Mains Marathon

Compilation

10th to 15h July, 2023

1. Evaluate the evolution of India's relations with Ukraine since 1992. How has India's relationship with Russia influenced its approach towards Ukraine?
2. Explain the role of reliable statistical data in effective economic policymaking. What could be the consequences of policymaking based on unreliable data?

3. Discuss the significance of the bilateral strategic partnership between India and France. How can this partnership serve as a platform for India's re-engagement with European security?
4. How do the new amendments to the Forest (Conservation) Act, of 1980 address the industrial development and forest conservation in India?

5. The heavy rains in North India led to significant damage, including flooded homes, washed away roads and bridges, and disrupted communication networks. Analyze the impact of such extreme weather events on the socio-economic fabric of the region. How can India prepare better to mitigate these impacts?
6. Discuss the evolution of India-Philippines bilateral relations, with special emphasis on the maritime partnership. How can this partnership influence the geopolitical dynamics in the South China Sea region?

7. Elaborate on the importance of encouraging social and political discussions in scientific institutions. Discuss how the participation of scientists in these discussions can contribute to society.
8. Discuss the significance of the Chandrayaan-3 mission for India's space ambitions. How does this mission contribute to ISRO's larger goals and objectives?

9. Discuss the impact of global and local warming on urban flooding in India. How can existing governance and infrastructure systems be adapted to effectively handle these extreme weather events, particularly in cities along the coast, rivers, and hills? Provide examples of successful climate adaptation and flood response measures implemented in Indian cities.
10. Discuss the historical relationship between Delhi and the Yamuna River. How have urban development and environmental changes impacted this relationship over time? Use specific examples from the article to support your answer.

1. **Evaluate the evolution of India's relations with Ukraine since 1992. How has India's relationship with Russia influenced its approach towards Ukraine?**

Introduction: Give a brief context of India's relations with Ukraine.
Body: How has India's relationship with Russia influenced its approach towards Ukraine?
Conclusion: Way forward.

India and Ukraine have close bilateral ties that span many different areas of collaboration. One of the first nations to acknowledge Ukraine was India. India's government established diplomatic ties with the Republic of Ukraine in January 1992 after recognizing it as a sovereign nation in December 1991. India was the first country in Asia where Ukraine opened its Mission in Delhi in 1993 while India opened its Embassy in Kiev in 1992.

Evolution of India's Relations with Ukraine:

- **Defence Cooperation**: Both nations have defence cooperation with each other. Ukraine has been a major source of military technology and equipment to India like R-27 air-to-air missiles.
- **Trade relations:** In 2021, Ukraine exported $2.51B to India. The main products that Ukraine exported to India are Seed Oils, Nitrogenous Fertilizers, and Sawn Wood. India's exports to Ukraine were to the tune of $694M. The main products that India exported to Ukraine were Packaged Medicament, Refined Petroleum, and Broadcasting Equipment.
- **Cultural relations**: The cultural relations cover aspects related to dances, yoga, philosophy, Ayurveda and spirituality. Indian students are pursuing their education in Ukraine, with a strong focus on the field of medicine. The Indian business community is primarily engaged in various sectors such as pharmaceuticals, information technology, engineering, medicine, and education.

How has India's relationship with Russia influenced its approach towards Ukraine?

- **Historical reasons:** Since Ukraine was part of the USSR, India has maintained a close relationship with both Russia and Ukraine. India has respected Russia's view of Ukraine to treat it as its immediate neighbourhood and has avoided taking sides or intervening in any conflicts or tensions between Russia and Ukraine.
- **Reliance on Russia for defence items**: India's reliance on Russia for defence equipment has also made India cautious not to take any side and maintain a neutral stance on issues involving Russia- Ukraine.
- **Strategic autonomy**: During the Russia-Ukraine war, India refused to take a side between Ukraine and Russia and adopted a strategic autonomy approach to maximize its policy space. Instead, India pursued diplomatic activism to evacuate over 22,500 Indians and foreign nationals from 18 countries through its Operation Ganga.

Conclusion:

Various research scholars have argued that India should adopt a different policy to maintain its relations with Ukraine. They feel India relies too much on the Russo-centric view of Europe. India should be firm about the UN principle of territorial integrity, and the sovereignty of member states. India as chair of G20 can raise issues of war-torn Ukraine and help in the rebuilding of Ukraine. India should work with nations like Saudi Arabia, South Africa and Brazil to help raise the voice of the Global South in an international system dominated by the West and Sino-Russia alliance

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2. **Explain the role of reliable statistical data in effective economic policymaking. What could be the consequences of policymaking based on unreliable data?**

> **Introduction:** Why is statistical data crucial?
> **Body:** How does data help in effective policymaking and what are the challenges associated with it?
> **Conclusion:** Way forward

The role of statistical data is very crucial for effective economic policymaking. Data-based policy-making makes vital use of data obtained from various sources and collaborates it with basic principles set out by the planners which helps policymakers fine-tune policies, adapt strategies, and improve overall economic performance.

How does reliable data help in effective policymaking?

- **Transparency:** Data collection and its utilisation helps in maintaining transparency between the citizens and the government. Citizens can view the outcomes based on data published in various periodicals, reports like Economic Survey.
- **Targeted allocation**: Reliable and timely data helps in targeted interventions where it is easy for planners to allocate a targeted amount which is best beneficial for the economy. Eg, COVID data on food insecurity and lack of employment, forced the government to allocate money to schemes offering food grains and employment allowance.
- **Accountability:** Statistical data helps in ensuring the accountability of public officials as data helps in comparing current data with historical trends & evaluating the performance of officials according to the desired outcome.
- **Decision making**: Policymaking based on reliable data is grounded on solid evidence rather than personal preferences. Statistical analysis helps analyse past trends and project future performance based on logical assumptions. It helps policymakers evaluate different policy options and choose the ones that are most likely to achieve desired outcomes.

Challenges of policymaking based on unreliable data:

- **Irregularity in conducting surveys:** Past few years there has been a shortfall in data collection owing to the pandemic and administrative difficulties. There is a delay even in important data like Census.
- **Economic data**: Important data related to the economy like monthly inflation & GDP data are not published periodically which creates uncertainty in the minds of consumers as well as corporates. It can lead to scepticism among investors, hamper economic growth, and deter both domestic and foreign investment.
- **Legitimacy:** Members of data collection agencies are selected based on political preference and to portray the ruling government in good light. This erodes the confidence of the public and creates a legitimation crisis.

Conclusion:

The urgent need is to strengthen the National Statistical Commission by ensuring that its members are picked from the committee of Parliamentarians and not the government. It is also essential to make NSC a statutory body as it was intended in 2006 to maintain its financial independence. There should be a policy of decentralisation of data with states building their databases for subjects in States List and the Centre can invest in capacity building and creating human and technical infrastructure.

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3. **Discuss the significance of the bilateral strategic partnership between India and France. How can this partnership serve as a platform for India's re-engagement with European security?**

> **Introduction:** Give a brief context of the relationship.
> **Body:** What is the significance of the relationship for European security?
> **Conclusion:** Way forward.

The relationship between India and France is based upon shared values of rule of law, democracy, individual liberty and respect for human rights. India and France have entered into strategic partnership since 1998 when India conducted nuclear tests and France stood by us. From January to December 2021, the India-France bilateral trade in goods (excluding military equipment) stood at US$ 12.14 billion.

Significance of bilateral strategic partnership between India and France:

- **Ideas and Outlook**: Both India and France favour multilateralism, non-military deterrence policy and resolving issues through peaceful cooperation.
- **Defence Partnership**: India looks forward to France purchasing critical military technologies as seen during the purchase of Rafale jets, submarines, and helicopters. The cooperation is further deepened by conducting joint naval exercises in the form of the Varuna exercise. France is a preferred partner in the Indo-Pacific as highlighted in Joint Strategic Vision for Cooperation in the Indian Ocean Region concluded by both countries.
- **Space Cooperation**: Space has always been central to the strategic partnership between both countries. Joint Vision for Space Cooperation in 2018 document talks of bringing societal benefits of space technology, situational awareness in the space domain and cooperation in satellite navigation and related technologies.
- **New areas of cooperation**: Both nations have agreed to cooperate on connectivity, climate change, cyber-security and science and technology. The two nations are working on joint construction of the world's largest nuclear park in Jaitapur, Maharashtra.

How can this partnership serve as a platform for India's re-engagement with European security?

- **Ukraine crisis**: The two nations can cooperate and deal with the Ukraine crisis as both have good relations with both Ukraine and Russia. Leaders of both nations can play the role of peace interlocutor and make efforts to end the war.
- **Asian security**: India's partnership with France should interconnect the concept of Europe security with Asia security. The big question of dealing with China can make cooperation between the two countries inevitable.
- **Defence modernisation**: France can play a crucial role in modernising India's defence industrial base through co-development and co-production of weapons. This will boost India's national power and help maintain the balance of power in Asia.
- **Recalibrate Europe strategy**: India should try to evolve a new European policy which should include Russia and see the continent as a collective whole and not through Russia's view of Europe.
- **Institutional cooperation**: The partnership can be beneficial for India as it gives India a chance to engage with NATO, Permanent Structured Cooperation (PESCO) on defence issues among the members of the European Union, the EU Intelligence and Situation Centre (INTCEN), and the intelligence-sharing forum among the EU's national spy agencies, Club de Berne.

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Conclusion:

The moment to redefine the partnership amidst the 25th-anniversary celebrations of the bilateral strategic partnership is good for both nations to pursue intense and wide-ranging cooperation that would contribute to world security.

4. **How do the new amendments to the Forest (Conservation) Act, of 1980 address the industrial development and forest conservation in India?**

> **Introduction:** Give a brief introduction about Forest Act 1980.
> **Body:** State the new amendments proposed and their effect on industrial development and forest conservation.
> **Conclusion:** Way forward.

Forest (Conservation) Act 1980 was enacted for providing a higher level of protection to forests and to regulate the diversion of forest lands for non-forestry purposes. Recently, the government introduced The Forest (Conservation) Amendment Bill, 2023 to make changes to The Forest (Conservation) Act, 1980.

How do proposed amendments address industrial development and forest conservation in India?

- **Unrecorded forests:** The proposed amendments seek to restrict the scope of the Act to only "recorded forest". This will have the effect of removing the protection of the Act from millions of hectares of land that have the characteristics of forests but are not notified as such.
- **Develop Carbon stock through plantations:** The new amendments allow developers to raise plantations on land which is not classified as forest. These plantations can be used to incentivize private agro-forestry, and tree plantation activities and streamline the forest clearance process.
- **Diversion of forest land: The** proposed amendments seek to make "unrecorded" land available for developers to meet their legal obligation towards compensatory afforestation in place of forest land diverted for development projects.
- **Excess power to Central Government:** The changed bill authorises the central government to list activities exempted from forest clearance. Eg, all strategic linear projects of "national importance and concerning national security" within 100 km of international borders. The amendments also seek to exempt "security-related infrastructure" requiring up to 10 hectares, without defining its scope. The Bill adds silvicultural operations, construction of zoos and wildlife safaris, eco-tourism facilities, and any other activities which "the Central Government may, by order, specify to be exempted from the provisions of Forest Conservation Act.
- **Increased carbon stock:** As compared to stable natural forests, fast-growing plantations score faster carbon growth which will help raise the carbon stock. From various forest surveys, it is learnt that growth in natural forest in India is slow or stagnant and it is tree cover in orchards, plantations and village homesteads that has been responsible for increasing India's carbon sink.

Conclusion:

Environment activists have raised concerns regarding the diversion of forest land which will lead to corporate ownership and the disappearance of large tracts of forests. The government should ensure to engage all stakeholders whether tribals, activists, industry leaders and most importantly state government to come up with suggestions to address the concerns raised by

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the proposed bill to harmonise the issue of industrial development with forest conservation in India.

5. **The heavy rains in North India led to significant damage, including flooded homes, washed away roads and bridges, and disrupted communication networks. Analyze the impact of such extreme weather events on the socio-economic fabric of the region. How can India prepare better to mitigate these impacts**?

Introduction: Describe the causes leading to heavy rain.
Body: What is its impact on socio-economic factors and how can India be prepared to mitigate these impacts?
Conclusion: Way forward

Recently, North India witnesses heavy rains causing flash floods which led to the destruction of property, infrastructure, and communication networks. Such intense downpours in the region and the Himalayas can be caused by three main sources. First, a strong monsoon is active and carries moisture from the Arabian Sea or the Bay of Bengal into the area. Secondly, there is a significant atmospheric forcing on a huge scale that manifests as outflows in the upper atmosphere that move through mid-latitude troughs and go eastward. Third, the Himalayan mountains' steep terrain paired with orographic uplift causes deep convection.

What is the impact of such heavy rain on the socio-economic fabric of the region?

- **Loss of life**: Heavy rain and resulting floods can cause the displacement of people from their homes. It often results in the loss of life and poses significant challenges for governments in providing relief and rehabilitation.
- **Infrastructure:** Heavy rainfall can cause significant damage to infrastructure, including roads, bridges, buildings, and public utilities leading to the disruption of transportation networks, communication systems, and power supply which affects the daily lives of people but also hampers trade, commerce, and industrial activities, leading to economic losses.
- **Agriculture:** Heavy rain and flash floods adversely affect agriculture as it leads to crop damage, soil erosion, and waterlogging.
- **Public Health**: Heavy rain is responsible for the outbreak of waterborne diseases like cholera, typhoid, and diarrhoea. This puts strain on public resources, reduces the disposable income of citizens, and has long-term socio-economic effects.

How can India prepare better to mitigate these impacts?

- **Early warning system**: It can alert people about the weather update, giving real-time information about possible flash floods.
- **Monitoring of rainfall/river level patterns**: The use of Doppler weather radar (DWR) and a high-resolution numerical weather prediction model can help monitor and forecast data.
- **Mapping of various factors**: Flood risk mapping should take into account factors such as topography, historical flood data, and hydrological modeling to assess vulnerability.
- **Planned Infrastructure:** Improved and climate-resilient infrastructure like drainage systems, channels & proper implementation of land use planning, and zoning regulations can help prevent waterlogging.

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- **Conservation of the ecosystem**: Conservation of forests and wetlands acts as a natural buffer, absorbing rainfall and reducing runoff which reduces the intensity of flash floods.

Conclusion:

The focus of the government should be to help citizens on issues ranging from providing first aid, arranging evacuation, and providing information regarding the latest weather information. These proactive efforts would go a long way in providing relief to the affected people.

6. **Discuss the evolution of India-Philippines bilateral relations, with special emphasis on the maritime partnership. How can this partnership influence the geopolitical dynamics in the South China Sea region?**

> **Introduction**: Context of India-Philippines bilateral relationship.
> **Body:** Describe briefly the evolution of bilateral relations and how has it impacted dynamics in the South China Sea.
> **Conclusion:** Way forward.

Recently, Foreign Ministers of India and the Philippines met on the sidelines of the Philippines-India Joint Commission on Bilateral Cooperation, in New Delhi outlining the path for a strengthened bilateral partnership between Manila and Delhi in the 21st century after completing 75 years of diplomatic history.

Evolution of India-Philippines bilateral relations:

- Political relations: India and the Philippines formally established diplomatic relations on **26 November 1949,** with both nations strengthening their relationship following the Act East Policy.
- **Economic relations**: Bilateral trade has increased from 1.89 billion USD in 2015-16 to 2.84 billion USD in 2021-22. Both nations are expanding economic relations to cover collaboration between the Philippine Space Agency and the ISRO.
- **Maritime relations**: Both nations are committed to the stability and security of a rules-based order in the Indo-Pacific. India and the Philippines also participate in ASEAN-India Maritime Exercise.
- **Defense relations**: Both nations have a growing defense and security partnership with the signing of a $374-million contract for the procurement by the Philippines' defense forces of India's BrahMos Shore-based Anti-Ship Missile System & taking part in maritime RIMPAC exercise.

How does this relationship influence geopolitical dynamics in South China Sea region?

- **Strengthen Defence relationship:** India has decided to open a resident defense attaché office in Manila, cooperation between the Coast Guards of the two countries; acquisition of naval assets by Manila under a concessional line of credit from Delhi; expansion of training and joint exercises on maritime security and disaster responses, and commencing a maritime dialogue are some of the noted steps taken recently.
- **Securing Sea Lines of Communication:** South China Sea is a crucial maritime gateway and junction for shipping between the Pacific and Indian Oceans. India and the Philippines both have a vital interest in safeguarding the shipping lanes in terms of geopolitics, economy, and global security.

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- **Peaceful resolution of disputes:** Both nations are committed to peaceful conflict resolution based on the principles of international law, as reflected notably in the UNCLOS involving disputed islands in the South China Sea claimed both by China & Philippines.

Conclusion:

The geopolitical dynamics in South China region can be resolved only through dialogue involving all stakeholders, especially ASEAN nations by working towards the creation of a "political framework" and progress towards a legally binding "code of conduct". More intense regional cooperation is necessary to fully utilize the Indo-Pacific as a growth engine. To support the region's position as a global economic powerhouse, stronger economic integration, better connectivity, and increased innovation are essential. The Philippines and India play significant roles in this regard as leaders in the promotion of inclusive multilateralism and the rule of law.

7. **Elaborate on the importance of encouraging social and political discussions in scientific institutions. Discuss how the participation of scientists in these discussions can contribute to society.**

Introduction: What is the issue?
Body: What is the importance of encouraging social and political discussions in scientific institutions for society?
Conclusion: Way forward.

Recently, authorities of the Indian Institute of Science (IISc) sought to ban a discussion on the Unlawful Activities Prevention Act (UAPA) by a student collective on the campus raising the important issue regarding the importance of social and political discussions in scientific institutions.

What is the importance of social and political discussions in scientific institutions?

- **Constitutional right**: Scientific institutions are also part of Indian society and as such their members too have a fundamental right to express their views and took part in socio-political discussions.
- **Critical inquiry**: Social and political discussions widen the perspectives on multiple issues and helps in pursuing a critical inquiry into a variety of subjects. Further, critical analysis of discussions can help academicians in their responsibility to educate and express themselves on matters of public interest.
- **An argumentative tradition of India**: Indian scientists have a long and distinguished history of taking an active interest in social issues. Eg, physicist Meghnad Saha, the mathematician D.D. Kosambi, and the chemist Amulya Reddy. Another famous example is Kerala Sasthra Sahithya Parishad, which has made a significant contribution to the dissemination of scientific ideals throughout the State and All India Peoples Science Network has advocated that science should be applied for societal good rather than for personal gain.
- **Ethical consideration**: Science often involves ethical dilemmas related to implications of future technology or potential research as seen in AI and CRISPR Gene editing technology. Encouraging discussions can help in understanding the implications and consequences of research.

How the participation of scientists in these discussions can contribute to society?

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- **Policy development:** These discussions can help bridge the knowledge gap between the scientific community and the common citizenry and ensures that policy decisions address societal challenges effectively.
- **Foster a culture of transparency:** These discussions foster a culture of accountability and transparency in the institutions and help scientists to demonstrate their findings to the masses.
- **Inclusivity and diversity:** Social and political discussions in scientific institutes and scientific discussions in art institutes provide a platform for diverse voices to be heard & valued. It fosters creativity and encourages new ideas within the community.

Conclusion:

There is an urgent need to relook at the issue of self-censorship which has restricted academic freedom in our universities. It is rightful for the authorities to abide by various orders of High Courts invoking that Civil Service (Conduct) Rules are ill-suited for academic scientists and "have no application to a Central University".

8. **Discuss the significance of the Chandrayaan-3 mission for India's space ambitions. How does this mission contribute to ISRO's larger goals and objectives?**

> **Introduction:** What is Chandrayaan-3's mission?
> **Body:** What is its significance and how does it contribute to ISRO's larger goals and objectives?
> **Conclusion:** Way forward.

Chandrayaan-3 is the second attempt of the ISRO is set to land the spacecraft on the surface of the moon. Earlier in 2019, due to problems that had emerged during the last stage of the descent, Chandrayaan-2's lander and rover crashed on the moon's surface. If Chandrayaan-3 makes a successful safe landing on the moon India will become only the fourth country – after the United States, Russia, and China – to do so.

Why this mission is significant for India's space ambitions?

- **SHAPE**- Chandrayaan-3 is different from its predecessor as its propulsion module has a payload -- SHAPE (Spectro- polarimetry of HAbitable Planet Earth) to study Earth from lunar orbit.
- **Lander payloads**: The lander module's payloads include *RAMBHA-LP*, which will measure the near-surface plasma ions and electrons density and its variations, *ChaSTE Chandra's Surface Thermo Physical Experiment*, which will measure the thermal characteristics of the lunar surface near-polar region, and *ILSA (Instrument for Lunar Seismic Activity*), will measure seismicity in the area of the landing site and delineate the lunar crust's structure.
- **Rover payloads**: The rover payload includes *APXS - Alpha Particle X-Ray Spectrometer* - to derive the chemical composition and infer mineralogical composition to further enhance understanding of the lunar surface. Another *payload Laser Induced Breakdown Spectroscope (LIBS)* will determine the elemental composition of lunar soil and rocks around the lunar landing site.

How does this mission contribute to ISRO's larger goals and objectives?

- **Open new ventures:** The controlled and safe landing on the moon opens new vistas in space exploration and space-based science and research.

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- **Increases confidence:** The success of Chandrayaan-3 will be crucial and help ISRO to deliver on its upcoming missions ***Gaganyaan*** (India's first manned mission to space), ***Aditya L-1*** (a mission to study the Sun), ***Shukrayaan*** (mission to Venus).
- **Joint Missions:** Chandrayaan-3 has the potential to reaffirm ISRO's position as one of the front-ranking space-faring nations & also allow it to get actively involved in more collaborative missions with other space agencies. Eg, ISRO, and NASA are realizing a joint satellite mission called _NISAR (NASA ISRO Synthetic Aperture Radar_) for earth science studies. As part of the Indo-French cooperation, ISRO and CNES have completed the feasibility study on realizing an earth observation satellite mission with a thermal infrared imager, named _TRISHNA_. ISRO and JAXA scientists are conducting a feasibility study to realize a joint satellite mission to explore the moon's polar region _(Lunar Polar Exploration Mission (LUPEX), also as Chandrayaan-4)_

Conclusion

The moon is the closest cosmic neighbor of Earth and can be used as a potential site for testing futuristic technologies for deep space missions. The success of the mission would further help "stimulate the advancement of technology, promote global alliances, and inspire a future generation of explorers and scientists".

9. **Discuss the impact of global and local warming on urban flooding in India. How can existing governance and infrastructure systems be adapted to effectively handle these extreme weather events, particularly in cities along the coast, rivers, and hills? Provide examples of successful climate adaptation and flood response measures implemented in Indian cities.**

> **Introduction:** Give context to urban flooding.
> **Body:** How does global warming impact flooding ad what are measures taken to deal with this?
> **Conclusion:** Way forward.

The recent deluge in north-western India and Delhi has raised concerns regarding the effects of urban flooding in India.

How does global and local warming impact urban flooding?

- **Urban Heat Island effect**: Urban areas tend to be hotter as compared to rural areas because of the greater absorption of heat by buildings, roads, and infrastructure which naturally raises the temperature. Such high temperatures intensify evaporation from water bodies leading to flood risk.
- **Sea level rise**: Due to global warming there is melting of ice caps and glaciers which leads to a rise in sea level. This results in low-lying coastal cities experiencing heavy rainfall and sea level rise which finally leads to urban floods.
- **High rainfall intensity**: Global warming increases temperature which often leads to high-intensity rainfall in a few hours. This intense shower overwhelms the city's drainage system and causes flooding.

How can the existing governance structure be revamped to handle such events?

- **Ensuring drainage system works**: A monsoon audit is undertaken by urban civic bodies like ***in Mumbai*** to ensure that storm water drains, tanks, and lakes exist and work, and they are not choked by construction debris, silt, garbage, or blocked

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encroachments. This can reduce the impact of flooding, and help recharge groundwater and surface storage.

- **Recycle wastewater**: The integration of drainage, water supply, and wastewater systems to store brief, heavy downpours while also treating and recycling wastewater to maintain clean water and sanitary conditions for the remainder of the year.
- **Improving roads infrastructure**: The road infrastructure has expanded faster than our drainage infrastructure. Effective infrastructure planning and coordination by all concerned agencies is the need of the hour as seen in _**Chennai.**_
- **Sponge Cities**: The main goal of Sponge Cities is to lessen reliance on "grey infrastructure" such as levees, pipes, dams, and channels. Instead, green infrastructures—strategic natural, semi-natural, and engineered systems—will be developed to enable water absorption and storage during the monsoon and supply that water during the dry season. Permeable roads and sidewalks are being built with this objective in mind. Eg, _**Kochi & Bangalore.**_
- **Improve warning services**: There has considerable progress in mapping cities most prone to flooding and using satellite and topographical data to identify them. Eg, _**IFLOWS**_ is a monitoring and flood warning system being operationalized in Mumbai.

Conclusion:

India needs to be prepared for more such events in the future on account of climate change. The priority of government should be to ensure that all urban residents have access to basic services and the focus of urban bodies should be on improving public health and reducing our collective vulnerability, and re-imagine our cities to have more forests, parks, wetlands, and lakes.

10. **Discuss the historical relationship between Delhi and the Yamuna River. How have urban development and environmental changes impacted this relationship over time? Use specific examples from the article to support your answer.**

Introduction: Briefly describe the geographical origin of Yamuna.
Body: Describe its historical relationship with Delhi and how has urban development impacted this relationship.
Conclusion: Way forward.

The Yamuna River originates from the Yamunotri Glacier & is the largest tributary of the Ganga River. The stretch of the river from its origin to Okhla in Delhi is called "Upper Yamuna". It covers parts of Delhi, Uttar Pradesh, Himachal Pradesh, Uttaranchal, Haryana, Rajasthan, and Madhya Pradesh. Its water is used for farming and irrigation, making it one of the highest food-yielding river basins in the country benefiting Haryana, Uttar Pradesh, NCT of Delhi, Rajasthan, and Uttarakhand. It is also the main source of raw water for the national capital and is a breeding ground for aquatic organisms. Today, Yamuna is one of the most polluted rivers in the country.

What is the historical relationship between Delhi and Yamuna?

- **Important monuments**: The two most important forts of Delhi, Salimgarh Fort built by Salim Shah Sur, in 1546 & Red Fort built by Shah Jahan in 1648, are connected by a bridge as the river Yamuna flows between the two forts.
- **Water entrance**: Shah Jahan's original city of Delhi had 14 gates with a water gate', Khizri Darwaza, that opened directly to the river through which the Emperor used to enter the fort.

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- **Strategic use**: The river location was instrumental in the construction of the fort as it provided a barrier against enemy forces, its water was used to feed the population.
- **Baolis**: It is a reservoir in which water can be stored and can be used for drinking and bathing purpose. It was also source of groundwater. Some important baolis in Delhi are Purana Qila Baoli, Feroz Shah Kotla Baoli, Agrasen ki Baoli, & Nizamuddin Baoli. These baolis are important was rainwater conservation.

How have urban development and environmental changes impacted this relationship over time?

- **Change of course**: The river has changed its course over the decades. Scientists have believed this is due northward movement of the Indian Tectonic Plate.
- **Dead River**: Sewage and domestic and industrial effluents have made its water toxic and unfit for consumption. Studies have called it a "glorified drain" and a **"dead river"**, unable to sustain any life. According to a _2020 report by Yamuna Monitoring Committee (YMC_), the 22-kilometer stretch of the Yamuna which traverses Delhi is only two percent of the length of the river but accounts for over 75 percent of the total pollution load in the river, which comes from untreated domestic sewage, industrial and solid waste.
- **Encroachment on floodplains**: A report by Centre for Science and Environment has shown that 63% of wetlands and waterbodies in the Yamuna floodplain are dry. The loss of waterbodies makes the city more prone to floods.

Conclusion:

There is an urgent need to implement natural solutions like creating green areas along the river, timely de-silting of drains, making pavements porous, and ensuring accountability of officials to mitigate the situation of urban flooding in Delhi.

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