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Foreword

Officers Pulse-In Depth provides detailed analyses of significant articles from a variety of sources including **The Hindu, Indian Express, Business Standard, Yojana, Kurukshetra, Down to Earth, and others.** These insights are extremely valuable for UPSC CSE Mains preparation. To ensure comprehensive preparation for both Prelims & Mains, we recommend studying **Officers Pulse-In depth** along with **Officers Pulse-Digest**.

Note: The keywords provided in the blue box below are crucial for Mains. They highlight essential themes and terminologies that can enhance the quality of answers.

Sample:

KEY WORDS

- **Monetary Policy Committee (MPC)** – Six-member RBI body deciding repo-rate to maintain inflation target ($4 \pm 2\%$).
- **Core Inflation** – Inflation rate excluding food and fuel, showing underlying price trends.
- **Headline Inflation** – Overall inflation measured by Consumer Price Index (CPI).
- **Tolerance Band** – Permissible inflation range around RBI's target for policy flexibility.
- **Section 45ZN, RBI Act 1934** – Mandates RBI to explain causes and remedies if inflation exceeds target for three quarters.
- **Fiscal-Monetary Coordination** – Synchronization of government spending and RBI policy for macro stability.
- **Financial Inclusion** – Ensuring affordable access to financial services for all sections, esp. vulnerable groups.

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1) Public Interest Litigation: A Tool for Social Justice and Its Distortions

GS Paper II (Constitution, Judiciary, Judicial Activism, Social Justice, Governance, Transparency & Accountability, Protection of Vulnerable Sections).

Introduction

Public Interest Litigation (PIL) is an important change in the judiciary that relaxes the traditional rule of *locus standi*, allowing public-spirited individuals or organizations to approach the court on behalf of poor or marginalized people, or to protect wider public interests.

It started in the late **1970s** through the efforts of **Justice V.R. Krishna Iyer and Justice P.N. Bhagwati**. PIL has developed into a strong tool of judicial activism and social justice. Although there is no specific law for PIL, its working has been developed and improved through court decisions and guidelines given by the Supreme Court.

Significance of PIL in India

- **Protecting Fundamental Rights:** It has expanded the scope of constitutional protection, enabling "**public-spirited citizens**" to enforce the **fundamental rights** of those who cannot approach the courts themselves.
- **Easy Access to Courts:** *S.P. Gupta vs. Union of India (1981)* revolutionized judicial access by relaxing *locus standi*, allowing individuals to invoke the jurisdiction of the **Supreme Court (Article 32)** or **High Courts (Article 226)** on behalf of those suffering from social or economic disabilities.
- **Court Taking Action on Its Own:** Enables *Suo motu cognizance*, allowing courts to act on issues of public importance without a formal complainant.
- **Protecting Environment through PIL:** Landmark cases like *M.C. Mehta vs. Union of India (1987)* established the "**absolute liability**" principle, while *Rural Litigation and Entitlement Kendra (RLEK) vs. State of Uttar Pradesh (1985)* recognized a healthy environment as an integral part of the right to life under **Article 21**.
- **Helping Poor and Weak People:** The *Bandhua Mukti Morcha vs. Union of India (1984)* case was a turning point in fighting the **exploitation of bonded laborers**, marking the first PIL filed by an NGO and leading to the release and compensation of workers.
- **Quick Justice for Prisoners:** *Hussainara Khatoon vs. State of Bihar (1979)* recognized speedy justice as a **fundamental right for under-trial prisoners**, highlighting the inhuman conditions of prisons.
- **Protecting Women at Workplace:** The *Vishaka Guidelines (1997)* addressed sexual harassment at the workplace, eventually leading to the **Sexual Harassment of Women at Workplace Act, 2013**.
- **Making Institutions Transparent:** The *Office of the Chief Justice of India Case (2019)* brought the judiciary itself under the ambit of the RTI Act, strengthening transparency.
- **Fair Legal Rights and Custody Protection:** *People's Union for Civil Liberties vs. Union of India (1997)* highlighted the right to legal aid and dignity in custody.
- **Support for Poor and Oppressed:** In *Mumbai Kamagar Sabha vs. Abdul Thai (1976)*, it was said that PIL is an important support to the normal court system. It helps the courts work for poor and oppressed people, so that justice is not only for the rich but for everyone.

Challenges and Issues

- **Misuse of PILs:** Often used for political gains or publicity ("Publicity Interest Litigation") rather than genuine social welfare.

- **Judicial Interference in Other Branches:** The judiciary occasionally enters the domain of the Executive or Legislature, violating the principle of separation of powers.
- **Case Backlog:** Many PIL cases increase the workload of courts, making the justice system overloaded.
- **Lack of Implementation:** Court decisions are often not properly followed or enforced by government officials.
- **Delays in PIL Cases:** PIL cases take a long time to be decided, which reduces their usefulness for urgent public issues.
- **Resource Intensive:** PIL cases need a lot of time, research, and investigation, which puts extra pressure on the courts.
- **Lack of Expertise:** Courts may sometimes lack the technical expertise required to adjudicate complex socio-economic or scientific policy matters.
- **Different Views of Public Interest:** Different courts may understand “public interest” differently, which can lead to unequal or inconsistent decisions.
- **Weak Screening of PILs:** Poor checking of petitions allows misuse of PILs for personal or wrong motives.
- **Pressure on Government Work:** Frequent court intervention can slow down government decisions and create delays in policy-making.

Way Forward

- **Strict Screening of PILs:** Courts should strictly verify the petitioner's credentials and motives before admitting a PIL, as per the Supreme Court's 2003 guidelines.
- **Impose Penalties:** Courts should discourage false or useless PILs by giving heavy fines to people who misuse the system.
- **Clear Rules for PILs:** Every High Court should have proper and uniform rules for PILs to ensure fairness, transparency, and consistency.
- **Balance of Power:** The judiciary should follow self-restraint and not interfere in the work of the legislature or executive, to maintain the separation of powers.
- **Expert Help in Cases:** For difficult technical or scientific issues, courts should take help from experts or appoint special committees to make better decisions.

Conclusion

Public Interest Litigation has clearly been a major change in the Indian legal system. It has made the judiciary a protector of weak and vulnerable people and a support for social justice. Even though there are real concerns like misuse and judicial overreach, PIL is still a very important tool for ensuring accountability. A proper balance is needed where courts stay active in protecting rights but do not interfere too much with the work of the legislature and executive, so that the importance of PIL is maintained in the future.

KEY WORDS

- **Locus Standi** - The legal right of a person to approach a court; PIL relaxes this requirement.
- **Suo Motu Cognizance** - Action taken by a court on its own without a formal petition.
- **Judicial Overreach** - Excessive judicial intervention into the domain of the Executive or Legislature.
- **Amicus Curiae** - A court-appointed expert who assists the court in complex matters.

UPSC PYQ

- *Explain the reasons for the growth of Public Interest Litigation in India. As a result of it, has the Indian Supreme Court emerged as the world's most powerful judiciary? (2024)*

2) Right to Information (RTI) Act, 2005: Empowering Citizens for Transparency and Accountability

GS Paper II (Important aspects of governance, transparency and accountability, e-governance- applications, models, successes, limitations, and potential; citizens charters, transparency & accountability and institutional and other measures).

Introduction

The Right to Information Act, 2005 is one of India's most significant transparency and accountability laws. It came into force on **12 October 2005** and, as of **2026, has completed over 20 years** of implementation. The Act empowers every citizen to seek information from public authorities, making governance more open, participatory, and accountable. It gives practical effect to the fundamental right to freedom of speech and expression under **Article 19(1)(a)** by recognizing the citizen's right to know, thereby strengthening democratic governance and combating corruption.

Importance of the RTI Act

- **Constitutional Right:** The Supreme Court in *Raj Narain v. State of Uttar Pradesh (1976)* declared the right to information a fundamental right under **Article 19(1)(a)**.
- **Government Accountability:** It transforms the relationship between the state and the people by making government officials answerable for their actions.
- **Anti-Corruption:** Enables public scrutiny of government decisions and processes, serving as a deterrent against corrupt practices.
- **Empowering Citizens:** Allows individuals to seek information that directly affects their lives, rights, and access to services.
- **Proactive Disclosure:** It mandates that public authorities must publish organizational details, budgets, and decisions, reducing the need for individual requests.
- **Judicial Transparency:** Landmark judgments like the *Office of the Chief Justice of India Case (2019)* brought the judiciary under the ambit of RTI, enhancing institutional accountability.
- **Financial Transparency:** The *RBI vs Jayantilal Mistry (2015)* judgment established that bank inspection reports could be disclosed to ensure transparency in financial institutions.
- **Fair Elections:** The *Association for Democratic Reforms (ADR) v. Union of India (2013)* case mandated the disclosure of criminal records of electoral candidates.
- **Right in Education:** The *CBSE vs Aditya Bandopadhyay (2011)* judgment granted students the right to access their evaluated answer sheets.
- **Better Administration:** It improves internal government decision-making by ensuring that information is managed and shared more openly within the administrative system.

Challenges in Implementation

- **Staff Shortage in Information Commissions:** Many Central and State Information Commissions (CICs and SICs) remain understaffed or operate without heads, leading to severe administrative inefficiency.
- **Weak Punishment System:** Penalties for **Public Information Officers (PIOs)** are rarely imposed, with fines applied in only about **2% of eligible cases**.
- **Poor Transparency:** Inconsistent implementation of Section 4 (proactive disclosure) and the failure of many commissions to publish **annual reports** hinder oversight.
- **Low Public Awareness:** Awareness is significantly low among marginalized groups and rural populations, with **only 48%** of dissatisfied citizens knowing how to file an appeal.

- **Administrative Barriers:** Mandatory **user guides (Section 26)** are often missing, and submission channels are frequently limited or inconvenient.
- **Poor Record Management:** Inadequate systems for organizing and retrieving government documents frequently delay the processing of RTI requests.
- **Quality of Information:** Lack of training for PIOs often results in the delivery of incomplete or unclear information to applicants.
- **Reduced Independence of Information Commissioners:** The **RTI Amendment Act 2019** allows the central government to decide the tenure and salaries of commissioners, which is criticized for reducing their independence and working freedom.
- **Data Privacy Conflict:** The **Digital Personal Data Protection (DPDP) Act, 2023**, weakened the "larger public interest" override in **Section 8(1)(j)**, potentially shielding public servants from accountability.
- **Security Risks:** RTI activists frequently face intimidation, harassment, or physical violence when attempting to expose corruption or mismanagement.

Way Forward

- **Fill Vacancies:** Expedite the appointment of Chief Information Commissioners and Information Commissioners to clear backlogs and restore functional capacity.
- **Strict Action:** Apply penalties properly on officers who delay or wrongly reject RTI requests.
- **Digital Improvement:** Improve online systems and record-keeping for faster and easier RTI access.
- **Create Awareness:** Launch massive awareness campaigns specifically aimed at rural areas and marginalized communities to educate them on their rights and appeal procedures.
- **Protect RTI Users:** Establish legal and physical protection measures for RTI activists so they can work without fear of threats or harm.

Conclusion

The RTI Act, 2005 remains an essential pillar of Indian democracy, providing the necessary framework for a transparent and responsive government. While it has achieved significant milestones in empowering citizens and exposing systemic inefficiencies, the current challenges ranging from administrative apathy to legislative dilution necessitate urgent reforms. By strengthening the autonomy of Information Commissions and prioritizing the safety of those who hold power to account, India can ensure that the right to information remains a potent weapon against corruption and a catalyst for inclusive governance.

KEY WORDS

- **Public Information Officer (PIO)** – The designated official responsible for receiving and responding to RTI applications.
- **Central Information Commission (CIC)** – The apex body that hears appeals and complaints related to RTI matters at the Central Government level.
- **State Information Commission (SIC)** – The state-level authority that adjudicates RTI appeals and complaints.
- **Proactive Disclosure** – Mandatory publication of key information by public authorities without waiting for RTI requests.
- **Digital Personal Data Protection (DPDP) Act, 2023** – A law governing personal data protection that may affect disclosure of information under RTI in certain cases.

3) Alternative Dispute Resolution (ADR) Mechanisms in India

GS Paper II (Separation of powers between various organs, dispute redressal mechanisms and institutions).

Introduction

Alternative Dispute Resolution (ADR) comprises non-adversarial processes such as arbitration, mediation, and conciliation designed to resolve disputes outside the traditional courtroom. By offering faster, cost-effective, and cooperative pathways to justice, ADR serves as a critical mechanism for reducing the judicial backlog and fostering a stable, investor-friendly environment in India.

Need for ADR

- ADR is needed to reduce **court burden, case pendency, delays in justice delivery, and high litigation costs**, while ensuring **faster, cheaper, and more accessible justice**.
- **Arbitration** is a formal and **binding process** where an independent arbitrator delivers a final decision, governed by the **Arbitration and Conciliation Act, 1996**.
- **Mediation** is a voluntary process where a neutral mediator helps parties reach a mutually acceptable settlement, governed by the **Mediation Act, 2023**.
- **Conciliation** is a more active process where the conciliator suggests possible solutions to help parties settle disputes, governed by the **Arbitration and Conciliation Act, 1996**.
- **Negotiation** is an informal process where parties directly communicate to resolve disputes without any third party, and it is **not governed by a specific statute**.
- **Lok Adalat**, established under the **Legal Services Authorities Act, 1987**, resolves disputes through **speedy compromise and settlement**, ensuring affordable justice.
- **Online Dispute Resolution (ODR)** uses **digital platforms and technology** for resolving disputes efficiently and is supported under the **Consumer Protection Act, 2019** and India's evolving ADR framework.
- ADR is applicable to a wide range of cases such as **commercial disputes** (high-value business conflicts, cross-border transactions, infrastructure and financial contracts), **family and matrimonial matters** (divorce, child custody, and property division), **consumer disputes** (e-commerce, banking, insurance grievances), **employment and labour disputes**, **property and land disputes**, and **public utility service disputes** (such as electricity, transport, water supply, and hospitals, especially through Permanent Lok Adalats).
- ADR is accessible to **corporates, MSMEs under the MSMED Act, 2006, common citizens, government departments, and economically weaker sections receiving free legal aid under the Legal Services Authorities Act, 1987**.

Challenges in ADR Implementation

- **Lack of Infrastructure:** India has limited ADR centres, and **Section 89 of the CPC** is underutilized. Only **2–5%** of eligible cases are referred to mediation (Vidhi Centre), while **NITI Aayog (2021)** highlighted inadequate ODR infrastructure.
- **Enforcement Issues:** Arbitral awards face delays due to court challenges. The **World Bank (2020)** reported that contract enforcement takes around **1,445 days** and costs **31%** of the claim value.
- **Litigation Mindset:** Preference for court litigation limits ADR adoption. The government accounts for nearly **46–50%** of pending cases, reinforcing an adversarial legal culture.
- **Lack of Skilled Experts:** India faces a shortage of trained arbitrators and mediators. The **Justice B.N. Srikrishna Committee (2017)** stressed the need for standardized training and accreditation.

- **Lengthy and Costly Arbitration:** Despite **Section 29A**, many commercial arbitrations still take **2–3 years or more**, increasing costs.
- **Delay in ADR Proceedings:** ADR is sometimes misused to delay litigation. Around **17%** of mediation referrals fail before commencement, mainly due to the **non-appearance of parties** (Vidhi Centre).
- **Lack of Trust in Mediators:** Before the **Mediation Act, 2023**, private mediation settlements lacked direct enforceability. However, court-annexed mediation recorded a **68% settlement rate** (MCPC, 2019–20).
- **Lack of Awareness:** Low legal and digital awareness limits ADR adoption, while subordinate courts continue to face over **4.6–4.7 crore pending cases**.
- **Absence of Uniform Standards:** Lack of uniform accreditation for ADR professionals led to the proposal of the **Arbitration Council of India (ACI)** under the **2019 Arbitration Amendment Act**.
- **High Cost of ADR Institutions:** Institutional arbitration remains costly for MSMEs and individuals. The **MSME Samadhaan Portal** has received **over 2.56 lakh delayed-payment applications** involving claims of **over ₹55,244 crore**, highlighting the need for affordable dispute resolution. Additionally, delayed payments to MSMEs across the economy are estimated at **around ₹8.1 lakh crore**.

Way Forward

- **Better ADR Infrastructure:** Create a robust network of accredited ADR centers and fully implement the structures envisioned in the Mediation Act, 2023.
- **Public Awareness & Education:** ADR should be included in legal education, and awareness campaigns should be conducted to reduce dependence on court cases.
- **Stronger Rules for Mediators:** Strengthen the regulatory framework for neutrals by ensuring standardized training and enforcing a strict, ethical code of conduct.
- **Faster Processes:** Introduce quick resolution methods and punish those who misuse ADR to delay cases.
- **International Cooperation:** Work with other countries (like BRICS nations) to share good practices and improve online dispute resolution systems.

Conclusion

Alternative Dispute Resolution is an essential pillar of India's vision for a modern, accessible, and efficient justice system. The adoption of the 2026 BRICS Declaration marks a significant step in institutionalizing mediation and arbitration through global cooperation and capacity building. By addressing infrastructure gaps, standardizing training, and embracing digital innovation, India can successfully transition toward a culture of consensus, ensuring that ADR serves as the primary and preferred mechanism for resolving disputes.

KEY WORDS

- **Alternative Dispute Resolution (ADR)** – Methods of resolving disputes outside traditional courts through consensual and less adversarial processes.
- **Online Dispute Resolution (ODR)** – Use of digital technology and online platforms to resolve disputes remotely.
- **UNCITRAL Model Law** – A model legal framework developed by the United Nations to harmonize international commercial arbitration laws.
- **Permanent Lok Adalat** – A statutory body that resolves disputes related to public utility services such as transport, electricity, and water supply.
- **MSME** – Micro, Small and Medium Enterprises that receive special protection under the MSMED Act, 2006 for payment-related disputes.

UPSC PYQ

- What are the major changes brought in the Arbitration and Conciliation Act, 1996 through the recent Ordinance promulgated by the President? How far will it improve India's dispute resolution mechanism? Discuss. **(2015)**

4) REFORMS IN WORLD HEALTH ORGANIZATION

GS II Effect of Policies & Politics of Developed & Developing Countries on India's Interests, Bilateral, Regional & Global Groupings & Agreements Involving India and/or Affecting India's Interests

Background

The World Health Organization (WHO), a specialized agency of the **United Nations**, is responsible for coordinating international **public health, setting global health standards, and responding to health emergencies**. However, in recent years, growing global health challenges have underscored the need for reforms to make the organization more effective, transparent, and responsive. In this context, the **79th World Health Assembly** brought together member states to discuss a comprehensive overhaul of global health governance and **to reshape the global health architecture**, with a focus on strengthening **pandemic prevention** and preparedness, streamlining emergency response mechanisms, and advancing negotiations on the **WHO Pandemic Agreement**.

- The WHO is the United Nations' specialized health agency and is mandated to coordinate the world's response to global health threats.
- **Membership:** 194 member states grouped into 6 regions (Africa, Americas, Eastern Mediterranean, Europe, South-East Asia, and Western Pacific).
- **World Health Assembly (WHA):** WHO's highest level decision-making forum, is held annually in Geneva, Switzerland.

Role of the World Health Organization (WHO)

- **Global Health Governance:** WHO coordinates global health responses among 194 countries through the World Health Assembly (WHA). It enforces International Health Regulations (IHR) and can declare a Public Health Emergency of International Concern (PHEIC).
- **Standards and Guidelines:** It sets global health norms to ensure safe medical practices. Key tools include the Model List of Essential Medicines and the Prequalification Programme for vaccines and medicines.
- **Disease Control and Eradication:** WHO leads global efforts against diseases like smallpox (eradicated in 1980) and polio (reduced by over 99%), and supports malaria elimination strategies.
- **Health Systems and UHC:** It helps countries build strong health systems and achieve Universal Health Coverage (UHC) through support in financing, workforce, and primary healthcare.
- **Monitoring and R&D:** WHO tracks global disease trends and supports research. Systems like GISRS monitor influenza, while the R&D Blueprint prepares for future pandemics like "Disease X."

Need for Reforms in World Health Organization

- **Global Health Architecture Reform:** Member states agreed to streamline global health governance by mapping mandates and reducing duplication among institutions like the WHO, World Bank, and UNICEF, aiming for faster and more coordinated crisis response.
- **Pathogen Access and Benefit Sharing (PABS):** Negotiations continued on the PABS Annex under the WHO Pandemic Agreement to ensure equitable access to vaccines and medical countermeasures for developing countries during future pandemics.

- **Emergency Care Strategy:** A new Global Strategy for Integrated Emergency, Critical, and Operative Care was adopted to strengthen timely and affordable emergency healthcare delivery across all levels of health systems.
- **Funding Constraints:** WHO's financial structure remains heavily dependent on voluntary contributions, with less than a quarter coming from mandatory assessed contributions, limiting predictability and operational independence. Calls are growing to increase mandatory funding.
- **Compliance Gap:** The absence of enforcement mechanisms means member states face no penalties for non-compliance with WHO guidelines, weakening global health accountability.
- **Vaccine Approval Process:** Ongoing discussions highlight demands to review WHO vaccine approval mechanisms. However, concerns such as alleged delays in COVAXIN's emergency use listing have no established evidence.

Way Forward for WHO Reforms

- **Strengthening Global Health Architecture:** Clearly define roles of WHO, World Bank, UNICEF, and others to avoid duplication and improve coordination. The **COVID-19 Vaccine Delivery Partnership** shows how joint action can improve vaccine access.
- **Equitable Access to Medical Resources (PABS):** Ensure fair sharing of vaccines and medicines during pandemics. The **COVAX initiative (Gavi-WHO-CEPI)** highlighted both the importance and limitations of global vaccine equity.
- **Strengthening Emergency Health Systems:** Improve primary healthcare, ICU capacity, and emergency services under WHO's strategy. India's **PM-ABHIM** reflects efforts to strengthen health infrastructure.
- **Reforming Financing Mechanism:** Increase mandatory contributions to reduce dependence on voluntary funding. The **Global Fund** is a model of stable, pooled financing for disease control.
- **Improving Compliance and Accountability:** Strengthen enforcement of International Health Regulations (IHR). The **Ebola outbreak (2014–16)** showed how weak compliance can worsen global health crises.

KEY WORDS

- **Global Health Governance:** The collaborative framework led by the WHO to coordinate international responses to public health crises.
- **Pandemic Agreement:** A proposed international treaty designed to formalize global standards for future pandemic prevention and preparedness.
- **Pathogen Access and Benefit Sharing (PABS):** A system ensuring equitable, fair distribution of medical resources and data during health emergencies.

UPSC PYQ

Critically examine the role of WHO in providing global health security during the COVID-19 pandemic (2020)

5) Insolvency and Bankruptcy Code (IBC): A Decade of Institutional Transformation

GS Paper III (Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment; Inclusive growth and issues arising from it; Effects of liberalization on the economy, changes in industrial policy and their effects on industrial growth; Investment models).

Introduction

The **Insolvency and Bankruptcy Code (IBC)**, enacted in **2016**, marks a decade of transformative reform in India's credit landscape by replacing fragmented legacy laws with a unified, creditor-driven, and time-bound insolvency resolution mechanism. By fundamentally shifting control from defaulting promoters to a Committee of Creditors (CoC), the IBC has successfully institutionalized corporate accountability and emerged as the most effective instrument for stressed asset recovery in the Indian economy.

Achievements: A Decade of Value Creation

- **High Recovery of Money:** By March 2026, the IBC process helped recover more than **₹4 lakh crore for creditors**, which is about **95%** of the fair value of assets.
- **Decrease in Non-Performing Asset:** Bank bad loans (GNPA) reduced from about **11.8% in 2017 to 2.1% by September 2025**.
- **Main Recovery Method:** In **2024–25**, IBC helped recover about **52.4%** (₹0.54 lakh crore) of total bank recoveries.
- **Prevention of Cases:** More than **30,000 cases** worth nearly **₹14 lakh crore** were resolved even before entering the IBC process.
- **Business Revival:** A study (**IIM Ahmedabad, 2025**) shows that companies improved strongly after resolution, with **89% growth in sales and 131% rise in asset use**.
- **Increase in Market Value:** The total market value of resolved companies increased from **₹2.8 lakh crore to ₹9 lakh crore in five years**, showing higher investor trust.
- **Better Payment Behaviour:** The time companies delay payments reduced from **248–344 days to 30–87 days**, showing improved discipline.
- **Global Recognition:** S&P Global upgraded India's insolvency system from '**Group C**' to '**Group B**', showing better performance.
- **Better Recovery Rate:** Creditors' recovery improved from **15–20% (before IBC) to 36.6% in 2024–25**.
- **Revival of Sick Companies:** About **42%** of resolved cases were old or closed companies, which were successfully revived under IBC.

Challenges: Hurdles in a Maturing Regime

- **Delays in Process:** Even though the **rule is 330 days**, cases actually take **around 2 years** to complete.
- **Loss of Asset Value:** Delays reduce the value of companies and assets, causing about **30% loss in recovery value**.
- **More Liquidation Cases:** Out of 8,987 cases (as of March 2026), 3,003 ended in liquidation because companies could not be saved in time.
- **Different Results in Different Sectors:** Recovery success is not the same in all industries and changes every year.
- **Case Backlog in NCLT:** A large number of cases are **pending, causing delays in hearings and decisions**.
- **Technology Gaps:** Even with online systems, some authorities still lack proper technical use and data integration.
- **Unused Insolvency Fund:** The **Insolvency and Bankruptcy Fund**, planned under the **2016 law**, is still not fully active.

- **Too Many Old Cases:** Many cases involve companies that are already inactive, increasing the workload of courts.
- **Wrong Valuation Issues:** Using liquidation value instead of true business value often leads to high losses for creditors.
- **Coordination Problems:** Conflicts between the IBBI, RBI, and enforcement agencies regarding asset claims often delay the resolution timeline.

Way Forward

- **Increase NCLT/NCLAT Capacity:** More benches should be set up and vacancies filled to reduce case backlog and ensure timely decisions.
- **Promote Pre-Pack Insolvency:** Pre-pack systems should be expanded to allow faster and mutual settlement of insolvency cases outside court.
- **Better Data Systems:** Information Utilities should be improved to give quick and accurate information about loan defaults.
- **Include Small Businesses:** A proper system should be made for insolvency of partnerships and proprietorships.
- **Better Valuation Method:** Companies should be valued based on their overall business value instead of only liquidation value, to save more firms and jobs.

Conclusion

Over the last ten years, the IBC has greatly changed the Indian economy by focusing on credit discipline and making companies more responsible. By successfully recovering over ₹4 lakh crore and restarting thousands of struggling companies, it has shown its importance as a key part of India's financial stability. As India moves towards the vision of **Viksit Bharat 2047**, improving the IBC to reduce delays and fix valuation issues will be important for maintaining a strong and business-friendly system.

KEY WORDS

- **Insolvency** – A financial condition where a person or company cannot repay its debts on time.
- **Committee of Creditors (CoC)** – A group of financial creditors that decides the future of a stressed company under IBC.
- **Non-Performing Asset (NPA)** – A loan on which interest or principal repayment remains overdue for a specified period.
- **National Company Law Tribunal (NCLT)** – The adjudicating authority responsible for insolvency and bankruptcy cases under the IBC.
- **Pre-Packaged Insolvency (Pre-Pack)** – A resolution process where creditors and debtors agree on a restructuring plan before formally entering insolvency proceedings.
- **Haircut** – The reduction in the amount creditors agree to accept compared to the total debt owed.
- **Enterprise Value** – The total value of a business as a going concern, including debt and equity.
- **Liquidation** – The process of selling a company's assets to repay creditors when revival is not possible.

6) Water Governance in Rural India: Empowering Communities through Participatory Water Budgeting

GS Paper III (Major crops cropping patterns in various parts of the country, different types of irrigation and irrigation systems).

Introduction

India is facing growing water challenges due to **groundwater depletion, irregular rainfall, climate change, increasing population, and high agricultural water use**. To address these issues, **water budgeting** has emerged as an effective community-based approach that assesses available water resources, estimates future demand, and promotes sustainable and equitable water use. It helps improve water security, supports agriculture, and strengthens climate resilience through scientific planning and community participation.

Significance: Why Water Budgeting Transforms Rural Water Governance

- **Water Security & Climate Strength:** 180 out of 229 Atal Bhujal Yojana blocks showed improvement in groundwater levels between 2023–2025.
- **Groundwater Recharge:** By March 2026, 81,700 water conservation and recharge structures were created or repaired under Atal Bhujal Yojana.
- **Better Farming Productivity:** In Maharashtra's Jalyukt Shivar Abhiyan, farm production increased by 30–50%, and over 11,000 villages were declared drought-free.
- **Increase in Groundwater Level:** Rajasthan saw a 4% rise in groundwater levels, and Maharashtra saw an increase of 1.5–2 metres.
- **Support for Livelihoods:** Better water access in Rajasthan helped 4.1 million people and 4.5 million livestock.
- **Successful Drought Model:** Hiware Bazar in Maharashtra achieved water security even in low rainfall and became a model for 5,000 villages per year.
- **Better Water Use:** More than 9 lakh hectares now use drip and sprinkler irrigation systems.
- **Women Participation in Water Management:** Programs trained 1,645 women in Uttarakhand, and 300 women-led water committees are working now.
- **Use of Data for Planning:** The Varuni app creates water budgets using data like rainfall, land use, and crops.
- **Community Participation & Training:** 8,203 water budgets have been completed across Gram Panchayats, supported by 1.25 lakh training programmes and the revival of traditional systems (e.g., Gokatte, Bawdi, Johad, Tanka, Kalyani, Diggi).

Challenges: Critical Barriers to Sustainable Water Governance

- **Less Water per Person:** Available usable water is about 1,999.20 BCM, and per person water is decreasing due to population growth.
- **High Water Use in Farming:** Agriculture uses 80–90% of rural water, and demand may reach 807 BCM by 2050.
- **Groundwater Loss:** Seven groundwater-stressed states are identified under Atal Bhujal Yojana due to serious depletion.
- **Water Shortages:** Seasonal water scarcity is increasing, leading to more conflicts over water sharing.
- **More Water Needed for Livestock:** Livestock populations reached 53.6 crore in 2019 a 4.6% increase since 2012 with the cow population rising by 18%.

- **Irregular Rainfall and Droughts:** Regions like Rajasthan face high rainfall variability and frequent droughts, resulting in significant runoff losses.
- **Lack of Local Data:** Accurate water budgeting remains difficult at the **Gram Panchayat level** due to a lack of reliable, localized data.
- **Low Technical Skills:** Local bodies often lack the necessary expertise to effectively utilize digital tools like the **Varuni App** without intensive training.
- **Poor Infrastructure:** A lack of adequate groundwater recharge and surface water storage infrastructure restricts effective water management.
- **Old Thinking in Water Use:** Many systems still follow supply-based planning instead of demand-based water management.

The Way Forward: Measures to Institutionalize Sustainable Water Governance

- **Strict Water Budgeting:** Gram Panchayats should regularly prepare and update water budgets under Atal Bhujal Yojana.
- **More Training Programs:** Increase the existing **1.25 lakh** training programmes to improve skills of local bodies.
- **Water Checking Units:** Set up **Water Budgeting Cells** at block and district levels to check water-related plans.
- **Special Water Benches:** Create dedicated state-level water management benches focused on the intersection of environment and public health.
- **Save Water Use:** Expand the implementation of drip/sprinkler irrigation, mulching, and crop diversification across the target 9 lakh hectares.
- **Expert Support:** Use expert committees to study soil, water, and climate-related issues.
- **Women Participation:** Expand "**Nari Shakti se Jal Shakti**" and increase training for women in Self-Help Groups (SHGs) and Water User Associations (WUAs) under the Jal Jeevan Mission.
- **Use of Technology:** Scale the adoption of the Varuni web app and integrate it with the Sujalam Bharat digital architecture for real-time monitoring.
- **Restore Traditional Systems:** Prioritize the restoration of traditional water harvesting systems (Gokatte, Bawdi, Johad, Tanka, Kalyani, Diggi) across all water-stressed blocks.
- **Better Policy Coordination:** Integrate water budgeting into the **National Water Mission** and state-level drought-proofing strategies to ensure policy alignment.

Conclusion

Water budgeting is a transformative instrument for rural water security. By aligning agricultural practices with local water availability, strengthening community-led institutions, and leveraging digital tools like Varuni, India can build climate-resilient water security. The convergence of policy, technology, and collective action demonstrates that institutionalizing water budgeting is essential for long-term water security, agricultural sustainability, and inclusive economic growth.

KEY WORDS

- **Water Budgeting** – Estimating water availability and demand to ensure sustainable use of water resources.
- **Atal Bhujal Yojana (Atal Jal)** – A Central Sector Scheme focused on community-led groundwater management in water-stressed areas.
- **Groundwater Recharge** – The process of replenishing underground water reserves through natural or artificial means.
- **Demand-Side Management** – Reducing water consumption through efficient practices such as drip irrigation and crop diversification.
- **Water User Associations (WUAs)** – Community-based groups that participate in the management and distribution of irrigation water.
- **Varuni App** – A digital platform that generates local water budgets using data on rainfall, land use, and cropping patterns.

UPSC PYQ

- Examine the factors responsible for depleting groundwater in India. What are the steps taken by the government to mitigate such depletion of groundwater? **[2025]**

7) RUPEE DEPRECIATION

GS-III Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment.

Background

The **Indian rupee** has recently **breached the ₹95–96 per U.S. dollar mark**, reflecting growing **stress in the global and domestic economic environment**.

What is Rupee depreciation?

Rupee depreciation refers to the **decline in the value of the Indian Rupee against foreign currencies**, especially the U.S. Dollar, **under India's managed floating exchange rate system**. It occurs when demand for foreign currency exceeds the supply of rupees due to factors such as higher imports, capital outflows, or global economic shocks. While depreciation can boost export competitiveness, it also raises import costs, fuels imported inflation, and affects India's balance of payments, often requiring intervention by the Reserve Bank of India.

Factors responsible for the Depreciation of Rupee

- **Persistent Merchandise Trade Deficit:** India consistently **imports more physical goods than it exports**, which forces domestic companies to aggressively sell rupees to buy dollars to settle international invoices, as seen when the rupee breached the ₹96 per dollar mark.
- **Surging Global Crude Oil Prices:** Since India heavily relies on imported energy, **high global oil prices bloat the national import bill** and drive massive dollar outflows, requiring firms to pay nearly ₹9,600 per barrel compared to ₹8,500 previously.
- **Aggressive U.S. Federal Reserve Monetary Tightening:** When the U.S. central bank hikes domestic interest rates, it closes the yield gap with emerging markets, triggering a swift reversal of global capital flows as international investors repatriate funds back to safer, dollar-denominated U.S. Treasury assets.
- **Volatile Foreign Portfolio Investment (FPI) Outflows:** Speculative **"hot money" rapidly exits Indian stock and bond markets** during global uncertainty, leading to large-scale capital flight where investors liquidate rupee assets and sell the local currency, mirroring the stark 12% annual depreciation witnessed in 2013 and 2026.
- **Escalating Global Geopolitical Uncertainty:** Intensifying conflicts and international trade tensions push risk-averse global investors toward safe-haven assets, artificially strengthening the U.S. dollar globally and applying severe systemic downward pressure on emerging market currencies like the rupee.

Impacts of Rupee Depreciation

- **Imported Inflation:** A weaker rupee raises the cost of dollar-denominated imports such as crude oil, increasing fuel and transport prices.
- **Widening Current Account Deficit (CAD):** Costlier imports expand the trade deficit, especially due to India's dependence on oil, electronics, and gold.
- **Foreign Capital Outflows:** A depreciating rupee prompts FPIs to withdraw investments, increasing pressure on financial markets.
- **Higher External Debt Burden:** Repayment of foreign currency loans becomes more expensive in rupee terms for Indian firms.
- **Improved Export Competitiveness:** Indian exports become cheaper globally, benefiting sectors like IT, textiles, and pharmaceuticals.

Measures Taken by the RBI and Government

- **Forex Market Intervention:** RBI sells U.S. dollars from its forex reserves to reduce excessive volatility. **Ex:** Amid West Asian tensions, falling forex reserves, and Strait of Hormuz disruptions, the RBI sold U.S. dollars in spot and forward markets to curb rupee depreciation.
- **Forex Swap Auctions:** Currency swap operations help manage dollar liquidity without affecting domestic liquidity significantly. **Ex:** RBI's **USD-INR Forex Swap Facility** introduced a concessional 1.5% forex swap facility for PSUs and banks to hedge ECBs and long-term overseas liabilities, easing dollar liquidity pressures.
- **Regulating Forex Speculation:** Limits on banks' forex positions curb speculative pressure on the rupee.
- **Reducing Non-Essential Imports:** Higher duties and policy measures discourage imports of items such as gold.
- **Attracting Stable Capital Inflows:** Measures like easing NRI deposit schemes and promoting foreign investments strengthen forex reserves. **Ex:** In **2022**, the RBI temporarily relaxed norms on **Foreign Portfolio Investors investments** and offered incentives for **FCNR(B)** and **NRE deposits** to attract durable foreign currency inflows and strengthen forex reserves.

Challenges in Stabilising the Rupee

- **Global Geopolitical Uncertainty:** Conflicts and trade disruptions strengthen the U.S. dollar and increase crude oil prices, putting pressure on the rupee.
- **Volatile Capital Outflows:** Continued FPI/FII withdrawals increase demand for dollars and weaken the rupee.
- **Import Dependence:** Heavy reliance on imported crude oil and other essential commodities widens the trade and current account deficits.
- **Limited Forex Reserves:** Frequent RBI intervention can gradually deplete forex reserves if external pressures persist.
- **Policy Trade-offs:** Higher interest rates and tighter forex regulations may stabilize the rupee but can slow economic growth and investment.

Way Forward

- **Promote Local Currency Trade:** Expand bilateral trade settlements in rupees to reduce dependence on the U.S. dollar.
- **Attract Stable Capital Inflows:** Encourage long-term FDI, NRI deposits, and global bond investments.
- **Reduce Import Dependence:** Accelerate renewable energy, ethanol blending, and domestic manufacturing.
- **Strengthen Export Competitiveness:** Improve logistics, infrastructure, and ease of doing business to boost exports.
- **Maintain Macroeconomic Stability:** Prudent fiscal and monetary policies, along with adequate forex reserves, are essential for exchange rate stability.

Conclusion

Rupee depreciation reflects both global economic headwinds and India's structural external sector challenges. While short-term RBI interventions can contain excessive volatility, long-term stability depends on strengthening exports, reducing import dependence, attracting stable capital inflows, and maintaining sound macroeconomic fundamentals. A balanced policy approach will ensure a resilient and stable rupee in the face of global uncertainties.

KEY WORDS

- **Monetary Tightening:** A policy of raising interest rates or reducing money supply to control inflation and stabilize the economy.
- **Safe-Haven Currency:** A currency, such as the **U.S. dollar**, that investors prefer during periods of global economic or geopolitical uncertainty.
- **Local Currency Trade Settlement:** A mechanism where two countries conduct bilateral trade using their own currencies instead of the U.S. dollar.
- **Currency Internationalisation:** The process of increasing the use of a country's currency in international trade, investment, and foreign exchange reserves.

8) Critical National Infrastructure (CNI)

GS PAPER III- "Infrastructure: Energy, Ports, Roads, Airports, Railways etc."Challenges to internal security through communication networks, role of media and social networking sites in internal security challenges, basics of cyber security."

Background

Critical National Infrastructure (CNI) refers to the physical and cyber-based systems, assets, and networks so vital to a country that their incapacitation or destruction would have a debilitating impact on national security, economic stability, public health, or safety. As India rapidly integrates Artificial Intelligence (AI), the Internet of Things (IoT), and Operational Technology (OT) into its foundational sectors, such as power grids, banking, transport, and telecommunications, the security of this infrastructure has become a top-tier national security priority.

Significance

- **National Security:** Protects defense networks and strategic assets from foreign interference and cyber-warfare. **Example: Protecting Command and Control Systems.** Securing the **Integrated Air Command and Control System (IACCS)** of the Indian Air Force.
- **Economic Stability:** Ensures the uninterrupted operation of banking, financial payment gateways (like UPI), and stock markets. **Example: UPI Transaction Integrity.** Protecting the **National Payments Corporation of India (NPCI)** infrastructure.
- **Public Health and Safety:** Maintains the continuity of essential public services, including urban water distribution and public healthcare systems. **Example: Hospital Information Systems.** Preventing **Ransomware attacks on AIIMS** (or similar large hospital chains).
- **Operational Resilience:** Prevents cascading failures where a disruption in one sector (e.g., telecom) could cripple others (e.g., energy or logistics). **Example: The Telecom-Energy Nexus.**
- **Digital Sovereignty:** Reduces dependence on untrusted foreign technologies, ensuring that the nation maintains control over its digital assets and intelligence. **Example: Hardware Trustworthiness.** Encouraging the use of **indigenously developed microprocessors** (like the *Shakti* processor) in government infrastructure.

Challenges

- **IT-OT-IoT Convergence:** The integration of IT systems with industrial operational technology (OT) has removed "air-gapping," exposing physical machinery (dams, power grids) to remote cyber-attacks. **Example: Water Treatment Plants.**
- **Supply Chain Infiltration:** Vulnerabilities arise from the procurement of foreign-made hardware (e.g., IoT sensors, surveillance cameras) that may contain hidden malware or "backdoors." **Example: Surveillance Infrastructure.** The use of "off-the-shelf" **foreign-manufactured CCTV cameras** in critical government buildings.
- **Quantum Threat:** The "harvest now, decrypt later" risk, where adversaries steal sensitive encrypted data today to decrypt it once quantum computing matures. **Example: Surveillance Infrastructure.** The use of "off-the-shelf" **foreign-manufactured CCTV cameras** in critical government buildings.
- **Legacy Systems:** Many public sector undertakings (PSUs) still rely on outdated legacy software that lacks modern security protocols and is difficult to patch.
- **Weak Cybersecurity Culture:** A reliance on default manufacturer passwords, hard-coded credentials, and inadequate compliance audits leaves systems highly susceptible to unauthorized access. **Example: Default Passwords on IoT Devices.** A government office installs a fleet of smart printers or biometric attendance systems.

Way Forward

- **Adopt Post-Quantum Cryptography (PQC):** Accelerate the migration to quantum-resistant encryption to protect sensitive data against future computing capabilities.
- **Implement Zero-Trust Architecture (ZTA):** Shift from perimeter-based defenses to a "never trust, always verify" model, ensuring continuous authentication for every user and device. **Example:** Following the **CERT-In 2022 incident reporting directives**, many government agencies and Public Sector Undertakings (PSUs) have begun adopting ZTA principles.
- **Achieve Silicon Sovereignty:** Incentivize the domestic manufacturing of trusted microprocessors and hardware to reduce reliance on external supply chains. **Example:** The **India Semiconductor Mission (ISM) 2.0** (launched in 2026) is the centerpiece of this effort. It provides up to 50% fiscal support for domestic silicon fabs and chip design.
- **Establish a Unified Cyber Command:** Integrate siloed agencies (e.g., CERT-In, NCIIPC, I4C) into a centralized apex body to provide a cohesive, real-time response to threats. **Example:** India is transitioning toward a more **fused intelligence model**. The **Integrated Command and Control Strategy (ICCS)**, originally developed for air defense, is being adapted for the cyber domain.
- **Protect the "Human Layer":** Invest in localized cybersecurity talent and conduct continuous awareness campaigns to counter sophisticated digital impersonation and scams. **Example: e-SafeHER:** A flagship program launched in April 2026 by MeitY and C-DAC (in partnership with Reliance Foundation) that aims to train one million "Cyber Sakhis" across rural India. It focuses on localizing cybersecurity training for women to prevent financial fraud.

Conclusion

As India accelerates its trajectory as a global economic powerhouse, securing its critical national infrastructure is no longer merely an IT overhead expense but a core pillar of strategic sovereignty. By embracing indigenous technology, quantum-resistant encryption, and rigorous regulatory compliance, India can ensure that its foundational assets remain resilient against the complex, asymmetric threats of the 21st century.

KEY WORDS

- **Critical National Infrastructure (CNI):** Physical and cyber systems whose disruption would severely impact national security, economic stability, public safety, and essential services.
- **Operational Technology (OT):** Hardware and software that monitor and control industrial processes, such as power grids, oil pipelines, transport systems, and water treatment plants.
- **Zero-Trust Architecture (ZTA):** A cybersecurity model based on the principle of "**never trust, always verify**," requiring continuous authentication of every user, device, and application.
- **Post-Quantum Cryptography (PQC):** Quantum-resistant encryption algorithms designed to protect sensitive data from future attacks by quantum computers.

9) QUANTUM TECHNOLOGY

("GS-III: Science & Technology – Quantum Computing, Quantum Communication, Quantum Sensing & Metrology, Indigenization of Critical Technologies, National Quantum Mission, Cyber Security, Research & Innovation Ecosystem.")"

Introduction

Quantum Technology refers to a new generation of technologies that exploit the principles of **Quantum Mechanics** such as **superposition, entanglement, quantum interference and quantum tunnelling** to perform tasks beyond the capabilities of classical systems. Unlike conventional computers that process information using bits (0 or 1), quantum computers use **qubits**, enabling exponentially greater computational power for specific classes of problems, India launched the **National Quantum Mission (NQM)** (2023–31) with an outlay of **₹6,003.65 crore** to develop indigenous capabilities and position India among the leading quantum-enabled nations.

Significance of Quantum Technology

- **Technological Sovereignty** – Reduces dependence on imported technologies by promoting indigenous quantum research, quantum processors, chips, superconductors and advanced semiconductor devices. It strengthens **Atmanirbhar Bharat** and India's technological self-reliance in strategic sectors.
- **Strategic and National Security** – Enables ultra-secure communication through **Quantum Key Distribution (QKD)**, secure military and satellite communications, and quantum-resistant **cybersecurity**. It also has implications for **cryptanalysis**, intelligence gathering and protection of critical infrastructure.
- **Economic Growth** – Drives the growth of high-value industries such as quantum computing, photonics and semiconductors while promoting deep-tech startups. It enhances financial modelling, risk analysis and **logistics optimisation, creating high-skilled jobs** and boosting India's innovation-driven economy.
- **Scientific Advancement** – Accelerates breakthroughs in chemistry, pharmaceuticals, biotechnology and material science through advanced simulations beyond the capabilities of classical computers. It strengthens India's research ecosystem and innovation capacity.
- **Digital Transformation** – Enhances **Artificial Intelligence, Machine Learning, Big Data analytics** and **complex optimisation** problems while securing Digital Public Infrastructure and banking systems through quantum communication. It enables faster, more efficient and secure digital services.
- **Global Competitiveness** – Positions India among leading nations in frontier technologies through innovations in quantum processors, **single-photon sources** and advanced computing systems. It strengthens international collaborations and improves competitiveness in emerging technology markets.
- **Societal Development** – Supports **drug discovery, personalised medicine, advanced medical diagnostics, climate and weather modelling, disaster management, precision agriculture**, GPS-independent navigation, Earth observation and mineral exploration. It contributes to sustainable development and improved public service delivery.

Challenges of Quantum Technology

- **Technological Limitations** – Qubits are highly fragile and susceptible to decoherence, noise and error rates, making reliable large-scale quantum computing difficult.
- **High Infrastructure Cost** – Quantum systems require sophisticated laboratories, cryogenic cooling, specialised fabrication facilities and significant capital investment.
- **Shortage of Skilled Manpower** – Limited availability of quantum scientists, engineers and interdisciplinary researchers constrains innovation and commercialisation.

- **Cybersecurity Transition Risks** – Quantum computers may eventually break existing encryption systems, requiring large-scale adoption of **Post-Quantum Cryptography (PQC)** and new security standards.
- **Commercialisation and Ecosystem Gaps** – Most quantum technologies remain in the research stage, with challenges in scalability, industry adoption, intellectual property creation and competition from technologically advanced countries.

India's initiatives Related to R&D Government Initiatives

National Quantum Mission (NQM)

1. **Overview:** Approved in 2023; implemented from **2023–24 to 2030–31** with an outlay of **₹6,003.65 crore** by the **Department of Science and Technology (DST)**.
2. **Four Thematic Hubs:** Quantum Computing (IISc Bengaluru); Quantum Communication (IIT Madras); Quantum Sensing & Metrology (IIT Bombay); Quantum Materials & Devices (IIT Delhi).
3. **Major Objectives:** Develop **50–1000 physical qubit** quantum computers; establish **2,000 km** secure quantum communication; develop quantum sensors, atomic clocks & advanced materials; promote startups and global collaboration.

Recent Updates under NQM

- **Technological Milestones:** Demonstrated a **1,000 km** secure quantum communication network, among the longest globally.
- **Startup & Research Ecosystem:** Support extended to **17 quantum startups**; Mission now covers **43 institutions across 17 States and 2 UTs**.
- **Capacity Building & Quantum Valley:** Approved quantum teaching labs in **23 institutions**; Quantum Valley, Amaravati aims to develop India's first **133-qubit** quantum computer through a government–academia–industry partnership.

Way Forward

- **Strengthen Indigenous R&D:** Increase investment in quantum hardware, photonics & semiconductors; promote academia–industry translational research.
- **Build Skilled Workforce:** Expand specialised UG, PG & doctoral programmes; encourage interdisciplinary quantum education.
- **Promote Startup Ecosystem:** Enhance funding, incubation & access to quantum infrastructure; facilitate technology transfer to industry.
- **Develop Quantum-Safe Cybersecurity:** Accelerate adoption of Post-Quantum Cryptography (PQC); establish national standards for quantum-secure infrastructure.
- **Enhance Global Cooperation & Governance:** Collaborate internationally in research and standardisation; establish robust regulatory, cybersecurity & IP protection frameworks.

Conclusion

Quantum Technology is poised to become a defining technology of the **Fourth Industrial Revolution**, with far-reaching implications for economic growth, national security and scientific innovation. Through the **National Quantum Mission**, India has laid the foundation for a globally competitive quantum ecosystem by fostering research, indigenous technology development, startups and skilled manpower. Sustained investment, stronger industry-academia collaboration, quantum-ready cybersecurity and timely commercialisation will be essential for translating India's scientific potential into strategic and economic leadership in the global quantum era

KEY WORDS

- **Cryptanalysis:** The science of breaking or deciphering encrypted information without knowing the secret key.
- **Quantum Key Distribution (QKD):** A quantum communication technique that uses the principles of quantum mechanics to securely generate and distribute encryption keys, with any eavesdropping being detectable.
- **Post-Quantum Cryptography (PQC):** Cryptographic algorithms designed to remain secure against attacks from both classical and quantum computers, while running on conventional computer systems.
- **Qubit:** The fundamental unit of quantum computing that can represent both **0 and 1 simultaneously** using the principles of **superposition** and **quantum mechanics**.

UPSC PYQ

- Introduce the concept of Artificial Intelligence (AI). How does AI help clinical diagnosis? Do you perceive any threat to privacy of the individual in the use of AI in healthcare? **[2023]**

10) Environmental, Social, and Governance (ESG)

GS Paper III (Economic Development; Conservation, environmental pollution and degradation, environmental impact assessment; Growth, development and employment)

Introduction

The ESG (Environmental, Social, and Governance) framework evaluates a company's sustainability, ethical practices, and long-term risk management. Unlike India's Corporate Social Responsibility (CSR) law, which mandates a 2% profit spend on philanthropy, ESG integrates sustainability directly into core operations. Compliance is primarily driven by SEBI's mandatory Business Responsibility and Sustainability Report (BRSR) for the top 1,000 listed firms.

The Need for ESG

- **Mitigating Operational and Legal Risks:** Safeguards businesses against climate disasters, resource scarcity, and penalties from regulatory bodies like the National Green Tribunal (NGT).
- **Attracting Global Capital and Green Finance:** Opens doors to specialized international green funds, sustainability bonds, and institutional investors who prioritize ethical operations.
- **Improving Cost Efficiency and Innovation:** Lowers operational overheads by optimizing resource use, reducing waste, and transitioning to renewable energy.
- **Building Brand Reputation and Stakeholder Trust:** Wins customer and employee loyalty by ensuring fair labor practices, human rights compliance, and safe product standards.
- **Fulfilling National and Global Climate Pledges:** Helps Indian industries align with national commitments toward the UN Sustainable Development Goals (SDGs) and the Paris Climate Agreement.

Regulatory and Operational Obstacles to ESG Adoption

- **Rising Danger of Greenwashing:** Companies increasingly make false or exaggerated sustainability claims to gain public goodwill without actual operational shifts, as seen when **Volkswagen AG falsely marketed its diesel vehicles as "clean diesel" while manipulating emissions tests.**
- **Subjectivity and Inconsistency in ESG Ratings:** The lack of standardized grading allows different rating agencies to give conflicting scores, creating market confusion. For example, **Tesla, Inc. has received significantly different ESG ratings from agencies such as MSCI and S&P.**
- **High Financial and Resource Burden on MSMEs:** Smaller businesses struggle with the high upfront costs needed for professional auditing, data collection, and certifications, as **many garment MSMEs in Tiruppur face difficulties meeting ESG compliance requirements for global buyers.**
- **Lack of Reliable and Standardized ESG Data:** Poor internal tracking systems across sectors result in fragmented, unverified, and inconsistent corporate disclosures, as highlighted by **scrutiny over the consistency of certain ESG-related disclosures by Adani Green Energy Limited.**
- **Flawed Focus on Single Materiality Metrics:** Current assessments only look at how environmental changes financially harm the company, ignoring how the company harms the ecosystem. For instance, **BP plc reports climate-related financial risks while continuing investments in fossil fuel projects.**
- **Regulatory Fragmentation and Lack of Uniform Laws:** Apart from SEBI's mandate for the top 1,000 listed firms, India lacks a cohesive, nationwide legal framework for all businesses, leaving

most unlisted Indian companies outside the mandatory ESG disclosure requirements of the Securities and Exchange Board of India.

Way Forward

- **Setting Up a Centralized ESG Regulatory Body:** Establish a dedicated oversight authority under the Ministry of Corporate Affairs (MCA) to standardize evaluation and check greenwashing.
- **Amending the Companies Act of 2013:** Legally modify corporate laws to include environmental and social sustainability under the direct duties of company directors.
- **Transitioning Toward Double Materiality Standards:** Upgrade policies to measure both the commercial risks to the business *and* the business's actual footprint on society and nature.
- **Mandating Board-Level Independent ESG Committees:** Require large corporations to form internal, independent committees to strictly supervise and audit their sustainability practices.
- **Investing in Training and Support for Smaller Firms:** Provide subsidized compliance tools, expert consulting, and widespread professional training to help MSMEs adopt ESG seamlessly.

Conclusion

Transitioning from corporate philanthropy to structured ESG compliance is vital to integrate Indian businesses into the global sustainable economy. Standardizing regulations, improving data systems, and eliminating greenwashing will ensure an ethical corporate ecosystem that balances commercial profit with planetary welfare.

KEY WORDS

- **ESG:** A framework evaluating a company's operational impact on the environment, society, and its internal governance.
- **CSR:** A legal mandate in India forcing large companies to spend 2% of their profits on philanthropic projects.
- **SEBI:** India's capital market regulator that oversees stock exchanges and protects investors.
- **BRSR (Business Responsibility and Sustainability Report):** SEBI's mandatory disclosure format requiring India's top 1,000 listed companies to transparently report their environmental, social, and governance (ESG) performance.
- **NGT:** A specialized Indian court that fast-tracks environmental disputes and penalizes polluters.
- **Double Materiality:** Assessing both how climate change impacts a business and how that business impacts the planet.
- **Greenwashing:** Making false, exaggerated, or misleading marketing claims about how environmentally friendly a company is.
- **Green Finance:** Capital or investments exclusively dedicated to financing eco-friendly projects like renewable energy.

11) SILVER ECONOMY

(GS II: Issues relating to development and management of Social Sector/Services relating to Health, Education, Human Resources) & (GS III: Indian Economy and issues relating to Planning, Mobilization of Resources, Growth, Development and Employment; Inclusive Growth and issues arising from it.)

Background

India's rapidly **ageing population** is making the Silver Economy an **emerging pillar of inclusive economic growth**. The country's elderly population is projected to increase from 103.8 million in 2011 to 193.4 million by 2031 and exceed 20% of the population by 2050, creating significant opportunities in healthcare, housing, insurance, financial services, technology and wellness. The Silver Economy refers to the **system of production, distribution and consumption of goods and services designed to meet the needs of senior citizens** while leveraging their purchasing power, experience and continued economic participation.

Features of the Silver Economy

- **Growing Consumer Market:** Rising elderly population and increasing wealth among older age groups are expanding demand for healthcare, housing, insurance, wellness and financial services, with the sector expected to manage **nearly USD 1.5 trillion in assets by 2030**.
- **Active Ageing and Economic Participation:** Senior citizens are increasingly viewed as productive contributors through continued employment, entrepreneurship, mentorship and experience-based roles rather than as dependents.
- **Technology-driven Elder Care:** Telemedicine, wearable health devices and remote patient monitoring are improving accessibility and quality of elderly healthcare, with the remote monitoring market projected to grow at **12.7% CAGR** by 2030.
- **Expansion of Elderly-focused Services:** Rapid growth in home-based healthcare, assisted living, senior housing and AYUSH-based preventive care reflects the evolving needs of an ageing population.

Challenges of the Silver Economy

- **Inadequate Geriatric Healthcare:** Shortage of specialised geriatric infrastructure and professionals limit access to quality healthcare despite rising demand.
- **High Healthcare Expenditure:** Rising medical inflation and low health insurance coverage increase out-of-pocket expenditure, making long-term care unaffordable for many elderly persons.
- **Financial Insecurity:** Limited pension coverage, particularly among workers from the unorganised sector, reduces financial independence in old age.
- **Rural-Urban Disparities:** Most elderly people reside in rural areas where healthcare, assisted living and specialised services remain inadequate.
- **Digital Divide:** Low digital literacy restricts access to telemedicine, digital banking, e-commerce and government services.
- **Social Isolation and Workforce Barriers:** Nuclear families, migration and age-based discrimination increase loneliness while limiting opportunities for productive ageing.

Way Forward

- **Strengthen Geriatric Healthcare Services:** Integrate comprehensive elderly healthcare into **Ayushman Arogya Mandirs (AAMs)** by expanding preventive, promotive, curative and

rehabilitative geriatric services under the **National Programme for Health Care of the Elderly (NPHCE)**.

- **Enhance Financial Security:** Expand pension coverage through the **Atal Pension Yojana (APY)** and promote age-specific insurance products to reduce out-of-pocket healthcare expenditure, particularly for elderly persons in the informal sector.
- **Promote Productive Ageing:** Strengthen the **SACRED (Senior Able Citizens for Re-employment in Dignity) Portal** to facilitate reskilling, flexible employment and second-career opportunities, enabling senior citizens to remain economically productive.
- **Foster Innovation in Eldercare:** Encourage public-private partnerships through the **Seniorcare Aging Growth Engine (SAGE)** to support startups developing assistive technologies, home-care solutions and age-friendly services.
- **Bridge the Digital Divide:** Launch dedicated digital literacy programmes for senior citizens and promote user-friendly digital platforms to improve access to healthcare, financial services and e-governance.
- **Develop Age-friendly Communities:** Promote universal design in housing, transport and public infrastructure while strengthening community awareness programmes to ensure dignity, accessibility and social inclusion for elderly persons.

Conclusion

The Silver Economy should be viewed not as a welfare obligation but as an opportunity for inclusive and sustainable economic growth. By combining age-friendly policies, technological innovation and social security with active ageing, India can transform its growing elderly population into a valuable economic and social asset. This will promote the vision of "**healthy, productive and dignified ageing**" in an ageing society.

Major Schemes Supporting the Silver Economy

1. **SAGE (Seniorcare Aging Growth Engine)** – It promotes startups developing products and services for senior citizens, including assistive technologies, healthcare, mobility and home-care solutions.
2. **SACRED (Senior Able Citizens for Re-employment in Dignity) Portal** - It is a digital platform that connects senior citizens with employment opportunities, promoting active ageing, reskilling and continued economic participation.
3. **National Programme for Health Care of the Elderly (NPHCE)** – It provides dedicated geriatric healthcare services at primary, secondary and tertiary levels with a focus on preventive, curative, rehabilitative and palliative care.
4. **Rashtriya Vayoshri Yojana (RVY)** – It provides free assistive living devices such as hearing aids, wheelchairs, walking sticks and spectacles to economically weaker senior citizens, promoting independent living.
5. **Ayushman Bharat-PMJAY** – It provides health insurance coverage of **₹5 lakh per family per year**, with **expansion of eligibility to include all senior citizens aged 70 years and above**, thereby promoting healthy ageing through enhanced financial protection against medical expenses.
6. **Atal Vayo Abhyuday Yojana (AVYAY)** - It is an Umbrella scheme that supports old-age homes, day-care centres, mobile medicare units, physiotherapy clinics and awareness programmes to improve the quality of life of elderly persons.

KEY WORDS

- **Healthy Ageing:** Maintaining physical, mental and functional ability to ensure well-being and independence in older age.
- **Active Ageing** - Optimising opportunities for health, participation and security to enable senior citizens to continue contributing to economic, social and civic life.
- **Geriatric Care** - Specialized healthcare focused on the prevention, diagnosis, treatment, rehabilitation and long-term care of age-related health conditions among older adults.
- **Age-friendly Communities** - Communities designed with accessible infrastructure, housing, transport and public services that enable senior citizens to live safely, independently and with dignity.

UPSC PYQ

- Examine the relationship between ageing population, demographic transition and social security in India [2020]

MODEL QUESTIONS

- 1) Public Interest Litigation (PIL) has strengthened access to justice in India, but concerns regarding judicial overreach and misuse have necessitated reforms. Critically examine." (15 Marks, 250 Words)
- 2) Discuss the significance of the Right to Information Act, 2005 in promoting transparency and accountability in Indian governance. What challenges does it face, and what measures are needed to strengthen it? (15 Marks, 250 Words)
- 3) Alternative Dispute Resolution (ADR) mechanisms are increasingly being viewed as an effective complement to the formal judicial system. Examine their significance and the challenges in their wider adoption in India. (15 Marks, 250 Words)
- 4) The recent deliberations at the 79th World Health Assembly highlight that the contemporary global health architecture requires a systemic overhaul rather than mere incremental adjustments." Critically analyse the core institutional bottlenecks hindering the effectiveness of the World Health Organization (WHO) and suggest a pragmatic way forward to ensure equitable health governance. 250 words (20 marks)
- 5) The Insolvency and Bankruptcy Code (IBC) has significantly transformed India's insolvency resolution framework and strengthened credit discipline. Examine its achievements and the challenges that continue to affect its effectiveness. (15 Marks, 250 Words)
- 6) Water budgeting has emerged as an important tool for sustainable water governance in rural India. Examine its role in improving water security, agricultural sustainability and climate resilience. (15 Marks, 250 Words)
- 7) Discuss the major causes of the recent depreciation of the Indian rupee. How does a sustained depreciation affect inflation, external sector stability, and economic growth in India? (10 Marks, 150 words)
- 8) "The convergence of IT, OT, and IoT in critical sectors has enhanced efficiency but significantly expanded the attack surface for cyber-adversaries. In this context, critically examine the vulnerabilities facing India's Critical National Infrastructure and suggest a multi-pronged strategy to ensure long-term digital sovereignty." (15 Marks, 250 Words)
- 9) "The emergence of quantum computing poses both opportunities and challenges for cybersecurity." Examine in the context of Quantum Key Distribution (QKD) and Post-Quantum Cryptography (PQC)". (15 Marks, 250 Words)
- 10) "Critically analyse how the structural limitations of the current ESG framework in India, particularly 'single materiality' metrics and regulatory fragmentation, affect the country's transition to a truly sustainable economy. Suggest actionable institutional reforms to make ESG compliance more inclusive and transparent." (15 Marks, 250 Words)
- 11) Population ageing is creating new opportunities for economic growth while posing significant policy challenges. Discuss the significance of the Silver Economy in promoting inclusive growth in India. (10 Marks, 150 words)