



**INSIGHTSIAS**

SIMPLIFYING IAS EXAM PREPARATION

# INSIGHTS MINDMAPS

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# FEBRUARY 2025

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# General Studies – 1

Topic: Population and associated issues

## 1. Old Age in India

### Understanding Perceptions of Old Age

- **Younger individuals often associate old age with physical decline**—walking sticks, grey hair, and nursing homes.
- In contrast, financially secure seniors view it as a time of freedom, travel, and spiritual growth.
- As India transitions from a youthful nation to an elderly population, these perceptions highlight the importance of adapting societal attitudes and policies to better serve the aging population.

### Challenges of an Aging Population

- India is currently benefiting from a **demographic dividend due to its large youth population**.
- However, the rise in the elderly population will present new challenges in terms of **care, support, and integration of seniors into society**.
- With an average lifespan of 67.2 years, many seniors face the dual challenges of **inadequate social security and healthcare**.
- Only a small percentage of seniors receive reliable social security benefits, leaving many vulnerable.

### Socio-Economic Realities of Elderly in India

- **Around 40% of India's elderly population lives in poverty**, compared to less than 10% of the general population.
- This economic vulnerability is exacerbated by **limited access to technology, social organizations, and education**.
- The elderly population in India is more likely to be female, less educated, and living in rural areas, leading to further **marginalization and challenges in accessing resources**.
- Many seniors, particularly those in rural areas and agriculture, continue to work out of necessity, with 65% engaged in unpaid labor.
- **Retirement often brings challenges such as loss of purpose and increased loneliness, especially with the rise of nuclear families**.

### Role of Community Service Organizations (CSOs)

- **Organizations like HelpAge India, Agewell Foundation, and Carers Worldwide** play a crucial role in supporting the elderly, advocating for better state intervention, and changing the narrative around aging.
- CSOs highlight inspiring stories of seniors like Rajinder Singh and Harbhajan Kaur, who continue to contribute to society in meaningful ways despite their age.

### The Need for Societal and Policy Reforms

- India faces the challenge of redefining old age, moving beyond traditional views of decline and dependence to one of active contribution and engagement.
- The state's response to the aging population has been slow, with **less than 5% of seniors receiving reliable social security**.
- Policies like the **Maintenance and Welfare of Parents and Senior Citizens Act, 2007**, remain largely unimplemented.
- The private sector has yet to fully tap into the "silver economy," valued at \$7 billion, or provide adequate living and recreational facilities for seniors.

### The Role of Society and Philanthropy

- It is society's role to lead the way in redefining aging and creating an environment where seniors can thrive.
- **This includes ensuring that older adults have opportunities to contribute meaningfully to their communities.**

- Private philanthropy is essential in driving the multi-sectoral innovation required to meet the needs of an aging population.

### International Best Practices for Old Age Care

- **Germany's "Pay-As-You-Go" pension system**, coupled with additional private pension plans, ensures that elderly citizens have a stable income during retirement.
- **Japan promotes "Active Aging" policies**, encouraging seniors to remain active in the workforce and participate in community activities.
- **France offers universal healthcare with specialized services for the elderly**, including in-home care, geriatric care, and mental health services.
- **Australia's healthcare system includes the "My Aged Care" service**, which provides information, referrals, and assessments to help elderly Australians access appropriate care services.
- **The U.S. has embraced technology to support aging in place**, with innovations like telemedicine, remote monitoring, and wearable devices that help elderly individuals live independently.

### Government Schemes for Old Age in India

- **Rashtriya Vayoshri Yojana (RVY)** provide physical aids and assisted-living devices to senior citizens from BPL families.
- **National Programme for Health Care of the Elderly (NPHCE)** provide accessible, affordable, and comprehensive healthcare services to the elderly.
- **Pradhan Mantri Vaya Vandana Yojana (PMVVY)** provide a financial security scheme for senior citizens with assured returns.
- **Senior Citizens Savings Scheme (SCSS)** offer a safe and secure investment option with a regular income for senior citizens.
- **Atal Pension Yojana (APY)** create a universal social security system for all Indians, particularly the poor and the underprivileged, with a focus on informal sector workers.

### Conclusion

- As India faces a seismic demographic shift, there is an urgent need to rethink how society views and supports its elderly population.
- Ensuring that seniors are valued and cared for will be crucial for the country's social and economic future.

## General Studies – 2

Topic: Statutory, regulatory and various quasi-judicial bodies

### 2. Lokpal vs. Judiciary

#### Introduction

- **The recent assertion by the Lokpal that it has the authority to examine complaints against sitting High Court (HC) judges has raised significant legal and constitutional questions.**
- This debate revolves around the **scope of the Lokpal's powers, judicial accountability, and constitutional protections for judges.**

#### Lokpal's Assertion and Supreme Court's Intervention

- The Lokpal, directed that **corruption complaints against an HC judge** be forwarded to the **Chief Justice of India (CJI)** for consideration.
- The **Supreme Court (SC)** took **suo motu cognizance**, stayed the Lokpal's order, and barred the disclosure of the judge's identity.
- **Key Concerns of SC Judges:**
  - HC judges are **constitutional authorities**, not statutory functionaries.
  - The Lokpal's move could threaten **judicial independence**.

- **Article 214(1)** of the Constitution mandates the setting up of HCs, ensuring their status as part of the higher judiciary.

### Lokpal's Argument

- The **Lokpal Act, 2013**, under **Section 14**, empowers the Lokpal to investigate corruption complaints against **public servants**.
- The **K Veeraswamy case (1991)** held that **superior court judges are public servants** and cannot be excluded from corruption inquiries.
- Lokpal contended that **HCs are not established under Article 124** (which pertains only to the SC), implying they fall within its jurisdiction.

### Supreme Court's Counterargument

- HC judges are **not mere public servants**; they are **constitutional functionaries**, enjoying **protection similar to SC judges and other high constitutional authorities**.
- The Lokpal **overlooked Article 214(1)**, which establishes HCs as part of the **higher judiciary**, ensuring their **autonomy and protection from external influences**.
- If Lokpal were allowed to act against sitting judges, it could **compromise judicial independence**.

### Importance of Judicial Independence

- **Judiciary is the guardian of the Constitution**, and its independence is essential for **fair and impartial adjudication**.
- **External investigations into HC judges** can lead to **political interference** and pressure, affecting judicial decision-making.
- Similar protections exist for the **President, SC judges, and Election Commissioners**, ensuring they are **shielded from arbitrary actions**.

### The Need for Judicial Accountability

- While judicial independence is crucial, **accountability is equally necessary** to maintain public trust.
- **When instances of corruption in the higher judiciary** occur, secrecy often surrounds them.
- The current **mechanism for dealing with corruption in HC judges is inadequate** and needs reform.

### The Dilemma: Finding the Right Balance

- The **Lokpal's assertion raises valid concerns** about ensuring transparency in the judiciary.
- However, any mechanism to hold judges accountable must be **constitutionally sound and free from political motivations**.
- **Judicial reforms should focus on strengthening internal mechanisms** for accountability, such as:
  - **Judicial Complaints Authority** or an **independent internal committee** under the Supreme Court's supervision.
  - **Greater transparency in judicial appointments and disciplinary actions**.

### Current Procedure for Action Against Judges

- **Judges Inquiry Act, 1968** outlines the process for **removal of HC and SC judges**:
  - Impeachment by **Parliament** through a **motion supported by two-thirds majority**.
  - Investigation by a **three-member committee** (SC judge, HC Chief Justice, and an eminent jurist).
- The **CJI plays a crucial role** in recommending action against erring judges.

### Limitations of the Current System

- **Impeachment is rare and cumbersome**, requiring a high political consensus.
- There is **no independent complaints mechanism** for investigating corruption allegations before reaching the impeachment stage.
- **Lack of transparency** in handling complaints against judges.

### Institutional Credibility

- The **conflict between the Lokpal and judiciary** highlights the **larger debate on institutional roles and checks and balances**.

- The **Lokpal** was created to tackle corruption, but its powers must align with **constitutional safeguards for judiciary**.
- Any attempt to **dilute judicial independence** can erode trust in the judiciary.
- At the same time, **judicial accountability is critical** for maintaining public confidence in the **justice system**.

#### Way Forward

- **Judicial independence and accountability must go hand in hand.**
- A balanced approach should involve:
  - **Internal judicial accountability mechanisms** rather than **external interference**.
  - **Strengthening the existing impeachment and disciplinary procedures.**
  - **Greater transparency in judicial misconduct cases.**
- A **Judicial Oversight Panel** under the Supreme Court can handle complaints against judges.
- **Time-bound inquiry procedures** to ensure quick resolution of complaints.
- **Periodic disclosures of actions taken against judges** to enhance public confidence.

Topic: Issues relating to development and management of Social Sector/Services relating to Health, Education, Human Resources.

### 3. India's Health-Care Transformation

#### Introduction

- India's health-care sector has seen significant **transformation from dependence on the West to becoming a global health-care hub**.
- Today, India is globally recognized for its world-class medical services, attracting patients from over 147 countries.

#### India's Healthcare Transformation

- India's healthcare transformation is characterized by rapid digitalization, with the implementation of the Ayushman Bharat Digital Mission.
- The country has also made strides in pharmaceutical manufacturing, becoming a global hub for generic drugs and vaccines.

#### From Medical Tourism to a Global Health-Care Hub

- **Economic Implications:**
  - **India offers high-quality medical care at significantly lower costs than Western countries**, thus retaining valuable foreign exchange.
  - The influx of international patients has positively impacted the economy by **creating jobs and fostering growth** in related sectors such as hospitality, transportation, and pharmaceuticals.
  - Medical tourism is estimated to generate over \$9 billion annually for the Indian economy.
- **"Heal in India" Initiative:**
  - The Prime Minister's "Heal in India" initiative aims to position India as a global leader in health care.
- India's health-care system focuses on holistic care, addressing not just physical ailments but also the emotional and psychological needs of patients.

#### Challenges and Opportunities

- **Medical Device Dependency:**
  - **India imports a significant portion of its medical devices**, adding to treatment costs and impacting self-reliance.
  - The country imported medical devices worth over \$6.24 billion in 2021-22
  - The "Make in India" initiative is promoting domestic production of medical devices, aiming to reduce import dependency.
- **Towards Self-Reliance:**

- The progress in domestic medical device manufacturing highlights India's growing capability to produce high-quality health-care solutions.
- There is a growing need for young innovators and entrepreneurs to drive further advancements in the health-care sector.

### Inspiring the Next Generation

- **Career in Health Care:**
  - A career in health care offers young Indians the opportunity to contribute to nation-building.
  - Health care provides a unique platform to combine scientific knowledge, technological innovation, and compassion to create a lasting societal impact.
- **Youth's Role in Health Care:**
  - The youth of India, with their energy, creativity, and passion, are essential for driving the next wave of health-care innovations.
  - By embracing careers in health care, Indians can help transform its health-care system into one that is self-reliant and globally competitive.

### Way Forward

- India's transformation in health care is a testament to the nation's broader commitment to self-reliance and excellence.
- India can leverage its growing telemedicine sector to address rural healthcare disparities.
- India can leverage its pharmaceutical prowess to enhance its soft power by increasing medical aid and vaccine diplomacy, as seen in its 'Vaccine Maitri' initiative during the COVID-19 pandemic.
- The country can capitalize on its traditional medicine systems, such as Ayurveda, by promoting them globally through cultural exchanges.
- By strategically leveraging its healthcare transformation, India can significantly enhance its global influence.
- This approach, when balanced with addressing domestic challenges, can position India as a key player in global health governance and innovation.

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## 4. Women's Participation in India's Teaching Workforce

### Introduction

- The participation of women in India's teaching workforce has undergone significant transformation in recent years.
- According to data from the **Unified District Information System for Education (UDISE)**, the proportion of women school teachers increased in recent years.
- Despite these gains, **gender disparities persist across different educational levels and between private and government institutions.**

### Trends in Women's Participation in Teaching

- The number of female teachers increased from **49.98% in 2018-19 to 53.34% in 2023-24.**
- Growth has been higher in **private schools**, with a **20% increase in female teachers** in recent years.
- **Private schools have a higher proportion of women teachers**, largely due to **urban-centric locations** and better commuting facilities.
- However, **private school teachers often receive lower salaries** than their male counterparts, reinforcing gendered economic inequalities.
- Data from the **2021-22 All India Survey on Higher Education (AISHE)** shows that women make up only **43% of faculty in higher education.**
- Globally, **women dominate primary and secondary teaching roles** but see a **sharp decline in representation at the tertiary level.**

### The Impact of Female Teachers on Education

- Studies highlight that classrooms led by **female teachers show a 20% higher rate of inclusive participation.**
- Women teachers **create supportive learning environments** by integrating **social-emotional learning and cooperative teaching methods.**
- Female teachers play a **crucial role in breaking social taboos** and encouraging girls' education.
- They help **address menstrual health awareness, child marriage concerns, and gender equity in classrooms.**
- A **McKinsey report** estimates that achieving gender parity in educational roles could **add \$12 trillion to global GDP.**
- Greater female participation in higher education leads to **diverse academic perspectives and innovative research.**
- Women in leadership **inspire future generations to pursue careers in academia and education administration.**

### Systemic Challenges Faced by Women Teachers

- **Private school teachers earn lower salaries** than government counterparts, and women often face **gendered pay gaps.**
- Society continues to view **women's earnings as supplementary**, limiting their **bargaining power for equal pay.**
- **Women teachers in rural areas** face challenges such as **unsafe transportation, lack of housing, and workplace harassment.**
- **Absence of grievance redressal mechanisms** discourages women from **pursuing or continuing careers in teaching.**
- **Women continue to bear the primary responsibility for household work** and childcare, limiting their career growth.
- The **lack of flexible work hours and childcare support** prevents many from advancing into leadership positions.
- **Fewer women in leadership positions** results in **limited mentorship and role models.**
- Promotion policies in universities **favor male candidates** due to implicit biases and societal norms.

### Way Forward

- Governments must **implement gender-sensitive policies to promote women's participation in education.**
- **Providing housing allowances, transport facilities, and safety measures** in rural schools can encourage **more women to join.**
- Expanding **financial aid for women pursuing education degrees** will help increase **teacher diversity.**
- **Bangladesh's initiative to provide stipends for female teachers in rural areas** has successfully **increased women's participation**—India can adopt similar models.
- Providing **higher pay and special allowances** for women teaching in remote locations will **bridge the gender gap in rural schools.**
- Establishing **mentorship programs and leadership training** for female educators in higher education.
- Ensuring **transparent promotion policies** and **recognition programs** for women faculty members.
- Implementing **family-friendly workplace policies** such as **flexible work hours, parental leave, and on-campus childcare.**

### Conclusion

- The **increasing participation of women in India's teaching workforce** is a positive trend, but **gender disparities remain in higher education and leadership roles.**
- Addressing these disparities requires **comprehensive policy measures, cultural shifts, and institutional support.**

## 5. Food Safety, Security, and Food Irradiation

### Introduction

- **The food industry contributes significantly to India's economy through domestic consumption and exports.**
- Advancing food safety and security is crucial for achieving the vision of "Viksit Bharat".
- Minimizing food loss and waste, particularly of perishable items like fruits and vegetables, is essential to ensure sufficient, nutritious food for all.

### Food Safety and Trade Growth

- With the expansion of processed food trade, **food safety management has gained importance, especially in complying with stringent regulations in developed economies.**
- Food safety incidents can cause public health risks, disrupt food supplies, reduce consumer confidence, and destabilize prices.

### Food Irradiation Technology

- **Irradiation involves exposing food to ionising radiation, eliminating harmful microorganisms, delaying spoilage, and reducing the need for chemical preservatives.**
- It extends shelf life, prevents premature ripening, and reduces food loss.
- The Union Budget 2024-25 has allocated funds to establish 50 multi-product food irradiation units in the MSME sector.
- After the Codex Alimentarius Commission set global standards for food irradiation, **countries such as the US, Japan, and the EU adopted the technology for both domestic and export markets.**
- The 2012 agreement allowed Indian mangoes to be exported to the US after undergoing irradiation.
- This agreement marked the end of a 20-year ban, demonstrating the effectiveness of irradiation in meeting stringent international food safety standards.

### Investment Opportunities and Government Support

- The Indian food processing sector is expected to reach \$535 billion by 2025-26.
- With rising domestic and international demand for safe, long-lasting food products, food irradiation facilities are a promising investment.
- The Ministry of Food Processing Industries (MoFPI) offers up to Rs 10 crore per project to establish food irradiation units, particularly to treat perishable produce and enhance shelf life.
- MoFPI has invited entrepreneurs to set up irradiation units under the **Integrated Cold Chain and Value Addition Infrastructure Scheme.**

### Challenges in Food Irradiation Facility Commissioning

- Establishing a food irradiation facility involves multiple stages, including proposal approval, site clearance, safety assessments, and ongoing maintenance.
- Key institutions like the Bhabha Atomic Research Centre (BARC) and the Atomic Energy Regulatory Board (AERB) oversee these processes.

### Way Forward

- India must expand its food irradiation infrastructure to meet the growing demands of the agrifood supply chain and export sector.
- Entrepreneurs and investors should seize the opportunity to contribute to the sustainable development of India's food industry by establishing irradiation facilities.
- The expansion of food irradiation facilities plays a vital role in transforming the agrifood industry and contributing to India's long-term economic growth.

## 6. Youth Lifestyle and Mental Well-being

### Introduction

- India is poised for rapid economic growth driven by its young population.
- The youth contribute significantly to both production and demand, positioning India to be a future economic powerhouse.

### Lifestyle Changes Affecting Youth

- The rapid changes in lifestyle, spurred by economic growth, have negatively impacted the mental well-being of Indian youth.
- **India reports the highest growth in ultra-processed food consumption among youth**, contributing to poor physical and mental health outcomes.
- Research suggests these foods may be as addictive as smoking.
- **Low levels of exercise and inadequate sleep** are becoming common, contributing to health concerns.
- **The early introduction and widespread use of smartphones among teenagers** have adverse effects on cognition, emotional regulation, and overall mental well-being.

### Mental Health Challenges

- **India is experiencing a silent mental health epidemic, particularly among adolescents.**
- Recent findings from a database of over 1,50,000 individuals highlight this growing issue.
- Shifts in cultural practices, such as weakened family relationships, are contributing to declining mental health, especially among youth.

### Socioeconomic Factors and Mental Well-being

- Data indicates that **youth from lower-income families who exercise regularly, have strong family relationships, and avoid ultra-processed foods show better mental well-being** than their wealthier counterparts with sedentary lifestyles and weakened family bonds.
- There is growing evidence that **returning to traditional values**, such as strong family connections, healthy diets, and physical exercise, contributes to improved mental health.

### Long-term Consequences

- If the current trends of poor mental health continue, India's demographic dividend may be undermined.
- A shortage of qualified, capable, and productive workers could affect the economy as a whole.

### Paths to Transformation in Mental Health

- **Step up funding and human resources** in mental health services across health and other sectors.
- **Reduce stigma and discrimination** by including individuals with mental health conditions in all aspects of society and decision-making.
- **Address social and structural determinants of mental health** by intervening in homes, schools, workplaces, and communities.
- Implement actions such as protecting children from abuse, supporting early childhood development, addressing bullying, and enhancing green spaces.
- **Regulate harmful substances, such as ultra-processed foods and hazardous pesticides**, which are linked to poor mental health outcomes.
- Build networks of community-based mental health services.
- Scale up care options for common mental health conditions, such as depression and anxiety.
- **Ensure that mental health services are accessible and affordable, particularly for vulnerable and underserved populations.**

### Conclusion:

- To protect the demographic dividend and ensure sustainable economic growth, India must intervene now to improve the mental well-being of its youth.
- This requires a coordinated effort from government, the private sector, and civil society to reshape environments, strengthen care systems, and promote mental health as a national priority.

Topic: Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

## 7. National Critical Minerals Mission (NCMM)

### Introduction

- The **Union Cabinet's approval of the National Critical Minerals Mission (NCMM)** is a crucial step toward self-reliance in critical minerals.

### Significance of Critical Minerals for India

- Essential for manufacturing **solar panels, wind turbines, and battery storage systems**.
- Plays a key role in achieving India's **net-zero carbon emission targets** by 2070.
- Lithium, cobalt, and nickel are **key components of EV batteries**.
- India currently **imports 60-70% of EV battery materials** from China, making self-reliance crucial.
- Rare earth elements (REEs) are vital for **chip manufacturing, smartphones, and other electronic devices**.
- Reducing import dependence will boost **India's semiconductor manufacturing initiatives**.
- Critical minerals are used in **fighter jets, missiles, satellites, and radar systems**.
- Strategic minerals like **beryllium and titanium** are essential for defense-grade materials.
- Boosting domestic mining and refining will create **employment opportunities**.
- Strengthening India's **export potential** in mineral-rich global markets.

### Objectives and Key Features of NCMM

- The mission aims to conduct **1,200 domestic critical mineral exploration projects** by 2030-31.
- Over **100 mineral blocks** will be auctioned for private and public sector mining.
- Expanding **geo-mapping and aerial surveys** for mineral discovery.
- The mission aims to **build a technological, regulatory, and financial ecosystem** to ensure steady supply.
- Development of **refining and processing infrastructure** to reduce dependence on imports.
- **Investments in R&D** for new extraction and refining techniques.
- India has already signed agreements with **Argentina, Zambia, and the United States** for mineral cooperation.
- Special focus on **reducing deforestation, preventing groundwater depletion, and rehabilitating displaced communities**.
- **Regulatory frameworks** for sustainable mineral extraction and refining.

### Strategic International Partnerships

- **Ongoing discussions** with **Australia, Chile, and Bolivia**, known for lithium and other critical mineral reserves.
- Collaborations to **secure long-term mineral supplies** and access to advanced mining technologies.
- Responsible mining practices will be promoted to **minimize ecological degradation**.

### Challenges in Implementing NCMM

- **Exploration to production cycle** can take **10-15 years** due to regulatory and geological complexities.
- Need for **continuous research and updating of mining technologies**.
- **Large lithium reserves in Reasi (Jammu & Kashmir)** raise concerns over **deforestation, groundwater depletion, and local displacement**.
- **Complex land acquisition laws** and **slow environmental clearances** can delay projects.
- **Ensuring a balance between environmental protection and industrial growth**.
- Developing **efficient transportation and storage systems** for critical minerals.
- Mining and refining require **highly skilled professionals**, which India currently lacks.

### Way Forward

- **Simplify mining laws** to accelerate exploration and production.
- Establish **fast-track clearance mechanisms** for critical mineral projects.
- Investment in **advanced refining and processing infrastructure**.

- Encouraging **technology transfer from global partners** to improve refining efficiency.
- Implement **strict environmental safeguards** to minimize damage to ecosystems.
- Promote **circular economy models** by investing in **recycling and urban mining** (extraction of minerals from e-waste).
- Setting up **dedicated research institutions for mineral exploration and refining**.
- Encouraging **innovation in battery technology to reduce dependency on scarce minerals**.
- **Creating a national stockpile** of critical minerals to **mitigate supply disruptions**.
- Establishing a **Critical Minerals Fund** to ensure financial stability in the sector.

### Conclusion

- With the right execution, **NCMM has the potential to drive India's self-reliance in critical minerals and support its journey toward a green and technology-driven future.**

## 8. Role of National Sample Survey (NSS) in Policy Formulation

### Introduction

- The **National Sample Survey (NSS)** has played a pivotal role in shaping India's **social and economic policies**.
- As India celebrates the **diamond jubilee** of NSS, it is crucial to acknowledge its contribution to **labour markets, poverty reduction, education, health, migration, and financial inclusion**.
- NSS remains critical in ensuring **data-driven governance**, aligning with the vision of **Viksit Bharat 2047**.

### Understanding Female Labour Force Participation (FLFPR) Trends

- **Challenges Identified:**
  - Gender discrimination in hiring.
  - Lack of childcare facilities.
  - Low wages in informal sectors.
- **Interventions Based on NSS Data:**
  - **Access to credit:** Expansion of **Self-Help Groups (SHGs)** and microfinance for women.
  - **Entrepreneurship promotion:** **PM Mudra Yojana** supporting women-led businesses.
  - **Skill development initiatives:** **Pradhan Mantri Kaushal Vikas Yojana (PMKVY)** to improve employability.

### NSS and Social Sector Development

- **Education Sector Insights**
  - **Preference for private vs government schools.**
  - **Regional disparities** in education spending.
  - Impact of **mid-day meal schemes and scholarships.**
- **Policy Takeaways:**
  - Expansion of **Right to Education (RTE) Act** implementation.
  - Growth of **digital learning platforms** post-pandemic.
  - Focus on **girls' education** through **Beti Bachao, Beti Padhao Yojana**.
- **Health Sector Insights**
  - High **out-of-pocket expenditure (OOPE)** for healthcare.
  - Low **insurance coverage**, especially in rural areas.
  - Need for **better public healthcare infrastructure**.
- **Policy Impacts:**
  - Launch of **Ayushman Bharat (PMJAY)** for health coverage.
  - Expansion of **primary health centers and telemedicine**.
  - Increased focus on **maternal and child healthcare**.

### NSS and Migration

- **Key Findings:**
  - Women migrate not just for marriage but also for **work and economic opportunities**.

- Migrant women play a **significant role in informal urban employment**.
- Seasonal migration trends impact **rural labour availability and remittances**.
- **Policy Implications:**
  - Strengthening **urban employment opportunities**.
  - Expanding **migrant worker protections**.
  - Designing **inclusive housing and transport policies**.

### NSS and Financial Inclusion

- **Jan Dhan Yojana and Digital Transactions**
  - **95% of individuals aged 18+ have a bank account** under PM Jan-Dhan Yojana (PMJDY).
  - However, **only 51% of men and 29% of women aged 15-29 know how to perform online banking transactions**.
- **Challenges Identified:**
  - **Lack of digital banking awareness**, especially among women.
  - **Limited use of UPI and mobile banking** despite high penetration of accounts.
- **Policy Recommendations:**
  - **Financial literacy campaigns** targeting youth and rural populations.
  - Expanding **digital training programs** under **Digital India Mission**.
  - Encouraging **women's participation in fintech and digital economy**.

### Challenges Facing NSS and Way Forward

- **Non-sampling errors** due to:
  - Households refusing to answer survey questions.
  - Fatigue affecting **response accuracy**.
- **Global Trend:** Even in developed economies, response rates to **household surveys are declining**.
- The way forward is to **combine NSS survey data with administrative data** for a holistic approach:
  - **Administrative data** (such as tax filings and social security data) provides **macro-level insights**.
  - **NSS surveys** help assess **access, availability, and affordability** of services.
- A **hybrid model** where **NSS estimates complement government databases**, enabling better economic planning.

### Conclusion

- In an era of **big data and AI-driven analytics**, **NSS must adapt** by:
  - Improving **survey methodologies**.
  - Increasing **data integration with real-time administrative records**.
  - Ensuring **periodic, transparent reporting** on the well-being of Indian households.
- The goal should be to ensure "**Data for Development**", where **evidence-based policymaking** helps India progress toward **Viksit Bharat 2047**.

## 9. Digital Public Infrastructure (DPI)

### Introduction

- India has achieved over 80% financial inclusion in just six years, which has garnered international praise.
- This achievement sets a benchmark for other developing nations, especially in the Global South.
- India's success demonstrates the country's ability to create scalable, inclusive, and efficient digital and financial infrastructures for over a billion people.

### What is Digital Public Infrastructure (DPI)

- **Digital Public Infrastructure (DPI)** refers to the **foundational technology that enable a wide range of digital services for citizens, governments, and businesses**.
- The implementation of DPI aims to achieve broader goals like digital inclusion, financial inclusion, and efficient governance.
- India's success with the Pradhan Mantri Jan Dhan Yojana (PMJDY) and UPI highlights the power of DPI in bridging financial gaps.

- DPI is closely aligned with the United Nations Sustainable Development Goals (SDGs), particularly those related to **reduced inequalities, economic growth, and strong institutions**.

#### Focus of the G20 Summit 2023:

- The G20 summit in New Delhi highlighted the significance of **Digital Public Infrastructure (DPI)**.
- India's G20 task force released a comprehensive report emphasizing a **global strategy for developing DPI**, showing India's leadership in this domain.
- The comprehensive global strategy aims to assist countries worldwide in creating reliable DPIs that support their unique needs.

#### Stakeholders in the DPI Landscape:

- The digital landscape involves various stakeholders, including private enterprises, government bodies, non-profit organizations, and think tanks.
- This multi-sector involvement aims to **develop authentic and reliable DPI solutions to address societal needs**.
- The challenge lies in identifying trustworthy DPIs and ensuring they align with core values like security, inclusivity, and scalability.

#### The Role of Citizen Stack:

- **Citizen Stack** emerges as a trusted ecosystem inspired by the success of the **India Stack**, a comprehensive digital infrastructure serving over a billion citizens.
- Citizen Stack serves as a **regulatory body** or **auditor**, authenticating and certifying DPI solutions.
- It guarantees stringent standards of quality and security, thus providing a reliable benchmark for evaluating DPIs.
- India's commitment to high standards of DPI through the **Citizen Stack** represents its dedication to global excellence in digital infrastructure.

#### Five Sutras for a Good DPI:

- Uphold the citizens' relationship with the market and the state, ensuring the DPI is free from adverse influences.
- Safeguard citizen empowerment and privacy through consent-based data sharing.
- Prevent monopolistic lock-ins by ensuring **interoperability**.
- Promote **techno-legal regulation**, combining technology with law to ensure ethical use and protection of societal rights.
- Encourage public and private sector collaboration for innovation without the domination of corporate interests.

#### Concerns / Challenges

- There is often a **gap in access, especially in rural areas or among marginalized groups** lacking digital literacy or infrastructure.
- The more expansive and connected DPI becomes, the higher the risk of data breaches and misuse of personal information.
- Without proper regulation, DPIs may lead to the monopolization of digital services by a few large players.

#### Future of Digital Public Infrastructure:

- As the digital landscape evolves, the principles and models set by **India's Citizen Stack** will play a vital role in shaping the future of DPIs worldwide.
- India's focus on **authenticity, quality, and reliability** ensures that its DPI framework serves as a global standard, driving trust and adoption across borders.
- Advances in artificial intelligence (AI), blockchain, and machine learning will further enhance DPI's capability.
- Governments must continue to foster innovation through **public-private partnerships**, ensuring that the public good is prioritized over corporate profits.
- Need for **global standards** to ensure interoperability, security, and privacy across borders.

**Conclusion**

- India's remarkable progress in financial inclusion and its leadership in digital public infrastructure highlight its commitment to empowering the global community.
- With Citizen Stack as a model for excellence and security in DPIs, India continues to set the stage for a more inclusive and digitally sovereign world.

Topic: Effect of policies and politics of developed and developing countries on India's interests, Indian diaspora.

## 10. China-Africa Relations and Implications for India

**Introduction**

- Over the past 24 years, the **Forum on China-Africa Cooperation (FOCAC)** has become a key platform for dialogue and planning between the two sides.
- The latest summit in Beijing reaffirms China's commitment to Africa, solidifying political, economic, and strategic ties.

**Key Takeaways from the 9th FOCAC Summit**

- **Beijing Declaration Highlights**
  - Focuses on creating a "China-Africa Community with a Shared Future."
  - Promotes synergy between China's Belt and Road Initiative (BRI), the African Union's Agenda 2063, and the 2030 UN Agenda for Sustainable Development.
  - Emphasizes China's Global Development Initiative (GDI), Global Security Initiative (GSI), and Global Civilization Initiative (GCI).
  - Calls for expanding exchanges on governance, modernization, and poverty reduction.
- **Economic Cooperation and Debt Relief**
  - Synergy between African and Chinese economic goals, including support for the African Continental Free Trade Area (AfCFTA).
  - China calls on international financial institutions to assist in debt relief for African countries.
  - China pledged \$51 billion in financial support to Africa, focusing on loans, grants, and investment promotion.
- **Focus on Security and Development**
  - China supports increased UN funding for African peace operations and maritime security.
  - The summit stresses joint efforts to foster dialogue among civilizations.

**Strategic Perspectives on China-Africa Relations**

- **China's Perspective**
  - China sees a natural partnership with Africa, given that both are regions of the developing world.
  - Beijing positions itself as an alternative model of modernization, distinct from Westernization, which resonates with many African nations.
- **African Perspective**
  - While Africa benefits from Chinese investments, many African nations are concerned about becoming overly dependent on China, as seen in the donor-recipient dynamic.
- **Western and American Perspectives**
  - Some American analysts see China's deepening relations with Africa as part of Xi Jinping's anti-American strategy, positioning the Global South as a counterweight to U.S. global influence.

**Way Forward for India**

- India needs to resume high-level diplomatic engagement with Africa, akin to the three India-Africa Forum Summits (2008-2015).
- A decade-long gap in Africa-centered conference diplomacy has hindered India's strategic influence.
- While India enjoys historical and cultural ties with Africa, it must allocate more resources to match China's financial engagement.

- Without substantial investments, India risks falling behind in influencing Africa's developmental landscape.
- Africa's role in India's foreign policy needs reassessment.
- Political and financial commitments should reflect the continent's importance to India's strategic goals, especially in areas such as energy, food security, and technology.
- India should leverage multilateral platforms such as the African Union and G20 to expand cooperation with African nations in fields like renewable energy, counterterrorism, and capacity building.

### Conclusion

- China's deepening ties with Africa through the FOCAC platform demonstrate Beijing's long-term strategy for gaining influence on the continent.
- India must adopt a more proactive and sustained engagement to ensure that it remains a key player in Africa's development.

## General Studies - 3

Topic: Indian Economy and issues relating to planning, mobilization, of resources, growth, development and employment

### 11. Migrant Workers in the Agricultural Fields of the Cauvery Delta

#### Introduction

- The Cauvery delta is witnessing a gradual influx of migrant workers from other parts of India into its agricultural sector.

#### Major Factors Contributing to the Trend

- **Labor Shortage in the Delta:**
  - The younger generation is moving away from agriculture, seeking jobs in urban areas.
  - This has led to a reliance on older workers, many of whom struggle to meet the demands of modern agricultural practices.
- **Socio-Economic Changes:**
  - Socio-economic changes, including higher educational aspirations have contributed to the declining agricultural workforce.
  - The introduction of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) has also influenced labour availability, though its impact is debated.
- **Mechanization and Farm Operations:**
  - The rise of mechanization in farming has reduced the demand for manual labour to some extent.
  - There remains a need for manual labour, particularly for tasks like paddy transplantation, where migrant workers have proven to be effective.

#### Implications of the Influx of Migrant Workers

- **Economic Impact:**
  - Migrant workers provide a cost-effective solution for farmers, as they tend to work for lower wages compared to local labourers.
  - The influx of migrant workers helps sustain agricultural productivity in the delta region.
- **Social and Cultural Dynamics:**
  - The presence of migrant workers in the Cauvery delta has not yet led to significant tensions with local labourers, partly because the numbers are still relatively small.
  - However, there is a potential for future conflicts over wages and job opportunities if the trend continues to grow.
- **Impact on Local Laborers:**

- The decline in local agricultural labour has left many older workers, particularly women, struggling to find consistent employment.
- The shift towards migrant labour may further marginalize local labourers, exacerbating their economic challenges.
- **Caste and Labor Relations:**
  - The relationship between landowners and agricultural workers in Tamil Nadu is often influenced by caste dynamics, which could be affected by the introduction of migrant labour.

### Debates and Discussions

- **Merits and Drawbacks of Migrant Labour:**
  - Proponents argue that migrant labour is necessary to address the acute labour shortage and keep the agricultural sector viable.
  - Critics worry that reliance on migrant labour may weaken local communities and disrupt traditional labour practices.
- **Role of MGNREGA:**
  - The impact of MGNREGA on labour availability in agriculture is contested, with some farmers blaming the scheme for rising wages and labour shortages.
  - A potential solution could be to confine MGNREGA work to non-cultivation seasons, reducing competition between the scheme and agricultural labour demands.

### Way Forward

- **Ensuring Fair Wages:**
  - It is crucial to ensure that migrant and local labourers receive equal pay for equal work. This could help maintain harmony and fairness in the labour market.
- **Strengthening Local Labor:**
  - Initiatives to make agricultural work more attractive to the local population.
  - Offering better wages, benefits, and training, could help mitigate the labour shortage without over-relying on migrant workers.
- **Balancing Mechanization and Labor Needs:**
  - While mechanization can reduce dependence on manual labour, it is important to strike a balance to ensure that those who rely on agricultural work for their livelihood are not left behind.
- **Monitoring Socio-Economic Impact:**
  - The government and local authorities should monitor the socio-economic impact of the influx of migrant workers.

### Conclusion

- The gradual influx of migrant workers into the agricultural fields of the Cauvery delta reflects broader socio-economic changes in Tamil Nadu.
- Balancing the needs of farmers, local labourers, and migrant workers will be key to ensuring sustainable agricultural development in the region.

## 12. Agriculture as an Engine for Growth

### Introduction

- Historically, economists like Arthur Lewis argued that development comes from moving labor from agriculture to manufacturing and services.
- However, **modern agriculture in developed countries has become high-tech and highly productive**, suggesting that Indian agriculture can follow suit.
- Despite a five-year average growth rate of 4%, **Indian agriculture contributes only 18% to GDP but employs 46% of all workers.**

### Challenges in Agriculture

- India's water resources are depleting, and soil health is declining.

- Farming remains low-tech in much of India, with limited access to high-yield, climate-resilient technologies.
- Fragmented land holdings, poor credit access, and a lack of cooperative farming models hinder growth.

### Ecological Solutions

- Half of India's gross cropped area is irrigated, but overuse of groundwater due to free electricity has led to declining water tables.
- A balanced combination of **groundwater regulation**, **rainwater harvesting**, and **micro-irrigation** is crucial.
- **Example:** Gujarat's rainwater harvesting led to 9.6% annual agricultural growth between 1999-2009.
- **Shifting from monocultures to crop diversity and agro-ecological farming** can revive soils and increase yields.
- India must focus on building irrigation infrastructure, soil health, and credit facilities for smallholders.

### Technological Advancements

- Government studies show micro-irrigation boosts yields by 48-52% and incomes by 48%.
- Technologies like **heat-resistant crops** and the use of **drones** for pest control and crop monitoring can increase productivity and climate resilience.
- Agricultural advice provided via mobile phones increased yields by 4% and improved input adoption by 22%.

### Institutional Innovation

- One solution to fragmented land holdings is group farming.
- Although earlier attempts failed, new models such as Kerala's **Kudumbashree** initiative show promise.
- Research showed group farms produce 1.8 times the output/hectare of small individual farms.
- Group farming enables the pooling of resources, reducing costs, and improving market leverage.
- Attracting youth to farming through advanced technologies and organized group farming can help tackle the rural-urban job divide.

### Role of Allied Sectors

- **Livestock, Fisheries, and Forests** offer growth potential.
- Fisheries, for example, grew at 10% in 2022-23, employing 28 million people, with 44% of those jobs held by women.

### Synergizing Agriculture with the Non-Farm Sector

- 61% of rural incomes come from non-farm sectors like agro-processing, machine tools, and eco-tourism.
- Strengthening these linkages can boost both job creation and incomes.

### Conclusion

- By overcoming ecological, technological, and institutional challenges, agriculture can emerge as an engine of growth, contributing significantly to job creation and economic development in India.
- With innovative approaches and focused reforms, farming can become a highly productive and desirable sector.

Topic: Infrastructure: Energy, Ports, Roads, Airports, Railways etc.

## 13. Solar Energy as a Transformative Force

### Introduction

- From natural processes to powering homes, **solar energy is now a decentralized, democratized source of electricity.**
- Unlike coal, oil, gas, nuclear, and hydropower, solar can be harnessed directly at the point of use without extensive infrastructure.

### Impact of Decentralized Solar Power

- Lowers carbon emissions and reduces reliance on polluting fossil fuels.

- Provides energy independence, empowers marginalized groups, particularly women.
- **Gujarat's salt farmers moved to solar pumps, boosting income by 94% and reducing emissions.**
- **Organizations like Barefoot College, Grameen Shakti, and Solar Sister train women as solar engineers, directly impacting community health and safety.**
- The solar industry is a large employer of women, with 40% female workforce participation in the solar photovoltaic sector.
- Aids development in rural and remote areas through clean energy access.
- Avoids the 'resource curse' seen in coal-rich districts suffering poverty and poor health.

### Solar's Role in Building Climate Resilience

- **Off-Grid Solar and Mini-Grids** offers clean energy to unconnected regions, supporting rural economic activities.
- Rooftop solar installations and community mini-grids are eco-friendly, creating jobs without the environmental toll of large-scale projects.

### Role of Community Engagement

- Community institutions like self-help groups and panchayati raj bodies ensure inclusive planning and project ownership.
- In regions without formal structures, **Rural Energy Committees** oversee mini-grids, from planning and installation to tariff management.

### Challenges in the Solar Sector

- Majority of solar investments are in developed nations, while regions like Africa lack infrastructure and funding.
- Funding favors large solar farms, overlooking smaller applications like solar pumps and cold storage critical for rural livelihoods.
- Concentration of solar manufacturing in two countries disrupts supply chains, inflates prices, and impacts accessibility.
- Ensuring easy, affordable access to solar power at the household level requires government and market support.
- Need for robust recycling processes for solar materials to manage waste.
- Requires producer responsibility frameworks, end-of-life collaboration, and possibly mobile recycling plants for enhanced sustainability.

### Policies and Gender-Inclusive Energy Transition

- Solar must not only displace fossil fuels but also empower communities, especially marginalized ones.
- Policies must place women as central agents of change, not just beneficiaries.
- Current national policies often lack gender inclusivity, impacting women's full participation in the energy sector.
- Integration with sectors like agriculture and rural development can break systemic barriers and create a holistic approach to inclusive energy access.

### Way Forward

- Increase financial incentives for residential and community solar installations, particularly in underserved rural areas and marginalized communities.
- Encourage Public-Private Partnerships (PPPs) to expand off-grid and rooftop solar solutions in remote areas.
- Encourage domestic manufacturing of solar components through schemes like "Make in India".
- Promote policies that actively involve women across the solar value chain, from users to entrepreneurs.
- Develop a circular economy model by encouraging recycling of solar panels and other equipment.

Topic: Conservation, environmental pollution and degradation

## 14. Supreme Court's Role in Tackling Delhi's Air Pollution

### Introduction

- Delhi's air pollution crisis has been a pressing issue for decades, exacerbated by multiple environmental and administrative failures.
- Since 1984, the Supreme Court of India has played a proactive role in mitigating air pollution through **judicial interventions, particularly in *M.C. Mehta vs. Union of India***.
- Despite continuous efforts, the Air Quality Index (AQI) in Delhi and the National Capital Region (NCR) remains at hazardous levels.

### The Supreme Court's Proactive Role in Addressing Air Pollution

- The Supreme Court has been actively intervening in Delhi's air pollution crisis for nearly four decades, primarily through Public Interest Litigations (PILs).
- In *M.C. Mehta vs. Union of India*, the Court pushed for the implementation of pollution-control measures.
- The Supreme Court has consistently monitored vehicular emissions, industrial pollution, and waste management in Delhi.
- Most recently, in 2023-24, a bench led by *Justice Abhay Shreeniwas Oka* issued directives for controlling pollution.

### Root Causes of Delhi's Air Pollution Crisis

- Delhi has seen an **explosive growth in vehicles**, rising from **3 million in 1998 to over 12 million in 2019**.
- Vehicular emissions contribute **40% of Delhi's air pollution**, with older vehicles, diesel trucks, and congestion being primary culprits.
- **Road dust and particulate matter (PM2.5, PM10)** significantly worsen air quality.
- Farmers in Punjab and Haryana burn **millions of tonnes of crop residue** every October-November.
- Sustainable alternatives like **Happy Seeder machines** and **Pusa Decomposer** are yet to be widely adopted due to high costs and poor policy implementation.
- Industries in NCR release **sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and particulate matter** into the air.
- Several power plants around Delhi operate with outdated pollution-control mechanisms.
- Delhi generates **9,500 tonnes of waste daily**, but **landfills at Ghazipur, Okhla, and Bhalswa are overburdened**.
- Uncontrolled **burning of waste releases toxic gases like methane, dioxins, and sulphur dioxide**.
- **Waste-to-energy plants** remain underutilized due to inefficient waste segregation.
- Delhi's location in the **Indo-Gangetic plain** worsens its air quality due to:
  - **Low wind speeds and temperature inversion** trapping pollutants.
  - **Lack of rainfall in winter**, preventing natural dispersion.
  - **Surrounding urbanization** intensifying the heat-island effect.

### Judicial Limitations

- The Court can direct action but cannot enforce implementation.
- The **state and central governments engage in blame games**, delaying effective policies.
- The judiciary has **limited technical expertise** in environmental governance.
- Court orders are **often ignored or diluted** at the ground level.
- Lack of **awareness and enforcement** makes policies ineffective.

### Global Models

- **Beijing, China**
  - **Mass adoption of electric vehicles (EVs) – 99% of the world's e-buses are in China.**
  - **Coal power replaced with clean energy** – Resulted in a **35% drop in PM2.5 levels** by 2017.
- **Paris, France**
  - **Heavy investment in public transport** and car-free zones in city centers.
  - **Strict emission norms for diesel vehicles.**

- **Bogota, Colombia**
  - **Ciclovía Program:** Encouraging bicycle use by closing major roads every Sunday.
- **New York City, USA**
  - **Stringent emissions norms for industries and a shift towards clean energy.**

### Way Forward

- Enforce **polluter-pay policies** for industries and vehicular emissions.
- Provide **financial incentives for clean technologies.**
- **Expand Metro connectivity** and promote electric vehicles (EVs).
- Implement **congestion pricing** to reduce private car usage.
- **Strict penalties for illegal waste burning.**
- Investment in **waste-to-energy plants.**
- Large-scale adoption of **Happy Seeders and bio-decomposers.**
- **Subsidies for alternative crop disposal methods.**
- **Mass awareness campaigns** on pollution's health effects.
- Encouraging citizen-led initiatives like **carpooling and cycling.**

### Conclusion

- The **Supreme Court's interventions are necessary**, but they cannot substitute for **government action.**
- A **political consensus**, free from blame games, must drive the agenda for a **clean and sustainable future.**
- Without strong **executive leadership, citizen participation, and a science-backed policy framework**, judicial activism alone cannot resolve Delhi's pollution crisis.

## 15. Nature Restoration Law for India

### Introduction

- With nearly 30% of India's geographical area facing land degradation, there is an urgent need for a robust Nature Restoration Law (NRL).

### EU's Nature Restoration Law

- Enacted by the EU on June 17, 2024, as a landmark legislation aimed at restoring ecosystems.
- **Goals:**
  - Restore 20% of land and sea areas by 2030.
  - Fully restore all ecosystems in need by 2050.
- **Integration with Other Policies:** Part of the EU's Biodiversity Strategy for 2030 and the European Green Deal.

### India's Environmental Challenges

- **Current State:** Approximately 97.85 million hectares of land degraded (29.7% of total area) as per ISRO's Desertification and Land Degradation Atlas.
- **Key States Affected:** Gujarat, Karnataka, Maharashtra, and Rajasthan with significant desertification.
- **Desertification Concerns:** Highlighted with 83.69 million hectares affected.

### India's Existing Initiatives

- **Government Programs:**
  - Green India Mission.
  - Pradhan Mantri Krishi Sinchayee Yojana.
  - Integrated Watershed Management Programme.
  - National Afforestation Programme.
- **Need for Comprehensive Approach:** Current efforts insufficient to tackle the scale of degradation.

### Proposed Features of a Nature Restoration Law in India

- **Restoration Targets:**
  - 20% of degraded land to be restored by 2030.

- All ecosystems to be restored by 2050.
- **Wetland Restoration:** Targeting critical wetlands like the Sundarbans and Chilika Lake.
- **Biodiversity in Agriculture:** Promote agroforestry and sustainable practices.
- **River Restoration:** Focus on major rivers, addressing pollution and obstructions.
- **Urban Green Spaces:** Ensure no net loss of green spaces; promote urban forestry in cities.

### Economic and Social Benefits of Restoration

- **Economic Returns:** Potential global returns of up to \$10 trillion by 2030 from nature restoration.
- **Enhanced Agricultural Productivity:** Improving water security and job creation, particularly in rural areas.
- **Alignment with SDGs:** Contributing to Goal 15 (sustainable management of forests and combating desertification).

### Mitigating Climate Change

- **Carbon Sequestration:** Restoring ecosystems to enhance carbon sinks.
- **Commitments Under the Paris Agreement:** Addressing global warming through local actions.

### Global Implications and Precedent

- **Setting a Precedent:** The EU's NRL as a model for other nations facing similar challenges.
- **Importance for India:** Given high levels of land degradation and biodiversity loss, implementing an NRL would significantly contribute to ecological and socio-economic resilience.

### Concerns / Challenges

- **Developing a comprehensive regulatory framework** that can effectively enforce the provisions of the NRL across diverse geographical and ecological contexts.
- **Significant funding will be required** to implement restoration initiatives, which may strain existing budgets and resources.
- **Balancing the interests of various stakeholders**, including farmers, industrialists, and environmentalists.
- **Climate change and changing weather patterns** can alter ecosystem dynamics and restoration outcomes.
- **Lack of public awareness** regarding the importance of ecosystem restoration and the potential benefits of the NRL.

### Way Forward

- **Urgency of Legislative Action:** Immediate steps required to formulate and implement a Nature Restoration Law.
- **Engagement of Stakeholders:** Involvement of local communities, policymakers, and environmental organizations in restoration efforts.
- **Long-term Vision:** Establish a sustainable framework that ensures the protection and restoration of India's diverse ecosystems.
- **Explore public-private partnerships**, green bonds, and international funding opportunities to diversify funding sources.
- **Leverage technology** such as remote sensing and Geographic Information Systems (GIS) to monitor ecosystems, assess land degradation, and evaluate restoration progress.
- **Launch nationwide campaigns to educate the public** about the importance of ecosystem restoration and the role of the NRL.

### Conclusion

- By adopting such legislation, India can work towards restoring its natural ecosystems, enhancing biodiversity, and promoting sustainable development.
- The 75th anniversary of the Constitution serves as a timely reminder of the need for a holistic approach to environmental governance, ensuring that future generations inherit a healthier and more resilient planet.

Topic: Disaster and disaster management.

## 16. Teesta Dam Project

### Introduction

- The **approval of a 118-meter-high dam on the Teesta River in Sikkim** has sparked concerns among **environmentalists, geologists, and local communities** due to its location in an **ecologically fragile and disaster-prone region**.
- The project comes as a **revival of the Teesta III hydel power project**, which was **devastated by a Glacial Lake Outburst Flood (GLOF) in 2023**.

### Glacial Lake Outburst Floods (GLOFs) and Risks to the Project

- GLOFs occur when **glacial lakes overflow suddenly due to ice or rockfalls, earthquakes, or rising temperatures**.
- These floods release **huge volumes of water, causing catastrophic downstream impacts**.
- **Why is the region prone to GLOFs?**
  - **Rapid glacier retreats due to climate change**.
  - **Seismic activity in the Himalayan belt**, increasing the risk of landslides and dam breaches.
  - **Unpredictable weather events**, including cloudbursts and extreme rainfall.
- **Key scientific concerns:**
  - **No credible study has been made public** regarding glacial lake hazards upstream.
  - **Previous predictions of flood risks have been proven wrong**—even the **National Hydropower Corporation (NHPC) had claimed Teesta III was safe**.
  - **The Himalayas are the world's youngest and most unstable mountains**, making them unsuitable for large hydropower infrastructure.

### Environmental and Ecological Concerns

- The Teesta River basin **supports diverse biodiversity, including rare and endangered species**.
- The region falls under the **Indo-Burma Biodiversity Hotspot**, one of the world's most ecologically sensitive areas.
- **Construction of a high dam will disrupt river flow, sediment transport, and aquatic ecosystems**.
- **Himalayan geology is naturally unstable, prone to landslides, earthquakes, and soil erosion**.
- **Large-scale construction will increase deforestation**, making the region **more vulnerable to natural disasters**.
- **China is also planning to construct a dam on the Yarlung Tsangpo (Brahmaputra) in Tibet**, which could affect downstream water flow in India.
- India's push for hydropower in the Himalayas could **trigger regional tensions over transboundary water governance**.

### The Debate on Hydropower in the Himalayas

- Hydropower is considered a **renewable energy source** and is **critical for India's energy security**.
- **India aims to generate 500 GW of non-fossil fuel energy by 2030**, and hydropower is part of this strategy.
- Large dams like **Teesta III are seen as solutions for reducing coal dependency**.
- The **Himalayan hydropower boom has led to massive ecological destruction**.
- **Recent disasters in Uttarakhand (Chamoli flash floods, Kedarnath floods) and Himachal Pradesh highlight the dangers of large dams in seismically active zones**.
- **Decentralized renewable alternatives** are safer and more sustainable than large hydropower projects in sensitive areas.

### Way Forward

- Conduct a **comprehensive climate vulnerability study** before approving large infrastructure projects in the Himalayas.
- **Improve early warning systems** for GLOFs, cloudbursts, and extreme weather events.

- The **Environmental Impact Assessment (EIA) process must be strengthened**, ensuring **greater scientific transparency and public participation**.
- The **approval process should involve independent hydrologists, geologists, and climate scientists** rather than relying solely on project proponents.
- Promote **small and micro-hydropower projects**, which have **lower environmental risks**.
- **Expand solar and wind energy projects** in non-ecologically sensitive zones.
- Strengthen **India's water diplomacy with China**, ensuring **collaborative river management in the Brahmaputra basin**.
- Establish a **permanent GLOF monitoring mechanism** with upstream and downstream data-sharing agreements.

### Conclusion

- The **Teesta dam project highlights a critical dilemma**—balancing **energy security with environmental sustainability** in fragile ecosystems.
- A **holistic energy approach focusing on smaller hydropower, solar, and wind alternatives** could provide **sustainable solutions** without endangering Himalayan ecology.

Topic: Challenges to internal security through communication networks, role of media and social networking sites in internal security challenges, basics of cyber security.

## 17. Cybersecurity in Public Transportation Systems

### Introduction

- IRCTC had addressed a critical vulnerability on its insurance portal
- The vulnerability allowed unauthorized access to passengers' travel details
- It also enabled changes to nominee information in travel insurance policies

### Background

- Cybersecurity vulnerabilities in public transportation systems have been a growing concern
- IRCTC, as a major online ticketing platform, handles sensitive passenger data
- Travel insurance is often bundled with ticket bookings, involving third-party insurers
- Increasing digitization of travel services has led to new cybersecurity challenges

### Major Debates

- Balance between user convenience and data security in online services
- Responsibility of data protection in multi-party digital ecosystems
- Need for regular security audits and vulnerability assessments in public sector digital platforms
- Role of ethical hacking and bug bounty programs in improving cybersecurity

### Supporting Arguments

- Quick response by IRCTC to address the vulnerability shows commitment to data security
- Involvement of CERT-In demonstrates the government's active role in cybersecurity
- The discovery highlights the importance of independent security researchers in identifying vulnerabilities
- Fixing the issue protects millions of passengers from potential data breaches and fraud
- The incident underscores the need for robust security measures in public-facing digital services

### Opposing Arguments

- The vulnerability existed for an unknown period, potentially exposing passenger data
- IRCTC's reliance on third-party services for critical functions like insurance may introduce security risks
- The ease of accessing data with random PNRs suggests inadequate security measures
- Lack of proactive detection of the vulnerability by IRCTC or the insurance provider
- The incident may erode public trust in digital government services

**Government Schemes**

- National Cyber Security Strategy
- Digital India Initiative
- Cyber Swachhta Kendra (Botnet Cleaning and Malware Analysis Centre)

**International Best Practise**

- Implementation of multi-factor authentication for accessing sensitive information
- Regular third-party security audits and penetration testing
- Adoption of data encryption and tokenization for storing personal information

**Way Forward**

- Implement stricter access controls and data validation mechanisms
- Conduct regular security assessments of all IRCTC digital platforms and partner services
- Enhance collaboration between government agencies, private sector, and cybersecurity experts
- Develop a comprehensive incident response plan for data breaches in public services



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