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✅ Saryu River:

🔘 It is a river that flows through the Indian states of Uttarakhand and Uttar Pradesh.

🔘 It is also known as the Sarayu or Sarju River.

🔘 This river is of ancient significance, finding mentions in the Vedas and the Ramayana.

🔘 Ayodhya, the birthplace of Lord Rama, is situated on the banks of the river Sarayu. The banks of Sarayu in Ayodhya are a common site for various religious rituals.

✅ Course:

🔘 It originates primarily from the foothills of the Himalayas and becomes an auxiliary river to the Sharada.

🔘 It flows through Kapkot, Bageshwar and Seraghat towns before discharging into the Sharada River at Pancheshwar at the India-Nepal border.

🔘 Sharada River (also known as Kali River) then flows into the Ghaghara River in Sitapur District, Uttar Pradesh.

🔘 Lower Ghaghara is popularly known as Sarayu in India, especially while it flows through the city of Ayodhya.

UPSC PRACTICE QUESTION

Q. Consider the following statements:

1. India is the largest importer of coking coal in the world.

2. Mongolia is major coking coal exporting country to India.

Which of the statement(s) given above is/are correct?

A) 1 only

B) 2 only

C) Both 1 and 2

D) Neither 1 nor 2

Answer

Correct Answer: A

Explanation – Statement 1 is correct. India, the world's second-largest steelmaker, is the largest importer of coking coal.

Statement 2 is incorrect. While India is exploring the possibility of importing coking coal from Mongolia and has initiated discussions and logistical planning, Mongolia is not currently a major supplier of coking coal to India. The major suppliers of coking coal to India are Australia, the United States, and Russia.

National Security Adviser

- **Concept –**
- The National Security Advisoris the senior official on the National Security Council of India, and the chief adviser to the Prime Minister of India on national security policy and international affairs.
- Ajit Doval is the current NSA, and has the same rank as a Union Cabinet Minister.
- The post has high vested powers, so the NSA is a highly prominent and powerful office in the Government of India.
- All NSAs appointed since the inception of the post in 1998 belong to the either Indian Foreign Service or to the Indian Police Service, and serve at the discretion of the Prime Minister of India.
- **Role –**
- The National Security Advisor (NSA) is tasked with regularly advising the Prime Minister of India on all matters relating to internal and external threats and opportunities to India, and oversees strategic and sensitive issues on behalf of the Prime Minister.
- The NSA of India also serves as the Prime Minister's Special Interlocutor with China as well as the envoy to Pakistan and Israel on security affairs.
- The NSA receives all intelligence (RAW, IB, NTRO, MI, DIA, NIA) reports and co-ordinates them to present before the Prime Minister.
- NSA is assisted by the Deputy National Security Advisors (Deputy NSAs).

- The policy group is the main mechanism for inter-ministerial coordination and integration of inputs in forming national security policies.
- The group members include the NITI Aayog vice chairman, the cabinet secretary, the three military chiefs, the Reserve Bank of India governor, the foreign secretary, home secretary, finance secretary and the defense secretary.

- **National Security Council**
- The National Security Council (NSC) of India is an executive government agency tasked with advising the Prime Minister's Office on matters of national security and strategic interest.
- It was established by the former Prime Minister of India Atal Bihari Vajpayee on 19 November 1998, with Brajesh Mishra as the first National Security Advisor.
- Prior to the formation of the NSC, these activities were overseen by the Principal Secretary to the preceding Prime Minister.

- **Members –**
- Besides the National Security Advisor (NSA), the Deputy National Security Advisors, the Ministers of Defence, External Affairs, Home, Finance of the Government of India, and the Vice Chairman of the NITI Aayog are members of the National Security Council.
- PM can chair the meeting of NSC (for eg – PM chaired the meeting of NSC Post Pulwama to discuss heightened tension with Pakistan).
- Other members may be invited to attend its monthly meetings, as and when it is required.

- **Organisational structure**
- The NSC is the apex body of the three-tiered structure of the national security management system in India.
- The three tiers are the Strategic Policy Group, the National Security Advisory Board and a secretariat from the Joint Intelligence Committee.

Air Pollution Control in India

- **The News :-**

- Air Pollution has become an "obvious environmental status" in India, often perceived as a manifestation of economic progress. However, this issue has severe consequences, including economic losses and health impacts, making it crucial to address it urgently.
- In 2023, India stood as the third most polluted nation globally, recording an average population-weighted fine particulate matter (PM) 2.5 concentration of 54.4 micrograms per cubic metre (µg/m3), found a new global report by IQAir. The economic impact of air pollution is staggering.
- Annual deaths attributable to air pollution translate to an economic loss of Rs 2.7 lakh crore, which accounts for 1.36% of India's GDP. Furthermore, a recent survey revealed that India's GDP could have been 4.5% higher if air pollution had grown 50% slower each year.
- **What is Air Pollution?**
- **About:**
- Air pollution encompasses the presence of solids, liquids, gases, noise, and radioactive radiation in the atmosphere, at concentrations harmful to humans, living organisms, property, or environmental processes.
- These substances, known as pollutants, can be either natural or human-made and can originate from various sources such as industrial processes, vehicle emissions, agricultural activities, and natural events like wildfires and volcanic eruptions.
- **Major Driving Factors of Air Pollution:**
- **Vehicular and Industrial Emissions:**
- Carbon monoxide (CO), nitrogen oxides (NOx), and non-methane volatile organic compounds (NMVOCs) are the primary pollutants from vehicles (>80%).
- Industries like iron and steel, sugar, paper, cement, fertiliser, copper, and aluminum contribute to suspended particulate matter (SPM), sulfur oxides (SOx), nitrogen oxides (NOx), and carbon dioxide (CO2).
- Road transport presently accounts for 12% of India's energy-related CO2 emissions and is a key contributor to urban air pollution (International Energy Agency)
- **Solid Waste Burning:**
- According to a report by The Energy and Resources Institute (TERI), India generates over 62 million tons (MT) of waste in a year, a significant portion of which is burned openly or in informal dump sites.

- Open burning of solid waste contributes to the release of various pollutants, including PM, dioxins, and furans.
- **Stubble Burning and Other Agricultural Activities:**
- Intentional burning of straw stubble after harvesting grains like paddy and wheat, particularly in Punjab, Haryana, and UP, contributes significantly to air pollution, especially in the NCR region during winter.
- The Supreme Court in 2023 proposed excluding stubble-burning farmers from minimum support price (MSP) as part of efforts to discourage this practice in Punjab and neighboring states near Delhi.
- In addition to crop residue burning, other agricultural activities like tilling, fertilizer and pesticide application, and improper livestock farming contribute to air pollution.
- These activities release ammonia, methane, and particulate matter into the air.
- **Domestic Cooking and Heating:**
- Around 62-65% of India's rural households rely on solid fuels, such as biomass, coal, and kerosene, for cooking and heating purposes.
- The incomplete combustion of these fuels releases harmful pollutants, including PM, carbon monoxide (CO), and volatile organic compounds (VOCs).
- **Coal Based Power Plants:**
- Coal-based thermal power stations with no pollution control technology are responsible for over half sulfur dioxide (SO2), 30% oxides of nitrogen (NOx), about 20% particulate matter (PM), among other man-made emissions in India (International Energy Agency).
- **Improper Use of Pyrolysis:**
- Pyrolysis, a technique to break down synthetic material, leaves fine carbon matter and residue like pyro gas and oil, contributing to pollution.
- The National Green Tribunal, in 2014, prohibited used tyres from being burnt in the open or used as fuel in brick kilns.
- **Why is India not able to Contain Air Pollution Despite Significant Initiatives?**

- Rapid Vehicular Growth Outpacing Infrastructure Development:
- India's economic boom has led to a surge in vehicle ownership, particularly two-wheelers and budget cars, which often have lax emission standards.

- According to the Society of Indian Automobile Manufacturers (SIAM), passenger vehicles sales in India grew by 26.7% in the fiscal year 2022-23.
- Public transportation infrastructure like metro networks and electric buses have not kept pace with this growth, leading to increased traffic congestion and higher emissions
- **Inadequate Infrastructure for Monitoring and Data Collection:**
- Many cities in India, particularly smaller towns and rural areas, lack adequate air quality monitoring stations or reliable data collection mechanisms.
- For instance, Bihar, which is 63 times the size of Delhi in square kilometers, has just 35 continuous ambient air quality monitoring stations.
- **Inconsistent Implementation of NCAP:**
- The National Clean Air Programme (NCAP), launched in 2019, aimed to reduce particulate matter (PM) levels by 20-30% by 2024. It was later revised to 40% by 2026.
- However, According to the Ministry of Environment, Forest, and Climate Change, on average, only 60% of the allocated funds have been used thus far, with 27% of cities spending less than 30% of their designated budgets.
- Visakhapatnam and Bengaluru have spent 0% and 1% of their NCAP funds, respectively.
- What Measures can be Adopted to Expedite Air Pollution Control in India?

- **Biochar Brigade:**
- Empowering rural communities, particularly women's self-help groups, to create and distribute biochar, a charcoal-like substance produced by burning organic waste in a controlled environment.
- Biochar can be mixed with soil to improve fertility and sequester carbon. It can also be used as a fuel source, reducing dependence on polluting firewood.

- The Pradhan Mantri Ujjwala Yojana distributes LPG cylinders to rural households, reducing firewood use. A similar program could promote biochar production and utilization.
- **Increasing Urban Forest Canopy Cover:**
- Launching a national competition among cities to increase their urban forest canopy cover.
- Cities with the most significant increase in green spaces within a set timeframe win grants for further greening initiatives.
- Curitiba, Brazil, is known for its innovative urban planning with a focus on green spaces. India could adapt similar strategies specific to its climate and urban environments.
- **National Air Quality Awareness Corps:**
- Create a dedicated National Air Quality Awareness Corps comprising trained volunteers and professionals who can conduct grassroots awareness campaigns, educate communities, and promote citizen engagement in air pollution mitigation efforts.

Daily Mains Question

- Q. Assess the primary sources of air pollution in urban areas of India and propose actionable measures to combat the rising pollution levels. Evaluate the role of technological advancements and public awareness in achieving long-term improvements in air quality (250 Words)

- प्र. भारत के शहरी क्षेत्रों में वायु प्रदूषण के प्राथमिक स्रोतों का आकलन करें और बढ़ते प्रदूषण स्तर से निपटने के लिए कार्रवाई योग्य उपाय प्रस्तावित करें। वायु गुणवत्ता में दीर्घकालिक सुधार प्राप्त करने में तकनीकी प्रगति और जन जागरूकता की भूमिका का मूल्यांकन करें (250 शब्द)

National Research Foundation

- **Context :-**
- By approving the National Research Foundation (NRF) Bill, the Indian Union Cabinet has taken a major step to enhance scientific research in the country. The NRF intends to address India's persistent gap in research and development investments and foster a strong research environment

within higher education institutions. The initiative is promising, but it also faces challenges such as ensuring fair allocation of funds, promoting interdisciplinary partnerships, and maintaining international standards.

- **National Research Foundation (NRF)**
- **About:**
- NRF is a proposed entity that will replace the Science and Engineering Research Board of India (SERB) and catalyse and channel interdisciplinary research for accelerating India's ambitious development agenda, through impactful knowledge creation and translation.
- The NRF's Goals:
- Promote interdisciplinary research that will address India's most pressing development challenges.
- Minimize duplication of research efforts.
- Promote the translation of research into policy and practice.

- **Features of NRF:**
- The NRF will be presided by the Prime Minister and consist of 10 major directorates, focusing on different domains of science, arts, humanities, innovation and entrepreneurship.
- The NRF will have an 18-member board with eminent Indian and international scientists, senior government functionaries and industry leaders.
- The NRF will be registered as a society and have an independent secretariat.
- **Expectations from NRF:**
- Increasing India's investment in R&D from 0.7% of GDP to 2% of GDP by 2030
- Enhancing India's share of global scientific publications from about 5% to 7% by 2030
- Creating a pool of talented researchers across disciplines and sectors
- Developing innovative solutions for India's development challenges
- Translating scientific knowledge into social and economic benefits
- Need of NRF
- **Declining Research Investment:**

- India's research and development (R&D) expenditure-GDP ratio of 0.7% is very low when compared to major economies and is much below the world average of 1.8%, while it was much higher in countries like the US (2.8%), China (2.1%), Israel (4.3%) and South Africa (4.2%).
- **Low Research Output and Impact:**
- India trails behind in the number of patents and publications generated.
- According to WIPO, China filed 1.538 million patent applications (with only 10% from non-resident Chinese), the US filed 605,571 applications, while India filed only 45,057, of which over 70% were from non-resident Indians.
- **Limited Research Opportunities:**
- Research funding is often restricted to elite institutions and researchers, leaving out those in marginalised areas.
- For instance, DST officials said that about 65 % of funds from SERB went to the IITs, and only 11% to state universities.
- **Fragmentation of Research:**
- Research in India is largely conducted in silos by different institutions, leading to wastage and duplication of resources.
- **Lower Private Sector Involvement:**
- About 56% of R&D spending comes from the government and 35% from the private sector.
- In contrast, in technologically advanced countries, the private sector leads R&D, contributing as much as 88% in Israel.
- Lack of Focus on Social Sciences and Humanities:
- Most of the research funding is skewed towards natural sciences and engineering, while social sciences and humanities are often neglected.
- **How will NRF Promote Inter-disciplinary and Problem-solving Research?**
- **Provides Platform:**
- The NRF will provide the unifying platform for multi-disciplinary and multi-institutional collaborative research that can address complex challenges that require solutions from different disciplines and sectors.
- For example, public health policy, child nutrition, air pollution and climate change are some of the areas that need inter- and trans-disciplinary research that can provide evidence informed, context relevant, resource optimising, culturally compatible and equity promoting solutions.

- The NRF will support both commissioned task force research and investigator-initiated collaborative research in prioritised areas of India's development.

- The NRF will also create mindsets for engaging in multi-disciplinary research early in scientific careers, by inviting young researchers from different knowledge domains to collaborate on problem solving research.
- **Foster Collaboration:**
- The NRF will seek to involve different stakeholders in the scientific enterprise, such as the private sector, state governments, state level institutions and civil society organisations.
- The private sector is viewed as a key partner, to infuse corporate and philanthropic funding that can augment the government's own committed contribution and also to infuse new ideas and stimulate innovation.
- State governments and state level institutions are vital for enhancing India's capacity for conducting locally relevant scientific research.
- **Challenges Faced by NRF**
- **Lack of Mentorship and Career Development Support:**
- Lack of formal or informal mentorship and career development support at the institutions.
- This can make it difficult for researchers to develop their skills and advance their careers.
- **Inadequate Support for Research Management:**
- Inadequate support for academic leadership, lab management, data management, research misconduct, and technology transfer.
- This can lead to problems such as poor research quality, data breaches, and ethical violations.
- **Underrepresentation of Women in Science:**
- In India while the percentage of female enrolment to total enrolment has increased from 45% in 2014-15 to around 49% in 2020-21, however female occupying faculty positions in science departments is low.

- This can limit the pool of talented researchers and create a hostile environment for women in science.

- **Equitable Funding Distribution:**
- One of the biggest challenges facing the NRF is ensuring that funding is distributed equitably across institutions in various geographic locations.
- The NRF will need to find ways to break pattern and ensure that funding is available to institutions in all parts of the country.
- **Other Challenges:**
- **Political Interference:**
- There is a risk that the NRF will be subject to political interference.
- The NRF will need to establish clear guidelines and procedures to ensure that its decisions are based on merit, rather than political considerations.
- Lack of Public Awareness:
- There is a lack of public awareness about the importance of research in India.
- The NRF will need to raise public awareness about the benefits of research, in order to build support for its work.
- **Way Forward**
- **Increasing R&D Spending:**
- As India's R&D spending is low, the NRF should aim to increase the public and private investments in research and innovation and leverage the existing resources and infrastructure efficiently.
- **Ensuring International Competitiveness:**
- The NRF should aim to enhance the quality and impact of India's research output and improve its ranking and visibility in the global scientific community.
- It should also facilitate the mobility and exchange of researchers, both within India and abroad, and attract talent from across the world.

Daily Mains Question

- Q- "National Research Foundation will promote multi-institutional, inter-disciplinary research and funding to address prioritized areas of India's development". Comment (250 Words)

- प्रश्न- "नेशनल रिसर्च फाउंडेशन भारत के विकास के प्राथमिकता वाले क्षेत्रों को संबोधित करने के लिए बहु-संस्थागत, अंतर-विषयक अनुसंधान और वित्त पोषण को बढ़ावा देगा"। टिप्पणी (250 शब्द)

Anusandhan National Research Foundation Act, 2023

- The Anusandhan National Research Foundation Act of 2023 provides for the establishment of the Anusandhan National Research Foundation (NRF).
- It also repealed the Science and Engineering Research Board (SERB) established by an act of Parliament in 2008 and subsumed it into NRF.
- NRF, as an apex body, aims to provide "high-level strategic direction for research, innovation and entrepreneurship", and enhance "India's national research infrastructure, knowledge enterprise, and innovation potential, for scientific pursuit".
- **What is National Research Foundation?**
- In 2005, the Science Advisory Council to the Prime Minister recommended the formation of a National Science and Engineering Research Foundation.
- It was approved by the then PM Manmohan Singh. In 2008, it was renamed the Science and Engineering Research Board (SERB).
- The National Research Foundation (NRF), an apex body to provide high-level strategic direction of scientific research in the country in accordance with the recommendations of the National Education Policy (NEP), will be established at a cost of 50,000 crore over the period 2023-28.
- **Goals:** To increase private sector contributions to research in India and to ensure that a larger portion of government funds go to state universities and colleges.
- The Department of Science and Technology (DST) will be NRF's administrative department.

Hathras Stampede Kills Over 100: Why Stampedes Take Place

- The News :-
- From overcrowding and poor planning, to human psychology, many factors may lie behind deadly stampedes.
- Tragic Stampede Incident
- Around 121 people, mostly women, killed in Hathras district, Uttar Pradesh. The incident occurred during a religious gathering.

- It is not the first fatal stampede at a religious gathering in India.
- 79% of all stampedes in India from 1954-2012 occurred during religious mass gatherings according to the “Human stampedes during religious festivals: A comparative review of mass gathering emergencies in India”
- **Definition of a Stampede**
- Defined by Wenguo Weng and others as “an impulsive mass movement of a crowd that often results in injuries and deaths”.
- Illiyas and others describe it as the “disruption of the orderly movement of crowds… leading to injuries and fatalities”
- **Causes of Stampede Casualties**
- Traumatic Asphyxia: Most common cause of death is the partial or complete cessation of respiration due to external compression of the thorax and/or upper abdomen
- Can occur even in moderate crowds of six to seven people pushing in one direction.
- **Other Causes:**
- Myocardial infarction (heart attack).
- Direct crushing injury to internal organs.
- Head injuries.
- Factors Contributing to Stampedes
- Lack of light.
- Undivided crowd flow.
- Collapse of barriers or buildings.
- Blocked exits and evacuation routes.
- Poor design of hardware (e.g., revolving doors at entrances).
- Fire hazards.
- Preventing and Mitigating Stampedes
- Controlled Entry: Ideally, limit the number of people entering a contained space.
- Critical Measures:
- Number and Placement of Exits: Essential for safe evacuation.
- Event Organisers’ Vigilance: Continuous monitoring and real-time interventions.
- Planning and Mitigation: Identify potential hazards. Design and execute appropriate mitigation measures.
- Importance of Communication: Between Organisers and with the Crowd. Coordination among temple authorities, local administration, and police.

- **Notable Deadly Stampedes**
- **Moscow, Russia (1896):**
- One of the first documented human crowd disasters. Occurred on the eve of Russian Tsar Nicholas II's coronation ceremony. Over 1,000 people crushed or trampled to death. Triggered by rumors of souvenir shortages.
- **Allahabad, India (1954):**
- Most fatal Kumbh Mela stampede in history. Lack of crowd control, poor planning, and excessive VIP presence. Triggered by a crowd surge breaking through barriers. Approximately 800 deaths. Lessons from this tragedy are foundational for managing the Kumbh Mela.
- **Mina, Saudi Arabia (2015):**
- Deadly stampede during Hajj pilgrimage. Two large groups of pilgrims intersected on the same street.
- **Lima, Peru (1963):**
- Fans incensed at a referee's decision during a Peru-Argentina match. Police fired tear gas into grandstands, causing mass panic. Escaping spectators crushed in enclosed stairways blocked with solid gates.
- **Conclusion**
- Effective crowd management, better space design, and vigilant monitoring are essential to prevent stampedes and ensure safety at mass gatherings, particularly during religious events.

Daily Mains Question

- Q. Stampedes at mass gatherings continue to pose a significant threat to public safety in India, often resulting in tragic loss of life.Suggest comprehensive strategies to mitigate the risk of stampedes in the future. (15 Marks, 250 Words)

- प्र. भारत में सामूहिक समारोहों में भगदड़ सार्वजनिक सुरक्षा के लिए बड़ा ख़तरा बनी हुई है, जिसके परिणामस्वरूप अक्सर लोगों की दुखद हानि होती है। भविष्य में भगदड़ के जोखिम को कम करने के लिए व्यापक रणनीतियाँ सुझाएँ। (15 अंक, 250 शब्द)

UNESCO World Heritage Sites

- A World Heritage site is a landmark or area with legal protection by an international convention administered by the United Nations Educational, Scientific and Cultural Organisation (UNESCO).
- World Heritage sites are designated by UNESCO for having cultural, historical, scientific or other forms of significance.
- The sites are judged to contain “cultural and natural heritage around the world considered being of outstanding value to humanity
- History and Background of World Heritage Sites
- The concept of World Heritage emerged after WWII amid concerns over the widespread destruction of cultural sites and nature.
- Efforts to remedy this led to the drafting of the 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage, commonly known as the World Heritage Convention. It established the framework to preserve the world's outstanding heritage.
- The Convention defines the kind of natural or cultural sites that can be considered for inscription on the World Heritage List by meeting specified criteria.
- By signing the Convention, member countries commit to protecting not just national heritage but mankind's shared heritage, irrespective of where sites are located.
- 191 State Parties have ratified this World Heritage Convention, including India. India formally signed the Convention on November 14, 1977.
- There are currently 1,172 World Heritage Sites across 166 countries, of which 913 are cultural, 220 are natural, and 39 are mixed properties that have outstanding universal value as the heritage of humanity.
- **The World Heritage Convention**
- The key aspects of the World Heritage Convention are:
- Defines cultural and natural heritage of Outstanding Universal Value that merits conservation globally, not just nationally.
- This makes it incumbent on signatory member states to protect their World Heritage Sites.
- Establishes the World Heritage Committee and List.
- Sites nominated by states are evaluated by designated advisory bodies before being inscribed on the list.
- Links the idea of heritage conservation to sustainable development goals.

- Set up the World Heritage Fund, supported by member contributions, to provide assistance for preserving sites
- The Convention thus created a framework of international cooperation and legal obligations to preserve humanity's shared heritage.
- Selection Criteria for UNESCO World Heritage Site
- For a site to be inscribed as a World Heritage Site, it must go through a rigorous nomination and evaluation process.
- UNESCO's advisory bodies - the International Council on Monuments and Sites (ICOMOS) and the International Union for Conservation of Nature (IUCN) - assess each nominated site
- A site must demonstrate Outstanding Universal Value (OUV) by meeting one or more criteria defined in the Convention to make it worthy of special protection for all humanity.