INSIGHTSIAS

SIMPLIFYING IAS EXAM PREPARATION

INSTA EDITORIAL

COMPILATIONS

MARCH 2024

Table of Content:

3. **A bold step towards a cervical cancer-free future**

EDITORIAL ANALYSIS

Many elections, AI's dark dimension

Source: The Hindu

- **Prelims:** Science and technology, Artificial intelligence(AI), Generative AI, Big Data, GANs, ChatGPT1 tool, DALL.E2 etc
- **Mains GS Paper III and IV:** Significance of technology for India, AI, indigenisation of technology and development of new technology.

ARTICLE HIGHLIGHTS

- **Elections** are scheduled to be held in as many as **50 countries across** the globe including **India, Mexico, the United Kingdom (**by law, the last possible date for a general election is January 28, 2025) and the **United States.**
- The rapid development of **Artificial Intelligence (AI)** models suggests that we are at an inflection point in the history of human progress.

INSIGHTS ON THE ISSUE

Context

Artificial intelligence(AI):

- It is a branch of computer science dealing with the simulation of intelligent behavior in computers.
- **It describes the action of machines** accomplishing tasks that have historically required human intelligence.
- **It includes technologies** like machine learning, pattern recognition, big data, neural networks, self algorithms etc.
- **E.g: *Facebook's facial recognition software*** which identifies faces in the photos we post, the voice recognition software that translates commands we give to ***Alexa***, etc are some of the examples of AI already around us.

Generative AI:

- **It is a cutting-edge technological advancement** that utilizes machine learning and artificial intelligence to create new forms of media, such as text, audio, video, and animation.

- **With the advent of advanced machine learning capabilities:** It is possible to generate new and creative short and long-form content, synthetic media, and even deep fakes with simple text, also known as prompts.
- **Generative Artificial Intelligence (GAI) will tr**ansform into Artificial General Intelligence (AGI), which can mimic the capabilities of human beings.
- **It will dramatically improve the standard** of living of millions of human beings.
- **Negative impact: AI would undermine human values** and that advanced AI could pose 'existential risks'.

AI innovations:

- GANs (Generative Adversarial Networks)
- LLMs (Large Language Models)
- GPT (Generative Pre-trained Transformers)
- Image Generation to experiment
- **Create commercial offerings** like DALL-E for image generation
- **ChatGPT for text generation.**
    - It can write blogs, computer code, and marketing copies and even generate results for search queries.

Impact of AI on elections:

- **Generative AI,** provides dynamic simulations and mimics real world interactions).
- **AI models such as ChatGPT, Gemini, Copilot** are being employed in many fields.
    - **AI's newer models c**ould alter electoral behaviors and verdicts as well.
- **Generative AI could impact the electoral landscape** this time as well.
    - **What might not happen in 2024,** may well happen in the next round of elections, both in India and worldwide.
- **Pew Survey**: It indicates that a majority of Indians support **'authoritarianism'**.

    - **Employing AI c**ould well have a field day in such a milieu to further confuse the electorate.
- **Deep Fake syndrome appears to** alter elections and lends itself to newer and newer techniques of propaganda
    - **Confusing and confounding** the electorate.
- **AI technology makes it easier to enhance falsehoods** and enlarge mistaken beliefs.
- **Disinformation is hardly a new methodology or technology,** and has been employed in successive elections previously.
    - **sophisticated AI tools** will be able to confuse the electorate to an extent not previously known or even envisaged.
- **The use of AI models to produce reams of wrong information,** apart from disinformation, accompanied by the creation of near realistic images of something that does not exist, will be a whole new experience.
- **AI deployed tactics will tend to make** voters more mistrustful
    - **It is important to introduce checks and balances t**hat would obviate efforts at AI ‘determinism’.
- **The recent inaccuracies associated with Google i**s a timely reminder that AI and AGI cannot be trusted in each and every circumstance.
- **The public wrath worldwide over Google AI models,** including in India, for their portrayal of persons and personalities in a malefic manner, mistakenly or otherwise.
    - These reflect the dangers of ‘runaway’ AI.

Implications:

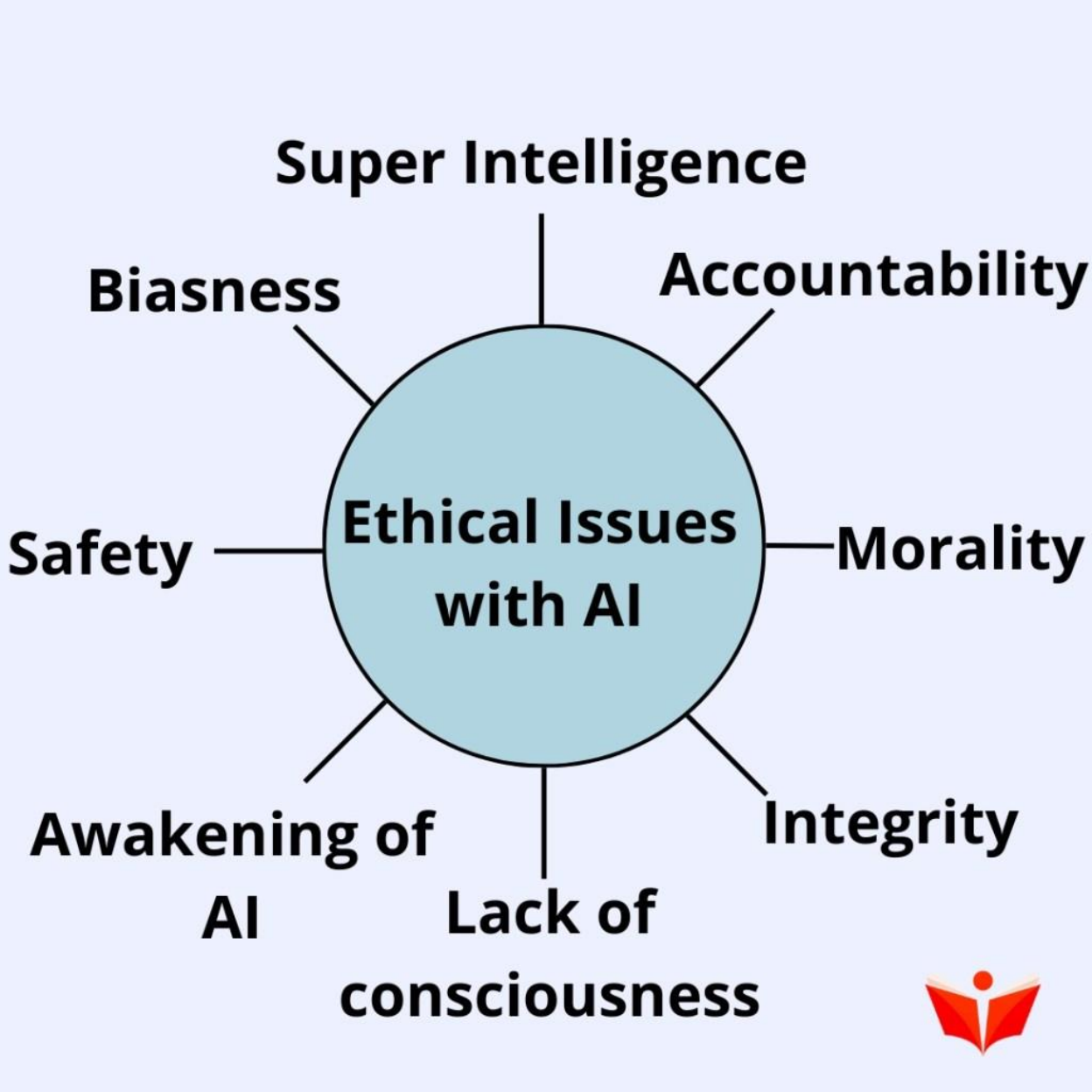
- **Nations increasingly depend on AI solutions f**or their problems.

    - **It tends at times to make up things** in order to solve new problems.
    - **These are often probabilistic in characte**r and cannot be accepted ipso facto as accurate.

The main types of adversarial capabilities, overshadowing other inbuilt weaknesses are:

- **Poisoning:** that typically degrades an AI model's ability to make relevant predictions.
- **Back dooring**: that causes the model to produce inaccurate or harmful results
- **Evasion**: that entails resulting in a model misclassifying malicious or harmful inputs thus detracting from an AI model's ability to perform its appointed role.

Ethical Issues with AI:



Way Forward

- **The dangers associated with AI p**ose a greater threat than harm arising from bias in design and development.
- **AI systems tend to develop certain inherent adversarial** capabilities.
    - Suitable concepts and ideas have not yet been developed to mitigate them, as of now.

- **Elections apart, India being one of the most advanced countries in** the digital arena, again needs to treat AI as an unproven entity.
- **While AI brings benefits, the nation and its leaders should** be fully aware of its disruptive potential.
- **India's lead in digital public goods could b**e both a benefit as well as a bane, given that while AGI provides many benefits, it can be malefic as well.
- **There are significant challenges to AI policy,** but a dearth of democratic voices and the tendency to surrender the policy process around AI to a handful of tech companies need to be extended.

QUESTION FOR PRACTICE

Q. What are the different elements of cyber security ? Keeping in view the challenges in cyber security, examine the extent to which India has successfully developed a comprehensive National Cyber Security Strategy.(UPSC 2022)

(200 WORDS, 10 MARKS)

EDITORIAL ANALYSIS

Looking to the future on St. Patrick's Day

Source: The Hindu

- **Prelims:** Current events of international importance(FTA, India-UK relations, G20, tariff etc)
- **Mains GS Paper II & III:** Bilateral, regional and global grouping involving India and affecting India's interests etc

ARTICLE HIGHLIGHTS

- **India** and **Ireland** will celebrate **75 years of diplomatic relations th**is year.
- **St. Patrick's Day: National Day** that is an opportunity to celebrate **Ireland** with the more than **70 million people** globally who claim Irish ancestry and the many more who show their fondness for Ireland in any number of ways

INSIGHTS ON THE ISSUE

Context

India-Ireland relations:

- **India and Ireland have traditionally** had cordial and friendly relations going back to the time of our freedom movement.
- **Economic relations:** complementarities between our flagship programmes, in particular **Skill India and Digital India** programmes and Ireland's proven educational institutions.
- **Bilateral trade**: Two-way trade in goods, **Euro 463 million in 2010** now stands at **Euro 650 million.**
- **Total trade in goods and services in 2013** was **€2.48 billion, up from €2.2 billion in 2012.**

- **There are about 26,000 Indians or persons** of Indian origin in Ireland, of whom about **17,000 are Indian** citizens.
- **The bulk of the community is in** healthcare (doctors and nurses), IT, engineering and senior management positions.
- **Ireland is becoming a significant destination for Indian students** seeking higher education, particularly post-graduate, doctoral and postdoctoral students.
- **There are over 1,400 Indian students** in Irish higher educational institutions

Ireland's stand on conflicts:

- **Ireland has a clear and principled position** on conflicts.
- **Ireland demanded accountability,** internationally, for Russia's illegal invasion
    - **Ireland is the strongest supporter** of **Ukraine's** path to **European Union membership.**

- **Ireland condemned Hamas's terrorist attack** in October and have called at every juncture for all hostages in **Gaza** to be released unconditionally.

    - **upholding of international humanitarian law,** a humanitarian ceasefire and for sustained humanitarian assistance to be provided for the civilians in Gaza.

The role of young people in the growth:

- **Young people are at the heart** of Ireland, a great place to invest, trade, visit and study too.
- **Ireland is home for all five of the world's top software companies** and 14 of the top 15 medical technology companies globally.
- **Those companies, and very many others,** have put down roots in Ireland because of:

    - economic track record
    - stability
    - ease of doing business
    - access to a European Union market of 450 million people.

- **Talent pool, with brilliant globally-connected young people** from across the European Union, who are a key part of our dynamic workforce.
- **Ireland is a country where enterprise** is valued and young entrepreneurs are supported to bring their products and ideas to international markets.
- **Irish university system** attracts thousands of students from around the world because of the safe, welcoming and culturally rich environment on offer in Ireland for young people.
- **Ireland featured in the top 10 countries in the UN's Human Development Index.**

Way Forward

- **India has a great contribution** to Irish society as leaders in IT, health care and a number of key sectors.
    - **They breathe lifeblood into the bilateral relationship** of today, as much as our Irish and Indian freedom fighters provided the soul of our partnership in the past.
- **Old Irish saying, "Ar scáth a chéile a mhaireann na Daoine (We live in each other's shadow").**
    - **This will remain true for young people** in the world of the years to come.
- **Protecting and supporting each other, and building enduring partnerships,** has never been more vital.
- **The partnership extends far beyond trade and investment i**nto culture, sport, education and tourism too.

QUESTION FOR PRACTICE

Q. The judicial systems in India and the UK seem to be converging as well as diverging in recent times. Highlight the key points of convergence and divergence between the two nations in terms of their judicial practices.(UPSC 2020)

(200 WORDS, 10 MARKS)

EDITORIAL ANALYSIS

Ties that epitomize India's neighborhood first policy

Source: The Hindu

- **Prelims:** Current events of international importance(India-Bhutan ties, **Petroleum Agreement, Doklam region, Gelephu etc**
- **Mains GS Paper II:** Bilateral, regional and global grouping involving India, Significance of Indo-Pacific for India etc

ARTICLE HIGHLIGHTS

- **The Prime Minister** will visit **Bhutan,** announced the visiting Bhutanese Prime Minister after the two leaders met in Delhi.

INSIGHTS ON THE ISSUE

Context

India-Bhutan Relations:

Dimension	Examples
Historical	Indo-Bhutan Treaty of Peace and Friendship (1949) is the foundation of the India-Bhutan relationship. India and Bhutan established formal diplomatic relations in 1968 based on the 1949 treaty (revised in 2007).
Strategic	Bhutan serves as a buffer between India and China, safeguarding the Siliguri Corridor (Chicken's Neck). Doklam standoff (2017) highlights Bhutan's strategic importance to India. Bhutan lacks formal diplomatic relations with China.
Economic	India is Bhutan's major trading partner, especially in electricity. It reached $ 1.42 Billion in 2021-22, accounting for 80% of Bhutan's overall trade
	Trade, Commerce, and Transit Agreement (2016) establishes a free trade regime between them and allows Bhutan duty-free transit of goods to/from third countries.
	India supports Bhutan's 13th Five-Year Plan, contributing 4500Cr for the 12th Five-Year Plan.
Cultural and Educational	Buddhism is a significant cultural tie.
	India provides scholarships through programs like Nehru-Wangchuck Scholarships and Ambassador's Scholarship for Bhutanese students. India also supports Bhutan's Gyalsung Project for skill development
Energy	India has built three Hydroelectric Projects in Bhutan (Chhukha HEP, Kurichhu HEP, and Tala HEP).
	Mangdechhu, Punatsangchhu 1 and 2 Hydroelectric Power Projects are under construction. Surplus power exported to India.
Regional	Collaboration in regional forums such as BIMSTEC and SAARC.
Technological	Joint initiatives like the E-Library project and the India-Bhutan satellite. Participation in India's Vaccine Maitri Initiative. Launch of RuPay, and BHIM app in Bhutan
Environmental	India supports Bhutan's efforts to achieve carbon negativity.
Rail Link	India and Bhutan collaborate on the Kokrajhar-Gelephu rail link project.

Key Highlights of the India-Bhutan Bilateral Talks:

Petroleum Agreement:

- **Signed an agreement on the supply of petroleum products** to ensure a reliable and sustained supply from India to Bhutan, fostering economic cooperation and growth in the hydrocarbon sector.

- **Food Safety Collaboration:**
    - Bhutan's Food and Drug Authority and **India's Food Safety and Standards Authority (FSSAI)**signed an agreement to enhance cooperation in **food safety measures.**
        - **It will ensure compliance with food safety standards** and reduce compliance costs.
- **Energy Efficiency and Conservation:**
    - Both countries signed an MoU on energy efficiency and conservation that demonstrates a **commitment to sustainable development.**
- **India aims to assist Bhutan in enhancing energy efficiency** in households, promoting the use of energy-efficient appliances, and developing standards and labeling schemes.
- **Border Dispute Resolution:**
    - The Bhutanese Prime Minister's visit coincides with ongoing discussions between **China and Bhutan to resolve their border dispute**, which has implications for regional security, particularly in the **Doklam region**.
    - In August 2023, China and Bhutan agreed on a plan to **address their border disagreement.**
    - This was followed by the formal signing of the agreement in October 2021.
        - This agreement came four years after a conflict between India and China in Doklam, sparked by **China's attempt to construct a road in the area in 2017.**

Bhutan's Regional Economic Hub in Gelephu:

- **Bhutan's plans for a regional economic hub i**n **Gelephu, mark** a significant step towards regional development and connectivity.

- **The project, initiated by Bhutan's King(2023):** aims to establish the **Gelephu Mindfulness City" (GMC) spanning 1,000 square kms.**
- **Gelephu will prioritize sustainable development,** focusing on **non-polluting industries** such as IT, education, hospitality, and healthcare.
- It is Positioned at the crossroads of **India's "Act East" policy** and the emerging connectivity initiatives spanning Southeast Asia and the Indo-Pacific region.
- **Gelephu holds strategic significance** in fostering economic integration and trade facilitation.
- **Gelephu city is expected to focus on human well-being too** with an emphasis on yoga, rest and recreation, spa therapies and mental relaxation channels.

Hydropower cooperation:

- **Hydropower cooperation is the bedrock o**f India's relations with Bhutan.
- **Several cooperative hydro projects** have been completed and commissioned by the two governments
    - **It provides Bhutan with a stream of revenue** due to which it has graduated out of the Least Developed Country status.
- **The delayed Punatsangchhu-II hydropower project** is expected to be completed in 2024
- **A new joint venture model was developed f**or the construction of **hydro projects** between India and Bhutan
    - **none of the proposed five projects** has taken off.
    - **There is a need to go back to the drawing board** to work out a more practical and potentially successful new model for hydro projects.

Other areas of cooperation:

- **India has also been a major development assistance partner** to Bhutan

- **India contributed ₹5,000 crore to its 12th Five Year Plan** which just concluded.

Way Forward

- **India must contribute to the success of the Gelephu Mindfulness City** and can perhaps consider the following measures:
  - **commence direct flights** between Mumbai/Delhi and Gelephu
  - **provide technology and knowledge** in building hard infrastructure to Bhutan (the private sector will take the lead)
  - **encourage high-end Indian tourist**s and businesspersons to visit Gelephu in controlled numbers
  - **Encourage Indian businesses** to set up shop in the **city**.
- **Gelephu is next to remote parts of West Bengal and Assam** and the success of the Mindfulness City will have positive socio-economic spillovers for these geographies as well.
  - **It will provide an example of the win-win cooperation** between India and Bhutan.

QUESTION FOR PRACTICE

Q. Project 'Mausam' is considered a unique foreign policy initiative of the Indian Government to improve relationships with its neighbors. Does the project have a strategic dimension? Discuss. (UPSC 2015)

(200 WORDS, 10 MARKS)

EDITORIAL ANALYSIS

China, a 'want-to-be' superpower

Source: The Hindu

- **Prelims:** Current events of international importance(BRI, Regional forums, **Saudi-Iran accord,** G20, SCO, mapping(Middle East) etc
- **Mains GS Paper II:** Bilateral, regional and global grouping involving India or affecting India's interests, BRI and issues associated with it etc

ARTICLE HIGHLIGHTS

- The **first anniversary o**f the **China-brokered** détente between **Saudi Arabia and Iran** in **2023** passed without much attention.

INSIGHTS ON THE ISSUE

Context

The Saudi-Iran accord:

- **The agreement** addresses the most serious regional confrontation
- **It reduces regional tensions** and puts in place the bases for further dialogue on improving relations and engaging on contentious issues.
- **Meetings of Saudi and Iranian officials in Baghdad and Muscat in 2021** and **2022**
    - Addressing issues that divide the two countries
        - The wars in Syria and Yemen
        - Saudi concerns relating to Iran's mobilization of Shia communities in the region
- **Arab states** were prepared to pursue their interests without United States involvement.
- **U.S. not as a security-provider:** The U.S.'s military failures in Iraq and Afghanistan contributed to its loss of credibility among its regional allies.

Role of China:

- **China** is an attractive partner.
- **It has substantial energy**, trade, investment and technology-related ties with West Asia
- **It is the region's** largest buyer of crude oil
- **It is a major trade and investment partner,** and rapidly expanding its role as a technology-provider in most countries.

China's mediation policy:

- **Wang Yi (director of the Office of the Foreign Affairs Commission of the Communist Party of China (CPC) Central Committee**) Set up a new China-backed **international mediation organization h**eadquartered in **Hong Kong.**
- **Algeria, Belarus, Cambodia, Djibouti, Indonesia, Laos, Pakistan, Serbia and Sudan** were signatories to the initial statement as a preparatory office was launched.
- **The Chinese establishment links the mediation initiative** to its economic corridor, the Belt and Road Initiative (BRI).
    - **The BRI has extensive membership in West Asia** as well, with Iran, Saudi Arabia and the UAE among others.
    - **Israel**, is **not** a signatory.

China's role in the Red Sea crisis:

- **China has been absent** through the crisis in the Red Sea
- **China's crafty diplomacy** is to predominantly protect its own interests and
- **China's support for the Palestinian cause** without criticizing Hamas
    - **This stands against U.S. suppo**rt for Israel.

Why is 'mediation diplomacy 'an aspirational design for China?

- **It is to position itself as an antithesis** to what China sees as decades worth of western interventionist policies, specifically in a region such as West Asia
    - **where conflict has direct** correlation with colonial history.
- **It is to increase its own geopolitical weight** as a responsible international actor and power.
- **Counter long-standing American influence a**nd to take advantage of crevasses in regional diplomacy,
    - **specifically** by the likes of **Saudi Arabia** and the **United Arab Emirates(UAE)**
    - **They are looking to chart their own path**s of strategic autonomy
    - **They are willing to partner with China** despite having close security ties with the USA.

Way Forward

- **China seems content with predominantly displacing American** hegemony without replacing it
    - **A perception of being a 'soft hegemon'** in the region will stand starkly against Chinese grandstanding against western policies.
- **China utilized the 'war on terror'-era** to build closer ties with the U.S.
    - **It benefited its own security concerns** regarding radicalisation and terrorism narratives around its restive **Xinjiang region.**
- **Scholars Sheena Chestnut Greitens and Isaac Kardon:** China, for its partner states, is more about their internal security rather than external.
    - **Prioritizing political security of regimes** rather than states.
- **The war in Gaza colors China a**s still being a 'want-to-be' superpower.
- **China remains a utilitarian superpower** for others to hedge against rather than being an upcoming traditional superpower.

QUESTION FOR PRACTICE

Q. Critically examine the aims and objectives of SCO. what importance does it hold for India.(UPSC 2021)

(200 WORDS, 10 MARKS)

EDITORIAL ANALYSIS

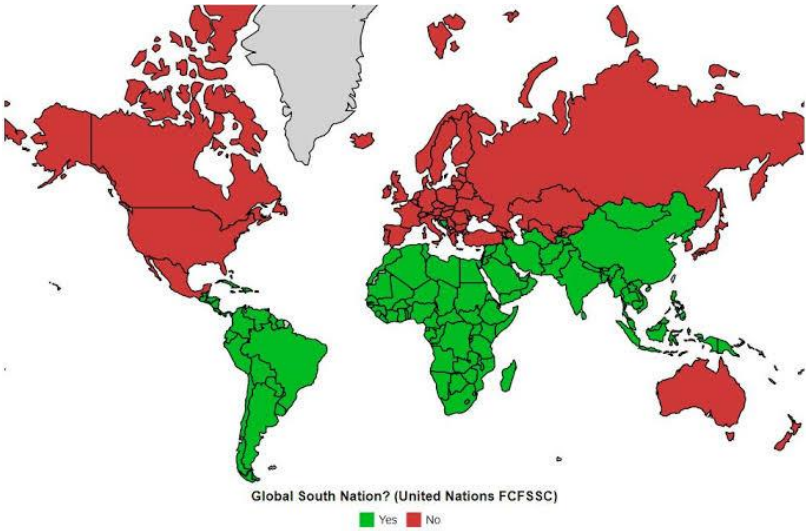
Africa At The Centre

Source: Indian Express

- **Prelims:** Current events of international importance, Global South, G20, GDP, African Union etc
- **Mains GS Paper II:** Bilateral, regional and global grouping involving India and Affecting India's interests etc

ARTICLE HIGHLIGHTS

- **President's visit to Mauritius:** "a close maritime neighbor, a cherished partner in the **Indian Ocean Region,** and a key player in our Africa outreach".
- She inaugurated **14 community development projects** and the laying of the foundation stone for a **forensic science laboratory,** all with Indian assistance.



INSIGHTS ON THE ISSUE

Context

Global South:

- The Global South is a term often used to identify regions within **Latin America, Asia, Africa, and Oceania.**
- It is one of a family of terms, including "***Third World"*** and "***Periphery***", that denote regions outside ***Europe*** and ***North America.***
- **Economies not fully developed:** Global South is used to describe countries whose economies are not yet fully developed and which face challenges such as low per capita income, excessive unemployment, and a lack of valuable capital.
- **Located in tropics:** Although the majority of Global South countries are indeed located in the tropics or Southern Hemisphere, the term itself is strictly economic.
- Australia is "**down under"** but not part of the Global South.

Importance of Africa:

- **Africa's** significant growth rate of **3.8 percent.**

- **Its young population,** with **60 percent** under the age of **25**,
    - It is estimated to reach **1.1 billion people by 2040.**

Opportunities in Africa :

- **The potential for economic partnerships i**s immense.
    - **Indian investments in Africa** reached $**98 billion in 2023,** with trade totalling $**100 billion.**
- **Forty-two African countries a**re the second-largest recipients of all credit extended by India.
    - **Around 200 developmental projects h**ave been completed in the region.
- **Indian social enterprises and NGOs** are exporting low-cost, scalable solutions, from eco-friendly houses to rural women solar engineers.
- **Africa's influence in global forums** will be important for India's vision for global governance.
    - **As Africa houses three-fourths of humanity** and over **39 percent o**f the global GDP
    - **There's a call to reform** existing structures towards a more inclusive system focused on development.

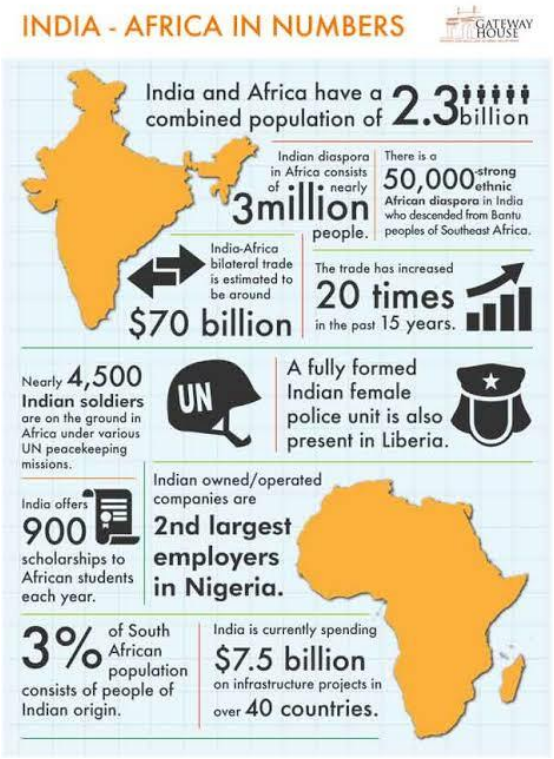
    - **India's advocacy for the African Union in the G20** has found resonance.

- **Cooperation in the critical m**inerals sector.

    - **To build solar panels and batteries** necessary for a low-carbon future
    - **access to minerals cl**assified as "**critical**", "transition" or "green" is key.
    - **Africa has 30 percent** of the world's mineral reserves, and is vital to power the energy transition.

- **Given the geographical concentration of critical minerals,** diversifying sources and fostering strategic partnerships with resource-rich nations are imperative for India's growth and national security.

India-Africa:



Way Forward

- **As India prepares for International Energy Agency terms "the dawn of a new industrial age:** convergence of India's supply chain diversification and Africa's desire to capture the value chain introduces avenues for cooperation.
- **India's longstanding commitment to education and capacity building** in Africa
    - **India could revamp** existing collaborations or establish new ones with African technical organizations.
    - **This would bolster negotiation skills, t**raining in project management, and devising industry-specific technical courses.

- **Indian research institutes engaging with Africa's research** community can facilitate the creation of solutions to address Global South challenges.
- **As India's aspirations for the Global South** take shape, leveraging historical partnerships with African countries remains imperative.
- **A Punjabi farmer who relocated to Ethiopia to invest in agriculture resonates:** "If you ask me why I moved, it's obvious. Africa is the future."
- **To truly represent the South:** It is essential to grasp the mood and changes in Africa, especially in its external partnerships.
    - This will determine the contribution India can make to advance the African agenda.
- **India's equity in Africa** is older and richer than that of China and the U.S., but that should not be a source of uncritical satisfaction.

QUESTION FOR PRACTICE

Q. The long sustained image of India as a leader of the oppressed and marginalized nations has disappeared on account of its new found role in the emerging global order.' Elaborate(UPSC 2019)

(200 WORDS, 10 MARKS)

EDITORIAL ANALYSIS

Actionable ideas for TB control

Source: The Hindu, The Hindu

- **Prelims:** Current events of national importance(AMR,TB, National TB Elimination Programme, Covid-19, Mission COVID Suraksha etc
- **Mains GS Paper II:** Government policies and interventions for development in various sectors and issues arising out of their design and implementations etc

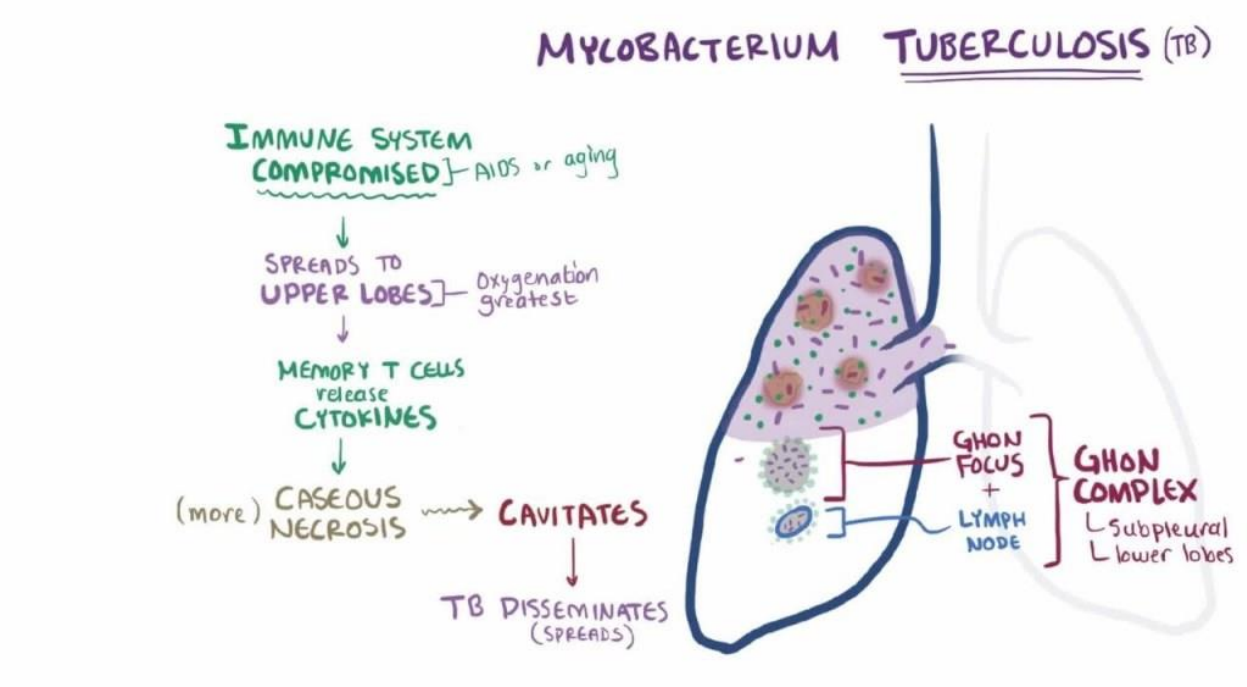
ARTICLE HIGHLIGHTS

- Every day, **3,500 people** worldwide lose their lives to **tuberculosis (TB),** and around **30,000 people b**ecome infected with **TB bacilli(**WHO) estimates.
- India accounts for **27% of global TB** cases
- **The theme for World TB Day 2024 (March 24):'Yes! We can end TB!'**
-

INSIGHTS ON THE ISSUE

Context

Tuberculosis:



- **TB is caused by a bacterium** called ***Mycobacterium tuberculosis,*** belonging to the **Mycobacteriaceae** family consisting of about 200 members.
- Some of Mycobacteria cause diseases like **TB and Leprosy** in humans and others infect a wide range of animals.
- **In humans, TB most commonly affects the lungs (**pulmonary TB), but it can also affect other organs (extra-pulmonary TB).
- **TB is a treatable** and curable disease.
- **TB is spread from person to person through the air.** When people with lung TB cough, sneeze or spit, they propel the TB germs into the air.
- Common symptoms of active lung TB are **cough with sputum and blood at times, chest pains, weakness, weight loss, fever and night sweats.**

What steps need to be taken to control TB?

- **Nutritional support: I**t is an important step towards healthy development of TB patients.
- **The growing focus on patient support,** addressing stigma, and gendered aspects of TB is important.
- **Bridge the gap** between policy intent and on-the-ground realities.
    - **For instance,** India needs to prioritize targeted interventions aimed at improving and expanding access to TB diagnosis and treatment.
- **Expand the reach of TB testing facilities,** particularly in rural and underserved areas
- **Ensure the availability of free, affordable** and quality-assured TB drugs.
- **Molecular testing is the gold standard** and less than a quarter of symptomatic patients are getting that as their first test.
- **Focus on efforts** to make care more humane.
    - **Mental health support a**nd gender responsive care become critically important.
- **Efforts are needed to strengthen community-based TB** care models, empowering frontline health-care workers to deliver comprehensive care which addresses treatment and social, economic and mental health needs
    - It is closer to where patients live.
- **By supporting frontline TB workers,** strengthening supply chains and procurement mechanisms, decentralizing TB services and empowering local communities
    - **India can reduce stigma, overcome** barriers to access and enhance treatment outcomes.
- **Addressing the socio-economic determinants of TB** requires a multi-sectoral approach.
- **Poverty alleviation, improvement in nutritional status, w**ell-ventilated housing and better air quality will all contribute towards reducing TB.

- **Recent research: It** has shown that nutritional supplementation reduced TB incidence substantially in household contacts of adults with microbiologically confirmed pulmonary TB.
- **By tackling the underlying root causes of TB,** India can make significant strides towards eliminating the disease and improving the overall health and well-being of its population.

Variants of TB:

- Drug-resistant (DR-TB)
- Totally drug-resistant (TDR-TB)
- Extensively drug-resistant (XDR-TB)
- Pulmonary TB (P-TB)
- Non-pulmonary TB

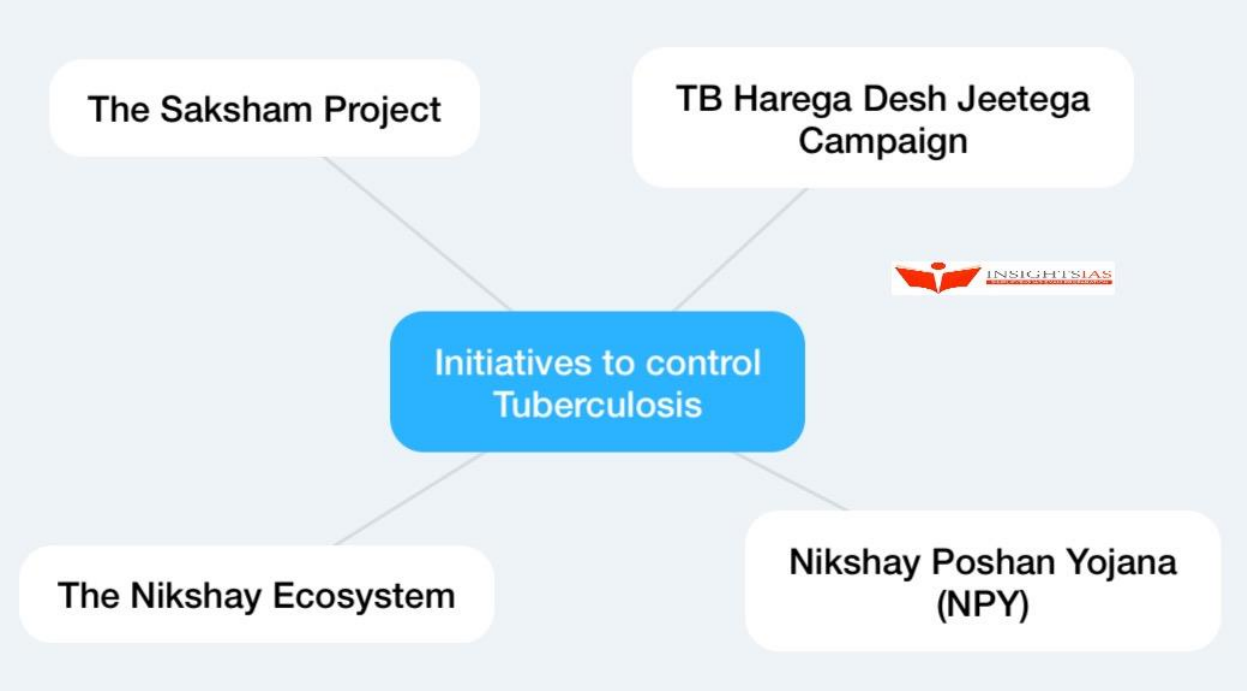
10-point agenda towards 'ending TB':

- **Early detection**: Given TB's etiology, early detection is the key.
    - **Compulsory screening for family and contacts** of each index case is essential
    - **necessitating availability of laboratory facilities a**nd efficient follow-up mechanisms within health systems.
- **Precise treatment categorisation:** With increasing **DR-TB, i**t is imperative to know the resistance status at the time of diagnosis to assign appropriate treatment regimens as per their phenotypic susceptibility.
- **Treatment adherence and follow-up:** TB requires a long period of sustained treatment.

    - **This leads to non-compliance,** which could be due to observable improvement in health status, or change of residence, movement across States and districts.
    - **The TB control programme has a built-in follow-up system,**
        - But compliance to complete treatment is not 100%.
    - **Leveraging technology to** monitor compliance needs focus.
- **Zero mortality:** Mitigating mortality due to TB, be it DR-TB or non-pulmonary TB, is necessary.
- **Controlling drug resistance:** Poor regulatory mechanisms for drug control and non-compliance with treatment regimens are the main reasons for such a high degree of drug resistance.
- **Assessing the extent of drug-resistant TB: T**here needs to be data on the proportion of people diagnosed with TB who have rifampicin-resistant TB (RR-TB) and multidrug-resistant TB (MDR-TB)
    - **This is resistance to both rifampicin** and **isoniazid**, collectively referred to as MDR/RR-TB.
    - It helps in better
        - plan and design of the control programme
        - resource allocation for diagnosis
        - the treatment regime as well as availability of trained staff mandated for DR-TB.
- **Availability of appropriate medicines:** Assured medical supply is mandated under the TB control programme.
    - **The procurement challenges for DR-TB medications** such as **bedaquiline** and **delamanid** must be addressed

    - **Ascertaining treatment facilities** for all DR-TB cases which require in-patient care.
- **Integration into larger health systems:** Strengthening referral networks within and between different levels of public health systems and private health systems is vital to ensure
    - no symptomatic cases are lost
    - no patients miss their dosages and are non-compliant
    - the screening of contacts for all positive cases of pulmonary TB cases (DR or non-DR).
- **Dynamic notification system:** A robust notification system will ease the burden of health system personnel. While **Ni-kshay** has evolved
    - **'Ni-Kshay-(Ni=End, Kshay=TB)** is the web enabled patient management system for TB control under the National Tuberculosis Elimination Programme (NTEP)'
    - **It requires improvements to capture real-time** TB data between sectors, practitioners, time, and locations.
- **Considering population mobility and migration:** Portability of TB treatment within the country is crucial at the policy level.

Initiatives:



Way Forward.

- **The needs and the interests of patients and communities** must be prioritized within the care paradigm and the health-care system.
    - **This principle, echoed by survivors, communities, health experts and policymakers,** underscores the need for a person-centered approach to TB care and management.
- **Leveraging technology and innovation holds pr**omise in enhancing TB care efforts in India.
- **The adoption of AI and digital health** solutions for TB diagnosis, adherence and surveillance can revolutionize the way TB care is delivered and accessed in the country.
- **By investing in developing better vaccines,** we can hope to ultimately eliminate this airborne disease.

- **The path to TB elimination in India** requires a concerted effort to prioritize person-centered care, address social determinants of health, and embrace innovation.

- **By adopting a holistic and person-centered approach,** India can overcome the barriers that stand in the way of TB control and create a healthier future for all its citizens.

QUESTION FOR PRACTICE

Q. Critically examine the role of WHO in providing global health security during the COVID-19 Pandemic.(UPSC 2020)

(200 WORDS, 10 MARKS)

EDITORIAL ANALYSIS

Central transfers — arresting the decline in shares of some States

Source: The Hindu

- **Prelims:** Current events of national importance(Federalism, Finance Commission, Cess and Surcharges, NITI Ayog, etc)
- **Mains GS Paper II & III:** Functions and responsibilities of the union and the states, issues and challenges pertaining to the federal structure etc

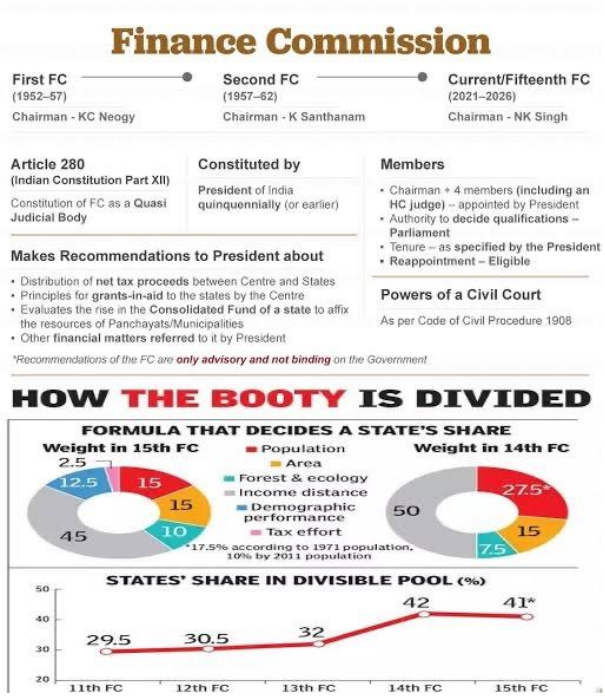
ARTICLE HIGHLIGHTS

- **States** have been facing a **decline** in their share out of the **resources** transferred from the Centre to the States, from **Finance Commission to Finance Commission as complained** by many states.

INSIGHTS ON THE ISSUE

Context

Finance Commission:



The vertical and horizontal dimensions

- **The Fourteenth Finance Commission** raised the share of States in the divisible pool of central taxes to **42%** from **32%**.
    - This was revised to **41%** when the number of States in India was reduced to 28.
- **During 2020-21 to 2023-24 (BE): The** effective share of States in the Centre's **gross tax revenues (GTR)** averaged close to 31%
    - **It was significantly lower than the corresponding share** of nearly **35%** during **2015-16 to 2019-20**.
    - **The increase in the share of cesses and surcharges** to **18.5(eighteen point five)%** of the **Centre's GTR** during **2020-21 to 2023-24** (BE) from **12.8(twelve point eight)%** during **2015-16 to 2019-20**.

Twelfth Finance Commission to the Fifteenth Finance Commission (final report):

- **In the case of the southern States,** there has been a steady fall in their share, from **19.785% to 15.800%.**
- **In a comparison of these two Commissions,** the northern and eastern States have also lost.
- **The 'gainer States'** were the hilly, central, and western States including **Maharashtra**.

Share of States/groups of States in tax devolution

Table 1: Share of States (%) in Commission-wise tax devolution for groups and selected States

Region	Overall				Overall	Distance criterion
	FC12	FC13	FC14	FC15 (final)	FC15 (final) minus FC12	
Northern of which:	**32.666**	**33.031**	**30.285**	**30.897**	**-1.769**	**4.907**
Bihar	11.028	10.917	9.665	10.058	-0.970	0.862
Uttar Pradesh	19.264	19.677	17.959	17.939	-1.325	2.509
Central	**12.726**	**12.392**	**13.767**	**14.564**	**1.838**	**1.298**
West of which:	**14.434**	**14.359**	**14.478**	**16.207**	**1.773**	**2.822**
Maharashtra	5.082	5.284	5.649	6.317	1.235	1.758
Gujarat	3.625	3.101	3.156	3.478	-0.147	-0.089
Southern of which:	**19.785**	**18.575**	**17.978**	**15.800**	**-3.985**	**-8.055**
Tamil Nadu	5.305	4.969	4.023	4.079	-1.226	-1.736
Eastern	**15.453**	**15.671**	**15.277**	**15.179**	**-0.274**	**-0.192**
Hilly	**3.639**	**4.421**	**6.361**	**7.353**	**3.714**	**-0.020**

Source (basic data): Reports of Finance Commissions (Twelfth to Fifteenth) and writers' estimates
Notes: (1) The Fifteenth Finance Commission had submitted two reports. Here, the reference is to the final report. | **(2)** Shares are not strictly comparable across Commissions because of change in the status of Jammu and Kashmir for FC15.

The distance criterion

- **The shares of individual States in tax devolution de**pend on the criteria and the weights used by different Commissions.
- **The distance criterion** has been accorded the highest weight amongst these criteria.
- **Its weight was reduced f**rom **50% to 47.5%** by the Thirteenth Finance Commission and further reduced to **45%** by the Fifteenth Finance Commission.
- **The Eleventh Finance Commission** had given this criterion a weight of **62.5%.**
- **The equalization principle** has been regarded as a key principle governing distribution. Economic and social justice demand this.
- **On account of the distance criterion,** low-income States such as Bihar and Uttar Pradesh have gained over time
    - **They have lost o**n account of other criteria.
- **Bihar and Uttar Pradesh show,** in terms of their **overall share, a** loss of **0.970% points** and **1.325% points.**

Reasons for loss and gain:

- **The main reason for the loss of the southern States** is the income distance criterion
    - **Distance criterion** means that the farther a State is from the highest income State, the higher its share.
- **The main reason for the gain of the hilly States** is area/forest criterion.
- **Between these two Finance Commissions,** the loss to the southern States due to the distance criterion amounted **to 8.055% points**
    - **The overall loss was much less at 3.985% points,** implying that there was a gain under other criteria.

Table 2: Relative weights for different tax devolution criteria: FC12 to FC15 (2)

#	Criteria	FC12	FC 13	FC 14	FC 15 (final)
1	Population	25	25	17.5	15.0
2	Demographic change	-	-	10	12.5
3	Income/ fiscal capacity distance	50	47.5	50	45.0
4	Area	10	10	15	15.0
5	Forest cover	-	-	7.5	10.0
6	Tax effort	7.5	-	-	2.5
7	Fiscal discipline	7.5	17.5	-	-

Source (basic data): Reports of Finance Commissions (Twelfth to Fifteenth)

Table 3: Share of Centre and States in combined revenue (%)

FC period	Pre-transfer		Post-transfer	
	Centre	States	Centre	States
12th FC	64.3	35.7	38.7	61.3
13th FC	61.8	38.2	36.1	63.9
14th FC	62.3	37.7	31.9	68.1
15th FC (first 3 years)	62.6	37.4	31.3	68.7
2020-21	62.3	37.7	29.3	70.7
2021-22	64.1	35.9	32.3	67.7
2022-23	61.5	38.5	32.5	67.5

Source (basic data): IPFS, Union Budget documents, RBI
Notes: (1) Transfers include tax devolution and Finance Commission as well as other grants. | **(2)** Grants from the Centre to States after 2015-16 are taken from the Union Budget. It includes grants-in-aid to the Union Territories.

Population criterion:

- **Until the Fourteenth Finance Commission,** the data for the population in 1971 was used.
- **For the Fifteenth Finance Commission,** data for the population **in 2011 w**as used.
- **In order not to penalize States t**hat showed better performance in reducing fertility rates, the **demographic change criterion** was introduced.
- **The joint impact of these two changes** has been marginal for all groups of States.
    - **For Tamil Nadu,** the joint impact was **marginally positive.**

Way Forward

- **The Sixteenth Finance Commission** can consider reducing its weight while correspondingly raising the weights attached to other criteria.
- **While accepting the recommendation of the Fourteenth Finance Commission** to raise the share of all States to **42% from 32%,** the Centre increased the cesses and surcharges, thereby reducing the size of the divisible pool.
    - This is not desirable.
    - **Limit the share of cesse**s and surcharges to **10% of** the **Centre's gross tax revenues.**
- **Address the issue raised by some of the States r**egarding their declining shares.
    - **The major factor contributing to this situation i**s the adoption of income **distance criterion** and giving it a weight as high as **45%**.
    - **The Finance Commission can reduce the weight of this criterio**n by **5% to 10% points.**
- **Cesses and surcharges** may be subjected to some upper limit by the **Sixteenth Finance Commission.**

QUESTION FOR PRACTICE

Q. How far do you think cooperation, competition and confrontation have shaped the nature of federation in India ? Cite some recent examples to validate your answer.(UPSC 2020)

(200 WORDS, 10 MARKS)

EDITORIAL ANALYSIS

India's R&D funding, breaking down the numbers

Source: The Hindu

- **Prelims:** GDP, GERD, Department of Science and Technology (DST), new scientific methods, CSIR etc
- **Mains GS Paper III:** Important aspects of technology, Achievements of Indians in science & technology; indigenization of technology and developing new technology etc

ARTICLE HIGHLIGHTS

- **Interim Budget(2024-25**) announced a corpus of **₹1 lakh crore** to bolster the research and innovation ecosystem within the country.
- Rebranding of the slogan, **'Jai Jawan Jai Kisan' (by Lal Bahadur Shastri)** to **'Jai Jawan, Jai Kisan, Jai Vigyan' (A.B. Vajpayee)** to now **'Jai Jawan, Jai Kisan, Jai Vigyan, Jai Anusandhan' (by the Prime Minister)**
- India's research and development (**R&D**) **expenditure-GDP ratio** of **0.7(zero point seven)%** is very low when compared to major economies and is much below the **world average** of **1.8(one point eight)%.**

INSIGHTS ON THE ISSUE

Context

Research and Development:

- **R&D** of new products and solutions to diseases are key drivers of economic performance and social well-being.
- It is important to inculcate scientific temper among masses in order to fight superstitions and distorted truth.
- **Innovation and technological improvement** is essential to combat and adapt to climate change and promote sustainable development.
- **It is imperative for combating national security** threats like cyber warfare.

- **The National Science and Technology Management Information System (NSTMIS)** of the **DST** is the agency that compiles GERD statistics in India.

Reasons for low expenditure on R&D:

- The main reason is the low investment in R&D by the corporate sector.
    - **Corporate sector accounts for** about **two-thirds of gross** domestic expenditure on R&D (**GERD**) in leading economies,
    - **Share in India-37%.**

Significance of research and innovation:

- Fuelling economic growth
- Technological advancement
- Global competitiveness.

India's R&D:

- **A notable increase in Gross Expenditure on Research and Development (GERD)** from **₹6,01,968 million in 2010-11** to **₹12,73,810 million in 2020-21.**
- **Investment as a percentage of GDP** standing at **0.64%**
- **India falls behind major developed and emerging economies** such as **China (2.4%), Germany (3.1%), South Korea (4.8%) and the United States (3.5%).**

Comparison of research productivity and innovation metrics in selected countries (2021-22)

Country	Researchers per million inhabitants (2021) (FTE)	PhDs produced annually (2021) (Rank)	Publication output (2022) (Rank)	Top 1% most cited articles (% share)	Patents granted (2022) (Rank)
India	262	40,813 (3)	3,06,800 (3)	0.7	30,490 (6)
The U.S.	4,452	69,525 (1)	15,06,000 (1)	1.88	3,23,410 (2)
The U.K.	4,491	27,366 (5)	2,87,200 (4)	2.35	10,578 (15)
China	1,687	53,778 (2)	9,78,100 (2)	1.12	7,98,347 (1)
S. Korea	9,082	13,882 (11)	1,09,200 (16)	1.02	1,35,180 (4)
Japan	5,638	15,804 (10)	1,71,000 (9)	0.88	2,01,420 (3)

Source: Publications data has been extracted from OpenAlex on February 7, 2024.

India's Research output, innovation:

- **India has emerged as a powerhouse** in producing academic talent.
- **Annually, India generates an impressive 40,813 PhDs** and is in third place after the **United States** and **China**.
- **India's research output remains substantial, ra**nking **third** globally, with over **3,00,000 publications in 2022**
    - **It highlights the nation's robust** research ecosystem and its commitment to advancing knowledge across diverse fields.
- **Patent grants: India** secured the **sixth position globally** with **30,490 patents** granted in **2022**.
    - **It is lower compared to the U.S. and China**.

Gross Expenditure on Research and Development (GERD):

- It is primarily driven by the government sector, including the **central government (43.7%), State governments (6.7%), Higher Education Institutions (HEIs) (8.8%),** and the **public sector industry (4.4%)**

    - **private sector industry** contributing only **36.4% during 2020–21**.
- **Collaboration between the government, business enterprises and HEIs** is essential to maximize the positive impact of science, technology, and innovation on economic growth and technological advancement.
- **According to the R&D statistics (2022-23) of the Department of Science and Technology:** India's total investment in R&D reached $**17.2 billion in 2020-21.**
    - **54% ($9.4 billion)** is allocated to the government sector
    - It is predominantly utilized by four key scientific agencies
        - **Defence Research and Development Organisation (30.7%)**
        - **Department of Space (18.4%)**
        - **Indian Council of Agricultural Research (12.4%)**
        - **Department of Atomic Energy (11.4%)**.
- **A significant portion of R&D funding originates** from the government, with considerable allocation directed towards autonomous **R&D laboratories** operated by the government.
    - **Laboratories serve a pivotal role** in driving research and technology development with strategic implications.
- **The symbiotic relationship between government funding, R&D execution,** and strategic focus underscores the integral role of the government in steering and fostering key scientific advancements.
- **Contribution of private industries l**ags behind that of many other economies.
    - **Indian businesses represent 37% of the country's GERD, i**n contrast to the global trend, where business enterprises typically contribute over **65% of R&D.**
    - **In leading innovative economies such as China, Japan, South Korea, and the U.S.,** a significant portion **(>70%) of R&D** funding is from private industries
    - **It is driven by market forces** and profit motives, and the actual R&D activities are conducted in the HEIs.
- **Higher Education Institutions (HEIs): HEIs play a comparatively minor role** in the overall R&D investment, **contributing 8.8%.**

What steps need to be taken?

- **Assess the current research and development (R&D) funding landscape in India and its resulting output**:

    - Examining India's comparatively lower R&D expenditure as a percentage of GDP
    - Output in terms of patent grants, PhDs awarded, and publication outputs.
    - **Analyzing the quality of output** is imperative in understanding the true implications of these initiatives.
- **A multi-pronged approach involving diverse stakeholders** is necessary to address the challenges and unlock the potential of R&D for India's economic growth and competitiveness.
- **Learning from the R&D ecosystem in other developed countries** while maintaining India's strengths in streamlined decision-making and strategic alignment could be a powerful force to optimize its R&D landscape.
- **India must implement policies** that incentivise private companies to invest in R&D.

Impact of initiatives

- **India's technological and manufacturing aspirations** hinge on a transformative shift in its R&D landscape.
- **Closing the existing gap demands a dual strategy: It** encourages private sector involvement and fortifies academia's research infrastructure.
- **Initiatives such as the National Deep Tech Startup Policy (NDTSP) si**gnal a strong commitment to technological progress and innovation.
    - **This policy holds the potential to incentivise private sector** engagement in India's R&D ecosystem.
- **Despite the substantial time and technical uncertainties i**nvolved in **Deep Tech's creation,** allocating resources to safeguard intellectual property and tackle technical obstacles can unlock untapped markets.

Way Forward

- **India's R&D ecosystem has its advantages in terms of efficiency,** but could benefit more from strong private enterprises involvement and stronger industry-academia collaboration, facilitating knowledge transfer and fostering innovation.

- **The recent enactment of the Anusandhan National Research Foundation (ANRF) Act,** underscores the government's dedication to catalyzing research and innovation as the cornerstone of development.
    - **This legislative move will bolster scientific research** nationwide.
    - **The Act aims to bridge India's persistent R&D investmen**t gap while nurturing a robust research culture within HEIs.
- **This initiative must surmount challenges s**uch as ensuring equitable fund distribution, fostering interdisciplinary collaborations, and upholding global standards.
- **These efforts are poised to elevate R&D spending in India,** providing strategic guidance for research, innovation, and entrepreneurship while encouraging greater private sector involvement.
- **The interim Budget, combined with the NDTSP and ANRF Act,** sends positive signals regarding India's commitment to incentivising private sector-led research and innovation, particularly in burgeoning industries.
- **Transforming India's R&D statistics** truly reflect the R&D ecosystem calls for short-term and medium-term measures.
    - **In the short term,** the NSTMIS should use the patents granted data, both in India and the U.S., in addition to its current method to identify R&D performing enterprises.

QUESTION FOR PRACTICE

Q. Why is there so much activity in the field of biotechnology in our country? How has this activity benefitted the field of biopharma?(UPSC 2018)

(200 WORDS, 10 MARKS)

EDITORIAL ANALYSIS

Mountains of plastic are choking the Himalayan States

Source: The Hindu

- **Prelims:** current events of national and interventions importance(Plastics, Microplastics, Himalaya and Himalayan rivers mapping, biodiversity, National Green Tribunal, Central Pollution Control Board (CPCB), Solid Waste Management Rules (SWM) 2016, Plastic Waste Management (PWM) Rules 2016, Extended

Producer Responsibility (EPR), Atal Mission for Rejuvenation and Urban Transformation (AMRUT) etc

- **Mains GS Paper III:** Conservation of Environment, Biodiversity and Environment(Environmental Pollution and pollutants and degradation)

NEWS HIGHLIGHTS

- The **National Green Tribunal i**ssued notices to the **Ministry of Environment, Forest and Climate Change, the Central Pollution Control Board (CPCB), t**he Himachal Pradesh State Pollution Control Board, the Deputy Commissioner Lahaul and Spiti and the Panchayat of Koksar in Himachal Pradesh on **waste dumping in eco-sensitive areas** by tourists and commercial establishments

INSIGHTS ON THE ISSUE

Context

Plastics:

- A group of materials, either synthetic or naturally occurring, that may be shaped when soft and then hardened to retain the given shape.
- **Plastics are polymers.** A polymer is a substance made of many repeating units
- **Plastics can be divided into two general categories:**
    - thermoplastics and thermosets.
    - **Thermoplastics** are defined as polymers that can be melted and recast almost indefinitely.
    - **Thermosets** is a polymer that irreversibly becomes rigid when heated

POLYMER TYPES	EXAMPLES OF APPLICATIONS	SYMBOLS
Polyethylene Terephthalate (PET)	Fizzy drink and water bottles. Salad trays.	
High Density Polyethylene (HDPE)	Milk bottles, bleach, cleaners and most shampoo bottles.	
Polyvinyl Chloride (PVC)	Pipes, fittings, window and door frames (rigid PVC). Thermal insulation (PVC foam) and automotive parts.	
Low Density Polyethylene (LDPE)	Carrier bags, bin liners and packaging films.	
Polypropylene (PP)	Margarine tubs, microwaveable meal trays, also produced as fibres and filaments for carpets, wall coverings and vehicle upholstery.	
Polystyrene (PS)	Yoghurt pots, foam hamburger boxes, plastic cutlery, protective packaging for electronic goods and toys. Insulating material in the building and construction industry.	
Unallocated references	Any other plastics that do not fall into any of the above categories - for example polycarbonate which is often used in glazing for the aircraft industry.	

Microplastics:

- They are formed by the **degradation** and the **fragmentation** of large plastic pieces that are improperly disposed of.
- **Microplastic deposition and accumulation** has been found in the Himalayan mountains, rivers, lakes and streams.
- **Microplastics** can be trapped in glaciers for a long time and released into rivers during snow melting.

Impact on Himalayan ecosystem:

- **Unscientific plastic disposal** is causing soil and water pollution in the Indian Himalayan Region
- **It is impacting its biodiversity**
- **Adverse impact** on the fresh water sources that communities downstream depend on.
- **Rapid and unplanned urbanisation a**nd changing production and consumption patterns are responsible for the plastic waste crisis in the Indian Himalayan Region.
- **Quantum jump in tourist footfalls is the reason** for exacerbation of the problem.

Reports:

- **Social Development for Communities (SDC) Foundation Dehradun(highlighting the plight of towns in Uttarakhand):**
    - Almost all the mountain States are drowned in plastics.
- **National Green Tribunal** issued notices to the **MEFCC, CPCB,** the **Himachal Pradesh State Pollution Control Board, the Deputy Commissioner Lahaul and Spiti** and the **Panchayat of Koksar in Himachal Pradesh**
    - on waste dumping in eco-sensitive areas by tourists and commercial establishments.
- **In Assam, at the Ramsar site of Deepor Beel, Greater adjutant storks** have been feasting on the plastic waste in the landfill instead of fish from the wetland.
- **In Manipur,** growing pollution in rivers(including the **Nambul**, has been widely reported.
- **The Himalayan Clean up (2018-21):**
    - **conducted by the Integrated Mountain Initiative** with **Zero Waste Himalayas)** and the **National Productivity Council of India's waste** and brand audit

    - It show increasing plastic waste, especially non-recyclables, in the Indian Himalayan Region.

- **The Himalayan Clean up (2022) waste audit r**esults showed that **92.7% of tras**h was **plastic**, with **72%** of waste being **non-recyclable plastic**

India's Plastic waste management:

- **Environment Action(Swiss-based organization) It** calls it **Plastic Overshoot Day.**
- **In 2023, India reached its plastic overshoot** day on January 6
- **India has one of the highest mismanaged waste index (MWI),** at **98.55%,** in the world (after Kenya, Nigeria and Mozambique)
    - which is the gap in waste management capacity and plastic consumption.
- **Statistical analysis(Centre for Science and Environment (CSE) using CPCB data): I**ndia is merely recycling (through mechanical recycling) **12%** of its plastic waste.
    - **Close to 20% of this waste i**s channelised for end-of-life solutions such as
        - co-incineration
        - plastic-to-fuel and road making
        - **Burning 20% of our plastic** waste and **68% o**f plastic waste is unaccounted for

Legal mandate for waste management:

- **Regulatory framework:**
    - Solid Waste Management Rules (SWM) 2016
    - Plastic Waste Management (PWM) Rules 2016
    - Extended Producer Responsibility (EPR) 2022
- **Special needs of hill areas** are recognised by the **SWM** but are not factored in while creating a mandate for both local bodies and producers, importers and brand owners (PIBOs),
- **PWM and EPR** have not recognised the special needs of the hills.
- **Himachal Pradesh and Sikkim** have special State laws banning the use of plastics.

- **Himachal Pradesh has a buy back policy for non-recyclable** and single-use plastic waste.
    - **There is still widespread littering** of plastic waste.
- **Sikkim banned packaged mineral** water use from January 2022 and has a fairly robust regulatory system.
    - **In the absence of proper infrastructure** to handle plastic waste, the State is still grappling with the issue.
- **Mizoram has been proactive on the regulatory front** — the Aizawl Municipal Corporation made by-laws under the PWM in 2019.
- **Tripura** has made policy changes, enacted municipal by-laws and has a State-level task force to eliminate Single Use Plastic though the results are not visible.

What steps need to be taken?

- **The collective mandate of SWM/PWM/EPR** requires waste segregation at source.
    - **Segregation of different types of plastics i**s a prerequisite for any strategy to dispose of plastic waste in a scientific and sustainable manner.
- **Under the SWM, PWM and EPR, the task of waste management** from collection to its scientific disposal is the duty of local bodies.
    - **They can take help from PIBOs** for the setting up and operationalisation of the plastic waste management system, as mandated under the EPR.
- **Though local bodies are the pivot of the waste management system** in the country, a commensurate devolution of power to them is still work in progress.
    - **Few States have enacted model by-laws** and very few local bodies themselves have made by-laws to operationalise the mandate.
- **There is a need to include traditional institutions** within the definition of local bodies when it comes to the Indian Himalayan Region (prevalent in many States in the northeast).
    - Under **Swachh Bharat Mission (SBM) an**d the **Fifteenth Finance Commission**, money was allocated to these traditional institutions

Way Forward

- **There is a need for appropriate resource allocation** and support that is considerate of and reflective of the rich biodiversity, ecological sensitivity and fragility of the Indian Himalayan Region

    - **Besides taking into account the specific geographical** challenges of mountain waste management.
- **Empowering local bodies and creating the necessary infrastructure** for waste management need immediate attention.
- **Segregation of waste and the participation of the people** in this endeavor with the help of sustained public education campaigns are a sine qua non.
- **Geographical neutrality of targets under the EPR** could be countered if the higher cost of EPR operationalisation in the mountain region is given its due consideration.
- **The value of the EPR certificate** which is earned by a PIBO in the Indian Himalayan Region could be higher than one earned in the rest of the country for every ton of plastic waste processed.
- **Data gaps in terms of the quantum and quality of waste being** generated in the Indian Himalayan Region States should be plugged.
- **Convergence in existing schemes s**uch as **SBM, the Mahatma Gandhi National Rural Employment Guarantee Act a**nd the **Finance Commission's** grants could be used to create the infrastructure, maintain and run operations.
- **The Swachh Bharat Kosh Trust** set up to facilitate the channelisation of philanthropic contributions and corporate social responsibility funds towards this cause could also be used to augment resources.
- **The Atal Mission for Rejuvenation and Urban Transformation (AMRUT) and Smart Cities Scheme** under which many cities in the Indian Himalayan Region are selected
    - **They could work in convergenc**e on the issue of scientific waste management and making cities in the Indian Himalayan Region free of plastic

QUESTION FOR PRACTICE

Q. Discuss several ways in which microorganisms can help in meeting the current fuel shortage.(UPSC 2022)

(200 WORDS, 10 MARKS)

EDITORIAL ANALYSIS

Green jobs and the problem of gender disparity

Source: The Hindu

Prelims: Current events of national importance, Environmental pollution and degradation(ILO, Confederation of Indian Industry (CII, science, technology, engineering, and mathematics (STEM), COP28 etc

Mains GS Paper III: Conservation, environmental pollution and degradation,Solar energy and its use in different sectors particularly agriculture etc.

ARTICLE HIGHLIGHTS

- A study in **2023** by the **Skill Council for Green Jobs** indicated that **85% of the training** for **green skills** was imparted to **men** while over **90% o**f **women** believed that social norms limited their participation in training for green jobs.
- **The transition to low-carbon development** has the potential to add about **35 million green jobs** in India by **2047**.

INSIGHTS ON THE ISSUE

Context

Green jobs:

- **They are a class of jobs** that directly have a positive impact on the planet, and contribute to the overall environmental welfare.
- **They're aimed at reducing the negative environmental impact** of economic sectors and furthering the process of creating a low-carbon economy.
- **Jobs involving** renewable energy, conservation of resources, ensuring energy efficient means are categorized under the same.

- **The International Labour Organization defines** green jobs as “decent jobs that contribute to preservation or restoration of the environment”.
- **They span across sectors,** such as manufacturing, construction, renewable energy, energy efficiency and automobiles, which traditionally saw a lower representation of women.

Gender parity:

- **Globally, men are likely to transition** to green jobs faster than women.
- **India increased its renewable energy** capacity by **250%** between **2015 to 2021,**
    - **women comprising merely 11%** of workers in the **solar rooftop sector.**
- **The Annual Survey of Industries 2019-20** shows that women workers are mostly concentrated in industries such as apparel, textile, leather, food, and tobacco.
- **Confederation of Indian Industry (CII) 2019 report** shows that men comprise **85% of** the workforce in sectors such as infrastructure, transport, construction, and manufacturing.
- **A study in 2023 by the Skill Council for Green Jobs** indicated that **85% of the training for green skills** was imparted to **men**
    - **over 90% of women b**elieved that social norms limited their participation in training for green jobs.
- **Restrictive social norms include factors su**ch as the belief that women are unsuitable for certain technical roles, safety concerns, lower representation in science, technology, engineering, and mathematics (STEM) subjects, and familial constraints.

How to address the gaps in data?

- **Mapping emerging areas** for green growth and collecting sex-disaggregated data on green jobs could be the starting point to improve women's participation.
- **Build evidence on the present and future impact** of low-carbon transitions on women workers and entrepreneurs while considering the hidden and invisible roles played by women across different sectors and geographies.
    - **Conducting gender analysis,**
    - **Collecting gender statistics** on green jobs through periodic labor force surveys
    - **Mobilizing additional resources** to emphasize
    - **Encourage women's role i**n the green transition.
- **In a critical stride towards justice and inclusivity in transition planning: COP 28's h**igh-level dialogue launched **'Gender-Responsive Just Transitions and Climate Action Partnership'** with a focus on improved data, targeted finance, and skill development.
- **There is need to ensure t**hat women can access emerging opportunities from low-carbon transitions.
- **There is a strong need to review the status quo, map t**he current roles of women
    - **address structural barriers t**hat hinder women's employment choices
    - **create a conducive ecosystem** to foster their participation in green jobs.
- **In India:** despite **42.7% of the total number of STEM graduates** being women
    - **They represent only 30.8% in engineering, manufacturing and construction programmes** which are the key sectors for green transition.

    - **Early hands-on learning,** mentorship, scholarships, financial assistance, and awareness generation are crucial to empower women in green jobs-related fields.
- **Supporting women entrepreneurs:** Gender-focused financial policies and products catering to the requirements of women entrepreneurs can spur their ability to enter the green transition market.
- **Collateral-free lending, financial literacy training and building supportive** networks are crucial steps to unlock their potential.
- **Suitable tools must be developed to assess creditworthiness,** disburse loans, and reduce operational costs for women-owned businesses.

Way Forward

- **As India embraces a green transition,** empowering women and advancing gender equity in climate actions will be one of the keys to unlock the co-benefits of a low-carbon and environmentally sustainable economy.
- **Bringing in more women into leadership positions** to incorporate gender-specific needs in low-carbon development strategies can promote women's integration in green jobs.
- **A gender-just transition demands** a multi-pronged strategy that focuses on employment, social protection, reduces the burden of care work, and enables skill development.
- **Partnerships across government, private sector** and other stakeholders are necessary to leverage the benefits of innovation, technology and finance for women entrepreneurs and workers.
- **Businesses must recognise the centrality of gender justice** and ensure equity throughout the process of green transition

    - **By mitigating barriers** that exist due to stereotyping or gender bias and fostering equitable job opportunities for a just transition that benefits everyone.
- **Build the capacity and support women in meeting the demands** of the new world of work and co-design a future pathway that is socially equitable and inclusive for all

QUESTION FOR PRACTICE

Q. What are the continued challenges for women in India against time and space?(UPSC 2019)

(200 WORDS, 10 MARKS)

EDITORIAL ANALYSIS

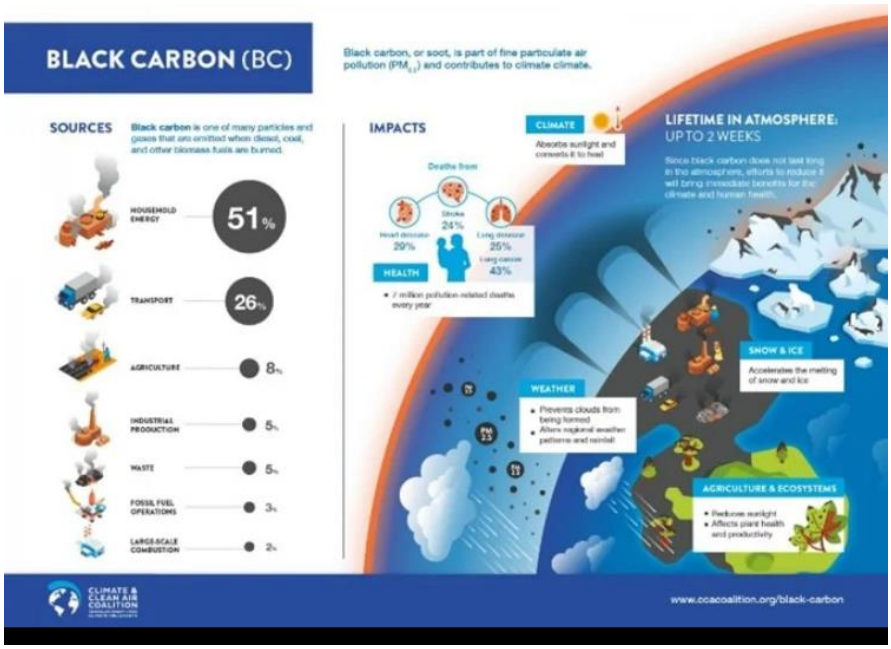
The need to curb black carbon emissions

Source: The Hindu

- **Prelims:** Current events of international importance, carbon tax, black carbon, Pradhan Mantri Ujjwala Yojana (PMUY),COP, etc
- **Mains GS Paper II:** Bilateral, regional and global grouping and agreements involving India or affecting India's interests, Important international institutions etc

ARTICLE HIGHLIGHTS

- At the **COP26 climate in Glasgow(**2021). India pledged to achieve **net-zero emissions by 2070.**
- According to the **Ministry of New and Renewable Energy, I**ndia has installed a **renewable energy capacity** of over **180 GW by 2023** and is expected to meet its target of **500 GW by 2030.**



INSIGHTS ON THE ISSUE

Context

Black carbon:

- **It is the dark, sooty material** emitted alongside other pollutants when **biomass** and **fossil fuels a**re not fully combusted.
- **It contributes to global warming** and poses severe risks.
- **There is a direct link between exposure to black carbon** and a higher risk of heart disease, birth complications, and premature death.
- **Most black carbon emissions in India** arise from **burning biomass,** such as **cow dung or straw**, in traditional cookstoves.
- **According to study(2016):**
    - **The residential sector** contributes **47% of** India's total black carbon emissions.
    - **Industries contribute** a further **22%, diesel vehicles 17%**
    - **open burning 12%, an**d other **sources 2%**.

Role of Pradhan Mantri Ujjwala Yojana (PMUY):

- **It provides free liquefied petroleum gas (LPG)** connections to households below the poverty line.
- **Primary objective** was to make clean cooking fuel available to rural and poor households and reduce their dependence on traditional cooking fuels.
- **The PMUY has established infrastructure t**o go with LPG connections, including free gas stoves, deposits for LPG cylinders, and a distribution network.
- **The programme has played a vital role** in reducing black carbon emissions.
    - **It offers a cleaner alternative** to traditional fuel consumption.
- **The programme has provided connections** to over **10 crore** households as of **January 2024.**

Issues:

- **According to RTI data(2022-2023): 25%** of all **PMUY** beneficiaries availed either zero LPG refill or only one LPG refill
    - They still relied entirely on traditional biomass for cooking.
- **The average PMUY beneficiary household** consumes only 3.5-4 LPG cylinders per year instead of the six or seven a regular non-PMUY household uses.
    - **Half of all the energy needs of a** PMUY beneficiary household are still met by traditional fuels.
- **A shortage of LPG and higher usage of traditional fuel**s affect women and children disproportionately.
    - **They are more prone to higher levels of indoor air pollution,** causing many health issues and leading to premature deaths.
- **In October 2023, the government increased the LPG subsidy to ₹300 from ₹200.** But rapid increase in LPG prices over the last five years

    - most PMUY beneficiaries find the price too high
    - **Cow dung, firewood, etc.** are 'free' alternatives.
- **Lack of last-mile connectivity in the LPG distribution network:**
    - **It results in remote rural areas** depending mostly on biomass.
    - **It can be solved by The local production of coal-bed methane (CBM) gas** by composting biomass.
    - **CBM is a much cleaner fuel** with lower black-carbon emissions and investment.
    - **Panchayats can take the initiative to produce CBM gas** locally at the village level, ensuring every rural household can access clean cooking fuel.

Way Forward

- **As India navigates its responsibilities on the global stag**e towards long-term decarbonisation, there is an urgent need to act.
- **Prioritizing black carbon reduction through initiative**s such as the **PMUY** scheme can help India become a global leader in addressing regional health concerns
    - **It will help meet its Sustainability Development Goal** of providing affordable clean energy to everyone and contributing to global climate mitigation.
- **A high carbon tax across China**, the U.S., India, Russia, and Japan alone (more than 60% of global effluents), with complementary actions, could have a notable effect on global effluents and warming
    - **It could also pave the way** to seeing decarbonisation as a winning development formula.

QUESTION FOR PRACTICE

Q. Describe the major outcomes of the 26th session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC). What are the commitments made by the India conference? (UPSC 2021)

(200 WORDS, 10 MARKS)

EDITORIAL ANALYSIS

A vaccine that prevents six cancers

Source: The Hindu

- **Prelims:** Current events of national importance, cervical cancer, Government policies, universal immunization programme, Human Papillomavirus (HPV) etc
- **Mains GS Paper II:** Government policies and interventions for development in various sectors and issues arising out of their design and implementations etc

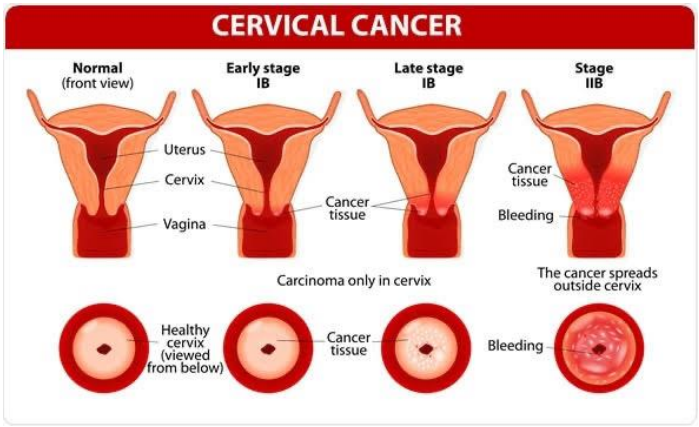
ARTICLE HIGHLIGHTS

- January was observed as **Cervical Cancer** Awareness Month.
- **March 4** is observed as **International HPV Awareness Day.**

INSIGHTS ON THE ISSUE

Context

Cervical cancer:



- **It is the second-most common cancer** among women in India, mostly affecting the middle-aged.

- **With 1,23,907 new cases and 77,348 deaths** in the year 2022, India contributed to **one-fifth of the global** burden.
- **Main cause**: Presence of persistent high-risk type of **Human Papilloma Virus (HPV) infection**
    - **co-factors** like low socioeconomic conditions, low immunity status, other genital infections, smoking etc, that facilitate initiation and progression to cancer.
- **Cervical cancer is preventable** and curable if detected early.
- **Most cervical cancer and precancer** cases can be detected in the reproductive age group.
- **Cervical cancer** has a long **pre-invasive phase** that lasts for **10–15 years.**
    - **This provides a window of opportunity** to detect and treat the neoplasia in pre-invasive stages
- **Cervical cancer is detected and managed** at an early stage, it is found to have over **93 percent cure rate.**
- **Cervical cancer c**an be prevented through **HPV vaccination of girls.**
- **It is the fourth most common cancer amon**g women worldwide
- **cervical cancer claims the lives of more than 3,00,000** women every year, or one life every two minutes.

- **Nine out of 10 women dying of cervical cance**r live in lower- and middle-income countries.

India:

- **Cervical cancer is the second most** common cancer after **breast cancer.**
    - **About 500 million women** above the age of **15** are at risk of cervical cancer.
- **With the current population growth rate,** the absolute number of new cases of cervical cancer for all ages in India in 2040 is estimated to be 1,91,347
    - **An increase of 54%** over the number of new cases reported in **2020**.

Reasons for high mortality:

- Lack of awareness
- Fear of cancer
- Early symptoms of disease not being evident
- **Women** not being screened

Strategies for prevention

- **Knowledge of HPV epidemiology and its role in causation of cancer** has resulted in the development of two major strategies for prevention and early detection:
    - **HPV vaccination and screening** for precancerous lesions.
- **WHO's strategy outlines a 90-70-90 triple pillar intervention** to be implemented by **2030** with an additional focus on high-quality health care and equitable health care services.
    - **Targets are:**
        - **9**0% of girls must be fully vaccinated with the HPV vaccine by the age of **15**
        - **70% of women** must be screened using a high-performance screening test by the age of **35 and again by 45**
        - **90% of women detected** with cervical pre-cancer and cancer lesions must receive treatment and care.
- **Accelerating global health pathways: to health equity for the G20: It** highlighted the commitment of India's G20 presidency to promoting equitable access to vaccines, particularly for **lower- and middle-income countries.**
- **The HPV vaccine** was introduced in India in 2008.
    - It is part of the Universal **Immunization Programme** from **2023**.

Challenges:

- **Research indicates that the HPV vaccine i**s not widely accessible to all girls across India.
    - **It is available in the private market** at a significant out-of-pocket cost.
- **Many physicians underestimate t**he incidence and risk of cervical cancer and the HPV infection.
- **Physicians underestimate the safety and effectiveness** of HPV vaccines.
- **The lack of trust in vaccine safety and effectiveness** leads to hesitation in recommending the HPV vaccine to parents of age-eligible adolescents.

- **Physicians hesitate to recommend this cancer prevention** vaccination because HPV infections are primarily transmitted through intimate skin-to-skin contact.
- **Feeling that it might be time-consuming** to answer parents' questions regarding myths and misinformation about the HPV vaccine.

HPV vaccine:(Cervavac)

- **It is a quadrivalent vaccines,** developed by the Serum Institute of India.
- **It prevents the entry of four of the most common types** of **HPV 16, 18, 6 and 11 t**hereby preventing infections, genital warts, and eventually cancer.
- It will be used in the government campaign.
- **The vaccine has to be administered** in **adolescent girls** before they are sexually active.

Way Forward.

- **The Federation of Obstetric and Gynaecological Societies of India (FOGSI) and the Indian Academy of Pediatrics (IAP): It has** joined hands to remind member **obstetricians-gynecologists** and **pediatricians** about the facts of HPV vaccination
    - **share best practices for effectively communicating** with parents about this cancer-preventing vaccine.
- **This safe and effective vaccine can help prevent** six HPV cancers.
    - **Five of these occur in women: vulvar, anal, vaginal, throat, and cervical.**
- **Recommending the HPV vaccine to all adolescents starting at age 9 years i**s part of completing the IAP immunization schedule.

- **The FOGSI Good Clinical Practice Recommendations: It** reinforced its recommendation for HPV vaccination to the primary age group of 9-14 years as well as regular screening for every woman above the age of 30 years.

- **The FOGSI and IAP seek to ensure** that every girl grows up protected from cervical cancer through HPV vaccination and every woman is protected through regular cervical screening.
  - **They are creating at least 20,000 HPV physician** champions in their cadres by mid-2024.
  - **The member physicians will share the importance of HPV** vaccination among their peers and the community at large.
- **Physicians are the most respected leaders in society a**nd the trusted source for health-related information. Their leadership is needed to eliminate cervical cancer in India.

QUESTION FOR PRACTICE

Q. Critically examine the role of WHO in providing global health security during the COVID-19 Pandemic.(UPSC 2020)

(200 WORDS, 10 MARKS)

EDITORIAL ANALYSIS

The tale of 'have money, buy miracle drug'

Source: The Hindu

- **Prelims:** Miracle drug, Type 2 diabetes mellitus, magic injection, Adcetris, Cancer drugs, standing committee on health, WHO, CDK etc
- **Mains GS Paper II:** Science and technology- developments and their applications and effects in everyday life, biotechnology and issues related to IPR etc

ARTICLE HIGHLIGHTS

- The press releases by **global pharma companies** advising patients not to use magic injections that guarantee weight loss in India do not get any publicity in the media.

INSIGHTS ON THE ISSUE

Context

Magic injection:

- It contains a drug called **Semaglutide**.
- It is Originally used for the treatment of **Type 2 diabetes mellitus,** this drug also results in weight loss.
- **It has not been approved for sale** in India but is being administered by doctors to patients who are mostly affluent.

Trials, sale approval in India:

- **Drugs are normally approved f**or sale in India only after the Indian **subsidiary or licensee** of the global brand owner conducts clinical trials.
- **Once approved, the regulator mandates monitoring a**nd reporting all adverse events for **two years.**
- **Global pharma companies s**ometimes choose to stay out of the Indian market and not launch drugs in India.
    - **In such circumstances, patients can get a license** from the drug regulator based on a doctor's prescription to import these drugs for personal use.
    - **Hospitals too can apply** for import licenses.
- **Drug needs to be tested in clinical trials in India** and is available for sale only after approval by the drug regulator.

Issues with miracle drugs:

- **Unapproved "miracle drugs":** there have been no clinical trials in India.

- It's not known if Indians will react differently to the drug.
- **Doctors in India will be unable to know h**ow patients who may be taking other drugs for ailments such as **diabetes and hypertension i**n India (that are not prescribed in most developed countries), will react to these injections.

Case of using drugs without approval:

- **Spurious imported drugs** such as **Adcetris**, a drug used to treat a type of blood cancer.
- **The drug regulator only issued** an alert regarding spurious drugs after the WHO issued in September 2023
- **This alert was delayed by two years** as the arrests made by the Mumbai police in October 2021
- **It raises the question of how sure doctor**s are that the **unapproved imported drugs** they are administering are not dangerous fakes.

Compulsory Licensing:

- It allows governments to license ***third parties*** (that is, parties other than the patent holders) to produce and market a patented product or process without the consent of patent owners.
- Any time after ***three years from date of sealing of a patent***, application for compulsory license can be made, provided:

1. Reasonable requirements of the public have not been satisfied.
2. Patented invention is not available to public at a reasonably affordable price
3. Patented inventions are not carried out in India.

- Compulsory Licencing is regulated under the ***Indian Patent Act, 1970.***
- The TRIPS Agreement does not specifically list the reasons that might be used to justify compulsory licensing.
- Doha Declaration on TRIPS and Public Health confirms that countries are free to determine the grounds for granting compulsory licenses, and to determine what constitutes a national emergency.

Evergreening:

- It is the practice of companies filing for an extension of a patent with minor process or product modifications just before the original patent expires at the end of 20 years.

Way Forward

- **The doctors should be sure of the provenance** of these drugs before administering them.
- **The Supreme Court has interpreted right to life as the most precious human right:**"ark of all other rights must be interpreted in a broad and expansive spirit so as to invest it with significance and vitality which may endure for years to come and enhance the dignity of the individual and the worth of the human person".
- **According to the WHO Constitution:** "enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being".

QUESTION FOR PRACTICE

Q. How is the Government of India protecting traditional knowledge of medicine from patenting by pharmaceutical companies?(UPSC 2019)

(200 WORDS, 10 MARKS)

EDITORIAL ANALYSIS

A bold step towards a cervical cancer-free future

Source: The Hindu

- **Prelims:** Current events of national importance, cervical cancer, Government policies, universal immunization programme, Human Papillomavirus (HPV) etc
- **Mains GS Paper II:** Government policies and interventions for development in various sectors and issues arising out of their design and implementations etc

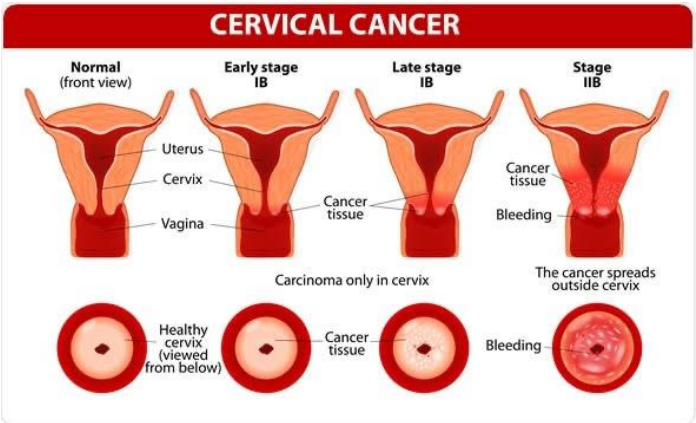
ARTICLE HIGHLIGHTS

- The government's support in encouraging the **vaccination of girls (9-14 years)** against **cervical cancer** stands out as a pivotal move towards safeguarding women's well-being.
- January was observed as **Cervical Cancer** Awareness Month.

INSIGHTS ON THE ISSUE

Context

Cervical cancer:



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- **Nine out of 10 women dying of cervical cance**r live in lower- and middle-income countries.

90-70-90’ targets, global programmes:

- WHO outlined the **‘90-70-90’ targets by 2030**
- **90% of girls** to be fully vaccinated with the HPV vaccine by **age 15**
- **70% of women** undergo cervical cancer screening tests by the **age of 35 and 45**
- **90% of women** with cervical cancer to be treated.
- **These targets represent milestones** in the global effort to eradicate cervical cancer

- **They highlight the pivotal role of India's** call for HPV vaccination in achieving this goal.

Global stand:

- **Over 100 countries** have implemented **HPV vaccination programmes.**
- **Scotland**: There has been no reported cases of **cervical cancer a**mong women born between **1988 and 1996** who received **full HPV vaccination** between the ages of **12 and 13.**
- **Australia**: initiated **HPV vaccination** for **girls** in **2007** and expanded to include boys in **2013**, is poised to eliminate cervical cancer by **2035**.
- **HPV vaccination campaign in Rwanda, Africa**, has significantly reduced the prevalence of vaccine-targeted HPV types
    - **Among women** who participated in their catch-up programme in 2011.
- **Six out of the 11 South East Asia Region countries** have introduced the **HPV vaccine nationwide,** i.e., Bhutan, Indonesia, the Maldives, Myanmar, Sri Lanka, and Thailand.
- **Bhutan** was the first **low-middle income country (LMIC)** to introduce a nationwide HPV vaccination programme for girls (12 to 18 years) in 2010
    - It achieved an initial coverage of **95% of targeted girls.**
    - **Bhutan** is one of the only **LMICs** to have begun **vaccinating boys as** well (in 2021).

The Sikkim model

- **Sikkim's exemplary approach to HPV vaccination** is an example of an effective public health strategy.

- **Targeted efforts to educate teachers, parents, girls,** health-care workers, and the media about the benefits of the HPV vaccine
    - **Sikkim achieved vaccination c**overage of **97%** during its campaign rollout in **2018**.

HPV vaccine and India(Indigenous quadrivalent vaccine, Cervavac)

- **Developed by the Serum Institute of India in** collaboration with the **Department of Biotechnology**
- **Cervavac** is cheaper than available vaccines
- **It prevents the entry of four of the most common types** of **HPV 16, 18, 6 and 11 t**hereby preventing infections, genital warts, and eventually cancer.
- It will be used in the government campaign.
- **The vaccine has to be administered** in **adolescent girls** before they are sexually active.

Expansion of vaccination programme:

- There is also an opportunity to include adolescent boys, thereby maximizing the impact of HPV vaccination in preventing HPV transmission and HPV-related diseases.
- **In line with recent evidence,** it has been recognised that one dose of HPV vaccine provides similar protection to that provided by two or three doses.

How to address the challenges associated with vaccine hesitancy?

- **Concerted efforts are needed to engage communities,** dispel misinformation, and strengthen health-care infrastructure.
- **The interim Budget also announced the rollout of U-WIN** throughout the country.
    - **U-WIN, like Co-WIN** is a portal that will maintain an electronic registry of all immunisations across the country and enable vaccination programmes to be responsive in real time.
- **Ensuring access to vaccination services is imperative,** particularly in underserved populations.
- **To improve demand among the community**, awareness must be improved.

- **Vaccine hesitancy, fuelled by myths and misinformation,** poses a significant barrier to the acceptance of HPV vaccines across different regions.
- **Utilizing diverse channels** such as social media and community workshops can amplify reach.
- **Including HPV information in health** education in schools can be a step to generate demand among adolescents.
- **Collaborations between government agencies,** community partners, health-care providers, and civil society organizations will be instrumental in building trust and ensuring the success of HPV vaccination programmes.
- **Build upon our experiences of the successful nationwide** rollout of **COVID-19 vaccines am**idst a landscape of pervasive digital and mass misinformation.
- **Public-private partnerships** are instrumental in ensuring equitable access to vaccination services, thereby advancing the collective goal of safeguarding women's health against cervical cancer.

Way Forward.

- **India's track record in vaccination campaigns**, exemplified by the widespread acceptance and coverage of the COVID-19 vaccine, instill confidence in the feasibility of scaling up HPV vaccination efforts.
- **India's ability to reach remote and underserved populations** highlights the inclusivity and accessibility of its vaccination programmes, laying a solid foundation for the success of the HPV vaccination initiative.
- **The importance of HPV vaccination extends beyond individual health** outcomes.

- **It has the potential to alleviate the societal and economic** burden of cervical cancer.

- **Cervical cancer predominantly strikes women** during their prime years, exerting a profound toll on both their families and communities.
- **Premature deaths of young mothers due to cervical cancer** negatively impact health and education outcomes in children.
    - **By preventing HPV infections, vaccination** diminishes the occurrence of cervical cancer and its associated health-care expenses, ultimately fostering the overall welfare and productivity of women.

QUESTION FOR PRACTICE

Q. Critically examine the role of WHO in providing global health security during the COVID-19 Pandemic.(UPSC 2020)

(200 WORDS, 10 MARKS)