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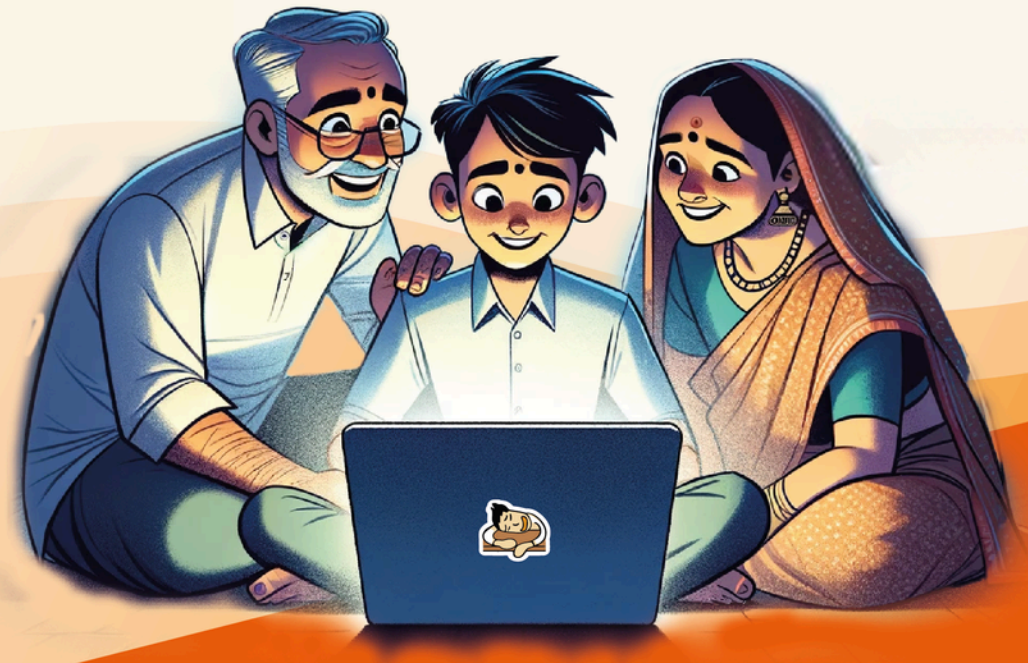
Awakening Toppers

UPSC MAINS

Solved PYQs

2023

General Studies Paper 3



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How to Maximize Your UPSC Mains Score Using These PYQs

Transform Your Preparation into Your Success Strategy

❌ "I solve PYQs but still struggle in mock exam"

Your Problem: You're treating PYQs like MCQs - solving for the sake of solving without strategic analysis.

Strategic Solution: After solving each question, spend 10 minutes analyzing: What was the examiner testing? Which keywords were crucial? How can I improve my answer structure? Create a "mistakes point list" to track recurring weaknesses.

⏰ "I can't finish questions within time limits"

Your Problem: You know the content but struggle with time management and answer structuring under pressure.

Time-Bound Practice: Set strict timers - 7 minutes for 10-mark questions, 12 minutes for 15-mark questions. Practice writing concise, impactful answers. Use bullet points and subheadings to save time while maintaining clarity.

📚 "My answers lack depth and examples"

Your Problem: Your answers are generic and don't stand out among thousands of similar responses.

Content Enhancement: For each PYQ, create a "example bank" - collect 2-3 specific case studies, data points, or contemporary examples. Practice weaving these naturally into your answers to demonstrate comprehensive understanding.

🎯 "I don't know which topics to prioritize"

Your Problem: Without pattern analysis, you're studying everything equally instead of focusing on high-weightage areas.

Smart Analysis: Create a frequency chart of topics from last 7 years. Identify recurring themes and question patterns. Allocate 60% of your time to high-frequency topics, 40% to emerging trends. Also Sleepy Classes has a video on complete pattern analysis of UPSC mains.

⚠️ Critical Mistake to Avoid

Don't just read solved answers and move on. The real learning happens when YOU attempt the question first, then compare with model answers to identify gaps.

💡 Remember: PYQs are your blueprint, not just practice material

Every question tells you exactly what UPSC expects. Use this collection to decode the examiner's mindset, not just to test your knowledge. Your success lies in understanding the 'why' behind each question.

FREE - GS Mains PYQs Discussion			
Date	**Day**	**Topic**	**Year**
02 June 2025	Monday	General Studies Paper 1	2024
03 June 2025	Tuesday	General Studies Paper 2	2024
04 June 2025	Wednesday	General Studies Paper 3	2024
05 June 2025	Thursday	General Studies Paper 4	2024
15 June 2025	Sunday	General Studies Paper 1 to 4	2023
22 June 2025	Sunday	General Studies Paper 1 to 4	2022
29 June 2025	Sunday	General Studies Paper 1 to 4	2021
06 July 2025	Sunday	General Studies Paper 1 to 4	2020

Economy

1) Explain the changes in cropping pattern in India in the context of changes in consumption pattern and marketing conditions

Approach

- Introduction: Write about cropping pattern in India briefly
- Body: Write about Historical Overview of Cropping Patterns and briefly discuss changes in consumption Patterns, changes in Marketing Conditions and impact on cropping patterns.
- Conclusion: Give appropriate conclusion in this regard

Solution:

Historical Overview of Cropping Patterns

- Traditionally, Indian agriculture was dominated by subsistence farming, with a focus on staple crops like rice, wheat, millets, and pulses. The Green Revolution of the 1960s and 1970s marked a significant shift, introducing high-yielding varieties of rice and wheat, which led to increased productivity and self-sufficiency in food grains. However, this period also entrenched a monoculture approach, primarily in the northern and northwestern regions of India.

Cropping pattern is the spatial representation of crops rotations, or the list of crops that are being produced in an area and their sequence in time.

Case Studies

- **Punjab and Haryana**: Traditionally dominant in wheat and rice, these states are now exploring **maize, vegetables, and floriculture** due to **water scarcity and declining soil health.**
- **Maharashtra:** Known for **cotton and sugarcane**, Maharashtra is diversifying into horticulture and allied sectors like **dairy and poultry**.
- **North-Eastern States**: These states are focusing on organic farming and niche products like **spices, medicinal plants, and tea**, capitalizing on their unique agro-climatic conditions. **The state of Sikkim has led the way by becoming India's first 100% organic state**

Changes in Consumption Patterns

Rising Incomes and Urbanization

- With economic growth and rising incomes, dietary preferences have shifted towards more diversified and **protein-rich diets.**
- Increased urbanization has led to greater demand for processed and convenience foods, fruits, vegetables, and animal-based products.

- **According to the National Sample Survey Office (NSSO) data, the per capita consumption of cereals has declined, while the consumption of fruits, vegetables, dairy, and meat has increased.**

Health and Nutrition Awareness

- Growing awareness of health and nutrition has spurred demand for **organic produce, superfoods, and a balanced diet.**
- There is a noticeable shift towards pulses and coarse grains like **millets and sorghum**, which are **rich in nutrients and often marketed as health foods**.

Changing Demographics

- The youth population is more inclined towards **varied dietary patterns**, including increased consumption of **fast foods and international cuisines**.
- As life expectancy increases, the aging population demands more health-oriented foods, affecting the types of crops grown.

Changes in Marketing Conditions

Improved Market Access

- · The liberalization of the Indian economy in the 1990s opened up agricultural markets, leading to **better access for farmers to national and international markets**.
- · The advent of e-commerce platforms and digital marketplaces has enabled direct marketing, reduced the role of intermediaries and improved price realization for farmers.

Grapes from Maharashtra and bananas from Gujarat are now being shipped to European and Middle Eastern markets, affecting what crops are grown and where, as farmers aim to meet international demand.

Infrastructure Development

- Investment in cold storage facilities, transportation, and logistics has facilitated the marketing of perishable goods like **fruits, vegetables, and dairy products.**
- The government's push for rural infrastructure development, including **better roads and connectivity, has improved market access for remote farmers.**

Policy Reforms

- Policies such as the introduction of the **Minimum Support Price (MSP)** for certain crops, crop insurance schemes, and subsidies for inputs have influenced cropping decisions.
- The recent farm laws, though controversial, aim to deregulate agricultural markets, potentially impacting crop choices based on market demand rather than government support prices.

Impact on Cropping Patterns

Diversification

- Farmers are diversifying their cropping patterns to include high-value crops such as fruits, vegetables, spices, and medicinal plants.
- There is an increasing trend towards horticulture, floriculture, and aquaculture in response to market demand and better price realization.

Shift from Food Grains to Cash Crops

- Areas traditionally under food grains like rice and wheat are now being used for cash crops like **cotton, sugarcane, and oilseeds due to better profitability and market demand**.
- For instance, states like Maharashtra and Gujarat have seen a significant increase in the area under cotton and groundnut cultivation.

Regional Variations

- Different regions are responding to market and consumption changes in unique ways. For example, **Punjab and Haryana, the grain bowls of India, are now experimenting with maize and horticulture crops.**
- Southern states like Karnataka and Tamil Nadu are seeing a shift towards plantation crops, spices, and floriculture.

Technological Adoption

- Adoption of modern agricultural practices, including **precision farming, drip irrigation, and genetically modified crops, has influenced cropping patterns.**
- Technological advancements have enabled farmers to optimize crop choices based on **soil health, climate conditions, and market trends.**

Conclusion

- The transformation in India's cropping patterns, driven by changing consumption patterns and evolving marketing conditions, highlights the adaptability of Indian agriculture. These shifts present both challenges and opportunities, necessitating supportive policies, technological adoption, and sustainable practices to ensure a resilient and prosperous agricultural sector. Integrating market demand with sustainable agricultural practices will be key to addressing the future needs of the nation.

2) Faster economic growth requires increased share of the manufacturing sector in GDP, particularly of MSMEs. Comment on the present policies of the Government in this regard.

Structure:

- Introduction
- Contribution of manufacturing sector
- Write about contribution of MSME's in GDP
- Policies which helps growth of manufacturing sector.
- Way forward.

The role of the manufacturing sector, especially **Micro, Small, and Medium Enterprises (MSMEs),** in **fostering economic growth** cannot be overstated. Historically, countries that have experienced rapid economic development have often witnessed a significant contribution from the manufacturing sector to their Gross Domestic Product (GDP).

Manufacturing sector, contributing approx 17% to the GDP, with a targeted increase to 25%, and employing over 27.3 million workers by 2025 whereas, overall MSMEs contribute 30% of India's GVA and employ over 25 crore people and also account for nearly 46% of exports.

Current Policies Supporting MSMEs

Make in India Campaign

- Launched in 2014, the Make in India initiative aims to promote domestic manufacturing and position India as a global manufacturing hub.
- This campaign emphasizes simplifying regulations, improving infrastructure, and providing incentives to attract investment in the manufacturing sector, including MSMEs.

Atmanirbhar Bharat Abhiyan (Self-Reliant India Mission)

- Introduced in 2020, the Atmanirbhar Bharat Abhiyan focuses on promoting self-reliance and resilience in key sectors, including manufacturing.
- It includes measures such as production-linked incentives (PLI) schemes to boost domestic manufacturing, particularly in sectors like electronics, pharmaceuticals, and automobiles, which can benefit MSMEs.

Credit Guarantee Scheme

- The Credit Guarantee Fund Scheme for Micro and Small Enterprises (CGS) provides collateral-free credit to MSMEs.
- Under this scheme, the government guarantees a portion of the loans extended by financial institutions to MSMEs, reducing the risk for lenders and improving access to finance for MSMEs.

Ease of Doing Business

- Enabling MSMEs to reach government buyers, expanding their market reach, and promoting transparent procurement, significantly boosting the MSME sector.
- Initiatives like GST, IBC, and SWIFT simplify processes for MSMEs, enhancing operational convenience.

India ranked 79th in Ease of Doing Business Ranking 2020.

Raising and Accelerating MSME Performance (RAMP) Program

- Launched in 2023-24 with a Rs. 6,000 crore budget, RAMP provides financial and technical assistance to improve MSMEs' quality, technology adoption, innovation, and market reach.

Conclusion

- While the Government of India has introduced various policies to promote MSMEs and foster economic growth, several challenges persist. Addressing issues related to access to finance, infrastructure deficiencies, and regulatory burdens requires concerted efforts and a holistic approach.
- Only through continuous monitoring, evaluation, and adaptation can India achieve its vision of becoming a global manufacturing powerhouse while ensuring inclusive and sustainable development.

3) Most of the unemployment in India is structural in nature. Examine the methodology adopted to compute unemployment in the country and suggest improvements.

Approach

- **Introduction –**
  - Define unemployment
- **Body-**
  - Write how most of the unemployment in India is structural in nature
  - The methodology adopted to compute unemployment in the country
  - Write suggestions for improvements
- **Conclusion-**
  - Give appropriate conclusion in this regard (whatever we have discussed in the body)

Introduction

- Unemployment refers to the share of the labour force that is without work but available for and seeking employment. One of the main causes of unemployment is structural unemployment, which occurs when there is a mismatch between the skills of the workers and the skills demanded by the employers.

According to CMIE's Consumer Pyramids Household Survey Unemployment rate in India rose to 8.1 per cent in April 2024 from 7.4 per cent in March 2024.

Measurement of Unemployment

The extent of unemployment is measured by three different concepts used by the National Sample Survey Organization.

- **Current daily status:** It is calculated in the **number of days or person years**. It indicates **the number of people who did not find work for one or more days in a week.** This is considered as the most comprehensive measure of unemployment.
- **Current weekly status:** It is the number of people who did **not find even an hour of work in a week.**
- **Usual status or chronic unemployment:** It is the number of **people who remained unemployed for the major part of the year.**

Current Methodology for Computing Unemployment

In India, unemployment data is primarily gathered through three main surveys conducted by government agencies:

Periodic Labour Force Survey (PLFS)

- **Conducted by:** National Statistical Office (NSO)

- **Frequency:** Annual with quarterly updates for urban areas

Methodology: PLFS uses a stratified multi-stage sampling technique. It measures unemployment based on three approaches:

- **Usual Status Approach (UPS):** Considers the activity status of an individual over a long period (usually one year).
- **Current Weekly Status (CWS):** Considers the activity status during the reference week.
- **Current Daily Status (CDS):** Considers the activity status for each day of the reference week.
- **Indicators Measured:** Unemployment rate, worker population ratio, labour force participation rate.

All-India Quarterly Establishment-based Employment Survey (AQEES)

- **Conducted by-**the Labour Bureau
- **About-**this survey offers quarterly updates on employment in **both organized and unorganized sectors of selected industries.** It comprises the Quarterly Employment Survey (QES) for establishments employing 10 or more workers and the Area Frame Establishment Survey (AFES) for those employing 9 or less workers.

Census and Other Administrative Data

- **Conducted by:** Registrar General and Census Commissioner of India.
- **Frequency:** Decadal (every ten years).
- **Methodology:** Collects comprehensive demographic data, including employment status, through household surveys.

Suggested Improvements

Enhanced Data Collection Techniques

- **Use of Technology**: Implement mobile-based and online data collection methods to reach a broader and more diverse population.
- **Real-time Data Analytics**: Employ big data and real-time analytics to monitor labour market trends and employment patterns.

Inclusion of Informal Sector

- **Micro-Surveys**: Conduct micro-surveys focused on the informal sector to gather more granular data.
- **Collaboration with Local Bodies**: Work with local governments and community organizations to better capture informal employment.

Dynamic Survey Models

- **Adaptive Sampling**: Use adaptive sampling techniques to adjust sample sizes and selection criteria based on **preliminary findings and emerging trends**.
- **Panel Surveys**: Implement **longitudinal panel surveys to track the same individuals over time, providing insights into employment transitions and career trajectories.**

Integration of Administrative Data

- **Unified Database**: Create a unified database by integrating various administrative records **(e.g., tax filings, social security)** to complement survey data.
- **Cross-Verification**: Use administrative data to cross-verify and validate survey responses, **reducing biases and inaccuracies.**

Focus on Skill Mapping and Training Needs

- **Skill Assessment Surveys**: Conduct specialized surveys to assess the skill levels of the workforce and identify gaps.
- **Training and Education Metrics**: Include metrics on access to and effectiveness of vocational training and educational programs.

Conclusion

- Accurate unemployment measurement is crucial for effective policy-making to address structural unemployment in India. Enhancements in data collection techniques, better focus on the informal sector, dynamic survey models, integration of administrative data, and consideration of geographical and seasonal variations can provide a comprehensive picture. These improvements will aid in designing targeted interventions for reducing unemployment and promoting inclusive growth.

4) What are the direct and indirect subsidies provided to farm sector in India? Discuss the issues raised by the World Trade Organization (WTO) in relation to agricultural subsidies

Approach

- Introduction: A brief introduction about Agriculture subsidies
- Body: Briefly discuss about Direct and indirect subsidies, then discuss issues raised by the WTO and then discuss Implications for Indian Agriculture.
- Conclusion: Give appropriate conclusion in this regard.

Introduction

- Agricultural subsidies play a crucial role in supporting India's farm sector, which is pivotal for the country's economy and food security. These subsidies, both **direct and indirect, aim to stabilize farm incomes, promote agricultural productivity, and ensure affordability of inputs.** However, the World Trade Organization (WTO) has raised concerns regarding these subsidies, arguing that they may distort global trade and violate international trade agreements.

- Agricultural subsidies are financial aids provided by the government to support farmers in improving their income, reducing the cost of farming, and promoting agricultural sustainability.
- The government's spending on the agricultural sector has been increasing annually, reaching Rs. 1,25,036 crores in 2023, up from Rs. 1,22,836 crores in 2022

Direct Subsidies

Those subsidies which involve an actual payment of funds toward a particular individual, group, or industry. These subsidies are delivered in the form of cash subsidies to the consumers.

The following are the example of Direct Subsidies in India:

Direct Income Support

- PM-KISAN (Pradhan Mantri Kisan Samman Nidhi): Provides direct cash transfers of ₹6,000 per year to small and marginal farmers.
- Impact: This support helps in reducing farmers' financial stress and provides them with the flexibility to invest in necessary inputs.

Crop Insurance Schemes

- Pradhan Mantri Fasal Bima Yojana (PMFBY): Provides insurance coverage and financial support to farmers in the event of crop failure due to natural calamities, pests, and diseases.
- **Impact: Reduces risk and provides financial security**, encouraging farmers to invest in better inputs and technologies.

Indirect Subsidies

- Those subsidies which are provided in the form of discounts to lower the price of a particular commodity. It does not include direct cash payments to the beneficiary.
- It is intended to increase the consumption of a particular commodity by lowering its price in the market. The following are the example of Indirect Subsidies in India:

Minimum Support Price (MSP)

- **The government sets MSPs for various crops to ensure farmers receive a guaranteed price**. This helps in stabilizing income and incentivizing production of essential crops.
- **MSP** is announced for **23 crops, including major cereals, pulses, oilseeds, and commercial crops.**
- **Impact:** MSP ensures a safety net for farmers, but it has led to **overproduction of certain crops** like **rice and wheat**, causing market distortions and storage issues.

Fertilizer Subsidy

- The government provides subsidies on chemical fertilizers like **urea, reducing the cost for farmers.**
- **Impact**: Encourages the use of fertilizers, boosting crop yields, but has led to **imbalanced fertilizer use and soil degradation.**

Electricity Subsidy

- Subsidized or free electricity for agricultural purposes, primarily for irrigation.
- Impact: Promotes groundwater extraction for irrigation, leading to overexploitation of water resources.

Subsidized Inputs and Machinery

- Subsidies on seeds, pesticides, and agricultural machinery through various schemes like the National Food Security Mission (NFSM) and Rashtriya Krishi Vikas Yojana (RKVY).
- Impact: Facilitates access to modern inputs and technologies, enhancing productivity and efficiency.

Issues Raised by the WTO

Trade Distortion

- The WTO argues that India's agricultural subsidies distort international trade by artificially lowering the prices of Indian agricultural products in the global market.
- Other countries claim that these subsidies give Indian farmers an unfair competitive advantage, leading to trade disputes.

Breach of Subsidy Limits

- According to the WTO's Agreement on Agriculture, domestic support measures are categorized **into "boxes" (Amber, Blue, and Green).** Amber Box subsidies are considered **trade-distorting and are subject to reduction commitments.**

- The WTO has raised concerns that India's MSP and input subsidies fall under the Amber Box and exceed the de minimis limit of 10% of the total value of agricultural production.

· Impact: This puts India at risk of facing sanctions or disputes from other WTO members.

Public Stockholding Programs

- India's public stockholding for food security purposes, which involves buying food grains at MSP, has been criticized for potentially breaching WTO rules.
- Impact: While India argues this is essential for food security, the WTO views it as a market distortion, complicating negotiations.

Implications for Indian Agriculture

- **Sustainability Issues**: Over-reliance on subsidies, particularly for **fertilizers and electricity**, has led to environmental degradation, including **soil health decline and groundwater depletion**.
- **Inequitable Distribution**: Subsidies often benefit larger farmers more than small and marginal ones, exacerbating income disparities.
- **Market Distortions**: MSP and public procurement practices have led to market distortions, with overproduction of certain crops and neglect of others.

Conclusion

- Agricultural subsidies are vital for supporting India's farm sector, but they need to be balanced with international trade commitments and sustainable practices. Addressing WTO concerns through thoughtful policy reforms can ensure that subsidies enhance productivity and resilience while promoting equitable and sustainable agricultural growth.

5) What is the status of digitalization in the Indian economy? Examine the problems faced in this regard and suggest improvements.

Structure:

- What is Digital Economy and its status in Indian economy?
- Write about Problems faced in digital Indian economy
- Suggest improvements
- Conclude.

Introduction

- In recent years, digitalization has emerged as a transformative force in the Indian economy, promising to revolutionize various sectors and drive inclusive growth. The proliferation of digital technologies has facilitated greater connectivity, efficiency, and innovation, presenting new opportunities for businesses, governments, and citizens alike.

According to the RBI, the share of India's core digital economy increased from 8.5% of GVA in 2019 to 12.5% in 2023 with a growth rate of 15.6% over 2019-2023. India is driven by increased smartphone adoption, improved internet connectivity, and government initiatives promoting a digital economy.

Status of Digitalization in the Indian Economy

Digital Infrastructure

- India has witnessed substantial improvements in digital infrastructure, with increasing internet penetration, widespread mobile connectivity, and the rollout of broadband networks.
- Initiatives such as the **BharatNet project, aimed at providing broadband connectivity to rural areas, have helped bridge the digital divide and extend digital services to previously underserved regions.**

An optical fibre network of 2, 74,246 km has connected over 15 lakh Gram Panchayats under the Bharat Net programme.

E-Governance Initiatives

- The Indian government has launched numerous e-governance initiatives to enhance service delivery, promote transparency, and streamline administrative processes.
- Projects like Digital India, Aadhaar, and e-Kranti seek to digitize government services, facilitate digital identity verification, and promote digital payments, driving the digital transformation of governance.

The market is rapidly growing due to convenience and affordability factors, with a projected value of $175 billion by 2025.

Digital Payments and Fintech Innovation

- The adoption of digital payment systems, spurred by initiatives like **Unified Payments Interface (UPI) and RuPay cards**, has witnessed exponential growth in recent years.
- Fintech startups like **Paytm, PhonePe, and Google Pay** have disrupted traditional banking by offering digital wallets, UPI-based payments, and innovative financial products, driving financial inclusion.

As per PwC India report, UPI transactions are likely to reach 1 billion per day by 2026-27.

Problems Faced in Digitalization

Digital Divide

- Despite improvements in digital infrastructure, a significant digital divide persists, with rural areas and marginalized communities lagging behind in access to digital technologies and services.
- **Limited internet connectivity, lack of awareness, and affordability constraints exacerbate disparities in digital access and skills, hindering inclusive digitalization**.

Cybersecurity Concerns

- The rapid digitization of services has exposed organizations and individuals to cybersecurity risks, including **data breaches, phishing attacks, and ransomware threats.**
- Weak cybersecurity infrastructure, inadequate awareness, and regulatory gaps pose significant challenges in safeguarding digital assets and ensuring trust in online transactions.

Digital Literacy and Skills Gap

- Despite the growing importance of digital skills in the workforce, there remains a substantial gap in digital literacy and skill levels among the population.
- **Limited access to quality digital education, outdated curriculum, and resistance to technological change hinder efforts to equip individuals with the necessary skills for the digital economy.**

Suggestions for Improvement

Closing the Digital Divide

- Enhance infrastructure development efforts, particularly in rural and remote areas, to improve internet connectivity and access to digital services.
- Implement targeted initiatives to **promote digital literacy and awareness, including community-based training programs and digital literacy campaigns.**

Strengthening Cybersecurity Measures

- Invest in robust cybersecurity infrastructure, including advanced threat detection systems, encryption technologies, and incident response mechanisms.
- Enhance cybersecurity awareness among businesses and individuals through educational campaigns, training programs, and collaborations with cybersecurity experts.

Promoting Digital Skills Development

- Integrate digital literacy and skills development programs into formal education curricula at all levels, with a focus on practical training in emerging technologies.
- Encourage partnerships between government, industry, and educational institutions to offer upskilling and reskilling opportunities in digital fields through vocational training programs and online courses.

With the recent focus of the government on Open Data Initiatives, Big Data and Industry 4.0, the status of digitalisation in India is poised to improve.

Conclusion

- While the digitalization of the Indian economy has made significant strides, various challenges persist, requiring concerted efforts to address them. Closing the digital divide, strengthening cybersecurity measures, and promoting digital skills development are essential for realizing the full potential of digitalization in driving inclusive growth and socio-economic development.
- By implementing targeted interventions and fostering collaboration between government, industry, and civil society, India can navigate the complexities of digital transformation and emerge as a global leader in the digital economy.

6) How does e-Technology help farmers in production and marketing of agricultural produce? Explain it.

Approach:

- **Introduction:**
  - Briefly introduce E-technology and how it has revolutionised agricultural sector.
- **Body:**
  - Discuss how e-Technology help farmers in production.
  - Explain how e-Technology help in marketing of agricultural produce.
- **Conclusion:**
  - Summarise the answer

Answer:

Introduction:

- E-technology refers to the internet and associated technologies. It encompasses electronic devices such as cell phones, computers, and tablets etc along with communication tools like social media, text messages, apps, chatbots and websites etc.
- It has revolutionized the agricultural sector, empowering farmers with innovative tools and solutions to enhance their productivity, optimize resource utilization, and expand their market reach.

Enhancing Agricultural Production

- **Precision Agriculture:** It enables precision agriculture practices that utilize data and sensors to optimize resource usage and achieve higher yields.
  - **Example:** John Deere's FieldDoc platform uses GPS-guided tractors and soil sensors to apply fertilizers and pesticides precisely in areas that need them most, reducing waste and environmental impact.
- **Weather Forecasting and Crop Monitoring:** It provides farmers with real-time weather updates and crop monitoring tools.
  - **Example 1:** The Climate Corporation's FieldView platform provides farmers with weather forecasts, crop growth models, and pest and disease alerts, enabling them to make informed decisions.
  - **Example 2:** Kisan Suvidha mobile app provides farmers with crop-specific advisories and weather updates.
- **Agricultural Inputs Marketplace:** E-commerce platforms using e-technology connect farmers directly with suppliers of agricultural inputs such as seeds, fertilizers, and pesticides.
  - **Example 1:** e-NAM platform connects farmers with buyers and provides them with real-time market prices, eliminating the need for intermediaries.
  - **Example 2:** SBI's Yono Krishi app helps farmers to meet financial, inputs and advisory needs.

- **Knowledge Dissemination and Expert Guidance:** Online platforms and mobile apps provide farmers with access to a wealth of agricultural knowledge.
    - **Example 1:** mKisan portal provides timely crop advisories to the farmers on their mobile phones aiding informed decision making.
    - **Example 2:** Farmer's Friend app in East Africa connects farmers with agricultural experts for personalized advice and support.

Transforming Agricultural Marketing

- **E-commerce Platforms for Direct-to-Consumer Sales**: E-commerce platforms like Amazon Fresh and Local Bountiful and government platforms like e-NAM enable farmers to sell their produce directly to consumers.
- **Market Intelligence and Price Transparency:** E-technology provides farmers with real-time market intelligence.
- **Example:** Kisan Suvidha app provides farmers with real-time market prices and crop yield forecasts.
- **Supply Chain Optimization and Efficiency**: It optimizes supply chain management by connecting farmers, distributors, and retailers through digital platforms.
    - **Example:** IBM's Food Trust blockchain platform tracks the movement of agricultural products from farm to fork, ensuring transparency, reducing food fraud, and improving supply chain efficiency.

Conclusion:

- The transformative impact of e-technology on agriculture is evident, empowering farmers with tools for precision farming, efficient resource management and expanded market access. As this technological evolution continues, it holds the potential in ensuring food and nutritional security, promoting sustainable development, and alleviating poverty.
- With majority of farmers being small and marginal, the integration of e-technology becomes a key strategy for elevating productivity and incomes, thereby making a significant contribution to the reduction of hunger and poverty. The ongoing and future developments in e-technology are poised to further revolutionize the agricultural sector, reinforcing its role as a cornerstone for sustainable and resilient food systems.

7) Q4. State the objectives and measures of land reforms in India. Discuss how land ceiling policy on landholding can be considered as an effective reform under economic criteria.

Structure:

- **Introduction:**
  - Briefly introduce with aim of Land reforms in India
- **Body:**
  - Objectives and Measures of Land Reforms
  - Explain Land Ceiling Policy as an Effective Reform
- **Conclusion:**
  - Summarise the answer

Introduction

- Land reforms have been a significant aspect of India's socio-economic development strategy, aiming to address historical land inequalities, stimulate agricultural productivity, and promote rural development.
- Among the key measures of land reforms is the implementation of land ceiling policies, which restrict the maximum area of land that an individual or entity can hold.

Objectives and Measures of Land Reforms

Redistribution of Land

- **Objective**: To redistribute land from large landowners to landless and marginal farmers, promoting equitable landownership.
- **Measures:** Various measures have been implemented to achieve land redistribution, including **the imposition of land ceilings, acquisition of surplus land, and redistribution to landless and marginal farmers.**
- **Example: The Zamindari Abolition Act of 1950** abolished the **zamindari system**, redistributing land from landlords to tenant farmers and sharecroppers, thereby addressing land concentration.

Promotion of Agricultural Efficiency

- **Objective:** To enhance agricultural productivity through consolidation of landholdings, access to irrigation, and adoption of modern farming practices.
- **Measures:** Land consolidation, land development programs, provision of agricultural credit, and extension services are implemented to promote agricultural efficiency.
- Example: The National Land Records Modernization Program (NLRMP) aims to computerize land records, streamline land administration, and facilitate land consolidation, leading to improved agricultural productivity.

Social Justice and Poverty Alleviation

- **Objective:** To empower marginalized communities, alleviate poverty, and promote inclusive growth through land reforms.
- **Measures:** Distribution of surplus land, provision of land to scheduled castes and tribes, and regularization of tenancy rights are undertaken to achieve social justice.
- **Example: The Forest Rights Act of 2006** recognizes **the rights of forest-dwelling communities over land and resources, empowering them economically and socially.**

Land Ceiling Policy as an Effective Reform

Redistribution of Landownership

- **Example**: **The Kerala Land Reforms Act, 1963**, imposed a **land ceiling of 15 acres of wetland and 30 acres of dryland,** redistributing surplus land to landless and tenant farmers.
- **Impact:** The implementation of land ceiling policies in Kerala led to significant reductions in **land inequality and improved landownership among marginalized communities.**

Efficient Land Utilization

- **Example: The West Bengal Land Reforms Act, 1955**, introduced land ceilings and initiated land redistribution programs, aiming **to promote efficient land utilization.**
- **Impact:** By preventing land accumulation and encouraging landowners to cultivate or lease out their land, land ceiling policies in West Bengal contributed to enhanced agricultural productivity and rural development.

Stimulating Rural Development

- **Example: The Telangana Land Ceiling Act, 1973**, imposed a **land ceiling of 10 to 54 acres**, with surplus land redistributed to landless and marginal farmers.
- **Impact:** The implementation of land ceiling policies in Telangana led to improved rural livelihoods, **increased agricultural production, and enhanced socio-economic development in rural areas.**

Conclusion

- Land ceiling policies, as part of broader land reform initiatives, have played a significant role in addressing land inequalities, promoting agricultural efficiency, and stimulating rural development in India.
- However, challenges such as implementation gaps, concerns about productivity, and the need for a comprehensive approach underscore the complexities of land reforms. By addressing these challenges and leveraging the lessons learned from successful examples, India can advance towards more equitable landownership, enhanced agricultural productivity, and inclusive rural development.

8) Distinguish between 'care economy' and 'monetized economy'. How can care economy be brought into monetized economy through women empowerment?

Approach

- Introduction: Write about 'care economy' and 'monetized economy' briefly
- Body: Write differences between 'care economy' and 'monetized economy' and Ways to Integrate Care Economy into Monetized Economy Through Women Empowerment
- Conclusion: Give appropriate conclusion in this regard

Introduction

- The care economy encompasses unpaid labour typically performed within households and communities, such as caregiving, child-rearing, and elder care. This work, often predominantly undertaken by women, is crucial for societal well-being but remains largely invisible and undervalued in economic metrics.
- And the **monetized economy** includes **activities measured and accounted for in monetary terms, such as goods and services traded in the market**. Integrating the care economy into the monetized economy, particularly through women empowerment, can significantly enhance economic growth and social equity.

Aspect	Care Economy	Monetized Economy
Definition	Unpaid work within households and communities	Economic activities measured in monetary terms
Examples	Childcare, elder care, housework	Jobs, businesses, market transactions
Measurement	Often unmeasured and undervalued	Measured through GDP, income, and expenditure
Workforce	Predominantly women	Mixed, but with formal labor force participation
Recognition	Low societal and economic recognition	High societal and economic recognition
Economic Impact	Indirect, through enabling formal economy	Direct, through contributions to GDP

- The distinction between the care economy and the monetized economy lies in the visibility and valuation of the work performed. **The care economy's contributions are significant but often go unrecognized in traditional economic metrics like GDP.**

- For instance, according to the International Labour Organization (ILO), unpaid care work represents 9% of global GDP, with women performing over 75% of this work.
- As India wants to become developed nation by 2047, contribution of half of population must be brought in the mainstream economy. This will also help us achieve SDG 5 (Gender Equality) too.

Ways to Integrate Care Economy into Monetized Economy Through Women Empowerment

Policy and Legislative Reforms

- Paid Family Leave: Implement policies that provide paid family leave, recognizing the value of caregiving work. For example, countries like Sweden offer extensive paid parental leave, which not only supports caregivers but also encourages higher female labour force participation.
- Social Protection: Extend social protection measures to caregivers, including pensions and health insurance. The ILO estimates that globally, only 57% of women are covered by a social protection system, highlighting the need for inclusive policies.

Formal Recognition and Valuation

- Inclusion in GDP: Develop methodologies to include the economic value of unpaid care work in national accounting systems. According to UN Women, recognizing unpaid care work could add an estimated $10 trillion to global GDP.
- Time-Use Surveys: Conduct regular time-use surveys to quantify the extent of unpaid care work. In India, the National Sample Survey Office (NSSO) has been conducting such surveys, revealing that women spend about 5.8 hours a day on unpaid care work compared to 1.7 hours by men.

Access to Education and Training

- **Skill Development Programs:** Provide training programs for women in caregiving roles to transition into formal employment sectors. For instance, vocational training programs in nursing and childcare can empower women to enter the healthcare and early childhood education sectors.

Programs like India's Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) have included components that support women's participation in the workforce.

- Financial Literacy: Enhance financial literacy among women to enable better participation in the monetized economy. Studies have shown that women with financial literacy skills are more likely to start businesses and manage household finances effectively.

Supportive Infrastructure

- **Childcare Services:** Expand access to affordable childcare services to reduce the burden on women caregivers. The availability of affordable childcare is directly linked to higher female labour force participation.
- Elderly Care Facilities: Develop community-based elderly care facilities to support women engaged in elder care. According to the World Health Organization (WHO), by 2050, the global population aged 60 and over is expected to reach 2 billion, underscoring the need for robust elder care infrastructure.

Public Awareness and Advocacy

- Campaigns: Launch public awareness campaigns to highlight the economic and social value of care work. Campaigns like the International Women's Day celebrations often focus on recognizing and valuing unpaid care work.
- **Advocacy:** Promote advocacy efforts to include care economy issues in policy discussions at national and international levels. Organizations like UN Women and the ILO advocate for the recognition of unpaid care work in policy-making.

Conclusion

- Bridging the gap between the care economy and the monetized economy is essential for fostering inclusive economic growth and gender equity. Accurate measurement and valuation of care work, coupled with supportive policies and infrastructure, can significantly enhance the visibility and economic contribution of unpaid care work. As nations strive for sustainable development, recognizing and integrating the care economy into the monetized economy becomes a pivotal step toward achieving gender parity and economic prosperity.

9) 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?

Approach:

- Introduction:
  - Briefly introduce the concept of Artificial Intelligence
- Body:
  - Discuss how AI help clinical diagnosis.
  - Explain how use of AI in healthcare can threaten the privacy of the individual.
- Conclusion:
  - Summarize the answer by mentioning the steps which can be taken.

Artificial Intelligence in Clinical Diagnosis and Privacy Concerns

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines capable of tasks like visual perception, decision-making, and language understanding. Prominent examples include robots like Sophia and AI models used in healthcare and research.

In clinical diagnosis, AI plays a transformative role:

- **Medical Imaging**: AI analyzes X-rays, MRIs, and CT scans to detect diseases faster and with higher accuracy. For example, Google Health's AI system outperformed radiologists in breast cancer screening, reducing both false positives and negatives.
- **Data Analysis**: AI systems like **IBM Watson Health** evaluate vast electronic health records to identify trends and suggest evidence-based treatments, enhancing early detection and personalized care.
- **Natural Language Processing (NLP)**: AI extracts information from unstructured clinical notes and literature. Watson, for instance, identifies patients at high risk of diabetic complications through text analysis.
- **Predictive Analytics**: AI models such as **MyHealthPal** can predict surgical site infections by analyzing patient inputs and vital signs.

Beyond diagnosis, robotic systems like **Da Vinci** are used in minimally invasive surgeries, enhancing precision and recovery time.

Privacy Concerns in AI-Driven Healthcare

While AI improves diagnosis and treatment, it raises serious privacy and ethical challenges:

- **Data Security**: AI requires access to sensitive health data, increasing risks of cyberattacks. A ransomware attack on the University of Vermont Medical Center in 2020 disrupted operations and exposed patient records.

- **Informed Consent & Data Ownership**: Patients often aren't informed about how their data is used. With many AI systems owned by private corporations, individuals have little control over their data.
- **Misuse & Lack of Transparency**: AI systems can be hacked or manipulated. The opaque "black box" nature of some models can also affect trust and accountability.
- **Algorithm Bias**: A study found **Optum's AI algorithm** under-assessed health needs of Black patients, perpetuating racial disparities in care.

Conclusion

- To balance innovation with ethics, robust data protection laws and ethical frameworks are essential. Stakeholders can draw on initiatives like India's Health Data Management Policy and the global **Bletchley Declaration** to mitigate AI's risks while maximizing its healthcare potential.

10) Discuss several ways in which microorganisms can help in meeting the current fuel shortage.

Approach:

- **Introduction:**
  - Start with a brief definition of microorganisms.
- **Body:**
  - Discuss the Ways in which microorganisms can help in meeting fuel shortage
  - Highlight the programs which have been taken up by the government of India for use of micro-organisms.
  - Describe the challenges associated
- **Conclusion:**
  - Summarize the answer by providing am appropriate way forward.

Answer:

Introduction:

- Microorganisms are tiny living organisms, including bacteria, viruses, fungi and algae, that are invisible to the naked eye. They have diverse metabolic capabilities that can be harnessed for the production of renewable fuels.

Ways in which microorganisms can help in meeting fuel shortage:

- **Bioethanol Production:** Yeast and bacteria can ferment sugars from biomass, such as sugarcane or corn, into bioethanol. **Example: Saccharomyces cerevisiae (Baker's Yeast)** can be used to efficiently ferment sugars like glucose and fructose into ethanol.
- **Biodiesel Production:** Microalgae can produce lipids used for biodiesel. **Example: Chlamydomonas reinhardtii (Green alga)** can capture sunlight and convert CO2 into lipids. These can be extracted and converted into biodiesel. Moreover, it is fast-growing, can be cultivated in wastewater, and doesn't require arable land, making it a sustainable source for biodiesel.
- **Natural Gas Production:** Microbes in anaerobic digesters can break down organic matter to produce methane gas. **Example: Methanosarcina barkeri (Archaea)** can feast on organic waste, such as food scraps and animal manure, and break it down to produce methane gas. Methane is the primary component of natural gas.
- **Hydrogen Production:** Some bacteria such as **Geobacter sulfurreducens** can produce hydrogen through microbial electrolysis.
- **Bioremediation:** Microorganisms can be employed to clean up contaminated environments and develop a circular economy which indirectly addresses fuel shortages. **Example:** Oil-eating bacteria like **Pseudomonas putida** can degrade oil pollutants. Bacteria like **Bacillus subtilis** and fungi like **Aspergillus niger** can absorb and immobilize heavy metals.

- **Microbial Fuel Cells:** Microorganisms can be employed to convert organic matter into electricity in Microbial fuel cells (MFCs). **Example: Shewanella oneidensis MR-1**, a facultative anaerobe, is capable of utilizing extracellular solid materials, including anodes in microbial fuel cells (MFCs), as electron acceptors, to enable generation of electricity.

Conclusion:

- By addressing these challenges and implementing a holistic approach that involves technological innovation, policy support, and public awareness, India can leverage microorganisms to make significant strides in meeting its energy demands while reducing the environmental impact associated with conventional fuels, besides achieving SDG 7.

11) What is the main task of India's third moon mission which could not be achieved in its earlier mission? List the countries that have achieved this task. Introduce the subsystems in the spacecraft launched and explain the role of the Virtual Launch Control Centre' at the Vikram Sarabhai Space Centre which contributed to the successful launch from Sriharikota.

Approach:

- **Introduction:**
  - Briefly introduce the missions which have been undertaken by India for moon.
- **Body:**
  - Discuss the main tasks of Chandrayaan 3.
  - Mention the tasks which could not be achieved in Chandrayaan 2.
  - Mention the list of nations that have achieved the objectives achieved by Chandrayaan 3
  - Introduce the subsystems in the spacecraft launched.
  - Explain the role of the Virtual Launch Control Centre at the Vikram Sarabhai Space Centre
- **Conclusion:**
  - Summarize the answer with a forward-looking approach.

Answer:

Introduction:

- Exploration of the Moon is crucial for advancing scientific understanding of planetary formation, Earth's history, and potential resources. It also serves as a stepping stone for future deep-space exploration and human missions.
- Towards this endeavour, India has undertaken several lunar missions as part of its space exploration program. These include Chandrayaan-1 (2008), Chandrayaan-2 (2019) and Chandrayaan-3 (2023).

Main tasks of Chandrayaan-3

According to ISRO, the main tasks of **Chandrayaan-3** are:

- To demonstrate Safe and Soft Landing on Lunar Surface.
- To demonstrate Rover roving on the moon.
- To conduct in-situ scientific experiments.

Chandrayaan-2 (2019) also aimed to soft-land a rover on the Moon's South Pole. However, the lander Vikram lost communication with ground control during the final descent and crashed. Chandrayaan-3 was able to soft land on the south pole of the moon.

Countries that have achieved the task of a soft landing on the Moon are:

- **United States:** Achieved multiple soft landings with the Apollo missions, starting with Apollo 11 in 1969.
- **Soviet Union (now Russia):** Achieved the first soft landing with the Luna 9 mission in 1966.
- **China:** Accomplished soft landings with the Chang'e-3 mission in 2013 with Yutu rover and the Chang'e-4 mission in 2019.

Subsystems in Chandrayaan-3 Spacecraft

The Chandrayaan-3 mission consisted of three main components:

1. Lander Module (Vikram)

- Equipped with navigation, guidance & control systems, hazard detection, altimeters, and thrusters for controlled descent and soft landing.
- Carried scientific payloads including:
  - ChaSTE (Chandra's Surface Thermophysical Experiment) – to measure thermal conductivity and temperature.
  - ILSA (Instrument for Lunar Seismic Activity)
  - LP (Langmuir Probe) – to study plasma density near the surface.

2. Rover Module (Pragyan)

- A six-wheeled autonomous vehicle designed to travel 500 meters on the Moon's surface.
- Instruments included:
  - APXS (Alpha Particle X-ray Spectrometer) – to study chemical composition.
  - LIBS (Laser Induced Breakdown Spectroscope)- For qualitative and quantitative elemental analysis

3. Propulsion Module

- Used to carry the lander from Earth's orbit to lunar orbit.
- Payload included:
  - SHAPE (Spectro-polarimetry of Habitable Planet Earth) – to study Earth's atmosphere from lunar orbit.

Role of the 'Virtual Launch Control Centre':

The Virtual Launch Control Centre (VLCC) at the Vikram Sarabhai Space Centre (VSSC) played a key role in the successful launch of Chandrayaan-3 mission. It allowed for:

- **Central control** and serving as the nerve centre during the launch, overseeing all operations. It monitored and controlled all aspects of the launch, from the preparation of the rocket to the deployment of the spacecraft.

- **Real-time monitoring** of data and visuals of the launch, ensuring that all parameters were within the desired range.
- **Remote diagnosis** of the system and checking up of major components of the rocket before the launch.
- **Adapting to changes** using artificial intelligence and machine learning and responding to real-time changes in the rocket launch environment.

Conclusion:

- Success of India in Chandrayaan-3 mission marked a momentous milestone for India and enhanced its position in the field of space exploration. This accomplishment not only showcases technological prowess but also sets the stage for forthcoming missions, solidifying India's role as a prominent player in the future of space exploration.

12) Dam failures are always catastrophic, especially on the downstream side, resulting in a colossal loss of life and property. Analyze the various causes of dam failures. Give two examples of large dam failures.

Causes

- **Structural Failures:**
  - Design Flaws
  - Construction Defects
  - Foundation Issues
- **Operational Failures:**
  - Human Error
  - Lack of Maintenance
  - Poor Drainage
- Inadequate Spillway Capacity – Overtopping
- Seepage and Piping
- Natural Disasters
- Sabotage and Terrorism

Examples

- **Banqiao Dam (China, 1975):** Its collapse due to Typhoon Nina and poor design killed over 170,000 people and displaced more than 11 million, showing the immense human and infrastructural toll of dam failure.
- **Machchu II Dam (India, 1979):** A cloudburst led to the failure of the dam near Morbi in Gujarat, killing an estimated upto to 25,000 people.

13) What is oil pollution? What are its impacts on the marine ecosystem? In what way is oil pollution particularly harmful for a country like India?

Introduction

- Oil pollution refers to the contamination of marine and coastal environments by petroleum products, primarily due to
  - Oil spills from ships
  - Offshore drilling
  - Pipeline leaks
  - Accidents.
- *The Liberian-flagged container ship **MSC ELSA 3** capsized ~38 nautical miles off Kochi while en route from Vizhinjam to Kochi in May 2025.*

Impacts

- **Physical Smothering -** Decreased Oxygen Levels
- **Toxic Effects –** Acute and Bioaccumulation
- Habitat Degradation
- Disruption of food chain
- Economic Impacts
  - Fisheries
  - Tourism
  - Recreation

India

- **Economic Losses -** Fisheries, aquaculture, blue flag beaches etc leading to significant economic losses for coastal communities.
- India is the third largest fish producing country, contributing 8 percent to the global fish production and ranks second in aquaculture production.
- **Threat to Biodiversity** - India's rich marine biodiversity, including endangered species like turtles, dolphins and coral reefs, is highly vulnerable to oil pollution, endangering their survival.
- **Public Health Concerns -** Contaminated seafood from oil-affected areas poses risks to public health, as consumption of polluted fish can lead to adverse health effects in humans.
- **Geopolitical Considerations -** India's strategic position within the Indian Ocean renders it a crucial juncture for global shipping routes. This heightened maritime activity amplifies the potential for oil spills stemming from accidents or illicit discharges, thus carrying geopolitical ramifications.

14) The adoption of electric vehicles is rapidly growing worldwide. How do electric vehicles contribute to reducing carbon emissions and what are the key benefits they offer compared to traditional combustion engine vehicles?

Reducing Carbon Emissions

- Zero Tailpipe Emissions
- Less Greenhouse Gas footprint - Renewable energy sources for charging
- Higher energy efficiency
- Reduced Upstream Emissions over time
- They reduce dependency on Oil

Key Benefits

- **Economic Advantages**
  - Lower running costs
  - Reduced maintenance
  - Government incentives
- **Energy Security**
  - Reduces dependence on imported crude oil.
  - Supports the use of domestically produced renewable energy.
- **Urban Sustainability**
  - Cleaner cities with better air quality.
  - Ideal for public transport, delivery vehicles, and last-mile connectivity.

Challenges

- While the progress in adoption undeniable, challenges remain which need to be addressed by the stakeholders. These challenges include:
  - Range anxiety.
  - Limited charging infrastructure.
  - Higher initial costs.
  - Higher dependence of critical mineral resources like lithium and cobalt.

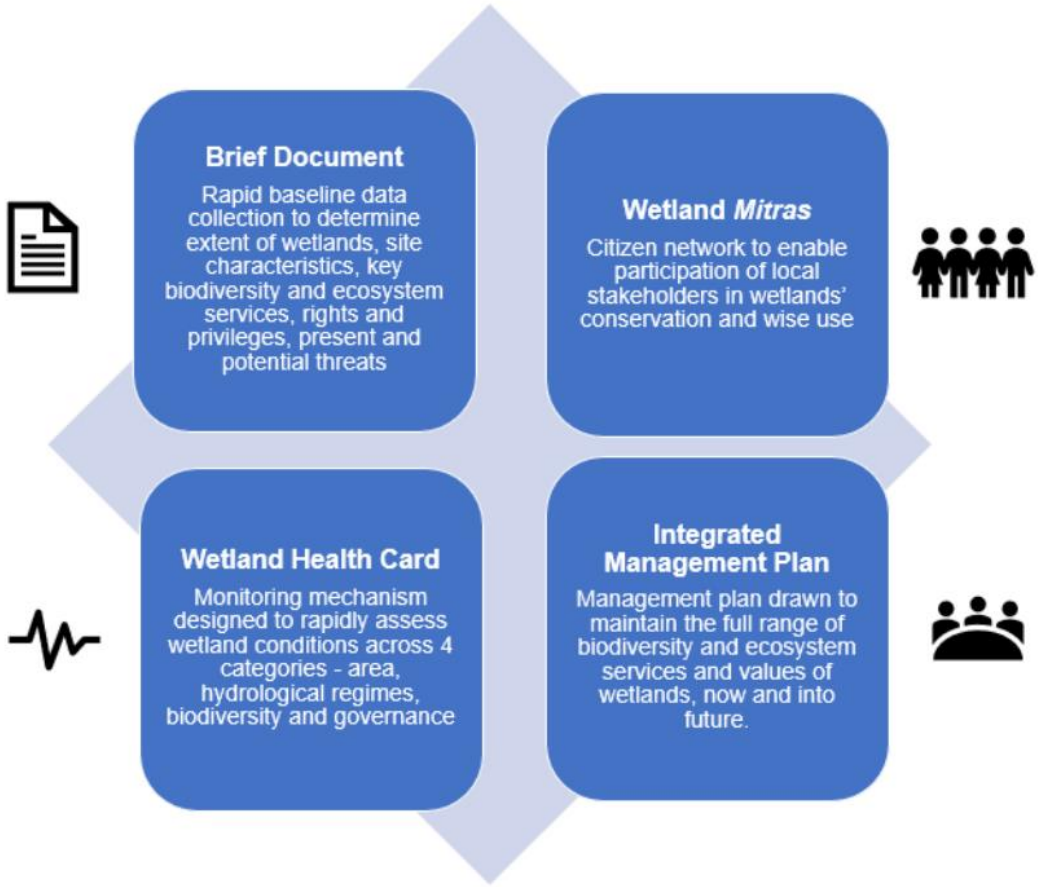
Way Forward

- Steps like investing in research to enhance efficiency, continuous battery improvements, rapid expansion of fast-charging networks and innovative financing options can quickly address these concerned challenges

15) Comment on the National Wetland Conservation Programme initiated by the Government of India and name a few India's wetlands of international importance included in the Ramsar Sites.

NWCP

- **The National Wetland Conservation Programme (NWCP)** was a **Centrally Sponsored Scheme** (CSS) initiated by the Government of India in 1986 under Ministry of Environment, Forest and Climate Change of India (MoEFCC), aimed at conserving and restoring the country's precious wetland ecosystems.
- The **NWCP's goals are to**:
  - *Conserve and restore wetlands, improve water quality, enhance biodiversity and ecosystems, integrate wetlands into developmental planning, and provide local communities with access to wetland benefits*



Challenges

- Limited coverage
- Interagency coordination- Administrative challenges and delays.
- Invasive species. Managing and controlling is complex and resource-intensive.
- Climate change
- Data deficiency

Wetlands of International Importance

91 Ramsar Sites

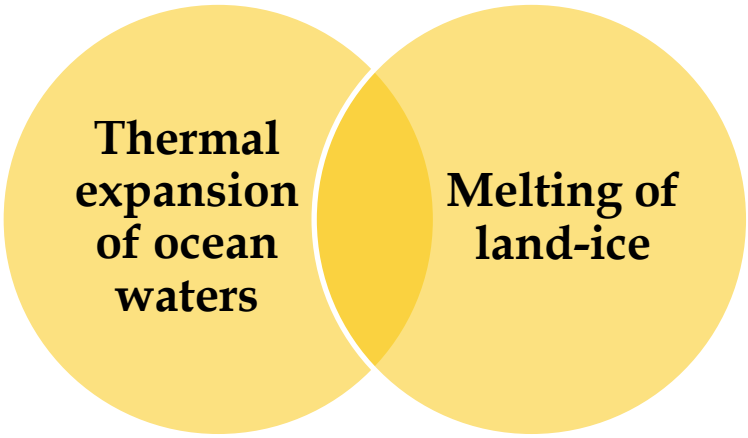
Keoladeo National Park	Rajasthan	UNESCO site
Chilika Lake	Odisha	Asia's largest brackish water lagoon
Sundarbans Wetland	West Bengal	Largest mangrove forest
Loktak Lake	Manipur	Phumdis

16) The Intergovernmental Panel on Climate Change (IPCC) has predicted a global sea level rise of about one metre by AD 2100. What would be its impact in India and the other countries in the Indian Ocean region?

Introduction

- According to IPCC AR6 report, Global mean sea level is **rising and accelerating.**
- The **sum of glacier and ice sheet** contributions is now the dominant source of GMSL rise.
- Globally, the rate of sea-level rise was **4.5 millimetre per year between 2013 and 2021.** This was more than twice the rate between 1993 and 2002.
- A number of studies published recently suggest that the **worst-case projections** for SLR could be much higher, **up to 2 m or more this century.**
- *El Niño years where temperatures are a bit warmer tend to have more rapid SLR than cooler La Niña years.*

Causes



Impacts

Impacts

Migration

- The main social impact of sea level rise is forced migration.
- Some estimates suggest that **2 billion people** may have had to migrate by 2100.
- Social conflicts
- Refugee crisis

Way Forward

- Initiatives at the **global and national level for adaptation and mitigation** of climate change.
- **Nature-based strategies** - Wetlands and dunes naturally diffuse floodwaters and storm surges. One study even found that simply allowing our natural coastal defenses to remain in place would reduce the **number of people at risk for sea level rise damage by half.**

Way Forward

- **Kiribati** has purchased land in Fiji as a potential new home, and **New Zealand** is working on plans to accept some of the former residents of inundated Pacific islands.
- Indonesia's capital is being moved from Jakarta to Borneo.
- The Dutch city of Rotterdam constructed **barriers, drainage, and unique architectural features** such as a "water square" with temporary ponds to help control the flow of water.
- In 2014, the Indonesian government initiated a coastal development project named "**Giant Garuda**" to safeguard the city from flooding.
- The city of Wellington in New Zealand has created a **digital twin, a virtual model of the city,** that can show decision-makers and residents how climate impacts like sea level rise will affect it - and crucially, how policy can help.
- '**Sponge' cities in China** - Since 2014, China has been pioneering a sponge city initiative, which was the brainchild of Kongjian Yu, dean of Peking University's College of Architecture.

Internal Security

17) Winning of 'Hearts and Minds' in terrorism affected areas is an essential step in restoring the trust of the population. Discuss the measures adopted by the Government in this respect as part of the conflict resolution in Jammu and Kashmir. (Answer in 150 words)

Introduction- Brief & Effective

- **Define** "Winning Hearts and Minds" (WHAM) as a counter-insurgency strategy to build trust and foster peace in terrorism-affected areas like Jammu and Kashmir (J&K).
- Highlight J&K's history of conflict since 1989, necessitating people-centric measures for reconciliation.
- State the Government of India's multi-pronged approach to restore trust and promote development.

Measures Adopted by the Government (4 key points - remember as "TRUST")

- **T**ransformative Development: Infrastructure projects like the Chenani-Nashri Tunnel and PM's Development Package (₹80,000 crore) improve connectivity, healthcare (e.g., AIIMS), and education.
- **R**ehabilitation and Skills: Programs like Himayat, Udaan, and Umeed offer vocational training and jobs to youth, reducing radicalization.
- **U**nity through Integration: Abrogation of Article 370 (2019) and National Integration Tours (~100 annually) promote cultural and political inclusion.
- **S**ocial Engagement: Operation Sadbhavana (since 1998) by the Indian Army conducts medical camps, educational tours, and sports to build community trust.
- **T**rust via Governance: Strengthened Panchayati Raj (e.g., 2020 DDC elections, >50% voter turnout) empowers local communities for grassroots democracy.
- **Impact**
  - Reduced militancy (e.g., Srinagar declared terror-free in 2020), increased tourism, and higher civic participation.
- **Challenges**
  - Persistent cross-border terrorism, human rights concerns, and need for sustained dialogue with locals.

Decline in Local Militant Recruitment in Kashmir

Conclusion

- Reiterate WHAM's role in fostering trust and peace in J&K through development and engagement.
- Emphasize the need for continued efforts to counter external influences (e.g., Pakistan's ISI) and ensure inclusive growth.
- End with a vision of J&K's integration into India's mainstream via Insaniyat, Jamhuriat, and Kashmiriyat.

18) The use of unmanned aerial vehicles (UAVs) by our adversaries across the borders to ferry arms/ammunitions, drugs, etc, is a serious threat to the internal security. Comment on the measures being taken to tackle this threat.

Introduction

- Highlight the growing threat of UAVs used by adversaries (e.g., Pakistan, non-state actors) to smuggle arms, drugs, and explosives across India's borders, undermining internal security.
- Emphasize the challenge posed by small, low-flying drones, especially along the India-Pakistan border (Punjab, J&K).
- State India's multi-faceted approach to counter this threat through technology, policy, and coordination.

Nature of Threats

- Smuggling of weapons and drugs.
- Potential for surveillance and targeted attacks.

Recent Incidents

- Over 600 drone and missile attacks intercepted along Gujarat and Rajasthan borders; concerns over drones facilitating new smuggling routes.

Measures to Counter UAV Threats (4 key points - remember as "STOP")

- **S**urveillance Systems: Deploy anti-drone technologies like DRDO's Anti-Drone System (detects up to 5 km) and RF-based jammers along borders.
- **T**echnological Upgrades: Use AI-powered radar (e.g., Smash-2000) and laser-based systems to neutralize drones; integrate UAV monitoring with C4ISR networks.
- **O**perational Coordination: Strengthen inter-agency collaboration (BSF, Army, NCB) for real-time intelligence-sharing; conduct joint operations like Operation Poorvi Prahar.
- **P**olicy and Regulation: Enforce Drone Rules 2021, mandating registration and No-Fly Zones; enhance international cooperation (e.g., FATF) to curb cross-border smuggling.

Impact & Challenges

- **Impact**: Over 500 drones intercepted in Punjab (2023-24), reduced smuggling attempts; enhanced border security with 360-degree surveillance.
- **Challenges**: Evolving drone technology (e.g., stealth drones), porous borders, and limited rural detection infrastructure.

Conclusion

- Reiterate the effectiveness of India's technological and coordinated measures in countering UAV threats.
- Stress the need for continuous R&D and regional cooperation to address evolving threats.
- End with a vision of robust border security ensuring national safety and sovereignty.

19) What are the internal security challenges being faced by India? Give out the role of Central Intelligence and Investigative Agencies tasked to counter such threats.

Introduction

- Outline India's diverse internal security challenges, including terrorism, insurgency, cyber threats, and communal violence, threatening national stability.
- Highlight the pivotal role of Central Intelligence and Investigative Agencies in countering these threats through intelligence, coordination, and enforcement.
- State the focus on identifying challenges and agency roles in ensuring security.

Internal Security Threats (TICL- BORD)

- Terrorism
- Insurgency (North East & Kashmir)
- Left-Wing Extremism (LWE) in central India.
- Cybersecurity Threats
- Border Security
- Organized Crime & Drug Trafficking
- Religious & Communal Violence
- Disaster-induced Challenges

Role of Central Intelligence and Investigative Agencies (4 key points - remember as "ACTS")

- **A**nalysis and Intelligence: Intelligence Bureau (IB) and Research & Analysis Wing (RAW) gather actionable intelligence to preempt terror plots (e.g., IB foiled 20+ terror attacks in 2024).
- **C**oordination: National Investigation Agency (NIA) coordinates with state police for terror investigations (e.g., 2023 Punjab terror module busts); Multi-Agency Centre (MAC) ensures real-time intel sharing.
- **T**echnological Intervention: National Technical Research Organisation (NTRO) monitors cyber and drone threats; Cybercrime Coordination Centre (I4C) tackles online crimes.
- **S**ecurity Enforcement: Central Armed Police Forces (CAPF, e.g., CRPF) conduct anti-Naxal operations (e.g., 250+ LWE cadres neutralized in 2024) and maintain law and order.

Challenges and Way Forward

- **Challenges**: Inter-agency coordination gaps, evolving technology (e.g., encrypted apps), and resource constraints in remote areas.
- **Solutions**: Strengthen NATGRID for data integration, invest in AI-based surveillance, and enhance community policing for trust-building.

Conclusion

- Reiterate the complex internal security challenges and the critical role of Central Agencies in countering them through intelligence and enforcement.
- Emphasize the need for technological upgrades and public cooperation to ensure a secure India.
- End with a vision of a resilient nation safeguarded by proactive and coordinated agency efforts.

20) Give out the major sources of terror funding in India and the efforts being made to curtail these sources. In the light of this, also discuss the aim and objective of the No Money for Terror (NMFT) Conference recently held at New Delhi in November 2022.

Introduction

- Highlight terror funding as the lifeblood of terrorism, enabling operations in India, a country ranked 13th on the Global Terrorism Index 2022 (score: 7.17/10).
- Note India's multi-pronged efforts to curb funding sources and the role of global initiatives like the NMFT Conference 2022 in New Delhi.
- State the focus on sources, countermeasures, and NMFT objectives.

Major Sources of Terror Funding (4 key points - remember as "FUND")

- **F**oreign Sponsorship: State (e.g., Pakistan's ISI) and non-state actors fund groups like LeT, JeM via remittances, especially from Gulf countries.
- **U**nlawful Activities: Drug trafficking (Golden Crescent opium), extortion, kidnapping, and smuggling generate significant funds.
- **N**GO Misuse: Charitable organizations and NGOs are exploited as fronts to funnel donations to terror groups.
- **D**igital Channels: Hawala networks, counterfeit currency, and cryptocurrencies enable covert fund transfers (e.g., 1993 Bombay bombings via hawala).

Efforts to Curtail Terror Funding (4 key points - remember as "BLOCK")

- **B**olstered Legislation: Amendments to UAPA (2013, 2019) and PMLA enable property confiscation and designate individuals as terrorists.
- **L**aw Enforcement: NIA's Terror Funding and Fake Currency Cell investigated 105 cases (2022), with 100 convictions; ED arrested 5 in ₹300 crore hawala case (2023).
- **O**perational Coordination: NATGRID and MAC enhance real-time intelligence-sharing; Financial Intelligence Unit (FIU) monitors suspicious transactions.
- **C**ollaboration Globally: India's FATF membership and UNSC Resolution 2462 compliance strengthen international action (e.g., Pakistan's FATF grey-listing, 2018-2022).

NMFT Conference 2022: Aim and Objectives (3 key points - remember as "CUT")

- **C**ollaboration: Foster global cooperation with 78 countries and 20 ministers to disrupt terror financing networks (e.g., FATF guidelines adoption).
- **U**nderstand Threats: Address emerging methods like cryptocurrencies, dark web, and crowdfunding misuse; promote "Trace, Target, Terminate" strategy.
- **T**ools and Policies: Share best practices, strengthen legal frameworks (e.g., EU's 4th AML Directive), and build capacity via training (e.g., US Treasury's CTF courses).

NMFT Conference 2022: Aim and Objectives (3 key points - remember as "CUT")

- Reiterate that curbing terror funding is critical to India's security, with robust national and global measures in place.
- Highlight NMFT 2022's role in advancing "Beyond-Border Cooperation" to choke terror finances.
- End with a vision of a safer India through sustained efforts and global unity.