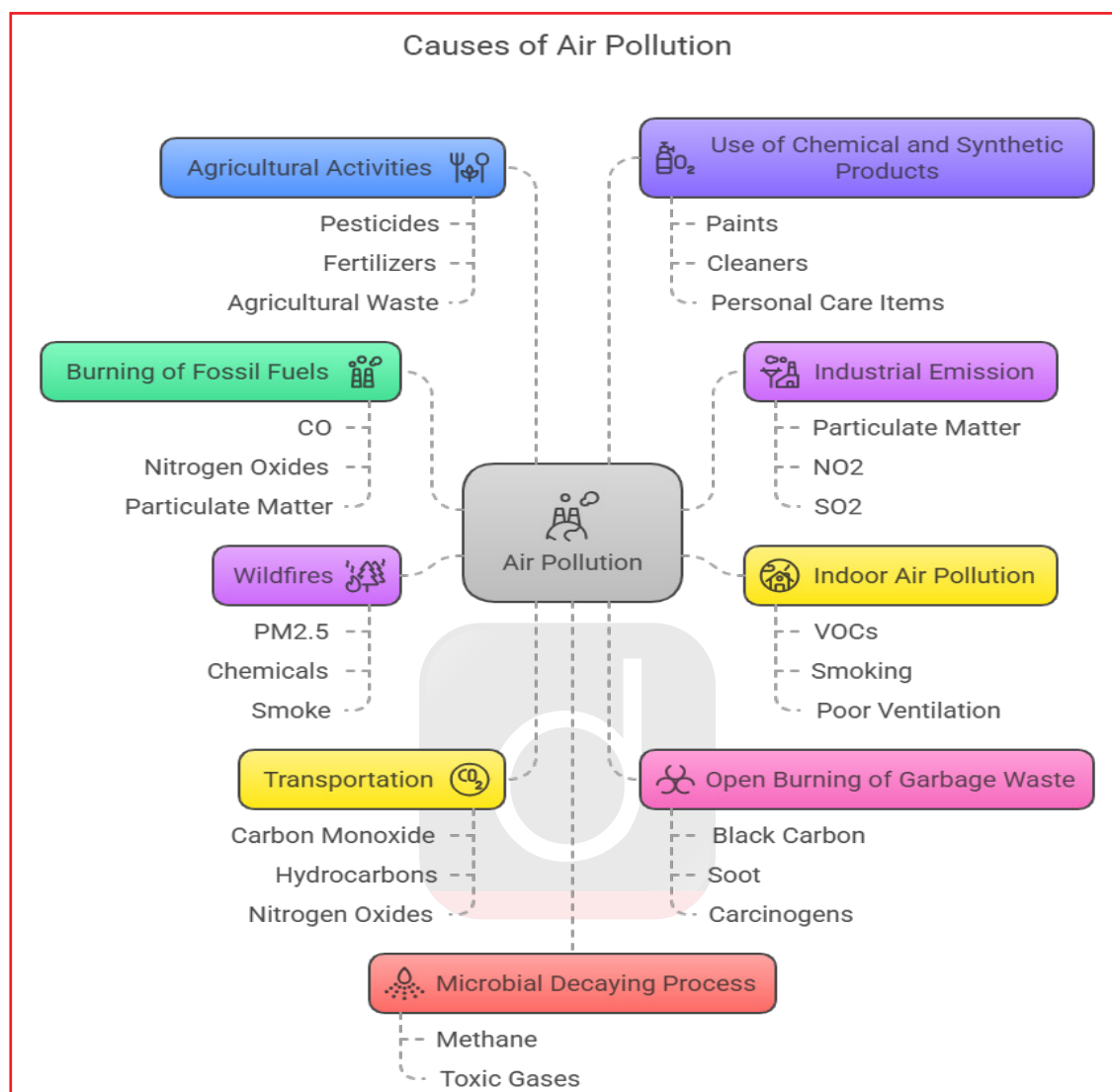
What is the Significance of Transparent Air Quality Monitoring?

- **Public Health Protection**: Air pollution, particularly PM2.5, is a major public health threat, contributing to about a million and a half deaths every year from 2009 to 2019 (Lancet).
  - High-pollution areas (like Anand Vihar) where AQI often exceeds 400, expose vulnerable populations—children, elderly, and low-income communities—to respiratory and cardiovascular risks.
  - Strategic placement of CAAQMS in such zones provides real-time data, enabling targeted interventions like anti-smog guns or traffic controls, which can mitigate health impacts.
- **Evidence-Based Policymaking**: Accurate air quality data is the cornerstone of effective environmental governance. The **National Clean Air Programme (NCAP), aiming to reduce particulate matter by 40% by 2026 (2019-20 as the base year)**, relies on reliable data to design city-specific action plans.
  - Misplaced monitors, as seen in Delhi, distort AQI readings, **undermining policies like the Graded Response Action Plan (GRAP)** and delaying action against polluters in industrial or traffic-heavy areas.

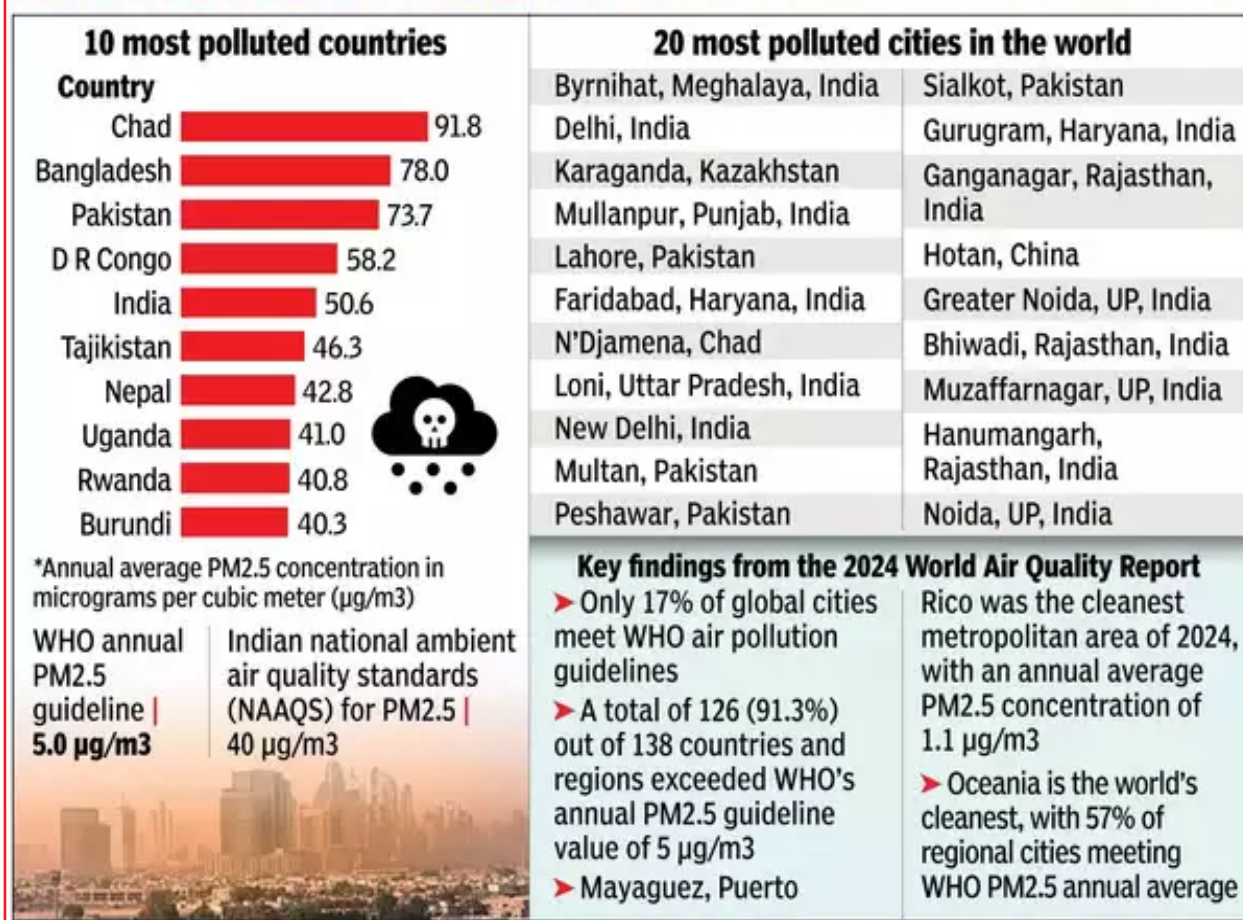- 💡 **Economic Efficiency**: **Air pollution costs India 3% of its GDP annually** due to healthcare expenses and lost productivity (World Bank, 2022).
  - ✦ Each **CAAQMS, priced at over ₹1 crore,** represents a significant public investment. **Deploying these in high-pollution zones maximizes their impact,** ensuring resources are used to address critical areas **rather than generating misleadingly optimistic data** from green zones like Delhi Cantonment, where AQI is often 100 points lower than Anand Vihar.

What is the State and Impact of Air Pollution in India?

- 💡 **Air Pollution in India:** According to the <u>World Air Quality Report 2024</u> by **IQAir, India is the 5th most polluted country**, with an average **PM2.5 level of 50.6 μg/m³, 10 times the WHO safe limit (5 μg/m³).**
  - ✦ **Delhi remains the most polluted capital,** while Byrnihat (Assam-Meghalaya border) is the world's most polluted city.
  - ✦ **India dominates the global pollution list,** with 6 of the top 10 and 13 of the top 20 most polluted cities.
  - ✦ **Globally, WHO reports that 99% of the population breathes polluted air,** with low- and middle-income countries most affected.

LITTLE KNOWN BYRNIHAT WORLD'S MOST POLLUTED

10 most polluted countries

Country	PM2.5
Chad	91.8
Bangladesh	78.0
Pakistan	73.7
D R Congo	58.2
India	50.6
Tajikistan	46.3
Nepal	42.8
Uganda	41.0
Rwanda	40.8
Burundi	40.3

*Annual average PM2.5 concentration in micrograms per cubic meter (μg/m3)

WHO annual PM2.5 guideline | 5.0 μg/m3	Indian national ambient air quality standards (NAAQS) for PM2.5 | 40 μg/m3

20 most polluted cities in the world

Byrnihat, Meghalaya, India	Sialkot, Pakistan
Delhi, India	Gurugram, Haryana, India
Karaganda, Kazakhstan	Ganganagar, Rajasthan, India
Mullanpur, Punjab, India	
Lahore, Pakistan	Hotan, China
Faridabad, Haryana, India	Greater Noida, UP, India
N'Djamena, Chad	Bhiwadi, Rajasthan, India
Loni, Uttar Pradesh, India	Muzaffarnagar, UP, India
New Delhi, India	Hanumangarh, Rajasthan, India
Multan, Pakistan	
Peshawar, Pakistan	Noida, UP, India

Key findings from the 2024 World Air Quality Report

- ➤ Only 17% of global cities meet WHO air pollution guidelines
- ➤ A total of 126 (91.3%) out of 138 countries and regions exceeded WHO's annual PM2.5 guideline value of 5 μg/m3
- ➤ Mayaguez, Puerto Rico was the cleanest metropolitan area of 2024, with an annual average PM2.5 concentration of 1.1 μg/m3
- ➤ Oceania is the world's cleanest, with 57% of regional cities meeting WHO PM2.5 annual average

- 💡 **Impact of Air Pollution:**
    - ✦ **Health Impact:** In 2021, **air pollution caused 8.1 million deaths globally,** with India (2.1 million) and China (2.3 million) being the worst affected (State of Global Air Report 2024).
        - 📎 Health impacts include **respiratory infections**, lung diseases, **chronic obstructive pulmonary disease (COPD),** asthma, **cardiac arrest,** and gastrointestinal issues.
    - ✦ **Economic Loss:** Air pollution **lowers GDP growth (3%)** by reducing productivity, increasing health costs, and decreasing asset efficiency.
    - ✦ **Reduced Solar Efficiency:** Air pollution reduces solar power efficiency by **blocking radiation, while rising temperatures lower photovoltaic performance**.
        - 📎 By 2041-2050, India's solar panel efficiency may drop by 2.3%, causing an annual loss of at least 840 GWh of electricity.
    - ✦ **Environmental Degradation:** Air pollution accelerates **climate change by increasing greenhouse gases**, degrades ecosystems through acid rain and toxin buildup, and threatens biodiversity.
        - 📎 It weakens **plants by excess nitrogen deposition** and reduces crop yields by impairing photosynthesis due to ozone pollution.

What Measures Have Been Taken to Control Air Pollution in India?
💡 **National Clean Air Programme** (NCAP)
💡 **System of Air Quality and Weather Forecasting and Research (SAFAR) Portal**
💡 **Graded Response Action Plan (for Delhi)**
💡 **For Reducing Vehicular Pollution:** 　✦ **BS-VI Vehicles** 　✦ **Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME)**
💡 **Pradhan Mantri Ujjwala Yojana (PMUY)**
💡 **Commission for Air Quality Management in the NCR**

> **Note:** In *M.C. Mehta vs. Union of India*, the Supreme Court treated the right to live in a pollution free environment as a **part of fundamental right to life under Article 21 of the Constitution.**

What Measures can India Adopt in Strengthening Air Quality Monitoring?

- 💡 **Strategic Deployment of CAAQMS**: India must **prioritize installing CAAQMS and other air quality monitoring devices** in high-pollution zones using GIS-based pollution mapping to identify hotspots.
    - ✦ Collaborating with research institutions can ensure data-driven site selection, maximizing the impact of monitoring investments.
- 💡 **Enhancing Institutional Capacity**: Increasing **funding and staffing for DPCC and State Pollution Control Boards (SPCBs) is critical**.
    - ✦ Training programs in advanced monitoring technologies and data analytics can improve operational efficiency and ensure consistent data quality.
- 💡 **Promoting Data Transparency**: India should **revamp its public platforms** and **develop an independent platform for pollution related data** (like Judicial Grid) for real-time, unfiltered AQI data, to prevent manipulation.
    - ✦ **Revamping initiatives like the Sameer app of CPCB** can be scaled up to provide localized pollution alerts, empowering citizens to demand accountability.
- 💡 **Fostering Regional Cooperation**: Strengthening **CAQM's mandate to coordinate with neighboring states can address transboundary pollution**.
    - ✦ Incentives for farmers to **adopt alternatives to stubble burning (like Pusa Decomposer and biomass decomposition for biogas)**, coupled with rural monitoring stations, can tackle regional disparities.
- 💡 **Leveraging Technology and Innovation**: Integrating **low-cost sensor networks and satellite-based monitoring can complement CAAQMS,** expanding coverage to underserved areas.

✦ Partnerships with startups developing AI-driven pollution forecasting tools can enhance predictive capabilities, aiding proactive interventions.

Conclusion

India's air pollution crisis demands a robust and transparent air quality monitoring framework to protect public health, drive evidence-based policies, and optimize resources. By prioritizing high-pollution zones, enhancing institutional capacity, and engaging citizens, India can align its monitoring efforts with the goals of the National Clean Air Programme. As air pollution remains a pressing concern for UPSC aspirants, this issue underscores the need for integrated governance and technological innovation to ensure breathable air for all.

Revitalizing India'S Justice System

This editorial is based on "Towards fixing India's flailing justice system" which was published in Hindustan Times on 04/05/2025. The article brings into picture the deep structural deficiencies in India's justice system, marked by chronic vacancies and resource gaps.

Tag: GS Paper - 2, Constitutional Amendments, Judiciary, Government Policies & Interventions

India's justice system is structurally crippled by **chronic resource deficiency, with one in four positions vacant across police, judiciary, and prisons.** Overwhelmed courts have led to prison overcrowding increasing from **18% to 30% in a decade, with 76% of inmates being undertrials rather than convicts.** To ensure timely and equitable justice, India must undertake **comprehensive reforms to revamp its judicial system,** addressing structural inefficiencies and enhancing institutional capacity across all levels.

What is the Institutional Framework of India's Justice System?

💡 **Supreme Court:** Established under **Article 124**, the Supreme Court is the apex constitutional authority and the **final interpreter of the Constitution.**

✦ It exercises **original (Article 131), appellate (Articles 132–136), and advisory jurisdiction (Article 143**). It currently consists of the **Chief Justice of India and 33 other judges.**

💡 **High Courts:** High Courts function at the state level under **Articles 214–231.** They have original and appellate jurisdiction over civil and criminal matters.

✦ India has **25 High Courts,** with some serving more than one state or Union Territory.

💡 **Subordinate Judiciary:** At the district level, **District and Sessions Courts (Article 233)** serve as the backbone of the judicial system.

✦ These include **civil and criminal courts at district, taluka, and metropolitan levels.** While judicially subordinate to High Courts, their administration is managed by state governments.

💡 **Police and Law Enforcement:** Law and order is a state subject under the **Seventh Schedule.** Each state has its own police force, governed by the **Police Act of 1861** and state-specific legislations.

✦ Central agencies like the **CBI, NIA, ED**, and paramilitary forces supplement state efforts. The **Prakash Singh judgment (2006)** laid out key police reforms, though implementation remains uneven.

💡 **Prosecution System:** Public Prosecutors, appointed under **Sections 18 of the Bharatiya Nagarik Suraksha Sanhita,** form the prosecution machinery.

✦ Many states have a **Directorate of Prosecution**, though lack of autonomy and poor coordination with the police hampers effectiveness.

💡 **Prison Administration:** Prisons fall under the **State List (List II) and are administered by respective Home Departments**, as per the **Prisons Act, 1894** and state prison manuals.

✦ The prison population includes undertrials, convicts, and preventive detainees, with oversight provided by judicial officers at district and High Court levels.

- 💡 **Legal Aid and Access to Justice:** The [National Legal Services Authority](#) **(NALSA),** established under th**e** [Legal Services Authorities Act, 1987](#), is mandated to provide free legal aid to the underprivileged under **Article 39A.**
  - ✦ Each state has corresponding **State Legal Services Authorities (SLSAs)** and **District Legal Services Authorities (DLSAs)** to facilitate grassroots access.

- 💡 **Quasi-Judicial and Specialised Forums:** To reduce the burden on regular courts and offer domain-specific justice, India has established tribunals such as the **NGT, CAT, and DRT,** as well as fast-track courts**,** [Lok Adalats](#)**,** and special courts for handling **POCSO**, NDPS, and corruption cases.

What are the Key Issues Associated with India's Justice System?

- 💡 **Backlog Crisis Undermining Justice Delivery:** Justice in India suffers from an **endemic backlog** that undermines the rule of law and erodes citizen confidence.
  - ✦ The sheer volume of pending cases results in **judicial fatigue and procedural stagnation.**
  - ✦ Over **5 crore cases are pending in various courts of the country,** including 80,000 in the Supreme Court, the backlog **may hit 6 crore by 2026 (IJR 2025).**

- 💡 **Vacancies Weakening Institutional Capacity:** Widespread vacancies across judiciary, police, and prisons severely hinder institutional capacity, causing delays, under-enforcement, and burnout.
  - ✦ This weakens justice delivery at every level. According to **India Justice Report 2025,** India has just **15 judges per 10 lakh people**, far short of the **50 recommended by the** [Law Commission](#) **(1987).**
    - 📎 Even **top-performing states like Karnataka** face key staffing shortfalls in legal aid and court support staff.

- 💡 **Underfunding and Skewed Resource Allocation:** Justice remains a **low-budget priority** despite its foundational role in democracy. Most funds are locked in salaries, with minimal investment in infrastructure, training, or tech.
  - ✦ For instance, on average, **4.3% of states' budget funds were allocated for justice in 2024-25**. Specialist courts like [POCSO](#) remain under-resourced.

- 💡 **Inaccessibility for the Marginalised:** India's justice system often excludes the very communities it should protect — **the poor, Dalits, Adivasis, minorities** — due to geography, cost, and social capital barriers.
  - ✦ **Undertrial prisoners constitute 76% of the total prison population,** reflecting a deep systemic crisis. Access to timely bail and speedy trials remains a distant dream for many.
    - 📎 **Legal aid services are largely concentrated in urban areas**, leaving rural and marginalised communities underserved.

- 💡 **Procedural Illegality and Custodial Violence:** Frequent cases of custodial deaths, illegal detentions, and police brutality point to a **culture of impunity worsened by poor oversight and minimal legal consequences.**
  - ✦ In 2019, **India estimates 1723 custodial deaths** have occurred which constitutes 5 deaths every day. **Despite** [SC's D.K. Basu judgment](#) **(1997)** mandating safeguards, **compliance with CCTV** and arrest protocols remains uneven across most states.

- 💡 **Legal Aid Gaps and Ineffectiveness:** Despite a constitutional guarantee **(Article 39A),** legal aid remains patchy in **quality, reach, and perception, often failing the poor in practice.**
  - ✦ For instance, India spends only **INR 0.78 per capita on legal aid**, which is one of the lowest in the world. Also, most jail legal clinics are non-functional.

- **Undertrial Crisis and Prison Overcrowding:** The justice system holds **thousands in prolonged pre-trial detention due to systemic delays.**

  - Many remain incarcerated at the pre-trial stage for years without conviction. **Ineffective bail processes** further contribute to **rising prison overcrowding.**

  - Recent data shows that **25 States and Union Territories** reported overall prison occupancy rates above **100% in 2022.**

- **Gender and Social Representation Gaps:** Under-representation of **women, SC/STs, OBCs, and minorities in judiciary** and police undermines public confidence and restricts empathetic justice delivery.

  - For instance, **women constitute 37.4% of all judges in India—14%** in high courts and **38%** in subordinate courts.

    - In the last 75 years, the **Supreme Court has only had 11 women judges,** an abysmal **4% of the total 276 judges.**

  - Also, between 2018 and 2023, **only 17% of High Court appointments** were from SC, ST or OBC communities.

- **Institutional Fragmentation and Lack of Coordination:** The four pillars—**police, judiciary, prisons, and legal aid**—function in isolation, weakening holistic justice delivery. Policy coherence and data-sharing are limited.

  - India Justice Report scores show wide variation: states ranking high in police lag in judiciary or prisons. **No shared performance dashboards** or grievance systems exist across institutions.

- **Lack of Transparency and Performance Evaluation:** Judicial and police accountability mechanisms remain weak. **Opaque appointments, absence of case disposal benchmarks, and no community feedback** reduce institutional responsiveness.

  - For instance, **the Collegium system** faces criticism for opacity. NJAC was struck down in 2015 but no reforms have followed.

What Measures can India Adopt to Revamp the Justice System?

- **Constituting National Judicial Infrastructure Authority:** India's judiciary continues to function in dilapidated buildings with poor access, especially in subordinate courts.

  - **A centralized NJIA, as proposed by former CJI N.V. Ramana,** can ensure uniform infrastructure standards, dedicated funding, and modern amenities like digital courtrooms and barrier-free access.

    - This would **institutionalize infrastructure planning across states**, reduce inter-state disparities, and enhance the dignity and functionality of the justice system.

- **Establish Regional Benches of the Supreme Court:** Access to the apex court is geographically skewed due to its centralization in Delhi.

  - **There is a need to explore the feasibility of invoking Article 130 to establish regional benches in east, west, south, and northeast zones that would** decentralize appellate access and reduce cost, time, and case overload.

    - This measure, supported by the **2023 Standing Committee,** enhances the fundamental right to access to justice under **Article 21 and operationalizes federal equity in judicial access.**

- **Enacting Comprehensive Victim Rights and Compensation Law:** India's criminal justice system remains accused-centric.

  - A **dedicated victim rights law must guarantee participation of victims in trials,** state-funded legal counsel, and enforceable compensation mechanisms.

- A **Victim Compensation Fund, as proposed by the Malimath Committee**, must be institutionalized and **linked to proceeds from organised or economic crimes,** placing victim dignity at the center of justice delivery.

💡 **Strengthen Judicial Accountability:** To counter perceptions of judicial opacity, India needs a robust judicial appraisal mechanism **assessing disposal rates, conduct, and reasoning quality —** alongside a statutory requirement for annual declaration of assets.

- Inspired by the **Judicial Standards and Accountability Bill (2010)**, this **would uphold ethical integrity, improve internal evaluation, and align judiciary** with transparency norms applicable to other constitutional authorities.

💡 **Rationalize Court Vacations:** The colonial-era practice of long court vacations reduces effective working days and delays case disposal.

- A shift to staggered leave systems and vacation benches**, along with a Malimath-style "Arrears Eradication Scheme,"** can clear long-pending cases through dedicated fast-tracks or Lok Adalats.
  - This would **directly reduce pendency, optimize judicial time, and uphold the principle of continuous access to justice.**

💡 **Revamp Legal Aid Delivery Through Technology and Community Models:** While **Article 39A promises free legal aid,** its delivery is urban-centric, underfunded, and poorly monitored.

- **AI-powered chatbots (as piloted in Maharashtra)**, mobile legal vans, and trained paralegal volunteers embedded in panchayats can widen the net of accessible justice.
  - This reform will **operationalize "justice as a service,"** especially for SC/STs, women, and rural poor.

💡 **Modernize Police Investigation with Structural and Forensic Reforms:** Separation of law-and-order from **investigation, specialization in cyber and financial crimes**, and expansion of forensic labs are crucial to credible and timely prosecutions.

- Establishing a **National Forensic Grid and Police Establishment Boards,** as recommended by the **Malimath Committee,** would professionalize investigation, reduce custodial excesses, and increase conviction rates.

Conclusion:

India's justice system, though institutionally well-structured, suffers from deep-rooted inefficiencies that **compromise access, equity, and trust.** Structural vacancies, delays, and exclusion of the marginalised have turned justice into a privilege rather than a right. Reforming the system requires coordinated, well-funded, and inclusive measures across all pillars — **police, judiciary, prisons, and legal aid.** Only then can justice **truly serve as a pillar of democracy and social transformation.**

Transforming India'S Gig Economy

This editorial is based on "The harsh reality of gig work in India" which was published in The Hindu Business Line on 02/05/2025. The article brings into picture the harsh realities of India's gig economy—low wages, lack of social security, and poor retirement prospects—despite its rapid growth.

Tag: GS Paper - 3, Employment, Inclusive Growth, GS Paper - 2, Issues Relating to Development, Government Policies & Interventions, Human Resource

India's gig economy, projected to employ over **12 million workers by 2025,** masks precarious reality behind its **promise of flexibility and autonomy**. Despite their growing numbers, gig workers face grueling hours, sub-minimum wages and complete absence of social security benefits. They also face bleak retirement prospects as **"independent contractors" excluded from formal protections.** Active empowerment through **strict regulation, social security inclusion, and skill development pathways** is imperative to transform gig work from exploitation to opportunity.
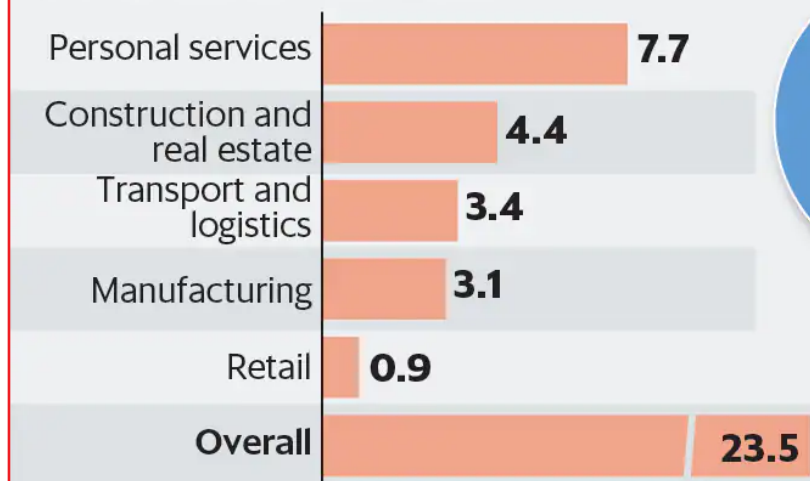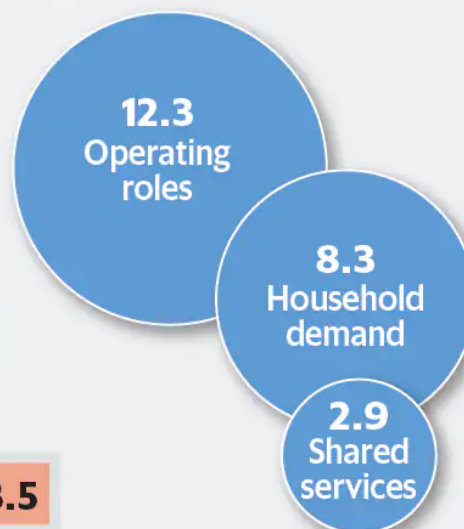
Growing gigs

Construction, manufacturing, retail, transportation and logistics sectors may create around 70 million 'gigable' jobs within 8-10 years.

No. of gig jobs projected (in mn)

Gig workers may service 23.5 million jobs in three to four years

Sector	Value
Personal services	7.7
Construction and real estate	4.4
Transport and logistics	3.4
Manufacturing	3.1
Retail	0.9
Overall	**23.5**

Type of gig roles

- 12.3 Operating roles
- 8.3 Household demand
- 2.9 Shared services

Source: Unlocking the Potential of Gig Economy in India Report

What role does the Gig Economy Play in Accelerating India's Economic Growth?

- 💡 **Job Creation and Employment Flexibility:** The gig economy plays a crucial role in addressing India's job crisis by offering flexible, **short-term employment opportunities.**
  - ✦ Amidst the **formal sector's stagnation, gig work provides an avenue for millions, especially the youth, to participate in the workforce**.
    - 🖉 Data from **NITI Aayog** estimates that gig workers in India will rise from **7.7 million in 2020** to **23.5 million by 2029-30**. This surge indicates the sector's ability to absorb a large section of the underemployed population.
- 💡 **Supporting the Informal Economy Transition:** The gig economy acts as a bridge for workers transitioning from the **informal sector to more structured employment models,** providing a safety net and structured earnings.
  - ✦ For example, a large portion of India's gig workforce, like **drivers and delivery workers,** comes from **informal sectors like agriculture and unskilled labor.**
  - ✦ With the rise of **platforms like Zomato and Swiggy,** millions of informal workers have found an additional space for work in spare hours, with NITI Aayog projecting a significant rise in such workforce participation.
- 💡 **Fostering Innovation and Entrepreneurship:** Gig platforms empower workers to operate as independent contractors, **cultivating an entrepreneurial mindset among millions.**
  - ✦ This flexibility drives the development of **innovative service models** across sectors like transport, food delivery, and freelancing.

- Gig work has **become synonymous with "be your own boss,"** with companies like **Uber and UrbanClap** providing opportunities for workers to develop their business acumen.
  - 📎 **Over 80% of gig workers on platforms like these are self-employed,** showing the entrepreneurial growth sparked by this model.
- 💡 **Driving Digital Transformation and Economic Growth:** The gig economy is a significant driver of digital penetration in India, **fostering increased usage of smartphones, digital payments, and other online services.**
  - By integrating **gig work into the mainstream economy,** digital platforms contribute to India's tech-driven economic expansion.
  - India's growing e-commerce sector is a testament to this shift, **as evidenced by the 2023 surge in gig-based deliveries during festival seasons.**
    - 📎 Platforms like **Blinkit and Swiggy reported increased earnings by 40-50% during such periods,** showcasing the role of gig workers in stimulating economic activity.
- 💡 **Contributing to Tax Revenue Generation:** Gig platforms contribute to India's tax revenue, especially with the **implementation of digital payments and the rise of regulatory frameworks.**
  - By formalizing payments and work, gig platforms enable governments to tap into previously untaxed economic activity.
  - In 2024, the **Indian government introduced frameworks for gig workers' registration under the e-Shram portal**, aiming to track and regulate the industry.
    - 📎 The inclusion of **gig workers under social security programs like e Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY)** also opens up new channels for expanding the sector.
- 💡 **Enhancing Inclusivity and Empowering Marginalized Groups:** The gig economy provides an **avenue for marginalized groups, particularly** women and rural populations, to earn independently, improving their financial autonomy and social mobility.
  - The work-from-home nature of many gig jobs allows women to enter the workforce in an environment that is less restrictive.
  - Reports indicate that **women make up nearly 28% of India's gig economy workers,** with **many women turning to platforms like UrbanClap for home-based services.**

What are the Key Issues Associated with the Gig Economy in India?

- 💡 **Lack of Social Security and Benefits:** A major issue in India's gig economy is the **absence of social security, including health insurance, pension plans, and paid leave.** Gig workers are often classified as independent contractors, leaving them without any formal benefits. This leads to financial insecurity, especially in case of illness or accidents.
  - A 2024 NITI Aayog report highlighted that **90% of gig workers lack savings and face high vulnerability to emergencies.**
    - 📎 The recent inclusion of gig workers in the AB-PMJDY is a step forward, **but comprehensive social security remains a challenge.**
- 💡 **Income Instability and Low Wages:** Despite the promise of flexible earnings, gig workers face income instability and wages below the national minimum standard. Many workers struggle to earn enough to meet basic living expenses, working long hours for meagre pay.
  - The **2023 Fair Work India study** found that gig workers in delivery services and ride-hailing platforms earn **₹15,000-20,000 per month,** below the minimum wage for the hours they work.
    - 📎 **Over 70% of gig workers reported difficulty managing household expenses** due to irregular earnings, with a large portion of their income being eaten up by platform commissions.

- **Exploitation and Unfair Working Conditions:** Gig workers often face exploitative conditions, **including long working hours without adequate compensation or job security.**
  - These workers are pressured to meet high performance targets, sometimes leading to physical and mental exhaustion.
  - The **"Prisoners on Wheels" report** found that **78% of gig workers work over 10 hours a day**.
    - Such long hours lead to serious health issues. Also, The **10-minute delivery race** turns into a daily hustle for gig workers, **endangering their safety as they bear the brunt of consumer convenience.**

- **Absence of Legal Protections and Recognition:** Gig workers in India are not recognized under traditional labor laws, leaving them without legal protections such as minimum wages, overtime, or dispute resolution mechanisms.
  - This lack of recognition complicates efforts to secure fair treatment.
  - The **2020 Code on Social Security acknowledges gig workers** but fails to **provide full labor rights,** such as minimum wage guarantees and regulated working hours.

- **Digital Exclusion and Technological Dependence:** While digital platforms offer gig work opportunities, the **growing reliance on technology excludes workers without adequate digital skills or access to technology**.
  - **Rural workers** often lack access to high-paying gig opportunities due to poor internet connectivity and platform availability **(NITI Aayog, 2022).**
  - Moreover, the dependency on mobile apps for daily operations increases **technical or algorithmic errors,** further marginalizing these workers.

- **Arbitrary Deactivation and Customer Misbehavior:** A major issue faced by gig workers is the arbitrary deactivation of accounts and harassment from customers.
  - **Platforms often block or deactivate worker accounts** without clear reasons, leading to a loss of income and job insecurity.

  - In a survey, **83% of cab drivers and 87% of delivery personnel reported being negatively affected by deactivation.**
    - Additionally, **72% of drivers and 68% of delivery workers cited customer misbehavior as a major stressor,** underscoring the lack of adequate grievance redressal mechanisms.

What Measures can India Adopt to Strengthen and Optimize the Gig Economy?

- **Comprehensive Legal Framework for Gig Workers:** India should introduce a robust legal framework that explicitly defines the rights and responsibilities of gig workers.
  - This framework **must address issues such as minimum wage standards, working hours,** and protection against unfair termination.
    - **This framework could also include provisions for collective bargaining,** allowing gig workers to have a unified voice in negotiations with platforms.

- **Portable Social Security Benefits:** A system of portable social security benefits should be established, where gig workers can accumulate benefits **(like insurance and paid leave)** regardless of the platform they work for.
  - This would resolve the **issue of multiple employers and ensure continuity of welfare provisions.**
  - It would also allow for **easier transfer of benefits if a worker shifts between platforms or projects**, without losing their social security entitlements.
    - Such a model would provide stability and financial security to gig workers, which is critical for their long-term welfare.

- **Digital Literacy and Inclusion Programs:** To bridge the digital divide, India should **implement large-scale digital literacy programs** targeted at gig workers, especially in rural areas.
  - These programs should focus on **enhancing their technical skills and equipping them with the knowledge** to navigate digital platforms effectively.

- By improving digital literacy, **workers would be empowered to access more job opportunities**, improve their performance, and reduce vulnerability to technological errors or exploitation.
  - The **government could partner with digital platforms** to create training modules tailored to the needs of gig workers.
- 💡 **Strengthening Grievance Redressal Mechanisms:** India should mandate that gig platforms implement transparent and accessible grievance redressal mechanisms.
  - These systems should **allow workers to file complaints about unfair practices, arbitrary deactivations,** or exploitation in a clear and efficient manner.
  - **Platforms must be legally bound to resolve these complaints in a timely manner,** with a system for oversight by labor authorities.
- 💡 **Incentivizing Platform Compliance with Welfare Laws:** India can adopt a policy that ties incentives to platform compliance with welfare laws, such as the **inclusion of workers under social security schemes** and adherence to fair payment practices.
  - This would create a **competitive advantage for platforms that prioritize worker welfare,** encouraging other platforms to follow suit.
  - These incentives **could include tax breaks, subsidies, or preferential treatment in government tenders.**
    - Such measures would encourage platforms to voluntarily comply with legal requirements and promote a more sustainable gig economy.
- 💡 **Formalization of Gig Work through E-Shram Portal Integration:** India can strengthen the integration of gig workers into the formal economy by expanding the **e-Shram portal to include gig workers comprehensively.**
  - The portal should be made more user-friendly and provide workers with a d**igital identity that links them to welfare schemes and employment opportunities.**
  - This integration would not only help in tracking gig workers but also ensure that they receive benefits like health coverage, pension schemes, and employment insurance.

- 💡 **Encouraging State-Level Initiatives for Gig Workers' Welfare:** States should be encouraged to **develop region-specific policies that cater to the unique needs of gig workers in their area**s.
  - By tailoring solutions to local contexts, **such as offering subsidies for skill development, creating affordable housing for workers,** or establishing worker support centers, states can ensure a more equitable distribution of benefits.
  - This decentralized approach would also enable more effective implementation of national policies while addressing local challenges faced by gig workers in different regions.
    - **Rajasthan's Platform-Based Gig Workers Act** is a significant step, other states can learn from the same.

Conclusion:

India's gig economy holds immense **potential in driving job creation, fostering innovation, and supporting digital transformation.** To unlock the full potential of gig work, India must implement comprehensive measures like **robust legal frameworks, portable social security, and enhanced grievance redressal systems**. Extended social security measures under the **Union Budget of 2025-26** is a significant step in the right direction.

India's Renewed Focus on West Asia

This editorial is based on "Link West marks India's strategic pivot in West Asia" which was published in Hindustan Times on 06/05/2025. The article brings into picture the transformation of India's West Asia engagement from peripheral to strategic through the "Link West" policy, marked by key partnerships and initiatives like IMEEC, Chabahar Port, and defense ties.

Tag: GS Paper - 2, Bilateral Groupings & Agreements, Groupings & Agreements Involving India and/or Affecting India's Interests, Effect of Policies & Politics of Countries on India's Interests, International Treaties & Agreements

India has transformed **India's West Asia engagement** from peripheral involvement to strategic influence through the pragmatic **"Link West" outlook**. This diplomatic pivot is anchored in robust partnerships with the **UAE and Saudi Arabia,** with bilateral trade reaching **$84 billion and $43 billion respectively in 2023-24**. India's strategic initiatives include the **IMEC corridor connecting India to Europe via the Gulf**, deepened defense cooperation with Israel, and development of **Iran's Chabahar Port through the INSTC**. The approach balances energy security, diaspora interests, and regional connectivity while navigating complex geopolitical tensions.

How have India's Relations with West Asia Evolved over Time?

💡 **Pre-Independence Era: Early Trade and Cultural Exchange**

✦ India's relationship with West Asia dates back to ancient times, driven by **trade** and **cultural exchanges**.

✦ Key trade routes linked India with the **Arabian Peninsula, Persia**, and beyond, facilitating the exchange of goods, ideas, and religious influences.

- 💡 **Post-Independence (1947-1990s): Diplomacy with Non-Aligned Neutrality**
 - ✦ After independence, India's ties with West Asia were influenced by its <u>**Non-Aligned Movement (NAM)**</u> stance.
  - ✦ While maintaining neutral relations with countries like **Saudi Arabia, Iraq, and Iran**, India also supported the **Palestinian cause**.
    - ◈ The 1970s and 1980s saw India maintain strong relations with **oil-rich nations,** but economic engagement was limited to **energy imports** and **labor migration**.

- 💡 **Liberalization and Economic Growth (1991-2000s): Expanding Economic Ties**
  - ✦ In the 1990s, India's **economic liberalization** opened new doors for stronger commercial and diplomatic ties with West Asia.
    - ◈ The Gulf region became critical for India's **energy security** and **remittances**.
    - ◈ India's growing **IT sector** also began attracting **interest from the Gulf states, strengthening economic ties.**

- 💡 **Strategic Reorientation (2000s-Present): Strengthe-ning Strategic and Security Cooperation**
  - ✦ India pursued a more **proactive foreign policy**, leading to enhanced security and defense ties, particularly with **Saudi Arabia**, the **UAE**, and **Israel**.
  - ✦ The region became a key partner in **energy diversification**, **technology exchanges**, and **defense collaborations**.
    - ◈ New initiatives, like the <u>**I2U2**</u> (India, Israel, UAE, US) and **IMEC (India-Middle East-Europe Economic Corridor),** underscore India's increasing integration into regional geopolitical frameworks.
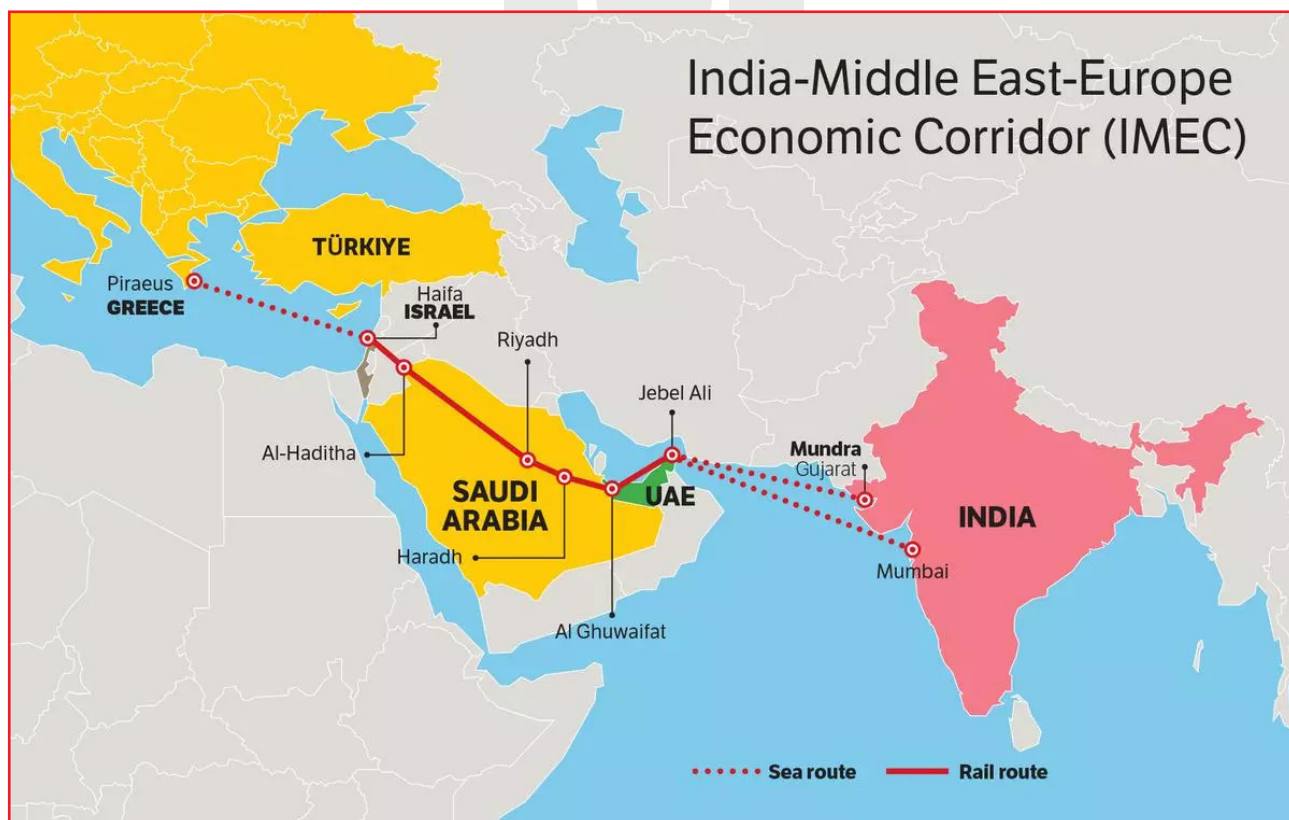
India-Middle East-Europe Economic Corridor (IMEC)

- **Current Dynamics: Regional Leadership and Partnership**
  - ✦ Today, India's relations with West Asia are marked by **strategic partnerships**, **co-development projects**, and a **shared vision for sustainable growth**.
    - ✐ India's **"Look West"** outlook focuses on enhancing **multidimensional engagement**, prioritizing **economic cooperation**, **security collaboration**, and **cultural exchanges**.

What is the Significance of West Asia for India?

- **Economic and Trade Partnerships:** India's economic engagement with West Asia is vital, driven by trade in **hydrocarbons, infrastructure projects, and emerging sectors like renewable energy.**
  - ✦ As India's **fifth-largest economy,** the region supplies critical energy resources while offering lucrative investment opportunities.
  - ✦ The **UAE, India's third-largest trading partner,** shared **$84 billion in trade in 2023-24,** illustrating the region's economic importance.
    - ✐ The **India-UAE Comprehensive Economic Partnership Agreement (CEPA)** targets $100 billion in non-oil trade by 2030.
    - ✐ Additionally, the **Gulf Cooperation Council region accounts for 15.8% of India's total trade in 2022-23**, emphasizing the interdependence between both regions.

- **Energy Security:** West Asia remains a cornerstone of India's energy security, particularly in the oil and gas sectors, which fuel India's growing industrial demands.
  - ✦ Despite diversification, **over 50% of India's crude oil imports still come from the Gulf.**
  - ✦ **Saudi Arabia and Iraq are India's top oil suppliers.** India's energy diversification efforts have been bolstered by partnerships like the **20-year LNG deal signed with Qatar** in February 2024, which **provides 38% of India's LNG imports.**

- **Geopolitical and Strategic Importance:** The Middle East is crucial for India's broader **geopolitical strategy,** serving as a gateway to **Europe, Africa, and Central Asia**.
  - ✦ India's deepening ties with key regional powers like **Saudi Arabia and Israel,** alongside a growing defense and security cooperation, solidify its regional influence.
  - ✦ India's participation in initiatives like the **I2U2 (India, Israel, UAE, US)** reflects the region's growing role in India's strategic calculus.
    - ✐ Furthermore, the **India-Middle East-Europe Economic Corridor** is a game-changing project to enhance connectivity through the Gulf.

- **Security and Defense Cooperation:** West Asia is pivotal for India's security interests, particularly with regard to maritime security in the **Arabian Sea and the Indian Ocean Region (IOR).**
  - ✦ Increasing missile and drone threats from **Yemen's Houthi rebels** highlight the region's security vulnerabilities **(as seen in the Red Sea Crisis recently).**
  - ✦ India's expanded naval cooperation with countries like **Oman, Saudi Arabia, and the UAE** ensures regional stability, especially in securing vital trade routes.
    - ✐ In **2023**, trilateral maritime exercises involving **India, the UAE, and France** marked a significant step in regional defense collaboration.

- **People-to-People and Diaspora Ties:** As **India's External Affairs Minister** rightly quoted that **"our presence in the Gulf is both pervasive and crucial. More than 9 million Indians live and work here, and gulf also serves as a gateway to the MENA region and the Mediterranean"**.
  - ✦ The 9 million-strong Indian expatriate community sends home vital remittances, amounting to billions annually, strengthening bilateral ties.
    - ✐ **The UAE alone hosts over 3.5 million Indians,** contributing significantly to the country's labor force and economic development.
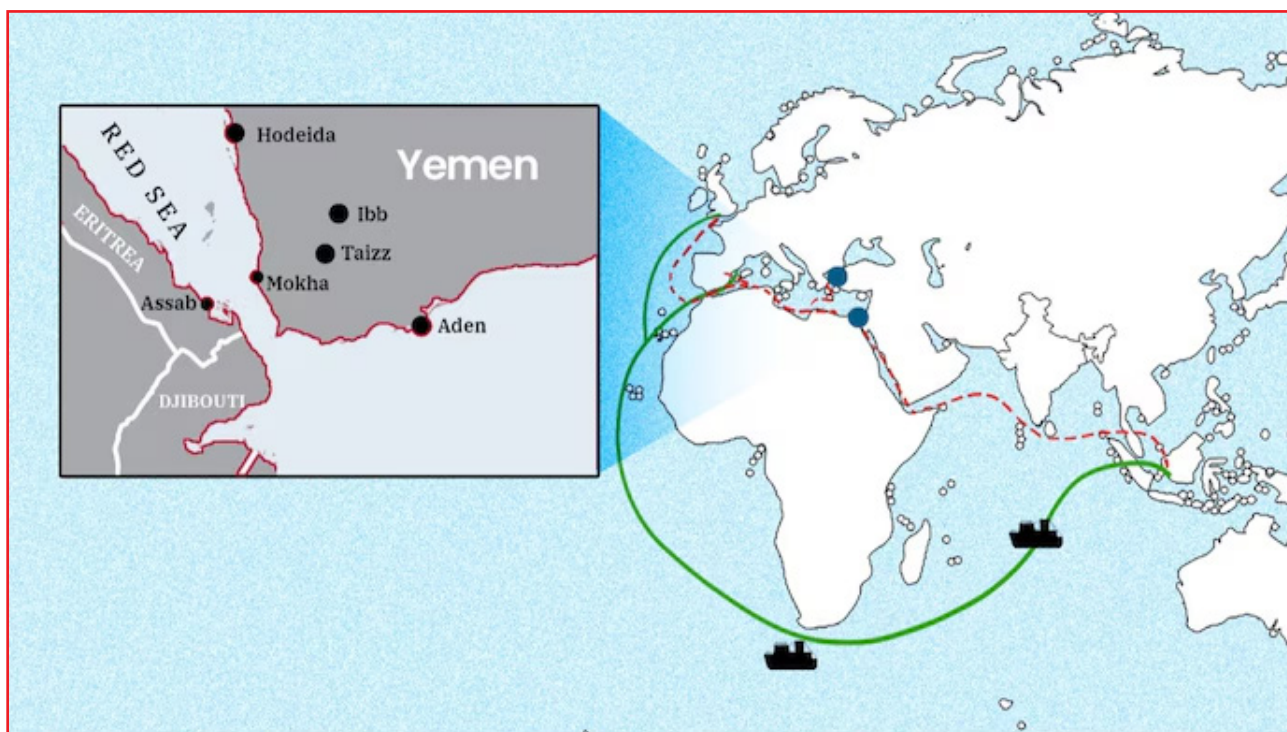
What are the Key Challenges Affecting Effective India–West Asian Ties?

- 💡 **Geopolitical Instability and Shifting Alliances:** West Asia's geopolitical volatility, marked by conflicts like **Israel-Hamas and the Saudi-Iran tensions,** complicates India's diplomatic efforts.
  - ✦ While India seeks a balanced approach, **recent shifts like the Saudi-Iran détente brokered by China** challenge its neutrality.
  - ✦ India's interests with both nations, such as **energy cooperation with Saudi Arabia and Chabahar Port access with Iran**, are tightly interwoven.
- 💡 **Energy Transition and Diversification of Sources:** India's push for renewable energy creates tensions with its **ongoing reliance on West Asian hydrocarbons,** which still supply **over 50% of its crude oil.**
  - ✦ While India continues to engage with the Gulf states for energy needs, the transition to green energy complicates long-term relations.
  - 🖉 India must navigate this dual challenge of energy security and green energy ambitions **without destabilizing key partnerships in the Gulf.**
- 💡 **Competition from Global Powers and Strategic Alliances:** <u>China's Belt and Road Initiative (BRI)</u> has deepened its economic footprint in West Asia, challenging India's influence in infrastructure and trade.
  - ✦ While India's economic ties with the UAE and Saudi Arabia have strengthened, **China's dominance in the other region complicates India's goals**.
  - ✦ In 2023, China's trade with Saudi Arabia exceeded $100 billion, further expanding its economic presence.
  - 🖉 India has responded by leveraging initiatives like the **India-Middle East-Europe Economic Corridor (IMEC),** but the competition for influence, especially in ports and infrastructure,that include**s Gwadar Port (Pakistan), Port of Djibouti (Djibouti), Port of Aqaba (Jordan), and the proposed Iran-China trade corridor.**

- **Security Threats and Maritime Challenges:** Increasing missile and drone attacks from **Houthi rebels in the Red Sea** complicate India's maritime security efforts, impacting vital trade routes.
  - ✦ The ongoing West Asian conflicts is expected to raise logistics and insurance costs, hurting India's trade in sectors like **oil, electronics, and agriculture.**
  - ✦ The <u>Bab el-Mandeb Strait</u> **and other choke points** remain critical to India's energy imports and trade, necessitating continued defense engagement.

- **Diplomatic Balancing in a Multipolar Region:** India faces the challenge of balancing its deepening ties with I**srael and Gulf Arab nations while upholding its traditional support for Palestine.**
  - ✦ Though, India has leveraged its relationships with both **Israel and the UAE in areas like defense, cybersecurity, and renewable energy,** demonstrating its diplomatic agility. However, balancing these relationships with India's long-standing support for Palestinian statehood remains **a tightrope walk.**

- **Labor Rights and Migrant Issues:** With over 9 million Indians working in the Gulf, ensuring migrant welfare remains a pressing concern in India-West Asia ties.
  - ✦ Despite recent improvements, such as the **UAE's adoption of the RuPay card to facilitate financial integration,** labor rights issues continue to strain relations.
  - ✦ The r**ecent fire tragedy in Kuwait**, which claimed the lives of several Indian migrant workers, has brought renewed attention to the critical issue of their safety and well-being.

What Measures can India Adopt to Strengthen its West Asian Outlook?

- **Deepening Multilateral Diplomatic Engagement:** India should bolster its diplomatic footprint in regional multilateral frameworks, such as the **India-Gulf Cooperation Council (GCC) Strategic Dialogue** and **I2U2 (India, Israel, UAE, US)** partnerships.

  - ✦ These platforms allow India to foster **multilateral cooperation** in **regional security, economic development**, and **technological innovation**.
  - ✦ By engaging in regular **dialogues on strategic issues** like **maritime security, climate resilience**, and **energy transition**, India can emerge as a **reliable partner** in West Asia's evolving geopolitical landscape.

- **Expanding Economic and Trade Partnerships:** India must strengthen its **bilateral trade agreements** with key Gulf nations, targeting sectors beyond **traditional hydrocarbons**, including **renewable energy, information technology**, and **healthcare innovation**.
  - ✦ By fostering **co-development initiatives** in infrastructure, **smart cities**, and **manufacturing**, India can drive **sustainable economic growth** and create long-term interdependencies.
  - ✦ A holistic approach to economic cooperation, underpinned by **strategic commercial diplomacy**, will solidify India's position as a central economic partner for West Asia.

- **Strengthening Security and Counterterrorism Cooperation:** India should **intensify security collaboration** with Gulf nations through **joint counterterrorism operations, intelligence-sharing platforms**, and **strategic defense partnerships**.
  - ✦ By creating **regional security frameworks** that prioritize **collective defense** and **cybersecurity**, India can enhance regional peace and security while safeguarding critical maritime routes.
  - ✦ Strengthening **counterterrorism mechanisms** and **border security initiatives** will ensure that India and its West Asian partners collectively address growing threats from extremism.
    - ✐ **Operation Sindoor** underscores **India's resolute commitment and capability to combat the menace of terrorism with precision and strategic resolve.**

💡 **Promoting People-to-People and Cultural Diplomacy:** India must leverage **soft power diplomacy** by enhancing **people-to-people connections** through cultural exchanges, **educational partnerships**, and **labor welfare programs**.

✦ Strengthening the **Indian diaspora's role** in West Asia will deepen **socio-cultural bonds** and build a foundation of trust and shared values.

✦ By facilitating **educational exchange programs**, **collaborative research initiatives**, and **cultural diplomacy**, India can establish itself as a leader in **human capital development**.

💡 **Fostering Strategic Regional Infrastructure Projects:** India should spearhead **infrastructure co-development** projects across West Asia, focusing on **connectivity corridors** and **port development**.

✦ Initiatives like the **India-Middle East-Europe Economic Corridor (IMEEC)** will be instrumental in enhancing **regional trade integration** and fostering **multimodal connectivity**.

✦ By prioritizing **cross-border infrastructure** and **sustainable development**, India can foster **economic interdependence** and **strategic regional integration**.

📎 This will not only boost trade and investment but also serve as a catalyst for **regional cooperation** and **geopolitical stability** in the long term.

💡 **Leveraging Digital and Technological Cooperation:** India must intensify its **digital diplomacy** by promoting **cybersecurity collaboration**, **digital financial inclusion**, and **AI-driven partnerships** with West Asia.

✦ By offering **technology transfer** and establishing **joint innovation hubs**, India can support the region's **digital transformation** and **smart governance** initiatives.

✦ Fostering **technology incubators** and **entrepreneurship partnerships** in sectors like **FinTech**, **blockchain**, and **AI** will enable both India and West Asia to co-develop **future-proof economies**.

Conclusion:

India's West Asia outreach has **matured into a future-ready strategic engagement**—anchored in energy security, economic diversification, and regional connectivity. The growing synergy in trade, technology, and defense highlight**s India's evolution from a passive partner to a proactive regional stakeholde**r. Going forward, India must sustain this momentum through **inclusive diplomacy, infrastructural leadership, and people-centric partnerships.**

Modernising India'S Defence

This editorial is based on "India's defence policy must gear up for a 3.5-front security challenge" which was published in Livemint on 06/05/2025. The article brings into picture the urgent need for India to revamp its defense strategy following a deadly terror attack, stressing modernization, indigenization, and enhanced R&D.

Tag: GS Paper - 3, Defence Technology, Indigenization of Technology, GS Paper - 2, Government Policies & Interventions

India is currently engaged in a **severe military standoff with Pakistan**, ignited by a terrorist attack in **Pahalgam** Kashmir that resulted in 26 civilian casualties. In retaliation, India launched **"Operation Sindoor,"** targeting alleged militant infrastructure across Pakistan and Pakistan-occupied Kashmir. This situation underscores the necessity for India to **reevaluate its defense strategy, emphasizing modernization, indigenization,** and reforms to address emerging threats effectively. Enhancing defense spending, particularly in research and development, and fostering private sector participation are crucial steps toward strengthening **national security.**

What are the Key Major Developments in India's Defence Sector?

- 💡 **Indigenous Defence Production Surge:** India has made significant progress in achieving <u>self-reliance in defence manufacturing</u>, **reducing dependence on imports, exemplified by** <u>Positive Indigenisation Lists</u>.
  - ✦ This effort has contributed substantially to both national security and economic growth.
  - ✦ In **FY 2023-24,** India's indigenous defence production reached **₹1.27 lakh crore, up by 16.7% from 2022-23**.
    - 📎 Moreover, **65% of defence equipment is now produced within India**, showcasing the effectiveness of the <u>**Make in India**</u> initiative.

- 💡 **Defence Exports Expansion:** India's defence export sector has experienced unprecedented growth, **positioning the country as a key player in the global arms market.**
  - ✦ India now exports to over **100 countries,** with major buyers including the **USA, France, and Armenia**.
  - ✦ In FY 2023-24, India's defence exports reached ₹21,083 crore, **marking a 30-fold increase in exports over the last decade.**
    - 📎 The government targets **₹50,000 crore in defence exports by 2029,** strengthening its economic and strategic influence.

- 💡 **Technological Advancements in Defence R&D:** The focus on technological innovation through <u>**iDEX (Innovations for Defence Excellence)**</u> and the **Technology Development Fund (TDF)** has spurred India's technological self-reliance.
  - ✦ These programs enable startups and MSMEs to engage in defence research, fostering rapid indigenisation.
  - ✦ As of February 2025, **549 problem statements were issued, with 619 startups collaborating with defence R&D institutions.**

- 💡 **Defence Industrial Corridors (DICs) Development:** India has established two <u>**Defence Industrial Corridors**</u> in Uttar Pradesh and Tamil Nadu to boost indigenous defence production and attract foreign investments.
  - ✦ These corridors provide significant infrastructure and incentives to industries, creating a conducive environment for defence manufacturing.
  - ✦ Over ₹8,658 crore has already been invested in these corridors. These corridors aim to attract a potential investment of ₹53,439 crore, **making them critical to India's defence industrial expansion.**

- 💡 **Modernisation of Armed Forces with Latest Procurement:** India has been focusing on modernising its armed forces with high-tech acquisitions, including the procurement of <u>**Light Combat Helicopters (LCH)**</u> and **Advanced Towed Artillery Gun System (ATAGS)**.
  - ✦ In March 2025, contracts worth ₹62,700 crore were signed for **156 LCH Prachand helicopters**, strengthening India's aerial capabilities.
  - ✦ The Indian Air Force (IAF) has also integrated high-precision weapons, such as <u>**SCALP Cruise Missiles**</u>, <u>**HAMMER Precision-Guided Bombs,**</u> and <u>**Loitering Munitions**</u>, which were notably used in **Operation Sindoor** for precision strikes, ensuring high accuracy and minimal collateral damage.

- 💡 **Strategic Defence Partnerships and Global Diplomacy:** India's growing role as a global defence exporter is supported by strategic partnerships with nations like the USA, France, and Russia.
  - ✦ The <u>**BrahMos missile**</u> **export deal** to Indonesia, valued at ₹3,800 crore, showcases India's technological prowess in missile systems.
  - ✦ Additionally, I**ndia's participation in multilateral defence exercises with countries like Japan, the Philippines, and Malaysia** further cements its position as a dependable partner in global security.

- 💡 **Indigenisation of Critical Defence Platforms:** India is significantly reducing its reliance on foreign military platforms through the indigenisation of critical systems.
  - ✦ One key development is the **INS Vikrant**, India's first indigenous aircraft carrier, commissioned in 2022. The ship, which has **76% indigenous content,** demonstrates India's ability to design and manufacture complex naval platforms.
  - ✦ Furthermore, the **T-90 Bhishma tank overhaul** by the Indian Army highlights the nation's commitment to enhancing the life cycle of its existing fleet.
- 💡 **Defence Testing Infrastructure:** India is rapidly enhancing its testing infrastructure for defence equipment to ensure the reliability and efficacy of indigenous systems.
  - ✦ The **Defence Testing Infrastructure Scheme (DTIS)** aims to set up state-of-the-art testing and certification facilities across India.
  - ✦ As of February 2025, **7 testing facilities have been approved,** focusing on areas like unmanned aerial systems and electronic warfare.
    - 🖉 This infrastructure **boost will enable India to conduct advanced trials and meet international standards,** supporting the country's self-reliance goals.

What are the Key Challenges Confronting India's Defence Sector?

- 💡 **Technological Gaps and Dependence on Imports:** Despite significant strides in indigenisation, India's defence sector still faces challenges in developing **high-tech systems indigenously.**
  - ✦ This dependence impedes India's goal of full self-reliance in defence. As of 2023, **36% of India's defence procurement budget is still allocated to foreign imports,** highlighting the gap in technological capabilities.

- 💡 **Bureaucratic Delays in Defence Procurement:** India's defence procurement process is often criticized for its slow pace due to bureaucratic inefficiencies, causing significant delays in the modernization of the armed forces.
  - ✦ Long timelines between the **approval of contracts and the delivery of equipment hinder operational readiness** and strategic planning.
  - ✦ It has plagued India's defence acquisitions, with past deals like **Rafale fighters and Scorpene submarines** facing extended timelines.
- 💡 **Insufficient Defence Budget Allocation for Modernisation:** While the defence budget has seen an increase, the allocation remains insufficient to meet the evolving needs of modern warfare and the growth of the defence industry.
  - ✦ The provision for defence R&D remains meagre, with the **DRDO receiving only 3.94% of the total defence budget.**
  - ✦ In 2025-26, the Ministry of Defence allocated ₹6.81 lakh crore, but only ₹1.8 lakh crore is for modernisation of the military, highlighting the gap between modernization needs and available funds.
    - 🖉 The growing financial demands for upgrading ageing systems, like the **T-90 Bhishma tank overhaul,** further strain limited resources.
- 💡 **Private Sector Participation and Public-Private Collaboration:** While private sector involvement in defence manufacturing has grown, **challenges persist in fostering robust collaboration between public and private entities.**
  - ✦ The defence ecosystem remains fragmented, with **public sector units (DPSUs) traditionally dominating,** while private sector players face hurdles in accessing key defence projects.
  - ✦ Recent investments like **JSW Defence's drone manufacturing** in Telangana are encouraging, but only **21%** of total production comes from the private sector, which remains limited.

- **Limited Export Market Penetration and Competitiveness:** Despite significant growth in defence exports, India faces challenges in penetrating key international markets due to competition from established players like the **USA, Russia, and China.**
  - ✦ India's defence exports, while growing, still lag behind global leaders, both in volume and technology.
  - ✦ The **BrahMos missile export deal** to Indonesia in February 2025 is a notable achievement, but India's overall defence exports stand at ₹21,083 crore, far behind major exporters like the US and Russia.
    - 🖉 The slow pace of securing major international contracts for systems like the **Tejas fighter** illustrates India's struggle to compete globally.

- **Vulnerability in Cyber and Electronic Warfare:** As warfare evolves, the need for cybersecurity and electronic warfare (EW) capabilities has grown.
  - ✦ **India's current cybersecurity frameworks and electronic warfare systems** are underdeveloped compared to adversaries like China.
  - ✦ India's **Cybersecurity Strategy**, still in its infancy, lags behind in building a cohesive defence architecture to protect critical systems from cyber-attacks.
    - 🖉 One prominent example is the **2020 cyberattack on India's power grid in Mumbai,** attributed to a Chinese-backed group.

- **Hampered Internal Security and Insurgency Threats:** India continues to face internal security challenges, including **insurgencies and cross-border terrorism,** particularly in regions like **Jammu & Kashmir and the Northeast.**
  - ✦ The **recent Pahalgam terror attack,** along with ongoing insurgency issues in the Northeast (like **Kuki-Meiti conflict in Manipur),** underscores India's internal security challenges.

- 🖉 These security issues drain resources that **could otherwise be dedicated to modernizing the military for conventional warfare**.
- **Lack of Integrated Defence Strategy:** India's defence planning suffers from a lack of integration across its three armed forces, which operate in silos.
  - ✦ Despite the creation of the **Chief of Defence Staff (CDS)** position, challenges **remain in harmonizing the strategies, resources, and capabilities of the Army, Navy, and Air Force.**
  - ✦ A notable example of these integration challenges is the **delayed implementation of the Integrated Theatre Commands**, a key reform aimed at enhancing jointness among the services.

What Measures can India Adopt to Further Strengthen its Defence Sector?

- **Enhanced Focus on Defence Technology Innovation:** India must prioritize investing in emerging technologies like **artificial intelligence, quantum computing, and autonomous systems for modernizing its military capabilities.**
  - ✦ By establishing **dedicated research hubs and fostering collaborations with leading global tech companies**, India can accelerate indigenous development in critical defence technologies.
  - ✦ This would reduce dependency on foreign suppliers and enhance India's competitive edge in areas like cyber warfare, precision-guided munitions, and next-generation radar systems.

- **Strategic Defence Ecosystem Collaboration:** A seamless integration between **Defence Public Sector Undertakings (DPSUs),** private sector companies, and academia is crucial for driving innovation and boosting production efficiency.
  - ✦ Establishing more collaborative platforms, like public-private innovation labs, can expedite the development of new defence products.

- Moreover, incentivizing **defence start-ups** through easy access to procurement contracts and seed funding would help tap into grassroots innovations.

💡 **Comprehensive Defence Skill Development Program:** Developing a highly skilled workforce is key to sustaining growth in indigenous defence production.

- ✦ India should establish specialized defence training institutes and incentivize collaborations with global defence corporations for skills development.

- ✦ A dedicated **Defence Talent Academy**, in partnership with top-tier educational institutions, could create a pipeline of **skilled engineers, technicians, and cyber specialists tailored to defence needs.**

  - Such initiatives would address the gap in advanced skill sets and enhance R&D capabilities.

💡 **Efficient Defence Procurement Reforms:** India needs to streamline its procurement process to reduce delays and inefficiencies that hinder the timely modernization of the armed forces.

- ✦ This can be achieved by implementing **faster, more transparent approval mechanisms**, such as digitizing the entire procurement cycle.

- ✦ Additionally, revising the **Defence Acquisition Procedure (DAP)** to prioritize **"Buy Indian" over "Buy Global"** could ensure that the domestic defence industry gets the first right of refusal on large contracts, speeding up delivery timelines and ensuring better quality control.

💡 **Strengthening Defence Export Channels and Diplomacy:** India should enhance its defence export strategy by **identifying new markets, strengthening diplomatic ties, and facilitating easy access to international defence tenders.**

- ✦ Building strategic partnerships with nations in **Africa, Southeast Asia, and Latin America** could open up new avenues for India's defence products.

- ✦ India could also leverage multilateral defence forums to position itself as a reliable exporter of advanced military technologies, further boosting its geopolitical influence.

💡 **Establishment of Defence Innovation Zones:** India should create dedicated **Defence Innovation Zones (DIZs)**, focusing on high-tech military innovations.

- ✦ These zones would act as concentrated hubs for the development of next-generation systems such as drones, cyber defence solutions, and satellite technologies.

- ✦ They would encourage both **start-ups and established companies** to work on joint solutions, foster cross-sector innovation, and offer tax incentives and funding for R&D projects.

💡 **Enhanced Cybersecurity and Digital Defence Framework:** To address the rising cyber threats, India should establish a **National Defence Cyber Command (NDCC)** dedicated to defending military networks and critical infrastructure.

- ✦ This command should focus on building **resilient cybersecurity measures**, integrating **AI-based defence strategies**, and fostering partnerships with global cybersecurity firms to stay ahead of evolving threats.

- ✦ India should also incorporate **cyber warfare simulations** into military training programs to prepare personnel for real-time cyber-attacks.

💡 **Strengthening the Defence-Industrial Collaboration with International Partners:** India should deepen its collaboration with foreign defence companies to accelerate the **co-development of defence systems**, particularly in aerospace, shipbuilding, and advanced missile technologies.

- ✦ Joint ventures with **international OEMs (Original Equipment Manufacturers)** would bring in critical technological expertise while also providing India with **cutting-edge technologies** under **Technology Transfer** agreements.

Conclusion:

India's evolving defence posture reflects both significant achievements and pressing challenges. The **urgency of external threats like terrorism and internal gaps** in coordination and technology demand bold reforms. **Accelerated indigenisation, streamlined procurement, and integrated strategic planning** are now imperative. A future-ready military must be anchored in innovation, self-reliance, and global partnerships.

FTAs Shaping India'S Global Presence

This editorial is based on "India-UK FTA could be a template for other deals" which was published in Hindustan Times on 09/05/2025.The article brings into picture the India-UK FTA as a landmark in bilateral relations, offering key market access amid global trade challenges. It highlights India's policy shift by accommodating non-trade issues like labor rights.

Tag: GS Paper - 3, Effect of Policies & Politics of Countries on India's Interests, GS Paper - 2, International Treaties & Agreements, Government Policies & Interventions

The recently concluded **India-UK Free Trade Agreement** represents a watershed moment in bilateral relations, offering crucial market access amid global trade uncertainties. Notably, India has shown unprecedented flexibility by incorporating **non-trade elements like labor rights, signaling a significant policy evolution.** India's overall stance on FTAs has undergone a remarkable transformation in recent years. Once hesitant about trade liberalization, India now actively pursues strategic trade partnerships as evidenced by agreements with **EFTA**, UAE, and Australia.

How do Free Trade Agreements Enhance India's Strategic and Economic Interests?

- 💡 **Increased Market Access for Indian Goods:** FTAs significantly expand access to foreign markets by reducing tariffs and non-tariff barriers.

- ✦ For instance, the **India-UAE CEPA ensures duty-free access to over 90% of India's exports**, including textiles, gems, and pharmaceuticals.

- ✦ This preferential access is vital as it helps Indian industries gain competitiveness, especially in labor-intensive sectors.

  - 🔖 **India's exports to the UAE grew 12%** in the first year of the CEPA's implementation.

- 💡 **Enhanced Investment Opportunities:** FTAs encourage **foreign direct investment (FDI)** by providing a stable and predictable environment for investors.

  - ✦ The **India-Australia Economic Cooperation and Trade Agreement (ECTA)** offers substantial tariff eliminations on key sectors, bolstering investor confidence.

  - ✦ By lowering trade barriers, **India attracts increased FDI flows,** vital for sectors such as technology, manufacturing, and infrastructure.

    - 🔖 As of 2024, **FDI inflows from Australia have surged 25%,** indicating the positive impact of the ECTA in enhancing investor confidence.

- 💡 **Improved Competitiveness of Indian Businesses:** Trade liberalization under FTAs fosters competition, forcing Indian companies to innovate and improve efficiency.

  - ✦ In sectors like textiles, **the India-ASEAN FTA has boosted Indian exports by reducing tariffs on key products like apparel.**

  - ✦ For example, **India's textile exports to ASEAN nations grew by 15% post-FTA,** improving India's competitiveness in the region. This ensures sustained long-term growth for Indian industries.

- 💡 **Strengthened Services Sector:** FTAs, especially with developed nations, offer better access for Indian services, including IT and healthcare.

  - ✦ The **India-UK FTA,** for example, opens up easier access to the UK labor market for Indian professionals, particularly in IT and healthcare sectors.

- ✦ Such provisions will not only generate employment for Indian professionals abroad but also increase remittances.
  - 📎 India's IT exports, which constitute nearly 25% of total services exports, are expected to see growth, with the UK accounting for 17% of this share post-FTA.
- 💡 Agricultural and Rural Sector Benefits: FTAs with partner countries open new markets for Indian agricultural exports, improving rural income levels.
  - ✦ The India-Mauritius CECPA has enhanced India's agricultural exports by cutting tariffs on products like sugar and tea.
  - ✦ By promoting agriculture-focused trade, FTAs provide farmers with new opportunities for exports.
- 💡 Technology and Knowledge Transfer: FTAs facilitate technology transfer, especially in sectors like manufacturing, green energy, and digital infrastructure.
  - ✦ The India-Australia ECTA provides India access to advanced Australian technology in sectors like renewable energy, which is crucial for India's energy transition.
    - 📎 The ECTA is also expected to reduce carbon emissions in India, boosting both environmental and economic sustainability.
- 💡 Support for Small and Medium Enterprises (SMEs): FTAs open up global markets to SMEs, offering them the opportunity to scale up their operations.
  - ✦ The India-Singapore CECA has particularly helped Indian SMEs in sectors like engineering and information technology gain market access to Singapore, which acts as a gateway to ASEAN.
  - ✦ This access helps Indian SMEs grow by engaging in global value chains (GVCs), which provide a broader market for their products.
- 💡 Regulatory Harmonization and Reduced Trade Barriers: FTAs help harmonize regulations across countries, making it easier for businesses to operate in partner markets.

- ✦ For instance, the India-EFTA TEPA, signed in 2024, facilitates easier movement of goods and services by aligning product standards and certifications across India and European countries.
- ✦ This regulatory alignment reduces the cost of compliance and trade disruptions.

What are the Major Concerns Associated with India's Free Trade Agreements?

- 💡 Trade Deficits and Imbalanced Gains: One of the key concerns with India's FTAs is the growing trade deficits with several partner countries, particularly ASEAN and UAE.
  - ✦ While India gains preferential access to markets like the UAE, it faces an increasing import intensity, especially from ASEAN.
  - ✦ The India-ASEAN FTA has led to a significant rise in imports to $44 billion in FY23, compared to $8 billion in FY13.
    - 📎 While India's share in ASEAN's exports remained stagnated, highlighting the imbalanced benefits of such agreements.
- 💡 Limited Market Access in Developed Economies: Despite tariff reductions, India faces challenges accessing markets in developed economies due to non-tariff barriers, such as stringent regulatory standards.
  - ✦ The India-EU FTA, for instance, has faced delays over issues like intellectual property rights (IPR) and data localization, restricting full access to the European market.
  - ✦ The share of the European Union in India's overall goods exports declined from 18% in 2001 to 14% in 2020, indicating barriers beyond just tariff reduction.
    - 📎 These non-tariff barriers often negate the benefits of lower tariffs.
- 💡 Vulnerability of Small Farmers and Unorganized Sectors: FTAs expose Indian farmers and small-scale industries to intense global competition, particularly in agricultural and labor-intensive sectors.

- For instance, the **India-ASEAN FTA has impacted India's domestic agricultural sector**, especially rubber farmers in South India, who face price suppression due to cheaper imports from ASEAN nations.
  - 🖉 As the **market becomes flooded with imports,** the livelihoods of small producers in unprotected sectors are increasingly at risk.
- 💡 **Job Losses in Certain Sectors:** While FTAs promote growth in many sectors, they also result in job losses in industries that cannot compete with cheaper imports.
  - The **India-UAE CEPA**, for instance, while beneficial for exports in textiles, has led to the **erosion of jobs in certain manufacturing sectors that struggle to compete** with cheaper imports from the UAE and other countries.
  - The textile industry has seen a dip in domestic production capacity **(though improved only recently)** due to heightened competition. This highlights the risk of losing domestic employment in specific sectors.
- 💡 **Environmental and Labor Standards Concerns:** Many of India's FTAs, such as those with the EU and the UK, have incorporated clauses on labor rights and environmental standards.
  - However, India's reluctance to fully embrace these standards often limits the effectiveness of such agreements in promoting sustainable trade.
  - The **India-UK FTA includes provisions for labor rights,** yet India has resisted fully binding labor provisions, fearing the negative impact on domestic policy autonomy.
  - Moreover, **environmental clauses like the Carbon Border Adjustment Mechanism (CBAM)** threaten to impose taxes on carbon-intensive products like **steel and cement,** posing a competitive disadvantage.
- 💡 **Monopoly and Market Power Concerns:** India's FTAs often fail to address issues of monopoly and restrictive trade practices, which disproportionately benefit large corporations over small businesses.

- The India-UAE CEPA, for example**, lacks provisions to prevent market dominance by big firms,** particularly in sectors like textiles and pharmaceuticals.
- **India's pharmaceutical exports have seen growth**, but a 2018 CCI investigation found that Indian pharma companies were facing anti-competitive practices, which could worsen under FTAs if not properly regulated.
  - 🖉 These unregulated practices can undermine the competitive environment for Indian businesses.
- 💡 **Lack of Effective Dispute Resolution Mechanisms:** FTAs often lack robust mechanisms for resolving disputes, particularly in the case of trade barriers that unfairly impact one side.
  - India's experience with the ASEAN FTA has shown that when **trade barriers are erected,** such as restrictions on agricultural exports or excessive tariffs on machinery, the **existing dispute resolution frameworks are often too slow to offer timely solutions.**
  - For instance, the India-ASEAN dispute over palm oil exports. India contends that non-reciprocity in FTA concessions, non-tariff barriers, import regulations, and quotas have **hindered its exports to ASEAN.**
- 💡 **Strategic Dependence on FTAs for Global Trade Integration:** Critics argue that India's rush towards signing FTAs can lead to strategic dependence on these agreements for access to global markets, which can **undermine multilateral efforts like those at the WTO.**
  - With India negotiating over a dozen FTAs simultaneously, **it risks diluting its bargaining power in multilateral trade negotiations**.

What Measures Can India Adopt to Further Strengthen its FTAs?

- 💡 **Enhance Domestic Competitiveness through Capacity Building:** India should focus on strengthening the competitiveness of its domestic industries, **especially in sectors exposed to global competition under FTAs.**

- This can be achieved through **targeted investments in technology, research and development,** and skill development programs.
- Strengthening the domestic supply chain, particularly in high-growth sectors like **electronics, pharmaceuticals, and textiles,** will ensure that Indian businesses can compete effectively in global markets.

💡 **Strengthening Dispute Resolution Mechanisms:** India must advocate for stronger, more **efficient dispute resolution mechanisms** within its FTAs to ensure fair treatment and timely resolution of trade issues.

- Establishing a robust and transparent framework for resolving trade disputes can help **prevent unnecessary delays and protect India's interests in trade relations.**
- This would involve integrating clear timelines, penalties for non-compliance, and more accessible legal recourse for Indian exporters and businesses.

💡 **Incorporating Sustainable Trade Provisions:** With global trade moving toward sustainability, **India should push for FTAs that include clear and binding provisions on environmental protection**, climate change, and sustainable practices.

- Incorporating these aspects into trade agreements will not **only promote green technologies and sustainable industrie**s but will also ensure India's industries remain competitive in the growing global market for environmentally conscious products.

💡 **Strengthening Labor and Social Standards:** India should work towards integrating fair labor standards and social protections within its FTAs to safeguard the rights of workers while engaging in international trade.

- These provisions can help **avoid exploitation in sectors like textiles and agriculture,** which are vulnerable to price fluctuations.
- By balancing economic interests with labor welfare, India can improve working conditions and foster more inclusive trade policies.

💡 **Diversification of Trade Partners and Product Sectors:** India needs to diversify its trade partners and product sectors under FTAs to **reduce over-reliance on a few markets or industries.**

- By pursuing agreements with a wider range of countries and focusing on non-traditional sectors like **digital services, green energy, and advanced manufacturing**, India can create new opportunities and ensure that it remains resilient to changes in global trade dynamics.

💡 **Promoting Digital Trade and E-Commerce Integration:** Incorporating **digital trade frameworks within FTAs** is crucial for India's participation in the rapidly growing global e-commerce ecosystem.

- India should negotiate provisions that facilitate **data flows, digital trade, and cross-border e-commerce**, ensuring that Indian businesses, especially SMEs, can easily access global digital markets.
- This would involve provisions for data localization, intellectual property protections, and regulatory harmonization for digital goods and services.

💡 **Promoting Investment Protection and Facilitation:** India should negotiate **Bilateral Investment Treaties (BITs) alongside its FTAs** to provide greater protection for foreign investors and enhance bilateral investment flows.

- This includes ensuring **fair and transparent treatment of investors, dispute resolution mechanisms,** and protection against expropriation.
- A robust investment protection framework will encourage foreign capital, technology transfer, and job creation in strategic sectors.

💡 **Monitoring and Adapting Trade Agreements Based on Changing Global Dynamics:** India should establish a dedicated mechanism to continuously monitor the outcomes of FTAs and adjust policies based on emerging global trends and domestic needs.

- This could involve **periodic reviews, public consultations, and collaboration with industry stakeholders** to ensure that FTAs remain relevant and adaptive to the evolving economic landscape.
  - By staying flexible and responsive, India can maximize the long-term benefits of its trade agreements.

Conclusion:

India's FTAs enhance **market access, boost exports, attract FDI, and improve global competitiveness.** They support key sectors like services, agriculture, and SMEs while enabling technology transfer. To strengthen FTAs, India must build domestic capacity, ensure fair dispute resolution, and promote sustainable, inclusive trade.

Millets for Sustainable Agriculture

This editorial is based on "The paddy pivot: Rethinking subsidies to drive sustainable farming", published in Financial Express on 05/05/2025. The article highlights the need to repurpose the current government expenditures to move away from intensive paddy production to the production of alternative crops like millets that are more sustainable.

Tag: GS Paper - 2, Government Policies & Interventions, GS Paper - 3, Cropping Patterns.

India's paddy cultivation, which has long supported millions of livelihoods, is now being seen as a **barrier to the nation's environmental and economic sustainability. As of 2023-24,** paddy occupies **36% of the total area** under food grain production, which is approximately **47.82 million hectares.** It comes at a high environmental cost, contributing to methane and nitrous oxide emissions and exacerbating water usage concerns.

Furthermore, states like Punjab and Haryana, despite their long history of paddy farming, now show declining agricultural growth rates. This has triggered a debate on the need to adopt Sustainable Agricultural Practices like **millets production.**

What is Sustainable Agriculture?

- 💡 **About:** Sustainable agriculture refers to **farming methods** that meet **current food and textile needs without compromising** the ability of future generations to meet their own needs.
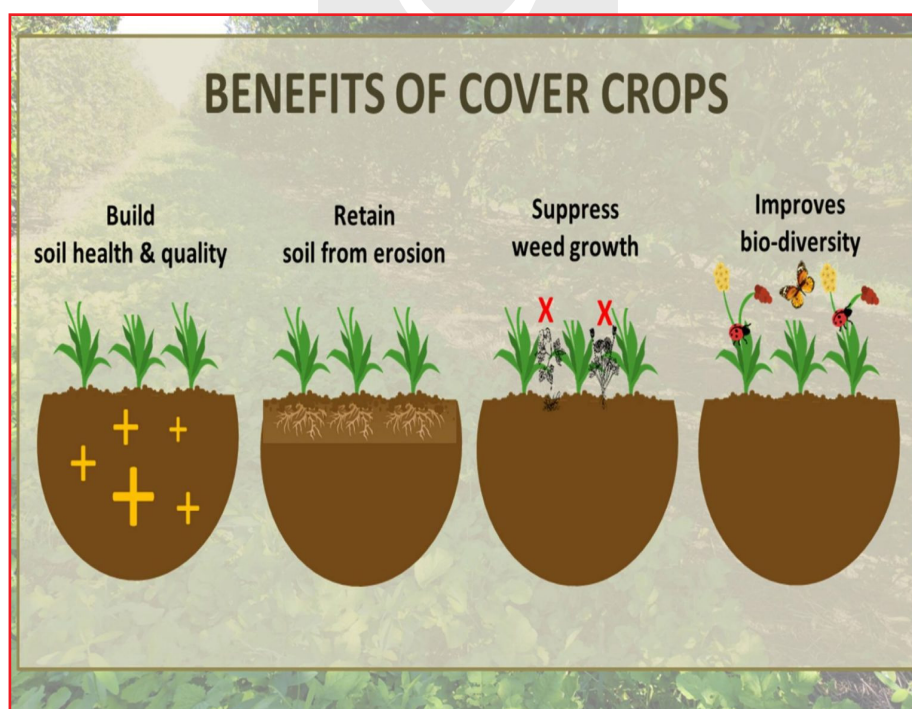
- 💡 **Aim:** These practices **aim to create a balance between agricultural productivity,** environmental health, economic profitability, and social equity.

✦ Sustainable agriculture focuses on **minimizing the use of non-renewable resources,** promoting biodiversity, enhancing soil health, and reducing the impact on ecosystems.

Millets

About
- Small-grained cereals also known as **coarse grains**
- Often referred to as **'Superfood'**
- Among the **first crops to be domesticated** - evidence of millet consumption dates back to the **Indus Valley Civilisation (3,000 BC)**
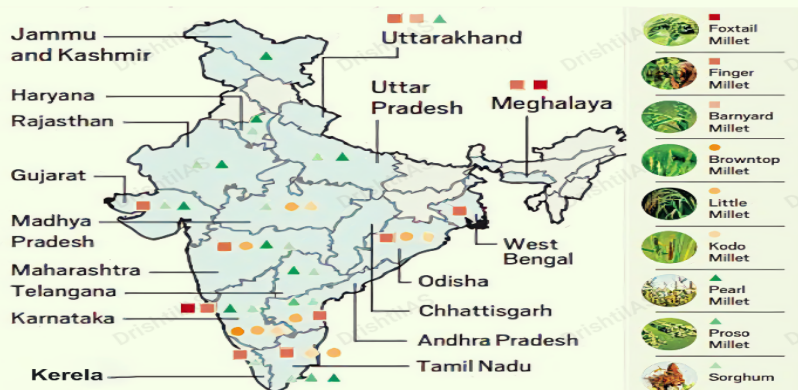
Climatic Conditions
- **Mainly a Kharif crop in India**
- **Temperature:** 27°C - 32°C
- **Rainfall:** Around 50-100 cm
- **Soil Type:** Inferior alluvial or loamy soil

India and Millets
- **Global Largest Millet Producer:**
  - 20% of global production, 80% of Asia's production
- **Common Millets:**
  - **Ragi** (Finger millet), **Jowar** (Sorghum), **Sama** (Little millet), **Bajra** (Pearl millet), and **Variga** (Proso millet)
  - **Indigenous varieties** (small millets) - **Kodo, Kutki, Chenna and Sanwa**
- **Top Millets Producing States:**
  - Rajasthan (largest), Karnataka, Maharashtra, Madhya Pradesh and Uttar Pradesh
- **Govt. Initiatives:**
  - Initiative for Nutritional Security through Intensive Millet Promotion (INSIMP)
  - **'India's Wealth, Millets for Health'**
  - **Millet Startup Innovation Challenge**
  - **Hiked MSP** for Millets
  - Agriculture Ministry declared millets as **"Nutri Cereals"** in 2018

Significance
- Less expensive, **nutritionally superior**
- High protein, fibre, minerals, iron, calcium and a **low glycemic index**
- Help **tackle lifestyle problems and health** (obesity, diabetes etc.)
- Photo-insensitive, **resilient to climate change & water efficient**

Jammu and Kashmir, Uttarakhand, Haryana, Uttar Pradesh, Meghalaya, Rajasthan, Gujarat, Madhya Pradesh, Maharashtra, Telangana, Karnataka, Kerela, Odisha, Chhattisgarh, Andhra Pradesh, Tamil Nadu, West Bengal

Foxtail Millet, Finger Millet, Barnyard Millet, Browntop Millet, Little Millet, Kodo Millet, Pearl Millet, Proso Millet, Sorghum

International Year of Millets - Year 2023
Proposed by India, declared by **UNGA**

Drishti IAS

- **Key Characteristics:**
  - ✦ **Conservation Centric:** Efficient irrigation techniques like **drip irrigation, rainwater harvesting, and water-efficient crop management** to minimize water wastage.
    - 🔖 Techniques such as **crop rotation, agroforestry, reduced tillage**, and the use of organic fertilisers to preserve soil fertility and structure.
  - ✦ **Organic Farming:** Avoiding **synthetic pesticides and fertilisers**, relying on organic alternatives to maintain healthy soil and ecosystems.
    - 🔖 **Integrated Pest Management (IPM)**, combining biological, cultural, and mechanical control methods to manage pests and reduce dependence on chemical pesticides.
  - ✦ **Climate-Resilient Crops:** Growing crops that are **more resistant to droughts, floods, pests, and diseases,** which helps farmers adapt to climate variability.
    - 🔖 Planting trees to absorb **carbon dioxide from the atmosphere, helping mitigate climate change.**
    - 🔖 Minimizing practices such as **paddy cultivation**, which emits large amounts of **methane**, and adopting low-carbon farming practices.

What are the Key Advantages of Millet Production?

- **Enhanced Food Security: Millets are** highly nutritious, rich in protein, fiber, and essential minerals, offering a healthy alternative, aiding in the management of **diabetes and promoting better digestion and heart health.**
- **Environmental Sustainability**: Millets are **drought-tolerant, requiring minimal water, fertilizers, and pesticides,** making them ideal for cultivation in arid and semi-arid regions. This helps conserve water and protect the environment.

- **Economic Viability for Farmers**: Millets have a **lower cost of production, leading to higher profit margins for farmers**. They also offer diversification, reducing economic risks associated with monocropping.
- **Rural Livelihood Support**: Millet cultivation provides employment opportunities in rural regions, especially in dryland areas, and can improve incomes through both food production and livestock fodder.
- **Global Market Expansion**: India is the largest producer and exporter of millets, followed by Niger and China. Global millet production stood at **28 million metric tons in 2020**, with major consumption in Africa and Asia.
- **Support for SDGs**:Promoting millet production aligns with global goals like **Zero Hunger**, **Climate Action**, and **Clean Water**, contributing to sustainable agriculture and climate resilience.

What are the Challenges in Moving Away from Paddy Cultivation in India?

- **Economic Factors:** Despite the environmental and **resource-intensive nature of paddy cultivation,** it continues to be economically lucrative for farmers. For example, the gross profit from paddy farming is notably high in states like **Punjab** as per data from 2023-24.
  - ✦ On the other hand, **millets** (e.g., bajra and jowar) are more environmentally sustainable due to their lower water and fertiliser requirements, but they are not as profitable as paddy.
  - ✦ The substantial subsidies provided by the **government to paddy production,** including fuel and electricity subsidies for irrigation and fertilisers, make it an economically attractive choice for farmers.
- **Farmers' Resistance to Change:** Farmers are inherently risk-averse when it comes to switching crops. Since agriculture is highly dependent on weather conditions, yield fluctuations, and market prices, there is a significant psychological barrier.

✦ Farmers are not convinced that switching to millets, **despite the environmental benefits,** will guarantee the same or better profits, especially when the price for millets can vary significantly from year to year.

✦ Millets, while resilient and less resource-intensive, may yield less per hectare compared to paddy under current farming conditions.

💡 **Infrastructural and Knowledge Gaps**: There is a lack of infrastructure for millet processing and marketing, especially in comparison to paddy.

✦ While paddy has an established **supply chain and processing infrastructure,** millets still face challenges related to storage, transportation, and market access. This hampers the commercial viability of millets.

✦ Many farmers in **traditional rice-growing states like Punjab and Haryana** lack the technical know-how for growing millets. This knowledge gap needs to be addressed through government initiatives and agricultural extension services**.**

💡 **Cultural and Social Factors:** Farming in states like Punjab and Haryana is deeply embedded in cultural and traditional practices, where paddy cultivation has been passed down through generations.

✦ The idea of switching crops is not only an economic decision but also a cultural one.

✦ Overcoming this social inertia requires a concerted effort to change the mindset of farmers about the benefits of millet cultivation.

💡 **Policy Gaps and Regulatory Constraints;** While the government has increased awareness about millets through campaigns like the **International Year of Millets (2023)**, there is still a gap in the policy support structure when it comes to incentivizing large-scale millet cultivation.

✦ The focus has predominantly been on food security through staple crops like rice and wheat, and millets have often been overlooked in terms of government procurement, MSP support, and subsidies.

What are India's Initiatives Related to Sustainable Agricultural Practices?

💡 **National Mission on Sustainable Agriculture**
💡 **Paramparagat Krishi Vikas Yojana (PKVY)**
💡 **Sub-mission on AgroForestry (SMAF)**
💡 **Rashtriya Krishi Vikas Yojana**
💡 **National Mission on Natural Farming**
💡 **Soil Health Card Scheme**

What Steps can be taken to Promote Sustainable Agriculture?

💡 **Shift Paddy Production to Resource-Abundant Regions:** States like Chhattisgarh, Jharkhand, and Bihar have abundant land and water resources, making them ideal for expanding paddy production.

✦ On the other hand, **Punjab and Haryana,** contributing only **8.8% and 3.8**% to the national food grain pool, can reduce paddy production without jeopardising food security.

💡 **Provide Financial Incentives for Sustainable Practices:** To encourage farmers to adopt environmentally beneficial practices, financial incentives are crucial.

✦ The current incentive mechanisms must be overhauled to ensure that paddy farmers are adequately supported while maintaining economic welfare and food security.

✦ Studies suggest doubling the incentive to **₹35,000 per hectare, equally shared by the central and state governments**, would make the switch to sustainable crops like millets more attractive.

💡 **Repurpose Government Expenditure:** The government spends significant resources on paddy production and procurement.

✦ In 2023-24, Punjab and Haryana spent ₹1,55,004 and ₹83,836 per hectare, respectively, on paddy subsidies, almost **three times the gross profit earned** by farmers.

✦ Redirecting this expenditure towards millet production can ease the fiscal burden on the government, promoting a shift to more resource-efficient crops.

- 💡 **Establish Funds via Direct Benefit Transfer (DBT):** A DBT system can provide cash incentives to farmers who do not grow paddy, encouraging them to switch to sustainable crops like millets or leave the land fallow.
  - ✦ Governments can jointly offer cash incentives equal to or greater than the gross profit of paddy farmers—**suggested at ₹53,479 per hectare.**
- 💡 **Fiscal Savings and Reinvestment:** By halving government expenditure on paddy subsidies and procurement, the government could **save over ₹6 lakh crore in Punjab and Haryana** over the next decade.
  - ✦ These savings can be reinvested into creating a price stabilisation fund for millets, building infrastructure to promote millet exports, and supporting environmental rejuvenation.

Conclusion:

There is an urgent **need for Indian agriculture to rethink its practices** in pursuit of sustainability and move away from intensive paddy production to **millet production**. It is possible by providing **cash incentives** to farmers through initiatives like **a DBT system**, making it a win-win situation for all – farmers, the government, and the economy. Such incentives would not only encourage farmers to adapt to **new practices**, but they would also lead to greater **agricultural sustainability**.

HDR 2025 & AI-Driven Human Development

This editorial is based on "Signals from HDI ranking: Public delivery of social infra is key weakness" which was published in Business Standard on 08/05/2025. The article highlights that India's HDI improved from rank 133 to 130 in 2023, yet inequality, gender disparities, and inadequate public spending on health and education remain major challenges.

Tag: GS Paper - 1, Human Geography, GS Paper - 2, Human Resource, Issues Relating to Development, GS Paper - 3, Inclusive Growth, Sustainable Development.

India improved its **Human Development Index (HDI)** ranking from 133 in 2022 to 130 in 2023, marking steady progress. While still in the medium **human development category**, India's HDI value has risen over **53%** in recent decades, surpassing global and South Asian averages. The 2025 HDI report highlights **Artificial Intelligence (AI)** as a key driver for future growth, especially in **healthcare, education, and governance.** However, it emphasizes the need for **inclusive**, **human-centered AI policies** to ensure its benefits reach all sections of society **equitably and effectively**.

What is the Human Development Index (HDI)?

- 💡 **About HDI:** The **Human Development Index (HDI)** is a composite index developed by the **United Nations Development Programme (UNDP)** that measures and ranks countries based on three key dimensions of human development.
  - ✦ The HDI was introduced in **1990** as part of the first **Human Development Report (HDR)** published by the **UNDP**.
  - ✦ It was conceptualized by Pakistani economist **Mahbub ul Haq** and Indian Nobel Laureate **Amartya Sen** with the objective of shifting the focus from purely economic measures of development to a more inclusive understanding of human well-being.
- 💡 **Parameters of HDI:**
  - ✦ **Health Dimension:**
    - 📎 **Indicator:** Life Expectancy at Birth.
    - 📎 It measures the average number of years a newborn is expected to live, assuming current mortality rates remain constant.
  - ✦ **Education Dimension:**
    - 📎 **Indicators:**
      - ▪ **Mean Years of Schooling:** Average number of years of education received by people aged 25 and older.
      - ▪ **Expected Years of Schooling:** Total number of years of schooling a child entering the education system is expected to receive.
    - 📎 It reflects the ability to acquire knowledge and skills necessary for development.

- **Standard of Living Dimension:**
  - 📎 **Indicator:** <u>Gross National Income (GNI)</u> per capita (PPP adjusted).
  - 📎 It reflects the average income of citizens, adjusted for differences in the cost of living and inflation rates.

What is the Significance of HDI?

- 💡 **Holistic Measurement of Development:** HDI provides a broader perspective on development beyond economic growth, emphasizing **health, education, and living standards**.
  - ✦ Unlike GDP, which only measures economic performance, HDI evaluates the overall **quality of life and well-being of individuals**, offering a more inclusive picture of national progress.
- 💡 **Policy Formulation and Targeted Interventions:** Governments use HDI to **identify policy gaps** and strategize on improving social and economic indicators.
  - ✦ It enables policymakers to focus on critical areas like education, healthcare, and income distribution, allowing for **targeted** <u>welfare schemes</u> that can bridge developmental disparities.
- 💡 **International Comparisons and Benchmarking:** HDI facilitates the **comparison of developmental progress** between countries, highlighting global inequalities and areas needing improvement.
  - ✦ Countries can benchmark their performance against others, inspiring **competitive development and fostering international** cooperation in achieving higher human development standards.
- 💡 **Focus on Human Well-being and Quality of Life:** Shifts the focus from mere economic prosperity to **human well-being and quality of life**.
  - ✦ By integrating health and education indicators, HDI underscores that sustainable development must include the welfare of people, not just economic metrics.
- 💡 **Indicator for Sustainable Development Goals (SDGs):** HDI is a critical tool for monitoring progress towards achieving the <u>United Nations Sustainable Development Goals (SDGs)</u>, particularly goals related to **health, education, and poverty alleviation**.

- ✦ It acts as a measure to evaluate how well nations are performing in creating inclusive and sustainable growth.
- 💡 **Guidance for International Aid and Investment:** Global organizations like the <u>World Bank</u>, <u>International Monetary Fund (IMF)</u> and <u>United Nations (UN)</u> often rely on HDI rankings to determine **aid allocation and investment strategies**.
  - ✦ A higher HDI ranking signifies better governance and human capital, attracting more international funding and cooperation.
- 💡 **Empowerment of Civil Society and Advocacy:**
  - ✦ HDI serves as a powerful tool for **civil society and advocacy groups** to hold governments accountable.
  - ✦ By providing transparent data on development, it enables public discourse on socio-economic inequalities and drives movements for better policy initiatives.

What are Key Highlights of the Human Development Report 2025?

- 💡 **Global Highlights:**
  - ✦ **Stalled Human Development Progress:** The global HDI experienced its smallest increase since 1990, excluding the 2020-2021 crisis years.
    - 📎 If pre-Covid trends had continued, most countries could have achieved very high human development by **2030**.
      - 🙇 This projection is now delayed by decades.
  - ✦ **Top and Bottom Ranks: Iceland** topped the list with an **HDI of 0.972**, while **South Sudan** ranked last with an **HDI of 0.388**.
    - 📎 European nations continued to dominate the top 10, reflecting high standards in education, healthcare, and income levels.
  - ✦ **Growing Inequality:** The disparity between the richest and poorest nations has been widening. High-HDI countries are making consistent progress, while low-HDI nations face stagnation and setbacks.

- ✦ **AI and Future of Work:** The report highlights the rapid spread of <u>Artificial Intelligence (AI)</u>, with **1 in 5 people** globally already using AI tools.
  - About **60% of global respondents** believe AI will create new job opportunities, while **50% fear job displacement or transformation**.
  - The 2025 HDR emphasizes the need for **inclusive, human-centered AI policies** to harness AI's potential for positive human development.

💡 **India-Specific Highlights:**

- ✦ **India's HDI Ranking:**India moved up from **133rd in 2022 to 130th in 2023**, with its HDI value rising from **0.676 to 0.685**.
  - It remains in the **"medium human development"** category, nearing the threshold for **high human development (HDI ≥ 0.700)**.
- ✦ Regional Comparison:
  - Among neighbors, **China (78th)**, **Sri Lanka (89th)**, and **Bhutan (125th)** rank above India.
  - **Bangladesh** is on par at **130th**, while **Nepal (145th)**, **Myanmar (150th)**, and **Pakistan (168th)** rank below.
- ✦ Progress in Key Areas:
  - **Life Expectancy:** Rose from **58.6 years in 1990 to 72 years in 2023**, marking the highest recorded, largely due to programs like the <u>National Health Mission</u>, <u>Ayushman Bharat</u>, <u>Janani Suraksha Yojana</u>, and <u>Poshan Abhiyaan</u>.
  - **Education:** Mean years of schooling increased from **8.2 years in 1990 to 13 years in 2023**. Major initiatives include the <u>Right to Education Act 2009</u>, <u>National Education Policy 2020</u>, and <u>Samagra Shiksha Abhiyan</u>.
  - **National Income:** India's **GNI per capita** rose over fourfold, from **USD 2,167 in 1990 to USD 9,046 in 2023** (PPP adjusted).
  - **Poverty Reduction:** About **135 million Indians** escaped <u>multidimensional poverty</u> between **2015-16 and 2019-21**.

- ✦ **Role of AI:** India is emerging as a **global AI leader**, with the **highest self-reported AI skills penetration**.
  - **20% of Indian AI researchers** now stay domestically, a significant increase from nearly zero in 2019.
  - For instance, in India, AI is providing farmers with real-time assistance- such as access to insurance and subsidies in their local languages- by integrating data from multiple sources.

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HDI ranking and value (2023)

Rank	Country	HDI value
1	Iceland	0.972
2	Norway	0.970
2	Switzerland	0.970
4	Denmark	0.962
5	Germany	0.959
5	Sweden	0.959
7	Australia	0.958
8	Hong Kong, China (SAR)	0.955
8	Netherlands	0.955
17	United States	0.938
130	India	0.685

HDI: Human Development Index
Source: UNDP Human Development Report 2025

What are the Major Challenges Impacting India's Human Development?

💡 **High Inequality Reduces HDI Value**: Inequality reduces India's HDI by **30.7%**, one of the highest losses in the region.

- ✦ This reflects deep disparities in income, access to services, and opportunities, undermining overall human development progress.

💡 **Persistent Gender Disparities**: Female labour force participation in India stands at just **41.7%**, with limited political representation, curbing the potential for inclusive growth.

✦ While the **106ᵗʰ Constitutional Amendment** proposes one-third reservation for women in legislatures, implementation remains critical.

💡 **Digital Skill Deficits and Technological Inequity**: Less than **5% of students in low HDI countries**, including India, possess the basic skills needed to engage with new technologies.

✦ This digital skills gap limits India's ability to harness AI and digital tools for economic transformation and job creation.

💡 **Low Public Investment in Health and Education**: As per the **Economic Survey 2024-25**, India's Total Health Expenditure in FY22 was ₹9,04,461 crore, accounting for **3.8% of GDP and ₹6,602 per capita** at current prices.

✦ While per capita spending has steadily increased since FY19, public health investment remains low compared to global standards.

✦ Similarly, **education spending reaches up to 4.6% of GDP**, yet continues to lag behind countries that have achieved higher HDI rankings through greater investments in human capital.

✦ This underfunding hampers access to quality services, reducing life expectancy and learning outcomes.

💡 **Limited Economic Diversification**: India, like other medium HDI countries, still relies heavily on **agriculture and low-tech sectors**, making the economy vulnerable to shocks.

✦ Lack of diversification restricts the uptake of advanced technologies and impedes productivity growth.

💡 **Technosolutionism and Weak Institutions**: The rush to adopt digital solutions without robust institutional capacity leads to **context-blind "technosolutionism"**, where technology fails to address deeper social inequalities.
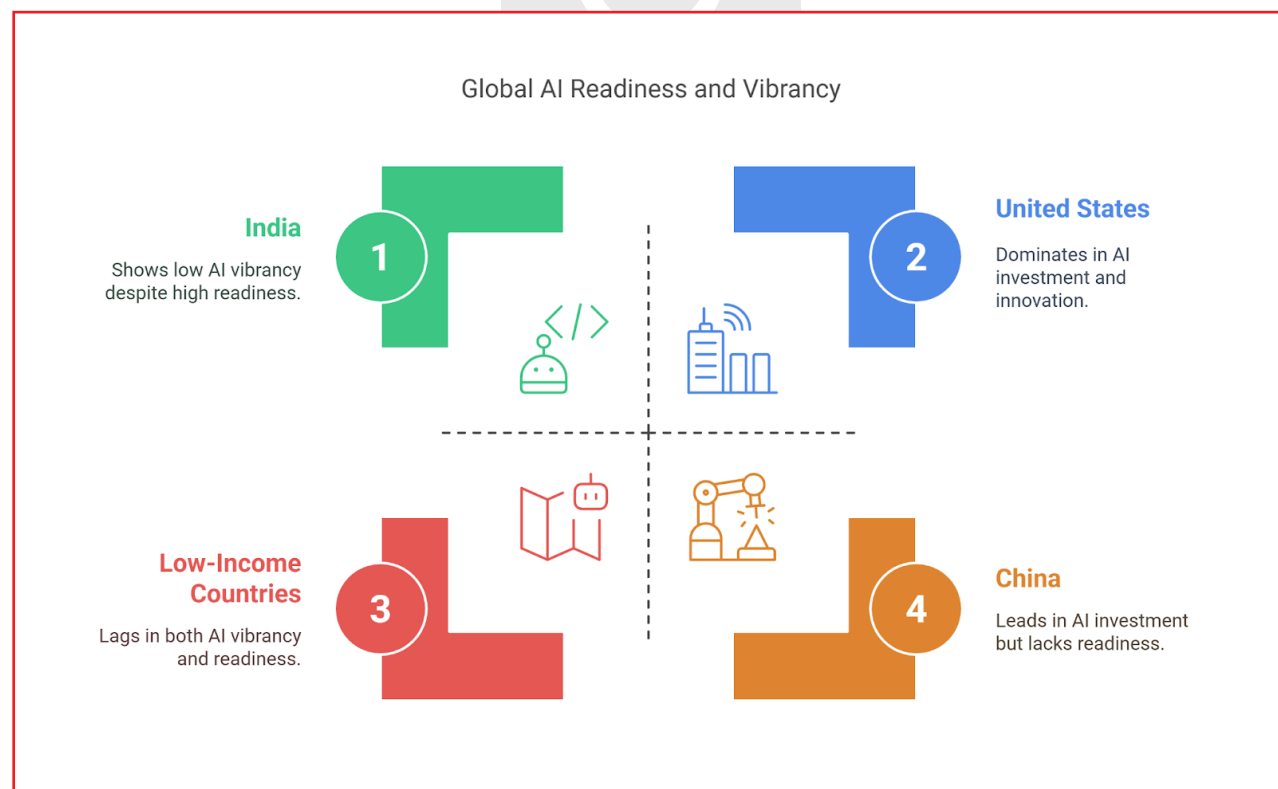
Global AI Readiness and Vibrancy

India (1)
Shows low AI vibrancy despite high readiness.

United States (2)
Dominates in AI investment and innovation.

Low-Income Countries (3)
Lags in both AI vibrancy and readiness.

China (4)
Leads in AI investment but lacks readiness.

Key Schemes for Human Development in India

💡 **Health and Nutrition:**
- ✦ Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana (AB-PMJAY)
- ✦ National Health Mission (NHM)
- ✦ Poshan Abhiyaan (National Nutrition Mission)
- ✦ Mission Indradhanush

💡 **Education and Skill Development:**
- ✦ Samagra Shiksha Abhiyan
- ✦ PM e-Vidya & DIKSHA Platforms
- ✦ Skill India Mission (Pradhan Mantri Kaushal Vikas Yojana - PMKVY)

💡 **Gender Empowerment and Social Welfare:**
- ✦ Beti Bachao, Beti Padhao
- ✦ Pradhan Mantri Matru Vandana Yojana (PMMVY)
- ✦ One Stop Centre Scheme

💡 **Poverty Alleviation and Social Protection:**
- ✦ Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)
- ✦ National Social Assistance Programme (NSAP)

💡 **Digital Inclusion and AI Governance:**
- ✦ MuleHunter.AI (by RBI)
- ✦ Bhashini (National Language Translation Mission)
- ✦ Digital India Programme

How Can AI Be Harnessed to Advance Inclusive Human Development?

💡 **AI as a Transformative Force for Human Development:** AI is recognized as a powerful enabler across **healthcare, education, and governance.**
- ✦ HDR 2025 stresses that while AI can significantly enhance well-being, its deployment must be human-centric and risk-aware to ensure equitable outcomes for all.

💡 **AI to Augment, Not Replace Human Capabilities:** Contrary to fears of human obsolescence, HDR 2025 presents AI as a complementary tool that automates routine tasks, enabling people to focus on creativity, innovation, and expression.
- ✦ This shift can unlock new dimensions of human potential and drive holistic development.

💡 **AI for Improved Healthcare Access and Outcomes:** AI applications in healthcare can optimize service delivery, enhance diagnostics, and expand reach in underserved areas.
- ✦ For example, **HDR 2025** cites that **AI-assisted teaching tools** in Sierra Leone reduced costs by **90%**, illustrating the cost-effectiveness of smart tech in essential services.

💡 **AI to Personalize Education and Enhance Learning:** AI-powered learning systems can tailor instruction to individual needs, improving literacy and numeracy, particularly in low-resource settings.
- ✦ According to HDR 2025, AI has the potential to **complement educators**, expand access, and create inclusive learning environments.

💡 **AI for Transparent and Efficient Governance:** Governments are deploying AI for better service delivery and fraud detection.
- ✦ **HDR 2025** highlights **India's MuleHunter.AI** for digital banking fraud detection and the **Bhashini** initiative for multilingual communication, showcasing how AI can improve governance accessibility.

💡 **Bridging the Digital Divide with Inclusive AI:** The report warns that AI may exacerbate global inequalities if access remains uneven.
- ✦ With only **15%** of the global population benefiting from **90% of AI innovation**, HDR 2025 urges investment in digital infrastructure and training to ensure marginalized groups are not left behind.

💡 **Fostering Global Collaboration in AI Research:** HDR 2025 calls for strengthened international cooperation, citing examples like **China–Singapore partnerships** that drive cross-border AI innovation.
- ✦ Shared research agendas and pooled resources can accelerate equitable technological development for global benefit.

- 💡 **Adopting a Human-Centered AI Policy Approach:** To ensure AI contributes positively to HDI goals, the report urges policymakers to prioritize inclusion, ethics, and equitable distribution of AI benefits.
  - ✦ AI should be harnessed not just for innovation, but to **promote fairness, opportunity, and human dignity**.

How Can India Improve Its Human Development Outcomes?

- 💡 **Build Inclusive Digital Infrastructure:** Expanding digital infrastructure is essential to close the technological divide in low and medium HDI countries.
  - ✦ The 2025 HDR stresses that equitable access for marginalized communities to **digital tools and internet connectivity** is foundational to inclusive human development.

- 💡 **Invest in Human Capabilities and Skills:** Strengthening basic **education, vocational training, and digital literacy** is vital for preparing populations for the evolving AI-driven economy.
  - ✦ As highlighted in the 2025 HDR, this requires sustained investment in human capital to enable **adaptive resilience and upward mobility.**

- 💡 **Ensure Contextual Technology Adoption:** Technological solutions must be tailored to local socio-economic realities to avoid one-size-fits-all failures.
  - ✦ The HDR 2025 recommends aligning tech interventions with local capacities and needs, ensuring that innovations **foster empowerment** rather than exclusion.

- 💡 **Promote Economic Diversification:** Reducing over-reliance on agriculture and primary commodities is key to enhancing economic complexity in low HDI economies.
  - ✦ According to the HDR, economic diversification allows countries to better integrate into global value chains and absorb productivity gains from new technologies.

- 💡 **Strengthen Institutional Capacity and Governance:** Public institutions must be equipped to guide and regulate AI-led transitions effectively.
  - ✦ The 2025 HDR emphasizes building **administrative competence and regulatory frameworks** to ensure that technological adoption supports human development outcomes.

- 💡 **Implement Ethical AI Governance:** Establishing robust ethical guidelines for AI deployment is crucial to prevent deepening of existing inequalities.
  - ✦ As per HDR 2025, principles of **fairness, transparency, and accountability** must underpin all AI-related policies and applications to safeguard inclusive progress.

Conclusion:

While India's steady progress in the **HDI rankings** is commendable, the report underscores the critical role of **AI** in shaping future human development. To unlock AI's full potential, India must focus on **inclusive, ethical policies that ensure equitable access and benefits**. With continued investment in human capital and infrastructure, India can move closer to achieving higher levels of human development.

Towards Fairer & Inclusive Global Trade System

This editorial is based on "Revenge of the rich: Time to rethink and rewrite the global trade script" which was published in Business Standard on 11/05/2025. The article highlights that the global trade system, established by the WTO, has created imbalances, benefiting industrialized nations while challenging developing countries like India, highlighting the need for reforms to ensure equity and sustainability in global trade.

Tag: GS Paper - 2, Effect of Policies & Politics of Countries on India's Interests, International Treaties & Agreements, Government Policies & Interventions, Important International Institutions, Deglobalisation & Protectionism.

The global trade order has evolved since the 1990s, with the World Trade Organization (WTO) taking center stage in shaping economic relations. However, the **system's shift** has not been without consequences, especially for developing nations, which has faced both **opportunities and challenges. India**, a **vocal advocate** for reform, has consistently pushed for fairer trade rules, to ensure that the interests of the Global South are represented. As the global trade system faces new challenges, including rising protectionism and climate change, India's role in advocating for a more **inclusive, equitable, and sustainable** trading environment is crucial.
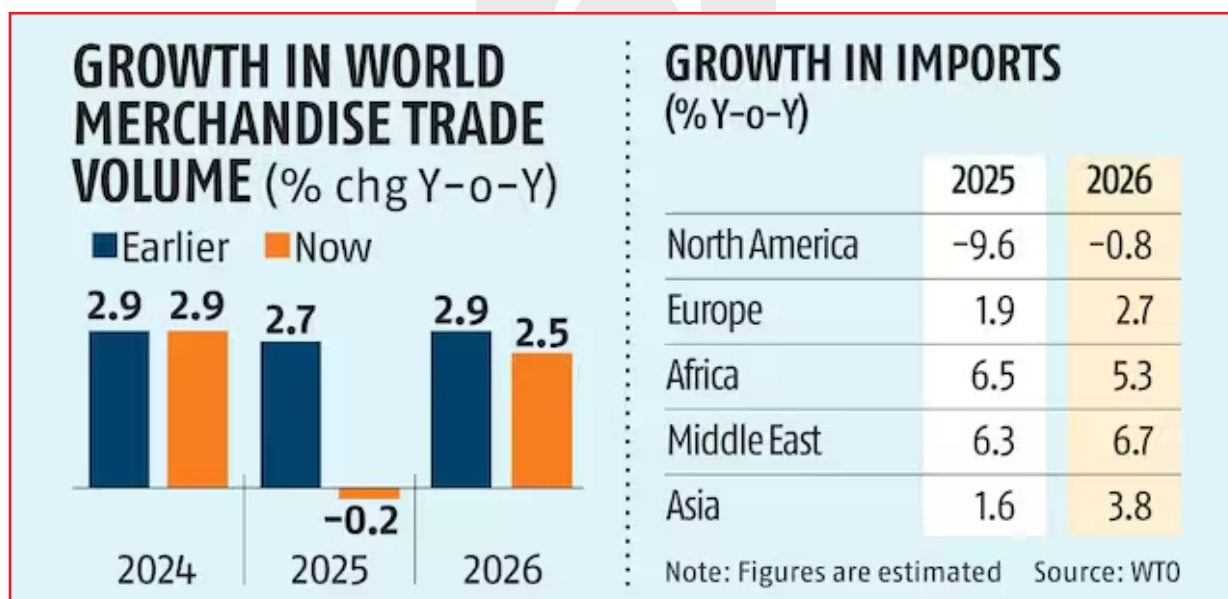
What is the Current Global Trade Scenario and India's Position?

- **Global Trade Outlook for 2025:** Global merchandise trade is projected to decline by **0.2%** in 2025, according to the WTO's Global Trade Outlook and Statistics 2025.
  - This decline is driven by US-China tariff tensions, with a potential of **1.5%** drop if tensions worsen.
  - This contrasts with **2.9%** growth in 2024, reflecting the **volatility and unpredictability** of the current global trade environment.
- **Services Trade Shows Modest Growth:** While **merchandise trade** faces challenges, **global services trade** is expected to grow by 4.0% in 2025.
  - However, this growth is slower than anticipated due to disruptions caused by tariff-related trade barriers.
  - The global services sector has been impacted by delays in **transport and travel services**, and broader uncertainty is curbing investment-related services.
  - Nonetheless, services trade remains a critical driver of **global economic growth**.

GROWTH IN WORLD MERCHANDISE TRADE VOLUME (% chg Y-o-Y)
■Earlier ■Now

Year	Earlier	Now
2024	2.9	2.9
2025	2.7	-0.2
2026	2.9	2.5

GROWTH IN IMPORTS (%Y-o-Y)

	2025	2026
North America	-9.6	-0.8
Europe	1.9	2.7
Africa	6.5	5.3
Middle East	6.3	6.7
Asia	1.6	3.8

Note: Figures are estimated Source: WTO

- **Regional Trade Performance:** Regional trade performance varies, with North America's **12.6%** export drop significantly impacting global trade flows.
  - In contrast, Asia's exports are projected to grow by **1.6%**, and Europe's by **1.0%**.
  - These regional trends highlight the **disparity in trade growth** across the world.
  - While some regions are in decline, others, especially in Asia and Europe, continue to show growth despite global challenges.

- **India's Position in Global Trade:** India ranks **14th** among **global merchandise exporters**, maintaining a steady share of **2.2% of global trade**.
  - In merchandise imports, **India** holds the **7th position** with a 3.4% share.
  - In commercial services, **India ranks 6th**, though its export share declined slightly from 5.4% to 5.3%.
  - Despite these shifts, India remains a key player in both **goods and services** trade globally.

- **India's Role in Global South Trade:** India's trade performance within the **Global South** remains strong, contributing significantly to the **region's agricultural and service exports**.
  - As a leader in the Global South, India continues to advocate for reforms that ensure equitable benefits from global trade.
  - India's position within the Global South allows it to play a **pivotal role** in shaping the future of multilateral trade and global economic governance.

Why is There a Growing Demand to Reform Global Trade Architecture?

- **Dispute Settlement System Paralysis:** The **WTO's Appellate Body**, which serves as the final court for trade disputes, has been **non-functional** since December 2019.
  - This dysfunctionality, caused by the **US blocking** the appointment of new members, has undermined the WTO's credibility.
  - **India** has called for the **restoration of the Appellate Body** as the highest priority for WTO reforms.
  - The lack of a functioning dispute settlement system has **diminished the WTO's ability** to enforce global trade rules, weakening the rule-based order.

- **Ongoing Trade Wars and Protectionism:** The US-China trade war has been a major source of disruption in global trade.

  - Tariffs imposed by the **US on Chinese goods** have triggered a series of **retaliatory measures**, escalating global tensions.
  - **Protectionist measures**, including national security tariffs, have undermined WTO principles.
  - This rise in protectionism poses a significant threat to **global economic stability**.

- **India's Opposition to AoA Subsidy Rules:** India's resistance to the **WTO's Agreement on Agriculture (AoA)** stems from restrictions on **public stockholding** for food security.
  - Developed countries, such as the US and EU, provide large subsidies, creating an uneven playing field.
  - These subsidies and tariffs distort **agricultural markets, hindering market access** and creating trade imbalances, especially for agricultural exports.

- **Fisheries Subsidy Rules as a Barrier:** The **WTO's fisheries subsidy** rules impose restrictions that could harm **India's small-scale fishing industry**, limiting its ability to support local livelihoods.
  - These rules create a barrier for developing countries like India, preventing them from addressing their unique challenges in the fishing sector.

- **Intellectual Property Rights (IPR) as a Trade Barrier:** Developed countries use strict **IPR regulations** as a **trade barrier**, limiting access to **affordable medicines and technologies** for developing nations like India.
  - By enforcing high patent standards, these countries prevent developing countries from **accessing critical innovations**, making it harder to develop their own industries and meet public health needs.
  - For instance, India remains on the **United States Trade Representative's (USTR's) 'Priority Watch List'** due to alleged violations of IPR.

- **Digital Trade Barriers:** There are no comprehensive global rules on digital trade, making cross-border data flows increasingly complicated.
  - With the rapid growth of **e-commerce and digital services**, countries are introducing **digital trade barriers**, including **data localization and cybersecurity regulations**.
  - The WTO's **inability to regulate digital trade** hampers the growth of global services trade.
  - This creates uncertainty for businesses involved in **cross-border data flows** and **digital commerce**, limiting the growth potential of the **global digital economy**.

- **Increased Inequities for Developing Nations:** Developing countries, particularly from the Global South, face significant barriers in accessing global markets.
  - **Developed countries** often impose **high tariffs and subsidies** that **distort global agricultural markets**.
  - **India,** as a major agricultural exporter, continues to face these challenges, particularly in sectors like **rice**, where subsidies in the US and EU create significant market entry barriers.
  - The inequities in the global trading system hinder the **ability of developing countries** to compete fairly on the global stage.

- **Fragmentation of Trade Rules Due to FTAs:** The proliferation of **Free Trade Agreements (FTAs)** has led to fragmentation in global trade rules.
  - While FTAs offer market access to participating countries, they bypass the **WTO's Most-Favoured-Nation (MFN)** principle, undermining multilateral trade efforts.
  - The rise of regional and bilateral agreements has created **divergent trade rules**, further complicating global trade governance.
  - This fragmentation threatens the WTO's ability to unify global trade rules and risks leaving countries outside these agreements at a disadvantage.

- **Sustainability and Modernization of Trade Frameworks:** The WTO's **outdated rules** fail to incorporate key emerging sectors like digital trade, green technologies, and environmental sustainability.
  - India calls for the integration of **green trade rules** and a **comprehensive framework** to regulate **digital trade and climate-related barriers**, ensuring that the global trade system evolves in line with **modern challenges**.

How Can India Contribute to Shaping a Fair and Future-Ready Trade Order?

- **India's Leadership in WTO Reforms:** India has led calls for **WTO reforms**, especially restoring the **Appellate Body** to ensure an equitable dispute settlement process.
  - **India's role** is vital in ensuring the WTO remains **credible and fair** for global trade governance.

- **Pushing for Fairer Trade Rules for Developing Countries:** India advocates for reforms in the **WTO's Special and Differential Treatment(SDT)** provisions, ensuring greater flexibility for developing countries.
  - This will ensure that the **Global South** is adequately represented and benefits from **global trade negotiations**.

- **Fisheries Subsidies:** India, as a low subsidizer of the fisheries sector, advocated for the allowance of subsidies for poor fishermen in developing countries to operate within their **Exclusive Economic Zones (EEZs)**.
  - India also proposed that developed nations stop subsidizing industrialized fishing fleets operating beyond EEZs, particularly in the high seas.

- **Advocating for Digital Trade and Green Trade Rules:** As global trade shifts digital, India pushes for cross-border data flow, e-commerce, and cybersecurity rules in future agreements.
  - Additionally, India advocates for integrating green trade rules to ensure sustainability in global trade frameworks.

MAJOR TRADE AGREEMENTS OF INDIA

A free trade agreement is a comprehensive deal between countries, offering preferential trade terms and tariff concessions, with a negative list excluding specific products and services.

Free Trade Agreement (FTA) With Neighbouring Countries

- India-Sri Lanka FTA
- India-Nepal Treaty of Trade
- India-Bhutan Agreement on Trade, Commerce, and Transit

Regional FTA's of India

- **India ASEAN Trade in Goods Agreement (11):** 10 ASEAN countries + India
- **South Asia Free Trade Agreement (7):** India, Pakistan, Nepal, Sri Lanka, Bangladesh, Bhutan, and the Maldives
- **Global System of Trade Preferences** (41 countries + India)

India's CECAs and CEPAs

CECA/CEPA is broader than FTAs, addressing regulatory, trade, and economic aspects comprehensively, with CEPA having the widest scope including services, investment, etc while CECA mainly focuses on tariff and TQR rates negotiation.

- CEPA with **UAE, South Korea, Japan**
- CECA with **Singapore, Malaysia**

Others:

- India-Australia Economic Cooperation and Trade Agreement (ECTA)
- India-Thailand Early Harvest Scheme (EHS)
- India-Mauritius Comprehensive Economic Cooperation and Partnership Agreement (CECPA)

An EHS precedes an FTA/CECA/CEPA, where negotiating countries select products for tariff liberalisation, paving way for broader trade agreements and fostering confidence.

Preferential Trade Agreements (PTAs)

Partners in a PTA grant preferential access to specific products by lowering duties on agreed tariff lines, maintaining a positive list of products eligible for reduced or zero tariffs.

- **Asia Pacific Trade Agreement (APTA):** Bangladesh, China, India, S. Korea, Lao PDR, Sri Lanka, and Mongolia
- **SAARC Preferential Trading Agreement (SAPTA):** Same as SAFTA
- **India-MERCOSUR PTA:** Brazil, Argentina, Uruguay, Paraguay and India
- India's PTA with **Chile, Afghanistan**

Drishti IAS

What is the Way Forward for Building a Resilient and Equitable Global Trade System?

- 💡 **Reforming Dispute Settlement:** Restoring the **WTO's Appellate Body** is crucial for effective dispute resolution and upholding the rule-based trading system.
- 💡 **Addressing Trade Barriers:** To address these trade barriers, there is a need for a more equitable global trade system that considers the unique challenges faced by countries.
  - ✦ This includes reforming WTO rules on **agricultural subsidies** for fair competition, **easing fisheries subsidy** regulations to support local industry, and **revising IPR frameworks** to improve access to affordable medicines and technologies.
    - 📎 The WTO should broaden its focus beyond economic and trade interests, incorporating **social welfare** and **addressing inequality** among nations.
- 💡 **Promoting Inclusive and Equitable Trade Rules:** Global trade reforms must prioritize adapting the WTO to meet the needs of developing countries.
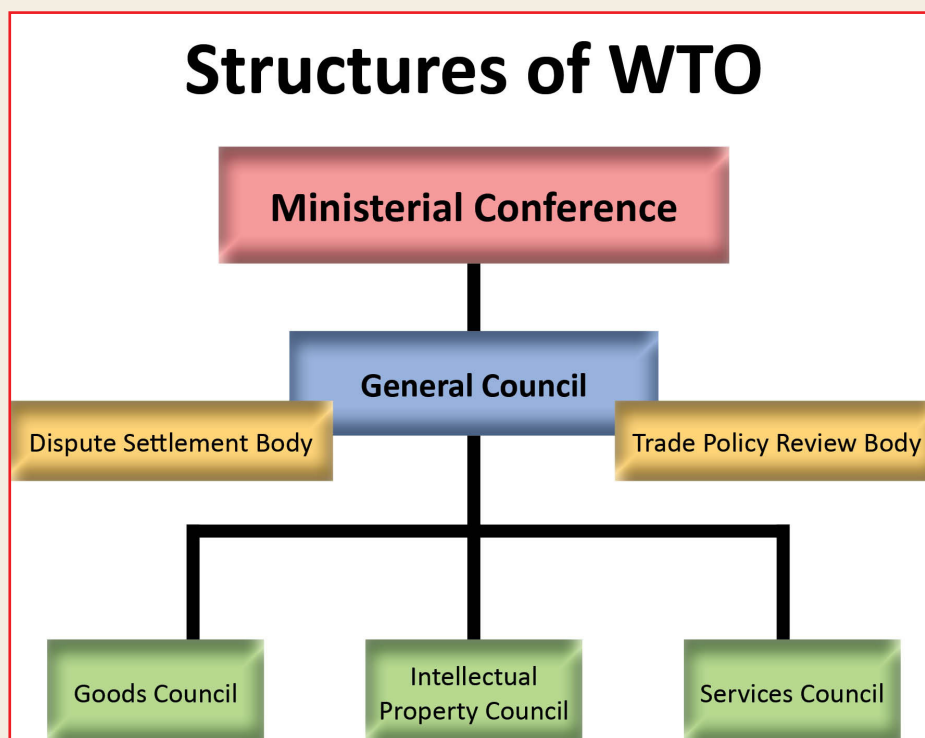
- India's advocacy for fairer trade rules, especially through **Special and Differential Treatment** reforms, aims to level the playing field for all WTO members.

💡 **Fostering Sustainable and Green Trade Practices:** Integrating sustainability into global trade rules is essential for addressing climate change.

- Incorporating sustainable practices in WTO frameworks could limit oppressive green measures like the **Carbon Border Adjustment Mechanism**, reducing the burden on developing nations.

💡 **Strengthening Multilateral Cooperation:** Building a resilient global trade system requires robust multilateral cooperation to address **trade imbalances**, ensure fair growth, and promote inclusive policies that benefit all nations, particularly developing economies.

- India's leadership in the **G20** **and WTO** will help align global trade practices with development goals, ensuring that trade remains fair, transparent, and inclusive.

World Trade Organization (WTO)

💡 **About:** The WTO is an international organization that governs trade rules between nations.

- The WTO is the **successor to the General Agreement on Tariffs and Trade (GATT),** established in 1947.
- The **Uruguay Round (1986-94) of GATT** led to the **creation of the WTO**, which started operations on 1st January 1995.
- The Agreement Establishing the WTO, also known as **the "Marrakesh Agreement,"** was signed in Marrakesh, Morocco, in 1994.
- The headquarters of the WTO is in Geneva, Switzerland.

💡 **Members:** The WTO has 164 members (including the European Union) and 23 observer governments.

- India is a founder member of GATT (1947) and its successor, the WTO.

💡 **Governing Structure:**

Structures of WTO

Ministerial Conference

General Council

Dispute Settlement Body   Trade Policy Review Body

Goods Council   Intellectual Property Council   Services Council

Conclusion

Global trade presents challenges with declines in merchandise trade and ongoing tariff tensions. **India's proactive role** in advocating for equitable global trade reforms positions it as a key player in shaping a fair and sustainable future. By championing **inclusivity, sustainability, and balanced trade rules**, India can lead the way in creating a more resilient and prosperous global trade system for all.

Skill Development for Future-Ready Competencies

This editorial is based on "ITI upscaling project: Plugging the skill gap" which was published in The Indian Express on 12/05/2025. The article highlights that India's shift from traditional workshops to modern manufacturing demands a skilled workforce, prompting the government's overhaul of Industrial Training Institutes (ITIs) to bridge the skills gap and enhance industry alignment through a Rs 60,000-crore upgradation scheme.

Tag: GS Paper-2, Human Resource, Government Policies & Interventions, GS Paper-3, Skill Development, Growth & Development

India is at a crucial juncture where its young workforce must be equipped with skills to meet the demands of the modern economy. As traditional workshops make way for industries requiring expertise in **Artificial Intelligence (AI)**, robotics, and sustainable technologies, skill deficits persist, leaving many unprepared. The government's recent initiatives, such as the upgradation of **Industrial Training Institutes (ITIs)** and the **Skill India Mission**, aim to address these gaps. By focusing on industry-aligned training and fostering **public-private partnerships**, these efforts seek to create a workforce that can drive India's economic growth and global competitiveness.

Why is Skill Development Critical for India's Demographic Dividend?

- 💡 **Current Employability Rates:** As per **India's Graduate Skill Index 2025,** India is facing a growing skill gap, with the graduate employability rate at just **42.6%** in 2024.

- ✦ This gap indicates a serious misalignment between educational outcomes and the needs of industries, particularly for fresh graduates entering the workforce.

- 💡 **Youth Skill Gaps:** Over 65% of India's population is under the age of 35, yet many lack essential, industry-relevant skills.

  - ✦ While, as per the **Economic Survey 2023-24**, only **4.4%** of India's youth workforce is formally trained and 16.6% informally.

  - ✦ Initiatives like **Pradhan Mantri Kaushal Vikas Yojana (PMKVY)** are trying to address these gaps, but the disconnect between what is taught and industry demands remains significant.

- 💡 **India's Demographic Advantage:** India's **median age of 28** is a clear advantage for economic growth, providing a youthful and dynamic workforce.

  - ✦ However, to capitalize on this **demographic dividend**, it is crucial that the youth are equipped with the right skills to meet the demands of a rapidly evolving job market.

- 💡 **Skill Gaps Amid Economic Growth:** Despite being one of the fastest-growing economies, India faces **substantial skill shortages** that hinder its growth potential.

  - ✦ Around **65%** of companies report **skill gaps**, which prevent them from scaling and innovating effectively, impeding India's economic competitiveness.

- 💡 **Underemployment and Unemployment Rates:** A significant portion of India's educated workforce remains underemployed or unemployed due to skill mismatches.

  - ✦ As per the **Economic Survey 2024-25** more than **50% of graduates and 44% of postgraduates** are working in low-skill jobs, limiting their career growth and economic mobility.

- 💡 **Global Competitiveness:** For India to maintain its competitiveness in the global economy, it needs a highly **skilled workforce**.

- Countries with skilled labor forces attract more foreign investments, and **skill development programs** help ensure that India's youth is prepared to contribute to global markets.

- The skill gap in India has led to the need for a portal to approve short-term visas for **Chinese technicians**, supporting key sectors.

- 💡 **Economic Impact of Skill Development:** Skilled labor boosts productivity, which directly contributes to GDP growth.

  - By investing in skill development, India can improve **labor force participation**, enhance productivity, and drive economic growth across various sectors, leading to higher wages and better job security.

- 💡 **Sectoral Growth and Skills Demand:** The **India Skills Report 2025** identifies **artificial intelligence, cybersecurity, engineering, and renewable energy** as high-demand areas for Indian talent.

  - Emerging technologies like **cloud computing, data science, and automation** are central to India's workforce development efforts .

- 💡 **International Mobility for Indian Workers:** Skill development programs, particularly **Mobility Partnership Agreements (MPAs)**, facilitate access for Indian workers to global job markets.

  - These agreements with countries like **France and Germany** ensure that Indian workers acquire internationally recognized skills, making them more competitive in the global labor market.

What are the Key Challenges Hindering Effective Skill Development in India?

- 💡 **Quality of Training:** India's skill development programs **suffer from a lack of consistent quality across institutions**.

  - Training centers (ITIs) vary significantly in terms of infrastructure, trainers, and resources, which undermines the effectiveness of skilling initiatives.

- 💡 **Lack of Industry-Academia Linkages:** There is insufficient collaboration between academic institutions and industries, leading to a skills mismatch.

  - Many courses under initiatives like **PMKVY and Skill India** are not aligned with current industry demands, leaving graduates unprepared for the workforce.

  - In the **absence of industry partnerships**, Indian institutions **focus heavily on exams and syllabus completion**, **neglecting qualitative skill development.**

    - In contrast, models like the **National Science Foundation** in the US and **Horizon Europe** in the EU **promote collaboration** between academia and industry.

- 💡 **Low Female Participation in Skilling Programs:** Women's participation in **skill development programs** remains limited due to sociocultural barriers and insufficient support systems.

  - Although programs like PMKVY have increased female participation, **gender disparity in high-skill sectors** persists.

- 💡 **Infrastructure Deficiencies:** A lack of modern infrastructure, especially in rural areas, limits access to quality training.

  - Training centers in remote regions often lack the necessary resources, making it difficult for youth in these areas to receive **effective skill development**.

- 💡 **Mismatch Between Demand and Supply:** There is a large gap between the skills imparted through training programs and the skills required by industries.

  - Sectors such as **AI, cybersecurity, and renewable energy** require specialized skills that existing programs fail to address effectively.

    - Also, a large number of ITIs lack trained instructors to operate essential machinery.

- **Poor Recognition of Informal Skills:** India's informal workforce, despite being skilled, lacks formal recognition for their expertise.
  - ✦ Initiatives like **Recognition of Prior Learning (RPL)** are working to certify informal skills, but outreach and implementation remain limited.
- **Lack of Apprenticeship and On-the-Job Training:** The apprenticeship model is underdeveloped in India compared to other countries like Germany.
  - ✦ While programs like **National Apprenticeship Promotion Scheme (NAPS)** provide financial incentives for apprenticeships, industry reluctance to engage apprentices limits the overall impact.

Key Skill Development Schemes and Initiatives
💡 **Skill India Mission**
💡 **Pradhan Mantri Kaushal Vikas Yojana (PMKVY)**
💡 **Pradhan Mantri National Apprenticeship Promotion Scheme (PM-NAPS)**
💡 **India Skills Accelerator (ISA)**
💡 **Pradhan Mantri Kaushal Kendras (PMKK)**
💡 **PM Vishwakarma Yojana**
💡 **SANKALP (Skills Acquisition and Knowledge Awareness for Livelihood Promotion)**
💡 **STRIVE (Skill Strengthening for Industrial Value Enhancement)**
💡 **Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY)**
💡 **Recognition of Prior Learning (RPL)**

How Effective have Government Initiatives Been in Promoting Skill Development?

- **Government Interventions and Initiatives:** The Indian government has launched several initiatives, including **Skill India and PMKVY**, to tackle skill shortages.
  - ✦ These programs target both short-term and long-term training, aiming to equip the workforce with industry-relevant skills.

- ✦ However, their **overall effectiveness** is limited by challenges such as poor industry alignment and inconsistent training quality.
- **Restructured Skill India Programme:** India's skill development system has faced challenges due to a **siloed approach**, limiting the impact of programs.
  - ✦ The lack of industry-academia convergence has hindered effective skilling and employability, necessitating a more integrated and industry-aligned approach.
  - ✦ The restructuring of the **Skill India Programme** combines key components such as **PMKVY 4.0, PM-NAPS, and JSS.**
  - ✦ This **composite scheme aims to align training with industry needs** and enhance employability through structured skill development and international mobility initiatives.
- **Low Placement Rate:** PMKVY and the Skill India Mission have successfully trained millions of individuals across India.
  - ✦ However, despite enrolling **31.55 million** candidates, only **18%** of **PMKVY-trained** individuals have secured employment.
  - ✦ This **low placement rate** underscores the need for better alignment between training programs and actual industry requirements.
- **Apprenticeship Training and DBT:** Apprenticeship programs under PM-NAPS have grown, with 2,77,036 apprentices engaged in FY 2024-25. The total number of apprentices undergoing training as of July 2024 is 7.46 lakh.
  - ✦ The **Direct Benefit Transfer (DBT)** system has also seen significant growth, with ₹122.36 crore disbursed to apprentices through DBT.
  - ✦ However, industries remain hesitant to engage apprentices due to concerns about **high training costs and potential attrition**.
  - ✦ This limited participation reduces the scheme's **overall effectiveness** in enhancing real-world training opportunities for youth.

- **Increased Female Participation:** Government programs like PMKVY and JSS have focused on increasing female participation in skilling initiatives.
  - ✦ Although the **number of women** trained has risen, gender inclusivity remains a challenge, particularly in high-skill sectors like technology and manufacturing, where women's participation is still low.

- **Sector-Specific Initiatives:** The government's focus on sector-specific skill programs, such as **PM Vishwakarma**, aims to modernize traditional skills.
  - ✦ These programs incorporate emerging technologies, ensuring that workers are equipped with both heritage skills and **future-ready competencies** in areas like AI, renewable energy, and green technologies.

- **Digitization of Skill Development:** The **Skill India Digital Hub** has significantly improved access to skill training through online platforms.
  - ✦ With over **60 lakh** learners registered, this initiative provides scalable solutions for **skill development**, particularly benefitting remote and underserved populations, thus democratizing access to high-quality education.

- **Quality Assurance and Recognition:** Aligning certifications with the **National Skills Qualification Framework (NSQF)** ensures formal recognition of skills acquired through various programs.
  - ✦ While this is a step forward, further work is **required to enhance the value of these certifications**, particularly for workers in informal sectors where recognition remains a challenge.

- **Private Sector's Role:** Private sector involvement has been crucial in scaling up skill development efforts, particularly through **CSR programs**.
  - ✦ **Collaborations with the government have improved the quality of training** and ensured that it meets the demands of industries, thus contributing to a more effective skilling ecosystem.

- **Technological Innovations in Skilling:** Technological platforms like **SWAYAM** and **Kaushal Bharat** have expanded access to skill training across India.
  - ✦ These platforms leverage **AI and data analytics** to create personalized learning paths, making it easier for individuals from diverse backgrounds to gain skills relevant to today's job market.

- **Skilling India at Global Standards:** India's efforts to meet global skilling standards are seen in the **Skill India International Centers** and strategic MoUs with countries like **France and Germany**.
  - ✦ The NSDC has engaged in over **131 industry partnerships**, benefiting over 3.10 lakh individuals.
  - ✦ Initiatives like the **Skill Impact Bond** have attracted private sector funds for training and job placements.

What Reforms are Needed to Bridge the Skill Gap and Enhance Employability?

- **Improved Mapping of Skills to Market Needs:** India's skilling ecosystem requires better alignment of skills with job market needs.
  - ✦ **Sector Skill Councils (SSCs)** can help in mapping skills to market demand, but a more coordinated effort is needed across sectors to ensure relevant training.
    - 🖉 SSCs set up as autonomous, industry-led bodies by the **National Skill Development Corporation (NSDC)**, align with **NSQF** and standardize affiliation, accreditation, and certification processes.

- **Enhanced Industry-Academia Collaboration:** Deepening collaboration between industries and educational institutions will ensure that **skilling programs** meet current demands.
  - ✦ Joint efforts between **industries and academia** will lead to curricula that better prepare students for the workforce.

- **Expansion of Apprenticeships and Work-Based Learning:** Expanding apprenticeship opportunities is critical to providing real-world experience.
  - ✦ **Reforms to the Apprenticeship Act** must incentivize employers to engage in apprenticeships, particularly in high-growth sectors like **AI, renewable energy, and cybersecurity**.
- **Focus on Gender Inclusivity:** To increase female participation, skilling programs must address the sociocultural barriers that limit women's access to training.
  - ✦ **Gender-responsive training centers**, flexible schedules, and childcare facilities will help ensure greater female participation.
- **Digital Skilling and Infrastructure Development:** India must expand digital learning infrastructure to provide skills training in emerging technologies like **AI and blockchain**.
  - ✦ The **Skill India Digital Hub** should be enhanced to provide more accessible, region-specific, and interactive learning opportunities.
- **Recognition of Informal Skills:** Reforms should focus on **formalizing informal sector skills, providing certifications for existing expertise.**
  - ✦ This will enable workers to access better jobs and improve their wage prospects, especially in sectors like construction, where informal skills are prevalent.
- **Private Sector Involvement:** Private sector participation must be encouraged through **tax incentives, grants**, and industry-led training programs.
  - ✦ These partnerships will ensure that skilling programs are sustainable and aligned with real-time industry needs.
- **Soft Skills and Professional Readiness:** Integrating soft skills training, such as **communication, leadership, and problem-solving**, into **vocational education** is essential.
  - ✦ These programs will ensure that graduates are job-ready and can excel in the modern workplace, enhancing their employability.

Conclusion

India's skill development initiatives are pivotal in aligning the workforce with emerging industry demands. The government's strategic reforms, along with active private sector involvement, are essential to bridging **skill gaps and fostering employability**. These efforts will play a crucial role in unlocking India's **demographic dividend** and ensuring **sustainable economic growth**.

Role Of Ecology in Economic Stability

This editorial is based on "Ecology is the world's permanent economy" which was published in The Hindu on 14/05/2025. The article brings into picture the idea that ecology forms the foundation of lasting economic prosperity, emphasizing that true sustainability lies in balancing environmental conservation with economic growth.

Tag: GS Paper - 3, Conservation, Environmental Pollution & Degradation, GS Paper - 2, Important International Institutions

The profound statement **"Ecology is the permanent economy"** made popular by environmentalist Sunderlal Bahuguna, reminds us that **human prosperity is fundamentally linked to ecological health. Economic development** and stability are impossible without both utilizing and conserving our natural resources. As **climate change** and **biodiversity loss accelerate**, finding the **right balance between environmental protection and economic growth has become essential.** This balance represents true sustainability—where neither ecological systems nor economic progress is sacrificed.

How are Ecology and Economy Interdependent?

- **Natural Capital as the Basis of Economic Wealth:** Economic activities fundamentally rely on **natural capital—ecosystems provide raw materials, energy, and services essential for production and consumption**.

- ✦ **Ignoring ecological limits risks resource depletion** and **economic instability.** Sustainable economies must integrate ecosystem health as a core asset.
- ✦ The **World Economic Forum's 2020 report titled "Nature Risk Rising"** estimates that **over 50% of global GDP,** or approximately $44 trillion, is dependent on nature and its services.

💡 **Climate Change Amplifies Ecological-Economic Risks:** The accelerating climate crisis, driven by **ecological imbalance, threatens economic sectors through extreme weather, resource scarcity, and health impacts.**

- ✦ Economic growth models ignoring climate risks face massive financial losses and social disruption. Climate-resilient development is imperative for economic stability.
- ✦ WEF estimates that **Climate change costs the world 12% in gross domestic product (GDP) losses for every 1°C of warming.** The 2023 IPCC report highlights global economic losses of trillions of dollars annually due to climate-induced disasters.

💡 **Biodiversity Loss Undermines Livelihoods and Food Security:** Biodiversity supports **ecosystem resilience, agricultural productivity, and pharmaceutical resources** critical to human well-being and economic health.

- ✦ Its rapid decline **jeopardizes food security and rural incomes, threatening sustainable development**. Conserving biodiversity safeguards economic futures.
- ✦ The **IPBES Global Assessment** found that one million species are threatened with extinction, a figure that underscores the severe impact of human activities on biodiversity.
  - 📎 This threat isn't just about individual species loss; **it jeopardizes the services ecosystems provide,** impacting the livelihoods and well-being of billions of people, **including at least 1.6 billion globally.**

💡 **Green Economy Transition Creates New Economic Opportunities:** Ecological sustainability drives innovation in **renewable energy, circular economy, and green technologies,** fostering job creation and economic diversification.

- ✦ Investing in **nature-based solutions promotes both ecological restoration and economic growth**, making sustainability a catalyst rather than a constraint.
- ✦ The **World Economic Forum** estimates that investment in nature-based solutions needs to at least triple in real terms by 2030

💡 **Human Well-being and Economic Productivity:** Clean air, water, and natural spaces directly affect **public health**, reducing healthcare costs and enhancing productivity.

- ✦ Ecological degradation increases disease burden and economic losses, linking **environmental stewardship with human capital and economic output.** Investing in ecological health is investing in human and economic capital.
- ✦ The **World Health Organization (WHO) estimates that 7 million premature deaths occur** annually due to the **combined effects of ambient and household air pollution,** costing economies billions in lost productivity.

How is Ecological Conservation Contributing to India's Economic Development?

💡 **Renewable Energy Driving Sustainable Economic Growth:** India's aggressive expansion in renewable energy enhances energy security, reduces fossil fuel dependence, and attracts green investments, fueling GDP growth.

- ✦ In FY 2024-25, **India added 23.83 GW of solar capacity, pushing total renewable capacity beyond 130 GW,** moving towards the 500 GW target by 2030.
- ✦ The **$19 billion Gujarat Hybrid Renewable Park** exemplifies large-scale sustainable infrastructure driving employment and regional development.

- 💡 **Forest Conservation Bolsters Carbon Sequestration and Livelihoods:** India's forest and tree cover increased to **25.17% of land area (India State of Forest Report 2023),** strengthening carbon sinks vital for climate mitigation and ecosystem services.
  - ✦ **Sustainable forestry supports livelihoods through agroforestry and non-timber forest products,** contributing to rural economies and biodiversity conservation, crucial for long-term ecological and economic resilience.
- 💡 **Eco-Friendly Mining Enhances Resource Sustainability:** India's mining sector is adopting stringent environmental norms and green technologies, minimizing land degradation and pollution.
  - ✦ With nearly **68 mines awarded a five-star eco-rating** by the Indian Bureau of Mines, sustainable extraction safeguards mineral supply chains vital for infrastructure and manufacturing, while aligning with the **National Mineral Policy** 2019's sustainability goals.
- 💡 **Urban Greening Improves Public Health and Productivity:** Urban afforestation and green infrastructure reduce pollution, enhance climate resilience, and improve quality of life, thereby boosting workforce productivity.
  - ✦ **Uttar Pradesh's Miyawaki forests and plastic road projects** demonstrate innovative waste-to-resource approaches, **enhancing urban livability in rapidly growing cities that contribute significantly to India's service-driven economy.**
- 💡 **Biodiversity Conservation Enhances Ecotourism and Rural Incomes**: India's rich biodiversity is a growing asset for ecotourism, which supports rural livelihoods and generates foreign exchange.
  - ✦ Wildlife tourism in destinations like **Kaziranga, that witnesses an all time high of over 4.06 lakh tourists in 2024-25 contribute significantly to the local economy.**

- ✦ The involvement of the **Dhurwa tribe of Bastar in promoting eco-friendly activities such as kayaking, bamboo rafting**, and trekking has not only provided them with a sustainable livelihood but also preserved their cultural heritage.

What are the Key Challenges in Balancing Economic Development with Ecological Conservation in India?

- 💡 **Resource Depletion due to Rapid Industrialization:** India's industrial growth exerts unsustainable pressure on finite natural resources, leading to deforestation, water stress, and soil degradation.
  - ✦ **Balancing development demands with conservation is difficult as resource extraction fuels GDP but harms ecosystems.** Unsustainable mining and infrastructure projects often bypass environmental safeguards.
    - ✎ For example, a CGWB report for 2023 stated that over **60% of wells in India showed signs of depletion,** indicating that **groundwater extraction is exceeding recharge in many areas**
    - ✎ A recent analysis suggested that **Nabarangpur, Puri, Kendrapara, and Kalahandi districts of Odisha lost more than 20% of their forest cover due to mining.**
- 💡 **Urbanization Leading to Environmental Stress:** Rapid urban expansion creates habitat loss, pollution, and waste management challenges, straining ecological systems.
  - ✦ According to **UN Habitat,** cities consume **78% of the world's energy** and produce more than **60% of greenhouse gas emissions.**
    - ✎ **Indian cities s**how significant emissions from major metropolitan areas like **Delhi, Mumbai, and Kolkata,** pushing India's urban ecosystems to the brink. Integrating green infrastructure into urban planning remains inadequate.

- **Conflicting Land Use Priorities:** Agriculture, industry, urban development, and conservation compete for limited land, creating conflicts that hinder sustainable planning.
  - ✦ **Prioritizing short-term economic gains often leads to forest encroachment and wetland destruction.** Lack of integrated land-use policy exacerbates these tensions.
  - ✦ For instance, according to an estimate by the **Wetlands International South-Asia (WISA), nearly 30% of the natural wetlands in India have been lost in the last four decades** due to urbanisation, infrastructure building, agricultural expansion and pollution
- **Inadequate Environmental Governance and Enforcement:** Weak implementation of environmental regulations and overlapping jurisdiction among agencies undermine conservation efforts.
  - ✦ **Delays in Environmental Impact Assessments (EIA) and corruption hamper accountability.** Balancing development with ecology is challenged by bureaucratic inefficiencies.
- **Poverty and Livelihood Dependency on Natural Resources:** Millions in rural India depend directly on forests, water bodies, and land for subsistence, creating tensions between conservation and livelihood needs.
  - ✦ Restrictive conservation policies can marginalize communities, leading to resistance and unsustainable exploitation.
  - ✦ **Over 275 million people rely on forest resources (India State of Forest Report 2023).**
    - 📎 A study in Jharkhand found that forest-based livelihoods contribute a significant portion of rural income, ranging from **12% to 42%, complicating strict conservation enforcement.**
- **Climate Change Exacerbating Ecological Vulnerabilities:** Climate change intensifies extreme weather, impacting agriculture, water availability, and biodiversity, complicating the development-conservation balance. Adaptive capacity is low in vulnerable regions, amplifying socio-economic and environmental risks.
  - ✦ In 2024, **India experienced 536 heatwave days**, the highest in 14 years. **Glacial retreat in the Himalayas** threatens water security for over **100 million people downstream.**

What Measures can India Adopt to Effectively Balance Economic Development with Environmental Conservation?

- **Landscape-Scale Integrated Resource Governance:** Implement cross-sectoral, landscape-level governance frameworks that synchronize forest, water, agriculture, and biodiversity management.
  - ✦ Harness **synergies between Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) and National Afforestation Programme** to optimize water use efficiency, enhance soil health, and restore degraded ecosystems, fostering climate resilience and sustainable livelihoods.
- **Strengthening Multi-tiered Environmental Regulatory Mechanisms:** Establish robust, decentralized environmental regulatory bodies equipped with advanced technologies like AI-powered remote sensing and blockchain for transparent monitoring and enforcement.
  - ✦ Promote **dynamic Environmental Impact Assessments (EIA)** that incorporate cumulative and long-term ecological-economic effects, while ensuring participatory decision-making involving local communities and stakeholders.
- **Circular and Bioeconomy Transformation in Industry:** Drive transition from linear to circular industrial models emphasizing waste valorization, eco-design, and closed-loop systems.
  - ✦ Integrate **Zero Defect Zero Effect (ZED) for MSMEs with Extended Producer Responsibility (EPR) frameworks,** incentivizing manufacturers to adopt sustainable materials,

reduce pollution footprints, and foster eco-innovation clusters, thereby decoupling growth from resource depletion.

💡 **Mainstreaming Nature-Based Climate Solutions (NbCS):** Scale up NbCS by embedding ecosystem restoration, urban green corridors, blue carbon initiatives, and agroforestry into national climate strategies.

✦ Institutionalize monetary valuation of ecosystem services using tools like **Payment for Ecosystem Services (PES),** enabling conservation finance through market-based incentives, which align economic development with biodiversity conservation imperatives.

💡 **Community-Centric Conservation with Sustainable Livelihoods:** Empower forest-dependent and indigenous communities through rights-based participatory forest management, **linking Forest Rights Act (FRA) with MGNREGA-backed eco-restoration projects**.

✦ Foster climate-resilient livelihoods via skill development in non-timber forest products, eco-tourism, and renewable energy entrepreneurship, creating a virtuous cycle of conservation and inclusive economic empowerment.

💡 **Green Urban Infrastructure and Sustainable Mobility:** Promote integrated urban planning under **Smart Cities Mission and Atal Mission for Rejuvenation and Urban Transformation (AMRUT)** by embedding nature-based infrastructure—permeable surfaces, urban wetlands, green roofs—and enhancing multimodal sustainable transport networks.

✦ This reduces urban heat island effect, air pollution, and carbon emissions, elevating liveability and economic productivity.

💡 **Accelerating Clean Energy Adoption with Synergistic Policies:** Fast-track deployment of renewables by aligning **National Solar Mission and**

Perform Achieve Trade (PAT) with emerging battery storage and smart grid technologies.

✦ Foster **public-private partnerships to incentivize green hydrogen and bioenergy** innovations, positioning India as a global clean-tech hub while ensuring energy security and industrial decarbonization.

💡 **Environmental Literacy and Behavioural Transformation at Scale:** Institutionalize **sustainability education across all levels,** integrating experiential learning with indigenous ecological knowledge systems.

✦ **Launch nationwide digital campaigns leveraging social media influencers and gamification to cultivate pro-environmental behaviours,** responsible consumption, and climate action commitment, reinforcing bottom-up societal stewardship.

💡 **Mobilizing Green Finance and Climate Risk Disclosure:** Develop a comprehensive green finance ecosystem through incentivized green bonds, **ESG-compliant investments, and mandatory climate-related financial disclosures across sectors.**

✦ **Establish national environmental risk assessment protocols** integrated with RBI's prudential norms to mainstream ecological risks in credit appraisal and investment decision-making.

Conclusion:

The **interdependence of ecology and economy is undeniable**, as sustainable economic prosperity hinges on the health of our natural environment. **India's challenge lies in integrating robust environmental conservation with ambitious development goals**. As the **Supreme Court** has affirmed, **forests and natural resources are national assets integral to the country's financial wealth,** underscoring their protection as a constitutional and economic imperative. Achieving this balance is essential not only for safeguarding biodiversity and climate but also for securing India's sustainable future.

Evolving India-Africa Partnership

This editorial is based on "Beyond the aid recipient: India's strategic shift in its Africa engagement" which was published in Business Standard on 15/05/2025. The article brings into picture the evolving India-Africa partnership, highlighting its shift toward strategic, investment-led cooperation aligned with Africa's development goals and a $200 billion trade target by 2030.

Tag: GS Paper - 2, Groupings & Agreements Involving India and/or Affecting India's Interests, India and its Neighbourhood, Effect of Policies & Politics of Countries on India's Interests

India's partnership with Africa has evolved **beyond historical ties into a strategic, multidimensional relationship** encompassing trade, investment, and development cooperation. With bilateral trade reaching **$100 billion** annually and cumulative investments of $80 billion, **India aims to achieve an ambitious $200 billion trade target by 2030.** Key areas for deeper collaboration include **manufacturing, agriculture, healthcare, renewable energy, and security assistance.** As Africa moves beyond its traditional aid-recipient status, India must develop a **long-term strategy of investment-led trade** that aligns with African aspirations for **self-directed development.**

How have India-Africa Relations Evolved over Time?

- **Historical and Cultural Foundations:** India-Africa relations date back to ancient times when Indian merchants traded spices, textiles, and precious stones with African kingdoms via the **Indian Ocean.**
  - The presence of the Indian diaspora in countries like **Kenya, South Africa, and Mauritius** has reinforced cultural and economic ties.
  - Both regions also shared **experiences of British colonialism,** which fostered mutual support during independence movements, with leaders like **Mahatma Gandhi** influencing African freedom fighters such as **Nelson Mandela.**

- **Post-Independence Period (1947-1990):** After independence, India strongly supported African liberation struggles, **opposing apartheid and colonialism,** exemplified by India's vocal stance in the **United Nations.**
  - Both India and many African nations were founding members of the **Non-Aligned Movement**, promoting sovereignty and development free from Cold War pressures.
  - India also provided technical assistance and scholarships to African students under the **Indian Technical and Economic Cooperation (ITEC) program,** laying the groundwork for long-term cooperation.

- **Post-Cold War to 2000s:** With the end of the Cold War, India-Africa relations shifted from ideological solidarity to pragmatic engagement.
  - India's development cooperation with Africa has grown significantly, notably through concessional lines of credit for infrastructure initiatives.
  - A notable example is the **Pan-African e-Network Project, envisioned by former President Dr. A.P.J. Abdul Kalam**, which set up a fibre-optic network to provide satellite-enabled telemedicine, tele-education, and digital connectivity across African countries.

- **Recent Developments (2008-Present):** The **India-Africa Forum Summit** (IAFS), **first held in 2008,** institutionalized high-level political dialogue and expanded partnerships in trade, security, and development.
  - India also increased cooperation on peacekeeping, counter-terrorism, and capacity building, training thousands of African professionals annually under ITEC and other programs.
  - India played a leading role in the inclusion of the **African Union in G20 during its 2023 G20 Presidency.**

Legend:
- Northern Africa
- Western Africa
- Central Africa
- Eastern Africa
- Southern Africa

What is the Strategic Significance of Africa in India's Foreign Policy?

- 💡 **Strategic and Maritime Security Imperative:** Africa's geopolitical positioning in the Indian Ocean region is critical for **safeguarding India's maritime trade routes and projecting naval influence.**
  - ✦ India's establishment of its first overseas naval base in **Mauritius in 2024, as part of its "Necklace of Diamonds" strategy,** exemplifies strategic outreach to secure sea lanes and counter emerging threats such as piracy and terrorism.

✦ The deployment of Indian defence attaches across key African states and the inaugural **India-Africa Army Chiefs Conclave in 2023** further strengthen military cooperation and regional stability.

💡 **Economic Growth Catalyst through Trade and Investment:** Africa's vast natural resources and expanding markets provide India with vital inputs and demand to sustain its growth trajectory.

✦ India-Africa bilateral trade surged to **USD 83.34 billion in 2023-24**, reflecting a **21% rise since 2011-12,** while Indian investments have reached USD 75 billion, poised to double by 2030.

💡 **Securing Critical Minerals and Energy Resources:** Africa's dominance in critical minerals like **cobalt, manganese, and copper** is indispensable for India's clean energy transition and manufacturing ambitions.

✦ The **Democratic Republic of Congo alone controls over 70% of mined cobalt supply of the world**, vital for electric vehicle batteries and renewable technologies.

✦ Simultaneously, **African oil producers such as Nigeria and Angola increasingly fuel India's energy needs,** with African countries accounting for a rising share of India's crude imports amidst global supply volatility.

💡 **Development Partnership and Capacity Building:** India's lines of credit worth over **USD 12 billion across 206 projects in 43 African countries** underscore its role as a development partner beyond aid.

✦ Capacity-building through **India's ITEC program, educational institutions like IIT Madras's Zanzibar campus,** and vocational training align with **Africa's Agenda 2063 goals.**

✦ These initiatives promote human capital development critical for Africa's industrialization and technological empowerment, fostering a resilient partnership rooted in mutual growth.

💡 **Diplomatic Leverage and Global Governance:** India's successful advocacy for the **African Union's permanent G20 membership in 2023** marked a diplomatic milestone, enhancing Africa's role in shaping global economic policies.

✦ India and Africa's joint initiatives at the **WTO on intellectual property waivers for Covid-19 vaccines** and agricultural frameworks illustrate their aligned pursuit of equitable global governance.

✦ This strengthened partnership elevates **India's leadership in the Global South** while reinforcing Africa's voice on the world stage.

💡 **Technological Collaboration and Innovation Partnership:** Africa's growing digital transformation and technological adoption present significant **opportunities for India to collaborate in innovation-driven growth sectors.**

✦ **Indian IT firms and startups are increasingly partnering with African governments to develop smart city projects,** fintech solutions, and digital infrastructure, contributing to sustainable urbanization and inclusive economic development.

✦ India, through its leadership in the **International Solar Alliance,** has committed **USD 2 billion towards solar projects in Africa**—advancing its energy security objectives while contributing to **Africa's sustainable electrification** agenda in a mutually beneficial framework.

What are the Key Issues Hindering Effective India-Africa Cooperation?

💡 **Strategic Inertia and Diplomatic Engagement Gaps:** India's delayed political engagement, exemplified by the **nine-year gap since the last India-Africa Forum Summit,** reflects a strategic inertia that undermines its ability to lead on the continent.

✦ While competing powers maintain active dialogue—**China, US, EU, and Russia** hosting multiple summits—**India's absence signals waning priority and weakens its agenda-setting role.**

✦ This diplomatic vacuum hampers India's influence in shaping Africa's future policy frameworks amid shifting global alignments.

💡 **Complex Security Landscape and Fragile Governance:** Africa's escalating security crises—**highlighted by 9 coups from 2020-2023** and persistent armed conflicts—create an **unstable environment that deters Indian investments and complicates defense collaboration.**

✦ Weak governance structures and rising radicalization challenge India's capacity to contribute meaningfully to peacekeeping and counterterrorism.

✦ Without addressing these fragile state dynamics, India's long-term security partnerships remain fragile and episodic.

💡 **Structural Economic and Infrastructure Bottlenecks:** Fragmented transport and logistics infrastructure, a **colonial hangover** designed for **resource export rather than intra-continental trade,** severely **restrict the India-Africa trade ambitions.**

✦ These infrastructural deficits **raise transaction costs, stymie regional value chains, and limit Indian firms' market access**.

✦ The lack of integrated corridors reduces Africa's attractiveness for Indian manufacturing and investment diversification.

💡 **Financial Constraints and Global Systemic Biases:** Sub-Saharan Africa's spiraling debt crisis, with debt-to-GDP ratios **doubling from 30% to 60%** in less than a decade, reflects systemic biases in global financial architecture that disproportionately burden developing economies.

✦ **India's lines of credit, though significant, are insufficient to overcome these structural financial constraints**. This debt overhang and financial fragility **hinder deeper India-Africa collaboration by limiting African countries' fiscal space** to engage in long-term development projects and strategic partnerships.

💡 **Multipolar Competition Diluting India's Influence:** The intensifying geopolitical contest in Africa among **China, US, EU, and Russia** challenges India's ability to carve out a distinct and influential role.

✦ China's expansive Belt and Road infrastructure projects **(first overseas military base in Djibouti) and Africa-focused financing** dwarf India's more modest engagement, while **Western powers leverage aid and security ties.**

✦ India's relatively cautious diplomacy and slower economic footprint risk marginalization in strategic sectors crucial for influence.

💡 **Health Infrastructure Deficits and Regulatory Challenges:** Africa's healthcare systems remain **under-resourced.** Limited local manufacturing capacity and fragmented regulatory environments impede the sustainability of medical cooperation.

✦ While India supplied vaccines and medicines to 32 African nations, **scaling up 'fill and finish' vaccine production** and affordable medicine distribution faces complex logistical and policy hurdles.

What Measures can India Adopt to Enhance its Ties with Africa?

💡 **Institutionalize a Robust Multi-Stakeholder Strategic Dialogue:** India should establish an annual **India-Africa Strategic Partnership Forum** involving governments, private sectors, academia, and civil society for continuous, adaptive engagement.

✦ This would enable **joint agenda setting, real-time policy coordination, and swift responses** to challenges like food security and climate resilience.

🔖 For instance, **creating dedicated working groups on trade facilitation** can ensure progress monitoring and enhanced policy alignment.

💡 **Lead Technology Transfer and Innovation-Driven Capacity Building:** ndia can set up **sectoral innovation hubs and joint R&D centers** in key African countries, focusing on **agri-tech, renewable energy, digital governance, and healthcare**.

✦ The success of the **IIT Madras campus in Zanzibar (2023)** provides a scalable model for expanding educational and tech incubation centers.

✦ Collaborating on **drone-enabled precision agriculture** or **telemedicine** can empower local communities with sustainable, homegrown solutions.

💡 **Champion Integrated Infrastructure Development via PPP Models:** India should co-finance **regional transport corridors, energy grids, and digital networks** through **public-private partnerships**, fostering **intra-African trade and regional value chains**.

✦ India's expertise in projects like the **Delhi-Mumbai Industrial Corridor** can be adapted to Africa's context, promoting seamless connectivity and unlocking economic complementarities aligned with **AfCFTA** goals.

💡 **Innovate Financial Instruments through Co-Financing and Blended Finance:** India could collaborate with the **African Development Bank** to launch **blended finance vehicles, diaspora bonds, and green bonds** to mobilize private capital for infrastructure and SMEs.

✦ These financial innovations would diversify risk and expand fiscal space, mirroring initiatives like the **India-Africa Development Fund** to support sustainable projects.

💡 **Deepen Security Partnerships within African-Led Frameworks:** India must strengthen its role in **African Union security architectures** by offering **specialized training at the Centre for UN Peacekeeping in New Delhi**, expanding intelligence sharing, and enhancing cyber-security cooperation.

✦ Building regional security centers and joint task forces would enhance capabilities to combat terrorism and protect critical maritime routes in the **Indian Ocean Region**.

💡 **Institutionalize Youth Empowerment and Entrepreneurial Ecosystems:** Launching continent-wide scholarships, vocational training, and innovation incubators aligned with Africa's economic sectors will harness the youth demographic dividend.

✦ Collaborations with Indian start-ups and innovation hubs can foster entrepreneurship, creating **job opportunities** and deepening **people-to-people connections** beyond diplomatic engagement.

💡 **Align Joint Initiatives with Africa's Green Transition and Climate Resilience:** India can co-develop **large-scale solar parks** modeled on India's **Rewa Ultra Mega Solar project** and promote climate-smart agriculture to enhance resilience.

✦ Sharing India's **water-efficient irrigation techniques** and sustainable urban transport solutions can accelerate Africa's green growth in line with **Agenda 2063** commitments.

💡 **Establish a Pan-African Digital Public Infrastructure Consortium:** Building on **India Stack's success**, India can lead a consortium to create **interoperable digital identity, e-governance, and fintech platforms** customized for African nations.

✦ Pilot projects in **digital land records and payments** in Kenya or Rwanda will improve governance transparency and financial inclusion, catalyzing economic empowerment.

💡 **Shift to Outcome-Oriented, Results-Based Development Cooperation:** India should implement **robust monitoring and evaluation frameworks** with African partners, using **data-driven approaches** to ensure accountability and impact.

✦ Co-developing success metrics tailored to local priorities will strengthen mutual ownership, transforming aid into **measurable socio-economic development**.

✦ Supporting diaspora-led **business incubators and advisory forums** will deepen grassroots diplomacy and amplify India's **soft power** organically across Africa.

Conclusion:

India-Africa relations stand at a pivotal juncture, **offering a unique opportunity to deepen strategic partnerships rooted in mutual respect and shared aspirations.** By embracing innovation, inclusive development, and robust multilateral engagement, **India can reinforce its role as a trusted partner in Africa's transformative journey.** Strengthening cooperation through outcome-driven initiatives will not only enhance economic growth but also promote **sustainable, resilient, and equitable progress.**

Ethanol'S Role in India'S Energy Future

This editorial is based on "[Taking ethanol blending beyond E20](#)" which was published in The Hindu Business Line on 07/05/2025. The article brings into picture the progress of India's Ethanol Blended Petrol (EBP) Programme towards the E20 target by 2025, while emphasizing the need for second-generation ethanol and feedstock diversification.

Tag: GS Paper - 3, Environmental Pollution & Degradation, Renewable Energy, GS-Paper 2, Government Policies and Intervention

India's Ethanol Blended Petrol (EBP) Programme has become pivotal in the nation's **green energy transition**, with **blending rates nearing 20%** and positioning **India to achieve its E20 target by 2025.** While this milestone is significant, sustainable progression beyond E20 requires developing second-generation ethanol technologies that utilize **agricultural residues instead of food crops.** The sugar industry remains central to India's ethanol economy, but addressing feedstock diversity and developing flex-fuel vehicles are crucial next steps. Policy reforms including **GST rationalization, differential pricing, and formula-based pricing models will be necessary to maintain growth.**
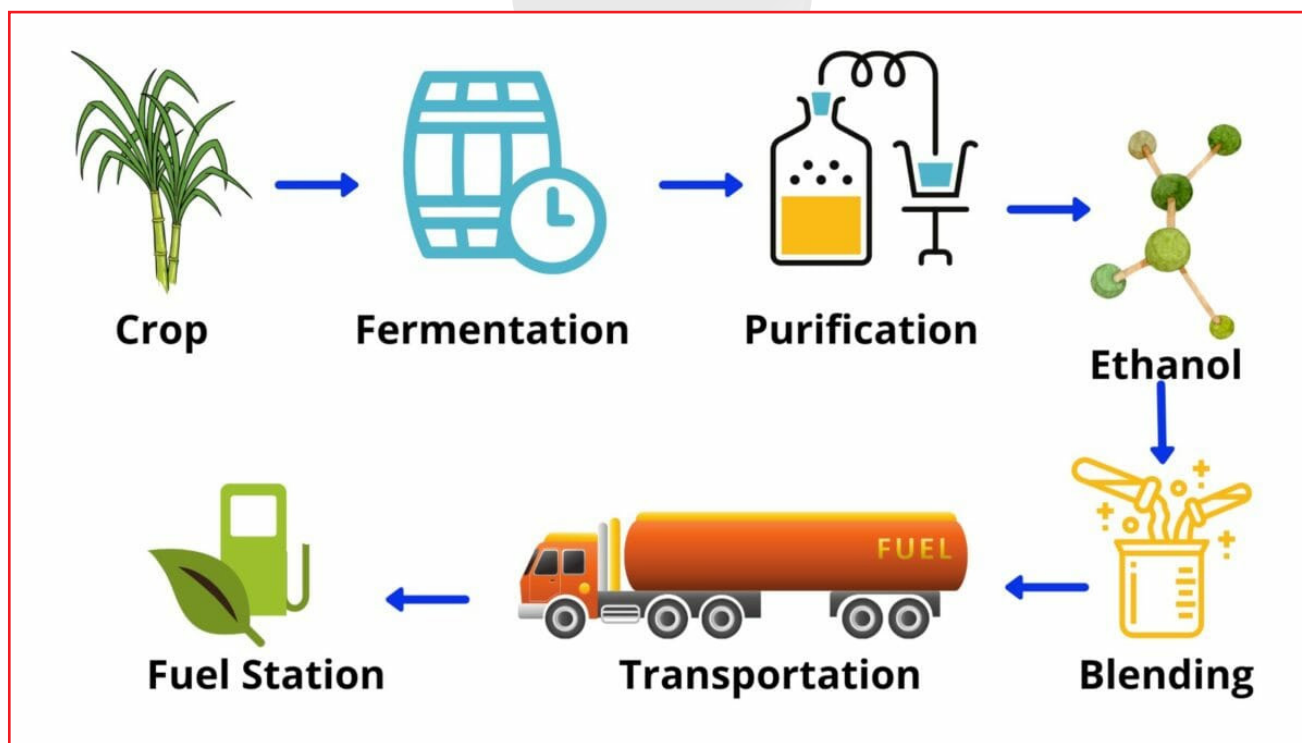
What Role does Ethanol Blending Play in India's Energy Transition?

- 💡 **Strengthening Energy Security by Reducing Oil Imports:** Ethanol blending reduces India's heavy reliance on imported crude oil, thereby **enhancing energy self-reliance and insulating the economy from volatile global oil prices.**
  - ✦ This substitution lowers the demand for foreign crude, saving valuable foreign exchange reserves.
  - ✦ Between 2014 and August 2024, **India saved approximately ₹1 lakh crore in foreign exchange by substituting 181 lakh metric tonnes of crude oil with ethanol blends,** marking a significant step towards energy security.

- 💡 **Mitigating Climate Change through Lower Carbon Emissions:** Using ethanol-blended petrol reduces carbon dioxide emissions from the transport sector, aligning with **India's commitment to the Paris Agreement and its Nationally Determined Contributions (NDCs).**
  - ✦ Ethanol burns cleaner than fossil fuels, helping improve air quality and public health.
  - ✦ The **Ethanol Blended Petrol (EBP) programme has cut CO2 emissions by 544 lakh metric tonnes since 2014**, supporting India's climate goals and reducing urban pollution.

- 💡 **Empowering Rural Economies and Supporting Farmers' Livelihoods:** Ethanol production generates substantial rural income, providing an alternative revenue source for farmers, particularly in **sugarcane and maize-growing regions.**
  - ✦ This biofuel economy enhances agricultural sustainability by promoting crop diversification and agro-industrial linkages.
  - ✦ Since 2014, **oil marketing companies have paid ₹87,558 crore directly to farmers,** boosting rural prosperity and contributing to the government's aim of doubling farmers' incomes.

- 💡 **Driving Technological Innovation and Flex-Fuel Vehicle Adoption:** The ethanol blending strategy stimulates automotive innovation by encouraging the development and **adoption of flex-fuel vehicles (FFVs)** that can run on higher ethanol blends.
  - ✦ These vehicles facilitate a transition to cleaner mobility while maintaining performance and fuel efficiency.
  - ✦ For instance, the **government launched E100 fuel in 2024 with an octane rating of 100–105, ideal for high-performance engines**, laying the groundwork for a more flexible and sustainable transport sector.

- 💡 **Advancing Circular Economy and Rural Bio-Hubs Development:** Ethanol-integrated bio-hubs consolidate renewable energy streams such as **bioelectricity, biogas, and bio-fertilizers**, maximizing resource utilization and fostering rural circular economies.
  - ✦ This multi-product model enhances energy access and rural employment, supporting sustainable development goals.
  - ✦ **Sugarcane-rich states are already witnessing investments in such bio-hubs,** integrating ethanol production with broader bio-based economic activities.

- 💡 **Enhancing Market Stability through Policy and Pricing Reforms:** Government interventions like **lowering GST on ethanol to 5%**, introducing **interest subvention schemes, and deregulating interstate movement** have created a stable and predictable ethanol market.
  - ✦ These reforms encourage investment and capacity expansion in ethanol production.
  - ✦ **Public Sector Oil Marketing Companies (OMCs) have procured ethanol worth over ₹1.45 trillion since 2014**, signaling sustained government commitment and market growth.

What are the Key Issues Associated with Ethanol Blending in India?

- 💡 **Food vs. Fuel Security Conflict:** The diversion of food crops like **sugarcane, maize, and surplus rice t**owards ethanol production raises serious food security concerns, risking inflation and supply shortages.
  - ✦ This intensifies the **trade-off between meeting energy goals and ensuring affordable food availability**.
  - ✦ For instance, **India became a net importer of corn in 2024 after decades of exports**, driven by increased maize demand for ethanol.

- 💡 **Environmental and Water Stress from Feedstock Cultivation:** Sugarcane-based ethanol production is highly water-intensive, aggravating groundwater depletion in already vulnerable states like **Maharashtra and Uttar Pradesh.**
  - ✦ This ecological cost threatens long-term sustainability and rural livelihoods dependent on water availability.
  - ✦ **Niti Aayog's report** explains that a litre of ethanol produced from **sugarcane consumes at least 2,860 litres of water in the process,** worsening water stress during years of erratic monsoons and droughts.

- 💡 **Supply Chain and Feedstock Availability Challenges:** Fluctuating availability of traditional feedstocks like sugarcane and FCI rice creates supply bottlenecks, risking ethanol production targets and blending rates.
  - ✦ Recent **pest infestations** and late rainfall have caused a decline in sugarcane output in 2024, highlighting the vulnerability of ethanol blending targets due to increased dependency on inconsistent feedstock supplies.

- 💡 **Impact on Vehicle Fuel Efficiency and Consumer Costs:** Higher ethanol blends like E20 can cause a **6–7% drop in fuel efficiency in vehicles not specifically designed for them,** increasing the operating cost for consumers.
  - ✦ This efficiency loss could offset fuel price benefits unless matched with **Flex Fuel Vehicle rollout.**

- ✦ Without the **widespread adoption of vehicles that can efficiently handle higher ethanol concentrations**, consumers may experience increased fuel consumption.
  - 🖇 Additionally, the **higher ethanol content could lead to more frequent fueling**, further increasing the overall cost burden on drivers.

- 💡 **Infrastructure and Logistics Constraints:** Inadequate ethanol storage, blending facilities, and supply chain infrastructure limit the efficient distribution and blending of ethanol across states.
  - ✦ State-level regulatory controls on ethanol movement hinder interstate supply, complicating the blending program's scale-up as **most states are imposing 'Export/Import' duties on ethanol,** leaving and entering their boundaries
  - ✦ Amendments to the **Industries Development and Regulation Act** to facilitate the free movement of ethanol across states are recent steps but **implementation challenges remain.**

- 💡 **Barriers to Petrol Price Reduction:** Theoretically, **ethanol blending should reduce petrol prices** because ethanol costs less than petrol due to lower taxes and production costs.
  - ✦ Despite this, r**etail petrol prices have yet to fully reflect these savings,** partly due to market and taxation structures.
  - ✦ Studies estimate that at **15–20% blending, petrol prices could fall by Rs 3.5 to Rs 8 per litre,** potentially easing the financial burden on consumers while promoting cleaner fuel use.

What Measures can India Adopt to Enhance Sustainability and Efficiency of its Ethanol Blending Programme?

- 💡 **Diversify Feedstock Portfolio with Emphasis on Non-Food Biomass:** Promote large-scale adoption of **second-generation (2G) ethanol technologies utilizing agricultural residues, forestry waste, and industrial by-products** to reduce dependence on food crops and alleviate the food vs. fuel conflict.

- Integrating this with the [Pradhan Mantri JI-VAN Yojana's](#) **expanded scope** can accelerate investment and innovation in sustainable feedstock sourcing.

- 💡 **Implement a Transparent, Dynamic Pricing Mechanism Linked to Input Costs:** Establish a formula-based ethanol pricing system that reflects real-time feedstock costs and production efficiencies, **ensuring fair remuneration for producers while maintaining cost competitiveness.**
  - This would replace **static administered pricing**, incentivizing producers to optimize operations and scaling production sustainably.

- 💡 **Accelerate Flex-Fuel Vehicle (FFV) Penetration Through Policy Incentives:** Introduce **targeted subsidies, tax rebates, and mandatory FFV production quotas** for automakers to stimulate market supply and consumer adoption of vehicles capable of running on higher ethanol blends.
  - Complementing the [PM E-DRIVE](#) (that is driving electric mobility) can **create a synergistic cleaner mobility ecosystem in India.**

- 💡 **Expand and Modernize Ethanol Storage and Distribution Infrastructure:** Invest in building **decentralized ethanol storage tanks, blending terminals**, and robust supply chain logistics to enable seamless interstate movement and consistent availability.
  - Amending regulatory bottlenecks via the **Industries Development and Regulation Act** should be **paired with digital monitoring systems for efficient inventory management.**

- 💡 **Promote Water-Efficient Feedstock Cultivation Practices:** Encourage adoption of **precision agriculture, drip irrigation, and drought-resistant crop** varieties for sugarcane and maize cultivation to reduce water footprints and environmental stress.
  - Linking these efforts with schemes like the [Pradhan Mantri Krishi Sinchayee Yojana](#) can enhance resource efficiency and farm-level sustainability.

- 💡 **Foster R&D in Ethanol-to-Hydrogen and Sustainable Aviation Fuels:** Support innovation in ethanol conversion technologies to **produce green hydrogen and sustainable aviation fuels**, expanding ethanol's utility beyond blending into advanced energy sectors.
  - **Public-private partnerships under the National Bio Energy Programme** can catalyze breakthroughs and commercial viability.

- 💡 **Integrate Circular Bioeconomy Models in Rural Areas:** Develop **ethanol-centric bio-hubs that integrate bioelectricity, biogas, and organic fertilizer production** from waste streams, creating a rural circular economy that maximizes resource use and generates diversified income for communities.
  - This approach aligns with the **Government's rural livelihood programs and energy access initiatives.**

- 💡 **Launch Consumer Awareness and Infrastructure Development Campaigns:** Implement nationwide awareness programs highlighting the environmental and **economic benefits of ethanol fuels**, complemented by expansion of ethanol refueling stations in urban and rural markets.
  - Collaboration with public sector OMCs and state governments can ensure infrastructure readiness to support increased consumption.

- 💡 **Encourage Sustainable Land Use through Crop Diversification Incentives:** Offer **financial and technical support to farmers for shifting from water-intensive sugarcane to less water-demanding and high-yielding feedstocks** like **cassava**, thereby optimizing land use and mitigating environmental impact.
  - This can be integrated with the [National Mission on Sustainable Agriculture](#) to balance energy and food security goals.

Conclusion:

India's Ethanol Blended Petrol (EBP) programme is a crucial step toward energy security, climate goals, and rural economic growth. To ensure **sustainable progress beyond E20,** it's vital to invest in **second-generation ethanol technologies and foster the development of flex-fuel vehicles.** The **Pradhan Mantri JI-VAN Yojana** can accelerate these efforts by promoting sustainable biomass-based ethanol production, directly contributing to **SDGs 7 (Affordable and Clean Energy), 13 (Climate Action), and 8 (Decent Work and Economic Growth).**

India GCC Economic and Strategic Links

This editorial is based on "Bridging the Gulf via trade, strategically" which was published in The Economic Times on 18/05/2025. The article highlights that India's growing trade and energy ties with GCC are crucial for economic stability, energy security, and investment opportunities, while also addressing expatriate welfare amidst Gulf economic diversification..

Tag: GS Paper - 2, Effect of Policies & Politics of Countries on India's Interests, International Treaties & Agreements, Important International Institutions, Deglobalisation & Protectionism.

India's engagement with the **Gulf Cooperation Council (GCC)** has evolved into a cornerstone of its **West Asia strategy**, driven by deep-rooted energy ties, expanding trade agreements, and strategic investments. As India's energy demands grow, the GCC's vast reserves provide a crucial lifeline, while trade agreements with **UAE and Oman** signify stronger economic bonds. Additionally, **remittances** from the large Indian diaspora in the **Gulf bolster India's economy**, highlighting the socio-economic interdependence. Strengthening these ties is not just strategic but essential for **India's energy security and economic resilience**.

What is the GCC?

- 💡 **Formation and Members:** The **Gulf Cooperation Council (GCC)** was established in 1981 by six Arab states with shared heritage.
  - ✦ The member states include **Saudi Arabia, UAE, Bahrain, Qatar, Kuwait, and Oman** in West Asia.
- 💡 **Shared Vision and Objectives:** The GCC's objective is to promote unity through political, economic, and cultural alignment among member nations.
  - ✦ This unity is based on common **Islamic values, tribal links, and mutual security and development goals**.
- 💡 **Institutional Framework:** The GCC operates through its Supreme Council, Ministerial Council, and Secretariat **headquartered in Riyadh**, Saudi Arabia.
- 💡 **Strategic Location and Importance:** GCC countries are located along the Persian Gulf, linking Europe, Asia, and Africa through maritime routes.
  - ✦ This location makes the GCC vital for global energy supplies, sea-lane security, and regional diplomacy.
- 💡 **Economic Powerhouse:** The bloc controls around **30% of global oil reserves and is a major exporter of natural gas.**
- 💡 **Modernization and Global Engagement:** Under **Saudi Vision 2030** and **UAE's national strategy**, GCC is pivoting toward innovation and global connectivity.
  - ✦ This shift creates new opportunities for external partners like India to collaborate on infrastructure and technology.

What is the Significance of India-GCC Relations?

- 💡 **Major Energy Security Partner:** GCC countries meet over **60% of India's crude oil** and **70% of natural gas import** needs.
  - ✦ This energy partnership is critical for **India's growing economy**, which depends on reliable hydrocarbon supply lines.

- **Top Trade Bloc for India:** India's **bilateral trade with GCC** exceeded USD 161 billion in FY 2023–24, led by **UAE and Saudi Arabia**.
  - ✦ This accounts for a significant share of India's global trade, showing GCC's centrality in India's export-import network.
- **Massive Diaspora Engagement:** Nearly **9 million Indians** live across GCC states, contributing to **remittances** worth over USD 50 billion annually.
  - ✦ The diaspora serves as a vital bridge in **diplomacy, labor, services, and retail sector** influence within GCC.
- **Cultural and People-to-People Ties:** Indian expatriates form the largest communities in GCC states like **UAE, Oman, and Saudi Arabia**.
  - ✦ These long-standing bonds foster cultural familiarity, religious harmony, and bilateral trust in regional dynamics.
  - ✦ **Cultural festivals, Shreenathji temple(Bahrain), BAPS Mandir**- the first traditional **Hindu temple** in the **UAE** and 7,500 Indian-owned companies enrich the bilateral ecosystem.
- **Maritime and Strategic Geography:** The **Arabian Sea and Strait of Hormuz** connect Indian and Gulf ports via major shipping lanes.
  - ✦ This makes GCC an indispensable partner for **India's Indo-Pacific maritime vision** and energy transport corridors.
  - ✦ Also, ports like the **Port of Duqm** in Oman hold significant strategic importance for India, especially in terms of its maritime presence and cooperation.
- **Joint Defense Cooperation:** India conducts regular defense drills with GCC members, including naval exercises like **Al Mohed Al Hindi** with Saudi Arabia.
  - ✦ Such collaboration enhances maritime security and counters threats like piracy and terrorism in shared waters.

- **Investment Opportunities and Capital Flow:** GCC sovereign wealth funds are increasingly investing in Indian infrastructure, tech startups, and renewable energy sectors.
  - ✦ **Saudi Arabia's Public Investment Fund** and UAE's Abu Dhabi Investment Authority (ADIA) have collectively committed over USD 30 billion.
  - ✦ **Qatar** supplies over 48% of India's LNG needs and co-chairs bilateral maritime drills like **Za'ir-Al-Bahr**.
    - 📎 Its sovereign fund plans USD 10 billion investment in Indian infrastructure, AI, and renewables by 2030.
  - ✦ India is the 6th largest investor in Bahrain, focusing on fintech, real estate, health, and education sectors.
- **Digital and Financial Integration:** India's **UPI and RuPay card** systems are being integrated with UAE and Oman's digital payment platforms.
  - ✦ This fosters seamless financial interaction, supporting tourism, retail, and business transactions for both sides.
- **Vision 2030 and India's Strengths:** Saudi and UAE's **diversification strategies** align with India's **Digital India, Startup India, and Green Hydrogen Missions**.
  - ✦ India's IT and solar technology capabilities complement Gulf efforts to modernize and decarbonize their economies.
- **Connectivity Projects and IMEC:** India is a key stakeholder in the **India-Middle East-Europe Economic Corridor (IMEC)**, linking the Gulf with Europe.
  - ✦ This project counters China's BRI and creates resilient supply chains benefiting both GCC and Indo-Pacific.
- **FTA and CEPA Prospects:** India and GCC are negotiating a **Free Trade Agreement (FTA)** to boost goods, services, and e-commerce.
  - ✦ A **Comprehensive Economic Partnership Agreement (CEPA)** already exists with the UAE, offering a roadmap for comprehensive trade pacts with other GCC states.

- 💡 **Balancing Geopolitical Equations:** India's GCC ties help balance regional tensions involving Iran, Israel, and Pakistan while preserving neutrality.
    - ✦ This diplomatic flexibility enhances India's stature as a constructive player in **West Asian and Indo-Pacific affairs**.
- 💡 **Saudi Arabia's Strategic Council Framework:** India-Saudi ties have evolved through the **Strategic Partnership Council (SPC)** co-chaired by leaders of both nations.
    - ✦ The SPC includes defense, energy, digital technology, and culture under its four institutionalized ministerial committees.

- 💡 **UAE's Role in Bilateral Modernization:** The UAE supports India's infrastructure push through investments in ports, renewables, logistics, and digital finance.
    - ✦ It also backs CEPA implementation, **Abu Dhabi Investment Authority (ADIA) operations in GIFT City**, and financial system linkages like **UPI-AANI**.

- **Oman as Defense and Maritime Ally:** Oman remains India's oldest strategic partner and only Gulf country for tri-service defense cooperation.
  - ✦ Over 6000 Indo-Omani joint ventures and the **Oman-India Investment Fund** mark its economic depth.
- **Joint Action Plan for Regional Stability:** The 2024–2028 **India-GCC Joint Action Plan** institutionalized cooperation in **health, energy, security, and education**.
  - ✦ It reflects the shared goal of peace, prosperity, and progress in the Indo-Pacific and extended neighborhood.

What are the Challenges Associated with India-GCC Relations?

- **Delayed Free Trade Agreement:** FTA negotiations between India and GCC have remained inconclusive despite multiple bilateral engagements since 2004.
  - ✦ **Bureaucratic hurdles, tariff disputes, and divergent economic priorities** have slowed the finalization of this vital agreement.
- **Labor Rights and Welfare Concerns:** Reports indicate persistent issues like unpaid wages, poor living conditions, and restricted mobility for Indian workers.
  - ✦ The **Kafala system** still limits worker autonomy in countries like **Saudi Arabia and Bahrain**, raising human rights questions.
- **Overdependence on Energy Imports:** India imports over USD 100 billion worth of fossil fuels from GCC, creating a lopsided trade balance.
  - ✦ **Rising global oil prices** and supply shocks increase India's vulnerability and widen its bilateral trade deficit.
- **Growing Trade Imbalance:** India's exports to GCC remain much lower than imports, especially with **Saudi Arabia and Qatar.**

- ✦ This persistent deficit undermines economic symmetry and impacts India's bargaining power in trade negotiations.
- **Geopolitical Instability in the Region:** Conflicts like the **Yemen war, Israel-Palestine tensions**, and **Saudi-Iran rivalry** affect regional peace and cooperation.
  - ✦ Such instability complicates India's diplomatic balancing act, especially given its ties with Iran and Israel.
- **Intra-GCC Frictions:** Tensions like the Qatar blockade in 2017 exposed fault lines within the GCC framework itself.
  - ✦ These internal differences reduce the bloc's effectiveness as a collective partner for external players like India.
- **Emerging Gulf-China-Pakistan Axis:** Saudi Arabia's closer ties with China and Pakistan present strategic challenges for India's Gulf outreach.
  - ✦ This shift may dilute India's influence, especially in defense, digital, and regional security cooperation frameworks.
- **GCC's Economic Localisation Drive:** Policies like **Saudization and Emiratisation** prioritize local hiring, reducing **job opportunities** for Indians.
  - ✦ This could impact Indian remittances and lead to return migration, straining India's domestic employment systems.
- **Limited R&D and Innovation Cooperation:** Technology collaboration remains limited due to weak IP regimes and nascent innovation ecosystems in Gulf states.
  - ✦ India seeks deeper tech transfer, but mutual gaps in research capabilities remain a bottleneck.
- **Environmental Vulnerabilities:** Climate change in GCC, including rising temperatures and water scarcity, affects Indian laborers' living conditions.
  - ✦ **Sustainable infrastructure collaboration** is crucial to address shared environmental stressors across the region.

What Should Be the Way Forward for Strengthening India-GCC Relations?

- 💡 **Finalize GCC-India FTA at the Earliest:** A fast-tracked FTA will unleash trade potential in services, digital platforms, and energy investments.
  - ✎ It will address **tariff asymmetries and institutionalize** a rules-based economic partnership benefitting both economies.
- 💡 **Encourage Two-Way Investments:** India must push for sovereign fund commitments into GIFT City and strategic infrastructure projects.
  - ✎ Similarly, the Indian private sector should invest more in Gulf tourism, health, and logistics.
- 💡 **Build Strategic Dialogue Mechanisms:** Establishing a permanent **India-GCC Summit** will allow structured review of cooperation in defense, diaspora, and technology.
  - ✎ Regular high-level meetings ensure policy continuity, accountability, and future-ready planning for emerging challenges.
- 💡 **Enhance Diaspora Safety and Integration:** India must push for c**omprehensive labor agreements** with better grievance redressal and legal protection systems.
  - ✎ Strengthening skill certification and **social security** portability can protect workers' rights across GCC nations.
- 💡 **Deepen Green Energy Partnerships:** India's leadership in **solar and hydrogen** can complement **GCC's Vision 2030 clean energy** goals.
  - ✎ Joint ventures under the **International Solar Alliance** can scale transnational renewable energy hubs.
- 💡 **Expand Digital and AI Cooperation:** Set up **GCC-India AI and FinTech Innovation Labs** in Bengaluru, Dubai, or Riyadh.
  - ✎ These will boost R&D, cybersecurity frameworks, and financial innovation across **Asia and the Middle East**.

- 💡 **Strengthen Defense and Maritime Engagements:** India should expand defense drills with GCC navies and improve **port-to-port** logistics frameworks.
  - ✎ This will enhance maritime domain awareness and counterterrorism capacity in the Western Indian Ocean.
- 💡 **Leveraging GCC for Counterterrorism:** India can use GCC cooperation to counter terrorism financing and isolate Pakistan's anti-India narratives regionally.
  - ✎ Joint intelligence sharing and extradition agreements with GCC can help in disrupting terror networks.
- 💡 **Create a Gulf-India Climate Taskforce:** India can offer **low-cost solutions** for water **scarcity, waste management, and climate resilience infrastructure**.
  - ✎ Joint research centers can study sustainable desert urbanization and renewable desalination models.
- 💡 **Utilize GCC for Indo-West Asia Strategy:** GCC forums can help India balance **Iran-Israel tensions** while advocating multilateralism in West Asia.
  - ✎ Coordinated diplomacy through GCC also boosts India's presence in the Red Sea and Hormuz corridors.
- 💡 **Promote Cultural and Educational Ties:** Establish new I**ndian Council for Cultural Relations chairs**, Hindi departments, and **India Studies Centers** across Gulf universities.
  - ✎ People-to-people diplomacy can mitigate cultural stereotyping and strengthen regional goodwill.

Conclusion

India-GCC relations are pivotal for **regional stability, energy security, and economic growth**. Strengthening trade agreements, energy cooperation, and protection for Indian expatriates can deepen this partnership. As the **Gulf diversifies** beyond oil, India stands to benefit from strategic investments, making this relationship crucial for mutual prosperity and regional security.

Navigating AI Growth in India

This editorial is based on "Copyright's tryst with generative AI" which was published in The Hindu on 19/05/2025. The article highlights that Copyright law, evolving with technology, now faces the challenge of regulating generative AI's use of copyrighted works while balancing creators' rights and innovation.

Tag: GS Paper - 3, Robotics, Artificial Intelligence, Scientific Innovations & Discoveries, IT & Computers, GS Paper - 2, Government Policies & Interventions.

Artificial Intelligence (AI) is no longer a distant frontier- it is a **transformative force** reshaping India's growth trajectory. From revolutionising agriculture to redefining public service delivery, AI holds immense potential to drive **economic inclusion and governance efficiency**. With visionary initiatives like the **INDIAai Mission**, India is not just adopting AI but actively shaping a uniquely indigenous **AI ecosystem**. Yet, alongside opportunity comes the urgency to address challenges around infrastructure, data, regulation, and equity.

What Opportunities does Artificial Intelligence Present for India's Growth and Governance?

- 💡 **Strategic Economic Multiplier:** **Artificial Intelligence (AI)** is projected to add nearly **$967 billion** to India's economy by 2035.
  - ✦ This figure from **NASSCOM and Accenture** suggests a transformative **15%** increase in India's **gross value added (GVA)**.
- 💡 **Economic Transformation:** AI adoption can significantly enhance productivity, quality, and **operational efficiency** across industries.
  - ✦ **India's IT services sector** alone is expected to gain **$500 billion** in economic value by 2030 through AI integration.
  - ✦ Also as per a recent survey, **Generative AI** could boost India's $254-billion software sector productivity by **43–45%**, with top gains in software development, as firms rapidly integrate AI into operations.

- 💡 **Empowering Agriculture:** AI-enabled crop monitoring and predictive analytics are revolutionizing agricultural productivity and risk management.
  - ✦ For instance, **Microsoft's AI Sowing App** boosted groundnut yields in **Andhra Pradesh** by 30%, demonstrating tangible impact.
- 💡 **AI in Healthcare Diagnostics:** AI-powered diagnostic tools bridge **healthcare gaps** in underserved and remote regions effectively.
  - ✦ Startups like **Qure.ai** leverage AI for early **tuberculosis detection**, drastically reducing diagnostic turnaround times.
- 💡 **Improving Education Access:** AI personalizes education by tailoring content to individual student needs and learning styles.
  - ✦ Platforms such use AI to customize learning experiences for millions across diverse Indian demographics.
- 💡 **Democratization of Knowledge & Innovation:** AI enables broader access to **information and affordable infrastructure** for startups and researchers.
  - ✦ Initiatives like **IndiaAI Mission** provide subsidized **Graphics Processing Units (GPU)** access, leveling the playing field for all innovators.
- 💡 **Governance through AI-led Data Analysis:** AI facilitates **real-time government decision-making** by processing large volumes of public data.
  - ✦ The **Ministry of Road Transport** utilizes **AI** for optimizing traffic flow, enhancing road safety and reducing congestion.
- 💡 **Public Sector Efficiency:** AI modernizes public service delivery, boosting speed, transparency, and citizen engagement.
  - ✦ **Delhi Police's Crime Mapping Analytics** uses AI for hotspot identification and proactive patrolling strategies.
- 💡 **Financial Inclusion Expansion:** AI-based credit scoring expands financial access to unbanked and underbanked populations in India.
  - ✦ Fintech firms employ alternative data with AI to generate credit scores for first-time borrowers.

- 💡 **Boosting MSME Competitiveness:** AI provides **MSMEs** with predictive analytics, automation, and enhanced customer insights.
  - ✦ **Small Industries Development Bank of India's (SIDBI)** partnership with Google empowers **MSMEs to adopt AI**, improving operational efficiency and growth.
- 💡 **Environmental Management:** AI-driven **climate models** assist in pollution forecasting and urban environmental risk mitigation.
  - ✦ The **Central Pollution Control Board** applies AI to predict air quality and issue timely public alerts.

AI for progress: some leading initiatives for growth
1. Skill India AI Portal
2. National AI Skilling Program
3. AI Youth Bootcamp
4. AI in Vocational Training
5. AI Research and Innovation Fund
6. AI Competency Development Centers
7. Collaborations with Global Tech Giants

- 💡 **Smart City Initiatives:** AI underpins smart city projects optimizing traffic, waste management, and energy efficiency.
  - ✦ **Pune Smart City** utilizes **AI-enabled surveillance** and **mobility analytics** for enhanced urban governance.
- 💡 **AI-Driven Judicial Reforms:** AI tools streamline case scheduling and improve legal research efficiency in courts.
  - ✦ Supreme Court's **Supreme Court Vidhik Anuvaad Software(SUVAAS)** platform offers AI-powered translation services, aiding multilingual legal processes.
- 💡 **Enhancing National Security:** AI strengthens border surveillance and cybersecurity by enabling advanced threat detection.
  - ✦ DRDO's **AI facial recognition systems** protect critical installations and sensitive zones effectively.

- **Supporting Skilling and Employment:** It is estimated that AI has the potential to generate 20 million jobs by 2025, contingent on robust skilling initiatives.
  - ✦ **NASSCOM's FutureSkills Prime** platform trains professionals in AI, data science, and cybersecurity domains.
- **India as an AI Export Hub:** India leverages its AI talent pool to become a global center for AI outsourcing and innovation.
  - ✦ With over 400,000 AI professionals, India ranks among the world's leading AI talent hubs.

What are the Major Challenges Facing AI Adoption?

- **Inadequate Data Ecosystem:** India suffers from fragmented, low-quality, and poorly annotated datasets essential for AI training.
  - ✦ Initiatives like the **National Data and Analytics Platform (NDAP)** aim to unify data, yet **challenges persist**.
- **Low R&D Investment:** India's AI research spending is under **0.1%** of GDP, far less than **US and China** investments.
  - ✦ This limited investment curtails the development of indigenous AI technologies and foundational models.
- **Shortage of Skilled Workforce:** Only about **4%** of India's workforce is **formally skilled** in AI and related digital technologies.
  - ✦ The **National Strategy on AI** by NITI Aayog highlights the need to upskill 10 million youth urgently.
- **Sectoral Digital Divide:** AI adoption is concentrated in IT and finance, while sectors like **textiles and rural healthcare** lag behind.
  - ✦ Poor digital infrastructure and lack of **AI awareness impede MSME** and agricultural sector participation.
- **Ethical and Privacy Concerns:** AI systems risk perpetuating bias, discrimination, and surveillance without responsible governance.

- ✦ India currently lacks comprehensive legislation to govern **AI ethics**, **privacy, and data protection**.
- **Copyright Challenges:** Copyright law has evolved alongside technology, protecting creators while adapting to new forms of expression.
  - ✦ Today, **generative AI challenges** the law by using copyrighted works for training without direct reproduction.
- **Limited Industry-Academia Collaboration:** Academic AI research often remains disconnected from industry needs due to weak partnerships.
- **Infrastructure Gaps:** As of 2023, about 45% of the Indian population had no internet access, limiting widespread AI adoption.
  - ✦ Projects like **BharatNet** aim to improve last-mile connectivity but face uneven implementation.
- **Underutilization of Public Sector Data:** Government datasets are often outdated and not machine-readable, reducing AI usability.
  - ✦ The **Open Government Data Platform** seeks to standardize and improve public data accessibility.
- **Fragmented Regulatory Landscape:** AI regulation is scattered across domains without unified national legislation, causing confusion.
  - ✦ A cohesive national AI law is essential to streamline deployment and governance at scale.
- **Slow Startup Scaling:** India hosts over **3,000 AI startups**, yet most struggle with access to capital and mentorship.
  - ✦ The **Startup India Seed Fund Scheme** supports early-stage ventures but faces uneven rollout.

How can India Strategically Navigate the Future of AI for Inclusive and Ethical Development?

- **Adopt a Rights-Based AI Framework:** India must embed fairness, accountability, and privacy protections in all AI deployments.

- ✦ **NITI Aayog's "Responsible AI for All"** advocates algorithmic governance centered on **equity and ethics**.
- 💡 **Strengthen Data Protection Regime:** Robust data privacy laws ensuring consent, grievance redressal, and enforcement are vital.
  - ✦ The **Digital Personal Data Protection Act 2023** provides a foundation but requires clearer enforcement.
- 💡 **Bridge the Skilling Divide:** Inclusive AI growth demands upskilling rural and marginalized youth through targeted programs.
  - ✦ Initiatives like **FutureSkills Prime** and **Skill India** should integrate AI modules in vocational training.
- 💡 **Promote Indigenous Innovation:** Reducing dependence on foreign AI models requires public-private investment in local R&D.
  - ✦ **INAI (INtel AI)** collaborative AI development in Telangana exemplifies **tailored solutions** for Indian contexts.
- 💡 **Ensure Equitable Access to AI:** Deployment must focus on social sectors- health, agriculture, education- with vernacular localization.
  - ✦ AI for All initiative aims to democratize AI access by addressing linguistic and geographic diversity.
- 💡 **Deploy AI in Governance Responsibly:** Government AI use must avoid exclusion, bias, and lack of transparency in public services.
  - ✦ **NITI's AIRAWAT** platform fosters trusted AI models for efficient and ethical service delivery.
- 💡 **Foster Multi-Stakeholder Governance:** Inclusive regulatory bodies with participation from civil society, academia, and industry are critical.
  - ✦ An **AI advisory council** is recommended to balance innovation with regulatory oversight.
- 💡 **Create Sector-Specific Regulations:** Tailored guidelines are needed for sectors like healthcare and finance to manage unique risks.
  - ✦ These should address **AI explainability**, liability, and **ethical challenges** effectively.

What is the Way Forward for Responsible and Effective AI Development?

- 💡 **Invest in Scalable Computational Infrastructure:** India must enhance **cloud computing**, **data centers**, and **distributed networks** for growing AI demand.
  - ✦ Prioritizing rural and underserved regions will help bridge the rural-urban digital divide effectively.
- 💡 **Enact Inclusive and Global AI Regulations:** India should formulate AI policies aligned with global frameworks like the **EU AI Act**.
  - ✦ Risk-based regulation with transparency and accountability will promote ethical AI deployment.
- 💡 **Democratize AI Education and Skills Training:** Expanding initiatives like **Responsible AI for Youth** and **IndiaAI FutureSkills** is imperative.
  - ✦ These programs must target rural and marginalized communities to build a diverse AI workforce.
- 💡 **Promote High-Quality Data Governance:** Implement governance frameworks ensuring data accuracy, privacy compliance, and unified access.
  - ✦ Platforms like the **IndiaDatasets Programme** will boost AI reliability and citizen trust.
- 💡 **Foster Consent-Based Data Sharing:** Consent-driven data policies encourage transparency and empower citizens in AI governance.
  - ✦ Such sharing enables efficient, personalized public services and supports data-driven policymaking.
- 💡 **Support Inclusive AI Ecosystems:** AI tools must address linguistic diversity and socio-economic inequalities across India.
  - ✦ Developing **vernacular AI applications** will enhance accessibility and social inclusion.
  - ✦ India emphasized the importance of a multi-stakeholder framework during the **GPAI Summit(2023)**, bringing together governments, industry, academia, and civil society to **advance safe, inclusive, and responsible AI** for sustainable global development.

- 💡 **Monitor, Evaluate, and Adapt AI Policies:** Establish real-time impact assessments to ensure AI policies remain relevant and effective.
  - ✦ Continuous refinement using data insights will help address evolving technological challenges.
- 💡 **Enhance Cybersecurity Frameworks:** Deploy AI-enabled threat detection and predictive analytics to safeguard digital infrastructures.
  - ✦ Strengthening **Digital Public Infrastructure (DPI)** security is critical for national resilience.
- 💡 **Leverage International Collaboration:** Global partnerships, such as the **US-India AI Initiative**, accelerate sector-specific AI applications.
  - ✦ Collaborations foster knowledge exchange and tailor solutions to India's unique developmental needs.
- 💡 **Strengthen R&D Ecosystems:** The **National Research Foundation** should promote academia-industry-government partnerships.
  - ✦ Such collaborations speed innovation and deployment of AI solutions addressing local challenges.

Conclusion

India's AI journey is at a decisive turning point, blending innovation with responsibility. By addressing challenges and leveraging its **demographic, linguistic, and digital strengths**, India can lead the world in **inclusive AI**. A strategic, ethical, and citizen-centric approach will ensure AI becomes a true catalyst for national transformation.

Dynamics Of India'S Fiscal Decentralization

This editorial is based on "A holistic assessment of states' performance across seven pillars" which was published in Business Standard on 19/05/2025. The article highlights that India's states are ranked holistically on seven pillars using 50 indicators to guide sustainable growth and promote competitive federalism toward Viksit Bharat 2047.

Tag: Federalism, Co-operative Federalism, Centre-State Relations, Inter-State Relations.

As India charts its course towards becoming *Viksit Bharat* by 2047, the dynamics of fiscal federalism have become more critical than ever. In a diverse and **competitive federal structure**, states play a decisive role in driving **inclusive development, governance, and economic resilience**. With states following varied growth trajectories, assessing their fiscal capacity, autonomy, and spending quality is vital. A robust framework for **fiscal decentralization** not only ensures equitable resource distribution but also empowers states to innovate, invest, and deliver public goods aligned with national goals and local aspirations.

What are the Constitutional and Policy Provisions Governing Fiscal Decentralization in India?

- 💡 **Tax Base Division:** The **Seventh Schedule of the Constitution** delineates distinct taxation powers between the Union and the States.
  - ✦ This structured division under **Article 246** provides legislative and fiscal clarity to both levels of government.
- 💡 **GST and Concurrent Taxation:** Inserted by the **101st Constitutional Amendment Act**, **Article 246A** enables concurrent taxation on **Goods and Services Tax (GST)**.
  - ✦ It permits the Union to levy Central Goods and Services Tax (CGST) and Integrated Goods and Services Tax (IGST), while States impose State Goods and Services Tax (SGST).
- 💡 **Revenue Devolution: Article 270** mandates the sharing of Union tax revenues with States based on **Finance Commission** recommendations.
  - ✦ Taxes like income tax, CGST, and corporation tax are shared, ensuring **vertical equity and distributive justice**.
- 💡 **Grants-in-Aid: Article 275** allows the Centre to provide **grants-in-aid** to States with specific developmental needs.
  - ✦ These grants address **fiscal disparities** and ensure a minimum level of public services.

💡 **Finance Commission: Article 280** provides for a periodic **Finance Commission** to assess and recommend inter-governmental resource sharing.

    ✦ It addresses both **vertical and horizontal fiscal imbalances** by suggesting devolution formulae and grants-in-aid.

Fiscal Federalism Provisions in India

Characteristic	Constitutional Provision	Policy Instrument
Tax Base Division	Article 246	Seventh Schedule
GST Taxation	Article 246A	101st Amendment Act
Revenue Sharing	Article 270	Finance Commission
Grants-in-Aid	Article 275	Addressing Fiscal Disparities
Finance Commission	Article 280	Vertical/Horizontal Balance
Discretionary Grants	Article 282	Flexibility Concerns
Borrowing Powers	Article 293	Central Control
Local Devolution	Empowering Articles	State Finance Commissions
Divisible Pool Exclusion	Article 270	Limited State Access
CSS Conditionality	State/Concurrent Lists	Fiscal Subsidiarity
Horizontal Criteria	Income, population, area	Multidimensional Formula

💡 **Discretionary Grants: Article 282** allows Union and States to make grants for any public purpose, even beyond legislative authority.

    ✦ While enabling flexibility, it raises concerns regarding transparency and the potential erosion of State autonomy.

- 💡 **Borrowing Powers: Article 293** permits States to borrow domestically, subject to Union consent if previous Union debt exists.
  - ✦ This central control restricts independent **fiscal planning** and **capital mobilization** for long-term investments.
- 💡 **Local Fiscal Devolution:** These empower States to devolve fiscal authority to **Panchayats and Municipalities**.
  - ✦ **State Finance Commissions** recommend resource-sharing frameworks to strengthen grassroots governance.
- 💡 **Exclusion from Divisible Pool:** Cesses and surcharges, though Union taxes, are excluded from the divisible pool under **Article 270**.
  - ✦ This limits States' access to growing revenue streams, aggravating vertical imbalances and fiscal dependency.
- 💡 **CSS Conditionality: Centrally Sponsored Schemes (CSSs)**, operating in **State and Concurrent List domains**, are part-funded by States with design control held centrally.
  - ✦ This conditional funding undermines the principle of **fiscal subsidiarity** and hampers localised development needs.
- 💡 **Horizontal Criteria:** The Finance Commission allocates horizontal shares using income distance, population, area, forest cover, and tax effort.
  - ✦ This multidimensional formula balances **efficiency and equity**, though not without inter-State discontent.

What are the Major Challenges Facing Fiscal Decentralization in India?

- 💡 **Vertical Imbalance:** The Union commands **63%** of national fiscal resources but bears only **38%** of total public expenditure.
  - ✦ States, with only **37%** of resources, shoulder **62% of public expenditure**, creating a severe fiscal mismatch.

- 💡 **Loss of Tax Autonomy: The GST** subsumed crucial State taxes like VAT and octroi under a unified regime.
  - ✦ States now rely predominantly on SGST and suffer **limited flexibility in fiscal policy innovation**.
- 💡 **Falling Revenue Share:** States' actual share in Union gross tax revenue declined from 35% (2015–16) to 30% (2023–24).
  - ✦ This deviation from the **15th Finance Commission's 41%** recommendation weakens States' fiscal capacity.
- 💡 **Cess and Surcharge:** Cesses and surcharges rose by **133%** from 2017–18 to 2022–23, forming nearly **25%** of Union tax revenue.
  - ✦ Being outside the divisible pool, these revenues bypass **Finance Commission recommendations** and reduce States' allocations.
- 💡 **Borrowing Limits:** States' borrowing limits are capped at 3% of GSDP, including off-budget borrowings and public account liabilities.
  - ✦ This severely hampers **counter-cyclical fiscal strategies** and large-scale capital investments during economic downturns.
- 💡 **GST Compensation:** Delayed GST compensation payments post-2017 have caused **liquidity crises** in States and disrupted fiscal planning.
  - ✦ States reported revenue shortfalls between **19% to 33%**, exposing the fragility of cooperative fiscal mechanisms.
- 💡 **Dependence on CSS:** CSS expenditure increased from ₹5.21 lakh crore (2015–16) to ₹14.68 lakh crore (2023–24), with strict guidelines.
  - ✦ States must often provide matching funds and cannot adapt schemes to local needs, reducing fiscal flexibility.
- 💡 **Decline in Grants:** Grants-in-aid declined from ₹1.95 lakh crore (2015–16) to ₹1.65 lakh crore (2023–24).
  - ✦ This shift increases reliance on **conditional transfers**, restricting development autonomy.

- 💡 **Horizontal Imbalance:** More populous and poorer States receive higher shares due to income distance criteria.
  - ✦ States like **Karnataka and Kerala** perceive this as penalising efficiency, stoking regional grievances.
- 💡 **Uneven Development:** States like **Bihar and Jharkhand** score poorly in **infrastructure and financial inclusion** in multi-pillar state rankings.
  - ✦ Such **disparities** weaken economic convergence and challenge the idea of balanced regional development through fiscal mechanisms.
- 💡 **Off-Budget Borrowing:** Inclusion of off-budget liabilities (e.g., Kerala Infrastructure Investment Fund Board) in Net Borrowing Ceiling limits fiscal manoeuvrability.
  - ✦ Absence of transparent norms complicates intergovernmental fiscal accountability and budgeting integrity.
- 💡 **Centralised Expenditure:** Tied transfers dominate public spending, with less than 22% devolved as untied funds.
  - ✦ This centralisation restricts States' ability to respond to region-specific development priorities.
- 💡 **Weak Panchayat Devolution:** **Status of Devolution to Panchayats in States 2024 Report** reveals inconsistent transfer of 29 subjects under the **Eleventh Schedule**.
  - ✦ Most States restrict Panchayats' autonomy, hindering local decision-making and effective implementation of schemes.
- 💡 **Institutional Gaps in PRIs:** District Planning Committees are dysfunctional, and frequent seat rotation weakens Panchayat leadership continuity.
  - ✦ These institutional flaws reduce accountability and governance efficiency at the grassroots level.

- 💡 **Poor Financial Autonomy at Local Level:** Non-implementation of **State Finance Commission (SFC)** recommendations and GST centralisation limit Panchayats' fiscal independence.
  - ✦ This affects bottom-up planning and deprives Panchayats of meaningful development control.

How can Fiscal Decentralization in India be Strengthened?

- 💡 **Increase Devolution:** The **16th Finance Commission** should raise States' share beyond 41% to restore fiscal balance.
  - ✦ Enhanced devolution empowers States to independently plan **welfare schemes**, infrastructure, and governance reforms.
- 💡 **Rationalise Cess:** The Union must rationalise cesses and surcharges or include them in the divisible pool.
  - ✦ This will ensure **equity, transparency, and predictability** in fiscal transfers across States.
- 💡 **Reform GST:** GST Council must guarantee timely compensation and consider expanding GST to include **petroleum and alcohol**.
  - ✦ This would boost **revenue buoyancy** and reduce over-dependence on CSS and discretionary transfers.
- 💡 **Benchmark States with Composite Indices:** Using weighted composite indices across fiscal, social, and environmental pillars enables fair **State performance benchmarking**.
  - ✦ This approach promotes balanced growth and encourages States to pursue multi-dimensional development strategies.
- 💡 **Relax Borrowing Limits:** States should receive temporary borrowing leeway during **economic downturns and natural disasters**.
  - ✦ Flexible borrowing ceilings ensure fiscal space for **capital investment and emergency response**.

- 💡 **Strengthen Local Bodies:** States must fully implement Articles 243G, 243H, and 243X by devolving clear functions, funds, and functionaries to PRIs.
  - ✦ As per the **Status of Devolution to Panchayats in States 2024 Report**, this will enhance local governance and service delivery.
- 💡 **Boost Capacity of Panchayats:** Schemes like **Rashtriya Gram Swaraj Abhiyan** must be expanded to train local leaders in governance and planning.
  - ✦ Enhancing digital infrastructure will also improve transparency and **Gram Sabha** participation.
- 💡 **Restructure CSS:** CSS should be consolidated into a few impactful umbrella schemes with flexible design frameworks.
  - ✦ This avoids duplication, respects State priorities, and improves developmental outcomes.
- 💡 **Institutionalise Dialogue:** Revive the **Inter-State Council** and strengthen **NITI Aayog's** consultative role in fiscal planning.
  - ✦ Coordination with the **GST Council** and **Finance Commission** will enhance integrated policy responses.
- 💡 **Use HDI Criteria:** The **16th Finance Commission** should include **Human Development Index** as a parameter for resource sharing.
  - ✦ This would prioritise social outcomes and reduce focus on population alone in tax devolution.
- 💡 **Ensure Borrowing Transparency:** All off-budget liabilities must be disclosed and managed within transparent fiscal responsibility frameworks.
  - ✦ This avoids hidden debts and enhances financial accountability.
- 💡 **Align Fiscal Rules:** Synchronise **FRBM Acts** of Centre and States with flexibility for regional economic diversity.
  - ✦ Uniform fiscal targets aligned with development goals will ensure sustainable public finance.

- 💡 **Fiscal Health Index Insights:** States should use the **Fiscal Health Index** to guide reforms in capital expenditure and debt management.
  - ✦ **Aspirational States** must focus on quality spending and revenue mobilisation for fiscal sustainability.

Conclusion

A **resilient and equitable fiscal decentralization** framework is essential to harmonize national priorities with state-specific aspirations. Strengthening devolution, empowering local bodies, and aligning fiscal incentives with development goals will not only deepen cooperative federalism but also accelerate India's journey toward inclusive, sustainable, and competitive growth in the **Amrit Kaal.**

India Bangladesh Bilateral Dynamics

This editorial is based on "Trade diplomacy: on India-Bangladesh trade-related tensions" which was published in The Hindu on 21/05/2025. The article highlights that India's recent trade restrictions on Bangladeshi garments signal deteriorating political ties amid Bangladesh's shifting alliances, urging India to balance strategic concerns with diplomatic engagement ahead of uncertain elections.

Tag: GS Paper 2, India and its Neighbourhood, Important International Institutions, Groupings & Agreements Involving India and/or Affecting India's Interests, International Treaties & Agreements, Effect of Policies & Politics of Countries on India's Interests.

India and Bangladesh share a **multifaceted relationship** marked by deep **historical ties, extensive economic cooperation, and strategic connectivity**. However, recent political upheavals in Bangladesh and shifting regional alignments have introduced challenges, spilling over into trade and security domains. As India navigates complex diplomatic waters, **balancing economic interests with geopolitical concerns**, maintaining stable bilateral ties becomes crucial. India's approach now requires **careful diplomacy, proactive engagement**, and a focus on long-term regional stability to safeguard mutual interests.

What is the Significance of India-Bangladesh Relations?

- 💡 **Shared Historical and Cultural Foundations:** India and Bangladesh share profound bonds grounded in **common history, language, and cultural heritage**.
  - ✦ These commonalities enhance **mutual trust** and foster vibrant **people-to-people connections** across borders.

- 💡 **Robust Bilateral Trade Relations:** Bangladesh is **India's largest trade** partner within **South Asia**, highlighting close economic ties.
  - ✦ The **bilateral trade** volume reached approximately **USD 14.01 billion** during the fiscal year 2023-24.

- 💡 **Extensive Security and Border Cooperation:** Both countries maintain active cooperation on policing, **anti-corruption, human trafficking, and drug trafficking** issues.
  - ✦ The peaceful management of the **4,096 km** shared border involves joint inspections and fencing initiatives.

- 💡 **Successful Boundary Dispute Resolutions:** The **2015 Land Boundary Agreement** and maritime delimitation stand as landmark peaceful settlements.
  - ✦ Such agreements contribute significantly to maintaining **stability and goodwill** in bilateral relations.

- 💡 **Strategic Maritime and Blue Economy Partnerships:** The **India-Bangladesh Green Partnership** and MoUs on maritime cooperation underscore **sustainable development** efforts.
  - ✦ Collaboration extends to **blue economy** and **oceanography**, enhancing regional security and environmental stewardship.

- 💡 **Engagement on Multilateral Platforms:** Both nations actively participate in **SAARC**, **BIMSTEC**, **BBIN**, and **Indian Ocean Rim Association (IORA)** regional groupings.

- ✦ These forums facilitate dialogue on shared challenges and r**egional economic integration**.

- 💡 **Enhanced Connectivity and Transit Protocols:** Agreements like the **Protocol on Inland Waterways Trade and Transit (PIWTT)** support smooth cargo movement.
  - ✦ India's access to **Chittagong and Mongla Ports** lowers logistics costs for Northeast India.

- 💡 **Significance for India's Regional Policies:** Bangladesh's geographical location is central to India's **Neighbourhood First** and **Act East** strategies.
  - ✦ Connectivity projects, such as the **Akhaura-Agartala rail link**, improve access to India's Northeast region.

- 💡 **Key Developmental Assistance to Bangladesh:** India has provided around **USD 8 billion** in **Lines of Credit** for infrastructure and capacity building.
  - ✦ This financial support boosts Bangladesh's development in transport, energy, and institutional strengthening.

- 💡 **Cultural Cooperation and Youth Engagement:** Cultural centers in Dhaka promote Indian classical arts, languages, and cultural festivals.
  - ✦ Youth delegation programs and scholarships nurture long-term social and educational linkages.

- 💡 **Energy and Commercial Cooperation:** India supplies over 1,160 MW of electricity to Bangladesh, aiding its power sector expansion.
  - ✦ T**he Friendship Pipeline** transports **High-Speed Diesel**, strengthening bilateral energy ties.

- 💡 **Digital and Space Technology Collaboration:** A key MoU enables cross-border **UPI** payments between **National Payments Corporation of India (NPCI) and Bangladesh Bank**.
  - ✦ **Joint satellite development** and launches deepen technological cooperation and innovation.

What are the Challenges Associated with India-Bangladesh Relations?

- 💡 **Unresolved River Water Sharing Disputes:** Lack of a permanent, mutually agreeable mechanism complicates interstate water sharing issues.
  - ✦ The contentious **Teesta River** dispute remains a significant sticking point in bilateral hydro diplomacy.
- 💡 **Rising Influence of China in Bangladesh:** China is Bangladesh's largest arms supplier and strategic partner, expanding its regional presence.
  - ✦ Recent military exercises, such as **Golden Friendship 2024**, highlight deepening **China-Bangladesh defense cooperation**.
- 💡 **Cross-Border Security Concerns:** Illegal migration, including **Rohingya influx**, strains **India's Northeast security** and **social stability**.
  - ✦ These movements complicate border management and generate humanitarian and political challenges.
- 💡 **Increasing Radicalization and Minority Persecution:** Growing **religious extremism** and ill-treatment of minorities in Bangladesh threaten internal and regional security.
  - ✦ Such conditions risk destabilizing Bangladesh and adversely impacting India's security environment.
- 💡 **Impact of Indian Domestic Policies:** **Citizenship Amendment Act** and **National Register of Citizens** fuel diplomatic sensitivities with Bangladesh.

- These policies have been used to **amplify anti-India** rhetoric within Bangladesh.
- 💡 **Trade and Transit Restrictions:** Bangladesh's port restrictions and high transit fees limit Northeast India's market access.
  - ✦ India's reciprocal curbs on Bangladeshi garment imports intensify commercial tensions between the two nations.
- 💡 **Political Uncertainty in Bangladesh:** The interim government's ambiguous legitimacy causes delays in **bilateral cooperation and project execution**.
  - ✦ Political instability hinders the implementation of development initiatives and regional connectivity projects.
- 💡 **People-to-People Connectivity Disruptions:** Suspensions of public transport and visa complications reduce cross-border cultural and social exchanges.
  - ✦ **Medical tourism** and educational contacts have declined, weakening grassroots bilateral relations.
- 💡 **Hydrological and Environmental Challenges:** Absence of coordinated water resource management increases vulnerability to floods and droughts.
  - ✦ These ecological concerns demand urgent cooperative mechanisms for sustainable transboundary river use.

How can India-Bangladesh Relations be Strengthened?

- 💡 **Initiate CEPA Negotiations:** Early commencement of **Comprehensive Economic Partnership Agreement (CEPA)** talks will institutionalize trade facilitation and strengthen economic ties.
  - ✦ A CEPA can address tariff and non-tariff barriers, fostering greater bilateral commerce.
- 💡 **Operationalize Special Economic Zones (SEZs):** Prompt development and activation of Bangladesh's SEZs will attract Indian investments and spur growth.
  - ✦ SEZs will enhance industrial cooperation and regional economic integration.

- 💡 **Conclude Water Sharing Treaties:** Finalizing the Teesta Water Sharing Treaty is critical for resolving long standing hydro-political disputes.
  - ✦ The **Joint Rivers Commission** should establish interim frameworks ensuring equitable water distribution.
- 💡 **Expand Power and Energy Collaboration:** Broaden joint power projects and electricity trade to meet Bangladesh's growing energy demands.
  - ✦ Institutional mechanisms like the **Joint Working Group** must expedite grid interconnections and supply.
- 💡 **Accelerate Connectivity Initiatives:** Fast-track railway, road, and inland waterway projects to boost trade and **people-to-people** contact.
  - ✦ **World Bank** estimates show a **172%** potential increase in India's exports with improved connectivity.
- 💡 **Enhance Regional and Sub-Regional Cooperation:** Position Bangladesh as a regional anchor within **BIMSTEC, SAARC, and IORA** frameworks.
  - ✦ This will promote shared interests and strengthen **South-South cooperation**.
- 💡 **Revise Development Partnership Framework:** Establish a new agreement expanding scope, reach, and impact of India's development assistance.
  - ✦ Continuous engagement will ensure sustainable and mutually beneficial projects.
- 💡 **Digitize Cross-Border Immigration and Border Management:** Implement digital tools for transparent and efficient immigration processes at the grassroots level.
  - ✦ This will improve security, ease legitimate movement, and reduce irregular migration.
- 💡 **Promote Cultural and Youth Exchanges:** Expand cultural centers, scholarship programs, and youth delegations to deepen interpersonal ties.
  - ✦ **People-centric** initiatives strengthen goodwill beyond governmental diplomacy.
- 💡 **Address Minority Rights and Social Stability:** Collaborate proactively on minority protection to ensure internal peace and bilateral trust.
  - ✦ Respect for human rights is essential for enduring and stable bilateral relations.

Conclusion

Sustaining India-Bangladesh relations requires balanced diplomacy, proactive engagement, and enhanced cooperation across **trade, security, and connectivity**. Addressing political uncertainties and external influences while deepening people-to-people ties will ensure mutual growth and regional stability. Strategic collaboration remains essential for advancing shared interests in South Asia's evolving landscape.

Logistics for India'S Global Trade Ambitions

This editorial is based on "A key driver of India's economic ambitions," published in The Financial Express on 20/05/2025. The article underscores the critical role of logistics efficiency in bolstering India's global trade competitiveness, particularly in light of evolving US tariffs and India's aspirations to achieve USD 2 trillion in exports by 2030.

Tag: GS Paper-3, Infrastructure, Industrial Growth, Industrial Policy, GS Paper-2, Government Policies & Interventions

India's **logistics sector** stands at a critical juncture as the **nation aspires to transform into a global manufacturing powerhouse** and achieve its **ambitious export targets of USD 2 trillion by 2030**. In a world reshaped by geopolitical uncertainties, shifting trade dynamics, and supply chain realignments, **logistics efficiency** has emerged as a non-negotiable pillar for trade competitiveness. The **urgency to fortify India's logistics ecosystem** through rapid modernization, infrastructure integration, and policy coherence has intensified, driven by the need to **align domestic capabilities with global market demands.**

While initiatives like the **PM Gati Shakti National Master Plan, Unified Logistics Interface Platform (ULIP), and Logistics Data Bank (LDB)** have laid a robust foundation, challenges such as **fragmented multimodal connectivity, underdeveloped port-led industrial zones, and skill gaps in tech-driven logistics operations persist.**

Strategic interventions ranging from sector-specific logistics parks for **electronics** and **textiles** to AI-powered customs systems are **essential to bridge these gaps** and capitalize on **emerging global trade opportunities.**

What is the Strategic Importance of Logistics in Global Trade?

- 💡 **Boosting Trade Competitiveness:** Efficient logistics systems directly enhance a **country's trade competitiveness** by reducing costs, improving reliability, and speeding up delivery times.
  - ✦ According to the **World Bank**, **improving logistics can boost trade by up to 15% in developing economies**.
  - ✦ For example, **Abu Dhabi's logistics sector contributes over 10% to its GDP** and **supports more than 100,000 jobs**, demonstrating how robust logistics drive economic growth and global market access.
- 💡 **Enabling Export Growth:** As trade volumes rise, **building logistics capacity**, such as sector-specific logistics parks and upgraded port operations, becomes essential.
  - ✦ India's logistics sector, valued at USD 338 billion in 2023 and **projected to reach USD 800 billion by 2030**, is a cornerstone for achieving its export targets.
  - ✦ Initiatives like the **Jawaharlal Nehru Port SEZ in Mumbai, which integrates warehousing and transport,** have streamlined export processes and reduced turnaround times.
- 💡 **Leveraging Advanced Technology:** Integrating advanced technologies like **AI, IoT**, and real-time tracking has transformed logistics by increasing speed, transparency, and efficiency.
  - ✦ The **World Trade Organization (WTO)** estimates that digital trade facilitation can cut trade costs by 14.3%.
  - ✦ Companies such as Amazon and JusLink use predictive analytics and automation to optimize inventory and reduce delays, leading to faster and more reliable deliveries.

- **Strengthening Infrastructure:** Investments in **multimodal transport networks, logistics parks, and port-led industrial zones** are critical for reducing logistics costs and supporting manufacturing growth.
  - ✦ India's government allocated USD 132.85 billion for logistics infrastructure in 2024–25, focusing on highways, railways, and warehousing.
  - ✦ **China's port-industrial cluster model,** replicated in India's **Sagarmala program,** has shown how **integrating ports** with manufacturing hubs can lower export costs and improve efficiency.
- **Building Skilled Workforce & Innovation:** A **digitally skilled workforce** and a strong innovation ecosystem are essential for **managing modern, technology-driven logistics.**
  - ✦ **India's initiative to skill 2 million youth in logistics over five years** aims to meet industry demand for digital and technical expertise.
  - ✦ Globally, logistics startups and **public-private partnerships** are driving innovation in automation, predictive analytics, and supply chain optimization.

State of Logistics Sector in India

- **Economic Significance & Employment:** India's logistics sector **contributes about 14.4% to the GDP** and **supports the livelihoods of over 22 million people**.
- **Market Size & Structure:** In 2019, the **logistics sector was valued at Rs. 15.1 lakh crore (USD 190 billion),** with 99% of it being unorganised, including small truck owners, brokers, warehouse owners, and freight forwarders.
- **Progress & Digitalization:** India's logistics improvements are reflected in its rising scores on **UNESCAP's Global Survey on Digital and Sustainable Trade Facilitation, from 63.4% in 2015 to 90.3% in 2021,** indicating enhanced trade facilitation and technology adoption.
- **Sector Composition:** The sector **comprises 37 export promotion councils,** 40 Participating Government Agencies (PGAs), 20 government agencies, handles 10,000 commodities, and involves 500 certifications.

What Fuels the Growth of Logistics in India?

- **Growing Export-Import Trade:** India's expanding role in global trade is evident with merchandise imports **rising 16.51% to USD 714.24 billion** and exports growing 6.03% to USD 447.46 billion in 2022-23.
  - ✦ Initiatives like the **India-Middle East-Europe Economic Corridor** are significantly **boosting demand** for advanced maritime and multimodal logistics services.
- **National Logistics Policy (NLP):** Launched in September **2022, the NLP aims to reduce logistics costs from 13-14% of GDP** to the **global average of 8% by 2030.**
  - ✦ This policy seeks to streamline regulations, foster collaboration, and promote technology adoption across the sector.
- **Infrastructure Development:** Massive investments under projects like the **PM Gati Shakti National Master Plan, Dedicated Freight Corridor (DFC)** and the **National Infrastructure Pipeline (NIP)** (Rs. 111 lakh crore allocated for FY 2020-25) have enhanced connectivity by improving highways, railways, ports, and airports, thereby reducing transit times and costs.
- **Unified Logistics Interface Platform (ULIP):** ULIP acts as a digital gateway **integrating over 30 government logistics systems,** enabling real-time consignment tracking and HSN code-level commodity flow visibility.
  - ✦ It supports the development of **standardized nationwide applications that improve** supply chain efficiency, production planning, and last-mile delivery.
- **Logistics Data Bank (LDB):** With nearly 3,000 RFID readers installed across major road and rail routes, including dedicated freight corridors, LDB **captures detailed container movement data.**
  - ✦ Analytics derived from LDB **inform port dwell times, transit speeds, and performance benchmarking across states,** helping identify bottlenecks and guide infrastructure improvements.
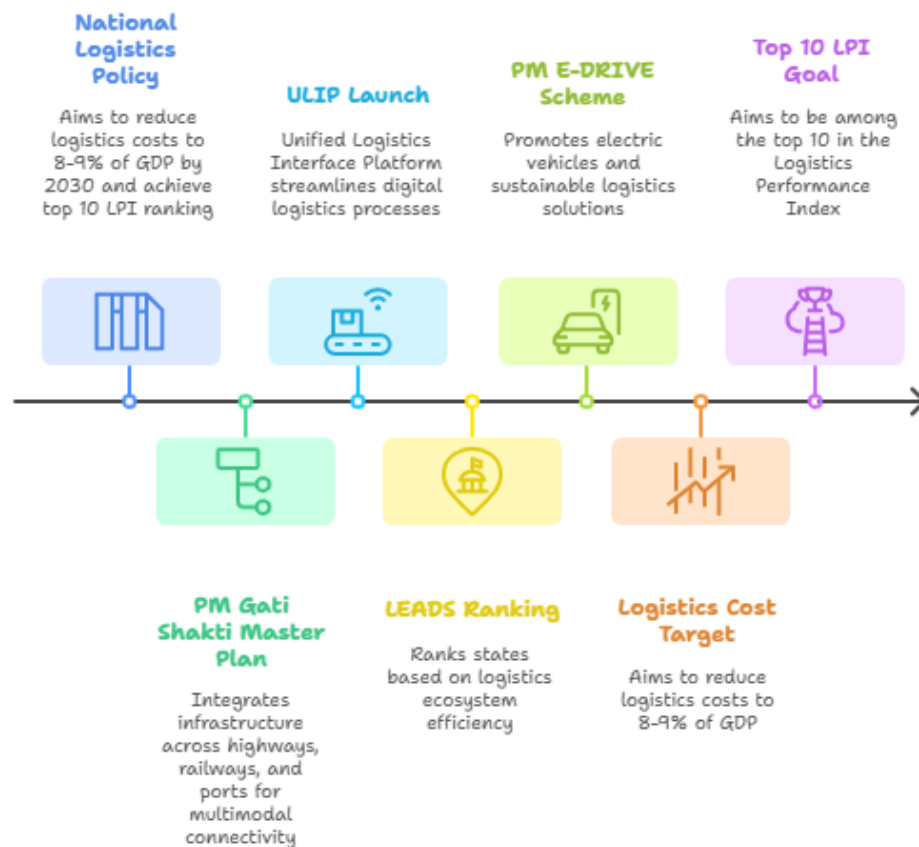
- 💡 **E-commerce Boom and Last-Mile Delivery:** India's e-commerce market is projected to grow at a 27% CAGR, reaching USD 163 billion by 2026, fueling strong demand for efficient last-mile delivery.
    - ✦ This surge has led to the emergence of specialized logistics firms and tech-driven solutions, with companies like Delhivery thriving amid accelerated online shopping trends post-Covid-19.
- 💡 **Technology Adoption and Digital Transformation:** Digitalization is transforming India's logistics sector **by boosting efficiency, transparency, and innovation** through AI, IoT, blockchain, and data analytics for route optimization, predictive maintenance, and real-time tracking.
    - ✦ **Rising demand for digitally skilled workers** in transport, customs, and tech management is driving growth opportunities for startups and IT providers **specializing in automation and supply chain visibility.**

Key Milestones in India's Logistics Policy and Infrastructure Development

National Logistics Policy
Aims to reduce logistics costs to 8-9% of GDP by 2030 and achieve top 10 LPI ranking

ULIP Launch
Unified Logistics Interface Platform streamlines digital logistics processes

PM E-DRIVE Scheme
Promotes electric vehicles and sustainable logistics solutions

Top 10 LPI Goal
Aims to be among the top 10 in the Logistics Performance Index

PM Gati Shakti Master Plan
Integrates infrastructure across highways, railways, and ports for multimodal connectivity

LEADS Ranking
Ranks states based on logistics ecosystem efficiency

Logistics Cost Target
Aims to reduce logistics costs to 8-9% of GDP

What are the Key Challenges in India's Logistics Ecosystem?

- 💡 **Infrastructure Gaps:** India's logistics suffers from poor last-mile connectivity and underdeveloped transport networks, causing delays and higher costs.

- Projects like **Dedicated Freight Corridors** and **Multi-Modal Logistics Parks** face slow progress due to **land acquisition, environmental clearances,** and bureaucratic delays.
- **Roads handle 66% of freight, causing congestion**, while cheaper, greener modes like inland waterways are underused.

💡 **Regulatory and Approval Delays:** Complex and **overlapping regulations across multiple ministries** create hurdles in logistics park development. Businesses must comply with numerous acts and face varying inter-state rules, increasing delays and costs.

- Though PM Gati Shakti **aims to improve coordination, regulatory fragmentation** still causes 20–25% of logistics delays.

Logistics Data Bank (LDB)

PORT	**18** PORTS (30 TERMINALS)
TOLL PLAZA	**183** TOLL PLAZA COVERAGE
CFS/ICD/EY/PP	**435+** CFS/ ICD/ EMPTY YARDS/ PARKING PLAZAS
SEZ	**88** MANUFACTURING SEZs
ICP	**03** INTEGRATED CHECK POSTS
RAIL STATION	**5700+** RAIL AND DFC STATIONS
	INTEGRATION WITH TOS, FOIS & SAGAR SETU
	100% TRACKING OF EXIM CONTAINERS
	4000+ RFID READERS DEPLOYED PAN INDIA

CFS : Container Freight Station
ICD : Inland Container Depot
FOIS : Freight Operations Information System
TOS : Terminal Operating System

💡 **Digital Integration Complexity:** Data and system integration across agencies is **fragmented, limiting real-time visibility** and supply chain efficiency.

- Only about 5.5–6% of the market is organised and tech-enabled. Small players lack access to tools like RFID, IoT, and blockchain, reducing overall productivity.

💡 **Skill Shortages:** A majority of the logistics **workforce is unorganised** and lacks training in modern technologies and **Environmental, Social, and Governance(ESG)** practices.

- This leads to low productivity and poor working conditions. The **sector needs an additional 4.3 million skilled workers by 2030**, especially in states like West Bengal, Tamil Nadu, and Maharashtra.

- **Fragmented Supply Chain Coordination:** Poor coordination among manufacturers, transporters, customs, and warehouses **causes inefficiencies and delays**.
  - ✦ **Heavy reliance on roads and weak multimodal integration** limit cost savings and sustainability. **MSMEs** are hit hardest due to high logistics costs and complex compliance burdens.

What are the Measures to Enhance Export-Led Growth through Logistics Reforms?

- **Accelerate Development of Logistics Parks:** Fast-track **Multi-Modal Logistics Parks (MMLPs)** near manufacturing hubs for sectors like electronics, textiles, and footwear.
  - ✦ These **parks should integrate warehousing, packaging**, inland container depots, customs clearance (**via platforms like ICEGATE**), and multimodal connectivity (rail via freight corridors and roads via Bharatmala).
  - ✦ **Co-locating with SEZs** and freight villages (e.g., Jawaharlal Nehru Port Authority SEZ) will **enhance cargo aggregation** and economies of scale.
- **Integrate Support and Skill Development:** Include skill centres aligned with the **National Logistics Workforce Development Mission** within logistics parks.
  - ✦ Provide modular training in digital logistics, multimodal handling, and ESG compliance to **build a capable workforce,** especially **upskilling informal sector workers.** Incorporate trade facilitation and innovation hubs to foster operational excellence.
- **Adopt Advanced Technology:** Implement **AI-powered customs clearance systems** and digitise logistics operations through platforms like ULIP and E-Logs.
  - ✦ **Develop unified digital platforms** for real-time cargo tracking and a **national e-marketplace** for logistics services, enabling small and medium operators to optimize routes and consolidate shipments via ONDC.
  - ✦ Ensure robust **cybersecurity** and **data privacy** to build stakeholder trust and enable predictive analytics.

- **Improve Infrastructure and Connectivity:** Address critical gaps in last-mile connectivity to ports and airports, **leveraging Bharatmala and Sagarmala projects.**
  - ✦ Enhance **rail** and **inland waterway freight capacity** by electrification and terminal expansion, fully utilising dedicated freight and coastal corridors.
  - ✦ These upgrades will **reduce transit times and support Make in India** and the National Manufacturing Mission.
- **Promote Port-led Industrial Zones and SEZs:** Expand multi-product SEZs and port-led industrial zones under Sagarmala, facilitating manufacturing, warehousing, and transshipment activities.
  - ✦ **Prioritise strategic nodes through PPPs,** co-located with **logistics hubs for scale advantages.** Use geospatial analytics in collaboration with **ISRO, NIC,** and **MoRTH** to optimize network planning and manage congestion.

Conclusion

By integrating digital platforms, sector-specific parks, and skilled workforce development, **India can reduce logistics costs from 14% to 8% of GDP**, aligning with global standards. With focused implementation, **these reforms can enhance India's ranking in the Global Logistics Performance Index** and drive the **Viksit Bharat goal** of a USD 32-trillion-plus economy by 2047.

Northeast India: From Periphery to Pivot

This editorial is based on "Frontier of progress: On the potential of the northeast" which was published in The Hindu on 26/05/2025. The article brings into picture the Northeast's strategic importance under the Act East Policy, highlighting the need for region-led, inclusive development amid ongoing conflicts, border disputes, and environmental concerns.

Tag: GS Paper - 3, Infrastructure, Growth & Development, Inclusive Growth, GS Paper - 2, Government Policies & Interventions, Act-East Policy

India's northeastern region exemplifies the nation's diversity through its rich cultural heritage and natural resources. The government is transforming the region with massive infrastructure investments—from the Sela Tunnel to the Northeast Gas Grid. However, significant challenges persist, including **stalled peace processes in Nagaland, inter-state border disputes, environmental concerns** over hydroelectric projects, and social tensions fueled by immigration rhetoric. For the Act East Policy to truly succeed, India must integrate the Northeast into its mainstream economy and prioritize a **model of development that is led by the region itself.**

INDIA NORTH-EAST ZONE MAP

What is the Significance of the Northeast Region in India's Developmental Outlook?

- 💡 **Strategic Geopolitical Pivot for India's Security and Foreign Policy:** The Northeast's geography as India's eastern frontier, sharing **porous international borders with China, Myanmar, Bangladesh, Bhutan, and Nepal,** positions it as a frontline region in countering Chinese influence and safeguarding territorial integrity.
  - ✦ The **2017 Doklam standoff (Operation Juniper)** near the tri-junction underscored the vulnerability of the Chicken's Neck.
  - ✦ The region's stability is thus **directly linked to India's Indo-Pacific ambitions** and border security imperatives.

A HIMALAYAN FACE-OFF

- 💡 **Untapped Hydrocarbon and Renewable Energy Potential:** The Northeast's vast natural resource base—**comprising substantial oil and natural gas reserves alongside hydropower potential**—makes it pivotal for India's clean energy transition and energy security.
  - ✈ For example, The Northeast holds an estimated **7,600 million metric tonnes of oil equivalent(MMTOE)**, but only around 2,000 MMTOE has been **discovered so far.**
    - 🖉 Arunachal Pradesh alone has over **50,000 MW of hydro potential.**
- 💡 **Cultural Diversity as a Catalyst for Regional Integration:** With over **135 tribes, Northeast India's ethno-cultural plurality** underpins its unique identity and provides India a distinct advantage in fostering cross-border cultural diplomacy with **Southeast Asia.**
  - ✈ Promoting **indigenous handicrafts, traditional festivals, and tribal art through initiatives like the North-East Festival** enhances local livelihoods and projects India's pluralistic ethos internationally.
  - ✈ For instance, the **2022 North-East Festival in Delhi featured 100 MSMEs,** significantly boosting handicraft exports and tourism.
- 💡 **Ecological Significance:** Situated in the **Indo-Burma biodiversity hotspot,** the Northeast's rich forest cover (Arunachal Pradesh ranking second in India in terms of forest cover in **India State of Forest Report 2023**) and endemic species—**such as the Hoolock Gibbon (India's only ape), the One-Horned Rhinoceros, and the endangered Red Panda**—are vital for ecological balance and climate resilience.
  - ✈ The **region also hosts rare orchids,** over 850 bird species, and serves as a critical corridor for migratory wildlife, underscoring its importance in India's biodiversity and carbon sequestration efforts.

💡 **Economic Gateway for India's Act East Policy and Regional Trade:** The Northeast's connectivity projects such as the **India-Myanmar-Thailand Trilateral Highway** and proposed extensions to Cambodia and Vietnam position it as a crucial hub linking India to ASEAN markets, supporting India's vision of becoming a **$5 trillion economy.**

   ✦ Strengthening transport and trade linkages can transform the region into a vibrant corridor for commerce and cultural exchange with East Asia.

What are the Key Issues Associated with India's Northeast Region?

💡 **Ethnic Fragmentation and Enduring Insurgency Undermine Stability:** Persistent **ethnic fragmentation fuels violent insurgencies and inter-community clashes,** eroding governance legitimacy and disrupting developmental trajectories.

- Lack of effective **reconciliation and political accommodation perpetuates a cycle of mistrust and insecurity**, deterring investments and social cohesion. The **ongoing conflict in Manipur exemplifies** how unresolved ethnic grievances destabilize the region and stall economic progress.
  - **Armed Forces Special Powers Act (AFSPA)** continues to be enforced extensively, reflecting persistent security challenges.

- **Infrastructure Deficiency Perpetuates Economic Isolation:** Geographical challenges coupled with inadequate multimodal connectivity **constrain the Northeast's integration with national and international markets.**
  - **Underdeveloped road, rail, air, and digital infrastructure** impede supply chains, health access, and disaster management, exacerbating the region's economic backwardness despite strategic initiatives like NLCPR and NESIDS.
  - The **digital divide further marginalizes rural populations** from mainstream opportunities.
  - For instance, **internet penetration at 43%, significantly below the national average of 55%. National Highway expansion reached 4,950 km (2014-23),** yet rail connectivity remains underdeveloped.

- **Porous Borders Amplify Security Risks:** The Northeast's extensive 5,182 km international boundaries **remain porous and inadequately surveilled,** facilitating illegal immigration, arms trafficking, and insurgent movements.
  - Inefficient fencing and coordination gaps compromise territorial sovereignty and fuel transnational insurgencies**, complicating diplomatic ties with Bangladesh and Myanmar**. This vulnerability remains a strategic concern for India's internal security architecture.
  - For instance**, Indo-Myanmar border fencing is incomplete**, allowing cross-border mobility (like **Rohingyas**).

- **Environmental Conflicts Expose Fault Lines:** Critics argue that aggressive pursuit of **hydroelectric and mining projects without robust environmental safeguards** has triggered local resistance, highlighting tensions between economic growth and ecological preservation.
  - For example, the **mega hydroelectric project, planned along the Siang River,** has sparked outrage among indigenous communities fearing displacement, environmental degradation, and cultural erosion.

- **Land Scarcity and Inter-State Boundary Disputes:** Population pressures and unclear land ownership **exacerbate tensions and interstate boundary conflicts,** obstructing development projects and social harmony.
  - **Several commissions** have been set up to resolve the conflicts, but they have yielded little progress.
    - For example, in the **Assam-Meghalaya dispute, Meghalaya rejected the recommendations of the Justice Chandrachud Committee report,** even though Assam had accepted them. Similarly, in 2014, it was **Assam that disagreed with the proposed resolution.**

- **Human Trafficking and Drug Abuse Crisis:** The Northeast region is a hotspot for human trafficking, particularly of women and children, due to its porous borders and strategic location.
  - The trafficking networks are often **linked to broader transnational organized crime syndicates**. In addition, the region faces a growing **drug abuse crisis,** with **opioids and other narcotics being smuggled across the porous borders,** exacerbating public health and security concerns.
    - This **drug abuse crisis** is also fueling a rise in HIV cases, as the use of contaminated needles and unsafe drug practices spread the virus
  - For example, the **state of Manipur is witnessing an alarming rise in opium production**, contributing to both local addiction problems and broader regional security challenges.

What Measures can India Adopt to Mainstream Northeast in Economic Push?

- 💡 **Strengthen Peacebuilding and Formalize Recognition for Indigenous Communities:** Implement **comprehensive peacebuilding initiatives involving local stakeholders, security forces, and civil society** to address insurgencies through dialogue, development, and trust-building.
  - ✦ Expedited the formal recognition of indigenous communities, **such as granting Scheduled Tribe (ST) status to deserving ethnic groups after verification (like Mising, Motok, and Moran in Assam)**, following recommendations from **Lokur Committee**
    - 🖉 The **Lokur Committee** recommended five criteria for identifying such communities, namely: **primitive traits, distinct culture, geographical isolation, reluctance to interact with the larger community, and overall socio-economic backwardness**

- 💡 **Strengthen Multi-Modal Connectivity and Digital Infrastructure:** Prioritize integrated development of **roads, railways, inland waterways, and airports** complemented by expansive digital networks to overcome geographical isolation.
  - ✦ Implement region-specific infrastructure corridors that **link local economies to national and ASEAN markets,** enhancing supply chain resilience and reducing transaction costs.
    - 🖉 Integrate physical connectivity projects like the **National Infrastructure Pipeline (NIP) with the PM Gati Shakti Master Plan** to create seamless transport corridors.
  - ✦ **Digital inclusion must be accelerated through rural broadband and e-governance** platforms to bridge the urban-rural divide and foster innovation ecosystems.

- 💡 **Foster Inclusive and Participatory Governance Models:** Encourage decentralization by empowering local self-governments through enhanced convergence of the **Panchayati Raj Institutions with schemes like Deendayal Antyodaya Yojana-National Rural Livelihoods Mission (DAY-NRLM),** building upon **PM-DevINE Scheme.**
  - ✦ This would enable **community-led development,** ensuring socio-cultural sensitivities are respected while integrating grassroots voices in mainstream economic planning.

- 💡 **Promote Sustainable and Eco-Sensitive Industrialisation:** Encourage green industries such as renewable energy, eco-tourism, organic agriculture, and forest-based **micro-enterprises that leverage the Northeast's ecological wealth without compromising biodiversity.**
  - ✦ Institutionalize rigorous **Environmental Impact Assessments** and incentivize circular economy practices, integrating sustainability with economic growth to balance development and conservation imperatives.

- 💡 **Develop Skill Ecosystems Aligned with Emerging Economic Sectors:** Launch specialized vocational and technical training hubs tailored to local strengths such as **agro-processing and healthcare**.
  - ✦ Create skill hubs linking the **Pradhan Mantri Kaushal Vikas Yojana (PMKVY) with the Aspirational Districts Programme** focusing on Northeast states, to tailor vocational training in agro-processing, tourism, and digital skills.
  - ✦ Embed digital literacy and innovation-driven curricula to prepare the workforce for future-ready economic participation.

- 💡 **Institutionalize Cross-Border Economic Corridors and Sub-Regional Cooperation:** Leverage Northeast's strategic location by formalizing trade and cultural linkages with ASEAN countries through customs facilitation, logistics hubs, and free trade zones.
  - ✦ Strengthen frameworks like **BIMSTEC and India-Myanmar-Thailand highway projects to boost regional integration**, attract foreign investment, and create a transnational economic ecosystem that stimulates local manufacturing and services.

- 💡 **Promote Cultural and Heritage-Based Entrepreneurship:** Capitalize on the Northeast's rich cultural heritage by fostering creative industries—**handicrafts, textiles, music, and festivals**—linking them to global value chains.
  - ✦ Establish **incubation centers and digital marketplaces that empower artisans and cultural entrepreneurs,** creating sustainable livelihoods and enhancing India's soft power. Facilitate skill preservation alongside commercialization to maintain authenticity.

- 💡 **Advance Climate-Resilient Agricultural and Rural Livelihoods:** Adopt precision **agriculture, climate-smart farming, and value addition in horticulture and plantation** sectors to increase farmer incomes and sustainability.
  - ✦ Strengthen rural infrastructure such as **cold storage, logistics, and market access to reduce post-harvest losses.** Integrate traditional ecological knowledge with modern agri-tech to build resilient rural economies that reduce urban migration pressures.

- 💡 **Launch Comprehensive Anti-Drug Awareness and Rehabilitation Programs:** Address the rising drug abuse challenge in the Northeast by deploying multi-pronged strategies **combining community awareness, education, and strict enforcement against trafficking.**
  - ✦ Establish **rehabilitation and de-addiction centers tailored to the cultural context of affected areas,** integrating traditional healing with modern therapies.
  - ✦ Engage youth through skill development, sports, and counseling to offer alternatives to drug use and create resilient social frameworks that mitigate the impact of narcotics on families and communities.

Conclusion:

To truly unlock the **Northeast's potential,** India must go beyond infrastructure and security-driven narratives. A sustainable future lies in embracing the region's unique identity while empowering its people through **3Ts: Trade,** **Tourism**, and **Training for Youth**. By placing the Northeast at the heart of India's growth story—**not just as a frontier, but as a fulcrum**—India can realize its Act East vision and foster a **more inclusive, secure, and vibrant nation.**

Rethinking Urban Development in India

*This editorial is based on "*Why India needs a national plan for building new cities*" which was published in The Hindu on 26/05/2025. The article brings into picture the disconnect between greenfield and brownfield urban strategies in India, highlighting the urgent need for a unified national urban plan to ensure sustainable growth and achieve Viksit Bharat.*

Tag: GS Paper - 1, Urbanization, GS Paper - 2, Government Policies and Interventions

India's urban development strategy suffers from a **dichotomy between greenfield cities like Amaravati and brownfield improvements in existing urban centers**, creating confusion about investment priorities and planning approaches. The disconnect between these two paradigms has led to **planning failures, uncontrolled urban sprawl, and cities struggling to manage even their legacy infrastructure**, let alone accommodate rapid growth. With urban investments needing an eightfold increase and cities becoming increasingly difficult to manage, India urgently requires a national plan that creates a **well-integrated urban network essential for achieving Viksit Bharat.**

What are the Key Drivers of India's Rapid Urban Development?

- 💡 **Demographic Transition and Rural-Urban Migration:** India's urban surge is propelled by sustained **rural-to-urban migration, fueled by better livelihood prospects and enhanced urban amenities.**
  - ✦ This migration intensifies pressure on cities to provide jobs, housing, and infrastructure, accelerating urban expansion but also challenging governance.

- ✦ By 2036**, India's urban population is expected to swell to 600 million (40% of the population)**, compared to 31% in 2011, signifying a massive demographic shift.

💡 **Structural Economic Transformation and Sectoral Shifts:** The shift from agriculture to industry and services concentrates economic activities in urban areas, making cities engines of growth and innovation.

- ✦ **Currently, urban centers contribute 63% of GDP, expected to rise to 75% by 2030,** driven by booming IT, manufacturing, and services sectors.
- ✦ The rise of **tier-2 and tier-3 cities**, supported by government schemes like Smart Cities Mission, is decentralizing growth beyond megacities, fostering regional economic diversification.

💡 **Robust Government Urban Policy Frameworks and Initiatives:** Ambitious schemes such as the **Smart Cities Mission** (over 8,000 projects), **AMRUT**, and **PMAY-U** exemplify targeted policy interventions to modernize urban infrastructure, housing, and governance.

- ✦ These initiatives **emphasize sustainability, climate resilience, and citizen-centric digital services**, crucial for managing rapid urbanization.
- ✦ They aim to transform urban spaces into hubs of economic activity and social inclusion, reflecting a shift from infrastructure-building to quality-of-life enhancement.

💡 **Technological Integration and Smart Urban Solutions:** Emerging technologies such **as AI, IoT, and big data analytics** are revolutionizing urban management, enhancing efficiency, transparency, and sustainability.

- ✦ **Pune's transition to a 90% clean-fuel bus fleet and Vadodara's USD 10.5 million Integrated Command Center** demonstrate how tech-driven governance improves public services and environmental outcomes.
- ✦ Digital infrastructure, intelligent traffic systems, and smart water and waste management are pivotal in addressing the complexities of rapid urban growth.

💡 **Urbanization as a National Development Strategy:** Urban growth is central to India's ambition of a **$30 trillion economy by 2047**, with cities becoming innovation hubs and engines of employment.

- ✦ The population of million-plus cities is projected to increase from 53 in 2011 to 87 by 2030, reflecting rapid urban consolidation.
- ✦ Initiatives like **'Vocal for Local' seek to harmonize urban economic dynamism with indigenous entrepreneurship**, supporting self-reliance and sustainability, while balancing growth with climate commitments.

What are the Key Issues Associated with India's Urban Landscape?

- 💡 **Infrastructure Deficit and Service Delivery Bottlenecks:** India's urban infrastructure is severely lagging behind demographic growth, resulting in **critical shortages of housing, potable water, sanitation, transport, and energy services.**

  - ✦ The legacy infrastructure in many cities is outdated and incapable of meeting escalating demand, causing chronic congestion, poor sanitation, and public health risks.

  - ✦ **Investment in urban infrastructure averaged only 0.6% of GDP between 2011-18, half the required 1.2%,** reflecting a persistent funding gap.

  - ✦ Despite the Smart Cities Mission's ambitious targets, **no Indian metro ranks in the top 100 globally on the IMD Smart City Index,** highlighting lingering infrastructural inadequacies.

- 💡 **Fragmented Urban Growth and Planning Failures:** The coexistence of greenfield city projects like Amaravati alongside brownfield upgrades in legacy cities creates disjointed urban development strategies, leading to sprawling, inefficient urban footprints.

  - ✦ This fragmented growth exacerbates **land-use conflicts, escalates transport costs, and intensifies environmental degradation** through unchecked urban sprawl.

  - ✦ **India's million-plus cities are projected to rise from 53 in 2011 to 87 by 2030,** intensifying pressures on urban governance and infrastructure in the absence of cohesive metropolitan planning frameworks.

- 💡 **Fiscal Constraints and Underutilization of Private Capital:** Urban local bodies remain financially constrained due to limited revenue autonomy, inefficient tax collection, and dependence on state and central transfers, undermining their capacity to fund essential services and infrastructure.

  - ✦ While **governments finance 72% of urban infrastructure, private sector participation lags at a mere 5%,** reflecting structural barriers in attracting commercial financing.

  - ✦ Municipal bond markets and innovative financing tools are nascent, as demonstrated by isolated successes in **Pune and Vadodara,** but widespread adoption is stymied by institutional weaknesses and risk perceptions, leaving a substantial **$840 billion funding gap looming till 2036.**

- 💡 **Environmental Stress and Resource Management Challenges:** Indian cities grapple with escalating environmental crises—**pollution, waste mismanagement, water scarcity, and vulnerability to climate change**—which threaten urban sustainability and health.

  - ✦ According to NITI Aayog's 2019 **"Composite Water Management Index,"** approximately 600 million Indians face high to extreme water stress**,** with many cities classified as water-stressed or critically water-scarce.

  - ✦ Surat's large-scale wastewater recycling and **Dharampuri's holistic water management offer replicable models**, yet the majority of urban centers lack integrated environmental management systems, risking irreversible ecological damage and resource depletion.

- 💡 **Rising Urban Inequality and Social Exclusion:** Urbanization has intensified socio-economic disparities, with marginalized communities disproportionately affected by inadequate housing, sanitation, and limited access to quality healthcare and education.

  - ✦ **Informal settlements or slums continue to house millions under substandard conditions,** exposing residents to health hazards and economic vulnerabilities.

  - ✦ Though PMAY-U has helped millions access affordable housing**. India's slum population in 2020 is still estimated at 236 million** suggesting that nearly half of its urban population lives in slums **(UN-Habitat 2021).**

- 💡 **Deficient Data Ecosystems and Non-Responsive Governance:** A significant barrier to effective urban management is the lack of comprehensive, real-time data, limiting evidence-based policy formulation and adaptive governance.
  - ✦ According to a 2023 study, at least 39% of India's capital cities lack active spatial plans.
  - ✦ **Vadodara's Integrated Command Center and Pune's smart mobility projects** demonstrate the benefits of technology-driven governance, but many urban local bodies lack the institutional capacity and technical expertise to scale such innovations nationwide.

What Measures can India Adopt for Sustainable Urban Development?

- 💡 **Strategic Polycentric Urbanism and Metropolitan Integration:** Implement polycentric urban development by interlinking emerging satellite towns and urban clusters with core cities through multimodal transit corridors.
  - ✦ This spatial strategy, harmonizing greenfield city frameworks with brownfield revitalization, can curtail urban sprawl, enhance regional competitiveness, and optimize land use efficiency.
  - ✦ Leveraging synergies between the **Smart Cities Mission and AMRUT programs** will enable a **coherent, scalable metropolitan governance model rooted in transit-oriented development (TOD)** and mixed-use zoning.
- 💡 **Deep Fiscal Decentralization with Revenue Innovation:** Empower Urban Local Bodies with comprehensive fiscal decentralization by expanding municipal revenue streams—**property taxes reforms, land value capture mechanisms,** and dynamic user fees—aligned with fiscal responsibility frameworks.
  - ✦ Catalyze municipal bond markets with ESG-linked instruments and develop outcome-based performance grants, incentivizing fiscal prudence, transparency, and public-private collaboration to unlock capital for resilient infrastructure investments.

- 💡 **Holistic Institutional Reforms for Integrated Urban Governance:** Reconfigure fragmented governance structures by institutionalizing metropolitan development authorities with unified mandates over land use, transport, housing, and environmental management.
  - ✦ Embed principles of **subsidiarity and cooperative federalism consistent with the 74th Amendment to ensure empowered**, **accountable leadership** that integrates vertical and horizontal coordination, breaking down bureaucratic silos and accelerating policy execution.
  - ✦ Following the recommendation of **Standing Committee on Urban Development (2020-2021), mandate inclusive participation in smart city governance and:**
    - 📎 Ensure **regular Smart City Advisory Forum meetings** with mandatory inclusion of local MPs and elected representatives.
    - 📎 Strengthen accountability and multi-stakeholder collaboration for responsive urban governance.
- 💡 **Climate-Adaptive Infrastructure and Ecosystem-Based Urban Resilience:** Mainstream climate risk into urban infrastructure through green building certifications, decentralized renewable energy adoption, and urban water-sensitive designs.
  - ✦ Prioritize e**cosystem-based adaptation strategies—urban wetlands restoration, green corridors, and bioswales**—to enhance microclimate regulation, stormwater management, and carbon sequestration, aligning urban development with India's NDC targets and net-zero pathways.
- 💡 **Inclusive Urban Regeneration through Cross-Scheme Convergence:** Operationalize integrative urban regeneration by **merging PMAY-Urban's affordable housing** thrust with **Smart Cities' digital governance and service delivery platforms.**
  - ✦ Facilitate comprehensive slum upgrading that **combines physical infrastructure, sanitation, livelihood support, and digital inclusion, fostering social equity** and empowering marginalized urban communities via participatory planning and real-time monitoring systems.

- **Gender-Responsive, Multi-Modal Smart Mobility Networks:** Develop sustainable, electric-powered multimodal transport ecosystems that prioritize last-mile connectivity and non-motorized options.
  - ✦ **Embed gender-responsive urban design— safe corridors, surveillance-enabled transit hubs, and accessible infrastructure**—to dismantle mobility barriers for women and differently-abled citizens, thereby amplifying female labor participation and inclusive economic growth.
- **Data-Driven Urban Governance and Transparent Digital Ecosystems:** Institutionalize **advanced urban data ecosystems harnessing AI, IoT, and geospatial analytics** to enable real-time monitoring, predictive maintenance, and citizen engagement through open government data platforms.
  - ✦ This **digital transformation fosters evidence-based policymaking**, enhances operational efficiency, and strengthens accountability mechanisms critical for responsive and adaptive urban management.
- **Catalyzing Green Finance and Impact-Driven Investment Models:** Scale municipal green bonds and ESG-aligned impact investments to mobilize capital for sustainable urban infrastructure projects—**renewable energy, green buildings, and waste-to-energy initiatives.**
  - ✦ Design **blended finance models combining concessional funds,** private capital, and performance incentives to bridge financing gaps while accelerating **India's urban climate commitments and Sustainable Development Goals (SDGs).**
- **Urban-Rural Synergistic Development and Regional Resilience:** Advance integrated regional planning frameworks that reinforce urban-rural economic linkages through **shared infrastructure, agri-logistics corridors, and circular resource flows.**
  - ✦ By promoting decentralized production-consumption systems and eco-sensitive urban expansion, this approach balances demographic pressures, fosters equitable growth, and strengthens regional food security and ecological sustainability.

Conclusion:

India's urban future hinges on harmonizing greenfield ambition with brownfield pragmatism to build inclusive, resilient, and sustainable cities. A unified national urban strategy must prioritize polycentric growth, smart governance, and climate-adaptive infrastructure. Empowering local bodies and leveraging technology will be crucial for bridging service deficits and ensuring equitable development. This aligns with **SDG 11 (Sustainable Cities and Communities), SDG 13 (Climate Action), and SDG 9 (Industry, Innovation and Infrastructure).**

Shaping Multilaterals- the India Way

This editorial is based on "Reimagining India's role at multilaterals via votes, values, and vision" which was published in Business Standard on 28/05/2025. The article brings into picture the inherent bias within multilateral institutions, as seen in the IMF's loan to Pakistan.

Tag: GS Paper - 2, Effect of Policies & Politics of Countries on India's Interests, Important International Institutions, International Treaties & Agreements

The **IMF's contentious $2.4 billion loan to Pakistan during active military tensions with India** has exposed the persistent issues within **multilateral institutions that undermines their claimed neutrality**. As India rises as a global power, it must urgently **professionalize its representation, recalibrate its voting strategies, and build stronger partnerships in the Global North** to ensure its strategic interests are protected. The **growing divergence of countries from multilateralism toward minilateralism** demands that India strategically balance both approaches—**leveraging traditional multilateral forums while building focused coalitions that serve its national interests** in an increasingly fragmented global order.

What Role Does Multilateral Forums Play in Global Governance?

- 💡 **Facilitating Collective Action on Global Challenges:** Multilateral forums provide indispensable platforms for countries to jointly **address transnational issues like climate change, pandemics, and financial crises.**
  - ✦ Their convening power enables **dialogue, resource pooling, and coordinated policies that no single nation can achieve alone.** This collective framework fosters global stability and sustainable development.
  - ✦ For instance, the **Paris Agreement under UNFCCC unites 196 countries in climate action**, while **WHO's COVAX initiative coordinated vaccine distribution during Covid-19,** ensuring access to poorer nations.

- 💡 **Promoting Rule-Based International Order:** Multilateral institutions uphold norms, laws, and procedures that regulate **state behavior, reducing chaos and unilateralism in global affairs.**
  - ✦ By providing dispute resolution mechanisms and enforcing trade and security rules, they contribute to predictable and peaceful international relations.
  - ✦ **WTO's dispute settlement mechanism,** despite recent challenges, **has looked over 600 trade disputes since 1995,** stabilizing global commerce.
    - 📎 The **UN Charter** continues to guide **sovereign conduct and conflict mediation.**

- 💡 **Amplifying Voices of Smaller and Developing Nations:** By offering an inclusive forum, multilateralism empowers less powerful states to influence global decisions, ensuring equity and representation.
  - ✦ This collective bargaining balances power asymmetries inherent in bilateral relations and fosters global cooperation rooted in fairness.
  - ✦ **India's leadership of the 'Voice of the Global South' summit** highlights multilateralism's role in elevating developing countries' priorities on climate justice and finance.

- 💡 **Enabling Economic Cooperation and Sustainable Development:** Multilateral forums coordinate economic policies, harmonize standards, and mobilize financial resources for development projects.
  - ✦ They help bridge gaps between developed and developing countries, facilitating inclusive growth and poverty reduction.
  - ✦ The **World Bank** and IMF channel trillions in **loans and grants annually; India's $4 trillion economy(recently surpassed Japan) benefits from integration via WTO rules** by increasing trade, fostering foreign investment, and enabling technology transfer and G20 economic dialogue enhancing stability and investment flows.

- 💡 **Enhancing Transparency, Accountability, and Global Governance Legitimacy:** Multilateral institutions provide platforms for public scrutiny, stakeholder participation, and monitoring, which build trust in global governance.
  - ✦ **Transparent decision-making and regular reporting** increase state accountability and reduce arbitrary policy shifts.
  - ✦ **WTO's openness to NGO participation** and the **UN's Sustainable Development Goals (SDG) progress reports promote transparency**, encouraging countries to align policies with global commitments.

- 💡 **Fostering Norm Diffusion and Soft Power Diplomacy:** These forums enable the spread of global norms related to human rights, environmental standards, and democratic governance.
  - ✦ They serve as arenas where countries showcase leadership, build coalitions, and influence international agendas through soft power.
  - ✦ **India's LiFE (Lifestyle for Environment)** initiative at COP26 in Glasgow propagated sustainable living norms globally, while the **International Solar Alliance promotes renewable energy leadership.**

- **Addressing Security Challenges through Collective Measures:** Multilateral platforms facilitate cooperation against threats such as terrorism, cyber-attacks, and pandemics by pooling intelligence, coordinating law enforcement, and harmonizing legal frameworks. Collective security mechanisms deter aggression and stabilize conflict-prone regions.
  - The UN Peacekeeping Force and counter-terrorism committee foster joint strategies.
- **Providing a Framework for Global Crisis Management and Recovery:** During global crises like financial meltdowns or pandemics, multilateral forums coordinate responses, stabilize markets, and mobilize aid. Their legitimacy and reach enable swift collective interventions essential for recovery and resilience.
  - The **G20's response during the 2008 financial crisis** and recent Global Pandemic Treaty exemplifies this.

What Factors are Leading to Declining Relevance of Multilateral Forums?

- **Geopolitical Rivalries and Power Politics:** Multilateral forums struggle as rising powers assert strategic interests, often sidelining consensus.
  - Conflicting agendas between major players like the **US, China, and Russia erode trust and stall collective decisions.** This power contest reduces multilateralism to a battleground for influence rather than cooperation.
  - For instance, the **UN failed to play an effective role in the Russia-Ukraine conflict, despite multiple resolutions,** highlighting its limited influence.
  - The **IMF's controversial $2.4 billion loan to Pakistan** amid India-Pak tensions reflects geopolitics influencing supposedly neutral institutions.
- **Bilateralism and Regionalism Supersede Global Cooperation:** Countries increasingly prefer **bilateral or regional deals for quicker, tailored outcomes, bypassing slower multilateral negotiations.**

- This pragmatic shift dilutes the influence of global forums as nations prioritize direct, strategic partnerships. The proliferation of **FTAs and currency swaps is evidence of this trend.**
- For instance, **in the last 5 years, India signed multiple PTAs, including the India-Australia Economic Cooperation and Trade Agreement and currency swap with UAE,** while **WTO negotiations remain stalled since the Doha Round.**
- **Weak Enforcement Mechanisms:** Multilateral agreements often depend on **voluntary compliance, lacking punitive measures for non-adherence.**
  - This weak accountability undermines trust and the credibility of such forums to enforce commitments on critical issues like climate change or trade rules.
  - For instance, **the Paris Agreement's NDCs are voluntary; failure to meet targets faces no penalties,** contributing to ongoing emission rises. Similarly, **WTO dispute settlement has weakened after the US blocked appointments to its appellate body.**
- **Unequal Power Dynamics:** Dominance by major powers in decision-making fosters perceptions of unfairness, alienating smaller or developing countries.
  - This imbalance challenges the legitimacy of multilateral forums as truly representative, fueling calls for reforms or alternative alliances.
  - For instance, **India's continuous push for UNSC reforms highlights the exclusion of emerging powers.** The **years of delay in meaningful UN Security Council restructuring** signals institutional inertia against inclusive governance.
- **Fragmentation of Global Issues and Overlapping Institutions:** The proliferation of specialized forums addressing niche issues causes **fragmentation, overlap, and policy incoherence,** diluting the impact of core multilateral institutions.

- Conflicting mandates among UN agencies, G20, WTO, and others complicate coordinated action.
- Climate governance involves **UNFCCC, IPCC, G20 climate action, and** <u>Regional Emissions Trading Systems</u>**,** often with inconsistent priorities. This fragmentation slows global consensus on urgent issues like carbon pricing.

- 💡 **Technological and Digital Sovereignty Conflicts:** Rising digital nationalism and concerns over data sovereignty disrupt multilateral efforts for a unified digital order. Competing regulations and mistrust over data sharing prevent global frameworks for cyberspace governance.
  - For instance**, India's cautious stance on cross-border data flow contrasts with US Silicon Valley interests**, reflecting divergent priorities. The stalled WTO e-commerce negotiations illustrate the challenge of aligning digital trade rules.

- 💡 **Increased Protectionism Erode Cooperative Spirit:** Resurgent **nationalism fuels protectionist policies**, undermining commitments to open trade and global cooperation.
  - Countries prioritize domestic interests, weakening the multilateral principle of mutual benefit and collective problem-solving.
  - For instance, the **rise of** <u>tariffs</u> **(US-China trade war)** has led to global trade tensions, reducing WTO's influence.

What Role can India Play in Reforming Multilateral Forums?

- 💡 **Championing Inclusive Global Governance and UN Reform:** India can lead efforts to democratize multilateral institutions, advocating for equitable representation reflecting current global power shifts.
  - Its push for **UN Security Council reform exemplifies this, aiming to amplify voices of the Global South** and emerging economies.

Such reforms will enhance legitimacy and effectiveness in global governance.

- 💡 **Bridging Developed and Developing World Interests:** With its unique position as a large developing economy and democratic power, India can mediate between developed and developing nations, fostering consensus on contentious issues like **climate finance and trade.**
  - This role is critical to maintaining cohesion in multilateral forums facing fragmentation.
  - **India's leadership of the 'Voice of the Global South** and its advocacy for enhanced climate finance and technology transfer underlines its bridging role.

- 💡 **Promoting Sustainable Development and Climate Leadership:** India's commitments to net-zero by 2070 and initiatives like LiFE position it to guide global climate governance toward equity and action.
  - By championing **climate justice, India can push for balanced financial and technological support to vulnerable countries**, shaping a reformed, sustainable multilateral order.

- 💡 **Strengthening South-South Cooperation and Regionalism:** India can invigorate South-South partnerships and regional multilateralism as complementary to global forums, promoting shared development and geopolitical balance.
  - Through platforms like **BIMSTEC and the India-Africa Forum**, it can amplify the collective voice of developing regions.
  - **India's $10 billion line of credit to Africa** and its active role in BIMSTEC demonstrate pragmatic efforts to build regional economic and strategic cooperation.

- 💡 **Advocating for Peaceful Conflict Resolution and Diplomacy:** India's principled non-alignment and emphasis on diplomacy position it as a mediator in global conflicts, reinforcing multilateral peace mechanisms.
  - Its **balanced stance on issues like Ukraine and Afghanistan** exemplifies leadership rooted in sovereignty and dialogue.

- **India's calls for a two-state solution in the Israel-Hamas conflict** and condemnation of crimes against humanity highlight its diplomatic influence within multilateral frameworks.

How can India Balance Multilateralism with Minilateralism?

- 💡 **Strategic Differentiation through Issue-Based Form Mapping:** India should develop a comprehensive, **dynamic 'forum-mapping' mechanism that categorizes global issues by complexity, urgency, and stakeholder composition,** enabling calibrated engagement.
  - ✦ It includes **leveraging multilateralism for systemic challenges** like climate governance **and minilateralism for tactical,** high-stakes domains like cybersecurity or regional security.
  - ✦ This precision diplomacy maximizes influence and minimizes diplomatic fatigue.

- 💡 **Institutionalizing Regional Multilateralism as a Strategic Nexus:** India should elevate regional platforms like **BIMSTEC and SAARC into sophisticated multilateral hubs by embedding cross-sectoral frameworks (economic, security, environmental)** that serve as **springboards for global diplomacy.**
  - ✦ This regional multilateralism acts as a strategic intermediary, ensuring that regional priorities seamlessly integrate into global decision-making.

- 💡 **Operationalizing Parallel Diplomatic Tracks:** India must institutionalize a multi-track diplomacy system where official multilateral negotiations, minilateral strategic dialogues, and **Track-II diplomacy operate in synergy, creating feedback loops that enhance coherence and flexibility.**
  - ✦ This holistic approach allows India to manage divergent interests, build consensus, and adapt swiftly to geopolitical flux.

- 💡 **Leveraging Cultural Diplomacy to Cement Multilateral and Minilateral Linkages:** India should deploy soft power by amplifying cultural, educational, and value-based diplomacy initiatives across forums, **reinforcing normative convergence on human rights, democracy, and sustainable development.**
  - ✦ This fosters emotional resonance and long-term alignment, strengthening cooperative foundations beyond transactional diplomacy.

- 💡 **Promoting Norm Entrepreneurship in Emerging Global Governance Areas:** India can position itself as a norm entrepreneur by actively shaping emerging governance regimes—**such as digital ethics, space law, and climate adaptation financing—**within multilateral and unilateral venues.
  - ✦ Proactively proposing innovative frameworks enhances India's thought leadership and normative influence globally.

Conclusion:

India stands at a pivotal juncture in global governance, **where its diplomatic agility must rise to match its growing global stature.** By championing **inclusive reforms in multilateral institutions and strategically engaging in minilateral groupings,** India can safeguard its national interests while upholding global equity. A calibrated blend of principle and pragmatism will allow India to shape a more **representative, resilient, and responsive world order.**

Positioning India in Global Value Chains

This editorial is based on "In the race for exports, India's competitive edge missing" which was published in The Financial Express on 29/05/2025. The article brings into picture the renewed trade opportunity for India amid US-China tensions, while highlighting that deep structural weaknesses and low competitiveness hinder its gains. To capitalize, India must pursue bold reforms and integrate effectively into global value chains.

Tag: GS Paper - 3, Liberalization, Fiscal Policy, Growth & Development, Achievements of Indians in Science & Technology, GS Paper - 2, Government Policies & Interventions

As **global trade faces uncertainty from US tariff policies** and **potential Chinese export diversions,** India stands at a crossroads between challenge and opportunity. Despite not capitalizing on the previous **US-China trade war,** India now has a second chance to benefit from **shifting global trade patterns.** However, a recent **Competitiveness Index** ranks India lowest among key Asian peers like **Malaysia, Vietnam, and Thailand, revealing deep structural weaknesses.** Therefore, India must move beyond reactive measures and implement comprehensive reforms that **boost competitiveness, reduce red tape, and actively connect with global value chains.**

What are the Key Drivers of the Growth in India's Exports?

- 💡 **Strategic Government Initiatives and Policy Reforms:** Robust government policies like the **Production Linked Incentive (PLI) schemes and Make in India** have significantly enhanced domestic manufacturing and export capacity.
  - ✦ The **Foreign Trade Policy 2023** further simplifies export procedures and incentivizes emerging sectors such as **e-commerce and high-tech products**.
  - ✦ For instance, **mobile phone exports surged from virtually zero in 2016 to over $20 billion in 2024**, driven largely by PLI incentives.
    - 🔖 Additionally, **exports in pharmaceuticals rose to $27.85 billion in 2023-24,** reflecting policy impact.
- 💡 **Diversification of Export Portfolio and Markets:** India's export basket has evolved **beyond traditional commodities to high-value sectors such as electronics,** engineering goods, and services, reducing dependence on a few products and markets.
  - ✦ This diversification **lowers vulnerability to external shocks and taps into fast-growing global demand**.
  - ✦ India's **merchandise exports to over 115 countries grew by 67% since 2013-14,** with top destinations including the **US, UAE, and Netherlands** constituting **51% of exports.**

- 💡 **Expansion into Global Value Chains:** India's growing participation in G**lobal Value Chains (GVC)** allows it to specialize in **value-added stages of production, enhancing export quality and scale.**
  - ✦ Despite a **relatively low GVC participation rate (around 41.3%)**, strategic infrastructure and policy reforms aim to boost backward and forward linkages, attracting lead firms and MSMEs into global supply chains.
  - ✦ **India's exports to China rose 8.7% to $16.67 billion in FY24,** showing increased regional integration, while sector-specific schemes target high-tech manufacturing.
    - 🔖 This integration **promises increased productivity and export diversification.**
- 💡 **Resilience and Growth of Services Exports:** The surge in India's **services exports,** particularly IT, telecom, and business services, underpins its export growth with relatively high value addition and global demand.
  - ✦ **Services exports rose 12.45% in FY25,** reaching a record $374 billion, offsetting merchandise export volatility and trade deficits.
  - ✦ India's strength in **digital services, coupled with global remote work trends, supports this expansion**. For example, telecommunications services exports led the charge alongside IT, highlighting India's competitive advantage in knowledge-based sectors.
- 💡 **Infrastructure and Logistics Modernization:** Improved port facilities, multimodal logistics, and digital customs platforms have reduced costs, enhanced efficiency, and accelerated export processes.
  - ✦ Initiatives like the **Sagarmala Programme and PM GatiShakti aim to cut logistics costs,** which **constitute up to 14% of export value,** thus improving competitiveness.
  - ✦ The establishment of **35 multimodal logistics parks and the expansion of national waterways** contribute to faster cargo movement.

- **Digitalization and Ease of Doing Business:** Digital platforms such as the **National Single Window System and Trade Connect** streamline approvals and facilitate exporters, reducing compliance burdens and time.
  - **Automation and cloud-based tax software lower error rates** and expedite customs clearance, helping SMEs access global markets efficiently.
  - The digital push directly supports export growth by enhancing transparency and reducing trade costs.
- **Geopolitical Shifts and Trade Realignments:** Rising US-China trade tensions and global supply chain disruptions present India with a unique opportunity to capture shifting trade flows and increase export share.
  - Despite challenges, **India's exports grew by 5.5% to $821 billion in FY25,** outperforming global averages amid uncertainty.
  - For example, **mobile phone exports to the US jumped 44% in 2024 as companies shifted production**. Ongoing **FTAs with UAE, Australia, and EFTA countries** enhance market access and diversification.
- **Rising Domestic Demand Supporting Export Competitiveness:** Strong and expanding domestic markets **create economies of scale and foster innovation**, improving the global competitiveness of Indian exporters.
  - Despite global economic headwinds**, India's growth remains stable at 6.5%,** supported by strong domestic demand.
  - With a growing middle class and robust consumption, sectors like electronics, pharmaceuticals, and automotive benefit from local demand-led capacity expansions.
- **Enhanced Financial Support and Export Credit:** Schemes like the **Interest Equalisation Scheme** and expanded credit facilities for MSMEs provide concessional finance, lowering costs and enabling export scale-up.

- Additionally, export credit agencies like **EXIM Bank** and SIDBI extend lines of credit, facilitating market entry and growth. This financial backing plays a pivotal role in enabling sustained export growth, especially for SMEs.

What are the Key Issues Affecting India's Integration in Global Value Chains?

- **Limited Backward Linkages and Low Import Integration:** India's GVC participation is **skewed towards forward linkages, relying heavily on raw material exports rather than integrating imported inputs** into export products.
  - This limits India's role in higher value-added manufacturing and reduces competitiveness.
  - The **country's backward linkage index declined from 47.6% in 2008 to 41.3% in 2018**, indicating weakening integration.
    - Meanwhile, **imports from China for high-tech components like telecom parts remain high at $101.7 billion in FY24**, highlighting dependence on external inputs.
- **Infrastructure Deficiencies and Logistical Bottlenecks: Inadequate transport infrastructure, port capacity constraints, and inefficient logistics** raise export costs and delay shipments, undermining India's GVC competitiveness.
  - Congestion at major ports like **Jawaharlal Nehru Port Trust and limited cold chain infrastructure** for perishables impede seamless supply chain integration.
  - These delays increase lead times, discouraging lead firms from sourcing from India.
- **Complex and Inconsistent Trade Regulations:** India's regulatory environment, marked by complex customs procedures, varying tariffs, and frequent policy changes, creates uncertainty for global firms.
  - **Misclassification of products and unclear HS codes add to compliance costs and delays**.
  - Exporters cite **regulatory bottlenecks as a key hurdle,** particularly in sectors like electronics and pharmaceuticals, where international standards must be met.

- The **fragmented tariff structure and inconsistent application of export incentives** limit India's attractiveness in GVCs.

- 💡 **Skill Gaps and Labor Quality Constraints:** While **India has a large labor pool, shortages of skilled workers in manufacturing and high-tech sectors** impede GVC integration.

  - ✦ High-tech GVC segments like **semiconductors and pharmaceuticals require specialized skills**, which are currently scarce.

  - ✦ Only **42.6% of Indian graduates were found employable in 2024**. Targeted skill development programs are underway, but **tangible improvements in workforce capabilities are gradual,** limiting India's ability to climb up the value chain.

- 💡 **Weak Linkages Between MSMEs and Lead Firms:** **MSMEs contribute nearly 50% to exports** but suffer from limited integration with global lead firms, restricting their GVC participation.

  - ✦ Issues like **lack of access to finance, technology, and management expertise hinder MSME competitiveness**.

  - ✦ For example, **MSMEs face difficulty meeting quality standards and certification** norms required by international buyers.

    - Strengthening these linkages, as seen in **Vietnam's Samsung-led supply chains**, remains an urgent priority for India.

- 💡 **Insufficient R&D and Innovation Ecosystem:** India's low investment in R&D (0.6% of the GDP) and **weak collaboration between industry and academia** curtail its ability to innovate and produce high-value exports.

  - ✦ This **limits participation in design and development stages of GVCs**, confining India largely to assembly and low-tech manufacturing.

  - ✦ Enhancing innovation capabilities is crucial for moving up GVCs and attracting foreign lead firms.

- 💡 **High Domestic Tariffs and Protectionist Policies:** Protectionist trade policies, including high tariffs on intermediate goods and domestic subsidies, **raise input costs and discourage import integration essential for GVC participation.**

  - ✦ This inward-looking approach **disincentivizes firms from embedding Indian operations in global supply chains.**

  - ✦ Despite recent shifts, **India still imposes tariffs higher than ASEAN peers**, impacting sectors like electronics and automotive.

    - Critics argue that reducing these barriers would **improve competitiveness and attract greater GVC involvement.**

- 💡 **Geographic Concentration of Export Activity:** **Export production and GVC participation are concentrated in a few coastal states** with better infrastructure, leaving vast regions underdeveloped and excluded.

  - ✦ **Six states contribute 70% of exports,** reflecting uneven industrial growth. Inland states struggle with inadequate logistics and power supply, deterring investments.

  - ✦ **Bridging regional disparities through infrastructure development a**nd policy support is critical to broaden GVC integration nationwide.

What Measures can India Adopt to Enhance Integration in Global Value Chains and Boost Exports?

- 💡 **Holistic Export-Oriented Skill Development Ecosystem:** Develop **sector-specific, industry-led skill development centers aligned with GVC requirements**, emphasizing advanced manufacturing, digital technologies, and quality standards.

  - ✦ Integrate vocational training with real-time industry exposure and certification frameworks to bridge skill gaps rapidly.

  - ✦ Leverage **PPP models and international collaborations to ensure global best practices.** This will create a ready workforce capable of engaging in higher **value-added activities** and innovation within GVCs.

- **Integrated Trade Facilitation and Digital Customs Reforms:** Implement **end-to-end digitization of customs and logistics** through blockchain-enabled platforms to ensure transparency, reduce clearance times, and eliminate paperwork redundancies.
  - **Harmonize tariff classifications and adopt AI-based risk management** to streamline inspections.
  - Link this with the **National Single Window System and Trade Connect portals** to create a seamless, single-source export facilitation ecosystem that enhances compliance and competitiveness.

- **Targeted MSME-GVC Linkage and Innovation Hubs:** Establish dedicated innovation clusters that connect MSMEs with global lead firms, providing technology transfer, quality certification support, and market access.
  - Facilitate **finance and capacity-building through schemes like the ECLGS combined with PLI incentives** tailored for MSMEs in export-oriented sectors.
  - These hubs should act as **localized export incubators to boost MSME productivity** and their role in complex supply chains.

- **Rationalization of Tariffs and Alignment with Trade Policy:** Undertake comprehensive tariff rationalization focused on **reducing duties on intermediate goods and raw materials essential for export production.**
  - Align tariff reforms with export promotion schemes to avoid policy contradictions and incentivize global integration.
  - Complement this with **active trade diplomacy and FTAs that facilitate tariff concessions and non-tariff barrier reductions**, expanding market access while maintaining strategic safeguards.

- **Infrastructure Upgradation with Emphasis on Multi-Modal Connectivity:** Accelerate development of integrated multimodal logistics parks combining **road, rail, air, and waterways** connectivity to drastically cut freight time and costs.

  - Expand **cold-chain infrastructure and warehousing near production clusters** to reduce perishability and inventory losses.
  - Synchronize these efforts under the **Sagarmala and PM GatiShakti programs** for optimized resource allocation and enhanced export supply chain resilience.

- **Innovation-Driven R&D Funding and Intellectual Property Ecosystem:** Increase public and private R&D investment with **tax incentives and grants targeting export-centric sectors like pharmaceuticals, electronics, and specialty chemicals.**
  - Foster academia-industry collaboration through innovation clusters and fast-track patent processing.
  - Enhanc**e IP-backed financing frameworks** to help exporters monetize innovations and strengthen global competitiveness.

- **Dynamic Export Market Diversification Strategy:** Adopt a **data-driven, flexible export diversification approach** using market intelligence to identify emerging demand hubs beyond traditional partners.
  - Boost market entry support via **diplomatic channels and trade missions focused on Africa, Latin America, and Southeast Asia.**
  - Integrate this strategy with initiatives like **Bharat Mart and E-Commerce Export** Hub to leverage digital platforms and expand SME participation.

- **Policy Coordination Mechanism Across Centre and States:** Establish a **high-powered export competitiveness council** involving central and state governments to harmonize policies on labor, land acquisition, infrastructure, and skill development.
  - Encourage states to **design region-specific export promotion roadmaps** aligned with national GVC goals, fostering inclusive growth. This coordinated approach will address regional disparities and unlock inland states' export potential.

- **Sustainability and Green Export Certification Framework:** Develop a national green export certification system that incentivizes sustainable production practices and eco-friendly supply chains aligned with global environmental standards.
  - ✦ Support exporters through **capacity-building on carbon footprint reduction and circular economy adoption**.
  - ✦ Link this initiative with existing schemes like the **National Programme for Organic Production (NPOP)** to create premium market positioning and future-proof export competitiveness.

Conclusion:

India's export growth is being driven by **strategic reforms, diversified markets, and digital transformation**. However, unlocking its full potential in global value chains requires overcoming deep-rooted structural barriers. Targeted interventions—**especially in skilling, MSME integration, infrastructure, and trade facilitation—are crucial**. A coordinated center-state approach, along with tariff rationalization and innovation support, can boost long-term competitiveness.

Data Governance in the Digital Age

This editorial is based on "Publicly funded data must be public" which was published in Financial Express on 29/05/2025. The article highlights that unlocking India's vast, granular public data through AI-driven, transparent, and secure access can drive innovation, governance, and economic growth.

Tag: GS Paper - 2, Government Policies & Interventions, GS Paper - 3, E-Governance, IT & Computers.

In today's digital age, **data** is a vital asset powering innovation, economic growth, and governance. Initiatives like **Digital India** have generated vast, granular datasets, while **artificial intelligence** enhances **data analysis and insights**. Unlocking this potential demands strong **data protection** and accountable institutions. India's **Digital**

Personal Data Protection Act 2023 and the proposed **Data Protection Board** aim to balance **privacy, transparency, and innovation**. Establishing effective frameworks is crucial to safeguard rights while fostering sustainable digital development and competitive advantage.

Why is Data the New Oil in the Digital Age?

- **Data Fuels Digital Transformation:** In today's interconnected world, digital **data** has become the **foundational asset** of economic, social, and political systems.
  - ✦ For instance, the **Aadhaar** digital identity program in India, with over 1.3 billion enrollments, is the world's largest biometric ID system.
    - 🖉 It underpins **digital payments (UPI), Direct Benefit Transfers (DBT)**, and **e-KYC processes**, streamlining both public and private sector services.
  - ✦ This powers **innovation, personalized services, efficient governance**, and **business decisions** across sectors and industries.
- **Granular Data Enables Precision:** Highly **granular datasets** are generated by **government departments** under programs like **Digital India** and public service digitization.
  - ✦ **Granular public data** refers to detailed, fine-level datasets collected frequently, providing **specific information** across small geographic or demographic units for precise analysis.
  - ✦ They include dynamic **data on health, education, infrastructure, and taxation**, often updated in real time.
    - 🖉 For example, In 2023-24, **Unified District Information System for Education (UDISE)** covered 1.5 million schools, providing detailed data on enrollment, infrastructure, teacher attendance, and learning outcomes to support targeted educational interventions.
- **Alternative Sources Expand Value:** Private firms use **alternative data** such as **satellite imagery, transaction records**, and **open-source scraping** for intelligence.

- This expands informational breadth and enriches decision-making with independent and **real-world indicators**.
- For example, private firms like CropIn use **satellite and IoT data** to provide **real-time crop health analytics**, serving over 5 million Indian farmers and improving precision agriculture and risk management.

💡 **AI Accelerates Data Analysis:** Artificial Intelligence systems process vast datasets, detect patterns, and generate **predictive insights** with exceptional efficiency.

- These tools have democratized data access, especially aiding junior analysts in navigating complex industry value chains.

💡 **Public Data Enhances Governance:** Publishing high-frequency, machine-readable **public datasets** supports transparency, accountability, and improved policy outcomes.

- The **Open Government Data Platform** India offers over 500,000 datasets, including real-time air quality, rainfall, and power data, helping NGOs monitor pollution and promote environmental compliance.

💡 **Unlocking Economic Potential:** India's public data hosts untapped **economic value**, enabling better macroeconomic forecasting and sectoral innovation.

- **Tax datasets** have already revealed important trends in India's fiscal behavior and corporate tax dynamics.
- For instance, **Goods and Services Tax (GST)** data analysis revealed sectoral recovery post-pandemic, aiding targeted stimulus; the Finance Ministry reported a 15% GST revenue rise in FY2024, driven by manufacturing and e-commerce growth.

How is India Responding Through Laws and Policies?

💡 **DPDP Act, 2023:** India enacted the **Digital Personal Data Protection Act, 2023** to regulate digital personal data and protect user rights.

- It defines roles for **Data Principals** (citizens) and **Data Fiduciaries** (processors), outlining their rights and duties.

💡 **Role of the Government:** The Ministry of Electronics and Information Technology is responsible for drafting and notifying implementation rules.

- It released the **Draft Digital Personal Data Protection Rules, 2025** for public consultation and feedback.

💡 **Functions of the Data Protection Board:** The **Data Protection Board of India (DPBI)** will investigate data breaches, resolve disputes, and impose penalties.

- Appeals from DPBI decisions will lie with the **Telecom Disputes Settlement and Appellate Tribunal**.

💡 **Consent Framework and Data Rights:** Consent is necessary for lawful processing, with exemptions for emergencies and state service delivery.

- **Data Principals** can access, correct, or erase their data and appoint nominees in case of incapacity or death.

💡 **Duties of Data Fiduciaries:** Fiduciaries must ensure **data accuracy**, security safeguards, and erasure post-usage unless legally required to retain.

- They must **report breaches** to both the DPBI and affected individuals promptly.

💡 **Consent Managers and Grievance Redressal:** The law introduces **Consent Managers**, registered entities that help users manage, withdraw, or modify consent.

💡 **Provisions for Children's Data:** Fiduciaries must obtain verifiable **parental consent** before processing data of persons below 18 years.

💡 **Regulation of Significant Data Fiduciaries:** Entities processing large or sensitive datasets may be declared **Significant Data Fiduciaries** by the government.

- They must conduct **Data Protection Impact Assessments**, appoint **Data Protection Officers**, and undergo independent audits.

- **Scope of Exemptions and Government Powers:** The Act exempts state agencies for national interest, judicial purposes, and research without user rights application.
  - Such powers are discretionary and lack judicial oversight, raising concerns over regulatory overreach.
- **Cross-Border Transfers and Localization:** The Act permits **data flows** outside India **with restrictions** on notified countries.
  - It **does not mandate** data localization or specify data storage protocols, unlike other global regimes.

What are the Key Challenges in Ensuring Data Protection?

- **Reconciling Privacy with Transparency:** Balancing the **fundamental right to privacy** under Article 21 and the **right to information** under Article 19 is difficult.
  - **Section 44(3)** of the **Digital Personal Data Protection Act** restricts information access even in larger public interest.
- **State Surveillance Concerns:** The Act permits government exemptions for national security, sovereignty, and public order, enabling **unchecked surveillance**.
  - Vague exemption clauses lack procedural safeguards and risk violating constitutional privacy protections.
- **Dilution of the RTI:** The amendment overrides Section 8(1)(j) of the **Right to Information Act, 2005**, weakening its transparency mandate.
  - It removes the provision guaranteeing **public access to data** not deniable to Parliament or State Legislatures.
- **Weak Regulatory Independence:** The **Data Protection Board of India** has a two-year tenure for members, unlike five-year terms in regulators like the **Securities and Exchange Board of India (SEBI)**.

- Government-heavy appointment committees limit institutional independence, undermining enforcement and public confidence.
- **Opaque Appointments and Processes:** Lack of diversity in selection panels increases risks of partisan bias in appointments to regulatory institutions.
  - **Transparent processes**, including publication of justifications for appointments, are absent in the current framework.
- **Delayed Rule Implementation:** There was a 16-month delay in notifying the 2025 rules for implementing the 2023 Act.
  - This stalled enforcement, left grievances unresolved, and delayed critical protections for citizens' data rights.
- **Limitations of Consent-Based Model:** The Act depends on **notice-and-consent** for data processing, assuming users understand risks and exercise informed choice.
  - This is unfeasible given widespread **digital illiteracy** and **information asymmetry** between users and corporations.
- **Digital Manipulation Risks:** Companies often deploy **dark patterns** and manipulative interfaces, invalidating genuine consent mechanisms.
  - These practices exploit user behavior, reducing agency and choice in personal data governance.
- **Children's Data Vulnerabilities:** Mandatory verification of parental identity for children's data is impractical and exclusionary.
  - It disregards realities of undocumented families and exacerbates India's digital divide.
- **Dilution of Child Protections:** Provisions banning **behavioural monitoring and profiling of children** were removed from earlier drafts of the legislation.
  - Current rules allow exemptions for ad targeting, undermining child data safety without adequate justification.

- 💡 **Undefined Criteria for Significant Data Fiduciaries:** There's no clear standard for who qualifies as a **Significant Data Fiduciary** under the law.

  - ✦ This ambiguity allows inconsistent enforcement and limited accountability for high-risk data processors.

- 💡 **No Recognition of Emerging Harms:** The Act does not address **non-consensual harms** like algorithmic discrimination, identity theft, or financial fraud.

  - ✦ Unlike the <u>**European Union's General Data Protection Regulation**</u>, India's law lacks a comprehensive **harm mitigation framework**.

- 💡 **Loopholes in Cross-Border Data Regulation:** Data can be transferred overseas, with the government only specifying restricted jurisdictions without clear criteria.

  - ✦ This weak regulation exposes citizens to privacy violations and weakens international data sovereignty.

- 💡 **RTI Web Portals Violate Privacy:** State-run RTI portals in states like Punjab, Odisha, and others demand <u>**Aadhaar**</u> **or device location**, violating privacy rulings.

  - ✦ Such mandatory disclosures breach Supreme Court judgments on proportionality and necessity of data collection.

What Should Be the Way Forward for a Robust Data Governance Framework?

- 💡 **Adopt Global Standards for Data Transfer:** India should adopt best practices like the **European Union-United States Data Privacy Framework** for secure data flows.

  - ✦ This will enhance **global interoperability**, promote trust, and enable cross-border digital trade.

- 💡 **Strengthen Institutional Independence:** Data Protection Board of India must be restructured for **autonomy and accountability** through longer tenures and diverse appointments.

- ✦ Inclusion of **judiciary, legislature, and civil society** ensures impartiality and enhances stakeholder confidence.

- 💡 **Form an AI-Privacy Task Force:** A dynamic **Artificial Intelligence and Privacy Task Force** (like **United States' National Conference of State Legislatures (NCSL)**) can identify **emerging risks** and **co-develop regulatory measures**.

  - ✦ This would ensure India's data regime remains adaptive and technology-neutral in a fast-evolving landscape.

- 💡 **Define Government Exemptions:** Terms like "public order" and "sovereignty" must be legally defined and judicially reviewable to avoid abuse.

  - ✦ Transparent procedures for granting exemptions are essential to balance privacy with national interest.

- 💡 **Revise Protections for Children's Data:** The government must prohibit **behavioural monitoring**, profiling, and targeting of children's data without exemptions.

  - ✦ Like the **Children's Online Privacy Protection Act (COPPA),** United States law bans collecting or using personal data from children under 13 for behavioral tracking or targeted ads without verified parental consent.

- 💡 **Clarify Significant Data Fiduciary Norms:** Provide detailed criteria and obligations for Significant Data Fiduciaries to ensure accountability.

  - ✦ Specify AI-related due diligence, including audit trails and transparency in automated decision-making systems.

- 💡 **Fix RTI Portal Privacy Violations:** Aadhaar or device location requirements must be eliminated from **Right to Information** web portals.

  - ✦ **Data minimization** and privacy-by-design must govern digital interfaces for civic access.

- 💡 **Timely Rule Notification and Enforcement:** Pending delays in rules undermine public confidence and legal enforceability.

✦ A fixed timeline for notification and implementation must be embedded in the regulatory architecture.

Conclusion

Robust data governance is essential for safeguarding privacy, enhancing transparency, and driving innovation. As India's Prime Minister recently said, "**Today it is said that data is the new oil. I will also add that data is the new gold.**" India must strengthen institutional independence, adopt global best practices, and ensure timely implementation of laws. Balanced policies will empower citizens, foster trust, and position India as a leader in the evolving digital economy and AI-driven future.

Strengthening India'S Cyber Defense

This editorial is based on "Arm employees against sophisticated cyberattacks" which was published in The Livemint on 28/05/2025. The article brings into picture the recent cyberattack on Marks & Spencer by the Scattered Spider group, exposing human vulnerabilities. It underscores the urgent need for stronger cybersecurity measures and employee awareness in India's rapidly growing digital landscape.

Tag: GS Paper - 2, Government Policies & Interventions, GS Paper - 3, Cyber Security, Cyber Warfare, Challenges to Internal Security Through Communication Networks

The **recent cyberattack on Marks & Spencer (M&S)** underscores the escalating threat of cybercrime in India, where **digital infrastructure is rapidly expanding**. The breach, attributed to the hacker group **Scattered Spider,** exploited human vulnerabilities through **social engineering tactics,** leading to significant financial and reputational damage. This incident highlights the urgent need for robust cybersecurity measures, including employee training and advanced threat detection systems. As cyber threats become more sophisticated, India's preparedness to combat such attacks is crucial to safeguard its **growing digital economy.**

What are the Key Emerging Cybersecurity Threats Confronting India?

💡 **Sophistication of AI-Driven Phishing and Social Engineering Attacks: Phishing attacks** have evolved **using AI-generated content and real-time social engineering,** bypassing traditional filters and deceiving employees effectively.

✦ These attacks exploit human vulnerabilities, as seen in the recent **Marks & Spencer breach** attributed to social engineering by Scattered Spider.

✦ Recent data shows a **175% increase in phishing attacks in India's BFSI sector in early 202**4, with 54% involving pretexting tactics.

  📎 **Daily cybercrime complaints rose by 113.7% in 2024,** underscoring this growing threat.

💡 **Exploitation of Cloud and API Vulnerabilities:** Rapid cloud adoption has created new attack surfaces through misconfigured environments and **weak API security.**

✦ Attackers exploit **publicly accessible cloud buckets** and poorly secured admin consoles, enabling unauthorized access to sensitive data and disrupting services. This reflects a **critical gap in securing evolving digital infrastructures in India's expanding economy.**

✦ For instance, **CERT-In reported a 180% rise in exploits targeting cloud misconfigurations and APIs in 2024,** highlighting increasing adversarial focus on these vectors.

💡 **Surge in Supply Chain Attacks Targeting Critical Ecosystems:** Cybercriminals increasingly **infiltrate trusted vendors and third-party providers** to bypass primary defenses, threatening entire supply chains.

✦ This **indirect attack method jeopardizes the integrity of critical financial and governmental networks**, requiring enhanced cross-sector coordination for defense.

- ✦ Supply chain attacks can also be **disrupted by DDoS attacks,** as seen a few years ago when **Sudanese hackers took down airport and hospital websites,** severely affecting their operations for an extended period.
- ✦ The Digital Threat Report 2024 **underscores supply chain risks as a major challenge**, with malicious code libraries and compromised vendor software as common entry points.

💡 **AI-Powered Deepfakes and Chatbot Phishing:** The emergence of **AI-generated deepfake audio and video for impersonation** and chatbot-based phishing campaigns significantly raise fraud sophistication.

- ✦ These technologies enable large-scale credential theft and social manipulation, undermining trust in digital communications. The threat landscape now demands AI-aware detection and response mechanisms.
- ✦ Incidents involving **malicious LLMs like WormGPT and FraudGPT have been reported,** with AI-enabled fraud causing multifaceted risks in finance and governance sectors.

💡 **Proliferation of Mobile Malware and Monetization Schemes:** Mobile platforms, especially Android, face **high infection rates from malware, adware, and potentially unwanted programs (PUPs)**, driven by commercial motives.

- ✦ **Mobile security remains a weak link in India's cybersecurity posture.** Seqrite's telemetry reveals **42% of mobile threats are malware, with 32% PUPs and 26% adware**, stressing urgent need for enhanced mobile defenses.
- ✦ Recently, a case in **Rajasthan highlighted the danger of steganography attacks**—where a seemingly harmless picture sent via WhatsApp was downloaded, resulting in the phone being hacked and money stolen.

💡 **IoT Vulnerabilities in Critical Sectors:** India's accelerating adoption of IoT devices introduces complex security challenges due to widespread use of outdated and vulnerable technology.

- ✦ Exploitation of **known IoT vulnerabilities can cause high-impact breaches,** especially in BFSI and healthcare sectors where device security is often neglected.
- ✦ For instance, **99% of IoT attacks exploit known flaws, with 34% costing Banking, Financial Services, and Insurance entities between $5-10 million,** revealing severe financial and operational risks.

💡 **Escalating Financial Frauds via Digital Platforms:** Financial frauds, **including online investment scams, illegal lending apps, Telegram task frauds and trading scams**, are soaring, exploiting regulatory and technological gaps.

- ✦ Such frauds drain consumer wealth and **erode confidence in digital finance,** demanding integrated efforts between regulators, fintechs, and law enforcement. India's rapid fintech growth paradoxically expands this attack surface.
- ✦ In 2024 alone, **cybercriminals caused losses of over ₹1,750 crore through digital frauds,** with 740,000 complaints on the National Cybercrime Reporting Portal, illustrating the gravity of this threat.

💡 **Growing Threat of Digital Arrest Scams and Social Manipulation:** Cybercriminals impersonating law enforcement agencies **conduct digital arrest scams, blackmail, and extortion, exploiting public trust in authorities.**

- ✦ These scams have caused significant financial losses and psychological distress, especially targeting vulnerable groups.
  - 📎 For instance, in **Haryana's Nuh village,** there have been numerous reports of such frauds (including OTP scams), highlighting the widespread impact of these scams in rural areas.
- ✦ The **Indian government blocked over 83,000 WhatsApp accounts linked to digital arrest scams in 2024,** and losses of ₹120 crore were reported, reflecting the scale of the problem.

India's Cybersecurity Framework

India's Cybersecurity Framework showing: Digital Personal Data Protection Act 2023, National Cyber Security Policy, Indian Cyber Crime Coordination Centre, Computer Emergency Response Team – India, Cyber Surakshit Bharat Initiative, Cyber Swachhta Kendra, National Critical Information Infrastructure Protection Centre, Defence Cyber Agency.
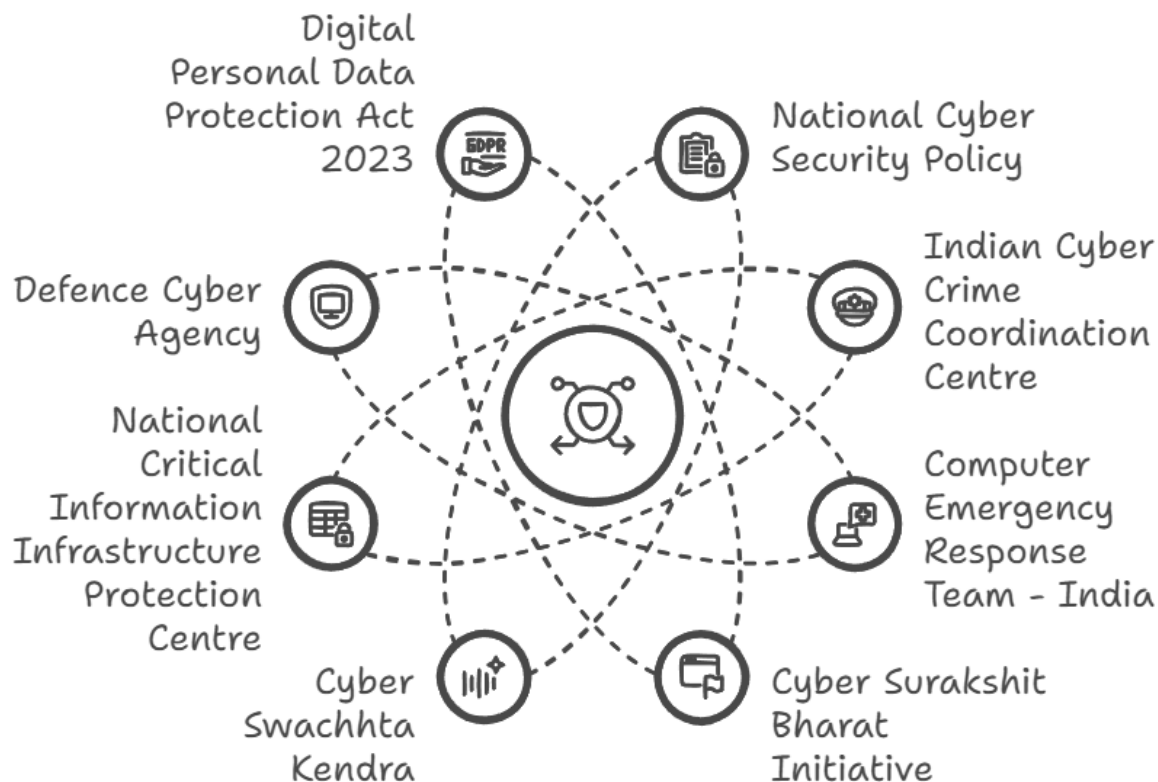
Why India's Current Security Framework is Inadequate for the Rising Threats?

- 💡 **Fragmented Coordination Among Agencies and Jurisdictions:** India's cybersecurity ecosystem suffers from **fragmented coordination across central and state agencies,** leading to delayed response and enforcement gaps.
  - ✦ **Overlapping mandates and lack of unified protocols** weaken rapid threat containment and intelligence sharing. Effective cybersecurity demands seamless inter-agency collaboration, which remains a work in progress.
  - ✦ Despite the establishment of **I4C** and **Joint Cybercrime Coordination Teams (JCCT),** cybercrime complaints surged to over 1.5 million in 2023, revealing systemic coordination challenges in timely mitigation.
- 💡 **Inadequate Skilled Cyber Workforce and Training:** The rapid evolution of cyber threats outpaces the **availability of skilled cybersecurity professionals**, resulting in critical talent shortages.
  - ✦ Training initiatives like **CyTrain have helped but remain insufficient to meet the vast demand for experts** across public and private sectors.
  - ✦ This gap hampers effective threat detection, incident response, and proactive defense strategies.
  - ✦ **About 76,000 police officers have completed cybercrime training via MOOC platforms**, still a major portion remains without specialized training..
- 💡 **Insufficient Adoption of Advanced Threat Detection Technologies:** India's security infrastructure largely relies on **signature-based detection, inadequate against emerging sophisticated threats like zero-day exploits and AI-driven attacks.**

- ✦ Slow adoption of behavior-based, AI-powered threat intelligence leaves critical vulnerabilities exposed.
- ✦ Modern cybersecurity demands cutting-edge technology integration to stay ahead of adaptive adversaries.
- ✦ Recent Seqrite data show**s 85% reliance on signature-based detection,** while **only 14.5% of threats are identified through behavior-based methods, reflecting technology gaps.**
- 💡 **Limited Focus on Cloud and API Security Governance:** The **surge in cloud adoption is not matched by robust governance frameworks** to secure APIs and cloud configurations, creating widespread exposure.
  - ✦ Many Indian enterprises lack comprehensive policies for continuous monitoring and patch management in cloud environments.
  - ✦ **CERT-In recorded a 180% rise in cloud and API exploits in 2024**, showing glaring deficiencies in cloud security posture.
- 💡 **Inadequate Regulation and Enforcement in Emerging Digital Domains:** Rapid fintech, IoT, and digital payments growth outpaces regulatory frameworks, leaving critical sectors exposed to novel cyber threats.
  - ✦ Existing laws are **often reactive and fail to comprehensively address new attack vectors like AI-enabled fraud and IoT vulnerabilities.** Regulatory agility and enforcement need urgent strengthening.
  - ✦ The [Digital Personal Data Protection Act, 2023](#) exempts AI tools from its provisions when processing personal data for r**esearch, archiving, or statistical purposes,** as long as no decisions are made about individuals and prescribed standards are followed — **a clause that opens the scope for potential exploitation.**
- 💡 **Lack of a Proactive Cyber Offensive Strategy:** India currently emphasizes **defensive cybersecurity, but the absence of a well-articulated offensive cyber capability** leaves adversaries unchallenged in cyberspace.

- ✦ Cyber deterrence through active countermeasures and threat hunting is critical to disrupt sophisticated attacks early. The **"Super Cyber Force" concept is yet to be operationalized.**
- ✦ PRAHAR's report warns of cyberattacks rising to 1 trillion annually by 2033, stressing the urgency of strategic offensive capabilities.
- 💡 **Insufficient Investment in Cutting-Edge Cybersecurity Infrastructure:** India's investments in **AI-based threat detection, blockchain for data integrity, and next-gen firewalls lag behind global peers,** undermining the defense against emerging multi-vector attacks.
  - ✦ **Budgetary constraints and prioritization issues** delay the deployment of critical infrastructure enhancements.

What Measures can India Adopt to Enhance Cyber Resilience?

- 💡 **Sovereign Cybersecurity Command with Integrated Threat Fusion:** Create a **high-powered, sovereign cybersecurity command center** that acts as a nerve center for seamless **integration of intelligence from CERT-In, I4C, Computer Security Incident Response Team, law enforcement, and private sector entities.**
  - ✦ This command should **leverage real-time threat fusion, coordinated tactical responses,** and strategic cyber deterrence policies to neutralize adversaries swiftly.
  - ✦ Such a **centralized architecture will transcend jurisdictional silos** and create a resilient national cyber defense ecosystem with rapid decision-making capabilities.
- 💡 **Mandatory Sector-Specific Cyber Hygiene:** Develop **rigorous, industry-tailored cybersecurity compliance mandates** that encompass continuous risk assessments, penetration testing, and incident reporting mechanisms.
  - ✦ Frameworks should align with **global standards like NIST but calibrated for India's unique threat environment,** especially targeting BFSI, healthcare, and critical infrastructure.

✦ **Public disclosure of compliance levels can drive transparency**, stakeholder accountability, and elevate baseline cyber hygiene nationwide.

💡 **National Cyber Talent Acceleration Ecosystem**: Design and deploy a comprehensive **national cyber workforce development initiative blending academia, industry, and government resources.**

- ✦ Cybersecurity education goes beyond teaching technology; **it enriches holistic learning by fostering critical thinking and problem-solving skills**.

- ✦ In today's digital age, where children's lives are deeply connected to screens amid rising cybercrime, incorporating cybersecurity into school curriculums is essential.

  - 📎 Ultimately, **cybersecurity education strengthens children's mental resilience** against cyber threats and supports their overall social and cognitive development.

💡 **Invest in AI-Enabled Proactive Cyber Threat Hunting:** Develop state-of-the-art AI systems capable of **ingesting vast, heterogeneous threat data streams to generate predictive threat intelligence** and automate containment protocols.

- ✦ Leveraging deep learning models for advanced anomaly detection (like Mulehunter.AI of RBI), these systems should **reduce mean time to detect (MTTD) and respond (MTTR),** enabling preemptive disruption of **advanced persistent threats (APTs)** and zero-day exploits at scale.

💡 **Conduct Pan-India Cyber Literacy Drives**: Scale up culturally nuanced cyber hygiene campaigns **leveraging regional languages, folklore, and digital influencers** to embed cybersecurity awareness deeply within diverse communities.

- ✦ Incorporate **gamification, mobile learning, and school curricula** integration to cultivate lifelong cyber-resilient behavior from grassroots.

✦ RBI's collaboration with Panchayats and **inclusion of celebrities like Amitabh Bachchan in automated phone warnings** that alert callers about cyber fraud risks—a powerful step in protecting communities at the grassroots level.

💡 **Propel Indigenous Cybersecurity Innovation:** Create dedicated innovation hubs and accelerators that fund R&D in frontier cybersecurity technologies including **quantum-safe encryption, AI-driven threat intelligence, blockchain for secure identity management,** and hardware-based security modules.

- ✦ Foster cross-border research partnerships and knowledge exchange to position India as a global cybersecurity innovation leader while reducing dependence on foreign technology imports.

💡 **Institutionalize Multi-Domain Cyber Crisis Simulations:** Regularly orchestrate large-scale, realistic cyber crisis simulations that **incorporate cyber, physical infrastructure, financial systems, and supply chains.**

- ✦ These exercises should engage **all stakeholders—government agencies, critical infrastructure operators, fintech firms, telecom providers, and civil society**—to identify systemic vulnerabilities, test crisis communications, and refine coordinated incident response strategies under high-pressure scenarios.

Conclusion:

The Marks & Spencer cyberattack highlights the **urgent need for India to strengthen its cybersecurity posture amid rising sophisticated threats.** The **upcoming Digital India Act** offers an optimistic path forward by aiming to enhance regulation, enforcement, and cyber resilience comprehensively building upon the **Budapest Convention on Cybercrime.**

Drishti Mains Questions

1. "Despite progressive legislation, persons with disabilities in India continue to face systemic barriers in accessing rights and opportunities". Discuss.

2. In the backdrop of evolving global health challenges and the recent WHO Pandemic Agreement, critically examine India's role in shaping global health governance.

3. "Transparent and strategic air quality monitoring is pivotal for addressing India's air pollution crisis." Discuss the challenges in India's air quality monitoring framework and suggest measures to strengthen it for effective pollution control.

4. "Despite a robust institutional framework, India's justice system continues to deny timely and equitable justice." Examine.

5. Discuss the challenges faced by gig workers in India and suggest measures to ensure their welfare and protection within the current labor framework.

6. "India's engagement with West Asia has evolved from peripheral involvement to a strategic partnership, underpinned by economic, energy, and geopolitical considerations. Examine

7. "India's shift from a defence importer to an emerging defence manufacturer reflects a strategic recalibration in national security and foreign policy. Examine this transformation in light of recent policy initiatives and challenges."

8. Assess the role of Free Trade Agreements (FTAs) in advancing India's strategic and economic interests. Discuss the key benefits and challenges associated with India's FTAs, and suggest measures to optimize their impact on the country's growth and development.

9. Despite its high water consumption and environmental impact, paddy continues to dominate India's cropping patterns. Discuss the reasons for this trend and suggest sustainable alternatives to ensure food and ecological security.

10. Examine the relationship between technological advancement and human development in India, emphasizing the role of AI in the HDI context.

11. What are the fundamental challenges to global trade today, and how can India's approach to multilateral and regional trade agreements influence reforms for more equitable and balanced trade governance?

12. Discuss the challenges and potential solutions in aligning India's skill development initiatives with the demands of the emerging digital and green economy.

13. "Ecology is the permanent economy." Critically analyze the interdependence between ecological conservation and economic development in India.

14. Examine the evolution of India-Africa relations and analyze their strategic significance in India's foreign policy.

15. Analyze the role of Ethanol Blended Petrol (EBP) in enhancing India's energy security and reducing carbon emissions and discuss key challenges in scaling up ethanol blending in India.

16. Discuss the significance of India-GCC relations. What are the key challenges and how can this partnership be strengthened?

17. Discuss how Artificial Intelligence can act as a catalyst for India's economic growth and governance transformation.

18. Critically analyse how fiscal federalism, as the foundation of India's cooperative and competitive federal structure, confronts structural, institutional, and political challenges.

19. India-Bangladesh bilateral relations are crucial for regional stability, connectivity, and economic growth. Comment.

20. Efficient logistics is central to India's strategy for becoming a global manufacturing and export powerhouse. Comment.

21. *"The Northeast is not India's periphery - it is a pivot."* In the context of India's Act East Policy, Discuss how the Northeast can be transformed into a strategic hub for trade, tourism, and talent.

22. India's urban development strategy reflects a fragmented approach marked by a dichotomy between greenfield and brownfield projects. In this context, examine the key drivers and challenges of India's urban transformation

23. *"The shifting contours of global governance, marked by declining trust in multilateralism and the rise of issue-based minilateralism, necessitate a strategic recalibration of India's diplomatic posture."* Discuss.

24. "India stands at a strategic inflection point to harness shifting global trade dynamics, yet structural challenges continue to constrain its integration into Global Value Chains (GVCs)." Discuss.

25. What are the key challenges to data protection and privacy in India's digital era, and how can policy reforms balance transparency, security, and innovation?

26. "Cybersecurity threats are increasingly becoming sophisticated and pose a significant challenge to India's digital economy and national security. Discuss and suggest measures to strengthen India's cyber resilience."