

**DAILY
CURRENT
AFFAIRS
ANALYSIS**



LAKSHYA ACADEMY®

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1 – Sundarbans:

GS III

Environmental Conservation

- **Context:**

- The Sundarbans, a vital mangrove ecosystem in West Bengal, are seriously threatened by air pollution, according to a recent research by eminent environmental scientists.

- **What are the Sundarbans?**

- Situated in the Bay of Bengal's delta, the Sundarbans are home to the world's largest mangrove forests, the Ganges, Brahmaputra, and Meghna.
- The mangrove ecosystem exists in tropical and subtropical climates as an ecotone between the land and the sea.

- **Plant and Animal Life:**

- This zone supports a diverse range of ecosystems, including saline forests, open water, freshwater swamps, and intertidal mangroves, because of the ecotonic impact.
- Numerous species from various environments can be found in the Sundarbans, including uncommon and internationally threatened species like the olive ridley turtle, water monitor lizard, Gangetic dolphin, and estuary crocodile.

- **Defence:**

- The remainder of the Sundarbans is in Bangladesh, with 40% of it in India.
- It received the UNESCO World Heritage designation in both 1987 for India and 1997 for Bangladesh.
- In January 2019, India's Sundarban Wetland was designated by the Ramsar Convention as a "Wetland of International Importance."
- Project Tiger: Top predators in the Sundarbans, Royal Bengal Tigers regulate prey populations to prevent overgrazing and preserve the sensitive ecosystem's equilibrium.
- By preserving a large amount of habitat for various plant and animal species, tigers help to maintain the Sundarbans' healthy forest ecology.
- Recognising the importance of Sundarbans monitoring and conservation, India and Bangladesh signed an MoU on Sundarbans conservation in 2011.

- **What Problems Does the Sundarbans Face?**

- **Increasing Sea Levels:** A result of global warming, low-lying mangroves are at risk of being submerged by rising sea levels. Their fragile equilibrium is upset by this saltwater incursion, which also increases their susceptibility to storm surges during cyclones.
- **Increased Intensity of Cyclones:** Frequent and strong storms are another effect of climate change. Mangroves may sustain physical harm from these cyclones, and the disturbance of vital sediment patterns may be detrimental to their existence.
- **Cash and Food Crops:** Mangrove forests lose their natural environment when they are converted for agricultural purposes, such as rice paddies or cash crops like palm oil.
- This impacts biodiversity by reducing the area accessible for these ecosystems and fragmenting those that do exist.
- **Loss of Ecosystem Services:** Mangroves are essential for maintaining shorelines and serving as fish nidification sites. Deforestation disrupts these services, impacting coastal communities and fisheries.
- **Threat to Wildlife:** The loss of mangrove habitats due to climate change is leading to the loss of species in the near-threatened or endangered category.
- Settlement mangroves used to be safe havens for diverse molluscs and crustaceans, but they are disappearing due to polluted discharges and breeding activities of these species.
- **Effect of Pollutants:** Pollutants, enriched with black carbon or soot particles, from nearby urban areas and the entire Indo-Gangetic Plain region are worsening the air quality of the Sundarbans, impacting its ecosystem.
- These air pollutants significantly affect the ecology and biogeochemistry of the Sundarbans mangrove ecosystem.

- **Way Forward:**

- **Protecting Streambanks:** Cultivating native grass species like wild rice, *Myriostachya wightiana*, biscuit grass, and salt couch grass can stabilise streambanks and prevent erosion, instead of introducing non-local species like vetiver, which are not salt-tolerant.
- **Promoting Sustainable Agriculture:** Promoting soil-tolerant paddy varieties and organic agriculture practices can increase agricultural productivity and income for farmers while minimising environmental impact.
- **Implementing rainwater harvesting and watershed development initiatives** will further enhance agricultural production.
- **Wastewater Treatment:** Using natural processes and microorganisms for wastewater treatment, such as lactic acid bacteria and photosynthetic bacteria, can support water quality and ecosystem health.
- **India-Bangladesh Collaboration:** The India-Bangladesh Joint Working Group (JWG) should be transformed into a high-powered board of interdisciplinary experts to plan and implement climate resilience for the Sundarbans and the communities dependent on it.

- **Innovative Solutions:** The corrective measures include solar energy promotion, electric transportation, subsidised LPG, regulated tourism, closing down of pollutant factories, regulation of brick kilns and land use and strengthening of coastal regulations.
- **Multi-Sectoral Approach:** A multilayered approach to multi-engagement and multidimensional planning can be followed by the ministries of tourism, disaster management, agriculture, fisheries, and rural development.
- **Source** → *The Hindu*

2 - Global Report on Neglected Tropical Diseases 2024:

GS II

Health related issues

- **Context:**
- Ahead of the World Health Assembly 77th session, the World Health Organization (WHO) released its Global report on neglected tropical diseases (NTD) of 2024.
- The report provides an account of the progress made in 2023 towards the implementation of the Road map for neglected tropical diseases 2021-2030.
- **What are the Key highlights of the WHO Report?**
- **Global:**
- **Status for 2023:**
- As of December 2023, a total of 50 countries have successfully eliminated at least one NTD, marking the halfway point towards the 2030 target of 100 countries.
- 5 countries were acknowledged by WHO for eliminating one NTD, and 1 country for eliminating two NTDs.
- In July 2023, Iraq became the 50th country to eliminate at least one NTD. This event marks the halfway point towards achieving the 100-country target set for 2030.
- Noma was added to the list of NTDs in 2023.
- In October 2023, Bangladesh became the first country to be validated by WHO for eliminating visceral leishmaniasis as a public health problem.

- **Status for 2022:**

- In 2022, 1.62 billion people required interventions against neglected tropical diseases (NTDs), reflecting a 26% decrease from 2010, but still dedicated efforts are needed to attain the road map's global target of a 90% reduction by 2030.
- In 2022, approximately 848 million people received treatment for at least one NTD through preventive chemotherapy interventions, 49 million fewer than in 2021 but 50 million more than in 2020.
- As of the end of 2022, the number of reported deaths from vector-borne NTDs has increased by 22% (as compared with 2016).

- **India:**

- India was certified free of NTDs like dracunculiasis and yaws.
- India, which has the highest disease burden, treated about 117 million fewer people for lymphatic filariasis and soil-transmitted helminthiasis in 2022 compared to 2021.
- 40.56% of India's population needed interventions against NTDs in 2022.
- Key challenges highlighted in the report include slow post Covid-19 recovery, funding uncertainties, geopolitical disruptions, climate change, gaps in knowledge and tools, and insufficient data in addressing NTDs.

- **What are the Key Facts About Neglected Tropical Diseases (NTDs)?**

- **About:**

- According to WHO, Neglected tropical diseases (NTDs) are a diverse group of conditions caused by a variety of pathogens (including viruses, bacteria, parasites, fungi and toxins) and are associated with devastating health, social and economic consequences.
- NTDs are mainly prevalent among impoverished communities in tropical areas, although some have a much larger geographical distribution.

- **Factors Contributing to these Diseases are Being "Neglected":**

- The epidemiology of NTDs is complex and often related to environmental conditions.
- Epidemiology is the study of the determinants, occurrence, and distribution of health and disease in a defined population.
- Many of them are vector-borne, have animal reservoirs and are associated with complex life cycles.
- Compared to diseases like HIV/AIDS, malaria, and tuberculosis, NTDs receive significantly less funding for research and development of treatments.

- **What are the Global and Indian Initiatives to tackle NTDs?**

- **Global Initiatives:**

- WHO's 2021-2030 Roadmap: This ambitious plan prioritises impact over simply treating NTDs. It emphasises collaboration across healthcare, sanitation, and communities. Additionally, it encourages countries to take ownership of their NTD programs.
- 2012 London Declaration: This international agreement recognises the global burden of NTDs and promotes a unified approach to eliminate them.

- **Indian Initiatives:**

- Elimination Programs: India has successfully eliminated guinea worm, trachoma, and yaws. The Accelerated Plan for Elimination of Lymphatic Filariasis (APELF) aims to achieve the same for this disease by 2027.
- WHO Collaborations: India partners with WHO in regional alliances. For instance, a 2005 initiative with Bangladesh and Nepal focuses on early diagnosis and treatment of Kala-azar.
- Mass Drug Administration (MDA): This program involves regular distribution of free anti-parasitic medication in high-risk areas to prevent NTD transmission.
- Vector Control: Programs like Indoor Residual Spraying target insect breeding grounds to prevent the spread of NTDs like Kala-azar.
- Financial Assistance: Wage compensation schemes help individuals affected by NTDs, particularly those with Post-Kala Azar Dermal Leishmaniasis, manage the financial burden of their illness.
- Conclusion
- The 2024 WHO report shows progress in the fight against neglected tropical diseases. Several countries eliminated these diseases in 2023, but more needs to be done to reach global targets. Challenges like funding gaps and the lingering effects of COVID-19 threaten progress. Increased national and global collaboration is necessary for achieving a future free from neglected tropical diseases.

- **Source → *The Hindu***

3 - SC Declines Plea Against Collegium System:

GS II

Judiciary related issues

- **Context:**

- Recently, two senior-most district judges moved to the Supreme Court alleging that the Himachal Pradesh HC collegium overlooked their merit and seniority in the selection process of judges, and have taken their grievances to the Supreme Court.
- The issue highlights concerns about the adherence to the Supreme Court-devised process for selecting High Court judges.
- Previously in April, the Supreme Court registry refused to accept a petition to end the Collegium system of judicial appointments and revive the National Judicial Appointments Commission (NJAC).

- **What is a Collegium System and How Did It Evolve?**

- **About:**

- It is the system of appointment and transfer of judges that has evolved through judgments of the SC, and not by an Act of Parliament or by a provision of the Constitution.
- Articles 124(2) and Article 217 of the Indian Constitution deal with the appointment of judges to the Supreme Court and High Courts.
- The Supreme Court has already upheld the collegium system, and struck down NJAC -which gave an equal role to the government in judicial appointments — by a Constitution Bench in 2015. A review plea against the judgement was also subsequently dismissed in 2018.

- **What are the Issues Related to the Collegium System?**

- **Exclusion of Executive:**

- The complete exclusion of the executive from the judicial appointment process created a system where a few judges appoint the rest in complete secrecy.
- Also, they are not accountable to any administrative body that may lead to the wrong choice of the candidate while overlooking the right candidate.

- **Chances of Favouritism and Nepotism:**

- The collegium system does not provide any specific criteria for testing the candidate for the post of CJI because of which it leads to wide scope for nepotism and favouritism.
- For instance, as per the two senior-most district judges, the Himachal Pradesh HC collegium had ignored the SC collegium's advice in the selection process of judicial officers much junior to them, bypassing their merit, seniority, and "unblemished judicial track record."
- Allegedly, the collegium system gives rise to non-transparency of the judicial appointments, which is very harmful for the regulation of law and order in the country.

- **Against the Principle of Checks and Balances:**

- The principle of check and balance is violated in this system. In India, three organs work partially independently but they keep check and balance and control the excessive powers of any organ.
- However, the collegium system gives the Judiciary immense power, which leaves little room for checks and poses the risk of misuse.

- **Close-Door Mechanism:**

- Critics have pointed out that this system does not involve any official secretariat. It is seen as a closed-door affair with no public knowledge of how and when a collegium meets, and how it takes its decisions.
- Also, there are no official minutes of collegium proceedings.

- **Unequal Representation:**

- The other area of concern is the composition of the higher judiciary, women are fairly underrepresented in the higher judiciary.

- **Way Forward:**

- **Ensuring Transparency and Objectivity:**

- Clear and objective criteria for selection, including factors like merit, seniority, and diversity should be developed.
- A mechanism for recording and publishing collegium decisions, while protecting legitimate privacy concerns should be implemented.

- **Balancing Independence and Accountability:**

- There is a need to find a way to involve the government in the appointment process without compromising judicial independence. This could involve a consultative mechanism or a time-bound confirmation process.

- **Promoting Diversity:**

- There is a need to implement affirmative action measures to increase the representation of women, minorities, and disadvantaged social groups in the judiciary.
- For instance, the issue of nepotism or 'Uncle Judges' syndrome' in judicial appointments was addressed by the Law Commission of India (230th Report).
- It recommended that judges not be appointed to High Courts where their family members have legal practices.
- The solution lies in balancing competing interests. The executive must demonstrate a genuine commitment to judicial independence, while the judiciary should be sensitive in maintaining transparency in judicial appointments. This inherent tension is essential for a healthy check and balance system that safeguards individual rights and the Constitution.

- *Source → The Hindu*

4 - China's High Energy Photon Source:



GS II
International Issues

- **Context:**

- China is on the brink of a major scientific breakthrough with the construction of the High Energy Photon Source (HEPS), a state-of-the-art fourth-generation synchrotron light source.
- This development places China among a select group of nations capable of producing some of the brightest X-rays in the world.
- A synchrotron is a large circular machine the size of a football field that produces intense beams of light using high-energy electrons forced to travel in a circular orbit inside tunnels with strong magnetic fields.
- The light is used to reveal the innermost secrets of materials, leading to advancements in medicine, agriculture, and materials science.

- **What is the HEPS Facility?**

- **About:**

- The High Energy Photon Source (HEPS) located approximately Huairou, this facility is designed to accelerate electrons up to energies of 6 giga electron volts within its 1.36-kilometer circumference storage ring.

- **Key Features of HEPS:**

- HEPS will produce high-energy X-rays that can penetrate deep into samples, revealing intricate details at the nanometer scale.

- **Technical Specifications:**

- Electron Acceleration: Up to 6 gigaelectron volts.
- Time Resolution: 10,000 times better than third-generation synchrotrons, enabling measurements in nanoseconds.
- Beamlines: 14 initially, with the capacity to expand up to 90.

- **Scientific Impact:**

- Nanometre-Scale Probing: Ability to study molecular and atomic structures in real time.
- Can analyse minuscule samples, including small protein crystals that are challenging for older synchrotrons.
- Broad Applications: Will benefit fields such as biomedicine, energy, advanced materials, and condensed-matter physics.
- Faster Experimentation: Experiments that took days at older facilities can now be completed rapidly.

- **Challenges:**

- Beam Stability: Ensuring the X-ray beam is stable enough for practical use requires meticulous, step-by-step adjustments.
- Technical Precision: The process of fine-tuning thousands of components is critical to maintaining the light's brightness and stability.

- **How does HEPS Compare to Other Synchrotrons?**

- Current Status in China: HEPS will surpass the Shanghai Synchrotron Radiation Facility, China's most advanced existing synchrotron.

- **Global Context: Joins the ranks of only a few fourth-generation synchrotron facilities worldwide, including:**
- MAX IV Laboratory (Lund, Sweden), Sirius (Campinas, Brazil), Extremely Brilliant Source (Grenoble, France), and Advanced Photon Source (Lemont, Illinois).
- **Synchrotrons in India:**
- India has two synchrotron radiation sources at the Raja Ramanna Centre for Advanced Technology (RRCAT) in Indore.
- **Indus-1:**
- A 450 MeV source that has been operating since 1999 and emits in the soft x-ray and vacuum ultraviolet (VUV) regions.
- **Indus-2:**
- Indus-2 is an indigenously built third generation Synchrotron Radiation Source (SRS) with 2.5 GeV energy and 200 mA beam current, operating at Raja Ramanna Centre for Advanced Technology (RRCAT), Indore.
- It has a provision of 21 beamlines based on bending magnets and additional 5 beamlines based on insertion devices.
- **Source → *The Hindu***