

GS PAPER2- POLITY- JUDICIARY

Issue of long judicial delays in India

The article discusses the issue of long judicial delays in India, highlighted by President Droupadi Murmu. It emphasizes the need for reforms to address these delays, which strain citizens, by balancing the speed of justice with maintaining its integrity.

What Did President Droupadi Murmu Say About Judicial Delays?

1. President Droupadi Murmu discussed the problem of judicial delays at a **National Conference of the District Judiciary**.
2. She called it the “**Black Coat Syndrome**,” referring to the financial and mental strain that people, especially the poor, face when dealing with prolonged court cases.
3. She questioned how long a case should take, mentioning examples of cases taking decades.

What are the Reasons for Judicial Delays?

1. **Prolonged Case Durations:** Cases can take decades to resolve, like the 32-year delay in the Ajmer POCSO case.
2. **Litigation Fatigue:** People withdraw cases due to repeated court appearances, as seen in the Delhi High Court case.
3. **Overburdened System:** According to the **National Judicial Data Grid**, over five crore cases are pending at different levels of the judicial system.
4. **Shortage of Judges:** India has only 15 judges per 10 lakh people, far below the 50 judges per 10 lakh people recommended by the Law Commission in 1987.
5. **Lack of Support Staff:** Insufficient staff hampers timely court functions.
6. **Ineffective Reforms:** Measures like e-filing and Lok Adalats have not significantly reduced delays.

What Steps Have Been Taken to Address This Issue?

1. **Addition of Courtrooms:** More courtrooms have been added to manage the increasing caseload, but the impact has been minimal.
2. **Updated E-filing System:** An updated e-filing system has been introduced to streamline case filings, yet delays persist.
3. **Pre-litigation Dispute Resolution:** Strategies like Lok Adalats have been used to resolve disputes before they reach the courts.

What Should be Done?

1. A long-term plan is needed to address judicial delays without compromising the integrity of the justice system.
2. The Chief Justice of India (CJI) outlined a three-stage plan to tackle this issue.
3. The demand for faster justice has increased, especially after recent cases of violence against women.
4. However, any reforms must balance the need for speed with ensuring justice is properly served.

GS PAPER2- INTERNATIONAL RELATIONS- BILATERAL, REGIONAL AND GLOBAL GROUPINGS AND AGREEMENTS INVOLVING INDIA AND/OR AFFECTING INDIA'S INTERESTS

The upcoming Forum on China-Africa Cooperation (FOCAC)

The article discusses the upcoming Forum on China-Africa Cooperation (FOCAC) and Africa's need for better strategic planning and negotiation. It highlights African priorities, including trade, agriculture, and debt issues. It also suggests lessons India can learn from Africa's approach to China for its own engagement with the continent.

What is the Current Context of FOCAC 2024?

1. The ninth Forum on China-Africa Cooperation (FOCAC) is set for September 4-6, 2024, in Beijing.
2. African nations are dealing with high inflation, currency depreciation, and a heavy debt burden.
3. Geopolitical challenges include the Israel-Hamas and Russia-Ukraine wars, and Houthi attacks on commercial shipping in the Mediterranean.
4. African leaders feel “summit fatigue” after recent Africa+1 summits with Türkiye, Russia, South Korea, and the U.S.
5. Adopting the Banjul format (15 countries plus the African Union Commission) is suggested for better management.
6. The effectiveness of FOCAC depends on Africa's ability to set the agenda and take ownership of its strategic planning.

What are the Priorities for Africa at FOCAC 2024?

1. **Trade Expansion:** Africa aims to increase exports to China. As of July 2024, China-Africa trade reached \$167 billion, with African exports at \$69 billion. However, most exports are raw materials.
2. **Agricultural Development:** Africa needs to build a sustainable agriculture sector. China and India can help with crops, fertilizers, and tools suited for African conditions. Processing agricultural products locally is also crucial.
3. **Green Energy and Industrialization:** Africa seeks to establish refining and processing hubs. Zimbabwe, for example, requires Chinese companies to refine lithium locally. However, electricity shortages and environmental issues are challenges.
4. **Debt Management:** Addressing debt sustainability is key. China accounts for 12% of Africa's public and private debt. African countries need transparency and better negotiation strategies.
5. **Strategic Engagement:** Africa must develop a coherent strategy and harmonize positions before the FOCAC summit to drive the agenda effectively.

What is China's Role in African Debt?

1. China's loans to African governments and institutions totaled \$170 billion between 2000-2022.
2. Chinese lenders hold 12% of Africa's public and private debt, making them a significant but not the main creditor.
3. A 2022 AidData study shows half of Chinese loans to sub-Saharan Africa are not disclosed in sovereign debt records, raising concerns about transparency.
4. China is unlikely to forgive large debts but may write off small, interest-free loans.
5. Despite the disputed narrative of “debt trap diplomacy,” some Chinese lending practices require closer scrutiny.

What Lessons Can India Learn from Africa's Engagement with China?

1. **Continuity in Engagement:** India should maintain regular dialogues with Africa, similar to how FOCAC is a recurring event. The last India-Africa Forum Summit (IAFS) was in 2015, so IAFS-IV should be held soon to maintain momentum.

- Industrial Support:** India can help integrate African economies into global value chains by investing in agriculture, pharmaceuticals, and manufacturing. Indian companies should focus on farm mechanization, food processing, and cold storage to create jobs and reduce food wastage.
- Innovative Financing:** Africa's caution about new loans post-COVID-19 underlines the need for innovative financing methods. India could employ mechanisms like public-private partnerships and blended finance to assist African projects without increasing debt burdens.
- Digital Tools for Connectivity:** Using digital technologies like UPI, which have been successful in Mauritius, can enhance financial transactions and connectivity between India and African nations, potentially extending to more countries in Africa.

GS PAPER3-SCIENCE AND TECHNOLOGY

State of R&D Spending in India

The article discusses India's need for more research and development (R&D) spending. It highlights that India's current R&D spending is low compared to other countries, partly due to limited competition in domestic markets and a lack of incentives for businesses.

What is the Current State of R&D Spending in India?

- India spends only 0.65% of its GDP on research and development (R&D), significantly lower than countries like South Korea (4.8%) and China (2.4%).
- The government contributes over 60% of total R&D expenditure, focusing on defense, space, agriculture, and nuclear research.
- The private sector's share in R&D has declined from 45% in 2012-13 to 40% in 2020-21.

What Factors Affect R&D Investment?

- Competitive Forces:** Countries with higher exposure to global competition tend to invest more in R&D. For example, South Korea and Taiwan have high R&D spending because their firms face intense global competition.
- Economic Structure:** Resource-rich countries like Indonesia and Mexico spend less on R&D (0.28% and 0.3% of GDP, respectively), showing that R&D investment is influenced by the underlying economic structure.
- Government Incentives:** Though India offers R&D tax deductions, the benefits are limited. Micro, small, and medium enterprises (MSMEs) struggle with protecting intellectual property due to court delays.

Why Does India Need More R&D?

- India needs to invest more in research and development (R&D) to progress faster and more effectively.
- Innovation will play a key role if incomes are to quadruple in the next two to three decades while addressing inclusion and sustainability challenges.

Why Is India's R&D Spending Low?

- A key reason is India's low per capita income, which generally correlates with lower R&D investment.
- Limited competition in domestic markets reduces the need for firms to invest in R&D.
- High profit-earning ratios in India reduce the incentive for businesses to invest in uncertain R&D.
- Cultural sentiment among Indian businessmen often favors short-term gains over long-term, uncertain R&D investments.
- Protective market policies, such as high tariffs, lower the competitive pressure on firms, reducing their incentive for R&D.

What Could Drive More R&D in India?

- Increase Competitive Forces:** More competition in domestic markets can push firms to innovate. High tariffs and non-tariff barriers currently protect firms, reducing their need to invest in R&D.
- Encourage Global Market Participation:** Firms that compete globally are more likely to invest in R&D. For example, South Korea and Taiwan have higher R&D spending due to their global market presence.
- Reduce Market Protection:** Reducing domestic market protection can compel firms to invest in R&D to stay competitive, as seen in other countries with higher R&D spending.

GS PAPER3- DISASTER MANAGEMENT

Concerns related to the Disaster Management (Amendment) Bill, 2024

The article discusses the centralization concerns in the proposed Disaster Management (Amendment) Bill, 2024. It criticizes the restricted definition of "disaster," excluding heatwaves, and highlights the need for better financial preparedness and cooperative federalism in disaster management.

What Does the Disaster Management (Amendment) Bill, 2024 Propose?

- The Disaster Management (Amendment) Bill, 2024, was introduced on August 1, 2024, in the Lok Sabha.
- The Bill aims to centralize disaster management further, building on the existing Disaster Management Act, 2005.
- It gives statutory status to pre-existing bodies like the National Crisis Management Committee and a High-Level Committee.
- The Bill complicates disaster response chains by adding more centralized layers, which could delay action.
- It introduces an Urban Disaster Management Authority for state capitals and cities with municipal corporations.
- However, the Bill lacks provisions for adequate financial support to these new authorities, creating potential issues.
- The amendment also removes specific purposes for using the National Disaster Response Fund, which could delay funding in severe disasters, as seen in past delays with Tamil Nadu and Karnataka.

What are the concerns related to the Disaster Management (Amendment) Bill, 2024?

Increased Centralization: The Bill further centralizes disaster management by giving statutory status to pre-existing committees like the National Crisis Management Committee, complicating response procedures. Centralized decision-making can delay disaster relief, as seen when Tamil Nadu faced delays in receiving funds from the National Disaster Response Fund (NDRF).

Restricted Definition of Disaster: The Bill does not include heatwaves as a recognized disaster, despite India experiencing 536 heatwave days, the highest in 14 years, and 10,635 heat-related deaths from 2013 to 2022.

Financial Imbalances: The Bill lacks provisions for financial devolution, forcing states to depend on the central government for disaster relief funds, undermining the spirit of cooperative federalism.

GS PAPER3- AGRICULTURE-ISSUES OF BUFFER STOCKS AND FOOD SECURITY

Monsoon Affected Agricultural Policies

The article discusses how India's good monsoon has led to the government easing restrictions on ethanol production and rice usage. However, it suggests that the government should also lift export bans on rice, sugar, onions, and pulses to avoid surplus problems and support farmers.

How Has the Monsoon Affected Agricultural Policies?

The monsoon in India has been favorable this year, with rainfall 7.5% above the long-term average. July and August saw surpluses of 9% and 15.3%, respectively. This abundance has allowed the government to reverse certain restrictions that were set to control inflation.

What Restrictions Have Been Lifted?

1. **Ethanol Production:** The government lifted the ban on sugar mills producing ethanol directly from cane juice, syrup, or "B-heavy" molasses on August 29. This ban was imposed in December 2023.
2. **Rice Usage:** Mills and distilleries are now allowed to use up to 2.3 million tonnes of rice from the Food Corporation of India's stocks for ethanol production. This was previously restricted since July 2023.
3. The Minister for Consumer Affairs and Food, Pralhad Joshi, mentioned that the government is considering relaxing the ban on white non-basmati rice exports, in place from July 2023.

What Is the Potential Impact of Not Lifting Export Bans?

1. **Surplus Issues:** Not lifting export bans could lead to surplus problems, as evidenced by the record 45.5 million tonnes of rice in public warehouses as of August 1, potentially causing market glut and price crashes.
2. **Farmers' Losses:** With high levels of production expected due to increased planting and favorable monsoon, farmers might face significant losses due to low market prices if export restrictions are maintained.
3. **Economic Inefficiency:** Continuation of export bans on commodities like rice, sugar, onions, and pulses contradicts the potential high yields anticipated from October-November, leading to wasted resources and economic inefficiency.

What is the government's challenge with trade policy?

1. **Bias Towards Consumers:** The policy often favors consumer interests, leading to price controls and export bans when supply is low.
2. **Cobweb Model:** This results in a cyclical problem of low supply with high prices, followed by high supply with low prices.

GS PAPER II SCIENCE AND TECHNOLOGY

Artificial Intelligence Agents

The next-generation AI assistants are called AI agents and are set to surpass their predecessors in ability as well as efficiency.

About AI Agents

- **Definition of AI Assistant:** As per Google DeepMind "An AI assistant is an artificial agent with a natural language interface. Its function is to plan and execute sequences of actions on the user's behalf across one or more domains and in line with the user's expectations."
- Example: Apple's Siri and Amazon's Alexa
- AI Agents: The next-generation AI assistants are called AI agents (AIA) and are set to surpass their predecessors in ability as well as efficiency.
- These agents can perform multiple functions as users' agents or autonomously, that is, without instructions or user intervention
- Categories of AI Agents:
 - Reactive agents: These are the first-generation AI agents developed to respond to specific inputs or commands. They follow predefined rules and perform tasks limited in scope as they cannot learn anything new and lack the ability to adapt.
 - Learning agents: They were enabled by machine learning to learn from their experiences. They have better abilities, such as pattern detection and data analysis, and can improve their performance over time.
 - Cognitive agents: They can reason, analyze, and plan. They have cognitive skills because they can learn from their environment, and adapt and make decisions based on algorithms and their own 'knowledge'.
 - These agents use techniques including natural language processing, computer vision, and deep learning to perform tasks.
 - The present generation of AIAs are cognitive agents.

Capabilities of Cognitive AIA

- Multi-Functionality: They are capable of performing a wide range of tasks both autonomously and as user agents.
- They can be integrated with the 'Internet of Things' to analyze data in real-time.
- Understanding Human Language: They can comprehend human speech and text to perform tasks that require understanding multiple domains.
- For example, they can plan a trip after listening in on a user's phone calls and reading their emails and understanding their preferences,
- Autonomous Decision-Making: Capable of making real-time decisions, such as handling items in a warehouse or driving autonomous vehicles, by integrating various data inputs and using advanced algorithms.
- Example: Bengaluru-based startup launched an AIA that could autonomously handle items in a warehouse
- A tool called Orby AI automates repetitive tasks while 4149 AI collaborates with humans inside apps like Slack and Notion to improve their productivity.

- Personalization: These agents can acquire new knowledge and tailor their responses based on user preferences and needs, enhancing personalization in services.

Challenges Posed by AIAs

- Privacy Concerns: As AIAs access and process vast amounts of personal data, protecting user privacy becomes a challenge.
- Dependency Risks: Increased reliance on AIAs may make users more vulnerable if the systems are compromised.
- Moral and Ethical Issues: AIAs can learn and adapt, potentially impacting user safety and autonomy. Their ability to exercise hindsight must align with moral principles without infringing on human creativity.
- Manipulation and Security: AIAs must be safeguarded against manipulation by malicious actors. Mechanisms should be in place to prevent compromised AIAs from harming users.
- Legal Liability: The use of AIAs raises complex legal and ethical questions about accountability and liability.

Legal Liability of AIAs

- Lack of Legal Agency: AIAs do not possess legal personhood. Hence, their actions are not distinct from those of their users in the eyes of the law.
- Liability on Creators: The responsibility for an AIA's actions typically falls on the developers or service providers. For example, a court held Air Canada liable for misinformation provided by its chatbot.
- Need for Regulation: Legal scholars argue for holding AI developers and companies to standards of liability and reasonable care, emphasising that the costs of potential risks imposed by AI should be internalised by these entities.
- Ethical Programming: It is unfair to hold users fully responsible for AIAs' actions; programmers and companies should share the blame, especially when their algorithms influence decisions.

PRELIM FACTS

1.7th Rashtriya Poshan Maah 2024

Recently, the **7th Rashtriya Poshan Maah** was inaugurated with a strong emphasis on enhancing nutrition awareness.

About Rashtriya Poshan Maah:

- The Rashtriya Poshan Maah is being celebrated during the **month of September every year**.
- It is celebrated under **POSHAN Abhiyaan (PM's Overarching Scheme for Holistic Nourishment)**, which was launched in 2018.

About POSHAN Abhiyaan:

- **Overview:** It is a flagship programme to **improve nutritional outcomes for children** under 6 years of age, **pregnant women and lactating mothers**.
- **Nodal Ministry:** Ministry of Women and Child Development (MWCD).
- **Mission Poshan 2.0 (Saksham Anganwadi and Poshan 2.0):** It has been launched as an integrated nutrition support program to strengthen **nutritional content, delivery, outreach and outcomes**.
 - It focuses on developing practices that nurture **health, wellness and immunity** to disease and malnutrition.

2. AgriSURE Fund & Krishi Nivesh Portal

Union Agriculture and Farmers' Welfare and Rural Development Minister launched **AgriSURE Fund & Krishi Nivesh Portal** recently at PUSA, New Delhi.

About Agri Fund for Start-Ups & Rural Enterprises (AgriSURE):

- **Launched:** To support **start-ups and agripreneurs** through investments in sector-specific, sector-agnostic, and debt **Alternative Investment Funds (AIFs)**, as well as direct equity **support to start-ups working in Agriculture and allied sectors**.
- **Aim:** To **foster innovation and sustainability** in India's agricultural sector through the **establishment of a Rs 750 crore Category-II Alternative Investment Fund (AIF)**.
 - The fund will offer both **equity and debt support**, specifically targeting high-risk, high-impact activities in the **agriculture value chain**.
- **Ministry:** Ministry of Agriculture & Farmers Welfare.
- **NABVENTURES**, a wholly-owned subsidiary of NABARD, will act as the **Fund manager of AgriSURE**.

About Krishi Nivesh Portal:

- **Aim:** To boost the **agriculture investment** in the country.
- **Developed:** As an Integrated, centralized **one stop Portal** for all Agri- investors to avail benefits from **various Government schemes**

3. Semiconductor Chip Manufacturing

The **Union Cabinet** has recently cleared a **semiconductor assembly and testing plant** being set up by **Kaynes Semicon** at a cost of **Rs 3,300 crore**.

Chip Manufacturing in India:

- **Chip Hub:** India has ambitions to become a major chip hub on the lines of the **United States, Taiwan and South Korea**.
- **Previous Projects:**
 - Country has approved a **fabrication plant worth \$11 billion** being set up by **Tata Electronics** in partnership with **Taiwan's Powerchip**.

- Three different chip assembly plants being set up by the **Tatas, US-based Micron Technology, and Murugappa Group's CG Power** in partnership with **Japan's Renesas**.
- **Subsidy:** Approved under India's ambitious **Rs 76,000 crore** chip manufacturing incentive scheme.

About Semiconductors:

- **Semiconductor:** it is a material that exhibits properties of both **insulators and conductors**.
- **Composition:** Typically made of **silicon**.
- **Doping Process:** The conductivity and other properties of semiconductors can be **modified by introducing impurities**.
- **Common Uses:** Integral to a wide range of products including Computers, Smartphones, Appliances, Gaming hardwares, Medical equipments etc.

4. Next-Generation Sequencing

National Institute of Animal Biotechnology (NIAB) using next generation sequencing for **genetic print of indigenous cattle**.

About Genetic Sequencing:

- **Genetic Sequencing:** It is the process of determining the **order of the four chemical building blocks**, or nucleotides, that makeup an organism's DNA.
- **Methods of Genetic Sequencing:** Includes **Sanger sequencing, Next-Generation Sequencing (NGS), and Single Molecule Real-Time (SMRT) sequencing**.

About Next-Generation Sequencing (NGS):

- **NGS:** It is a technology for determining the **sequence of DNA or RNA** to study genetic variation associated with **diseases or other biological phenomena**.
- Also known as **high-throughput sequencing**.
- **Significance:** Allow for sequencing of DNA and RNA much **more quickly and cheaply** than the previously used **Sanger sequencing**
- **Advantages of NGS:**
 - It offers **single-nucleotide resolution**, making it possible to detect related genes, allelic gene variants etc.
 - Higher **dynamic range** of signal.
 - Requires less DNA/RNA as **input**.
 - Offers higher **reproducibility**.

5. Project Bhediya

The Uttar Pradesh government launched '**Operation Bhediya**' to capture the pack of wolves that has **killed several people**.

About Operation Bhediya:

- **Objective:** To **catch wolves** that are targeting children and villagers in Uttar Pradesh's Bahraich.
- **Innovative Effort:** The forest department is using "**teddy dolls**" soaked in children's urine as a **false bait** to capture these predators.

About Indian Wolf (Canis Lupus Pallipes):

- **Description:** Intermediate in size, positioned between the **Tibetan and Arabian wolf**.
- **Habitat:** Found in areas with **scrub, grasslands, and semi-arid** pastoral agro-ecosystems.
- **Distribution:** Widely distributed from the **Indian subcontinent to Israel**.
- **Conservation Status:**
 - **IUCN:** Least Concern
 - **Wildlife (Protection) Act of 1972:** Schedule I
 - **CITES :** Appendix 1

6. Munich Agreement

The **Munich Agreement**, was an accord between Germany, France, Italy, and Great Britain, allowing Nazi Germany to annex the Sudetenland, a region in Czechoslovakia with a large ethnic German population.

- This agreement, aimed at appeasing Adolf Hitler to maintain peace in Europe, was strongly supported by British Prime Minister Neville Chamberlain.
- However, Czechoslovakia, despite being directly affected, was not a party to the negotiations and was pressured into accepting the deal.
- The Munich Agreement is widely seen as a disastrous act of appeasement that failed to prevent further aggression.
- Hitler violated the agreement within six months by invading the rest of Czechoslovakia, signalling that expansionist totalitarianism could not be placated.
- This sequence of events set the stage for World War II, which began on September 1, 1939, when Nazi Germany invaded Poland, leading Britain and France to declare war on Germany.

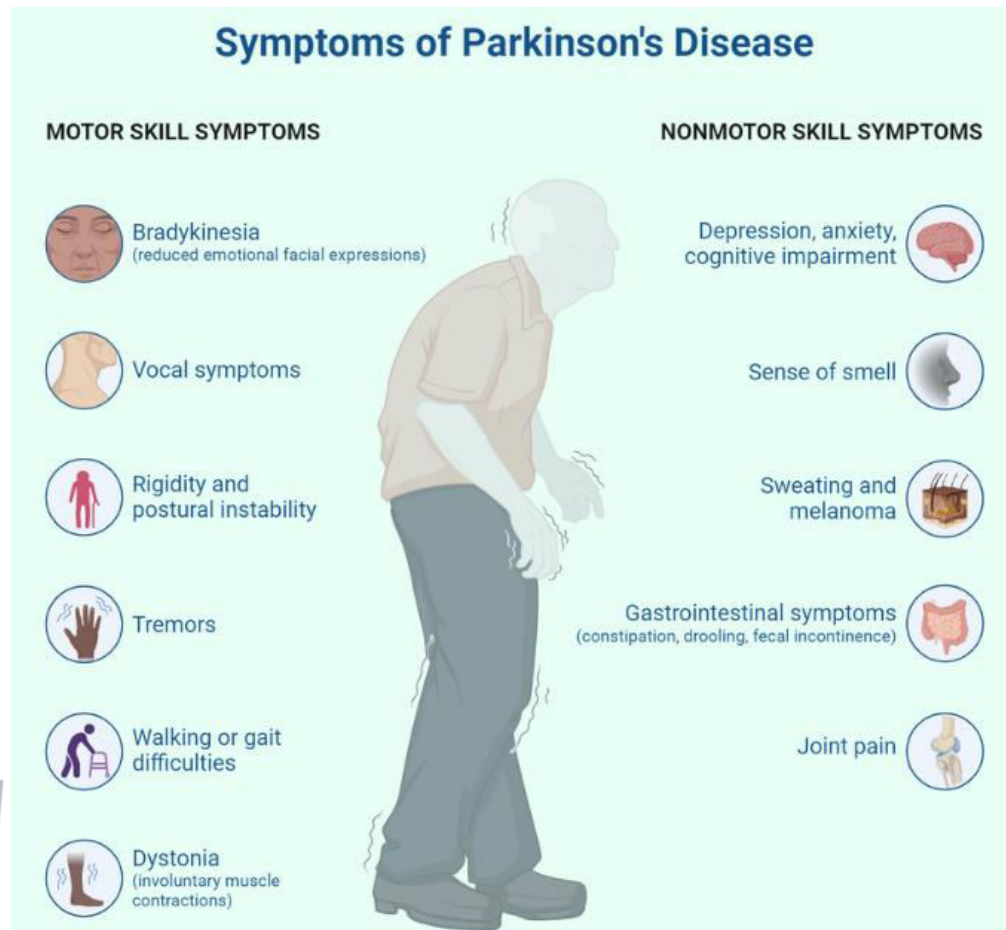
7. Mitochondria

Researchers have been studying the role of mitochondria, the cell's powerhouses, in Parkinson's disease.

- **Mitochondria** are dynamic, constantly changing in size, number, and location to meet cellular demands.
- Imbalances in mitochondrial dynamics have been linked to neurodegenerative diseases, including Parkinson's.
- The research team focused on a protein called **Drp1**, which controls mitochondrial division. Excessive Drp1 activity causes mitochondria to fragment, leading to cellular dysfunction and death.
- By reducing Drp1 activity in lab models of Parkinson's, including cell cultures and animal models, researchers were able to restore normal mitochondrial function, protect neurons from disease, and improve motor function in rats.

These findings suggest that targeting Drp1 could be a promising treatment for Parkinson's disease, and the researchers are now testing FDA-approved compounds that inhibit Drp1 as potential therapies.

Parkinson's disease, a neurodegenerative disorder characterized by the death of brain cells that control movement, leading to the disease's signature tremors. Currently, no treatments exist that can halt or slow down this cell death.



ANSWER WRITING

Q. Evaluate the impact of rejuvenating silted water bodies on India's water crisis. Discuss the associated challenges and suggest suitable measures to enhance water security in India.

With nearly 40% of India's population dependent on rain-fed agriculture, desilting water bodies presents a crucial opportunity to address the nation's water crisis. By enhancing water storage, replenishing groundwater, and boosting agricultural productivity, desilting can significantly mitigate the challenges faced by the agricultural sector. The Ministry of Jal Shakti's first-ever Water Body Census has identified over 2.3 million rural water bodies, many of which are affected by siltation.

Positive Impact of Rejuvenating Silted Water Bodies on India's Water Crisis:

- **Enhanced Water Storage Capacity:** Rejuvenating silted water bodies significantly increases their storage capacity, ensuring more water is available during dry periods, thereby **mitigating drought impacts**.
For example: The **Amrit Sarovar project** aims to revive **50,000 water bodies** across India, enhancing water availability in drought-prone regions.
- **Groundwater Replenishment:** Desilting water bodies helps recharge groundwater levels by improving **percolation rates**, which is vital for regions suffering from groundwater depletion.
For example: In **Chhatarpur, Madhya Pradesh**, rejuvenating **164 water bodies** added storage for **1.5 million litres** of water, boosting groundwater levels in 182 villages.
- **Improved Agricultural Productivity:** The **fertile silt** removed from water bodies can be used to enrich agricultural lands, improving **soil fertility** and crop yields, thus supporting farmers' livelihoods.
For example: Farmers in **Chhatarpur** used silt from desilted ponds, resulting in doubled incomes from better harvests of **tomatoes and chilies**.
- **Flood Mitigation:** Desilting enhances a water body's capacity to **absorb excess rainwater**, reducing the risk of floods in nearby areas and protecting communities and infrastructure.
For example: **Gujarat's Sujalam Sufalam Jal Abhiyan** effectively reduced flooding by increasing the storage capacity of water bodies through desilting.

- **Community Involvement and Empowerment:** Rejuvenation projects that involve local communities foster a **sense of ownership** and **responsibility**, leading to better maintenance and sustainability of water resources. **For example:** The Niti Aayog's **Aspirational District Programme** in **six states** highlighted successful community participation in water body rejuvenation, supported by local NGOs and technology platforms.

Negative Impact of Rejuvenating Silted Water Bodies on India's Water Crisis:

- **Temporary Disruption to Local Ecosystems:** Desilting activities can temporarily **disturb local aquatic ecosystems**, affecting biodiversity and water quality. **For instance:** In some parts of **Maharashtra**, desilting led to a temporary reduction in fish populations due to the disturbance of sediment layers.
- **High Initial Costs and Resources:** The desilting process requires substantial financial investment and resources, which can be a **burden** for **local communities** and **governments** without adequate support. **For example:** The **Water Body Census** by the **Ministry of Jal Shakti** identified funding constraints as a major challenge in the rejuvenation of 2.3 million water bodies.
- **Inequitable Benefits Distribution:** Benefits of desilting may not be equally distributed, with some areas receiving more attention and resources than others, leading to **regional disparities**. **For example:** In **Gujarat**, some water bodies under the **Sujalam Sufalam Jal Abhiyan** received more funding than others, causing local grievances.
- **Risk of Over-Extraction:** Improved water availability from rejuvenated water bodies could lead to over-extraction of water, threatening **long-term sustainability**. **For example:** In **Chhatarpur**, improved water storage led to increased water usage without regulation, raising concerns about future water scarcity.
- **Pollution and Contamination Risks:** Improperly managed desilting can lead to the contamination of water bodies with pollutants from **agricultural runoffs**, affecting water quality. **For example:** Many regions in **Punjab** have shown improper desilting practices leading to pesticide-laden sediments contaminating nearby water bodies.

Challenges Associated with Rejuvenating Silted Water Bodies:

- **Lack of Adequate Funding and Resources:** Ensuring sufficient financial and material resources for desilting activities is a significant challenge, particularly in underdeveloped regions. **For instance:** Niti Aayog's findings show that limited funds have constrained efforts in the **Aspirational Districts Programme**.
- **Coordination Among Multiple Stakeholders:** Effective rejuvenation requires coordination among various government bodies, NGOs, and local communities, which can be difficult to achieve. **For instance:** The **Ministry of Jal Shakti** faced challenges coordinating with local bodies during the Amrit Sarovar project implementation.
- **Sustaining Community Involvement:** Long-term success depends on maintaining community interest and involvement, which can wane over time due to **competing priorities**.
- **Technical and Logistical Issues:** Desilting large water bodies requires **specialised equipment** and **expertise**, which may not be readily available in rural areas. **For instance:** The **Water Body Census** highlighted the lack of technical expertise in some states as a barrier to effective desilting.
- **Environmental and Ecological Concerns:** Rejuvenating water bodies can have unintended environmental impacts, such as **altering local habitats** or **releasing trapped pollutants**.

Measures to Enhance Water Security in India:

- **Adopt Integrated Water Resource Management (IWRM):** Implementing IWRM can ensure **sustainable water use** by coordinating the management of water, land, and related resources across sectors. **For example:** The **Ministry of Jal Shakti's River Basin Management** approach is a step towards IWRM for holistic water management.
- **Promote Rainwater Harvesting:** Encouraging rainwater harvesting in urban and rural areas can **reduce pressure** on existing water bodies and enhance **groundwater recharge**.
- **Strengthen Legal and Regulatory Frameworks:** Developing and enforcing regulations to **prevent over-extraction** and **pollution** of water bodies is crucial for sustainable water management. **For example:** The **Environment Protection Act, 1986** provides a legal basis for protecting water bodies from pollution.
- **Enhance Community-Based Water Management:** Empowering local communities to manage water resources ensures sustainable practices and fosters a **sense of ownership** and **responsibility**. **For example:** The **Neeranchal National Watershed Project** promotes community-led water conservation and management.
- **Leverage Technology for Monitoring and Management:** Utilising technology for **real-time monitoring** of water levels, quality, and usage can help in better management and conservation of water bodies. **For example:** The **Jal Shakti Abhiyan** uses **satellite imagery** and **geospatial technology** to monitor water conservation efforts.

Rejuvenating silted water bodies is a vital strategy for addressing India's water crisis. While it offers significant benefits in terms of water storage, groundwater recharge, and agricultural productivity, the approach must be balanced with environmental considerations and sustainable practices. By integrating community involvement, technological innovation, and robust legal frameworks, India can enhance water security and build resilience against future water challenges.

MCQ

- Consider the following statements regarding Telecom industry in India:
 - Telecommunications Act 2023 provides for the prohibition of use of equipment which block telecommunication unless permitted by the Central Government.
 - Telecom Regulatory Authority of India (TRAI) consists of a chairperson and not more than two whole-time Members and not more than two part-time Members.

Which of the statements given above is/are correct?

a) 1 only b) 2 only
c) Both 1 and 2 d) Neither 1 nor 2
- Consider the following statements regarding Project NAMAN:
 - Project NAMAN is an initiative by the Indian Army to streamline pension processes for Defence Pensioners and Veterans.
 - The project relies on the SPARSH digital pension system, which is managed entirely by the Indian government without any private sector involvement.
 - Common Service Centres (CSCs) under Project NAMAN are managed by veterans or their families, ensuring community involvement in service delivery.

How many of the above statements is/are correct?

a) Only one b) **Only two**
c) All three d) None
- Consider the following statements regarding Parkinson's Disease:
 - Parkinson's disease is a common neurodegenerative disorder.
 - It can lead to immobility and dementia over time.
 - It is primarily characterised by the loss of dopamine-producing neurons in the brain.

Which of the statements given above are correct?

a) 1 and 2 only b) 1 and 3 only
c) 2 and 3 only d) **1, 2 and 3 only**
- Which one of the following statements is correct regarding the Next Generation Sequencing (NGS)?

a) **It allows the simultaneous sequencing of millions of DNA fragments, providing high-throughput and rapid sequencing capabilities.**

b) It can only sequence a single DNA molecule at a time, making it a slow and labour-intensive process.

c) It requires significantly more input DNA compared to traditional Sanger sequencing, limiting its use in clinical applications.

d) It produces results with lower accuracy and longer turnaround times compared to older sequencing methods.
- Which of the following acts established the Central Ground Water Authority (CGWA) for framing policies and programs related to groundwater management?

a) Indian Easement Act, 1882

b) National Green Tribunal Act, 2010

c) Water (Prevention and Control of Pollution) Act, 1974

d) **Environment (Protection) Act, 1986**
- Consider the following pairs:

Concepts-----Descriptions

 - Bio-Scaffolds-----Structures used to support cell growth and tissue formation
 - Bio-Banking-----Production of biological products using living cells or organisms
 - Biomarkers-----Indicators used to measure biological processes or responses
 - Bio-Manufacturing-----Storage of biological samples for research and clinical use

How many of the above pairs are correctly matched?

a) Only one pair

b) **Only two pairs**

c) Only three pairs

d) All four pairs
- Consider the following statements:
 - The Indian Constitution mandates that all proceedings in the Supreme Court and High Courts be conducted in English, unless Parliament decides otherwise.
 - The Indian Constitution allows the Chief Minister of the State to authorize the use of Hindi or another official language in the State's High Court.
 - At present, only four High Courts in India are allowed to use Hindi in their proceedings.

How many of the statements given above are correct?

a) Only one

b) **Only two**

c) All three

d) None
- Consider the following:
 - Agri Stack
 - Krishi Decision Support System (DSS)
 - Soil Profile Maps
 - Digital Crop Insurance Scheme

Which of the above are the pillars of the Digital Agriculture Mission (DAM)?

a) 1 and 3 only

b) 2, 3 and 4 only

c) 2 and 4 only

d) **1, 2 and 3 only**
- Which of the following country is not included in munirch agreement ?

a) Germany b) France

c) Italy d) **USA**
- Palaeogenomics is used to:

a) Study the genetic evolution of modern species

b) **Analyze ancient DNA to understand past evolutionary and ecological processes**

c) Develop new agricultural practices

d) Investigate the origins of human languages