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DEEPENING INDIA-US NUCLEAR COOPERATION: A NEW ERA IN BILATERAL TIES

WHY IN THE NEWS?

This development is making headlines because it marks a significant diplomatic breakthrough between India and the United States. The US has removed three key Indian institutions – Indian Rare Earths, the Indira Gandhi Atomic Research Centre (IGCAR), and the Bhabha Atomic Research Centre (BARC) – from its Entity List, a move that had long restricted collaboration between the two nations in critical scientific and technological sectors. The removal of these entities from the list signals a deeper partnership, particularly in areas like nuclear energy, clean energy technologies, and rare earth minerals, all of which are vital for global sustainability efforts. The decision opens the door for increased cooperation between India and the US in advanced research and development, fostering greater access to cutting-edge technologies that could benefit both countries, particularly in the race to address climate change and enhance green energy supply chains.

EVOLUTION OF INDIA- USA COOPERATIONS IN NUCLEAR TECHNOLOGY:

1. Indo-US Nuclear Deal (123 Agreement)

2005: U.S. President George W. Bush and Indian PM Manmohan Singh announced a joint framework for nuclear cooperation.

2006: U.S. Congress passed the Hyde Act, allowing nuclear cooperation with India.

2008: The 123 Agreement was signed, allowing India to access U.S. nuclear technology for civilian purposes, despite not signing the Non-Proliferation Treaty (NPT).

2. Membership to Global Nuclear Groupings

2008: Nuclear Suppliers Group (NSG) Waiver granted, allowing India to access nuclear materials and technology.

2016: India joined the Missile Technology Control Regime (MTCR).

2017: India became a member of the Wassenaar Arrangement for controlling arms and dual-use technology exports.

2018: India joined the Australia Group to control the spread of chemical and biological weapons.

3. Access to Nuclear Technology

Nuclear Fuel & Reactors: India gained access to civilian nuclear reactors and uranium, addressing energy needs.

Advanced Reactor Designs & Technology: Allowed access to state-of-the-art reactor designs, nuclear security, and waste management technologies.

KEY FACTS ABOUT IGCAR, BARC, AND INDIAN RARE EARTHS:

Aspect	IGCAR (Indira Gandhi Centre for Atomic Research)	BARC (Bhabha Atomic Research Centre)	Indian Rare Earths (IREL)
Establishment	1971	1954	1950
Location	Kalpakkam, Tamil Nadu, India	Mumbai, Maharashtra, India	Mumbai, Maharashtra, India
Parent Organization	Department of Atomic Energy (DAE)	Department of Atomic Energy (DAE)	Department of Atomic Energy (DAE)
Primary Focus	Nuclear research, fast breeder reactors, reactor engineering, and fuel cycle development.	Nuclear science and engineering, including reactor development and nuclear fuel cycle.	Mining, processing, and refining of rare earth minerals and metals.

Aspect	IGCAR (Indira Gandhi Centre for Atomic Research)	BARC (Bhabha Atomic Research Centre)	Indian Rare Earths (IREL)
Main Facilities	Fast Breeder Test Reactor (FBTR), KAMINI Reactor, Prototype Fast Breeder Reactor (PFBR)	Research reactors, nuclear fuel cycle, radiation processing, and research labs.	Mineral separation plants, Rare Earth Extraction Plants, REPM Plants.
Notable Achievements	Development of fast breeder reactors, reprocessing technologies, and sodium-cooled reactors.	Development of India's nuclear power reactors, fast breeder reactors, and reprocessing.	First commercial production of rare earth compounds in India.
Key Research Areas	Nuclear reactor technology, materials science, fuel reprocessing, reactor safety.	Nuclear reactor design, radiation safety, fuel cycle, and advanced nuclear technologies.	Rare earth mineral extraction, refining, and production of high-purity rare earth compounds.

KEY MILESTONES:

Year	Event	Significance
2005	India-US Joint Statement	Beginning of nuclear cooperation
2006	U.S. Hyde Act	U.S. agreed to share nuclear technology with India
2008	123 Agreement & NSG Waiver	Access to nuclear technology and materials
2016	India Joins MTCR	Access to missile and space technology
2017	India Joins Wassenaar Arrangement	Cooperation on dual-use technologies
2018	India Joins Australia Group	Control over chemical and biological weapons

YSIGNIFICANCE OF NUCLEAR COOPERATION WITH THE USA:

1. **Energy and Economic Growth:** The deal grants India access to nuclear fuel and technology, helping address its growing energy needs. It allows U.S. companies to build reactors in India, supporting plans to expand nuclear power capacity.
2. **Strategic Significance:** The deal strengthens U.S.-India relations, positioning India as a strategic partner to counterbalance China's rising influence in the Indo-Pacific. It also solidifies India's role in regional stability and counterterrorism.
3. **Nonproliferation Efforts:** India agrees to IAEA safeguards on its civilian reactors and continues its nuclear testing moratorium. Critics argue the deal undermines the NPT by enabling a non-signatory state to access nuclear technology, but proponents emphasize India's strong nonproliferation record.
4. **Impact on Global Nonproliferation:** The deal challenges the NPT's framework, as India, not an NPT signatory, gains access to nuclear technology. However, India has shown restraint in nuclear technology exports, unlike countries like Pakistan.
5. **China and Regional Dynamics:** The deal serves as a counterbalance to China, although it raises concerns about regional nuclear competition. India's expanding nuclear capabilities could influence its leverage in Asia.
6. **Nuclear Technology Transfer:** The deal allows dual-use technology, raising concerns it could aid India's weapons program, but critics note India's advanced nuclear capabilities and responsible track record.

WHY SLOW PROCESS IN NUCLEAR COOPERATION:

1. **Legal and Regulatory Hurdles:** The U.S. required congressional approval for nuclear trade with India, which took over 3 years (2005-2008). India's nuclear liability law (2010) further delayed U.S. supplier involvement.
2. **Nonproliferation Concerns:** Critics feared the deal would undermine the NPT and encourage proliferation. India's agreement to allow inspections of 14 reactors by the IAEA required extensive negotiations.
3. **Political Resistance:** The deal faced opposition in both India's Parliament (2008) and U.S. Congress, with concerns over security and sovereignty slowing progress.
4. **Technical Challenges:** The deal involved building nuclear reactors and ensuring safety standards, leading to delays in reactor construction and implementation.
5. **Geopolitical Sensitivities:** Diplomatic concerns, particularly over China's rise and Pakistan's nuclear capabilities, added complexity to the negotiations.
6. **Implementation Delays:** India's commitment to placing reactors under IAEA safeguards took years, with full implementation of safeguards expected by 2014.

WAYS TO HASTEN THE NUCLEAR TECHNOLOGY COOPERATION:

1. **Streamline Regulatory Processes:** Simplifying legal approvals and removing liability barriers can expedite cooperation.
2. **Enhance Technical Collaboration:** Strengthening joint research and development efforts can speed up nuclear technology sharing.
3. **Diplomatic Engagement:** Strengthening diplomatic ties can address geopolitical sensitivities and accelerate trust-building in the region.
4. **Faster Safeguard Implementation:** Expedited implementation of safeguards and reactors under IAEA inspections can improve transparency and speed up progress.
5. **Private Sector Involvement:** Encouraging private-sector partnerships and investments in nuclear technology can accelerate development and increase the pace of implementation.
6. **Addressing Regional Security Concerns:** Addressing security concerns, particularly with neighbouring countries, can help reduce tensions and ensure smoother cooperation.
7. **Establishing Clear, Long-Term Commitments:** Creating clear, long-term agreements and frameworks for cooperation between India and the U.S. can provide stability and reduce delays in decision-making.

CONCLUSION:

The recent diplomatic breakthrough between India and the U.S., with the removal of key Indian institutions like IGCAR, BARC, and Indian Rare Earths from the U.S. Entity List, marks a pivotal moment in their nuclear cooperation. This development not only strengthens their strategic and economic ties but also opens new avenues for collaboration in advanced technologies such as nuclear energy, clean energy, and rare earth minerals, crucial for addressing global sustainability challenges. While the progress in nuclear cooperation has been slow due to legal, geopolitical, and technical obstacles, efforts to streamline regulatory processes, enhance technical collaboration, and foster private sector involvement can hasten this partnership.

Prelims Question:

Q. With reference to the recent India-U.S. nuclear cooperation, consider the following statements:

1. The U.S. has removed key Indian institutions like IGCAR, BARC, and Indian Rare Earths from its Entity List, allowing enhanced nuclear cooperation.
2. The Indo-U.S. nuclear deal (123 Agreement) was signed in 2016, granting India access to U.S. nuclear technology.
3. The cooperation aims to address global energy needs, strengthen regional stability, and foster technological advancements in nuclear energy.

How many of the above-given statements are correct?

A. Only one

B. Only two

C. All three

D. None

Answer: B

Mains Question:

Q. Discuss the significance of the removal of Indian institutions like IGCAR, BARC, and Indian Rare Earths from the U.S. Entity List. How can India and the U.S. further accelerate their nuclear technology cooperation? (250 words, 15 marks)

THE SPEAKER: GUARDIAN OF PARLIAMENT

WHY IN THE NEWS?

Lok Sabha Speaker Om Birla's appeal for political parties to formulate an internal code of conduct for members has drawn attention during the 85th Session of the All India Presiding Officers' Conference (AIPOC) in Patna. This initiative aims to address concerns over the decline in decorum within legislative bodies and the reduction in legislative sittings. Birla emphasized the importance of leveraging digital technologies, AI, and social media to enhance legislative operations, particularly through platforms like the National e-Vidhan application. He also highlighted the goal of realizing the One Nation, One Legislative Platform by 2025. The conference, attended by over 300 delegates, seeks to promote better functioning and modernization of legislative bodies in India.

THE OFFICE OF THE SPEAKER:

1. Constitutional provisions:

The office of the Speaker of the Lok Sabha is established under the Constitution of India. The primary constitutional provisions relating to the Speaker are found in Article 93 and other related provisions:

Article 93: This article deals with the election of the Speaker and Deputy Speaker of the Lok Sabha. It stipulates that the Lok Sabha must elect a Speaker and a Deputy Speaker as soon as it convenes after its first meeting following the general elections.

Article 94: This article outlines the conditions under which the Speaker can vacate office, including resignation or removal through a resolution passed by a majority of the Lok Sabha.

Article 95: Deals with the role of the Deputy Speaker in the absence of the Speaker.

Article 105: This article provides for the privileges and powers of members of Parliament, including the Speaker, who has the authority to maintain order and discipline in the House.

Article 100: Concerns the proceedings of the Lok Sabha, including how voting is conducted, which the Speaker oversees.

2. Background and Origin of the Office

The office of the Speaker of the Lok Sabha has its origins in the British colonial era, and its evolution reflects the growing demands for legislative independence and democratic representation in India.

1. **Pre-Independence Era:** The Government of India Act of 1919 (Montague-Chelmsford Reforms) created the positions of President and Deputy President of the Legislative Assembly (now the Lok Sabha). These officials were the precursors to the modern-day Speaker and Deputy Speaker. In the Government of India Act of 1935, the titles were changed to Speaker and Deputy Speaker, aligning them with the British parliamentary system.
2. **Post-Independence:** The first Speaker of independent India was GV Mavalankar, who served from 1952 to 1956. He helped set the foundation for the role and function of the Speaker in the newly-formed Lok Sabha.
3. **Constitutional Role:** The office was formally institutionalized in the Constitution of India when it was adopted in 1950, giving the Speaker a central role in maintaining the legislative processes and the integrity of the parliamentary system in India

3. Independence of the Office

1. **Security of Tenure:** The Speaker's tenure is tied to the life of the Lok Sabha, typically lasting for five years unless the Lok Sabha is dissolved earlier. The Speaker cannot be easily removed or displaced, providing security of tenure to ensure their independence.

2. **Removal Process:** The Speaker can only be removed by a resolution passed by a majority of the Lok Sabha members. This ensures that the Speaker's removal is a democratic process and requires broad support within the House. The Speaker can also resign voluntarily by submitting their resignation to the Deputy Speaker.
3. **Impartiality:** The Speaker must act impartially, even though they are typically from the ruling party. Once elected, the Speaker is expected to rise above party politics and ensure fair treatment of all members of the Lok Sabha. The Speaker's conduct cannot be criticized or discussed in the Lok Sabha unless through a substantive motion, ensuring they are shielded from partisan attacks.
4. **Casting Vote:** The Speaker's casting vote is used only in the event of a tie during voting. This decision is made impartially, and the Speaker does not use their vote to influence outcomes unless necessary to break a deadlock.
5. **Salary and Benefits:** The Speaker's salary and allowances are fixed by Parliament and are paid from the Consolidated Fund of India, ensuring the Speaker's financial independence from external influences.

ROLE OF SPEAKER IN PARLIAMENTARY PROCEEDING:

1. **Presiding Over Sessions:** The Speaker chairs the Lok Sabha sessions, ensuring orderly debates and maintaining decorum.
2. **Ruling on Points of Order:** The Speaker is the final authority on points of order, clarifying procedural matters during debates.
3. **Impartiality:** The Speaker must act neutrally, treating all members equally, regardless of party affiliation.
4. **Casting Vote:** In case of a tie-in voting, the Speaker casts a deciding vote to break the deadlock.
5. **Certifying Money Bills:** The Speaker certifies Money Bills, ensuring they follow special procedures and are introduced only in the Lok Sabha.
6. **Disqualifying Members:** The Speaker decides on the disqualification of members under the Anti-Defection Law (Tenth Schedule).
7. **Referring Bills to Committees:** The Speaker refers bills to committees for detailed review and appoints committee chairpersons.
8. **Representing the Lok Sabha:** The Speaker acts as the spokesperson for the Lok Sabha in external matters and formal events.

ISSUES WITH THE OFFICE OF THE SPEAKER:

1. **Partisanship:** The Speaker is sometimes seen as biased toward the ruling party, compromising impartiality.
2. **Use of Discretion:** Criticism arises when the Speaker's discretion in decisions like disqualification or time allocation appears arbitrary or biased.
3. **Lack of Transparency:** The decision-making process, especially on disqualification or bill certification, can seem non-transparent.
4. **Delayed Decisions on Disqualification:** Delays in deciding on disqualification cases, particularly under the Anti-Defection Law, affect the integrity of the House.
5. **Handling of Disruptions:** The Speaker's response to disruptions and disorderly conduct can sometimes be insufficient.
6. **Judicial Review:** The Supreme Court has intervened in the Speaker's decisions, indicating concerns about impartiality.
7. **Perception of Weakness:** The Speaker is sometimes viewed as ineffective in managing disruptions or ensuring smooth proceedings.
8. **Political Pressures:** The office may be influenced by political pressures, affecting the Speaker's independence.

SUGGESTION TO STRENGTHEN THE OFFICE OF THE SPEAKER:

1. **Independent Selection Process:** Ensure a transparent, neutral election process for the Speaker to reduce political bias.
2. **Clearer Disqualification Rules:** Establish transparent, timely procedures for disqualification under the Anti-Defection Law.

3. **Judicial Oversight:** Allow limited judicial review of the Speaker's decisions to improve accountability.
4. **Better Handling of Disruptions:** Implement stronger guidelines for managing disruptions and maintaining order in the House.
5. **Training and Capacity Building:** Provide regular training for the Speaker to enhance impartiality and procedural knowledge.
6. **Conflict-of-Interest Framework:** Establish policies to prevent partisan influence on the Speaker's decisions.
7. **Transparency in Decision-Making:** Improve communication of the Speaker's rulings to enhance public trust.
8. **Active Role in Committees:** Empower the Speaker to ensure parliamentary committees function impartially and efficiently.

CONCLUSION:

The Speaker of the Lok Sabha is vital for maintaining order and impartiality in parliamentary proceedings, as outlined in the Constitution of India (Articles 93-100). Originating from the British era, the office was formalized post-independence. However, it faces challenges such as partisanship, lack of transparency, delayed decisions, and political pressures, which undermine its neutrality. To strengthen the office, suggestions include an independent selection process, clearer disqualification rules, judicial oversight, and better management of disruptions. These reforms would ensure that the Speaker can function more impartially and efficiently, fostering better governance. Speaker Om Birla's recent appeal for political parties to adopt codes of conduct and leverage digital tools emphasizes the need for modernization and accountability in the role.

PRELIMS QUESTION:

Q. With reference to the office of the Speaker of the Lok Sabha, consider the following statements:

1. The Speaker is elected by the members of the Rajya Sabha, not the Lok Sabha.
2. The Speaker has the authority to certify Money Bills before they are presented to the President.
3. The Speaker's tenure is tied to the life of the Lok Sabha, typically lasting five years unless the Lok Sabha is dissolved earlier.

How many of the above-given statements are correct?

A. Only one

B. Only two

C. All three

D. None

Answer: B

Mains Question:

Q. Critically examine the role of the Speaker of the Lok Sabha in ensuring the impartial functioning of the House and suggest measures to strengthen the office. (250 words, 15 marks)

EMPOWERING THE INFORMAL SECTOR: ADVANCING SOCIAL SECURITY AND FORMALIZATION

WHY IN THE NEWS?

The international seminar hosted by the Ministry of Labour and Employment, Government of India, and the Employees' State Insurance Corporation (ESIC), in collaboration with the International Social Security Association (ISSA), has made significant waves in the news. This two-day event, held at Yashobhoomi in New Delhi, brought together over 200 participants, including policymakers, social security experts, and representatives from Asia Pacific countries. The focus of the seminar on "Formalization and Social Security Coverage for Workers in the Informal Sector" underscored the urgent need for inclusive, sustainable, and equitable social security solutions, especially for vulnerable groups.

INFORMAL SECTOR IN INDIA:

1. Rural vs. Urban Informal Sector

Rural Areas: 80% of informal sector workers are employed, primarily in agriculture and small businesses.

Urban Areas: 60-70% of urban workers are in informal jobs, including street vending, construction, and small retail.

2. Male vs. Female Participation

Male Workers: Approx. 75% of informal sector workers are men engaged in construction, manufacturing, and transportation.

Female Workers: Around 25% of informal workers are women, often in domestic work, agriculture, and small-scale services, facing challenges like lower wages and less security.

WHAT IS THE INFORMAL SECTOR VS THE FORMAL SECTOR?

Aspect	Formal Sector	Informal Sector
Employment	Written contract between employer and employee	No formal contract; informal employment arrangements
Regulation	Heavily regulated by the government	Minimal to no government regulation or oversight
Organization	Well-organized, larger businesses, structured work environments	Unstructured, small enterprises, often family-run, low capital
Rights	Workers have legal rights (social security, paid leave, etc.)	Workers have limited or no legal rights or social protection
Taxation	Subject to income tax and other government taxes	Limited or no taxation, often off-the-books
Job Security	Better job security with clear employment terms	Job security is low, and often unstable work
Examples	Large corporations, government jobs, banks, etc.	Street vendors, casual labour, black market, the gig economy
Legal Protections	Workers are protected by labour laws	Workers are not protected by labor laws

3. Regional Disparities

Southern States: Higher formalization, yet informal employment remains significant (e.g., Kerala, Tamil Nadu).

Northern & Eastern States: Higher reliance on the informal sector, especially in agriculture (e.g., Bihar, UP).

Western States: The informal sector is diversified with trade, manufacturing, and construction (e.g., Maharashtra, Gujarat).

4. Contribution to GDP

The informal sector contributes 50-60% to India's GDP.

Agriculture: 17-18% of GDP, with informal workers.

Services and Construction: Significant informal workforce contributions.

IMPORTANCE OF THE INFORMAL SECTOR:

1. **Employment:** Provides millions of jobs, especially to those without job security, playing a vital role in supporting vulnerable populations.
2. **Poverty Reduction:** Offers a crucial income source, particularly in rural and underserved areas, helping reduce poverty.
3. **Skill Development:** Enables individuals to gain practical skills, which can lead to transitioning into the formal economy or self-employment.
4. **Contribution to GDP:** In regions like Asia and Sub-Saharan Africa, the informal sector contributes significantly to GDP, especially in agriculture-based economies.
5. **Flexibility:** Offers flexible work hours, making it ideal for those with caregiving or other personal responsibilities.
6. **Entrepreneurship:** Encourages small-scale entrepreneurship and innovation, addressing local market needs.
7. **Resilience:** Acts as a safety net during economic downturns, offering adaptable work opportunities when formal employment declines.

GOVT. INITIATIVE TO FORMALIZE THE INFORMAL SECTOR:

1. **E-Shram Portal:** Aimed at registering unorganized sector workers for social security benefits. Over 280 million workers have registered, offering access to insurance, job opportunities, and welfare.
2. **Labour Codes:** Four consolidated laws, Wages, Industrial Relations, Social Security, and Safety, aim to simplify labour laws, ensuring fair wages and better welfare for workers while promoting business growth.
3. **Pradhan Mantri Shram Yogi Maan-dhan (PM-SYM):** A pension scheme for unorganized workers (18-40 years) with incomes below ₹15,000. It offers a ₹3,000/month pension after 60. Over 50 lakh workers enrolled.
4. **PM SVANidhi (Micro Credit for Street Vendors):** Provides micro-loans (up to ₹10,000) to street vendors to restart businesses post-COVID. Over 30 lakh vendors benefited.
5. **PM Kisan Samman Nidhi (PM-KISAN):** Direct income support of ₹6,000/year for small farmers. Over 12 crore farmers are beneficiaries.
6. **World Bank Support:** The World Bank supports India's informal workforce (90% of total workers) through loans and projects aimed at financial inclusion, social security, and improved livelihoods. Over $1 billion was allocated to these initiatives.

ISSUES IN THE INFORMAL SECTOR:

1. **Female Disadvantage:** Women dominate the informal sector but face lower wages, income instability, and a lack of social safety nets, contributing to a decline in female labour force participation (21.2% in 2021).
2. **Lack of Legal Protections:** Informal jobs lack written contracts, paid leave, and minimum wage enforcement. The 2019 Wage Code has limited impact, with some jobs excluded from its scope.
3. **Tax Evasion and Data Gaps:** Informal businesses often evade taxes, and the lack of accurate economic data hinders effective policy and regulation.
4. **Poor Working Conditions:** Long hours, especially in agriculture, and the absence of guidelines contribute to poor working conditions in the informal sector.
5. **Poverty and Vulnerability:** Informal workers are more likely to be poor, with low wages affecting their nutrition and health. They are also highly vulnerable to natural disasters and lack social security support.

WAY FORWARD:

1. **Relaxation of Restrictions:** Relax restrictions on informal businesses to encourage formalization, benefiting both businesses and their employees.

2. **Self-Help Groups:** Form self-help groups to empower informal workers, foster self-sufficiency, and address issues related to working conditions.
3. **National Data System:** Establish a comprehensive statistical database on the informal economy to aid policymakers in making informed decisions.
4. **Vendor Rights and Accountability:** Grant vendors space vending rights to improve accountability for their surroundings. Provide vendor licenses in exchange for fees, which could boost local government revenue and fund public amenities (e.g., water, restrooms, waste collection).
5. **Grievance Redressal:** Implement transparent, officially regulated grievance procedures to regularly address and resolve issues faced by informal workers.
6. **Equal Pay for Women Workers:** Enforce the principle of equal pay for equal work (Article 39(d)), ensuring women farm labourers receive the same pay as their male counterparts through legislative support.

CONCLUSION:

The informal sector is vital to India's economy, offering significant employment and contributing to GDP. However, it faces challenges such as poor working conditions, lack of social security, and gender inequality. Government initiatives like the E-Shram Portal and PM-SYM have helped improve financial inclusion and social protection for informal workers. To fully address these issues, a comprehensive approach is needed. This includes relaxing restrictions to encourage formalization, supporting self-help groups, enhancing data collection, and ensuring equal pay for women. Strengthening grievance redressal systems and granting vendors space rights can further improve working conditions. These steps will help create a more inclusive and equitable environment for informal workers, fostering sustainable economic growth.

Prelims Question:

Q. Which of the following initiatives is aimed at registering unorganized sector workers for social security benefits?

A. PM Kisan Samman Nidhi

B. E-Shram Portal

C. Pradhan Mantri Shram Yogi Maan-dhan

D. PM SVANidhi

Answer: B

Mains Question:

Q. Discuss the government's initiatives to address these challenges and the way forward for formalizing the informal sector.

(250 words, 15 marks)

INDIAN COFFEE BREWS GLOBAL DEMAND

WHY IN THE NEWS?

India's coffee exports are surging on robust global demand, reaching a record $1.29 billion in FY 2023-24, nearly double the $719.42 million achieved in 2020-21. This surge is driven by a growing international appetite for India's unique coffee flavours, with major markets like Italy, Belgium, and Russia leading the demand. While unroasted Arabica and Robusta beans dominate exports, rising demand for value-added products like roasted and instant coffee presents significant growth opportunities for the Indian coffee industry. Moreover, the domestic market is witnessing a surge in coffee consumption, fueled by the rise of cafe culture, increased disposable incomes, and a shift in consumer preferences towards coffee over tea.

COFFEE IN INDIA:

COFFEE PRODUCTIONS:

Climate and Environmental Conditions for Coffee Growth

Factor	Description
Temperature	Ideal range: 73–82 °F (23–28 °C). No variety tolerates temperatures near 32 °F (0 °C). High temperatures during flowering can reduce bean size.
Rainfall	Requires 60–80 inches (1,500–2,000 mm) annually. Low rainfall and cool temps during the growing season can result in small beans. High rainfall and low temps during harvest can lead to bean defects.
Humidity	High humidity promotes diseases and pests.
Sunlight	Requires some shade, especially in hotter climates.
Altitude	Arabica grows best at elevations of 2,000–6,500 ft (600–2,000 m).
Soil	Physical and chemical soil characteristics are critical for healthy growth.
Wind	Wind can negatively affect coffee plants.
Topography	The landscape and landform impact coffee plant growth.
Climate Change	Rising temperatures and unpredictable rainfall patterns can reduce yields, create smaller beans, and increase vulnerability to pests.

COFFEE BOARD OF INDIA (CBOI):

Aspect	Description
Establishment	Constituted under Section 4 of the Coffee Act, 1942.
Composition	The Board comprises 33 Members, including the Chairperson.
Headquarters	Located in Bengaluru, Karnataka, India.
Powers	Authority to regulate and promote coffee production and export. The ability to provide financial assistance to growers. Power to conduct research and implement welfare measures for labourers.
Functions	**Research & Development**: Focus on improving coffee quality and productivity. **Promotion**: Promote coffee within India and abroad. **Extension**: Provide training and skill development to coffee growers. **Welfare Measures**: Ensure better working conditions for labourers in coffee plantations. **Market Intelligence**: Gather data to assist in marketing and export strategies. **Export Promotion**: Enhance India's coffee exports globally.

FACTORS FOR THE HIGH DEMAND FOR INDIAN COFFEE:

1. **Quality:** Indian coffee, especially Arabica, is valued for its mild, aromatic flavour. In 2020, India produced about 5.4 million 60-kg bags, with Arabica being a key contributor.
2. **Unique Flavors:** India produces varieties like Arabica, Robusta, and Monsooned Malabar. The Monsooned Malabar, processed by a unique method, is particularly popular in Europe.
3. **Sustainable Practices:** Over 20% of India's coffee is organic, aligning with global demand for eco-friendly products.
4. **Global Recognition:** India is the 8th largest coffee exporter, with over 4.1 million 60-kg bags exported in 2020, mainly to the US, Italy, and Germany.

5. **Growing Coffee Culture:** India's coffee market grows by 15-20% annually, driven by expanding café culture, especially in cities like Bengaluru and Mumbai.

6. **Competitive Pricing:** Indian Robusta is 30-40% cheaper than other global sources, making it attractive to international buyers.

7. **Export Strength:** India exports 70% Robusta and 30% Arabica, with major markets in the US, Russia, and Italy.

8. **Ideal Climate:** Coffee is grown in regions like Karnataka and Kerala, where conditions (altitude of 600-1,200 meters) are perfect for both Arabica and Robusta.

ISSUES GRAPPLED WITH COFFEE PRODUCTION IN INDIA:

1. **Climate Change and Unpredictable Weather:** Erratic rainfall, rising temperatures, and extreme weather events like droughts and floods disrupt coffee flowering and fruit maturation, leading to reduced yield and quality.

2. **Pests and Diseases:** Coffee is susceptible to pests (e.g., coffee berry borer) and diseases (e.g., coffee leaf rust), affecting crop health and reducing quality. Effective pest management is costly and challenging, particularly for small farmers.

3. **Labor Shortage and High Costs:** Coffee farming requires manual labour for tasks like harvesting, but there is a shortage of skilled labour, and labour costs are rising. This can lead to delays in harvesting and affect bean quality.

4. **Inadequate Infrastructure:** Poor transportation and storage facilities in coffee-growing regions delay the movement of harvested coffee, affecting quality. Lack of proper storage also leads to quality degradation post-harvest.

5. **Water Scarcity and Irrigation Issues:** Coffee needs consistent water, and in areas with unreliable irrigation, water stress during critical growth stages affects yield and quality.

6. **High Input Costs and Low Profits:** The cost of seeds, fertilizers, and labour is high, while global price volatility leads to uncertain income, squeezing profit margins for farmers.

7. **Limited Access to Modern Technology:** Adoption of modern farming practices and machinery is limited, leading to inefficiencies and lower productivity, especially for small-scale farmers.

8. **Aging Plantations:** Older coffee plantations lead to declining yields and quality. Replanting new trees is costly and requires long-term investment.

9. **Post-Harvest Losses:** Improper drying, storage, and processing of beans result in quality loss and reduced market value.

10. **Market and Price Instability:** Fluctuating global coffee prices make it difficult for farmers to predict their income, often resulting in financial instability.

WAY FORWARD:

1. **Awareness:** Educating farmers through training and workshops equips them with skills in pest control, disease management, and harvesting techniques, enabling informed decision-making and sustainable practices.

2. **Research:** Investing in research helps identify innovative solutions, such as disease-resistant varieties and improved farming techniques, addressing key farming challenges.

3. **Financial Support:** Access to credit and resources enables farmers to invest in equipment, inputs, and technology, enhancing productivity and helping to tackle challenges effectively.

4. **Government Support:** Government policies, subsidies, and research funding play a crucial role in supporting farmers and promoting sustainable coffee farming practices.

CONCLUSION:

India's coffee industry is growing, with record exports driven by global demand for unique varieties. Challenges like climate change, pests, labour shortages, and infrastructure issues affect productivity and quality. To address these, India needs to focus on educating farmers, investing in research, providing financial support, and implementing government policies. These efforts will help farmers adapt to challenges, boost productivity, and sustain growth, reinforcing India's position as a top coffee exporter and growing domestic market.

PRELIMS QUESTION:

Q. Consider the following statements:

1. India is the largest producer of coffee in the world.
2. The Coffee Board of India was established in 1942 under the Coffee Act.
3. Coffee is predominantly grown in the southern states of India, especially Karnataka, Kerala, and Tamil Nadu.

How many of the statements given above are correct?

A. Only one

B. Only two

C. All three

D. None

Answer: B

Mains Question:

Q. Discuss the importance of value-added coffee products like roasted and instant coffee for India's export potential. What measures can India take to capitalize on this emerging opportunity?

(250 words, 15 marks)

INDIA'S DEEP OCEAN MISSION GAINS MOMENTUM

WHY IN THE NEWS?

India's ambitious plan to launch its first human underwater submersible has been making headlines recently, as it marks a significant milestone in the country's scientific and technological progress. Union Minister Dr Jitendra Singh announced that this submersible, which will initially operate at a depth of 500 meters and eventually reach up to 6,000 meters, positions India among just a few nations with the capability to undertake such an advanced underwater exploration mission. The announcement is part of India's "Deep Ocean Mission" (DOM), a flagship initiative aimed at tapping into the vast resources of the ocean, including rare minerals and undiscovered marine biodiversity, which could boost the nation's economic growth and sustainability efforts. The mission also aligns with India's broader ambitions, such as the Gaganyaan space mission, showcasing the country's growing capabilities in both space and ocean exploration.

INDIAN DEEP OCEAN MISSION:

1. Launch Day:

Launch Date: The mission was formally approved in 2021 by the Cabinet Committee on Economic Affairs (CCEA). Specific details about the official launch day of individual components, such as the manned submersible, are still being planned, with the submersible's deployment expected to occur in phases.

Phase 1 (2021-2024): The first phase of the mission focuses on foundational research, technology development, and pilot projects with an estimated budget of Rs. 2,823 crore.

2. Basic Facts:

Total Budget: The Deep Ocean Mission has a total estimated cost of Rs. 4,077 crore over a 5-year period (2021-2026).

Coastal Significance for India: India has a coastline of 7,517 km and is home to 9 coastal states and 1,382 islands. Approximately 30% of India's population lives in coastal areas, making the ocean crucial for economic activities like fisheries, aquaculture, tourism, and maritime trade.

UN Decade of Ocean Science: The United Nations declared 2021-2030 as the Decade of Ocean Science for Sustainable Development, emphasizing the global importance of ocean exploration and sustainability.

Technological Innovation: The mission will focus on indigenizing deep-sea technologies that are currently not commercially available and will foster technological advancements through collaboration with institutions and private sectors.

Aspect	Details
Established	1994 under UNCLOS (1982)
Legal Foundation	Part XI of UNCLOS – Governs the international seabed as the "common heritage of all mankind"
Headquarters	Kingston, Jamaica
Membership	167 member states and the European Union (EU)
Mission	Regulate seabed mineral exploration and exploitation; protect the marine environment
Key Governing Bodies	Assembly, Council, Secretary-General (Secretariat)
Primary Resource Focus	Polymetallic nodules in the Clarion-Clipperton Zone (Pacific Ocean)

OBJECTIVES OF DEEP OCEAN MISSION:

1. **Development of Deep-Sea Mining Technologies:** Create technologies for mining deep-sea resources, such as Polymetallic nodules from the Central Indian Ocean at a depth of 5500 meters.
2. **Design of Manned Submersible:** Develop a working prototype and a final manned submersible capable of reaching 6000 meters depth, along with technologies for underwater vehicles and robotics.
3. **Climate Change Projections:** Provide predictions on trends in sea level, cyclone intensity, storm surges, wind waves, and impacts on fishery ecosystems in the North Indian Ocean under climate change scenarios.
4. **Deep-Sea Biodiversity and DNA Bank:** Conduct systematic sampling using Remotely Operated Vehicles (ROVs) to create a DNA bank and archive specimens of deep-sea fauna from the Northern Indian Ocean.

5. **Microbial Research and Biomolecule Screening:** Develop technologies to isolate piezotolerant and piezophilic microbes from the deep sea and screen for novel biomolecules through culture-based and metagenomic approaches.

6. **Exploring Hydrothermal Sulphide Mineralization:** Explore potential sites for multi-metal hydrothermal sulphides along the Indian Ocean's mid-oceanic ridges for future resource exploitation.

7. **Acquisition of Multidisciplinary Research Vessel:** Acquire a new all-weather, multidisciplinary research vessel for operations in the Indian Ocean to support deep-ocean exploration and research.

8. **Offshore OTEC Desalination and Marine Research Integration:** Develop an engineering design for an offshore Ocean Thermal Energy Conversion (OTEC) powered desalination plant and integrate research in marine biology, ecology, and marine engineering through an advanced Marine Station for Ocean Biology.

COMPONENTS OF DEEP OCEAN MISSION:

1. **Manned Submersible & Deep-Sea Mining:** Development of a manned submersible for 6000m depth and an Integrated Mining System for extracting Polymetallic Nodules from the Central Indian Ocean.

2. **Ocean Climate Change Advisory:** Creation of models and observations to predict climate variables like sea level rise and cyclone intensity on seasonal to decadal timescales.

3. **Public Awareness:** Promote knowledge about Earth system science and the achievements of the Ministry of Earth Sciences (MoES) among the public and academic communities.

4. **Deep-Sea Biodiversity Innovation:** Focus on bio-prospecting deep-sea species and microbes for sustainable use and resource conservation.

5. **Deep Ocean Survey:** Identify sites for multi-metal hydrothermal sulphides along the Indian Ocean mid-oceanic ridges.

6. **Ocean Energy & Freshwater:** Design an OTEC-powered desalination plant for offshore energy generation and freshwater production.

7. **Marine Biology Station:** Establish an advanced research station for ocean biology to foster industrial applications and start-up innovations.

8. **Blue Economy Support:** Drive initiatives in marine fisheries, coastal tourism, offshore energy, and marine biology through mission components.

SIGNIFICANCE OF DEEP OCEAN MISSION:

1. **Advancing Science:** Enhances understanding of deep-ocean ecosystems and biodiversity.

2. **Resource Exploration:** Supports the exploration of deep-sea minerals like Polymetallic Nodules for future resource needs.

3. **Blue Economy Growth:** Boosts sustainable use of ocean resources in sectors like fisheries, biotechnology, and offshore energy.

4. **Climate Change Research:** Provides critical data for understanding and mitigating the impacts of climate change, especially in coastal areas.
5. **Technological Innovation:** Develop advanced technologies such as manned submersibles and desalination plants.
6. **Conservation:** Promotes sustainable use and conservation of deep-sea biodiversity.
7. **Global Leadership:** Positions India as a leader in marine science and ocean governance.
8. **Economic Growth:** Generates jobs, fosters technological advancements, and supports India's blue economy.

CONCERN REGARDING DEEP OCEAN MISSION:

1. **Environmental Impact:** Deep-sea mining and exploration could harm fragile ecosystems and biodiversity.
2. **Sustainability:** Resource extraction, like mining Polymetallic Nodules, may not be sustainable long-term.
3. **Technology and Safety:** Operating submersibles and robots at 6000m depth present safety and equipment challenges.
4. **Regulatory Oversight:** Concerns about international regulations for managing deep-sea activities and preventing environmental harm.
5. **Ethical Issues:** Exploitation: Deep-sea species for commercial use raises ethical concerns.
6. **Climate Change:** Deep-sea operations could unintentionally disrupt oceanic carbon sinks.
7. **Cost and Funding:** High financial costs for technology development and environmental monitoring may strain resources.

WAY TO MAKE DEEP OCEAN MISSION SUSTAINABLE:

1. **Environmental Safeguards:** Establish strict environmental monitoring and impact assessments to minimize damage to ocean ecosystems, including biodiversity protection and habitat conservation.
2. **Regulation and Governance:** Strengthen collaboration with international bodies like the International Seabed Authority (ISA) to ensure that deep-sea mining and exploration activities follow responsible and sustainable practices.
3. **Technological Innovation:** Focus on developing eco-friendly technologies for mining, exploration, and resource extraction that reduce environmental footprints, such as non-invasive mining methods and sustainable energy solutions.
4. **Circular Economy:** Promote a circular economy approach by ensuring that resources extracted are used efficiently and waste is minimized or recycled, reducing overall environmental impact.
5. **Biodiversity Conservation:** Prioritize bio-prospecting and research on deep-sea species in a way that ensures sustainable use of marine life and maintains ecosystem balance.
6. **Scientific Collaboration:** Foster partnerships with global scientific communities to share data, expertise, and resources, ensuring best practices are followed and minimizing risks to marine environments.
7. **Sustainable Resource Management:** Set up clear limits on the amount of minerals that can be extracted and ensure that resources are used for long-term benefits rather than short-term exploitation.
8. **Community and Stakeholder Engagement:** Engage with local coastal communities and other stakeholders to understand their concerns, share knowledge, and ensure the benefits of the mission are equitably distributed.

CONCLUSIONS:

The Deep Ocean Mission (DOM) represents a significant leap forward in India's scientific and technological capabilities, aiming to tap into the vast

resources of the ocean for sustainable economic growth. By developing cutting-edge technologies such as manned submersibles and deep-sea mining systems, India is positioning itself as a global leader in marine science and ocean governance. The mission aligns with broader national goals like the Blue Economy, supporting sectors like fisheries, offshore energy, and biotechnology. While the mission holds immense potential for economic growth and environmental sustainability, it also brings concerns regarding environmental impact, resource sustainability, and regulatory oversight.

Prelims Question:

Q. With reference to the Deep Ocean Mission (DOM), which of the following is/are correct?

1. The mission aims to develop a manned submersible capable of reaching depths of 6,000 meters.
2. The mission's total budget is estimated at Rs. 4,077 crore for a 10-year period.

Select the correct answer using the code given below:

A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: A

MAINS QUESTION:

Q. Discuss the objectives, significance, and challenges associated with India's Deep Ocean Mission (DOM). How can India ensure that the mission remains sustainable in the long run?

(250 words, 15 marks)

SUKANYA SAMRIDDHI YOJANA: A DECADE OF TRANSFORMING LIVES

WHY IN THE NEWS?

The Sukanya Samriddhi Yojana (SSY), launched on 22nd January 2015 by Prime Minister Narendra Modi under the Beti Bachao, Beti Padhao campaign, recently marked its 10th anniversary on 22nd January 2025. This milestone highlights the scheme's role in promoting financial security and social empowerment for young girls across India. Over the past decade, the SSY has encouraged families to invest in their daughters' futures, fostering a culture of inclusion, progress, and empowerment and reinforcing the government's commitment to nurturing the dreams and aspirations of millions of girls nationwide.

KEY FACTS ABOUT THE SUKANYA SAMRIDDHI YOJANA (SSY)

Objective: A Government of India-backed savings scheme aimed at encouraging parents to save for the future education and welfare of their girl child.

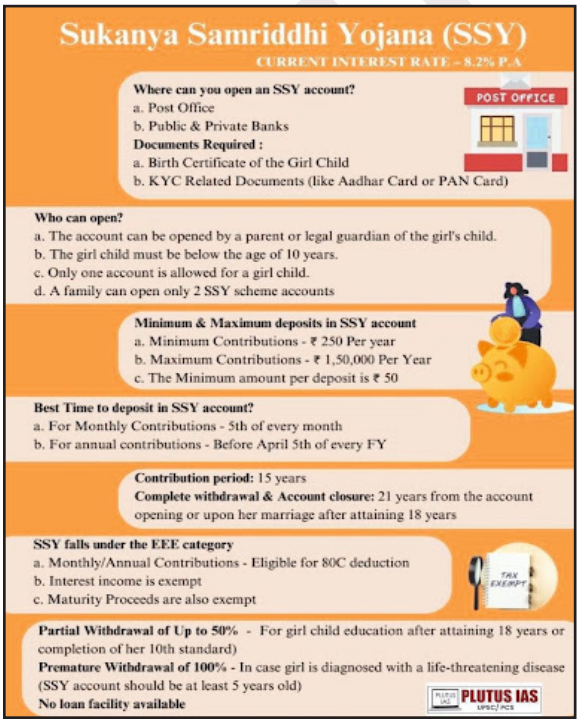
Launch Date: Launched on 22 January 2015 by Prime Minister Narendra Modi under the Beti Bachao, Beti Padhao campaign in Panipat, Haryana.

Account Opening: Accounts can be opened at any India Post office or authorised commercial bank branch.

Eligibility: A parent or legal guardian can open an account for a girl child aged below 10 years.

Interest Rate: Initially set at 9.1% (2015) and revised to 9.2% in March 2015 for FY2015-16. The current interest rate (as of January–March 2024) is 8.2%, compounded annually.

HOW SUKANYA SAMRIDDHI YOJANA WORKS?



KEY ACHIEVEMENTS OF SUKANYA SAMRIDDHI YOJANA (SSY):

Increased Girl Child Education: The scheme has contributed to increased girl child education by providing a dedicated financial resource for their future studies. According to the National Sample Survey Office (NSSO), the female literacy rate in India has steadily increased, reaching 70.3% in 2021-22.

Financial Empowerment of Girls: By providing a substantial corpus upon maturity, SSY empowers girls with financial independence, enabling them to pursue higher education, start a business, or make other life choices.

Positive Impact on Gender Equality: By promoting girl child education and financial security, SSY contributes to breaking gender stereotypes and empowering girls within society. This can lead to increased female participation in the workforce, improved decision-making power within households, and greater social and economic equality.

Attractive Interest Rates: SSY has consistently offered competitive interest rates, making it an attractive investment option for parents seeking to secure their daughters' future.

Tax Benefits: Tax benefits have undoubtedly played a crucial role in attracting investors to the scheme.

Wide Accessibility: The availability of SSY accounts at post offices and banks across India ensures widespread accessibility, making it easier for families in both urban and rural areas to enrol their daughters.

Social Awareness: The SSY scheme has raised awareness about the importance of investing in the future of girl children, promoting a positive shift in societal attitudes towards girls' education and empowerment.

CHALLENGES FACED BY THE SCHEME

Deep-rooted Cultural Norms: Societal preferences for male children are deeply ingrained, especially

in regions with skewed sex ratios. India's Child Sex Ratio (CSR) dropped from 945 in 1991 to 918 in 2011, reflecting the extent of the challenge.

Limited Awareness: Surveys indicate that only 53% of the rural population knows the scheme. Limited media outreach and ineffective communication strategies in certain regions hinder awareness.

Implementation Gaps: Reports from the CAG (Comptroller and Auditor General) revealed that 78.91% of funds allocated for the BBBP scheme (as of 2020) were spent on media campaigns rather than on-ground activities.

Lack of Proper Documentation: Many families, especially in rural and tribal areas, lack essential documents such as birth certificates and Aadhaar, making it challenging to access scheme benefits.

Child Marriage: Child marriage remains a prevalent issue, especially in rural and tribal communities. As per the National Family Health Survey (NFHS-5), about 23.3% of women aged 20–24 were married before the legal age of 18.

Low Penetration in Northeast India: Due to geographical and infrastructural challenges, the scheme has limited reach in the northeastern states.

Challenges for Tribal and Dalit Children: Tribal and Dalit girls face multiple layers of marginalisation due to caste-based and socioeconomic discrimination. Lack of access to quality education and entrenched biases hinder their participation in the scheme.

Socioeconomic Barriers: Over 22% of India's population lives below the poverty line, making gender equality in education a lower priority for struggling families. Female literacy remains lower than male literacy; as of 2021, the female literacy rate was 70.3%, compared to 84.7% for males.

RECOMMENDATIONS TO IMPROVE THE SSY SCHEME PERFORMANCE:

Increased Awareness: Conduct focused campaigns in areas with low SSY penetration, emphasising its benefits for girls' empowerment. Moreover, using digital platforms can improve awareness among the target group.

Process simplification: Facilitate online account opening to reduce paperwork and time spent at banks and post offices. Develop a user-friendly mobile app for account management, tracking deposits, and accessing information.

Enhanced Incentives: To make SSY more attractive compared to other savings options, consider offering slightly higher interest rates. Explore additional tax benefits for SSY contributions to incentivise parents to invest more.

Financial Literacy: Integrate financial literacy education into school curriculums to teach children about savings and investment.

Collaboration with NGOs: Collaborate with women's empowerment and child development NGOs to promote SSY and support beneficiaries.

Integration with Other Schemes: Link the SSY scheme with programs like Beti Bachao Beti Padhao for a holistic approach to girl child empowerment. Collaborate with educational initiatives to encourage families to save for girls' education.

CONCLUSION

The Sukanya Samriddhi Yojana is a transformative and forward-thinking initiative to safeguard the future of young girls in India. By instilling financial discipline among families and emphasising the critical importance of education and empowerment, the scheme has become a cornerstone for fostering social progress. The increasing number of account openings showcases this program's growing awareness and acceptance, reflecting a positive shift in societal attitudes towards gender equity. As India continues pursuing inclusive growth, the Sukanya Samriddhi Yojana ensures that every girl is empowered to dream, excel, and thrive within a nurturing and equitable environment.

Prelims Question:

Q. In the context of the Sukanya Samriddhi Yojana, which of the following statements is/are correct?

1. The Sukanya Samriddhi Yojana primarily focuses on financial support for the girl child within a specific age limit.
2. The Ministry of Women and Child Development implements the Sukanya Samriddhi Yojana.
3. The Sukanya Samriddhi Yojana allows premature withdrawal of money in cases.

Select the correct answer using the code given below:

A. 1 and 2 only

B. 2 and 3 only

C. 1 and 3 only

D. 1, 2 and 3

ANSWER: C

MAINS QUESTION:

Q. Discuss the objectives, achievements, and challenges of the Sukanya Samriddhi Yojana. Suggest measures to improve its implementation.

(Answer in 250 words)

INDIA'S HEALTH CARE: TRANSFORMING HEALTHCARE THROUGH DIGITALIZATION

WHY IN THE NEWS?

India's healthcare sector is undergoing a digital transformation driven by government initiatives, policy reforms, and technological advancements. With a growing population and rising healthcare demands, digital health solutions are enhancing accessibility, affordability, and efficiency. Key technologies like telemedicine, electronic health records (EHRs), and AI-driven diagnostics are helping bridge the gap between urban and rural services. The World Economic Forum highlights India's potential to lead globally in digital health, with a focus on public-private partnerships, interoperability, and strong data governance. Initiatives like the Ayushman Bharat Digital Mission (ABDM) and the Digital Health Incentive Scheme (DHIS) are paving the way for a resilient digital healthcare ecosystem and could set a global benchmark.

WORLD ECONOMIC FORUM APPRAISAL:

India's healthcare landscape is undergoing a digital transformation driven by government initiatives, policy reforms, and technological advancements. With a rapidly growing population and increasing demand for quality healthcare, digital health solutions are playing a crucial role in enhancing accessibility, affordability, and efficiency. Digital healthcare infrastructure in India is evolving to bridge the gap between urban and rural healthcare services, leveraging telemedicine, electronic health records (EHRs), and artificial intelligence (AI)-driven diagnostics. The recent World Economic Forum (WEF) article highlights India's potential to become a global leader in digital health by building a resilient digital health ecosystem. The report emphasizes the role of public-private partnerships, the importance of interoperability, and the need for robust data governance frameworks. It underscores how India's initiatives, such as the Ayushman Bharat Digital Mission (ABDM) and the Digital Health Incentive Scheme (DHIS), can set a global benchmark for digital healthcare transformation.

DIGITAL HEALTH INITIATIVES:

1. Ayushman Bharat Digital Mission (ABDM): The Ayushman Bharat Digital Mission (ABDM) aims to create a digital health ecosystem in India, connecting healthcare providers and patients via unique health IDs. Key features include:

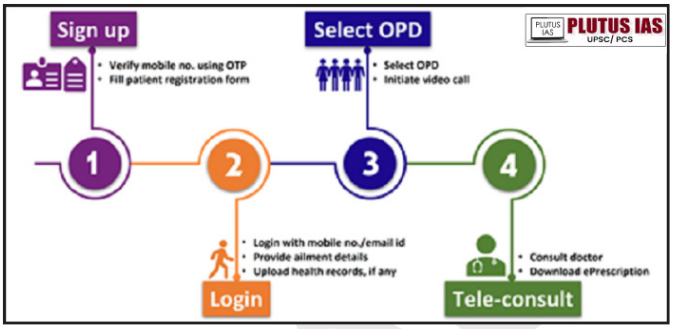
Health ID: A unique ID to store and share medical records.

Healthcare Professionals Registry (HPR): A database of registered healthcare professionals.

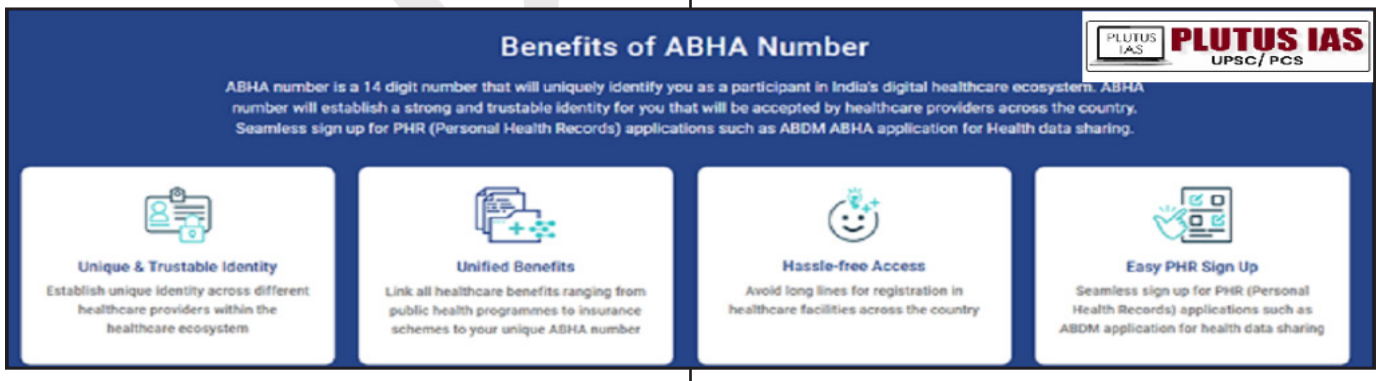
Health Facility Registry (HFR): A repository of healthcare facilities.

Unified Health Interface (UHI): A platform for digital health services.

Over 200,000 Ayushman Arogya Mandirs provide early diagnosis for diseases like cancer, hypertension, and diabetes. As of January 2025, 73 crore ABHA accounts have been created, with 49.15% women beneficiaries. The mission also facilitates offline account creation in areas with limited connectivity. A collaboration with IIT Kanpur will leverage AI for healthcare research, while the Digital Health Incentive Scheme (DHIS) offers financial rewards to healthcare providers adopting digital solutions, promoting a paperless healthcare system.



3. U-Win Portal: This platform is dedicated to digitizing vaccination services for pregnant women and children. It provides features like self-registration, automated alerts, and e-vaccination certificates and even allows users to create Ayushman Bharat Health Account IDs for themselves and their children.



2. Telemedicine and e-Sanjeevani: The e-Sanjeevani platform offers remote doctor consultations with two main modules: OPD (doctor-to-patient consultations) and AB-HWC (connecting remote Health and Wellness Centers with specialist doctors). This is particularly beneficial in rural or underserved areas.

4. Aarogya Setu App: Initially developed for COVID-19 tracking, this app has evolved into a broader digital health service platform. It integrates various services like scheduling doctor appointments, receiving prescriptions, downloading vaccination certificates, and managing digital health records.

5. e-Hospital: Part of the Digital India initiative, this platform is a hospital management system for both patients and healthcare providers. It integrates services like blood bank management and hospital registrations, making healthcare more accessible online.

6. National Tele Mental Health Programme (Tele MANAS): Launched in 2022, this program aims to improve access to mental health services through teleconsultations, with more than 17.6 lakh calls handled as of January 2025.

KEY POLICIES SHAPING DIGITAL HEALTH CARE:

1. National Health Policy (NHP) 2017: Focuses on using digital technologies like electronic health records and telemedicine to improve healthcare accessibility and efficiency, especially in rural and underserved areas.

2. National Health Mission (NHM): Supports health infrastructure and human resources, aiming to improve access to quality healthcare for marginalized and rural populations. It provides technical and financial assistance to states for strengthening public healthcare systems.

3. Health Data Management Policy: Ensures privacy, security, and governance of digital health records, with strict protocols for patient consent, data anonymization, and secure data exchange across stakeholders.

4. National Digital Health Mission (NDHM): Aims to provide universal health coverage through a digital infrastructure, including Health IDs, Digi Doctor repositories, Health Facility Registers, and Personal Health Records. It focuses on interoperability, cybersecurity, and data exchange to ensure a secure and accessible healthcare ecosystem.

5. Pradhan Mantri Ayushman Bharat Health Infrastructure Mission (PM-ABHIM): Strengthens primary, secondary, and tertiary healthcare

infrastructure, integrating digital health technologies to enhance service delivery, research, and emergency response capacities. It's the largest public health infrastructure initiative since 2005.

CONCERNS REGARDING DIGITAL HEALTH CARE:

1. **Data Privacy & Security:** The increasing use of digital health records raises risks of breaches and misuse despite policies in place to ensure data protection.
2. **Digital Divide:** Rural areas still struggle with limited internet access and digital literacy, preventing full adoption of digital health services.
3. **Interoperability:** Achieving seamless integration across various health systems (e.g., Health IDs, EMRs) is a major challenge, hindering data exchange and continuity of care.
4. **Regulation & Accountability:** Clear regulations are needed for AI-driven diagnostics and telemedicine to ensure quality care and patient safety.
5. **Healthcare Worker Training:** Ongoing training for healthcare professionals is crucial to effectively use digital tools, preventing errors in patient care.
6. **Ethical Concerns:** AI in healthcare raises questions around transparency, biases, and informed consent, potentially impacting patient outcomes.
7. **Sustainability & Funding:** Maintaining and scaling digital health infrastructure requires continuous investment and resources to stay up to date.

WAY FORWARD:

1. **Strengthening Data Security & Privacy:** Ensure strict compliance with data protection regulations and continually update security measures to safeguard health data. Implement advanced encryption and blockchain technologies to enhance security and maintain patient trust.
2. **Bridging the Digital Divide:** Increase investments in digital infrastructure, especially in rural and underserved areas, to ensure that everyone can access digital health services. Provide training programs to improve digital literacy among healthcare workers and the general population.
3. **Achieving Interoperability:** Promote standardized frameworks for data exchange across health systems. Ensure seamless integration between digital health services like Health IDs, EHRs, and telemedicine platforms to facilitate smooth and efficient healthcare delivery.
4. **Establishing Clear Regulations:** Develop comprehensive regulatory frameworks for AI-driven healthcare technologies and telemedicine, ensuring quality standards and accountability. Create transparent guidelines for AI usage and ensure consistent monitoring to guarantee patient safety.
5. **Healthcare Worker Training & Support:** Implement continuous training programs for healthcare professionals to effectively use digital tools and stay updated on new technologies. Provide ongoing technical support and education to ensure the proper utilization of digital health services.
6. **Addressing Ethical Issues in AI:** Develop ethical guidelines for AI usage in healthcare, ensuring transparency, fairness, and accountability in AI-driven decision-making. Conduct regular audits of AI systems to prevent biases and ensure equitable treatment for all patients.
7. **Sustainable Investment & Funding:** Ensure sustained government and private sector investments to expand and maintain digital health infrastructure. Explore innovative funding models like public-private partnerships (PPP) to ensure the long-term sustainability of digital health solutions.

CONCLUSIONS

India's digital healthcare transformation holds immense potential to enhance healthcare accessibility

and efficiency. With continued policy support, infrastructure development, and public-private collaborations, the country is poised to emerge as a global leader in digital health. Future focus areas include AI-driven diagnostics, blockchain-based health records, and enhanced cybersecurity frameworks. The Indian government's proactive approach toward digital healthcare infrastructure and policies is shaping a more efficient and accessible healthcare system. With growing investments in digital health and technological advancements, India's healthcare system is expected to evolve into a globally recognized model for digital transformation, setting benchmarks for other developing nations.

PRELIMS QUESTION:

1. **Q. With reference to the Ayushman Bharat Digital Mission (ABDM), consider the following statements:**

1. The ABDM aims to create a nationwide digital health ecosystem by connecting healthcare providers and patients through unique health IDs.
2. ABDM provides for the integration of AI technologies to improve the quality of healthcare services and outcomes.
3. The mission aims to provide only online consultation services, excluding physical healthcare infrastructure improvements.

How many of the above-given statements are correct?

A. Only one

B. Only two

C. All three

D. None

Answer: B

Mains Question:

Q. India's digital healthcare transformation is reshaping accessibility, efficiency, and affordability in the sector. Critically analyze the key initiatives driving this change, their potential challenges, and the way forward for ensuring a sustainable and equitable digital healthcare ecosystem.

(250 words, 15 marks)