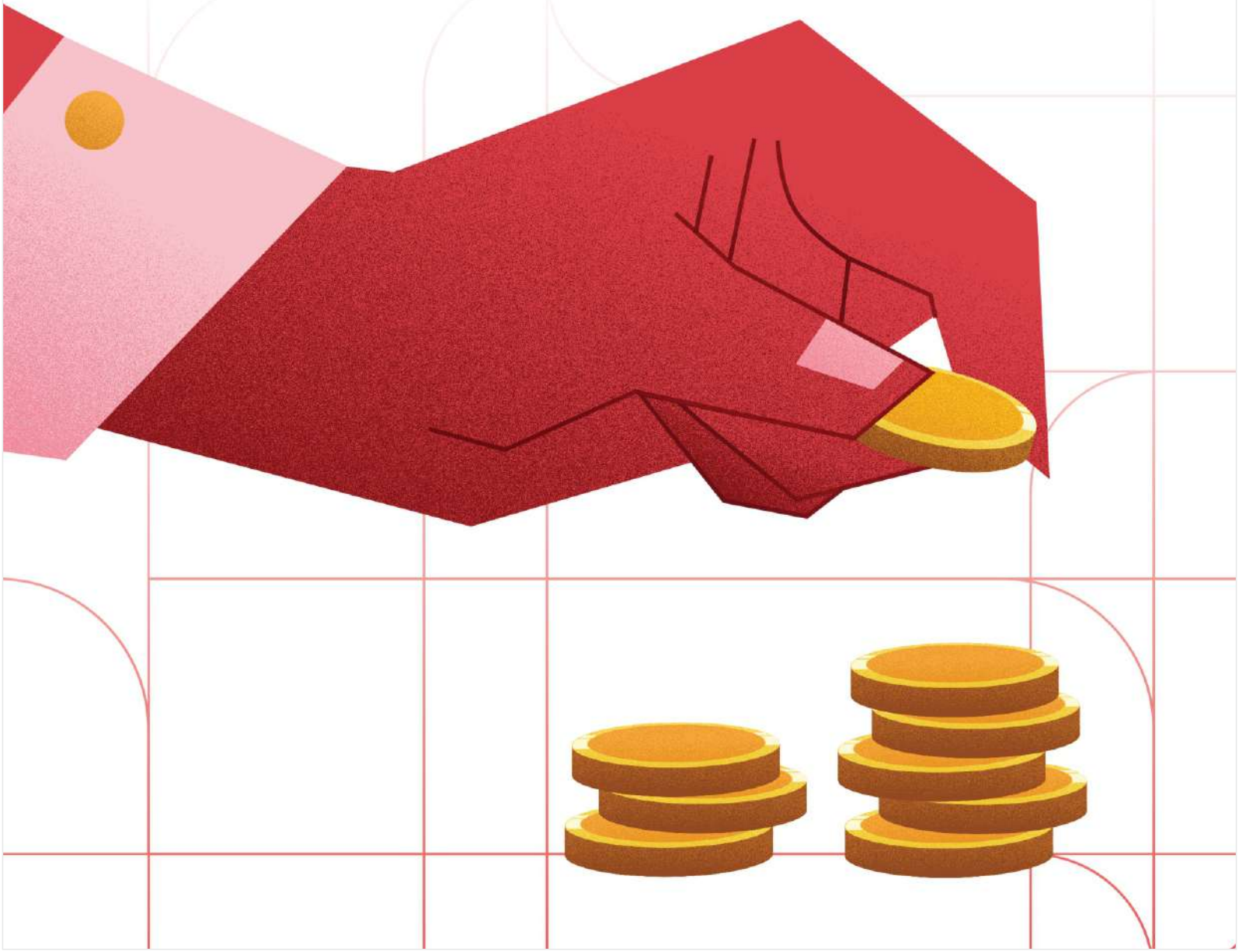
Economic Development

UPSC Mains

General Studies III

Class Notes



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UPSC MAINS

Economic Development

GENERAL STUDIES - III

(Class Notes)

Year 2025-26

Features of Your UPSC Mains Notes (Economic Development & Agronomy)

1. Syllabus–Mapped Organization

- Each topic is arranged strictly as per UPSC GS & Optional syllabus, ensuring no deviation.
- Subtopics broken into micro-units for quick recall (e.g., Agriculture → Cropping patterns → Agronomy perspective + Economic policy implications).

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2. PYQ Analysis & Trend Mapping

- Year-wise and theme-wise analysis of previous 10–15 years' questions.
- Identification of recurring themes (e.g., inclusive growth, MSP reforms, sustainable agriculture).
- Expected areas forecasted based on trend analysis.

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3. Keywords & Value-Add Terminology

- Each subtopic includes a set of keywords/phrases (e.g., "jobless growth", "nutritional security", "precision farming", "circular economy", "carbon neutrality") to be inserted in answers.
- Ethical/economic connectors like "Amartya Sen's Capability Approach", "Doubling Farmers' Income Strategy", or "4Cs of Sustainable Agriculture: Climate, Capital, Crops, Community".

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4. Case Studies & Examples

- India-specific examples:
  - Zero Budget Natural Farming (AP)
  - Fasal Bima Yojana impact studies
  - Millet Mission (International Year of Millets 2023)
- Comparative examples: Global best practices (Israel's drip irrigation, Brazil's biofuels).

- Case studies formatted in 1–2 lines with impact data → perfect for quick insertion in exam answers.

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5. Integration of Economic Survey & Budget (Latest Year)

- Key statistics, charts, and schemes distilled into ready-to-use points.
- Eg: "Economic Survey 2025 highlights agriculture contributes ~18% to GVA, but employs ~45% workforce → disguised unemployment issue."
- Budget references for schemes, allocations, and reforms in agriculture, infrastructure, and green growth.

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6. Interdisciplinary Approach

- Links Economics + Agronomy + Geography + Environment for holistic coverage.
- Example: "Impact of climate change on cropping patterns → water stress → MSP and procurement reforms."

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7. Diagram/Flowchart Enrichment

- Ready-made flowcharts (e.g., "Agriculture → Inputs → Production → Market → Income → Rural Development").
- Comparative tables (e.g., "Traditional Agriculture vs. Precision Farming").
- Mindmaps for answer frameworks (e.g., "Doubling Farmers' Income: Production, Productivity, Post-harvest, Price, Policy").

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8. Answer Writing Orientation

- Notes framed in Intro–Body–Conclusion style.
- Directive-word guidance (e.g., distinguish between "discuss" and "critically analyze" questions).
- "Value Addition Boxes" → containing facts, keywords, committee reports, and international indices (like Global Hunger Index, HDI, Climate Risk Index).

9. Contemporary Relevance

- Integration of 2025-current affairs: WTO disputes on subsidies, Agri-tech startups, AI in agriculture, Climate-resilient crops.
- References to SDGs (Goal 2: Zero Hunger, Goal 13: Climate Action), Paris Agreement, and FAO reports.

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10. Revision-Friendly Features

- One-pager summaries for each section.
- Highlighted Do/Don’t pointers for avoiding common mistakes in answers.
- Color-coded or bold fact vs. analysis vs. case study segregation for quicker recall.
- In short, your notes combine syllabus precision + trend analysis + keyword bank + case studies + contemporary data, making them exam-ready and easily reproducible under Mains time pressure.

INDEX

Part 2 : Agro-Economy

Part 1 : Economic Development

UNIT 1

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

Navigating the Syllabus: What You Need to Know

1. Introduction to Indian Economy

- Historical evolution: Ancient–Medieval, Colonial, Post-Independence, Liberalization (1991), 21st century reforms.
- Structure: Primary (agriculture), Secondary (industry), Tertiary (services).
- Features: Mixed economy, large informal sector, demographic trends, sectoral imbalance.
- Major challenges: Unemployment, poverty, inequality, agricultural distress, infrastructure gaps, environmental concerns.
- India in global context: Trade, digital economy, global uncertainties.

2. Economic Growth & Development

- Concept of **economic growth vs. economic development**.
- Measures of growth: GDP, GNP, NNP, PCI, GVA.
- GDP calculation methods in India: Production, Expenditure, Income.
- Potential GDP – determinants & constraints.
- Growth cycles & recovery types (V, U, W, L, K, etc.).
- Indicators of development: HDI, MPI, Gini, GDI, SDGs, GHI.
- Challenges: Poverty, unemployment, human capital deficit, regional disparities, environment.

3. Economic Resources & Mobilisation

- Types of resources: Domestic & External.
- Domestic: Tax revenue (direct/indirect), non-tax revenue, borrowings, disinvestment, PSUs.
- External: FDI, FPI, ECBs, ODA, multilateral/bilateral aid, Masala bonds.
- Challenges: Low tax-GDP ratio, informality, black money, global uncertainty, volatility of capital inflows.
- Government initiatives: GST, faceless tax system, disinvestment, asset monetization, financial inclusion, FDI liberalization.

4. Economic Planning & Issues

- Types: Centralized, decentralized, indicative, imperative, rolling, structural.
- Evolution: Planning Commission (1950), Five-Year Plans (1951–2017).
- Transition: NITI Aayog (2015) – cooperative & competitive federalism, innovation, real-time monitoring.
- Issues: Limited powers of NITI, state disparities, weak local integration, data gaps, fiscal stress.
- Way forward: Strengthen NITI, decentralized planning, data-driven monitoring, private sector engagement, sustainability focus.

5. Employment & Associated Issues

- Types of employment/unemployment: Formal, informal, self, casual, disguised, seasonal, structural, frictional.
- Trends (PLFS 2022–23): LFPR, WPR, UR, female participation, sectoral distribution.
- Major issues: Informality, low female LFPR, youth unemployment, skill mismatch, regional/social disparities, poor job quality.
- Impact of technology: Automation, gig economy, job polarization.
- Govt initiatives: MGNREGA, PM Internship Scheme, PMKVY, Skill India, Startup/Stand-up India, PMEGP, PLI, ABRY, e-Shram.
- Contemporary issues: Labour reforms (4 labour codes), care economy, gig/platform economy.

UPSC Previous Year Questions

Question	Nature of Question	Core Demand
Examine the (pattern) and trend of public expenditure on social services in the post-reforms period in India. To what extent this has been in consonance with achieving the objective of inclusive growth? (2024)	Public Expenditure + Social Sector + Inclusive Growth	Analyze expenditure trends post-1991 and assess alignment with inclusive growth goals
What is the status of digitalization in the Indian economy? Examine the problems faced in this regard and suggest improvements.(2023)	Digital Economy + Challenges + Policy Suggestions	Assess progress and barriers in digitalization and propose reforms
Most of the unemployment in India is structural in nature. Examine the methodology adopted to compute unemployment in the country and suggest improvements. (2023)	Unemployment + Structural Nature + Computation	Explain current methodology, structural causes, and suggest better metrics
Distinguish between 'care economy' and 'monetized economy'. How can care economy be brought into monetized economy through women empowerment? (2023)	Care Economy + Gender + Inclusion	Define both economies and link women empowerment as a tool for integration
“Economic growth in the recent past has been led by increase in labour productivity.” Explain this statement. Suggest the growth pattern that will lead to creation of more jobs without compromising labour productivity. (2022)	Labour Productivity + Job Creation + Growth Pattern	Explain productivity-led growth and propose inclusive job-creating growth model
Explain the difference between computing methodology of India’s Gross Domestic Product (GDP) before the year 2015 and after the year 2015.(2021)	GDP Estimation + Base Year Change + Methodological Shift	Compare old vs new GDP methodology and explain implications
Do you agree that the Indian economy has recently experienced V-shaped recovery? Give reasons in support of your answer. (2021)	COVID Recovery + Growth Pattern + Economic Cycle	Assess data and arguments for V-shaped post-pandemic recovery
Define potential GDP and explain its determinants. What are the factors that have been inhibiting India from realizing its potential GDP? (2020)	Potential GDP + Growth Inhibition	Explain the concept and discuss structural barriers to achieving it

Explain the meaning of investment in an economy in terms of capital formation. Discuss the factors to be considered while designing a concession agreement between a public entity and a private entity.(2020)	Investment + PPP + Concession Agreements	Link investment and capital formation; outline key PPP contract design factors
Explain the rationale behind the Goods and Services Tax (Compensation to States) Act of 2017. How has COVID-19 impacted the GST compensation fund and created new federal tensions? (2020)	GST Compensation + Federalism + COVID Impact	Explain GST Compensation Act and COVID-led strain on Centre-State fiscal relations
Enumerate the indirect taxes which have been subsumed in the goods and services tax (GST) in India. Also, comment on the revenue implications of the GST introduced in India since July 2017. (2019)	GST + Tax Structure + Revenue Impact	List subsumed taxes and analyze GST's impact on revenue and fiscal federalism
Do you agree with the view that steady GDP growth and low inflation have left the Indian economy in good shape? Give reasons in support of your arguments. (2019)	GDP Growth + Inflation + Economic Health	Evaluate macroeconomic stability through growth and inflation indicators
Comment on the important changes introduced in respect of the Long term Capital Gains Tax (LCGT) and Dividend Distribution Tax (DDT) in the Union Budget for 2018-2019.(2018)	Budget 2018-19 + LCGT + DDT	Explain key changes in capital gains and dividend taxation
How are the principles followed by NITI Aayog different from those followed by the erstwhile planning commission in India? (2018)	NITI Aayog vs Planning Commission + Planning Philosophy	Contrast institutional approach, structure, and planning mechanism
Among several factors for India's potential growth, savings rate is the most effective one. Do you agree? What are the other factors available for growth potential? (2017)	Growth Drivers + Savings Rate + Investment	Evaluate importance of savings among other growth-enabling factors

Account for the failure of manufacturing sector in achieving the goal of labour-intensive exports rather than capital-intensive exports. Suggest measures for more labour-intensive rather than capital-intensive exports. (2017)	Manufacturing + Export Strategy + Employment	Analyze export composition and recommend labour-oriented policies
One of the intended objectives of Union Budget 2017-18 is to 'transform, energize and clean India'. Analyse the measures proposed in the Budget 2017-18 to achieve the objective. (2017)	Budget 2017-18 + Reform Objectives + Governance	Assess specific schemes/measures promoting transparency, growth and reforms
"Industrial growth rate has lagged behind in the overall growth of Gross-Domestic-Product (GDP) in the post-reform period" Give reasons. How far the recent changes in Industrial Policy are capable of increasing the industrial growth rate? (2017)	Industrial Growth + GDP + Policy Reform	Explain stagnation reasons and evaluate new policy measures
Women empowerment in India needs gender budgeting. What are the requirements and status of gender budgeting in the Indian context? (2016)	Gender Budgeting + Women Empowerment + Public Policy	Explain gender budgeting concept, current status, and policy reforms needed
Justify the need for FDI for the development of the Indian economy. Why there is gap between MOUs signed and actual FDIs? Suggest remedial steps to be taken for increasing actual FDIs in India.(2016)	FDI + Investment Gap + Economic Development	Discuss FDI role, MOU-realization gap and policy improvements
The nature of economic growth in India in recent times is often described as jobless growth. Do you agree with this view? Give arguments in favour of your answer.(2015)	Jobless Growth + Employment Trends	Analyze employment elasticity of growth and support jobless growth argument
Craze for gold in Indians has led to a surge in import of gold in recent years and put pressure on balance of payments and external value of rupee. In view of this, examine the merits of the Gold Monetization Scheme. (2015)	Gold Imports + BoP + Gold Monetization Scheme	Assess gold import impact and evaluate gold monetization solution

Success of 'Make in India' programme depends on the success of 'Skill India' programme and radical labour reforms. Discuss with logical arguments. (2015)	Make in India + Skill India + Labour Reforms	Explain synergy between industrialization, skill-building and labour policy
Normally countries shift from agriculture to industry and then later to services, but India shifted directly from agriculture to services. What are the reasons for the huge growth of services vis-a-vis industry in the country? Can India become a developed country without a strong industrial base? (2014)	Service-led Growth + Industrial Base + Development Model	Analyze India's atypical growth path and assess industrial importance
While we found India's demographic dividend, we ignore the dropping rates of employability. What are we missing while doing so? Where will the jobs that India desperately needs come from? Explain. (2014)	Demographic Dividend + Employability + Job Creation	Critique unemployability amidst demographic advantage and suggest job avenues
What are the reasons for introduction of Fiscal responsibility and Budget Management (FRBM) act, 2003? Discuss critically its salient features and their effectiveness. (2013)	FRBM Act + Fiscal Discipline + Budget Management	Explain purpose, features, and evaluate effectiveness of FRBM Act
What is meaning of the term tax-expenditure? Taking housing sector as an example, discuss how it influences budgetary policies of the government. (2013)	Tax Expenditure + Housing + Budget Policy	Define tax expenditure and show impact via housing sector example
Discuss the impact of FDI entry into multi-trade retail sector on supply chain management in commodity trade pattern of the economy. (2013)	FDI in Retail + Supply Chain + Trade Patterns	Analyze supply chain reforms through FDI-led organized retail
Though India allowed foreign direct investment (FDI) in what is called multi brand retail through joint venture route in September 2012, the FDI, even after a year, has not picked up. Discuss the reasons. (2013)	FDI in Multi-Brand Retail + Policy Gap + Implementation	Identify reasons for low investment despite policy opening
Discuss the rationale for introducing Good and services tax in India. Bring out critically the reasons for delay in roll out for its regime. (2013)	GST + Tax Reform + Political Economy	Explain GST rationale and reasons for delayed implementation

1 Introduction to Indian Economy

Introduction

The Indian economy is a dynamic and diverse system, blending traditional and modern sectors. At independence, it was predominantly agrarian with low industrial growth and income levels. From a primarily agrarian economy with a weak industrial base and low per capita income, India has emerged as one of the fastest-growing major economies globally. Today, it ranks fourth by nominal GDP and third by PPP. With a large population and growing global influence, the Indian economy plays a crucial role in shaping both domestic development and international economic trends.

Historical Background

- **Ancient and Medieval India (Pre-Colonial Era, ~3000 BCE–18th Century)**
  - **Indus Valley Civilization (~3000–1500 BCE)**: One of the world's earliest urban economies, with advanced trade, agriculture, and craftsmanship. Cities like Harappa and Mohenjo-Daro engaged in trade with Mesopotamia, exporting textiles and spices.
  - **Mauryan and Gupta Periods (~321 BCE–550 CE)**:
    - The Mauryan Empire (321–185 BCE) had a centralized economy with state-controlled agriculture, trade, and taxation, as described in Kautilya's Arthashastra.
    - The Gupta period saw a golden age with flourishing trade, coinage, and advancements in agriculture, textiles, and metallurgy. India contributed significantly to global GDP (~20-30% in the 1st millennium CE).
  - **Medieval Period (8th–18th Century)**:
    - India was a global trade hub under empires like the Cholas, Delhi Sultanate, and Mughals.
    - Key industries included textiles (cotton, silk), spices, and handicrafts, with extensive trade networks across Asia, Europe, and Africa.
    - The economy was agrarian, with sophisticated irrigation systems and village-based production. India accounted for ~25% of global GDP during the Mughal era (16th–17th centuries).
- **Colonial Period (1757–1947)**
  - **British East India Company (1757–1858)**:
    - Post the Battle of Plassey (1757), the British East India Company gained economic control, shifting India from a manufacturing and trade powerhouse to a supplier of raw materials (e.g., cotton, indigo).
    - Deindustrialization occurred as British policies favored imports of manufactured goods, crippling local industries like textiles.
    - Heavy taxation and land revenue systems (e.g., Zamindari, Ryotwari) impoverished farmers, leading to famines (e.g., Bengal Famine of 1770).
  - **British Crown Rule (1858–1947)**:
    - Infrastructure like railways and telegraphs was developed, but primarily to serve colonial interests (e.g., resource extraction).
    - India became a market for British goods, with its share of global GDP dropping from ~25% in 1700 to ~4% by 1947.
    - Limited industrialization occurred (e.g., jute, railways), but the economy remained agrarian, with widespread poverty and stagnation.
- **Post-Independence Era (1947–1991)**
  - **Nehruvian Socialist Model (1947–1980s)**:
    - After independence in 1947, India adopted a mixed economy with heavy state intervention, inspired by socialist principles.
    - **Five-Year Plans**: Modeled on Soviet planning, the government prioritized self-reliance (Atmanirbhar), focusing on agriculture, infrastructure, and heavy industries (e.g., steel, power).
    - **Public Sector Dominance**: State-owned enterprises dominated key sectors like steel, coal, and banking.
    - **Green Revolution (1960s–1970s)**: Introduction of high-yield crops and

irrigation boosted agricultural productivity, achieving food security.
    - **Challenges**: The "License Raj" (excessive regulation) stifled private enterprise, leading to inefficiencies. GDP growth averaged ~3.5% annually (derisively called the "Hindu rate of growth").
  - **Economic Stagnation**: By the 1980s, India faced high fiscal deficits, balance-of-payments crises, and limited foreign exchange reserves, setting the stage for reforms.
- **Liberalization and Beyond (1991–Present)**
  - **Economic Reforms of 1991**:
    - Triggered by a balance-of-payments crisis, India liberalized its economy under Finance Minister Manmohan Singh and Prime Minister P.V. Narasimha Rao.
    - Key reforms: Reduced trade barriers, dismantled License Raj, encouraged foreign direct investment (FDI), and privatized some public sector enterprises.
    - Result: Shift from a closed, state-controlled economy to a market-oriented one, boosting growth and global integration.
  - **Post-1991 Growth**:
    - The 1990s saw the rise of the services sector, particularly IT and software exports, positioning India as a global IT hub.
    - GDP growth accelerated to ~6-7% annually, driven by domestic consumption, FDI, and exports.
    - The middle class expanded, and urbanization increased, fueling demand for goods and services.
  - **21st Century Developments**:
    - **2000s–2010s**: Robust growth made India one of the fastest-growing economies, with a focus on services (~50-55% of GDP), manufacturing, and digital infrastructure.
    - **Key Reforms**: Introduction of Goods and Services Tax (GST) in 2017, Insolvency and Bankruptcy Code (2016), and "Make in India" to boost manufacturing.
    - **Digital Economy**: Growth of fintech (e.g., UPI), e-commerce, and startups, with India emerging as a global leader in digital transactions.
    - **Current Status (2025)**: India is the fifth-largest economy (~$3.9 trillion nominal GDP), with ambitions to reach $5 trillion by 2027. It faces challenges like inequality, unemployment, and environmental sustainability but benefits from a young workforce and global supply chain shifts.

Structure of the Indian Economy

The economy is broadly divided into three sectors, with their contributions to GDP and employment as follows (based on recent estimates):

- **Primary Sector (Agriculture and Allied Activities)**:
  - **Contribution to GDP**: ~15-18% (2024 estimate).
  - **Employment**: Employs ~42-45% of the workforce, reflecting its role as a livelihood source for rural India.
  - **Key Features**:
    - Dominated by small and marginal farmers.
    - Major crops: rice, wheat, pulses, sugarcane, and cotton.
    - Challenges: Low productivity, dependence on monsoons, and limited mechanization.
    - Government initiatives like PM-KISAN and irrigation projects aim to boost productivity.
  - **Trends**: Declining share in GDP but critical for food security and rural economy.
- **Secondary Sector (Industry and Manufacturing)**:
  - **Contribution to GDP**: ~25-30%.
  - **Employment**: ~25% of the workforce.
  - **Key Features**:
    - Includes manufacturing, construction, mining, and electricity.
    - Key industries: automobiles, textiles, chemicals, and steel.

        - Initiatives like "Make in India" and Production-Linked Incentive (PLI) schemes aim to boost manufacturing.
        - India is emerging as a hub for electronics and renewable energy equipment.
    - **Challenges**: Infrastructure bottlenecks, regulatory hurdles, and competition from global players.
- **Tertiary Sector (Services)**:
    - **Contribution to GDP**: ~50-55%.
    - **Employment**: ~30% of the workforce.
    - **Key Features**:
        - Dominant sector, driven by IT, telecommunications, finance, retail, and tourism.
        - India is a global leader in IT and business process outsourcing (BPO), contributing significantly to exports.
        - Growing digital economy, with fintech, e-commerce, and startups thriving (e.g., UPI transactions, unicorn startups).
    - **Trends**: Rapid digitization and increasing foreign investment in tech and financial services.

Features of the Indian Economy

- **Developing Economy**: Characterized by low per capita income, high population growth, and widespread poverty, though showing steady improvements post-independence.
- **Mixed Economy**: Coexistence of public and private sectors, with the state playing a strategic role in infrastructure, defense, and social sectors.
- **Dominance of Agriculture**: Although its GDP share has declined, agriculture still employs a significant portion of the population, especially in rural areas.
- **Large Informal Sector**: A major portion of employment and output is generated in the informal/unorganized sector with low productivity and limited social security.
- **Demographic Trends**: Large and youthful population offers demographic dividend, but also creates pressure on jobs, education, and health services.
- **Sectoral Imbalance**: The services sector contributes the most to GDP, while agriculture remains the largest employer—indicating a mismatch in productivity and employment.
- **High Population Density**: India is the most populous country (According to the UNFPA's 2025 State of World Population report, as of April 2025, India's population is estimated to be 146.39 crore making it the most populous country in the world.), putting stress on land, water, and public services.
- **Planned Economic Development**: Guided by Five-Year Plans (till 2017) and now by NITI Aayog's vision documents focusing on inclusive and sustainable growth.
- **Income and Regional Inequality**: Uneven development across regions and social groups leads to disparities in income, health, education, and infrastructure access.
- **Rural-Urban Divide**: Stark differences in income, consumption, infrastructure, and access to services between rural and urban areas.
- **Policy Orientation Towards Welfare**: Emphasis on poverty alleviation, food security, employment generation, and financial inclusion through schemes like MGNREGA, NFSA, and PMJDY.
- **Global Integration**: Increasing participation in global trade, capital flows, and digital economy, especially after the 1991 economic reforms.

Major Challenges and Issues before the Indian Economy

- **Unemployment and Jobless Growth :** India faces high levels of unemployment, particularly among educated youth. The prevalence of informal and gig work, with limited job security and social protection, exacerbates the issue. Economic growth has not translated proportionately into employment creation.
- **Persistent Poverty and Rising Inequality :** Although poverty levels have declined over the years, a significant portion of the population still lives in multidimensional poverty. Income and wealth inequality have widened, with the top 1% holding a disproportionate share of national wealth (e.g., Oxfam reports).
- **Agricultural Distress :** The agriculture sector suffers from low productivity, fragmented landholdings, overdependence on monsoons, inadequate access to credit and insurance, and

ineffective implementation of Minimum Support Prices (MSP), leading to frequent farm distress.

- **Infrastructure Deficiencies :** Gaps in physical infrastructure such as roads, railways, power, logistics, and digital connectivity hinder economic growth and inclusion, especially in rural and backward regions.
- **Low Investment in Human Capital :** Education and healthcare systems continue to face issues of accessibility, quality, and affordability. Poor learning outcomes and skill mismatches impact employability and productivity.
- **Dominance of the Informal Sector :** A large share of India's workforce is employed in informal, unregulated sectors with low wages, limited rights, and no social security, making them highly vulnerable to economic shocks.
- **Environmental Degradation and Climate Vulnerability :** Rapid urbanization, industrial pollution, deforestation, and over-extraction of natural resources are contributing to ecological imbalances. India is also increasingly vulnerable to climate-related risks like floods, droughts, and heatwaves.
- **Fiscal and Budgetary Constraints :** High fiscal deficits, a narrow tax base, and inefficient subsidy mechanisms constrain the government's ability to invest in critical sectors and deliver welfare programs effectively.
- **Regional Disparities :** Economic development is uneven across states, with certain regions (e.g., southern and western India) showing higher growth and better indicators than the economically lagging regions in the north and east.
- **Inflation and Price Instability :** Frequent fluctuations in food and fuel prices, driven by supply-side disruptions and global factors, affect purchasing power, particularly of lower-income households.
- **External Sector Challenges :** India faces issues like trade deficits, reliance on energy imports, and sensitivity to global financial shocks. Volatility in foreign capital inflows affects currency stability and balance of payments.
- **Digital and Technological Divide :** Despite advances in digitization, large sections of rural and marginalized communities lack access to reliable digital infrastructure, excluding them from the benefits of digital governance and economy.

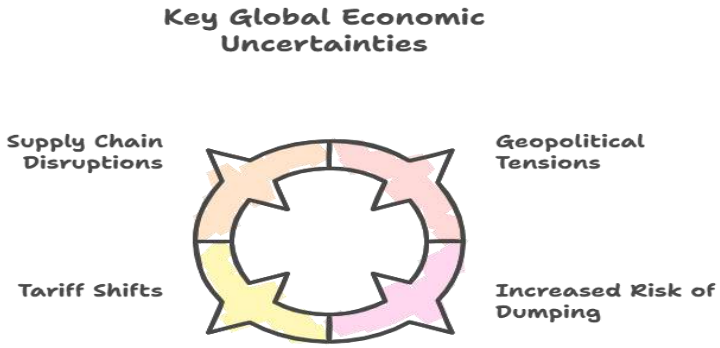
Contemporary Issue

India's Economy Amid Global Uncertainty

Context:

- India is navigating global uncertainties marked by rising costs, disrupted supply chains, and shifting trade policies, posing challenges for its economy and exports.

Key Global Uncertainties :



- **Geopolitical Tensions:** Ongoing conflicts, like the U.S.-China trade war and the Russia-Ukraine war, are disrupting global trade patterns and creating uncertainty in international markets.
- **Supply Chain Disruptions:** Global supply chains are facing delays and rising costs due to the pandemic, logistics issues, and natural disasters. China's control over critical minerals further exacerbates the supply chain challenges for industries relying on these materials.
- **Tariff Shifts:** The U.S. protectionist policies, including tariffs on Chinese imports, and the European Union's proposed carbon tax on imports are challenging exporters, particularly in sectors like textiles, electronics, and pharmaceuticals.
- **Increased Risk of Dumping:** Overproduction in countries like China and ASEAN nations increases the risk of cheap, unfairly priced imports flooding India's market, harming local industries.

India's Strategic Resilience in the Face of Global Uncertainty

- **Resilient Growth Prospect:** India has shown consistent growth, with real GDP projected to expand by 6.4% in FY25, maintaining its decadal average despite global disruptions.

- **Fiscal Discipline :** The government has adhered to fiscal consolidation targets, keeping the fiscal deficit under control while increasing capital expenditure to ₹11.21 lakh crore for 2025–26.
- **Bilateral Trade Agreements (BTA):** India has engaged proactively in trade talks with key partners, notably the U.S., to secure favorable agreements. Early and strategic Bilateral Trade Agreements, especially with the U.S., are intended to minimize tariff burdens on critical sectors such as services and manufacturing.
- **Free Trade Agreements (FTAs):** The conclusion of an FTA with the U.K. is a significant achievement. India is also pushing for other FTAs with the EU, Australia, and other critical partners, aiming to enhance market access for Indian exporters.
- **Import Monitoring and Trade Safeguards:** India has strengthened its import monitoring mechanisms to address the growing threat of dumping. The government has enacted trade remedial measures, including anti-dumping duties, to protect domestic industries.
- **Public Capital Expenditure (Capex):** India has focused on maintaining robust public capital expenditure to sustain domestic demand and create opportunities for private investments.
- **Monetary Policy Support:** The Reserve Bank of India (RBI) has kept its monetary policy accommodative, with a focus on controlling inflation while supporting economic growth through rate cuts.
- **Attracting Foreign Investments:** India has strategically targeted foreign companies seeking to diversify their supply chains from China and other countries. By positioning itself as an attractive investment destination, India hopes to strengthen its manufacturing base.
- **Production-Linked Incentive (PLI) Schemes:** The government has expanded the scope of PLI schemes to include more sectors like wearables, IoT devices, and raw materials for electric vehicle batteries. This aims to enhance India's manufacturing capabilities and reduce dependency on imports.

India's Challenges in Global Uncertainty:

- **Dependence on the U.S. Market:** India's exports to the U.S. constitute a significant portion of its merchandise exports. Any change in U.S. tariffs directly impacts key sectors like apparel, pharmaceuticals, and electronics.
- **Vulnerable MSMEs:** India's Micro, Small, and Medium Enterprises (MSMEs), which have a high reliance on exports, face the risk of unviable operations due to tariffs and non-tariff barriers.
- **Inflationary Pressures and Rising Costs:** Rising global commodity prices and logistical costs are putting additional pressure on industries, impacting margins and profitability.
- **Challenges in Trade Agreements:** India faces uncertainty about the structure and impact of the trade deals it is negotiating with major partners, including the U.S., EU, and others.
- **Potential Dumping Risk:** The increased risk of cheap imports from China and other countries may lead to a market imbalance, undermining domestic production.
- **Currency Volatility:** Exchange rate fluctuations, exacerbated by global economic instability, impact India's trade competitiveness, especially in sectors that are price-sensitive.

Way Forward:

- **Diversify Trade Partnerships:** Expand trade ties with emerging markets and secure favorable agreements to reduce dependency on traditional partners.
- **Foster Domestic Resilience:** Strengthen manufacturing, improve supply chains, and focus on export-oriented sectors to withstand global shocks.
- **Build Sustainable Trade Frameworks:** Develop long-term trade agreements that benefit India and promote global trade stability.
- **Adopt Technology and Innovation:** Invest in automation, digital infrastructure, and green technologies to enhance competitiveness.
- **Targeted Policy Interventions:** Focus on policies addressing inflation, cost pressures, and supply chain issues while attracting investment.

Conclusion

- India stands as a **rare "bright spot"** in an increasingly uncertain global landscape, as **noted by Chief Economic Advisor (CEA) V Anantha Nageswaran.** The country's consistent economic performance, despite ongoing global challenges, underscores its resilience and adaptability.

- As India sets its sights on becoming a $5 trillion economy by 2027 and establishing itself as a global manufacturing hub, this ambition requires more than mere growth—it demands strategic foresight, resilience, and the pursuit of autonomy in economic decision-making.

2 The Concept of Economic Growth & Development

Introduction

Understanding the difference between how fast an economy grows and how well its people live is central to evaluating a country's progress. For a country like India, with its vast population and regional disparities, it is not enough to measure success through income and production alone. True progress also depends on improving the quality of life, access to opportunities, and social equity. Over time, economists and policymakers have recognized that rising incomes must go hand in hand with improvements in health, education, gender equality, and environmental sustainability. This distinction between rising output and overall well-being forms the foundation for understanding economic growth and development as two interconnected, yet distinct, concepts.

Economic Growth

- Economic growth refers to the sustained increase in the productive capacity of an economy over time, usually measured by the rise in its real Gross Domestic Product (GDP). It reflects the increase in the total output of goods and services produced within a country, adjusted for inflation.
- In simpler terms, when an economy produces more goods and services in a given year than it did in the previous year, it is said to have grown economically.

Common Indicators Used for Measurement of Economic Growth

Indicator	Description
Gross Domestic Product (GDP)	Refers to the **total market value of all final goods and services** produced within the geographical boundaries of a country during a specific time period, usually one year. It is the most widely used indicator of economic performance.
Gross National Product (GNP)	GNP = GDP **+ Net Factor Income from Abroad** (i.e., income earned by residents from overseas investments minus income earned by foreigners in the domestic economy). It captures the **income generated by nationals**, regardless of location.
Net National Product (NNP)	NNP = GNP **– Depreciation** (consumption of fixed capital). It reflects the **actual net production** available for consumption or investment, after accounting for wear and tear of capital.
Net Domestic Product (NDP)	NDP = GDP **– Depreciation**. It measures the **net value of goods and services produced** within a country after subtracting the loss in value of capital goods.
Per Capita Income (PCI)	PCI = **National Income / Population**. It reflects the **average income earned per person** in a country and is a key indicator for comparing **standard of living** and **development levels** across countries.
Gross Value Added (GVA)	Measures the **value added by all sectors** of the economy (agriculture, industry, and services). GVA = GDP at basic prices = GDP – (Taxes – Subsidies). It helps in understanding the **sector-wise contribution** to the economy.

GDP Calculation in India

- **Nodal Agency**
  - The **National Statistical Office (NSO)**, under the **Ministry of Statistics and Programme Implementation (MoSPI)**, is responsible for estimating India's GDP.
- **Base Year**
  - The **base year** is the reference year against which economic growth is measured.
  - It serves as the benchmark for comparing current prices and real growth.
  - GDP figures are calculated both at **current prices** (including inflation) and **constant prices** (adjusted for inflation using the base year).
  - Base year ensures GDP reflects real structural changes in the economy.
- Helps **remove the effect of inflation** and gives a true picture of economic growth.
  - **Current base year**: 2011–12.
  - It is revised periodically to capture structural changes in the economy.
- **Approaches Used to Calculate GDP in India**
  - **Production (or Output) Method**
    - Measures the total **value added** by all producing units in the economy.

        - GDP is calculated as: **GDP = Gross Value Added (GVA) at Basic Price + Product Taxes – Product Subsidies**
        - GVA = Value of Output – Intermediate Consumption
        - Suitable for measuring **sector-wise contributions** like agriculture, manufacturing, and services.
    - **Expenditure Method**
        - Measures the total **expenditure** incurred on final goods and services produced within the economy.
        - GDP is calculated as: GDP = Private Consumption (C) + Investment (I) + Government Expenditure (G) + Net Exports (X – M).
        - Useful to understand **demand-side drivers** of the economy.
    - **Income Method**
        - Measures the total **income generated** by factors of production in the economy.
        - GDP is calculated as: **GDP = Compensation of Employees + Rent + Interest + Profits + Mixed Income**
        - Reflects how GDP is distributed among **labour, capital, land, and entrepreneurs**.
        - Helps assess **income generation** and factor payments.
- **Key Data Sources used for gdp Calculations**
    - **MCA-21** database (corporate filings).
    - **GST Network** and Income Tax Department (tax data).
    - **NSS Surveys** (household-level data).
    - **Annual Survey of Industries (ASI)**, **Index of Industrial Production (IIP)**.
    - **Administrative records** from RBI, SEBI, IRDAI, NABARD, TRAI, etc.

Computing methodology of India's Gross Domestic Product (GDP) before the year 2015 and after the year 2015

Parameter	Before 2015	After 2015
Base Year	2004–05	2011–12
Price Used for Real GDP	Constant prices of 2004–05	Constant prices of 2011–12
GDP Type Reported	**GDP at Factor Cost**	**GDP at Market Prices**
Institutional Coverage	Only **factories registered under Factories Act**	**All companies registered with MCA** (MCA-21 database)
Data Source for Private Corporate Sector	RBI study of company finances (~2500 companies)	MCA-21 database (~5 lakh companies)
Estimation of Manufacturing Sector	**IIP-based volume index**	**GVA based on company balance sheet data (MCA-21)**
Financial Sector Estimation	RBI data	Comprehensive coverage via MCA, SEBI, NABARD, NHB etc.
Services Sector Estimation	Traditional surveys and indicators	Inclusion of corporate filings, better tax data
Informal Sector Estimation	Labor input method	Effective labor input method (with improved productivity estimates)
International Standards Used	SNA (System of National Accounts) 1993	SNA 2008

Issues Associated with GDP Calculations in India

- **Methodological Revisions and Controversies**
    - In 2015, India adopted a new GDP calculation method based on the **2011–12 base year**, shifting from factor cost to **market prices** and aligning with **international standards (SNA 2008)**.
    - This led to **higher growth estimates** for the same period compared to the earlier series, creating confusion and doubts among economists.
    - Critics argue the new method **doesn't align with other macroeconomic indicators** like employment, credit growth, and tax collections.
- **Overestimation from MCA-21 Corporate Data**
    - The new series heavily relies on **MCA-21 database** (Ministry of Corporate Affairs), which includes many **dormant or shell companies**.
    - Inclusion of such non-operational firms can lead to **overestimation of industrial and services sector output**.
- **Informal Sector Underrepresentation**

- Over **90% of India's workforce is employed in the informal sector**, but its contribution is **not directly captured** in GDP.
- GDP estimates use **benchmarking and extrapolation** based on organized sector data, which can be misleading in times of disruption (e.g., COVID-19).

- **Weakness in Data Collection Systems**
  - India's statistical systems, such as NSSO surveys, **lack frequency and robustness**, especially in fast-changing economic environments.
  - **Delayed surveys** or lack of timely field data can affect the accuracy and credibility of GDP figures.
- **Disconnection from Ground Realities**
  - High GDP growth has often **not translated into job creation**, fueling criticism of "jobless growth."
  - GDP ignores crucial aspects like **inequality, environmental degradation, and unpaid care work**, thus offering an **incomplete picture of welfare**.
- **Base Year and Price Index Issues**
  - Outdated base year (2011–12) may not reflect the current structure of the economy, especially post-digitization, GST, and formalization trends.
  - Price deflators used to calculate **real GDP** may not accurately capture inflation dynamics across sectors.
- **Political Influence and Transparency Concerns**
  - Concerns have been raised about the **independence of statistical institutions**, especially after revisions that presented favorable growth data.
  - The resignation of members from the **National Statistical Commission (NSC)** in 2019 highlighted issues of transparency and data credibility.

Potential GDP

Definition of Potential GDP

- **Potential GDP** refers to the **maximum sustainable level of output** that an economy can produce **without triggering inflation**, when all resources (labour, capital, technology) are **fully and efficiently utilized**.
- It reflects the **productive capacity** of an economy under normal conditions, excluding short-term fluctuations.
- It is also known as the **natural level of output** or **full-employment GDP**.

Determinants of Potential GDP

- **Labour Force Growth**
  - Size, skills, health, and productivity of the working population.
  - Higher demographic dividend increases potential output.
- **Capital Stock**
  - Investment in physical infrastructure like factories, roads, power, etc.
  - Higher capital formation enhances productive capacity.
- **Technology & Innovation**
  - Technological advancement leads to better efficiency and productivity.
  - R&D, digitization, and automation play a key role.
- **Human Capital**
  - Quality of education, skill development, and healthcare.
  - Higher human capital improves labour productivity.
- **Institutional and Policy Framework**
  - Ease of doing business, governance, and regulatory environment.
  - Efficient legal, financial, and administrative institutions improve economic performance.
- **Total Factor Productivity (TFP)**
  - Efficiency with which labour and capital are used together.
  - Influenced by innovation, management practices, and structural reforms.

Factors Inhibiting India from Realizing its Potential GDP

- **Structural Unemployment :** Skill-job mismatch and low female labour force participation reduce workforce efficiency.
- **Infrastructure Deficiencies :** Inadequate transport, logistics, electricity, and digital infrastructure constrain industrial growth.
- **Low Investment Rate :** Private investment

remains subdued due to policy uncertainty, credit constraints, and global factors.

- **Education and Skill Gaps :** Poor quality of learning outcomes and lack of industry-relevant skills limit human capital potential.
- **Regulatory Bottlenecks :** Cumbersome compliance norms, judicial delays, and bureaucratic inefficiencies affect business climate.
- **Underutilization of Labour :** A large portion of the workforce is in the informal and low-productivity sectors (e.g., agriculture, MSMEs).
- **Financial Sector Weakness :** Issues like NPAs, risk aversion by banks, and weak credit flow to MSMEs hamper capital formation.
- **Gender Inequality :** Low participation of women in the workforce and gender gaps in access to resources reduce overall productivity.
- **Low R&D Expenditure :** India's R&D investment is below 1% of GDP, limiting innovation and productivity growth.
- **Policy Uncertainty and Implementation :** Frequent policy changes and poor last-mile delivery reduce investor and business confidence.

Phases of Economic Growth Cycle

Phase	Key Characteristics
1. Expansion	• GDP and national income rise • Increase in consumption, investment, and employment • Business optimism • Inflation remains moderate
2. Peak	• Maximum output level in the cycle • Economy operates near full capacity • Demand outpaces supply • Rising inflation • Low unemployment
3. Contraction	• Decline in GDP and industrial output • Rising unemployment • Falling consumer demand • Reduced business profits and investment
4. Trough	• Lowest point of economic activity • High unemployment • Low consumer and investor confidence • Excess capacity and idle resources
5. Recovery	• Early signs of revival in demand and production • Investment resumes gradually • Employment begins to pick up • Government stimulus often crucial

Types of Economic Recovery

- **V-shaped Recovery**
  - Sharp economic decline followed by a **quick and strong rebound**.
  - Indicates **short-lived recession** and swift restoration of growth.
  - **Example**: India post-COVID (as per official claims).
- **U-shaped Recovery**
  - Decline followed by a **prolonged period of stagnation**, then gradual rise.
  - Recovery takes **longer than V-shaped**, with more damage to employment/investment.
  - **Example**: US economy during the 1970s oil crisis.
- **W-shaped Recovery (Double-dip)**
  - Economy **recovers temporarily**, then falls again before a sustained revival.
  - Caused by **policy reversal**, new shocks, or weak fundamentals.
  - **Example**: Eurozone post-2008 crisis.
- **L-shaped Recovery**
  - **Steep and sustained downturn** with no early return to pre-crisis levels.
  - Reflects **deep structural damage** and long-term stagnation.
  - **Example**: Japan's "Lost Decade" after the 1990s asset bubble.
- **K-shaped Recovery**
  - **Divergent growth paths**: one segment rises while another declines.
  - Increases **inequality** — rich sectors recover, poor suffer more.
  - **Example**: Post-COVID India — digital/finance vs informal labor.
- **Z-shaped Recovery**
  - Sharp fall, quick rebound that **overshoots the original trend**.
  - Often due to **pent-up demand** or war-time rebuilding booms.

- **Example**: Post-war industrial bounce-backs.
- **Swoosh-shaped Recovery (Nike Logo)**
  - **Gradual and consistent** recovery after the fall.
  - Reflects **moderate policy success** and slow consumer/investor confidence.
  - **Example**: Many developing nations post-2008.

Economic Development

- Economic development refers to a **sustained and long-term improvement** in a country's economic, social, and institutional well-being. Unlike economic growth, which only focuses on increases in GDP or income, economic development encompasses **improvements in living standards, reduction in poverty, expansion of education and health services**, and **greater social equity and freedom**.
- According to **Amartya Sen**, development is a process of expanding the real freedoms that people enjoy that includes both economic and non-economic dimensions.
- **Key Characteristics of Economic Development**
  - **Qualitative in nature**: Focuses not just on how much an economy grows, but how that growth improves people's lives.
  - **Multidimensional**: Includes economic indicators (income, employment), as well as social indicators (health, education, gender equity).
  - **Sustainability-focused**: Aims for environmental balance and inter-generational equity.
  - **Inclusive and participatory**: Targets reduction in inequality and empowerment of marginalized groups.

Difference Between Economic Growth and Economic Development

Aspect	Economic Growth	Economic Development
Definition	Increase in the real output or income of an economy over time.	Sustained improvement in economic well-being, living standards, and quality of life.
Nature	Quantitative (focuses on numbers like GDP, GNP).	Qualitative (focuses on how growth improves people's lives).
Measurement	Real GDP, GDP per capita, GNP.	HDI, MPI, GDI, Gini coefficient, life expectancy, literacy rate, poverty ratio, etc.
Time Frame	Short-term or medium-term perspective.	Long-term structural change and sustained well-being.
Scope	Narrow — focused on economic output only.	Broad — includes health, education, equity, environment, and freedoms.
Inclusivity	May benefit only a section of society.	Aims for inclusive growth — benefits shared by all, especially the poor and vulnerable.
Sustainability	May ignore environmental or social costs.	Emphasizes intergenerational equity and sustainable use of resources.
Policy Focus	Industrial output, investment, GDP growth rate.	Human capital, social infrastructure, governance, environmental protection.
Examples of Indicators	GDP growth rate, Index of Industrial Production (IIP), national income.	Human Development Index (HDI), Multidimensional Poverty Index (MPI), life expectancy.

Indicators of Economic Development

- **Per Capita Income (PCI)**
  - Measures the **average income per person** in a country.
  - Higher PCI usually reflects a higher standard of living.
  - India's per capita income for the financial year 2024-25 is Rs 1,14,710. This figure represents the per capita net national income at constant prices.
  - **Limitation**: Ignores income distribution, non-monetary contributions (e.g., unpaid domestic work), and cost of living differences.

- **Human Development Index (HDI)**
  - Developed by **UNDP**, it is a **composite index** measuring:
    - Life expectancy at birth (health)
    - Mean and expected years of schooling (education)
    - Gross National Income per capita (standard of living)
  - In the 2024 Human Development Report, India's HDI ranking is 130th out of 193 countries
  - HDI reflects the broad human capabilities in health, knowledge, and income moving beyond mere economic growth to assess human welfare and quality of life.
- **Multidimensional Poverty Index (MPI)**
  - Measures **overlapping deprivations** across health, education, and standard of living.
  - More comprehensive than income poverty as it includes indicators like nutrition, child mortality, years of schooling, sanitation, electricity, etc.
- **Gini Coefficient**
  - Measures **income inequality** within a country.
  - Ranges from **0 (perfect equality)** to **1 (perfect inequality)**.
  - A lower Gini indicates more equal distribution of income.
- **Gender Development Index (GDI)**
  - Measures **gender disparities** in HDI components: health, education, and income.
  - A lower GDI indicates higher gender inequality.
- **Sustainable Development Goals (SDG) Index**
  - It measures a country's performance on 17 UN SDGs, including poverty, education, health, gender equality, climate action, etc.
  - Reflects **sustainable and inclusive development outcomes**, guiding governments to align policies with long-term development goals.
- **Global Hunger Index (GHI)**
  - Ranks countries based on undernourishment, child wasting, child stunting, and child mortality.
  - Hunger reflects **failure in food security, health systems, and social protection**, all of which are core components of human development.

Challenges to Economic Development in India

- **Poverty and Inequality**
  - Despite decline in absolute poverty, **over 230 million people still live in multidimensional poverty** (as per NITI Aayog, 2023).
  - **High income and wealth inequality** (e.g., top 1% own more than 40% of national wealth – Oxfam) weakens the redistributive impact of growth.
  - Economic development is **uneven across regions**, communities, and genders.
- **Unemployment and Underemployment**
  - High levels of **open, disguised, and educated unemployment**, especially among youth and women.
  - The economy exhibits **jobless or job-poor growth**, where rising GDP does not proportionately increase employment.
  - The informal sector accounts for **over 90% of jobs**, with low productivity and lack of social protection.
- **Low Human Capital Development**
  - Despite policy initiatives like NEP and Ayushman Bharat, **learning outcomes, school dropout rates, malnutrition**, and **out-of-pocket health expenses** remain serious concerns.
  - India ranks low in the **Human Development Index (HDI)** and **Global Hunger Index (GHI)**, indicating poor health and education outcomes.
- **Infrastructure Deficit**
  - Inadequate access to **roads, electricity, clean water, internet**, and **urban transport**, especially in rural and remote areas.
  - Poor infrastructure increases the **cost of doing business**, reduces productivity, and limits access to essential services.
- **Agricultural Distress**
  - **Low productivity, fragmented landholdings**, price volatility, and dependence on monsoons continue to plague the farm sector.

- **Over 50% of the population** depends on agriculture, but it contributes only about **15–18% to GDP**.
- Weak agri-market linkages and lack of diversification hinder rural development.

- **Environmental Degradation**
  - **Air and water pollution**, groundwater depletion, deforestation, and unplanned urbanization threaten ecological sustainability.
  - Development efforts often **conflict with environmental concerns**, affecting long-term well-being and disaster vulnerability.
- **Regional Disparities**
  - States like Bihar, Jharkhand, and Uttar Pradesh lag in human development and infrastructure, while others like Kerala, Maharashtra, and Tamil Nadu lead.
  - This creates **migration pressures, social tensions**, and **inequitable growth outcomes**.
- **Weak Public Institutions and Governance**
  - Challenges in **policy implementation, bureaucratic delays, corruption**, and regulatory bottlenecks slow down development efforts.
  - Weak local governance affects **last-mile delivery** of welfare schemes and infrastructure projects.
- **Fiscal Constraints**
  - Limited **tax-to-GDP ratio** (~10–11%) restricts the government's ability to invest in public goods and social infrastructure.
  - Rising subsidies and interest payments leave little fiscal space for development expenditure.
- **Skewed Urbanization and Informal Settlements**
  - Rapid, unplanned urbanization has led to **slums, congestion, pollution, and poor urban services**.
  - Urban poverty and housing shortages pose new development challenges.
- **Gender Gaps in Development**
  - **Female labor force participation** is among the lowest globally (under 25%).
  - Women face **barriers in education, employment, political participation**, and access to credit and land.
- **Digital Divide and Technological Exclusion**
  - Despite advances in digital services, many rural and poor households lack **reliable internet access, digital literacy, or financial inclusion**.
  - This limits their participation in the **modern economy and governance**.

Regional Disparity in Development in India

Context : A recent working paper by the Economic Advisory Council to the Prime Minister (EAC-PM), titled "Relative Economic Performance of Indian States: 1960–61 to 2023–24", has reignited the debate on rising regional inequalities in India's economic growth.

Emerging Trends in Regional Disparities

- **Rise of Western and Southern States**: States like Delhi, Karnataka, Telangana, and Haryana have consistently outpaced others in per capita income. Delhi's per capita income, for instance, is now more than 2.5 times the national average.
- **Shift in State Rankings**: Once among the top performers, West Bengal has seen a steady decline—from 3rd in 1960–61 to below the national average today. In contrast, Odisha, traditionally a lagging state, has steadily improved its relative income position.
- **Southern Economic Clout**: Southern states now account for over 30% of India's GDP, led by strong performance in services and manufacturing.
- **Punjab–Haryana Divergence**: Despite similar starting points, Haryana's shift toward industry and services pushed its per capita income far ahead of Punjab, which remained agriculture-dependent—a potential sign of Dutch Disease.
- **Underperformance in the East**: Bihar, West Bengal, and other eastern states continue to lag in economic indicators, despite some stability in recent years.
- **Maritime Advantage**: With better trade access and infrastructure, coastal states (except West Bengal) have generally outperformed landlocked ones.

Why Do These Disparities Persist?

- **Historical Path Dependence**: British-era investments were concentrated in port cities, creating structural advantages that persist

today. Developed states also benefitted from early industrialisation and stronger institutions.

- **Geographical Constraints**: Hilly terrain, flood-prone areas, and remoteness (e.g., in the Northeast, Bihar, Assam) raise costs and delay development projects.
- **Economic Composition**: States focused on manufacturing and services generate more income, while those reliant on agriculture remain stuck in low-value economic activity.
- **Infrastructure Gaps**: Poor connectivity, erratic power supply, and lack of financial access hinder private investment in backward regions.
- **Governance Deficits**: States with weak institutions, political instability, and poor law and order struggle to attract capital and implement reforms effectively.
- **Planning and Investment Bias**: Industries naturally prefer regions with stable infrastructure, skilled labour, and regulatory clarity—further concentrating development in already advanced states.

Measures to Bridge the Regional Divide

- **Aspirational Districts & Blocks Programmes**: These flagship initiatives focus on improving governance, health, education, and livelihoods in the most backward areas, using data-driven monitoring.
- **Local Entrepreneurship Promotion**: Under the "Vocal for Local" campaign, grassroots businesses in Aspirational Blocks are being supported to encourage self-reliance and inclusive growth.
- **Targeted Social Schemes**: Programmes like Janani Suraksha Yojana offer enhanced incentives in low-performing states to improve health outcomes and service delivery.
- **Border Area Development Programme (BADP)**: Aims to bridge development gaps in remote and strategic locations along international borders.

Way Forward

- **Region-Specific Policy Design**: A uniform development model does not work for a diverse country like India. Programmes tailored for drought-prone, hilly, or tribal regions are essential.
- **Performance-Linked Transfers**: States achieving social and economic benchmarks should be rewarded with additional fiscal support to incentivize reforms and innovation.
- **Institutional Reforms in Backward States**: Strengthening governance capacity can unlock local potential, improve revenue mobilisation, and enhance service delivery.
- **Balanced Infrastructure Push**: A strong focus on roads, rail, telecom, irrigation, and digital infrastructure in lagging areas can attract investment and generate employment.
- **Sectoral Focus for Inclusive Growth**: Boosting agriculture through better linkages, and expanding the service sector—especially banking, education, and IT—can accelerate growth in poorer regions.

3 Economic Resource & Its Mobilisation

Introduction

- Mobilization of resources refers to the process of collecting and channeling **financial, human, and natural resources** for productive and developmental use within an economy.
- In a developing country like India, where the demand for public spending on infrastructure, welfare, education, and health is high, efficient resource mobilization is vital for sustaining growth and achieving socio-economic goals.
- It involves raising resources from both **internal sources** such as taxation, public savings, and capital markets and **external sources** like foreign investment and loans.
- The effectiveness of resource mobilization determines the **state's capacity to implement policies**, reduce dependency on debt, and ensure equitable development across regions and sectors.

Types of Resources

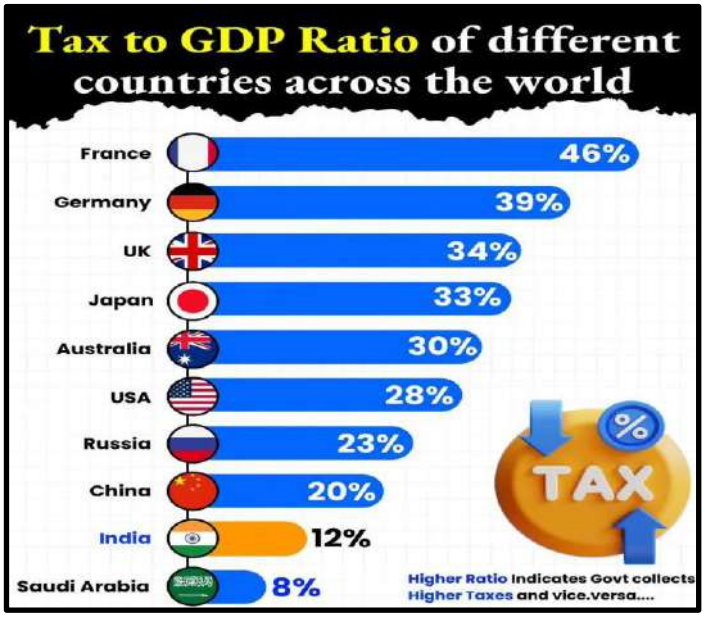
- Efficient mobilization and utilization of resources are crucial for achieving sustainable and inclusive development.The following are two types of resources:
  1. **Domestic Resources**
  2. **External Resources**

1.Domestic Resources

- **Tax RevenueDirect Taxes**:
  - Income Tax
  - Corporate Tax
  - **Indirect Taxes**:
    - Goods and Services Tax (GST)
    - Excise Duties
    - Customs Duties
- **Non-Tax Revenue**
  - Dividends and profits from Public Sector Undertakings (PSUs)
  - Interest receipts on loans given by the government
  - Fees and user charges (e.g., license fees, tolls)
  - Proceeds from spectrum auctions and mining royalties
  - Transfers from the Reserve Bank of India (RBI)
- **Public Borrowing**
  - Market borrowings through Government Securities (G-Secs)
  - Treasury Bills (T-Bills)
  - Ways and Means Advances (from RBI)
  - Small savings schemes (e.g., PPF, NSC)
- **Disinvestment**
  - Strategic sale of government stake in PSUs
  - Minority stake sales through stock markets
  - Listing of government-owned companies on stock exchanges
- **Public Sector Enterprises (PSUs)**
  - Internal accruals and profits reinvested in the economy
  - Resource generation through commercial operations
  - Capital mobilization through joint ventures and subsidiaries

Challenges in Domestic Resource Mobilization

- **Low Tax-to-GDP Ratio**
  - India's tax-to-GDP ratio has remained stagnant at around **11–12%**, compared to **25–35%** in developed countries.
  - This limits the government's capacity to finance infrastructure, welfare, and developmental spending.
  - The low ratio reflects inadequate tax collection relative to the size of the economy.
  - A high ratio is possible only when India achieves per capita income levels of the developed world.



- **Narrow Tax Base**
  - Only a small fraction of the population pays direct taxes; around **6 crore individuals** file income tax returns in a population of over 140 crore.
  - The large informal sector, agricultural exemptions, and non-compliance among high earners reduce the tax base.
  - Corporate tax avoidance through loopholes and exemptions also weakens tax mobilization.
- **Tax Evasion and Black Money**
  - Widespread use of **cash transactions** in real estate, retail, and informal trade leads to unreported income.
  - Black money circulation lowers reported profits and incomes, reducing both direct and indirect tax collections.
  - Weak enforcement and corruption in tax administration further aggravate the problem.
- **Overdependence on Indirect Taxes**
  - A significant share of tax revenue comes from GST, excise, and customs duties.
  - Indirect taxes are **regressive** in nature, disproportionately affecting the poor.
  - Dependence on indirect taxation reflects **weak direct tax compliance and capacity**.
- **Volatile Non-Tax Revenue**
  - Non-tax revenue like dividends from PSUs, interest receipts, and fees fluctuate with market and operational performance.
  - Over-reliance on **RBI surplus transfers** and one-time payments (e.g., spectrum auctions) is unsustainable.
  - Uncertainty in non-tax revenue affects budgetary planning and fiscal stability.
- **Inefficient Public Sector Enterprises (PSUs)**
  - Many PSUs operate with **low productivity, overstaffing**, and financial losses.
  - Their limited profitability reduces the government's return on investment through dividends and disinvestment.
  - Some PSUs continue to absorb budgetary support rather than generating net resources.
- **Delays in Disinvestment**
  - Procedural delays, regulatory clearances, and valuation issues slow down the disinvestment process.
  - Political opposition and labor resistance create additional barriers.
  - Unfavorable market conditions affect investor interest in PSU stake sales.
- **High Debt Servicing Burden**
  - A large portion of government revenue goes toward **interest payments** on public debt.
  - This crowds out productive expenditure in sectors like health, education, and infrastructure.
  - Persistent fiscal deficits increase borrowing needs, creating a **vicious cycle of debt dependency**.
- **Large Informal Economy**
  - Over **90% of India's workforce** is employed in the informal sector, which remains largely outside the tax net.
  - Informal enterprises often operate without registration, invoicing, or formal records.
  - This limits both direct and indirect tax mobilization and undermines formal economic measurement.
- **Weak Administrative Capacity**
  - Tax departments face a shortage of skilled personnel, especially in rural areas.
  - Lack of data integration and use of outdated IT systems hampers compliance tracking.
  - Bureaucratic delays and corruption reduce efficiency in tax collection and enforcement.

Government Initiatives in Domestic Resource Mobilization

- **Goods and Services Tax (GST) Reform**
  - Introduced in **2017** to create a unified national indirect tax system.
  - Aims to improve tax compliance, reduce cascading effect of taxes, and expand the indirect tax base.
  - GSTN (Goods and Services Tax Network) facilitates online tax filing and better data tracking.
- **Faceless Tax Assessment and E-Governance in Taxation**
  - Launched under the **'Transparent Taxation - Honoring the Honest'** platform in 2020.

- Eliminates human interface, reduces corruption, and improves efficiency and taxpayer confidence.
- Includes **faceless appeals, faceless scrutiny, and taxpayer charter**.

- **Expansion of Direct Tax Base**
  - Use of **data analytics and AI** to detect tax evasion and track high-value transactions.
  - Linking of **PAN with Aadhaar** for better identity verification.
  - Simplified ITR forms and online filing portals to improve compliance.
- **Disinvestment and Asset Monetization**
  - **National Monetization Pipeline (NMP)** launched to monetize public infrastructure assets and generate non-tax revenue.
  - Strategic sale of PSUs like **Air India** to enhance efficiency and raise capital.
  - Listing of PSUs on stock exchanges to raise funds and improve accountability.
- **Dividend and Surplus Transfers**
  - Mobilizing resources from **RBI surplus** and dividends from profitable PSUs.
  - Enhances non-tax revenue during fiscal stress.
- **Digitalization of Tax Administration**
  - Use of platforms like **GSTN, TIN (Tax Information Network), and MCA21** to integrate data and improve enforcement.
  - Expansion of **Aadhaar-based authentication** and digital payments improves transparency and reduces leakage.
- **Financial Inclusion Measures (JAM Trinity)**
  - **Jan Dhan Yojana, Aadhaar, and Mobile** integration ensures targeted delivery of subsidies, reducing leakages and enhancing fiscal efficiency.
  - Promotes formalization and improves tracking of money flows.
- **Promotion of Formal Economy**
  - Measures like **EPFO registration for workers**, **e-Shram portal**, and **Startup India** initiative help formalize employment and income.
  - Formalization increases taxable economic activity.
- **Voluntary Compliance Schemes**
  - Schemes like **Vivad se Vishwas** (tax dispute resolution) encourage settlement of pending cases.
  - **Sabka Vishwas Scheme** for indirect taxes aimed at resolving legacy disputes under excise and service tax.
- **Small Savings and Retail Participation**
  - Encouragement of public savings through **PPF, NSC, Sukanya Samriddhi Yojana**, etc.
  - Helps finance government borrowings domestically at competitive rates.

2.External Resource Mobilization

- **Foreign Direct Investment (FDI)**
  - Long-term investment by foreign entities in Indian businesses or assets.
  - Brought in via **automatic route** or **government route**, depending on the sector.
  - Key sectors: services, telecom, infrastructure, manufacturing, e-commerce.
  - Contributes to capital formation, technology transfer, and employment generation.
- **Foreign Portfolio Investment (FPI)**
  - Investment by foreign institutional investors (FIIs) in Indian stock, bond, and mutual fund markets.
  - Considered short-term and **more volatile** than FDI.
  - Adds liquidity and depth to financial markets.
  - Regulated by SEBI and subject to sectoral caps and thresholds.
- **External Commercial Borrowings (ECBs)**
  - Loans raised by Indian companies and public sector units from foreign lenders.
  - Sources include international banks, export credit agencies, and global bond markets.
  - Used for infrastructure, refinancing, working capital, and capital expansion.
  - Regulated by RBI under **automatic and approval routes**.
- **Official Development Assistance (ODA)**
  - Concessional loans or grants received from foreign governments and donor agencies.
  - Provided by agencies such as **JICA (Japan), USAID (USA), KfW (Germany)**.

- Typically directed towards health, education, transport, and urban development projects.

- **Multilateral and Bilateral Aid**
  - **Multilateral institutions**:
    - **World Bank** (IBRD & IDA) – large-scale development loans.
    - **Asian Development Bank (ADB)** – transport, energy, and urban infrastructure.
    - **Asian Infrastructure Investment Bank (AIIB)** – infrastructure investments.
    - **New Development Bank (NDB)** – BRICS countries' development financing.
  - **Bilateral aid**: Provided directly by individual countries for strategic or humanitarian purposes.
- **Masala Bonds and Sovereign Bonds**
  - **Masala Bonds**: Rupee-denominated bonds issued in foreign markets by Indian entities.
  - **Sovereign Bonds**: Foreign-currency-denominated debt issued by the Indian government (India has so far exercised caution in this area).
  - Help diversify funding sources and tap into global investor base.

Challenges in External Resource Mobilization

- **Global Economic Uncertainty**
  - Fluctuations in global growth, interest rates, and trade tensions impact capital inflows.
  - Events like the **COVID-19 pandemic** or **Russia-Ukraine conflict** lead to capital flight from emerging economies like India.
- **Volatility of Foreign Portfolio Investment (FPI)**
  - FPIs are **highly sensitive** to global interest rates, currency movements, and risk appetite.
  - Sudden withdrawal of FPI can cause stock market crashes and **rupee depreciation**.
- **External Debt and Currency Risk**
  - External Commercial Borrowings (ECBs) and sovereign debt in foreign currency expose India to **exchange rate volatility**.
  - Depreciation of the rupee increases the cost of servicing external debt.
- **Geopolitical and Regulatory Risks**
  - Bilateral or multilateral funding may come with **strategic conditions** or **policy prescriptions**.
  - Changing geopolitical alignments can affect aid or FDI commitments.
- **Sectoral Restrictions and FDI Caps**
  - Certain sectors in India have **FDI limits or approval requirements**, reducing inflows.
  - Sensitive areas like defense, telecom, and multi-brand retail face **policy and political resistance**.
- **Over-dependence on Select Countries and Agencies**
  - A large share of external aid and investment comes from a few countries (e.g., Japan, USA) and multilateral bodies (e.g., World Bank, ADB).
  - Creates **dependency and exposure to foreign policy changes**.
- **Inefficient Utilization and Absorptive Capacity**
  - Delays in project implementation reduce the **effective use of foreign aid and loans**.
  - Bureaucratic hurdles and weak institutional capacity lower fund absorption, especially in infrastructure.
- **Sovereign Credit Rating Concerns**
  - Credit rating agencies may downgrade India based on fiscal deficit or debt levels.
  - Poor ratings increase borrowing costs in global markets and affect investor sentiment.

Government Initiatives in External Resource Mobilization

- **Liberalization of Foreign Direct Investment (FDI) Policy**
  - **Automatic routes expanded** in key sectors like defense (up to 74%), insurance (up to 74%), and civil aviation.
  - FDI allowed in **space sector, coal mining, single-brand retail**, and **digital economy** with simplified compliance.
  - Consolidated FDI Policy and online portal for faster approvals via **DPIIT (Department for Promotion of Industry and Internal Trade)**.
- **Foreign Portfolio Investment (FPI) Reforms**

- Increased FPI limits in **government securities and corporate bonds**.
- Merged FPI categories into a single class to simplify regulation (SEBI circular, 2019).
- **Voluntary Retention Route (VRR)** introduced to encourage long-term stable FPI inflows.

- **Easing of External Commercial Borrowings (ECBs)**
  - RBI's revised ECB framework (2019) allows Indian corporates to **raise funds from foreign lenders** with fewer end-use restrictions.
  - Uniform borrowing limit of **USD 750 million per financial year** under automatic route.
  - Broader eligible borrowers and lenders with simplified documentation.
- **Masala Bonds Promotion**
  - Enabled Indian entities to issue **Rupee-denominated bonds in overseas markets**.
  - Helps mobilize foreign capital without currency risk exposure.
  - Used by entities like **NTPC, IRFC, and HDFC** to raise international funds.
- **Engagement with Multilateral Institutions**
  - Strengthened India's role in **World Bank, ADB, AIIB, and NDB** to access development finance.
  - Participation in co-financing large infrastructure and urban development projects.
  - Membership in **BRICS Bank (NDB)** and increased voting share in **IMF reforms** to improve bargaining capacity.
- **Bilateral Development Partnerships**
  - India receives concessional assistance from **JICA (Japan), USAID, KfW (Germany)** for infrastructure, environment, and social sectors.
  - Bilateral funding integrated with **national priorities** under programs like JICA-supported metro and bullet train projects.
- **National Infrastructure Pipeline (NIP) and Gati Shakti**
  - NIP projected a **₹111 lakh crore investment target** (2020–25), partly through **foreign investment and development loans**.
  - **PM Gati Shakti** platform offers integrated project visibility to attract global capital into logistics and infrastructure.
- **Foreign Investment Facilitation Portal (FIFP)**
  - Single-window digital platform for **processing FDI proposals under the government route**.
  - Enhances transparency and speeds up approvals across sectors.
- **India Investment Grid (IIG)**
  - A dynamic platform developed by **Invest India** and DPIIT to showcase investment-ready projects to global investors.
  - Promotes sector-specific investment and enables matchmaking between foreign capital and Indian opportunities.

4 Economic Planning & issue associated with it

Introduction

Economic planning is the process of allocating resources to achieve developmental goals within a set timeframe. In India, planning began in 1951 with the First Five-Year Plan under the Planning Commission, focusing on growth, equity, and self-reliance. Over the years, it evolved from a centralized model to a more flexible, indicative approach. The shift from the Planning Commission to **NITI Aayog in 2015** marked a move toward cooperative federalism and strategic policy thinking.

Types and Models of Economic Planning

- **Centralized Planning**
  - The entire planning process is controlled by a central authority (e.g., Planning Commission in India).
  - Decisions on resource allocation, targets, and priorities are made at the national level.
  - **Issues of Centralised Planning :**
    - Leads to inefficient allocation of resources due to information asymmetry.
    - Lacks flexibility in responding to changes in consumer demand and market conditions.
    - Discourages innovation and reduces incentives for productivity.
    - Increases the risk of bureaucratic inefficiencies and corruption.
    - Often results in consumer dissatisfaction due to shortages or poor-quality goods.
- **Decentralized Planning**
  - Planning responsibilities are distributed among different levels of government (State, District, Panchayat).
  - Encourages region-specific development and participation of local institutions (e.g., 73rd and 74th Amendments in India).
  - **Issues of Decentralized Planning**
    - Can lead to duplication of efforts and inefficient use of resources.
    - May cause regional disparities in development and resource allocation.
    - Coordination between different planning units can be challenging.
    - Local bodies may lack expertise or data for effective decision-making.
    - Risk of local-level corruption or political influence in planning priorities.
- **Indicative Planning**
  - The government sets broad targets and provides policy direction without strict enforcement.
  - Relies on market signals and private sector participation (e.g., post-1991 planning in India via NITI Aayog).
- **Imperative Planning**
  - Mandatory and rigid; state commands all economic activities.
  - Common in socialist economies (e.g., Soviet Union's Gosplan model).
  - Targets and resource allocations are binding.
- **Perspective Planning**
  - Long-term planning, typically over 15–20 years, focusing on structural transformation and vision-based goals.
  - Guides the formulation of medium-term and short-term plans.
- **Rolling Planning**
  - Plans are revised annually based on changing needs and performance.
  - Offers flexibility in target-setting and resource allocation.
  - Introduced in India after the failure of the Fifth Five-Year Plan (1978–1980).
- **Structural Planning**
  - Focuses on changing the structure of the economy (e.g., shifting from agriculture to industry and services).
  - Emphasizes institutional reforms, technological progress, and long-term competitiveness.

Evolution of Economic Planning in India

- **Formation of the Planning Commission (1950)**
  - Established by an executive resolution of the Government of India in **March 1950**.
  - Modeled on the Soviet-style central planning authority.
  - Chaired by the **Prime Minister** and responsible for drafting Five-Year Plans, allocating resources, and assessing performance.

- **Five-Year Plans (1951–2017)**

Five-Year Plan	Description
First Plan (1951–56)	Focus: Agriculture, irrigation & price stability. Based on Harrod-Domar Model. Community Development Programme launched. Growth rate: 3.6% (target: 2.1%).
Second Plan (1956–61)	Focus: Industrialization (especially heavy industries). Based on Mahalanobis Model. Creation of public sector enterprises. Growth rate: 4.1% (target: 4.5%).
Third Plan (1961–66)	Focus: Self-reliant & self-generating economy. Emphasis on agriculture and industry. Affected by wars (1962 with China & 1965 with Pakistan) and drought.
Plan Holiday (1966–69)	Due to economic crisis; 3 annual plans launched. Focus on food production, exports & price stability. Devaluation of rupee in 1966.
Fourth Plan (1969–74)	Focus: Growth with stability & self-reliance. Nationalization of 14 banks (1969). Green Revolution began. Growth rate: 3.3% (target: 5.7%).
Fifth Plan (1974–78)	Focus: Removal of poverty (Garibi Hatao), self-reliance. National Programme of Minimum Needs. Plan terminated in 1978 by Janta govt.
Rolling Plans (1978–80)	Replaced 5-year plans by 3 annual plans. Introduced by Janta government under concept of flexibility. Abandoned in 1980.
Sixth Plan (1980–85)	Focus: Poverty eradication, modernization & technology. Liberalization policies initiated. Growth rate: 5.7% (target: 5.2%).
Seventh Plan (1985–90)	Focus: Food, work, productivity & social justice. Emphasis on employment generation. Growth rate: 6.0% (target: 5.0%).
Annual Plans (1990–92)	Due to political instability & BOP crisis. Reforms initiated in 1991 under New Economic Policy (LPG reforms).
Eighth Plan (1992–97)	First plan after liberalization. Focus: Human resource development, employment, growth. Growth rate: 6.8% (target: 5.6%).
Ninth Plan (1997–2002)	Focus: "Growth with Social Justice and Equity". Emphasis on agriculture & rural development. Growth rate: 5.5% (target: 6.5%).
Tenth Plan (2002–07)	Aim: 8% GDP growth, doubled per capita income. Emphasis on governance & social indicators. Actual growth rate: 7.6%.
Eleventh Plan (2007–12)	Motto: "Faster and more inclusive growth." Priority to health, education, women, children. Growth rate: 7.9% (target: 9%).
Twelfth Plan (2012–17)	Theme: "Faster, More Inclusive and Sustainable Growth." Targets: 8% growth, poverty reduction, skill development. Growth rate: ~6.8%.

NITI Aayog

- **Established:** 1st January 2015, replacing the Planning Commission
- **Objectives of NITI Aayog**
  - To foster **cooperative federalism** through structured support and partnership with States and Union Territories.
  - To act as a **think tank** offering directional and strategic policy inputs.
  - To design frameworks for **long-term development strategies** (e.g., Vision 2047).
  - To promote **competitive federalism** by encouraging healthy competition among states (e.g., SDG Index, Health Index).
  - To focus on **evidence-based policy formulation** using real-time data and analytics.
  - To enable innovation and entrepreneurship through platforms like **Atal Innovation Mission (AIM)**.
- **Functions of NITI Aayog**

- **Policy Formulation and Strategic Planning**
  - Prepared **Strategy for New India @75** outlining development targets till 2022–23.
  - Leading the formulation of **Vision 2047** for Amrit Kaal.
- **Fostering Cooperative and Competitive Federalism**
  - Publishes **State-wise rankings** through **SDG India Index, School Education, Quality Index, Health Index**
  - Facilitates regular meetings of the **Governing Council** with Chief Ministers.
- **Monitoring and Evaluation**
  - Evaluates government schemes using **real-time data dashboards** (e.g., Aspirational Districts Programme).
  - Promotes **outcome-based monitoring** instead of input-based targets.
- **Promoting Innovation and Entrepreneurship**
  - **Atal Innovation Mission (AIM)** to foster a culture of innovation in schools, startups, and MSMEs.
  - Supports incubators and tinkering labs across India.
- **Infrastructure and Investment Planning**
  - Anchored the development of the **National Infrastructure Pipeline (NIP)**.
  - Coordinates with line ministries to align public-private investment priorities.
- **Sustainable Development and Climate Action**
  - Leads India's efforts in **localizing SDGs** and promoting sustainable agriculture, energy, and urban planning.
  - Works on **decarbonization pathways** and electric vehicle policy support.

- **<u>Difference Between NITI Aayog and Planning Commission</u>**

Aspect	Planning Commission	NITI Aayog
Year of Establishment	1950	2015
Role	Centralized planning and resource allocation	Policy think tank and strategic planning body
Approach	Top-down, directive	Bottom-up, participatory
Federalism	Cooperative federalism (limited engagement)	Cooperative + Competitive federalism
Financial Powers	Allocated funds to states and ministries	**No financial powers**; advisory and strategic role
State Participation	Minimal in decision-making	Governing Council includes all Chief Ministers
Focus	Five-Year Plans and fund allocation	Real-time data, innovation, outcomes, and SDGs
Monitoring Mechanism	Static evaluation of targets	Dynamic, outcome-based monitoring and indices
Innovation Promotion	Not a focus area	Actively promotes innovation (e.g., AIM, Startup India)

Issues and Challenges in Economic Planning in India

- **Lack of Legal Backing for NITI Aayog**
  - NITI Aayog operates via executive resolution and lacks constitutional or statutory status.
  - Its recommendations are **advisory, not binding**, limiting their enforceability.
- **Limited Financial Powers**
  - Unlike the Planning Commission, NITI Aayog does not allocate funds to states.
  - This weakens its influence over **implementation and prioritization of developmental schemes**.
- **Weak Coordination Between Centre and States**
  - Despite cooperative federalism, **vertical and horizontal coordination gaps** persist.
  - States often follow their own development agendas, diverging from national priorities.
- **Disparity in State Capacities**
  - States vary widely in their ability to **plan, implement, and monitor** developmental policies.

- **Lagging states struggle** to translate national strategies into effective action on the ground.

- **Inadequate Integration of Local Bodies**
  - Economic planning still lacks meaningful integration of **Panchayati Raj Institutions and Urban Local Bodies**.
  - This limits the effectiveness of bottom-up planning and local resource mobilization.
- **Overreliance on Aspirational Districts and Indices**
  - Programs like the **Aspirational Districts Programme** rely on rankings and indicators that may **oversimplify complex ground realities**.
  - Risk of data-driven planning becoming **target-focused rather than outcome-oriented**.
- **Data Gaps and Timeliness Issues**
  - Planning suffers from **inadequate, outdated, or poor-quality data**, especially at the district and sectoral level.
  - Lack of real-time monitoring reduces the scope for **adaptive planning**.
- **Insufficient Private Sector Integration**
  - While NITI Aayog advocates public-private partnerships, **private sector participation in long-term development planning remains weak**.
  - Challenges include trust deficit, regulatory barriers, and limited alignment of goals.
- **Resource Constraints and Fiscal Stress**
  - Planning exercises are often **undermined by budget limitations**, both at Union and state levels.
  - Rising debt and competing fiscal demands constrain the implementation of planned priorities.
- **Lack of Decentralized Planning Culture**
  - Despite policy intent, **planning is still largely top-down**, with limited community involvement.
  - Absence of robust **district or block-level planning institutions** affects need-based development.
- **Difficulty in Measuring Impact**
  - Many government plans still focus on **inputs (expenditure, coverage)** rather than **outcomes (impact, sustainability)**.
  - Absence of proper monitoring and evaluation frameworks affects evidence-based decision-making.

Way Forward in Economic Planning in India

- **Strengthen Institutional Backing for NITI Aayog**
  - Consider providing **statutory or constitutional status** to NITI Aayog to enhance its authority and legitimacy.
  - Define clear roles, responsibilities, and accountability mechanisms for strategic planning.
- **Enhance Financial Linkages with Planning**
  - Integrate planning with **budgeting and fund allocation** at both central and state levels.
  - Link performance in planning outcomes to **incentive-based resource transfers** (similar to Finance Commission grants).
- **Promote Decentralized and Participatory Planning**
  - Empower **local governments and district-level institutions** with technical and financial capacity for bottom-up planning.
  - Ensure participation of **citizens, NGOs, and community organizations** in need-based development.
- **Invest in Data Systems and Real-Time Monitoring**
  - Strengthen data infrastructure through **integrated digital dashboards, geotagging, and AI-enabled analytics**.
  - Ensure disaggregated and **real-time data availability at state, district, and sectoral levels**.
- **Outcome-Oriented and Adaptive Planning**
  - Shift from **target-based to outcome-based planning**, focusing on quality, efficiency, and long-term impact.
  - Build flexibility into plans to **adapt to shocks** (e.g., pandemics, climate events).
- **Foster Centre-State Coordination and Alignment**
  - Deepen **cooperative and competitive federalism** through platforms like **Governing Council meetings** and joint task forces.

    - Align national and state-level plans with **SDGs, Vision 2047**, and sectoral targets.
- **Improve Private Sector Engagement**
    - Involve private players in planning infrastructure, digital economy, skilling, and innovation ecosystems.
    - Create **public-private policy forums** for joint planning and monitoring.
- **Mainstream Sustainability and Climate Resilience**
    - Embed **environmental impact assessments, green budgeting, and disaster risk reduction** in all development plans.
    - Localize and integrate the **Sustainable Development Goals (SDGs)** at every tier of planning.

5 Employment & issue associated with it

Introduction

Employment refers to the engagement of individuals in productive economic activities that generate income and contribute to national output. In a developing country like India, employment is not just a means of livelihood but a critical driver of inclusive growth, poverty reduction, and social stability. However, despite sustained economic growth, India faces multiple employment-related challenges such as jobless growth, high informality, and low female labor force participation. Understanding the nature and structure of employment is essential to addressing these issues and formulating effective policy responses.

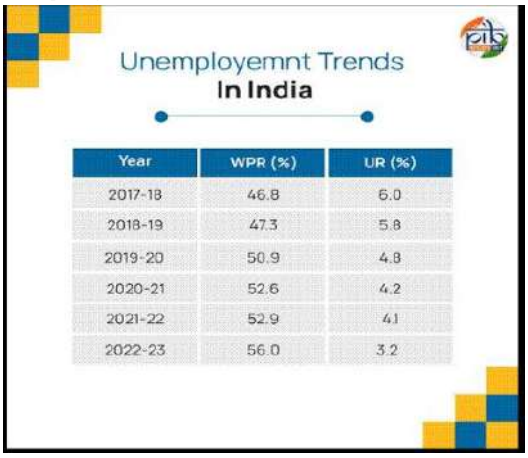
Types of Employment / Unemployment

- **Formal Employment**
  - Workers are employed in **organized enterprises** and are protected by labor laws.
  - Receive **regular wages**, written contracts, and **social security benefits** like EPF, ESI, and pension.
  - Found in sectors such as government services, corporates, PSUs, and registered private companies.
- **Informal Employment**
  - Employment without formal contracts, job security, or social protection.
  - Includes self-employed, casual workers, and those in small unregistered enterprises.
  - Over **90% of India's workforce** is employed informally (as per PLFS 2022–23).
- **Self-Employment**
  - Individuals operate their own businesses or work without a regular employer.
  - Includes farmers, shopkeepers, artisans, and freelancers.
  - Major source of livelihood in rural India.
- **Wage/Salaried Employment**
  - Individuals work for a wage or salary under an employer.
  - Can be in formal or informal settings depending on contract and benefits.
- **Casual Labor**
  - Workers are engaged on a **daily or short-term basis**.
  - Receive **no job security or social benefits**.
  - Common in agriculture, construction, and manual labor sectors.
- **Underemployment**
  - A situation where a person is **employed below their skill level** or for **fewer hours than desired**.
  - Common among educated youth and disguised workers in agriculture.
- **Disguised Unemployment**
  - More people are engaged in a task than actually required, leading to **zero or negligible marginal productivity**.
  - Typical in **subsistence farming** in rural areas.
- **Seasonal Unemployment**
  - Occurs when people are unemployed for a part of the year due to **seasonal nature of work**.
  - Common in agriculture and tourism sectors.
- **Structural Unemployment**
  - Caused by **mismatch between workers' skills and job requirements**.
  - Reflects deeper issues in education, skilling, and economic structure.
- **Frictional Unemployment**
  - Temporary unemployment during **job transition or search** period.
  - A natural and short-term part of labor market dynamics.

Employment Trends in India (with Latest Data & Sources)

- **Labour Force Participation Rate (LFPR)**
  - As per **Periodic Labour Force Survey (PLFS) Annual Report 2022–23 (MoSPI)**:
    - **Overall LFPR** (age 15+) increased to **57.9%** in 2022–23 from 55.2% in 2021–22.
    - **Rural LFPR**: 60.8%; **Urban LFPR**: 50.4%.
    - Notably higher among males (77.2%) than females (32.8%).
- **Worker Population Ratio (WPR)**
  - According to **PLFS 2022–23 (MoSPI)**:
    - **Overall WPR** (age 15+) rose to **56.0%** from 52.9% in 2021–22.
    - **Male WPR**: 73.5%; **Female WPR**: 38.0%.
    - **Rural WPR**: 59.4%; **Urban WPR**: 48.3%.
- **Unemployment Rate (UR)**

- As per **PLFS 2022–23**, the **unemployment rate (age 15+)** declined to **3.2%**, compared to 4.1% in 2021–22.
  - **Male UR**: 3.3%; **Female UR**: 2.9%.
  - **Rural UR**: 2.4%; **Urban UR**: 5.4%.
- **Female Labour Force Participation (FLFP)**
  - As per **PLFS 2022–23**:
    - Female LFPR rose to 32.8%, up from 30.0% in 2021–22.
    - Major contributors include self-employment and unpaid family work, especially in rural areas.
    - However, only 21.5% of female workers are in regular salaried jobs (PLFS data).
- **Youth Employment (Age 15–29)**
  - As per **CMIE and PLFS**:
    - Youth unemployment fell to **10.2%** in 2022–23 from **12.9%** in 2021–22 (PLFS).
    - **Graduate unemployment** remains high, especially in urban India (CMIE, 2023).
- **Sector-wise Employment Distribution**
  - As per **PLFS 2022–23**:
    - **Agriculture**: ~45.8% of total workforce
    - **Industry**: ~25.6%
    - **Services**: ~28.6%
  - Dominance of agriculture remains despite its falling share in GDP (~18%).
- **Job Creation and Quality**
  - From 2017-18 to 2023-24, India added **17 crore jobs**, with rising female participation and decline in youth unemployment, according to RBI-KLEMS data
  - However, strong employment growth through **small businesses** (11 million jobs between Oct 2023–Sept 2024) saw **wages rise only 13%**, trailing inflation at ~5.5%.
- **Unemployment Trends in India**



Year	WPR (%)	UR (%)
2017-18	46.8	6.0
2018-19	47.3	5.8
2019-20	50.9	4.8
2020-21	52.6	4.2
2021-22	52.9	4.1
2022-23	56.0	3.2

Major Issues Associated with Employment in India

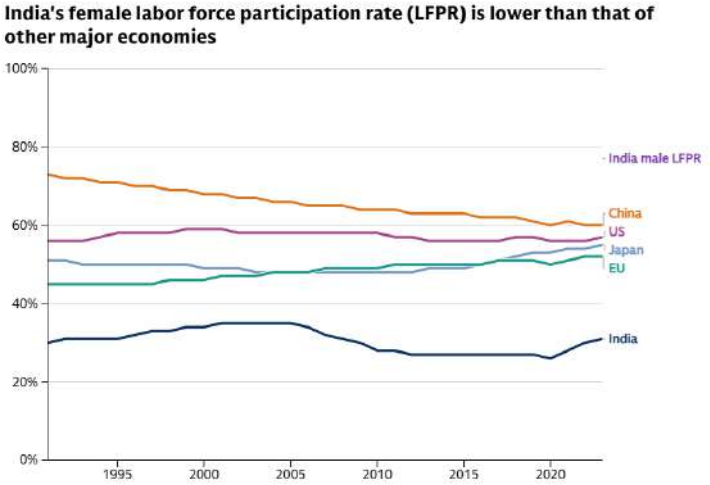
1.<u>High informal sector dependency</u>

- **Context :**
  - As per India Employment Report 2024 by ILO, nearly 90% of employment is informal and the proportion of salaried, regular jobs declining since 2018.
  - While contractual employment has grown in recent periods.
- **Reasons for High Dependency on the Informal Sector**
  - Legacy of agrarian-based economy
  - Slow pace of formal job creation
  - Predominance of low-skilled workforce
  - Rigid and complex labour laws
  - Minimal entry barriers in informal enterprises
  - High cost and complexity of formalization
  - Rapid urbanization and rural-to-urban migration
  - Lack of awareness about legal and social benefits
  - Inadequate access to formal credit and finance
  - Limited enforcement of regulatory frameworks
- **Challenges Posed by Informal Sector Dependency**
  - Absence of social security and legal protections
  - Low and unstable incomes
  - Poor and unsafe working conditions
  - Limited access to formal credit and financial services
  - Low productivity and technological backwardness
  - Loss of potential tax revenue for the government
  - Difficulty in policy targeting and implementation
  - High vulnerability to economic shocks and crises
  - Prevalence of exploitative labor practices
  - Limited upward mobility and career growth

2.<u>Low Female Labour Force Participation Rate (FLFPR) in India :</u>

- **Context :**

- According to the International Labour Organization, only about 31% of working-age women in India are in the labor force, relative to 54% in other major economies.



- **Reasons for Low FLFPR in India**
  - Prevailing patriarchal and cultural norms
  - High burden of unpaid domestic and caregiving work
  - Lack of suitable and flexible job opportunities
  - Safety concerns and poor mobility infrastructure
  - Gender discrimination in wages and career advancement
  - Low representation in the formal sector
  - Skill gaps and lower educational attainment in some regions
  - Career disruptions due to marriage and childbirth
  - Social stigma around women working outside the home
  - Inadequate support systems like childcare and maternity benefits
- **Consequences of Low FLFPR**
  - Reduced household income and consumption
  - Slower GDP growth and underutilized demographic potential
  - Higher economic dependency ratios
  - Widened gender inequality in economic empowerment

3.<u>Youth Unemployment:</u>

- **Context :**
  - According to the **India Employment Report 2024,** published by the International Labour Organization and the Institute for Human Development, the youth account for 83% of India's unemployed population.
  - As per report, the share of unemployed individuals with secondary or higher education has nearly doubled over two decades.
- **Reasons for High Youth Unemployment**
  - Mismatch between education and job market needs
  - Inadequate skill development and vocational training
  - Slow formal job creation in industry and services
  - Overdependence on public sector jobs
  - Automation and technological disruption
  - Urban-rural employment divide
  - Limited entrepreneurship support and risk capital
  - Lack of career guidance and employment services
- **Consequences of Youth Unemployment**
  - Economic underperformance and wasted demographic dividend
  - Rising frustration and mental health issues among youth
  - Social unrest and increased crime risk
  - Migration pressures on urban areas
  - Weakening of consumer demand and savings potential

4.<u>Skill mismatch and unemployability</u>

- **Context :**
  - The India Employment Report 2024 notes that Many young Indians struggle with technical skills.
  - The report states that 75% of young people struggle with basic digital tasks such as sending an email with an attachment.
  - Over 60% cannot perform simple file operations such as copy-pasting and 90% lack fundamental spreadsheet skills such as working with formulas.
- **Causes of Skill Mismatch and Unemployability**
  - Outdated curriculum and teaching methods in educational institutions
  - Lack of industry-academia collaboration
  - Insufficient practical and hands-on training

- Inadequate focus on vocational education and life skills
- Regional disparities in skill development infrastructure
- Low awareness about job market trends among youth
- Preference for degrees over competencies
- Limited reach and effectiveness of skilling programs

- **Consequences**
  - High unemployment and underemployment among educated youth
  - Reduced productivity and competitiveness of the workforce
  - Widening income inequality and social discontent
  - Increased burden on public employment schemes
  - Missed opportunity to harness the demographic dividend

5.<u>Regional and social disparities in employment</u>

- Industrialized states (e.g., Maharashtra, Gujarat, Tamil Nadu) offer more employment opportunities compared to underdeveloped ones (e.g., Bihar, Jharkhand, Chhattisgarh).
- Urban areas offer more formal, service-sector jobs; rural areas rely heavily on agriculture and informal work.
- **Caste-based Discrimination**: SCs and STs face limited access to quality education, skilling, and formal jobs.
- **Gender Inequality**: Women's labour force participation remains low due to societal norms, safety concerns, and domestic responsibilities.

6.<u>Poor quality of jobs (low wages, lack of social security)</u>

- While India has witnessed employment growth, much of it is concentrated in low-quality jobs,marked by low wages, job insecurity, and absence of social protection.
- **Reasons :**
  - Dominance of informal employment
  - Low industrial and labour productivity
  - Weak enforcement of labour laws and standards
  - Limited collective bargaining and union representation
  - Oversupply of unskilled or semi-skilled labour
  - Employer preference for contract and gig workers
  - Inadequate employer contribution to social protection schemes
- **Consequences of Low-Quality Jobs**
  - In-work poverty and reduced living standards
  - Low employee motivation and productivity
  - Intergenerational poverty and social instability
  - Increased vulnerability during economic shocks (e.g., COVID-19)
  - Weak domestic demand due to limited purchasing power

Impact of Technological Change and Automation on Employment

- **Job Displacement in Routine and Low-Skill Sectors**
  - Automation, AI, and robotics are replacing **manual, repetitive, and clerical jobs**, especially in manufacturing, textiles, retail, and logistics.
  - Example: **Automated warehousing**, driverless vehicles, and robotic assembly lines reduce demand for traditional labor.
- **Emergence of New Job Roles**
  - Technology is also creating new roles in **data science, cybersecurity, AI development, cloud computing**, and green technologies.
  - **WEF Future of Jobs Report (2023)**: India is expected to create **~69 million new tech-enabled jobs** by 2027, even as 83 million traditional jobs may be displaced globally.
- **Growth of the Gig and Platform Economy**
  - Rise of tech platforms like **Swiggy, Zomato, Uber, Urban Company** has created a large pool of gig workers.
  - Offers flexibility but lacks **job security, social protection, and formal contracts**
- **Increased Informalization through Digitization**
  - Digital platforms tend to **bypass labor laws**, promoting informal work arrangements.

- Many digital jobs (e.g., content creators, online tutors, freelancers) operate **outside formal regulatory systems**.
- **Skill Polarization and Mismatch**
  - High-skill jobs increase, while middle-skill routine jobs shrink — leading to **job polarization**.
  - India faces a **skill mismatch**, with millions of youth unemployable in a digital economy.
  - **Periodic Labour Force Survey (2022–23)** shows a large share of workers engaged in low-productivity self-employment
- **Digital Divide and Unequal Access**
  - Technological disruption widens inequality between:
    - Urban and rural workers
    - Digitally literate and non-literate populations
    - Men and women (especially in traditional sectors like textiles, where automation displaces female workers)
- **Upskilling Imperative**
  - Programs like **Skill India Mission**, **PMKVY**, and **Digital India** aim to make the workforce future-ready.
  - However, coverage and quality remain uneven across regions and industries.
- **Impact on Employment Quality**
  - While total job numbers may not fall drastically, **quality of employment** is affected.
  - Rise in **temporary, contract-based, low-paying tech-enabled jobs** lacking benefits and long-term growth.

Government Initiatives to Promote Employment in India

- **PM Internship Scheme 2025**
  - Launched under Budget 2024–25, targeting 1 crore internships in top 500 companies over 5 years.
  - Aims to involve 1.25 lakh interns in the pilot year, offering hands-on exposure across ~20 sectors (e.g., IT, healthcare, manufacturing).
  - Eligibility: youth aged 21–24 years from non-premier institutes or economically weaker families; interns receive a monthly stipend of ₹5,000 and ₹6,000 one-time support
- **MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act)**
  - Provides 100 days of wage employment per year to rural households.
  - Enhances rural purchasing power and creates durable assets.
- **Deendayal Antyodaya Yojana – NRLM (National Rural Livelihoods Mission)**
  - Promotes self-employment and SHG-led livelihood models in rural areas.
  - Focuses on women empowerment, micro-enterprises, and skilling.
- **Deendayal Antyodaya Yojana – NULM (National Urban Livelihoods Mission)**
  - Targets urban poor for self-employment, skilling, and support for street vendors.
  - Promotes access to credit and urban job creation.
- **Pradhan Mantri Kaushal Vikas Yojana (PMKVY)**
  - Offers short-term skill training with certification for unemployed youth.
  - Targets school dropouts and unorganized sector workers.
- **Skill India Mission**
  - Umbrella mission to promote skilling, upskilling, and vocational training.
  - Includes SANKALP and STRIVE for ITI reform and institutional strengthening.
- **PM-DAKSH (Pradhan Mantri Dakshta Aur Kushalta Sampann Hitgrahi Yojana)**
  - Provides skill training to SCs, OBCs, sanitation workers, and other marginalized groups.
- **Startup India**
  - Supports innovation-driven entrepreneurship through tax benefits, funding support, and ease of doing business.
  - Aims to create jobs through start-ups and tech-driven enterprises.
- **Stand-Up India**
  - Facilitates bank loans (₹10 lakh – ₹1 crore) to SC/ST and women entrepreneurs.
  - Promotes enterprise development among underrepresented groups.
- **Prime Minister's Employment Generation Programme (PMEGP)**

- Provides credit-linked subsidies to new micro-enterprises in rural and urban areas.
- Implemented through KVIC, DICs, and NGOs.

- **ASPIRE (A Scheme for Promotion of Innovation, Rural Industries and Entrepreneurship)**
  - Promotes innovation and employment in agro-based and rural industries.
- **Atmanirbhar Bharat Rozgar Yojana (ABRY)**
  - Offers EPF subsidy (employer + employee share) for new formal sector employees.
  - Targets workers earning less than ₹15,000/month.
- **e-Shram Portal**
  - National database for unorganized workers to improve delivery of welfare schemes and formalization.
- **Production Linked Incentive (PLI) Scheme**
  - Boosts manufacturing and employment in sectors like electronics, pharmaceuticals, and textiles.
  - Encourages job creation through scale-based production incentives.
- **Emergency Credit Line Guarantee Scheme (ECLGS)**
  - Supports MSMEs to retain jobs during economic shocks (e.g., COVID-19).
  - Offers collateral-free loans with government guarantee.
- **Green Skill Development Programme (GSDP)**
  - Skilling initiative in green sectors like renewable energy, water management, and biodiversity conservation.
- **Digital India**
  - Enables employment generation through IT-enabled services, gig platforms, and rural digital outreach.

Contemporary Issues

1.Labour law Reforms

What are labour reforms ? :

- Labour reforms refer to the changes or amendments made in the laws, regulations, and institutional frameworks governing the relationship between employers and workers, with the aim of improving labour market efficiency, worker welfare, and overall economic productivity.
- They seek to balance job security for workers with flexibility for employers in hiring, firing, wages, working hours, dispute resolution, and social security.

Need for Labour Reforms in India

- **Complexity of Existing Laws :** Before recent reforms, India had over 40 central and 100+ state labour laws, creating compliance burdens and legal ambiguity.
- **Outdated Provisions :** Many laws were framed during the pre-independence or early post-independence era and did not align with the current economic structure, technological changes, or global trade requirements.
- **Promoting Ease of Doing Business :** Rigid labour laws discouraged domestic and foreign investment, especially in labour-intensive sectors like textiles, manufacturing, and food processing.
- **Encouraging Formalization of Workforce :** About 80–85% of India's workforce is in the informal sector with no social security; reforms aim to bring more workers under formal coverage.
- **Boosting Employment Generation :** Greater flexibility in hiring and retrenchment can incentivize industries to expand and employ more workers without fear of legal hurdles.
- **Protecting Worker Welfare :** Labour reforms aim to strengthen safety, minimum wage, and social security norms, including for gig and platform workers.
- **Supporting Industrial Growth :** Simplified compliance, unified codes, and digitized filings reduce administrative delays and foster a better industrial climate.
- **Balancing Rights and Flexibility :** Need to strike a balance between protecting workers' rights and giving employers operational flexibility to stay competitive.

Recent Codification of labour laws :

Labour Codes	Acts being subsumed
Code on Wages, 2019	• Payment of Wages Act, 1936; • Minimum Wages Act, 1948; • Payment of Bonus Act, 1965; and • Equal Remuneration Act, 1976
Occupational Safety, Health and Working Conditions Code, 2019	• Factories Act, 1948; • Mines Act, 1952; • Dock Workers (Safety, Health and Welfare) Act, 1986; • Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996; • Plantations Labour Act, 1951; • Contract Labour (Regulation and Abolition) Act, 1970; • Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979; • Working Journalist and other Newspaper Employees (Conditions of Service and Miscellaneous Provision) Act, 1955; • Working Journalist (Fixation of Rates of Wages) Act, 1958; • Motor Transport Workers Act, 1961; • Sales Promotion Employees (Condition of Service) Act, 1976; • Beedi and Cigar Workers (Conditions of Employment) Act, 1966; and • Cine-Workers and Cinema Theatre Workers (Regulation of Employment) Act, 1981
Industrial Relations Code, 2019	• Trade Unions Act, 1926; • Industrial Employment (Standing Orders) Act, 1946, and • Industrial Disputes Act, 1947
Code on Social Security, 2019	• Employees' Provident Funds and Miscellaneous Provisions Act, 1952; • Employees' State Insurance Act, 1948; • Employees' Compensation Act, 1923; • Employment Exchanges (Compulsory Notification of Vacancies) Act, 1959; • Maternity Benefit Act, 1961; • Payment of Gratuity Act, 1972; • Cine-workers Welfare Fund Act, 1981; • Building and Other Construction Workers' Welfare Cess Act, 1996; and • Unorganised Workers Social Security Act, 2008

Features of the Four Labour Codes

Labour Code	Key Features
Code on Wages, 2019	• **Floor Wage** fixed by the Central Government (region-wise variation possible). • States to set **minimum wages above the floor wage**; revision at least once every 5 years. • **Overtime wages** at twice the normal rate. • **Wage deductions** not to exceed 50% of total wages.

	• Prohibits **gender discrimination** in wage payments.
Industrial Relations Code, 2020	• Prior government approval required for **closure, lay-off, or retrenchment** in establishments with 300+ workers. • **Sole negotiating union**: union with over 51% membership. • **Negotiating council**: if no sole union, representation from unions with at least 20% membership. • Establishment of **industrial tribunals** for dispute settlement.
Code on Social Security, 2020	• **Social Security Fund** by Centre and States for unorganised, gig, and platform workers. • **National Social Security Board** to recommend and monitor schemes. • **PF contributions** can be temporarily reduced during pandemics, epidemics, or disasters.
Occupational Safety, Health and Working Conditions Code, 2020	• **Occupational safety boards** at national and state levels. • Applies to establishments with **more than 10 workers**. • Mandatory **welfare facilities** such as canteens, first aid, drinking water, and health measures.

Benefits of the New Labour Codes

- **Simplification of Labour Laws :** Earlier, India had 29 central and over 100 state labour laws, often overlapping and difficult to follow. The new codes consolidate them into 4 laws, removing contradictions and making it easier for employers and workers to understand their rights and responsibilities.
- **Improved Ease of Doing Business :** A single registration, licence, and return system replaces multiple compliances, cutting paperwork and costs. This encourages investment, particularly in labour-intensive sectors, and supports industrial growth.
- **Promotion of Workforce Formalisation :** A large share of India's workforce is informal, without contracts or benefits. The new codes expand coverage of EPFO and ESIC to unorganised, gig, and platform workers, ensuring social security benefits for more people.
- **Greater Flexibility for Employers :** The Industrial Relations Code raises the threshold for prior government approval for retrenchment, lay-off, or closure from 100 to 300 workers. This allows industries to respond quickly to market needs, potentially boosting job creation.
- **Stronger Protection of Workers' Rights :** The Code on Wages guarantees minimum wages for all workers, ensures payment above a centrally fixed floor wage, mandates overtime pay at twice the normal rate, and prohibits gender-based wage discrimination.
- **Strengthened Social Security Measures :** Both Centre and States are required to set up Social Security Funds for unorganised, gig, and platform workers. These funds can provide benefits like health insurance, pensions, and support during crises such as pandemics.
- **Improved Workplace Safety and Welfare :** The Occupational Safety Code requires establishments with more than 10 workers to ensure clean drinking water, canteens, rest areas, first aid, and health facilities, along with national and state-level safety boards.
- **Faster and Fairer Dispute Resolution :** Industrial tribunals and sole negotiating unions (where one union has 51% membership) simplify negotiations and help resolve disputes more efficiently, reducing industrial unrest.
- **Adaptation to New Forms of Work :** Recognises gig and platform workers in law, ensuring that workers in digital and on-demand services are covered by basic protections and social benefits.

Challenges and Criticisms of the New Labour Codes

- **Apprehension of Job Insecurity for Workers :** Raising the threshold for government approval for retrenchment, lay-off, or closure from 100 to 300 workers may make it easier for employers to remove workers, potentially reducing job security.
- **Limited Immediate Coverage of Social Security :** Although the codes extend social security to gig and unorganised workers, actual implementation depends on framing rules and creating databases, which may take years, delaying benefits.
- **Possibility of Weaker Collective Bargaining :** Recognition of a sole negotiating union only if it has over 51% membership could sideline smaller unions, reducing collective bargaining power in industries with fragmented labour representation.
- **Concerns over Wage Protection in Practice :** While the Code on Wages mandates a floor wage, states retain flexibility to set their own minimum wages, leading to disparities across regions and potential underpayment in weaker states.
- **Compliance Burden for Small Businesses :** Even though compliance is simplified, small enterprises with limited administrative capacity may find it challenging to adapt to new reporting, record-keeping, and technology-based systems.
- **Ambiguity in Gig and Platform Worker Benefits :** Recognition of gig workers is a positive step, but the codes do not clearly specify the funding source, contribution rates, or the exact nature of benefits, leaving scope for disputes.
- **Potential for State–Centre Friction :** Labour is in the Concurrent List, and states may frame their own rules under the codes, leading to variations and possible conflicts with central provisions.
- **Risk of Diluting Workplace Safety Standards :** The Occupational Safety Code applies only to establishments with more than 10 workers, potentially excluding a large number of small workplaces where safety violations are common.

2.Care Economy

What is the care economy ?

- The care economy encompasses both paid and unpaid work that supports the well-being of children, the elderly, persons with disabilities, and dependent adults. It includes direct care activities (e.g., feeding, nursing) and indirect care activities (e.g.cooking, cleaning).
- In India, women bear a disproportionate burden of unpaid care, leading to time poverty, lower female labour force participation (FLFP), and economic inefficiency. The undervaluation of care work has resulted in a market failure, constraining women's economic potential and limiting overall productivity.

Need for a Care Economy Strategy in India

- **Demographic Transition and Rising Care Needs**: As of 2022, about 25% of India's population (≈ 360 million) is aged 0–14 years and 10.5% (≈ 147 million) is aged 60+, requiring significant care services. By 2050, the elderly population is projected to rise to 20.8% (≈ 347 million), while children will still constitute around 18% (≈ 300 million). This implies a growing demand for both childcare and elderly care infrastructure.
- **Gender Gaps in Unpaid Care Work**: The NSO Time Use Survey 2019 shows that women aged 15–59 spend 5.6 hours daily on unpaid work, compared to just 30 minutes for men. Urban women spend 9.6 times more time on unpaid care work than urban men, and rural women spend 8.2 times more. Even education does not significantly reduce this gap, and employed women face a double burden, doing nearly six times more unpaid care work than employed men.According to a report by **Goldman Sachs Research** women in India bear a disproportionate responsibility for domestic and care-giving activities which is upto 8 times than that of men.
- **Economic Value of Unpaid Care Work**: Women's unpaid care work in India is valued at 15%–17% of GDP. Using the minimum wage method, it is worth about ₹30.7 lakh crore (~USD 384 billion), while the weighted wage method estimates it at ₹34.5 lakh crore (~USD 431 billion). Globally, ILO estimates unpaid care work at 10–39% of GDP, and OECD figures

average 15%, rising to 27% when opportunity costs are considered.

- **Economic Potential of Investing in the Care Economy**: Expanding care services can boost female labour force participation, with McKinsey estimating that equal participation could increase India's GDP by around 60%. The care sector—covering childcare, elderly care, dependent adult care, domestic work, and early learning—offers opportunities for entrepreneurship, employment generation, and even export of care services through remittances.
- **Policy Imperatives**: Investments are needed in healthcare, social support, and community-based care systems to reduce women's time poverty and increase their economic participation. Public, private, and community-based providers must collaborate to make care services accessible and affordable. Strengthening the care economy should be a core part of India's strategy for Viksit Bharat @2047 and Amrit Kaal.

Current Challenges in the Care Economy

- **Gendered Time Allocation**: Women aged 15–59 spend an average of 5.6 hours per day on unpaid care work, compared to just 30 minutes for men, as per the NSO Time Use Survey 2019. This limits women's availability for paid employment, education, and leisure.
- **Urban Disparity**: Urban women spend 9.6 times more time on unpaid care work than urban men, indicating that economic development alone has not closed the gender gap in care responsibilities.
- **Double Burden for Working Women**: Women in paid employment still perform about six times more unpaid care work than employed men, creating a dual workload that affects their productivity, career growth, and health.
- **Skill and Wage Gaps**: Most care work is informal, low-paid, and undervalued, with limited opportunities for skill development or wage progression, discouraging workers from viewing it as a sustainable career option.
- **Infrastructure Deficit**: India faces a shortage of affordable and accessible childcare centres, eldercare homes, and long-term care facilities especially in rural and underserved regions leading to an overreliance on unpaid family care.
- **Social Perception**: There is societal stigma attached to institutional care facilities, and early childhood education and caregiving continue to be undervalued, reducing public investment and policy focus in this sector.

Five-Pillar Roadmap for India's Care Economy

- **Leave Policies**
  - The government can share the cost of maternity leave for employees of Micro, Small, and Medium Enterprises (MSMEs) to reduce hiring bias against women.
  - Move towards gender-neutral parental leave so that men and women can share caregiving responsibilities equally, with costs split between employers, employees, and the state.
  - Introduce flexible work arrangements such as remote or hybrid work, and allow short- or medium-term job-protected care leave.
  - **Example**: Sweden provides 480 days of shared parental leave, which has improved women's participation in the workforce and reduced child poverty.
- **Subsidies for Care Services**
  - Use Self-Help Groups (SHGs) and Community-Based Organisations (CBOs) to operate crèches, eldercare centres, and facilities serving multiple generations.
  - Offer tax benefits to women-led enterprises in the care services sector.
  - Expand Mission Shakti's Palna Scheme to rural and underserved areas.
  - **Example**: SEWA's Sangini model runs community-based crèches that allow informal sector women to work without worrying about childcare.
- **Investment in Care Infrastructure**
  - Increase the reach of the Palna Scheme beyond Anganwadi crèches to include services for differently-abled children and long-term eldercare.
  - Develop public–private partnership (PPP) models for building and operating care facilities with clear quality standards.

- Create multi-purpose care centres that combine childcare, eldercare, and community spaces.
- **Global Example**: The UK's OFSTED system inspects and rates childcare providers to ensure consistent quality.

- **Skill Training for Care Workers**
  - Establish a National Skill Framework to define clear job roles, career growth paths, and specialisations in the care sector.
  - Give incentives to private institutes to offer certified training programmes in childcare, eldercare, and special needs care.
  - Partner with other countries to provide internationally recognised training so Indian care workers can work abroad.
  - **Example**: Japan's Technical Intern Training Program offers both skill transfer and migration opportunities.
- **Institutional Quality Assurance**
  - Set national and state-level standards for service quality and ensure regular monitoring of care providers.
  - Build a reliable data system that collects gender-specific information on paid and unpaid care work.
  - Form a Sector Skill Council for Care Services to set wage standards, define qualifications, and assess worker performance.

3.Gig Economy

Context :

- The 2025 Union Budget took several measures to formally 'recognise' gig and platform workers, and extended various social protection schemes to this growing workforce.
- Despite this recognition, the revised Periodic Labour Force Survey (PLFS), 2025 does not include substantive changes to account for the diverse forms of gig and platform work.
- According to NITI Aayog's 2022 report 'India's Booming Gig and Platform Economy,' the gig workforce is expected to reach 23.5 million by 2029-30.

What is meant by the gig economy ?

- The gig economy, as defined by the World Economic Forum (WEF), involves the exchange of labour for money between individuals or companies via digital platforms that actively connect providers with customers on a short-term and payment-by-task basis.
- In India, gig workers are defined as "self-employed" workers, and the gig labour force has seen increasing participation of women. Gig work can be defined in two ways:
  - **Web-based gig work** : Gig workers perform their tasks virtually or digitally like content writing, software development, digital marketing, data analytics, etc.
  - **Location-based work** : Tasks are carried out locally or in person but are facilitated by digital platforms like Ola, Uber, Zomato, and Urban Company.
- Thus, gig workers provide a wide range of services like driving, beauty, housework, food delivery, etc. They are paid per assignment or gig, and their work is viewed as flexible with freedom from the traditional 9 to 5 office culture.

Features of the Gig Economy

- **Task-Based/Short-Term Work :** Employment is based on specific tasks, projects, or assignments rather than long-term contracts.
- **Platform-Mediated Jobs :** Digital platforms (e.g. Uber, Zomato, Urban Company) act as intermediaries between workers and consumers.
- **Flexible Work Arrangements :** Workers have autonomy over when, where, and how much they work.
- **Independent or Freelance Nature :** Gig workers are usually not on the payroll; they operate as freelancers or independent contractors.
- **Multiple Job Holdings :** Individuals often work for multiple platforms or clients simultaneously.
- **Technology-Driven:** Operations, hiring, payment, and feedback are managed through mobile apps and online systems.
- **Low Entry Barriers :** Minimal education or skill requirements for many gig jobs allow easier access to employment.
- **Lack of Social Security:** Gig workers often lack formal benefits like PF, health insurance, paid leave, or job security.

- **High Urban Concentration :** Most gig opportunities are concentrated in cities where digital infrastructure and demand are high.
- **Growth in Non-Traditional Sectors :** Expanding beyond transport and food delivery to include IT, education, legal services, health care, etc.

Advantages of the Gig Economy in India

- **Employment Generation :** Provides job opportunities, especially for youth, semi-skilled workers, and those in urban areas.
- **Flexibility for Workers :** Enables workers to choose their work hours and take up multiple assignments.
- **Boost to Women's Workforce Participation :** Work-from-home and part-time gig roles help women balance domestic responsibilities and income generation.
- **Low Entry Barriers :** Does not require high qualifications or investments — accessible to those without formal employment backgrounds.
- **Supplementary Income :** Gig work offers an additional income stream for students, retirees, and self-employed individuals.
- **Entrepreneurial Culture :** Encourages individuals to manage their own work, often leading to micro-entrepreneurship.
- **Cost Advantage to Companies :** Reduces overhead costs like office space, long-term benefits, and administrative expenses.
- **Technology-Enabled Efficiency :** Digital platforms improve service delivery, customer satisfaction, and worker discoverability.

Challenges of the Gig Economy in India

- **Lack of Job Security :** Workers can be easily terminated or replaced, leading to income instability.
- **Absence of Social Security Benefits :** No formal access to PF, gratuity, health insurance, paid leave, or pensions.
- **Low and Variable Earnings :** Wages often fluctuate based on demand, platform commissions, and customer ratings.
- **Excessive Workload and Burnout :** To maintain a decent income, workers often work long hours without rest or benefits.
- **Data Exploitation and Algorithmic Control :** Workers have limited control over how platforms use their data or assign work; lack of transparency in ratings and incentives.
- **Legal Ambiguity :** Gig workers are neither classified as employees nor fully independent — leaving them outside many labor protections.
- **Lack of Representation :** Gig workers lack unions or collective bargaining power, making it difficult to negotiate better conditions.
- **Urban-Centric Nature :** Limited presence in rural or remote areas due to poor digital infrastructure and demand.

Government Steps for Gig and Platform Workers in India

- **Code on Social Security, 2020 :** For the first time, the Code legally defines "gig workers" and "platform workers" and includes them within the ambit of social security provisions like life and disability insurance, health, maternity benefits, pension, and skill development.
- **e-Shram Portal Integration & Social Security Fund :** The government is implementing schemes via EPFO and ESIC, with aggregators contributing 1–2% of annual turnover (capped at 5% of payments to workers) to a dedicated Social Security Fund designed for gig workers.
- **Union Budget 2025–26 Measures :** Announced issuance of unique identity cards, registration of gig workers on the e-Shram portal, and provision of healthcare via Ayushman Bharat PM-JAY.
- **Inclusion under PM-JAY (Ayushman Bharat) :** Gig workers now eligible for health coverage under India's flagship PM-JAY scheme, expanding access to free medical treatment up to ₹5 lakh annually.
- **State-Level Initiatives**
  - **Rajasthan Platform-Based Gig Workers Bill, 2023 :** Aims to register gig workers and aggregators, safeguarding access to social security benefits and grievance redressal.
  - **Telangana Gig & Platform Workers Bill :** Mandates self-registration of workers, a Unique ID, welfare fund contributions by aggregators (1–2% per transaction), and institutional oversight with penalties for non-compliance
  - **Delhi's Welfare Board for Gig Workers :** Announced creation of a dedicated board

and welfare schemes backed by ₹10 crore to address pay, grievances, and rights.
    - **Tamil Nadu Welfare Measures :** Includes ₹20,000 subsidy for electric scooters and group insurance for 50,000 gig workers to support their mobility and social protection.

Value Addition

Keywords : Agrarian economy, Colonial deindustrialization, Zamindari system, Drain of wealth, Nehruvian socialism, Mixed economy, Public sector dominance, Green Revolution, Hindu rate of growth, License Raj, Balance of payments crisis (1991), LPG reforms, Structural adjustment program, Demographic dividend, Digital economy, Goods and Services Tax (GST), Make in India, Informal sector, Regional disparities, Sustainable and inclusive growth

Mains Question for Practice :

Q1. Colonial legacy vs. liberalization: How has India's economy evolved?
Q2. Is GDP growth in India jobless and exclusionary?
Q3. Why does India's tax-to-GDP ratio remain low?
Q4. Planning Commission vs. NITI Aayog: Has federalism improved?
Q5. Can labour reforms address informality, automation, and gender gaps?

Ready- Made Templates

Introductions

- India's economic journey has been shaped by a mix of centralized planning, structural reforms, and market forces. While significant strides have been made in growth and poverty reduction, challenges like resource mobilization, uneven development, and employment generation continue to dominate the policy discourse.
- The Indian economy stands at the intersection of rapid globalization and domestic aspirations. Issues relating to planning, efficient use of resources, inclusive growth, and job creation remain vital for ensuring that economic progress translates into social well-being.
- With a young population and expanding global role, India's economy is confronted with the dual challenge of sustaining high growth while creating sufficient productive employment. Planning and effective mobilization of financial, human, and natural resources thus become critical.
- Since independence, India has experimented with different economic strategies—from five-year plans to liberalization and structural reforms. Today, the focus lies on reconciling growth with inclusivity, resource efficiency, and employment generation to achieve long-term sustainability.

Conclusions

- India's economic future depends on how effectively it can mobilize resources, generate quality jobs, and ensure inclusive development. A balanced approach combining reforms, planning, and social equity will be key to sustainable growth.
- To harness its demographic dividend and global opportunities, India must emphasize efficient planning, equitable resource distribution, and employment-intensive growth. This will ensure that progress is both sustainable and inclusive.
- The challenge for India lies not merely in achieving high growth rates but in ensuring that growth translates into development and jobs. Strengthening institutions, fostering innovation, and inclusive policymaking can make this vision a reality.
- With sound economic governance, judicious use of resources, and people-centric policies, India can convert its structural challenges into opportunities and emerge as a resilient, equitable, and globally competitive economy.

Acronyms

1.Key Challenges

"RISE GAP"

- **R** – Regional disparities
- **I** – Informal sector dominance
- **S** – Structural imbalance (agri vs services)
- **E** – Environmental stress
- **G** – Global shocks (BOP, oil, supply chains)
- **A** – Agrarian distress
- **P** – Poverty & inequality

2. Resource Mobilisation – Challenges

"TAX WEAK"

- **T** – Tax-to-GDP ratio low
- **A** – Agricultural tax exemptions

- **X** – Extensive tax evasion/black money
- **W** – Weak PSUs & disinvestment delays
- **E** – External volatility (FPI outflows, forex risk)
- **A** – Administrative inefficiency in tax collection
- **K** – K-shaped dependence (narrow base, rich contribute more)

3**. Planning Issues (Post-NITI Aayog)**
"VISION GAP"

- **V** – Vision documents not legally binding
- **I** – Ineffective fund control (advisory only)
- **S** – State capacity disparity
- **I** – Inadequate local body integration
- **O** – Outcome-focus weak in practice
- **N** – No constitutional backing
- **G** – Governance bottlenecks (centre-state friction)
- **A** – Aspirational districts oversimplification
- **P** – Political divergence (different party agendas)

4. Employment – Challenges
"JOBS CRISIS"

- **J** – Jobless growth
- **O** – Overdependence on agriculture
- **B** – Burden of informal work (90%+ workforce)
- **S** – Skill mismatch & unemployability
- **C** – Care economy burden on women
- **R** – Regional disparities in job opportunities
- **I** – Informalisation of gig economy
- **S** – Slow manufacturing absorption
- **I** – Inequality in wages & security
- **S** – Social security gaps

5. Why Jobless Growth in India
: **"CAPITAL"**

- **C** – Capital-intensive industries dominant
- **A** – Automation reducing labour demand
- **P** – Policy rigidities in labour markets
- **I** – Informalisation of workforce
- **T** – Technological skill mismatch
- **A** – Agriculture overemployment
- **L** – Low female participation

UNIT 2

Inclusive Growth & Issues Arising From It

Navigating the Syllabus: What You Need to Know

Inclusive Growth & Issues Arising from It

- **Concept of Inclusive Growth** – meaning, features (broad-based, equitable, employment-oriented, sustainable, regionally balanced, socially inclusive).
- **Need for Inclusive Growth in India** – uneven benefits of growth, poverty, unemployment, low agriculture productivity, poor quality jobs, human development gaps, rural–urban and regional disparities.
- Major Concerns in India
- Equity Dimensions
- Government Initiatives for Inclusive Growth –
  Global Perspective – WEF's 3-way approach:

UPSC Previous Year Questions

Question	Nature of Question	Core Demand
Examine the (pattern) and trend of public expenditure on social services in the post-reforms period in India. To what extent this has been in consonance with achieving the objective of inclusive growth? (2024)	Public Expenditure + Social Sector + Inclusive Growth	Analyze expenditure trends post-1991 and assess alignment with inclusive growth goals
What is the status of digitalization in the Indian economy? Examine the problems faced in this regard and suggest improvements.(2023)	Digital Economy + Challenges + Policy Suggestions	Assess progress and barriers in digitalization and propose reforms
Most of the unemployment in India is structural in nature. Examine the methodology adopted to compute unemployment in the country and suggest improvements. (2023)	Unemployment + Structural Nature + Computation	Explain current methodology, structural causes, and suggest better metrics
Distinguish between 'care economy' and 'monetized economy'. How can care economy be brought into monetized economy through women empowerment? (2023)	Care Economy + Gender + Inclusion	Define both economies and link women empowerment as a tool for integration
"Economic growth in the recent past has been led by increase in labour productivity." Explain this statement. Suggest the growth pattern that will lead to creation of more jobs without compromising labour productivity. (2022)	Labour Productivity + Job Creation + Growth Pattern	Explain productivity-led growth and propose inclusive job-creating growth model

Explain the difference between computing methodology of India's Gross Domestic Product (GDP) before the year 2015 and after the year 2015.(2021)	GDP Estimation + Base Year Change + Methodological Shift	Compare old vs new GDP methodology and explain implications
Do you agree that the Indian economy has recently experienced V-shaped recovery? Give reasons in support of your answer. (2021)	COVID Recovery + Growth Pattern + Economic Cycle	Assess data and arguments for V-shaped post-pandemic recovery
Define potential GDP and explain its determinants. What are the factors that have been inhibiting India from realizing its potential GDP? (2020)	Potential GDP + Growth Inhibition	Explain the concept and discuss structural barriers to achieving it
Explain the meaning of investment in an economy in terms of capital formation. Discuss the factors to be considered while designing a concession agreement between a public entity and a private entity.(2020)	Investment + PPP + Concession Agreements	Link investment and capital formation; outline key PPP contract design factors
Explain the rationale behind the Goods and Services Tax (Compensation to States) Act of 2017. How has COVID-19 impacted the GST compensation fund and created new federal tensions? (2020)	GST Compensation + Federalism + COVID Impact	Explain GST Compensation Act and COVID-led strain on Centre-State fiscal relations
Is inclusive growth possible under market economy? State the significance of financial inclusion in achieving economic growth in India. (2022)	Inclusive Growth + Market Economy + Financial Inclusion	Critically assess compatibility of market economy with inclusion and explain role of financial inclusion
Investment in infrastructure is essential for more rapid and inclusive economic growth. Discuss in the light of India's experience.	Infrastructure + Inclusive Growth + Indian Experience	Explain link between infrastructure investment and inclusive growth using Indian examples
Explain intra-generational and inter-generational issues of equity from the perspective of inclusive growth and sustainable development.(2020)	Equity + Inter/Intra Generational Justice + Sustainability	Define equity types and relate them to growth and environmental sustainability
It is argued that the strategy of inclusive growth is intended to meet the objectives of inclusiveness and sustainability together. Comment on this statement. (2019)	Inclusive Growth + Sustainability + Strategy	Evaluate how inclusive growth serves both equity and environmental objectives

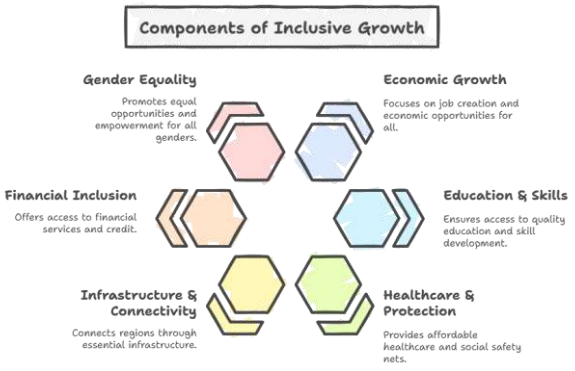
What are the salient features of 'inclusive growth'? Has India been experiencing such a growth process? Analyze and suggest measures for inclusive growth. (2017)	Inclusive Growth + Evaluation + Policy Measures	List inclusive growth features, assess India's record, and propose way forward
Comment on the challenges for inclusive growth which include careless and useless manpower in the Indian context. Suggest measures to be taken for facing these challenges. (2016)	Inclusive Growth + Human Resource Quality + Challenges	Discuss quality of workforce issues and suggest employment, education reforms
Capitalism has guided the world economy to unprecedented prosperity. However, it often encourages shortsightedness and contributes to wide disparities between the rich and the poor. In this light, would it be correct to believe and adopt capitalism driving inclusive growth in India? Discuss. (2014)	Capitalism + Inequality + Inclusive Growth	Critically examine the feasibility of achieving inclusion through capitalism
With a consideration towards the strategy of inclusive growth, the new companies bill, 2013 has indirectly made CSR a mandatory obligation. Discuss the challenges expected in its implementation in earnest. Also discuss other provisions in the bill and their implications. (2013)	CSR + Inclusive Growth + Companies Act 2013	Analyze mandatory CSR provisions and implementation challenges in promoting inclusion

Introduction

India today stands at a unique crossroads. On one hand, it is among the fastest-growing major economies in the world, producing billionaires at an unprecedented pace and leading global conversations in technology, digital payments, and renewable energy. On the other hand, millions of its citizens still struggle with poor housing, inadequate healthcare, limited education, and uncertain livelihoods. A farmer in rural Bihar, a street vendor in Mumbai, and a start-up founder in Bengaluru may all share the same national growth story, yet their lived realities remain worlds apart. This contrast raises a crucial question for policymakers — how can the benefits of economic progress reach every citizen, irrespective of their location, gender, caste, or income level? It is this challenge of ensuring **inclusive growth**, where prosperity is shared and opportunities are accessible to all, that lies at the heart of India's development journey.

What is Inclusive Growth ?

- Inclusive growth refers to a pattern of economic growth that is broad-based, equitable, and sustainable, ensuring that the benefits of increased prosperity are shared across all sections of society, particularly the poor, marginalized, and disadvantaged groups.
- It focuses not only on raising GDP but also on improving access to opportunities such as education, healthcare, employment, and infrastructure.
- The aim is to reduce inequality in income, wealth, and access to basic services.
- In the Indian context, inclusive growth aligns with the idea of **"Sabka Saath, Sabka Vikas, Sabka Vishwas"** this ensures that economic progress uplifts every citizen, regardless of region, gender, caste, or community.



Features of Inclusive Growth :

- **Broad-Based Participation** – Economic growth involves and benefits all sections of society, from rural farmers and informal workers to urban professionals and entrepreneurs, ensuring no group is left out of the development process.
- **Equitable Distribution of Benefits** – The gains from growth are shared fairly across income groups, regions, and communities, reducing both economic and social inequalities.
- **Employment-Generating Growth** – Emphasis is placed on creating a large number of productive and dignified jobs, especially in labour-intensive sectors, so that rising GDP directly translates into better livelihoods.
- **Access to Basic Services** – Every citizen, regardless of income or location, has access to quality education, affordable healthcare, clean drinking water, sanitation facilities, housing, and modern digital infrastructure.
- **Regional Balance** – Development strategies consciously target underdeveloped states, backward districts, and rural areas to reduce the rural–urban divide and prevent excessive concentration of wealth in certain regions.
- **Social Inclusion** – Removes structural barriers related to caste, gender, disability, and ethnicity, enabling historically marginalised groups to participate equally in economic, political, and social life.
- **Sustainability** – Integrates economic progress with environmental responsibility by promoting clean energy, efficient resource use, and policies that safeguard natural capital for future generations.
- **Empowerment through Capability Building** – Invests in education, skills, training, and entrepreneurship to expand people's ability to contribute to and benefit from economic growth.

Need for Inclusive Growth in India

- **High Growth but Uneven Benefits** – Since the 1990s, economic liberalisation has raised India's GDP growth from ~3.5% in earlier decades to 6–8%, with a major shift from agriculture to a service-driven economy. Yet, the benefits have not reached all sections equally.
- **Persistent Social Exclusion** – Rural residents, women, children, backward castes, minorities,

and marginalised communities often remain outside the mainstream growth story.

- **Sectoral & Regional Disparities** – Growth is concentrated in certain sectors (like IT) and regions, while agriculture and poorer states lag behind. This deepens rural–urban and regional divides.
- **Low Agricultural Growth** – Agricultural productivity remains low, affecting rural incomes and food security, and keeping a large section of the population vulnerable.
- **Poor Quality Job Creation** – Many new jobs are informal, low-paying, and lack social security, limiting their role in poverty reduction.
- **Human Development Gaps** – Health, education, and skill development indicators remain poor in many areas, restricting people's ability to benefit from economic opportunities.
- **Inadequate Infrastructure** – Weak rural infrastructure, limited connectivity, and poor public services hinder balanced development.
- **Political & Policy Shortcomings** – Ineffective or politically driven schemes have sometimes increased inequality rather than reduced it.
- **Need for Balanced Growth** – In a democracy like India, bringing the 70% rural population into the economic mainstream is vital for stability and fairness.
- **Policy Imperative** – As highlighted by former PM Manmohan Singh, inclusive growth requires large investments in rural infrastructure, agriculture, credit for farmers, social safety nets, and public spending on education and healthcare.

Major Concerns for Developing Countries like India in Achieving Inclusive Growth

- **Poverty** – Despite years of economic growth, nearly 30% of India's population still lives below the poverty line (Rangarajan Committee estimate). Poor households often lack access to quality education, skill training, and healthcare, which keeps them trapped in low-income work and reduces their ability to take part in and benefit from the growth process.
- **Employment Challenges** – Most Indian workers (over 90%) are in the informal or unorganised sector, where wages are low, productivity is poor, and there are no job benefits like pensions, health insurance, or paid leave. Heavy dependence on low-paying agricultural work, combined with slow creation of good-quality formal jobs, makes employment generation one of the toughest tasks for achieving inclusive growth.
- **Agriculture Sector Weaknesses** – Around 43% of the population depends on agriculture, yet the sector contributes only about 16% to GDP. Many people work on small, fragmented landholdings with little mechanisation. Productivity is low due to disguised unemployment, poor irrigation, and over-reliance on monsoon rains. This means a large share of the rural population is left out of the high growth enjoyed by other sectors after the 1991 reforms.
- **Slow Social Development** – India spends relatively little on essential services like health and education. Many government schools have poor infrastructure and teacher shortages, while health facilities are often under-staffed and under-equipped. Gender gaps remain high, and millions of children suffer from malnutrition, reducing their ability to grow into productive adults.
- **Regional Disparities** – Different states and regions experience very different rates of growth. For example, Punjab's per capita income is about four times that of Bihar. These disparities reflect uneven industrial development, unequal agricultural productivity, and varying access to infrastructure.
- **Urban–Rural Divide** – Cities enjoy far better infrastructure, healthcare, schools, and employment options, while many rural areas struggle with poor connectivity, unreliable electricity, and limited markets for goods and services. This gap leads to migration pressures and social tensions.
- **Infrastructure Deficit** – Many regions still lack quality roads, rail links, irrigation networks, reliable electricity, and high-speed internet. Without such infrastructure, industries cannot grow, farmers cannot access markets effectively, and services cannot reach remote populations.
- **Gender Inequality** – Female labour force participation remains very low (around one-fourth of working-age women). Women face wage gaps, limited property rights, and difficulty accessing credit. This not only reduces women's

economic independence but also limits the overall productive capacity of the economy.

- **Skill Mismatch** – While India produces millions of graduates every year, many lack the practical or technical skills required in the job market. At the same time, industries often face shortages of skilled technicians, engineers, and healthcare workers. This mismatch leads to educated unemployment alongside unmet labour demand.
- **Environmental Sustainability Concerns** – Rapid, uneven growth has sometimes led to environmental damage — such as deforestation, water scarcity, and pollution — which hits the poorest hardest. Displacement from large projects and resource depletion threaten the livelihoods of vulnerable groups.
- **Exclusion of Marginalised Groups** – Scheduled Castes, Scheduled Tribes, minorities, and persons with disabilities often face systemic discrimination and lower access to jobs, credit, and quality services. Without targeted policies, these communities risk being left out of the growth process altogether.

Intergenerational and Intragenerational Equity Issues in Inclusive Growth

- **Intergenerational Equity :** Intergenerational equity refers to fairness between present and future generations. In the context of inclusive growth, it means ensuring that today's development and economic policies do not compromise the ability of future generations to meet their own needs.The Intergenerational Equity issues can be seen as follow :
  - **Resource Sustainability:** Overexploitation of natural resources (forests, minerals, water) for short-term growth can leave future generations with depleted reserves and degraded ecosystems.
  - **Environmental Degradation:** Unchecked industrialization and urbanization can cause pollution and climate change impacts that disproportionately affect future populations.
  - **Fiscal Responsibility:** High public debt and unplanned subsidies may burden future taxpayers, reducing their fiscal space for investment in social and economic infrastructure.
  - **Human Capital:** Neglecting quality education, healthcare, and skill development today will limit the capabilities of tomorrow's workforce, perpetuating cycles of poverty.
- **Intragenerational Equity :** Intragenerational equity focuses on fairness among people of the same generation, ensuring that the benefits of economic growth are shared equitably across regions, social groups, and economic classes.The Intragenerational Equity issues can be seen as follow :
  - **Income Inequality:** Disproportionate growth in urban, formal sectors can widen the income gap between rural–urban areas and between skilled–unskilled workers.
  - **Social Inclusion:** Marginalized communities like SCs, STs, minorities, and women may remain excluded from mainstream growth due to discrimination, poor access to resources, and structural barriers.
  - **Regional Disparities:** Certain states or districts benefit more from infrastructure and investment, while others lag behind, creating uneven development patterns.
  - **Access to Basic Services:** Inadequate distribution of healthcare, education, and social security services deepens inequality within the same generation.

Government Initiatives for Inclusive Growth

In a diverse and unequal society like India, market forces alone cannot ensure that the benefits of economic growth reach every section of the population. Without targeted government policies, vulnerable groups such as rural poor, women, Scheduled Castes, Scheduled Tribes, minorities, and people in backward regions risk being left out of the growth process. Government intervention is, therefore, imperative to create equal opportunities, provide basic services, bridge regional and social disparities, and ensure that economic progress translates into improved quality of life for all.**For inclusive growth government has taken following initiatives :**

- **Poverty Alleviation & Social Protection :** Poverty eradication is central to inclusive growth, and the government has launched several welfare schemes to address income

insecurity and vulnerability. Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) guarantees 100 days of wage employment to rural households, creating a safety net and boosting rural purchasing power. The National Social Assistance Programme (NSAP) provides pensions to senior citizens, widows, and persons with disabilities from poor households, ensuring a basic standard of living. The Pradhan Mantri Jan Dhan Yojana (PMJDY) promotes financial inclusion by opening zero-balance bank accounts with insurance cover and enabling direct benefit transfers to eliminate leakages.

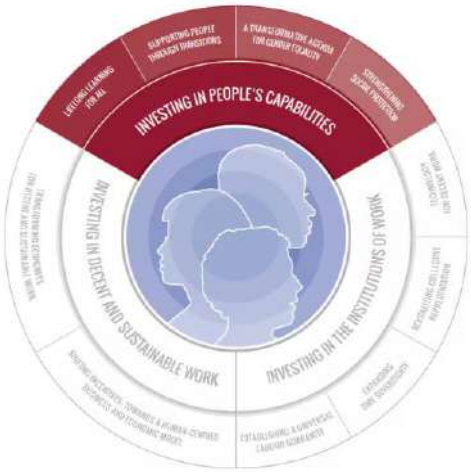
- **Rural Development & Infrastructure :** Rural infrastructure is the backbone of inclusive growth as it connects isolated populations to markets, education, and healthcare. The Pradhan Mantri Gram Sadak Yojana (PMGSY) improves rural connectivity through all-weather roads, reducing travel time and increasing access to services. Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY) focuses on skilling rural youth from poor families to enhance employability. The Saubhagya Scheme ensures universal household electrification, helping bridge the rural–urban divide.
- **Agriculture & Farmers' Welfare :** Agriculture supports nearly half of India's workforce but contributes a smaller share to GDP, making it essential to boost productivity and incomes. Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) provides direct income support to small and marginal farmers, while Pradhan Mantri Fasal Bima Yojana (PMFBY) offers affordable crop insurance against natural calamities and pests. The Soil Health Card Scheme promotes scientific nutrient management, increasing yields and reducing input costs.
- **Education & Skill Development :** Human capital development is critical for inclusive growth. Samagra Shiksha Abhiyan integrates pre-school, school, and secondary education under one umbrella to improve learning outcomes. The Mid-Day Meal Scheme addresses classroom hunger, improving attendance and learning performance. The Skill India Mission and associated programmes aim to bridge the skill gap by providing industry-relevant training, especially for youth from marginalized communities.
- **Health & Nutrition :** Access to quality healthcare is a key determinant of inclusive growth. Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana (PMJAY) offers free secondary and tertiary care up to ₹5 lakh per family per year for poor households. Poshan Abhiyaan takes a life-cycle approach to combat malnutrition among children, adolescent girls, and women. The National Health Mission (NHM) strengthens health systems, particularly in rural and underserved areas, with special focus on maternal and child health.
- **Financial & Digital Inclusion :** Financial and digital access enable participation in the modern economy. Initiatives like Unified Payments Interface (UPI) and the Digital India programme promote cashless transactions and improve service delivery. The Stand-Up India Scheme provides loans to women and SC/ST entrepreneurs to foster entrepreneurship. The Pradhan Mantri Mudra Yojana (PMMY) supports micro and small enterprises with collateral-free loans.
- **Housing & Urban Development :** Adequate housing is essential for dignity and well-being. Pradhan Mantri Awas Yojana (PMAY – Urban & Rural) seeks to provide affordable housing for all by 2024 through subsidies and direct assistance. Urban infrastructure is improved through Atal Mission for Rejuvenation and Urban Transformation (AMRUT) and the Smart Cities Mission, which focus on water supply, sanitation, and green spaces to create inclusive urban spaces.
- **Gender & Social Equality :** Social justice is a vital component of inclusive growth. Beti Bachao Beti Padhao (BBBP) addresses declining child sex ratio and promotes girl child education. One-Stop Centres provide integrated support to women facing violence. Reservation for women in Panchayati Raj institutions ensures their participation in governance and decision-making at the grassroots.
- **Regional Development :** Balanced regional development prevents certain areas from being left behind. The Aspirational Districts Programme targets lagging districts with focused interventions in health, education, and

infrastructure. Schemes like the North East Special Infrastructure Development Scheme (NESIDS) address infrastructure gaps in the North Eastern states, integrating them into the national growth story.

- **Environmental Sustainability :** Long-term growth must be sustainable. The National Solar Mission promotes renewable energy, especially in rural off-grid areas. Jal Jeevan Mission ensures piped drinking water to every rural household, improving health and reducing drudgery for women. The National Afforestation Programme links ecological restoration with livelihood creation for forest-dependent communities.

World Economic Forum's 3 Way Approach to boost social inclusion and economic growth

- **Invest in People's Capabilities :** Countries should prioritize both public and private spending on building citizens' skills, health, and education. Strengthening human capital is the most reliable way to raise productivity and sustain long-term growth.
- **Strengthen Work Institutions and Rules :** Governments, in partnership with employers' and workers' organizations, should modernize labour laws and institutions. Fair rules for job creation, wages, and working conditions improve employment quality, purchasing power, and overall demand in the economy.
- **Focus on Labour-Intensive, High-Impact Sectors :** Greater investment should flow into sectors that create large-scale jobs and deliver social benefits — such as sustainable infrastructure (water, energy, transport, digital), the care economy, rural development, and education and training.



Value Addition

Keywords : Inclusive growth, broad-based, equitable distribution, employment-oriented, sustainable, social inclusion, regional balance, human capital, poverty alleviation, inequality, rural–urban divide, informal sector, skill mismatch, agricultural stagnation, infrastructure deficit, financial inclusion, digital divide, intergenerational equity, intragenerational equity, environmental sustainability

Mains Question for Practice :

Q1. Define inclusive growth. How is it different from equitable growth in the Indian context?

Q2. Despite high GDP growth, India faces rising inequality and social exclusion. Critically examine the challenges to achieving inclusive growth.

Q3. Discuss the role of financial inclusion and digital infrastructure in promoting inclusive growth in India.

Q4. Evaluate the effectiveness of government initiatives like MGNREGA, JAM Trinity, and Skill India in advancing inclusive growth.

Q5. "Inclusive growth is not just an economic imperative, but a social necessity." Examine this statement with suitable examples from India.

Ready-Made templates

Introductions

- Inclusive growth goes beyond GDP expansion — it ensures that economic progress is broad-based, equitable, and employment-oriented. In India's diverse society, this is essential to bridge regional gaps, reduce inequality, and uplift marginalized groups.
- While India has achieved rapid growth post-liberalisation, its benefits remain unevenly distributed. Inclusive growth seeks to align economic efficiency with social equity, so that prosperity becomes truly national.
- The idea of inclusive growth emphasizes growth with justice — integrating poverty reduction, employment generation, and social empowerment. For India, it is both a developmental strategy and a democratic necessity.
- Inclusive growth means creating opportunities, expanding capabilities, and ensuring equitable access to resources. In a country marked by poverty, unemployment, and regional

imbalance, it defines the path toward sustainable development.

Conclusions

- For India, inclusive growth is the bridge between economic potential and social justice. By investing in human capital, strengthening social safety nets, and promoting employment-intensive sectors, growth can become more equitable and sustainable.
- True development lies not only in higher GDP but in empowering every citizen. Inclusive growth, backed by reforms, social protection, and regional balance, can transform India's demographic dividend into a development dividend.
- Without inclusion, growth risks deepening inequality and instability. The way forward lies in harmonising efficiency with equity, ensuring that no community, sector, or region is left outside India's growth story.
- Inclusive growth is both a moral and economic imperative. By focusing on poverty alleviation, skill development, and access to basic services, India can make growth people-centric and future-ready.

Acronyms

1.Features of Inclusive Growth

"GROWTH"

- **G** – Gender equity & participation
- **R** – Regional balance in development
- **O** – Opportunities for all (employment, entrepreneurship)
- **W** – Welfare focus (health, education, social security)
- **T** – Targeted poverty reduction
- **H** – Human capital development

2. Challenges to Inclusive Growth

"INEQUAL"

- **I** – Income & wealth inequality
- **N** – Neglect of rural/agriculture sector
- **E** – Employment is informal & insecure
- **Q** – Quality of education & health poor
- **U** – Uneven regional development
- **A** – Access gaps (finance, digital, infrastructure)
- **L** – Low female labour force participation

3. Pillars of Inclusive Growth

: **"CARE"**

- **C** – Capital (financial inclusion, credit access)
- **A** – Access (infrastructure, markets, opportunities)
- **R** – Redistribution (social security, welfare schemes)
- **E** – Empowerment (education, skill development, participation)

Government Budgeting

Navigating the Syllabus: What You Need to Know

Government Budgeting

- **Introduction & Importance** – Union Budget under Article 112; tool for growth, equity, fiscal discipline, and social justice.
- **Objectives of Budgeting** – resource allocation, economic stability, redistribution, inclusive growth, fiscal discipline, transparency.
- **Budget Components**
- **Types of Deficits**
- **Issues & Challenges in Budgeting**
- **Reforms & Initiatives**

UPSC Previous Year Questions

Question	Nature of Question	Core Demand
Distinguish between Capital Budget and Revenue Budget. Explain the components of both these Budgets. (2021)	Budget Classification + Capital vs Revenue	Differentiate capital and revenue budget and explain their key components
The public expenditure management is a challenge to the Government of India in context of budget making during the post liberalization period. Clarify it. (2019)	Public Expenditure Management + Budgeting + Post-Liberalisation	Highlight issues in expenditure control and budget planning post-1991 reforms

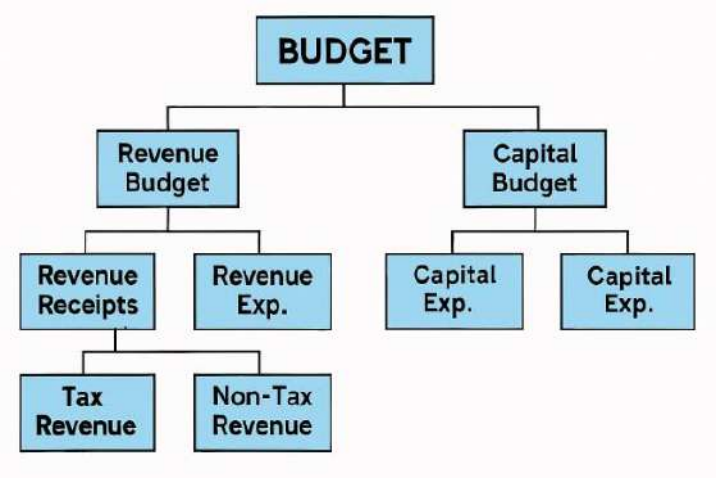
Introduction

Government budgeting is the process through which the state plans, allocates, and manages its financial resources to meet developmental priorities and maintain macroeconomic stability. In India, the Union Budget presented annually under Article 112 of the Constitution serves as the government's most important policy statement, outlining revenue collection and expenditure plans for the financial year. Beyond being a financial exercise, budgeting is a vital instrument for achieving social justice, reducing inequalities, and promoting inclusive growth. By directing funds towards infrastructure, social welfare, and capacity-building initiatives, a well-crafted budget can balance economic growth with equity, transparency, and fiscal discipline.

Objectives of Government Budgeting

- **Efficient Resource Allocation**: Ensure that limited public resources are directed towards priority sectors like health, education, infrastructure, and defence to maximise social and economic benefits.
- **Economic Stability**: Use fiscal policy tools in the budget to control inflation, reduce unemployment, and stabilise economic cycles.
- **Redistribution of Income**: Reduce inequalities through progressive taxation and targeted welfare spending for vulnerable sections of society.
- **Promotion of Inclusive Growth**: Allocate funds to programmes that uplift marginalized communities, reduce regional disparities, and improve access to essential services.
- **Fiscal Discipline**: Maintain a sustainable balance between revenue and expenditure to avoid excessive public debt and ensure long-term financial stability.
- **Support for Economic Growth**: Provide capital expenditure for infrastructure, industry, and innovation to boost productivity and GDP growth.
- **Social Justice and Welfare**: Promote equitable opportunities by financing schemes for poverty alleviation, health care, education, and social security.
- **Public Accountability and Transparency**: Ensure that the use of public funds is open to scrutiny, thereby fostering trust between the government and citizens.

Budget Components



1.Revenue Budget

- The Revenue Budget is one of the two main components of the Union Budget, the other being the Capital Budget. It deals with the government's day-to-day income and expenditure that do not lead to the creation of assets or liabilities. It reflects the government's ability to mobilize resources and manage its recurring obligations.
- **Components of Revenue Budget**
  - **Revenue Receipts**
    - These are the regular incomes of the government which do not create liability or reduce assets.Revenue receipts can be of two types
    - **Tax Revenue**: Income from taxes like GST, Income Tax, Corporation Tax, Customs Duty, Excise Duty.
    - **Non-Tax Revenue**: Income from dividends and profits of PSUs, interest on loans, fees, fines, spectrum auctions, etc.
  - **Revenue Expenditure**
    - These are expenditures that do not create assets or reduce liabilities.
    - Examples include salaries, pensions, subsidies (food, fertilizer, petroleum), grants to states/UTs, interest payments, defence revenue expenditure, etc.

2.Capital Budget

- The **Capital Budget** is the second major component of the Union Budget, alongside the Revenue Budget. It comprises transactions that **either create assets or reduce liabilities** of the government. Unlike revenue items, these expenditures and receipts have long-term

implications for the economy, as they directly influence infrastructure, investment, and development.

- **Components of Capital Budget**
  - **Capital Receipts**
    - These lead to either creation of liability or reduction in assets.It consist of borrowing,disinvestment proceeds and load recoveries
    - **Borrowings**: Market loans, issuance of government securities, loans from RBI, and external borrowings.
    - **Disinvestment Proceeds**: Revenue from selling government stake in PSUs.
    - **Loan Recoveries**: Repayments from states, UTs, and other parties of past government loans.
  - **Capital Expenditure**
    - Spending that leads to asset creation or reduction of liabilities.
    - **Examples**: Investment in infrastructure (roads, railways, defence capital outlay, etc.), Loans to states/PSUs for development purposes, Equity infusion in public sector enterprises and banks,Repayment of past loans.

Issues & Challenges in Government Budgeting

- **High Fiscal Deficit and Debt Burden**: India has often struggled to contain its fiscal deficit within FRBM targets. A persistently high fiscal deficit means the government borrows heavily, leading to a growing debt burden. This reduces the fiscal space available for future governments and increases interest payments, which consume a large portion of revenue receipts. Over time, this creates intergenerational inequality as future taxpayers bear the cost of today's borrowing.
- **Revenue Shortfalls and Narrow Tax Base**: Despite being one of the fastest-growing economies, India's tax-to-GDP ratio (~11–12%) is far lower than OECD countries. Widespread tax evasion, exemptions, a large informal sector, and dependence on indirect taxes limit the government's ability to mobilize adequate revenue. Over-optimistic revenue projections in the budget further worsen fiscal credibility, leading to mid-year cutbacks.
- **Rigid and Non-Productive Expenditure**: A large part of the budget is locked in committed expenditures such as salaries, pensions, defence spending, and interest payments. This leaves very limited resources for productive capital expenditure such as roads, schools, and healthcare. The imbalance between revenue and capital expenditure reduces the overall quality of government spending.
- **Subsidy Burden and Inefficiencies**: Subsidies on food, fertilizer, electricity, and petroleum products consume a large share of public expenditure. While they are politically sensitive and aimed at protecting vulnerable groups, they are often regressive, poorly targeted, and leak-prone. Subsidy spending crowds out investment in productive areas like infrastructure and innovation.
- **Populism and Political Pressures**: In a competitive electoral democracy, governments tend to prioritize short-term populist schemes like loan waivers, free power, or cash transfers. While politically rewarding, these schemes often undermine long-term fiscal prudence and crowd out investments in critical sectors. This populist budgeting reduces the credibility of fiscal discipline frameworks.
- **Transparency and Off-Budget Borrowings**: To make fiscal numbers appear better, governments often resort to off-budget borrowings, especially through PSUs and special-purpose vehicles. For example, food subsidy arrears are sometimes financed through loans taken by the Food Corporation of India rather than direct budget allocation. Such practices reduce transparency and hide the true fiscal stress.
- **Implementation Gaps in Schemes**: Even where allocations are made, implementation bottlenecks—such as bureaucratic delays, corruption, lack of monitoring, and capacity constraints—reduce the effectiveness of spending. Many schemes remain underutilized or fail to reach the intended beneficiaries, diluting the purpose of budgetary allocations.
- **Centre–State Fiscal Tensions**: States rely heavily on central transfers and GST compensation, but face limits on borrowing. Often, centrally sponsored schemes restrict state flexibility in designing policies suited to their needs. This creates tension in cooperative

federalism, with states demanding more fiscal autonomy and predictable devolution of funds.

- **External Shocks and Deviations from Fiscal Discipline**: External factors such as global recessions, oil price shocks, or pandemics like COVID-19 force governments to abandon fiscal consolidation targets. For instance, India's fiscal deficit shot up to 9.2% of GDP in 2020–21 due to pandemic-related spending. Frequent deviations reduce the credibility of fiscal frameworks like FRBM.
- **Overemphasis on Revenue Expenditure**: India's budget tends to prioritize revenue expenditure (subsidies, salaries, pensions, consumption) over capital expenditure (infrastructure, asset creation). This imbalance reduces the multiplier effect of public spending on long-term growth and job creation.
- **Data Reliability and Unrealistic Assumptions**: Budget projections often rely on optimistic assumptions about GDP growth, disinvestment targets, and revenue collection. When these targets are not met, it leads to mid-year expenditure cuts, increased borrowing, and a loss of credibility in fiscal policy.

Government Initiatives & Reforms in Budgeting

- **Fiscal Responsibility and Budget Management (FRBM) Act, 2003**
  - Introduced to institutionalize fiscal discipline and reduce unsustainable borrowings.
  - Targeted elimination of revenue deficit and capped fiscal deficit at 3% of GDP.
  - Required the government to present fiscal policy statements to Parliament for transparency.
  - Escape clauses allowed deviation during crises such as war or natural disasters.
  - N.K. Singh Committee (2017) recommended a debt-to-GDP framework (Centre 40%, States 20%).
  - Implementation often suspended during crises (2008 Global Recession, 2020 COVID-19).
- **Outcome Budgeting (2005-06)**
  - Shifted focus from input-based spending to output and outcome-based performance.
  - Each ministry mandated to link budget allocation with measurable outcomes.
  - Example: The Education ministry must report not only funds spent but also schools built and literacy improved.
  - Strengthened accountability by making ministries answerable for results, not just expenditure.
  - Helped Parliament and citizens track the efficiency of government programmes.
- **Gender Budgeting & Child Budgeting**
  - Gender Budgeting (2005 onwards) introduced to assess impact of expenditure on women.
  - Ensures earmarking of funds for women's welfare, education, health, and empowerment.
  - Child Budgeting highlights share of resources allocated to child-centric schemes like nutrition and protection.
  - Promotes inclusiveness by making vulnerable sections visible in fiscal planning.
  - Institutionalized within ministries, coordinated by the Ministry of Women & Child Development.
- **Medium-Term Expenditure Framework (MTEF), 2012**
  - Introduced rolling three-year expenditure targets for major schemes and sectors.
  - Aimed at linking annual budgets with medium-term fiscal policy for consistency.
  - Provided predictability in fund flows and reduced ad-hoc decision-making.
  - Helped ministries and departments plan their expenditure more strategically.
  - Improved fiscal stability by aligning short-term spending with long-term goals.
- **Public Financial Management System (PFMS)**
  - IT-based platform to track fund disbursal and utilization in real time.
  - Integrated with Direct Benefit Transfer (DBT) to reduce leakages and delays.
  - Ensures last-mile delivery of welfare funds to genuine beneficiaries.
  - Strengthens transparency and accountability in expenditure management.
  - Widely used in welfare schemes like MGNREGA and LPG subsidy.
- **Goods and Services Tax (GST), 2017**
  - Unified indirect tax regime replacing excise, VAT, service tax, octroi, etc.

- Aimed at avoiding cascading effect of multiple taxes ("tax on tax").
- Simplified taxation and widened the tax base for better revenue collection.
- GST Council institutionalized cooperative fiscal federalism between Centre and States.
- Digital GST Network (GSTN) improved compliance and reduced manual loopholes.
- Issues remain on rate rationalization and compensation to states.

- **Zero-Based Budgeting (ZBB)**
  - Concept of starting each budget cycle from zero instead of incremental allocation.
  - Every scheme and expenditure must be freshly justified before funds are granted.
  - Promotes cost-effectiveness by eliminating redundant or outdated schemes.
  - Applied selectively in India, notably in defence and some state budgets.
  - Encourages efficient resource allocation and reduces wastage.
- **Disinvestment & Asset Monetization**
  - Disinvestment involves selling stakes in public sector enterprises to raise revenue.
  - Examples: Air India privatization, LIC IPO, Bharat Petroleum disinvestment plans.
  - Asset Monetization leases under-utilized public assets like highways, airports, and pipelines.
  - National Monetisation Pipeline (NMP) launched to unlock capital tied in public infrastructure.
  - Reduces fiscal burden while generating funds for new infrastructure.
  - Faces resistance due to concerns over job losses and strategic asset control.
- **Digital Union Budget (2021 onwards)**
  - First paperless budget presented in 2021 amid COVID-19 digital shift.
  - Mobile app launched to provide public access to budget documents instantly.
  - Promoted eco-friendly, cost-effective, and transparent dissemination of information.
  - Improved accessibility for researchers, students, policymakers, and common citizens.
  - Marked a shift towards digital governance in fiscal management.

Government Deficits

Deficit Type	Definition	Significance
Revenue Deficit	• When revenue expenditure exceeds revenue receipts. • **Formula:** Revenue Expenditure – Revenue Receipts	Shows the government is borrowing even for routine expenses like salaries, subsidies.it is financially unsustainable.
Fiscal Deficit	• Total borrowing requirement of the government. • **Formula:** Total Expenditure – (Revenue Receipts + Non-debt Capital Receipts)	Indicator of overall financial health; high fiscal deficit = higher debt burden and crowding out of private investment.
Primary Deficit	• Fiscal deficit minus interest payments. • **Formula:** Fiscal Deficit – Interest Payments	Shows how much borrowing is for current needs vs. burden of past loans.
Effective Revenue Deficit	• Revenue deficit excluding grants to states for capital asset creation. • **Formula:** Revenue Deficit – Grants for Capital Asset Creation	Reveals true revenue shortfall after deducting productive spending.
Budget Deficit (obsolete)	• Excess of total expenditure (revenue + capital) over total receipts. • **Formula:** Total Expenditure – Total Receipts	Earlier used, now replaced with fiscal deficit; less reliable as it ignored borrowings.
Monetised Deficit	• That part of the fiscal deficit financed by borrowing from the RBI. • **Formula:** Borrowings from RBI	Expanding money supply → may lead to inflationary pressures.
Primary Revenue Deficit (rarely used)	• Revenue deficit excluding interest payments. • **Formula:** Revenue Deficit – Interest Payments	Useful to assess current imbalance without past debt servicing.

Deficit Financing

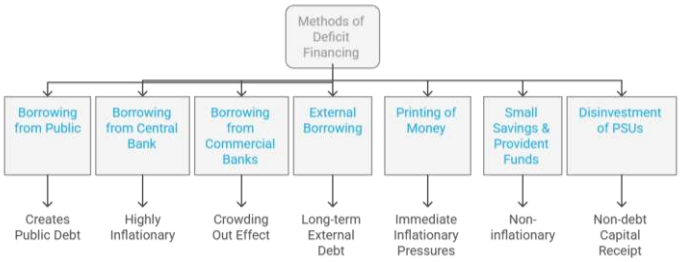
What is Deficit Financing?

- Deficit financing is the practice where government expenditure exceeds revenue, and the shortfall is met by either borrowing (from public, banks, or external agencies) or printing new currency through the central bank.
- In India, deficit financing historically meant borrowing from the RBI, leading to money creation, but now it is largely done through market borrowings after reforms.

Why is Deficit Financing Necessary?

- **Development Needs in Developing Countries**
  - Countries like India require huge investments in infrastructure, education, health, and poverty alleviation programs.
  - Tax revenues and private sector investments are often insufficient to meet these needs, making deficit financing a tool to fill the gap.
- **Stimulating Economic Growth :** In times of economic slowdown or recession, deficit financing increases government spending, which boosts demand, creates jobs, and stimulates growth (Keynesian principle).
- **Social Sector Expenditure**
  - Helps fund welfare schemes (like MNREGA, PM-Kisan, Food Security) ensuring redistribution of resources and reducing inequality.
  - Ensures support for vulnerable groups when private sector growth bypasses them.
- **Managing Crises :** During wars, pandemics, or natural disasters, government spending needs rise sharply, while revenue falls. Deficit financing becomes essential for relief and rehabilitation.
- **Bridging Revenue Shortfalls :** Tax evasion, inefficient resource mobilization, and low tax base limit revenues in many countries. Deficit financing bridges this fiscal gap.

Methods of Deficit Financing



- **Borrowing from the Public**
  - Government issues bonds, treasury bills, or securities to raise funds from individuals and institutions.
  - Creates public debt but avoids immediate inflationary pressures.
  - Increases interest obligations for future budgets.
- **Borrowing from the Central Bank (RBI in India)**
  - The government borrows directly from the central bank by issuing ad-hoc treasury bills.
  - The central bank prints new money to finance the deficit, leading to monetary expansion.
  - Highly inflationary if overused.
- **Borrowing from Commercial Banks**
  - Government raises loans from commercial banks, diverting credit away from private investment.
  - May cause "crowding out effect," where private sector gets less credit.
  - Less inflationary compared to central bank borrowing.
- **External Borrowing**
  - Loans from foreign governments, international organizations (World Bank, IMF, ADB).
  - Provides foreign exchange reserves and helps finance imports for development projects.
  - Creates long-term external debt obligations, vulnerable to currency fluctuations.
- **Deficit Financing through Printing of Money**
  - Most direct form of financing; government issues new currency to meet expenditure.
  - Causes immediate inflationary pressures due to rise in money supply.
  - Used in emergencies like wars, natural calamities, or economic crises.

- **Small Savings & Provident Funds**
  - Mobilizing household savings through schemes like NSC, PPF, post office deposits.
  - Non-inflationary as it diverts existing savings rather than creating new money.
  - Provides stable, low-cost financing source.
- **Disinvestment of Public Sector Undertakings (PSUs)**
  - Selling government stake in PSUs to raise funds.
  - Reduces fiscal deficit without creating inflationary pressures.
  - Considered a non-debt capital receipt.

Risks of Deficit Financing

- **Inflationary Pressures**
  - Deficit financing, especially when done by printing new currency, increases the money supply in the economy.
  - More money chases the same quantity of goods and services, leading to demand-pull inflation.
  - This reduces the purchasing power of common people, particularly hurting the poor and middle class.
- **Debt Trap and Fiscal Burden**
  - Excessive reliance on borrowing creates a mounting public debt.
  - Interest payments consume a significant portion of government expenditure, reducing resources available for development.
  - It may push future generations into intergenerational inequality, as they inherit the debt burden.
- **Crowding Out of Private Investment**
  - When the government borrows heavily from the market, it competes with the private sector for funds.
  - This raises interest rates and discourages private investment, affecting industrial growth and job creation.
- **Misallocation of Resources**
  - Political motives often drive deficit spending, leading to populist schemes rather than productive investments.
  - This reduces the efficiency of public expenditure and may create non-sustainable welfare measures.
- **External Dependence and Balance of Payments Crisis**
  - In developing countries, deficit financing sometimes depends on external borrowings.
  - This creates vulnerability to global shocks, currency fluctuations, and foreign debt crises (as seen in India's 1991 BoP crisis).
- **Reduced Investor Confidence**
  - High fiscal deficits can signal poor financial discipline, deterring domestic and foreign investors.
  - This can impact FDI inflows, sovereign credit ratings, and overall macroeconomic stability.
- **Risk of Stagflation**
  - If deficit financing leads to inflation without corresponding growth in production, it may result in **stagflation**—high inflation with low growth and unemployment.

Way Forward for Responsible Deficit Financing

- **Maintain Fiscal Discipline :** Governments should ensure that deficit financing is used mainly for capital expenditure like infrastructure, health, and education. This improves long-term productivity rather than creating recurring burdens through subsidies and giveaways.**Strict adherence to the Fiscal Responsibility and Budget Management (FRBM) Act will ensure long-term fiscal stability**
- **Balance Growth and Inflation :** Deficit financing must be calibrated so that it promotes growth without leading to excessive inflation. A coordinated approach between fiscal policy (government spending) and monetary policy (RBI measures) is necessary.
- **Strengthen Revenue Mobilization :** Instead of relying heavily on borrowing or printing money, the government should focus on broadening the tax base, reducing tax evasion, and mobilising non-tax revenues through disinvestment and asset monetisation.
- **Invest in Productive Sectors :** Borrowed or deficit-financed funds should be directed toward high multiplier sectors such as renewable energy, infrastructure, MSMEs, skill development, and digital economy. This ensures

higher returns in terms of employment and growth.

- **Protect the Vulnerable :** A portion of deficit financing should strengthen welfare schemes in health, education, and social security, ensuring that growth is inclusive and benefits the weaker sections of society.
- **Encourage Private Sector Participation :** Partnerships with the private sector (through PPPs) can reduce the burden on public finances and make deficit financing more efficient.
- **Be Cautious with External Borrowing :** Foreign loans should be taken selectively, ideally for projects that can generate **foreign exchange returns** (such as export-oriented industries) to avoid external debt traps.
- **Structural Reforms for Long-Term Stability :** Reforms in agriculture, labour, land, and the financial sector will make the economy more efficient. This reduces the need for frequent deficit financing and ensures that whenever it is used, it brings strong developmental returns.

Fiscal Responsibility and Budget Management (FRBM) Act

What is the FRBM Act?

- The Fiscal Responsibility and Budget Management (FRBM) Act, 2003 was enacted to institutionalize fiscal discipline, reduce fiscal and revenue deficits, and improve transparency in India's fiscal operations.
- It represented a landmark shift toward rules-based fiscal policy by setting legally binding targets for deficit reduction.

Objectives of FRBM Act

- Ensure fiscal discipline by setting limits on deficits.
- Achieve long-term fiscal stability for sustainable growth.
- Improve transparency and accountability in fiscal management.
- Create space for the RBI to focus on inflation management.

Key Provisions (Original Act, 2003)

- **Revenue Deficit:** To be eliminated by March 2008.
- **Fiscal Deficit:** To be capped at 3% of GDP by March 2008.
- Govt prohibited direct borrowing from RBI (except short-term).
- Budget to include 3 Statements:
  - Medium-Term Fiscal Policy Statement
  - Fiscal Policy Strategy Statement
  - Macroeconomic Framework Statement

Challenges and Relaxations

- **2007–08 Global Financial Crisis:** Targets were suspended in 2009 to allow counter-cyclical spending.
- **Persistent Shortfalls:** Tax evasion, low revenue mobilization, and welfare spending made deficit reduction difficult.
- **COVID-19 Shock:** Fiscal deficit shot up to 9.2% of GDP in FY21 due to welfare spending and economic slowdown.

N.K. Singh Committee Recommendations (2017) :

- **Debt-to-GDP target:** 60% by FY23 (40% Centre, 20% States).
- **Fiscal Deficit Roadmap:**
  - 3% of GDP by FY20
  - 2.8% of GDP in FY21
  - 2.5% of GDP by FY23
- **Escape Clause:** Deviation of up to 0.5% of GDP allowed for crises (war, calamity, slowdown, reforms).
- **Independent Fiscal Council:** 3-member body to monitor fiscal management.
- **Transparency:** Publish annual debt management strategy; realistic medium-term fiscal policy.
- **Shift in focus:** From rigid fiscal deficit targets to long-term **debt sustainability framework**.

Recent Trends

- Fiscal deficit widened sharply during COVID-19 but is being gradually reduced:
  - 9.2% of GDP in FY21
  - 6.8% of GDP in FY22
  - The government aims to bring it down to 4.5% by FY26.
- Revenue deficit and primary deficit remain concerns due to high subsidy bills and weak tax buoyancy.

Criticisms of FRBM

- **Rigid fiscal targets** limit the government's ability to increase spending during economic crises (restricts counter-cyclical policy).
- **Unrealistic revenue projections** : frequent breaches of targets.
- **Weak enforcement** ; no penalties for missing targets; deadlines often shifted or suspended.
- **Overemphasis on deficits** while ignoring **quality of expenditure** (e.g., capital vs. revenue spending).
- **Neglect of state finances** : FRBM largely focuses on the Centre, though states also face fiscal stress.
- **Lack of independent oversight** : government sets and monitors its own targets.

Value Addition
Value Addition
Keywords : Resource Allocation, Revenue Receipts, Capital Receipts, Revenue Expenditure, Capital Expenditure, Fiscal Deficit, Revenue Deficit, Primary Deficit, Effective Revenue Deficit, Deficit Financing, FRBM Act, Fiscal Consolidation, Disinvestment & Asset Monetisation, Outcome Budgeting, Medium-Term Expenditure Framework (MTEF), Gender Budgeting, Public Financial Management System (PFMS), GST & Fiscal Federalism, Debt Sustainability

Mains Question for Practice :
Q1. Define government budgeting. How does it act as an instrument of fiscal policy in India?
Q2. Critically examine the effectiveness of India's budgetary process in achieving fiscal discipline and developmental priorities.
Q3. Discuss the significance of transparency and accountability in government budgeting. Suggest reforms to strengthen them.
Q4. Evaluate the role of gender budgeting and green budgeting in promoting inclusive and sustainable development.
Q5. The Indian budget is often criticized for being more of an accounting exercise than a policy statement. Do you agree? Give reasons.

Acronyms
1.Objectives of Government Budgeting
"FISCAL"
- **F** – Fiscal discipline (deficit control, debt management)
- **I** – Inclusive growth (social sector spending)
- **S** – Stabilization of economy (counter-cyclical role)
- **C** – Capital formation (infrastructure investment)
- **A** – Allocation of resources (priority sectors, welfare)
- **L** – Long-term development (sustainability, green growth)

2. Challenges in Government Budgeting
"DEFICIT"
- **D** – Deficit financing & rising public debt
- **E** – Expenditure rigidity (subsidies, interest payments)
- **F** – Fiscal federalism issues (Centre–State imbalances)
- **I** – Inefficient tax collection (low tax-to-GDP ratio)
- **C** – Crowding out of private investment
- **I** – Inadequate transparency & data reliability
- **T** – Target slippages & populist measures

3.Reforms Needed in Budgeting
"SMART"
- **S** – Simplification & transparency (clear fiscal data)
- **M** – Medium-term expenditure frameworks (3–5 year outlook)
- **A** – Accountability (parliamentary oversight, audits)
- **R** – Results-oriented budgeting (outcome-based allocations)
- **T** – Technology-driven systems (e-governance, AI for monitoring)

Navigating the Syllabus: What You Need to Know

LPG & Industry

- Pre-LPG Industrial Policies (1948–1990)
- 1991 Industrial Policy (LPG Reforms)
- Impact of LPG
- Post-1991 Developments
  - SEZ Policy (2000, SEZ Act 2005).
  - National Manufacturing Policy (2011)
  - Make in India (2014)Start-up India (2016)
  - PLI Scheme (2020)
- Recent Announcements (2025–26)

UPSC Previous Year Questions

Question	Nature of Question	Core Demand
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.(2023)	Manufacturing Sector + MSMEs + Government Policies	Assess current MSME and manufacturing policies in promoting industrial growth and GDP share
How would the recent phenomena of protectionism and currency manipulations in world trade affect macroeconomic stability of India? (2018)	Trade Protectionism + Currency Manipulation + Macroeconomic Stability	Analyze impact of global trade barriers and currency moves on India's external and internal stability
How globalization has led to the reduction of employment in the formal sector of the Indian economy? Is increased informalization detrimental to the development of the country? (2016)	Globalization + Formal Employment Decline + Informalization	Examine globalization's role in formal sector job losses and assess effects of rising informalization
Foreign direct investment in the defence sector is now set to be liberalized. What influence is this expected to have on Indian defence and economy in the short and long run? (2014)	FDI + Defence Sector + Economic Impact	Discuss liberalized FDI's immediate and long-term effects on defence industry and overall economy
Examine the impact of liberalization on companies owned by Indians. Are they competing with the MNCs satisfactorily? (2013)	Liberalization + Indian Companies + Competition with MNCs	Evaluate Indian companies' performance post-liberalization and their competitiveness against MNCs

Introduction

After independence, India adopted a state-led industrialization strategy with the Industrial Policies of 1948 and 1956, which emphasized public sector dominance, heavy industries, and import substitution. This approach helped establish a base of core industries, but over time it also created inefficiencies, red tape, and the "license-permit raj." By the 1980s, industrial growth slowed, productivity remained low, and India faced a severe balance of payments crisis. These challenges exposed the limitations of the protectionist model. The turning point came with the New Industrial Policy of 1991, which introduced the Liberalization-Privatization-Globalization (LPG) framework. It dismantled licensing requirements, opened sectors to private and foreign investment, and integrated India with the global economy—marking a decisive shift in the country's industrial and economic journey.

Industrial Policies in the Pre-LPG Era (1948–1991)

Industrial Policy	Key Features & Objectives
Industrial Policy Resolution, 1948	• Marked the beginning of planned industrial development in independent India. • Classified industries into four categories: strategic (state monopoly), basic industries (state control with private participation), important industries (private under state regulation), and others (open to private sector). • Set the foundation for a mixed economy.
Industrial Policy Resolution, 1956	• Considered the 'Economic Constitution' of India's industrialization. • Expanded the role of the public sector; industries divided into Schedule A (exclusive state monopoly), Schedule B (progressively state-owned), and Schedule C (private sector with state regulation). • Emphasized import substitution, self-reliance, and heavy industries. • Paved the way for the dominance of the License-Permit-Quota Raj.
Industrial Policy Statement, 1973	• Introduced MRTP Act (1969) and FERA (1973) to curb concentration of economic power and regulate foreign companies. • Stressed on the growth of small-scale industries (SSIs). • Restricted expansion of large business houses without government approval.
Industrial Policy Statement, 1977	• Focused on promotion of SSIs, cottage and village industries. • Introduced concept of district industries centers (DICs). • Emphasized decentralization and employment generation. • Public sector to focus on basic and strategic industries.
Industrial Policy Statement, 1980	• Attempted to revive industrial growth by relaxing controls. • Encouraged modernization and technological upgradation. • Stressed on export orientation and efficiency. • First step toward gradual liberalization before 1991.
Industrial Policy Statement, 1990	• Aimed at partial liberalization of the industrial regime. • Introduced policy for greater autonomy to public sector enterprises. • Encouraged private sector participation in certain core industries. • However, reforms were limited and inadequate, setting the stage for the 1991 LPG reforms.

Issues of Industrial Policies in the Pre-LPG Era (1948–1991)

- **License-Permit-Quota Raj** : Industrial licensing created a rigid system where entrepreneurs required government approval for almost every decision—expansion, diversification, or imports. This not only delayed projects but also encouraged red-tapism, corruption, and rent-seeking behavior.
- **Dominance but Inefficiency of Public Sector** : The 1956 Industrial Policy reserved core sectors for public enterprises. While intended to build a strong industrial base, many PSUs became overstaffed, technologically outdated, and financially unviable, turning into a burden on public finances.
- **Neglect of Consumer Goods Industries** : The Mahalanobis model emphasized heavy industries and capital goods, leaving consumer goods industries underdeveloped. This caused shortages, rising prices, and black-market practices, affecting people's welfare.
- **Restrictions on Large Business Houses** : The MRTP Act (1969) and FERA (1973) tried to prevent concentration of economic power, but in practice, they stifled growth of big firms. This

discouraged economies of scale and limited India's competitiveness in global markets.

- **Over-Regulation of Foreign Investment and Technology** : Stringent FERA rules capped foreign equity at 40%, which discouraged multinational companies from investing. As a result, Indian industries lagged in advanced technology and innovation.
- **Small-Scale Industry (SSI) Reservation Policy** : Many industries were reserved exclusively for SSIs to generate employment. While this protected small units, it prevented modernization, scaling up, and international competitiveness in several sectors.
- **Low Productivity and Inefficiency** : Excessive protection from foreign competition led to complacency among Indian industries. Productivity remained low, products were often of poor quality, and costs were high compared to global standards.
- **Regional Imbalances** : Despite policy intent, industrial growth concentrated in states like Maharashtra, Gujarat, and Tamil Nadu. Backward regions (Bihar, Odisha, MP) remained neglected, deepening regional inequalities.
- **Slow Industrial Growth ("Hindu Rate of Growth")** : Industrial growth stagnated at ~3–4% annually. Lack of private sector dynamism, overdependence on state intervention, and restrictive policies contributed to this sluggish growth.
- **1991 Balance of Payments Crisis** : By the late 1980s, inefficiencies, fiscal imbalances, and poor export competitiveness led to a severe foreign exchange crisis. India was forced to pledge gold reserves and adopt the 1991 Liberalization, Privatization, and Globalization (LPG) reforms.

Industrial Policy of 1991

- **Background :** Announced on 24th July 1991 by then Finance Minister Dr. Manmohan Singh in the backdrop of the Balance of Payments Crisis, rising fiscal deficit, and inefficiencies of the License-Permit-Quota Raj.It marked a paradigm shift from a state-controlled economy to a market-oriented one, ushering in the era of Liberalization, Privatization, and Globalization (LPG).
- **Key Features**
  - **Abolition of Industrial Licensing :** The policy ended the long-standing License Raj by abolishing licensing requirements for most industries, except for a small list of sectors related to defense, hazardous chemicals, and strategic concerns. This was a major reform that reduced red-tapism, cut bureaucratic control, and encouraged faster establishment and expansion of industries.
  - **Reduction in Public Sector Monopoly :** The public sector was confined to a narrow set of strategic industries such as atomic energy, railways, and defense. Many areas previously reserved exclusively for public enterprises were opened up to private players, thereby increasing competition, efficiency, and investment.
  - **Encouragement of Foreign Direct Investment (FDI) :** The policy allowed automatic approval of FDI up to **51%** in high-priority industries and liberalized technology agreements with foreign companies. This marked the beginning of India's global integration by attracting foreign capital, modern technology, and managerial expertise.
  - **Dilution of MRTP Act Controls :** The Monopolies and Restrictive Trade Practices (MRTP) Act earlier restricted large firms from expansion, mergers, or takeovers without prior government approval. The 1991 reforms diluted these provisions, allowing large industrial houses to expand freely and achieve economies of scale, thereby increasing competitiveness.
  - **Foreign Exchange Reforms :** The earlier rigid system of foreign exchange control was replaced with a more market-oriented system. The rupee underwent partial convertibility on the current account, laying the foundation for a more competitive and globally integrated currency regime.
  - **Trade Policy Liberalization :** The policy dismantled the system of import licensing for most goods, reduced tariffs, and promoted export orientation. This encouraged Indian industries to compete globally, diversify production, and

modernize in response to international demand.

- **Support to Small-Scale Industries (SSIs) :** While encouraging overall liberalization, the policy continued to provide protection to SSIs by reserving certain industries for them. At the same time, emphasis was laid on upgrading technology and productivity in this sector to ensure competitiveness.

Effects of LPG (1991 Reforms) on the Indian Economy

- **Impact on Growth and Productivity :** Economic growth accelerated after 1991. From the Hindu Rate of Growth (~3.5%) during 1950–80s, GDP growth rose to 5.5% in the 1990s, further to 6–7% in the 2000s, and averaged ~7% in the last decade. Productivity gains came from competition, technology adoption, and private sector efficiency.
- **Sectoral Transformation and Services Boom :** Services became the main growth driver, especially IT, telecom, and finance. India's IT exports touched **$260 billion in 2023–24**, making India a global digital hub. However, growth was less labour-intensive, creating concerns of "jobless growth."
- **Integration into Global Trade :** India's trade openness improved substantially. Trade-to-GDP ratio increased from 15% in 1991 to ~47% today. Exports diversified from tea and textiles to pharmaceuticals, engineering goods, and software. Forex reserves rose from $1.2 billion in 1991 to over $600 billion in 2024, strengthening external resilience.
- **Foreign Direct Investment (FDI) and Capital Inflows :** FDI, negligible before 1991, expanded rapidly. India attracted $71 billion FDI in 2023–24, supported by liberalized FDI norms across telecom, aviation, retail, and manufacturing. This brought modern technology, global capital, and managerial expertise.
- **Poverty Reduction and Rising Middle Class :** Economic reforms contributed to poverty reduction. Extreme poverty fell from 55% (2005–06) to around 16% in 2019–20 (World Bank). A new middle class expanded domestic demand for housing, automobiles, healthcare, and consumer goods.
- **Rise of Indian Multinationals :** Domestic firms such as Infosys, TCS, Reliance, and Tata Group became global players. Expanded access to foreign markets and capital allowed Indian firms to invest abroad, increasing India's global corporate footprint.
- **Infrastructure Development :** Liberalization enabled large-scale investment in infrastructure. Projects like the Golden Quadrilateral improved connectivity. Private participation in sectors such as power, airports, and telecom increased. Yet, delays and cost overruns remained challenges.
- **Financial Sector Reforms :** The financial sector modernized with interest rate deregulation, SEBI strengthening, and NSE introduction. RBI gained greater autonomy in monetary policy. Today, India has one of the most vibrant stock markets, attracting global portfolio investors.
- **Regional and Sectoral Inequalities :** Growth remained concentrated in industrialized and coastal states such as Maharashtra, Gujarat, Karnataka, and Tamil Nadu. BIMARU states lagged behind. Urban India surged ahead of rural India, widening inequality between regions and sectors.
- **Vulnerability to External Shocks :** Higher global integration increased exposure to external volatility. The Asian financial crisis (1997), global financial crisis (2008), and COVID-19 shock (2020) disrupted India's growth. Heavy dependence on crude imports continues to pose risks to fiscal stability.

Post-1991 Developments

1.SEZ Policy

- **Background :** Special Economic Zones (SEZs) were introduced in India in **2000** (formalised through the **SEZ Act, 2005** and SEZ Rules, 2006) as part of post-liberalisation industrial and trade reforms. They were designed to overcome the shortcomings of earlier Export Processing Zones (EPZs) by providing a globally competitive environment for exports and investment
- **Objectives of the SEZ Policy**
  - Promote exports of goods and services.
  - Attract foreign direct investment (FDI) into India.
  - Facilitate technology transfer and global linkages.

- Generate employment and boost regional development.
- Improve infrastructure through private participation.

- **Key Features**
  - Treated as **deemed foreign territory** for trade operations, duties, and tariffs.
  - Duty-free imports/domestic procurement of goods for development and operation.
  - 100% income tax exemption for first 5 years, 50% for next 5 years, and further exemptions for reinvestment of profits.
  - Single-window clearance and simplified procedures.
  - 100% FDI allowed through the automatic route in SEZ units (except restricted sectors).
  - Private sector participation encouraged in SEZ development.
- **Achievements**
  - As of March 2025, India had **270+ operational SEZs**, with majority in IT/ITES, engineering, pharmaceuticals, and textiles.
  - SEZs accounted for around **30% of India's total exports**
  - Generated direct employment for over **2.5 million people**.
  - Enhanced India's integration with global supply chains, especially in IT and pharma sectors.
- **Challenges**
  - Regional concentration of SEZs in a few states like Tamil Nadu, Maharashtra, Karnataka, and Gujarat, limiting balanced growth.
  - Land acquisition disputes and farmer protests (e.g., Nandigram, 2007) created social resistance.
  - Revenue losses due to tax exemptions raised concerns for fiscal health.
  - Some SEZs became "real estate hubs" rather than industrial production centres.
  - WTO compliance issues as tax concessions were challenged as export subsidies.
- **Recent Policy Developments**
  - The **SEZ Amendment Bill, 2019** allowed trusts and other entities to set up SEZ units, widening participation.
  - The government is now working on transforming SEZs into **"Development of Enterprise and Service Hubs (DESH)"**, aimed at boosting manufacturing and services with broader incentives.

2.National manufacturing policy 2011

- **Background :** By 2011, India's manufacturing sector had stagnated at around **16–17% of GDP**, far below the levels of successful industrial economies. The sector was struggling with poor infrastructure, complex regulations, and low global competitiveness. To address this, the Government of India announced the **New Manufacturing Policy (NMP) in November 2011**, the first comprehensive policy framework dedicated exclusively to manufacturing.
- **Objectives**
  - Increase the share of manufacturing in GDP to **25% by 2022**.
  - Create **100 million additional jobs** in the manufacturing sector.
  - Enhance global competitiveness of Indian industry through skill development, innovation, and R&D.
  - Promote environmentally sustainable and green manufacturing.
  - Encourage balanced regional development through industrial corridors and clusters.
- **Key Features**
  - **National Investment and Manufacturing Zones (NIMZs):**
    - Large industrial townships with world-class infrastructure, managed under Special Purpose Vehicles (SPVs).
    - Equipped with simplified regulations, single-window clearances, and integrated townships for workers.
    - 16 NIMZs were approved in principle, linked to the Delhi–Mumbai Industrial Corridor and other major projects.
  - **Simplification of Business Regulations:**
    - Emphasis on reducing compliance burden, moving towards electronic clearances, and minimizing inspector raj.
    - Aligned with India's later "Ease of Doing Business" reforms.
  - **Skill Development:**
    - Integration with the National Skill Development Mission.

        - Focus on vocational training, apprenticeships, and industry–academic collaboration to meet skilled labour demand.
    - **Technology and R&D Promotion:**
        - Incentives for green technology, energy efficiency, and innovation-driven growth.
        - Public–Private Partnerships encouraged in R&D and cluster-based innovation centres.
    - **Public–Private Partnerships (PPP):**
        - PPP models for infrastructure development, skill training institutes, and industrial clusters.
- **Achievements (2011–2025)**
    - **Industrial Corridors and Clusters:** NIMZs have been integrated into projects like the **Delhi–Mumbai Industrial Corridor, Amritsar–Kolkata Industrial Corridor**, and **Chennai–Bengaluru Corridor**.
    - **Policy Continuity:** The NMP's goals laid the foundation for **Make in India (2014)** and **Production Linked Incentive (PLI) schemes (2020 onwards)**.
    - **Sectoral Success:** Electronics, mobile phones, and pharmaceuticals saw growth due to combined effect of NMP vision + PLI incentives. India became the **second-largest mobile manufacturer** globally by 2023.
    - **Exports:** Manufacturing exports touched **$450 billion in 2022–23**, driven by engineering goods, chemicals, and electronics.
    - **Jobs:** Manufacturing provided direct and indirect employment to ~60 million workers, though the **100 million target remains unmet**.
- **Challenges and Limitations**
    - **Missed GDP Target:** Manufacturing's share remains around **17–18% of GDP in 2024–25**, far below the 25% goal.
    - **Land Acquisition Issues:** Land and environmental clearances slowed the rollout of NIMZs.
    - **Job Creation Lag:** Automation and capital-intensive production limited job creation, raising concerns of "jobless industrialization."
    - **Regional Disparities:** Growth remained concentrated in states like Gujarat, Maharashtra, Tamil Nadu, and Karnataka, while eastern and northern states lagged.
    - **Infrastructure Bottlenecks:** Logistics, energy supply, and regulatory delays still hinder global competitiveness.

3.Make in india

- **Context :** Launched on **25th September 2014**, the Make in India initiative was aimed at reviving India's manufacturing sector, creating jobs, and transforming India into a global hub for design, innovation, and production. It emerged in the backdrop of declining industrial growth (IIP growth had slowed to <2% in 2012–13), a weak investment climate, and the need to generate large-scale employment for India's young population.
- **Objectives**
    - Increase the share of manufacturing in GDP to **25% by 2022–23**.
    - Generate **100 million additional jobs** in manufacturing.
    - Boost domestic value addition and reduce import dependence.
    - Attract foreign investment and integrate India into global value chains.
    - Promote innovation, R&D, and skill development across industries.
- **Key Features**
    - **Focus Sectors:** Identified **25 priority sectors** such as automobiles, defence manufacturing, electronics, textiles, chemicals, and renewable energy.
    - **FDI Liberalisation:** Automatic approval route extended to several sectors (e.g., 100% in railways infrastructure, 74% in defence).
    - **Ease of Doing Business Reforms:** Simplification of rules, faster clearances, online single-window systems, and insolvency reforms (IBC, 2016).
    - **Skill Development Linkages:** Integration with Skill India and Startup India to create a skilled workforce.

- **Infrastructure Push:** Emphasis on industrial corridors (DMIC, CBIC), smart cities, and logistics to improve industrial competitiveness.
- **Digital Promotion:** Branding of India as an investment destination globally through roadshows, investor summits, and the iconic lion logo made of cogs.

- **Achievements (2014–2025)**
  - **FDI Growth:** India attracted record FDI inflows of **$83.6 billion in 2021–22**, with cumulative inflows crossing **$950 billion (2000–2024)**.
  - **Sectoral Gains:** Electronics and mobile manufacturing surged; India became the **second-largest mobile phone producer** in the world (2023). Automobile and defence production also expanded significantly.
  - **Ease of Doing Business:** India improved its rank from **142 in 2014 to 63 in 2020** (World Bank index), reflecting regulatory simplification.
  - **Export Performance:** Merchandise exports crossed **$450 billion in 2022–23**, led by engineering goods, chemicals, and electronics
  - **Job Creation:** Millions of jobs were created in electronics, logistics, and textiles, though the ambitious 100 million target remains unmet.
- **Challenges**
  - **Manufacturing Stagnation:** Despite efforts, manufacturing's GDP share hovers at **17–18% in 2025**, below the 25% target.
  - **Jobless Growth:** New jobs have been fewer than expected due to automation, capital-intensive investments, and global competition.
  - **Regional Imbalances:** Benefits concentrated in states like Maharashtra, Karnataka, Gujarat, and Tamil Nadu, with weaker impact in eastern and northern states.
  - **Import Dependence:** High reliance on imports of semiconductors, defence equipment, and critical technologies persists.
  - **Global Disruptions:** COVID-19 pandemic and geopolitical tensions slowed investment flows and disrupted supply chains.

4.Start up india

- **Context :** The **Start-up India initiative** was launched on **16th January 2016** by the Government of India to build a strong eco-system for nurturing innovation, entrepreneurship, and job creation. It emerged against the backdrop of India's growing youth population, rising digital penetration, and the need to diversify beyond traditional employment sources.
- **Objectives**
  - Promote entrepreneurship and innovation in India.
  - Facilitate easier financing and reduce regulatory hurdles for new ventures.
  - Encourage job creation and wealth generation through start-ups.
  - Position India as a hub for innovation-driven enterprises globally.
- **Key Features**
  - **Definition of Start-up:** Entity less than 10 years old, turnover < ₹100 crore, and working towards innovation or improvement in products/services.
  - **Tax Incentives:** 3-year tax holiday in the first 10 years; exemption from capital gains tax under specific conditions.
  - **Simplified Compliance:** Self-certification for 9 labour and 3 environment laws; fast-track patent examination at lower costs.
  - **Funding Support:** Creation of a **₹10,000 crore Fund of Funds** managed by SIDBI to provide financial support.
  - **Incubation & Support:** Establishment of incubation centres, research parks, and industry–academia collaboration hubs.
  - **Single Window Portal:** Start-up India Hub for registration, networking, and grievance redressal.
  - **Easier Exit:** Fast-track exit within 90 days under the Insolvency and Bankruptcy Code (IBC, 2016).
- **Achievements (2016–2025)**
  - **Start-up Growth:** As of January 2024, India has **over 115,000 DPIIT-recognised start-ups**, making it the **third-largest start-up ecosystem** in the world after the US and China.

- **Unicorns:** India has produced **110+ unicorns (valuation > $1 billion)** by 2024 across fintech, edtech, e-commerce, and SaaS.
- **Employment:** Start-ups have created **12–13 lakh direct jobs** and millions of indirect opportunities.
- **Global Recognition:** India is seen as a global hub for affordable and scalable innovation, especially in fintech, health-tech, agritech, and clean-tech.
- **Digital Boost:** Integration with UPI, JAM Trinity, and Digital India has enabled start-ups to scale rapidly with lower costs of entry.

- **Challenges**
  - **Access to Finance:** Early-stage start-ups still struggle to raise funds, especially outside metro cities.
  - **High Failure Rate:** Over 80–90% of start-ups fail due to poor business models, cash flow issues, and weak market strategies.
  - **Regulatory Hurdles:** Despite reforms, compliance requirements and taxation complexity remain pain points.
  - **Regional Imbalance:** Most start-ups are concentrated in Bengaluru, Delhi-NCR, and Mumbai, while Tier-2 and Tier-3 cities lag.
  - **Global Competition:** Indian start-ups face strong competition from better-capitalised US and Chinese start-ups.

5.PLI Scheme

- **Context :** Introduced in 2020 under the Atmanirbhar Bharat initiative, the PLI scheme incentivizes firms based on their incremental domestic production. Initially launched for sectors like mobile devices and pharmaceuticals, it later expanded to cover **14 strategic sectors** with a cumulative outlay of **₹1.97 lakh crore**.
- **Objectives**
  - Boost domestic manufacturing and reduce import dependency.
  - Attract significant investment in priority sectors.
  - Drive innovation, integration into global value chains, and job creation.
  - Enhance exports and strengthen India's industrial base.
- **Key Features**
  - **Performance-Based Incentives**: Firms receive financial support linked to incremental production volumes.
  - **Sectoral Focus**: Covers 14 sectors including electronics, pharmaceuticals, automobiles, textiles, telecom, food processing, and renewable energy.
  - **Flexible Disbursement**: Incentives are tied to performance milestones, ensuring delivery-oriented outcomes.
  - **Achievements (2020–2025)**
  - **Investments Realised**: Around **₹1.76 lakh crore** committed across 800+ approved projects.
  - **Production Growth**: Generated about **₹16.5 lakh crore** in sales and production, with projections to cross ₹17 lakh crore by mid-2025.
  - **Employment**: Over **1.2 million (12 lakh)** direct and indirect jobs created.
  - **Sectoral Highlights**:
    - **Electronics & Mobiles**: Production rose from ₹2.13 lakh crore (2020–21) to ₹5.25 lakh crore (2024–25); mobile exports increased nearly eightfold.
    - **Pharmaceuticals**: India turned into a net exporter of bulk drugs; cumulative sales reached ₹2.66 lakh crore with strong export growth.
    - **Electronics Components**: A ₹22,919 crore PLI launched in 2025 to reduce import dependence.
  - **Exports**: Electronics exports recorded **32% growth**, reaching ₹2.87 lakh crore in FY25. IT hardware under PLI 2.0 saw ₹12,000+ crore in production.
  - **Government Disbursements**: Incentives worth ₹21,534 crore disbursed by mid-2025.
  - **Textile Sector**: Attracted ₹7,343 crore investment, with turnover of ₹4,648 crore and exports worth ₹538 crore.
- **Challenges & Limitations**
  - **Manufacturing Share Unchanged**: Contribution of manufacturing to GDP remains at **15–17%**, far below the 25% target.
  - **Underperformance vs Targets**: As of late 2024, production by PLI participants achieved only ~37% of government targets,

while incentives disbursed were under 10% of allocations.
    - **Phasing Out**: Government signaled discontinuation of broad PLI coverage post-2025 due to underperformance, shifting towards narrower, component-focused schemes.
    - **Concentration of Benefits**: Electronics and pharma sectors absorbed nearly 70% of total disbursements, while others like textiles and renewable energy saw limited success.
- **Significance**
    - The PLI scheme represents a **shift to performance-based industrial incentives** rather than input subsidies.
    - Triggered significant investment, output growth, job creation, and export gains in select sectors.
    - Strengthened India's positioning in global supply chains, particularly in electronics, mobile phones, and pharmaceuticals.
    - Its recalibration towards targeted manufacturing (e.g., electronics components, semiconductors) is expected to shape India's industrial policy focus in the coming decade.

Recent Industrial Policy Announcements (Union Budget 2025–26)

1. National Manufacturing Mission

- **Context**: Announced to further strengthen Make in India, covering small, medium, and large industries.
- **Focus Areas**:
    - Ease and cost of doing business.
    - Preparing a future-ready workforce for in-demand jobs.
    - Strengthening the MSME sector.
    - Access to modern technology.
    - Quality and globally competitive products.
- **Clean Tech Manufacturing**: Support for domestic value addition in solar PV cells, EV batteries, motors and controllers, electrolyzers, wind turbines, high-voltage transmission equipment, and grid-scale batteries.
- **Significance**: Aims to provide policy support, execution roadmaps, and monitoring frameworks at both central and state levels to accelerate industrial growth.

2. Focus Product Scheme for Footwear & Leather

- **Objective**: Enhance productivity, quality, and competitiveness of India's footwear and leather industry.
- **Key Support**:
    - Assistance for design capacity.
    - Promotion of component manufacturing and machinery.
    - Support for both **leather and non-leather footwear**.
- **Expected Outcomes**:
    - Employment generation for **22 lakh persons**.
    - Turnover of **₹4 lakh crore**.
    - Exports worth **₹1.1 lakh crore**.
- **Significance**: Addresses a **labour-intensive sector**, ensuring job creation and entrepreneurship opportunities.

3. National Action Plan for Toys

- **Objective**: Position India as a **global hub for toys** under the "Made in India" brand.
- **Key Focus**:
    - Development of toy clusters.
    - Skill development and training.
    - Establishment of a sustainable, innovative manufacturing ecosystem.
- **Significance**: Enhances domestic production, reduces import dependence, and creates a global identity for Indian-designed toys.

4. Support for Food Processing – Purvodaya Commitment

- **Announcement**: Establishment of a **National Institute of Food Technology, Entrepreneurship and Management in Bihar**.
- **Expected Outcomes**:
    - Strengthening of food processing in Eastern India.
    - Enhanced **value addition for farmers**.
    - Skilling and entrepreneurship opportunities for rural youth.

- **Significance**: Links industrial policy with rural development, supporting the broader goal of inclusive growth.

Value Addition

Keywords : FDI Liberalisation, Disinvestment & Privatisation, Manufacturing Share, Jobless Growth, Export Competitiveness, Supply Chain Resilience, Ease of Doing Business, Industrial Corridors, Technology Upgradation, Skilling & Apprenticeship, Regional Imbalance, Environmental Compliance

Mains Question for Practice :

Q1. Trace the evolution of India's industrial policy since independence. How did the 1991 reforms alter its trajectory?

Q2. Critically examine the impact of liberalization on industrial growth, employment, and competitiveness in India.

Q3. "The 1991 economic reforms dismantled the License Raj but created new challenges for inclusive industrialization." Discuss.

Q4. Evaluate the effectiveness of post-1991 industrial policies like "Make in India" and Production-Linked Incentive (PLI) in boosting manufacturing.

Q5. Has liberalization widened regional and sectoral disparities in industrial growth? Substantiate with examples.

Ready - Made Template

Introduction and Conclusion

Intros

- India's early industrial policies, guided by the 1948 and 1956 resolutions, placed the public sector at the commanding heights of the economy. While this built a foundation of core industries, the excessive controls of the License-Permit-Quota Raj gradually turned into a drag on efficiency, competitiveness, and innovation.
- The 1991 New Industrial Policy, announced in the backdrop of a balance of payments crisis, marked a watershed in India's economic history. By dismantling industrial licensing, opening to FDI, and reducing state monopolies, it redefined the relationship between government, industry, and the global economy.
- Special Economic Zones were introduced as enclaves of liberalized trade and investment to overcome domestic policy rigidities. By offering fiscal incentives and world-class infrastructure, SEZs aimed to integrate India into global supply chains.
- The National Manufacturing Policy was India's first comprehensive attempt to boost manufacturing, create 100 million jobs, and raise its share to 25% of GDP. It introduced industrial corridors, skill initiatives, and NIMZs as instruments of transformation.
- Launched in 2014, Make in India sought to turn the country into a global manufacturing hub. With its focus on 25 sectors, FDI liberalization, and regulatory reforms, it symbolized India's ambition to shift from being a service-driven to a manufacturing-led economy.
- Start-up India was launched to channel India's demographic dividend into innovation and entrepreneurship. With tax incentives, funding support, and easier compliance, it nurtured one of the world's largest start-up ecosystems.
- The Production Linked Incentive scheme marked a shift to performance-based industrial support. By rewarding incremental production in strategic sectors, it sought to reduce import dependence, attract investment, and integrate India with global value chains.
- India's industrial policy since 1991 reflects a journey from dismantling controls to proactively promoting competitiveness. From LPG reforms to PLI, the common thread has been building a globally integrated and resilient manufacturing base.

Conclusions

- The pre-LPG era delivered industrial self-reliance but also created structural bottlenecks. Its legacy highlighted the need for reforms that balance state guidance with market dynamism, setting the stage for 1991.
- The LPG reforms unlocked growth, competition, and global integration. Yet, the experience also underscored that liberalization alone cannot ensure jobs, inclusivity, or balanced development — reforms must be continuously recalibrated.
- SEZs boosted exports and employment but also created fiscal costs and regional imbalances. Their evolution into DESH hubs reflects India's attempt to refine its industrial strategy for greater inclusivity and competitiveness.

- Despite progress in electronics and pharmaceuticals, the National Manufacturing Policy fell short of its ambitious targets. The lesson is clear: manufacturing growth must be backed by robust infrastructure, skilling, and ease of doing business.
- Make in India revitalized investor sentiment and expanded FDI inflows, but the challenge of stagnant manufacturing share and job creation persists. Its success depends on deepening reforms and strengthening MSMEs.
- Start-up India positioned India as a global hub of affordable innovation, yet regional concentration and financing gaps remain. The next step is to scale this momentum beyond metros to make entrepreneurship truly inclusive.
- PLI has catalyzed investments in electronics, pharma, and automobiles, but uneven performance across sectors shows the need for sharper targeting. Its recalibration can define India's industrial strategy in the coming decade.
- India's industrial future lies not just in liberalization but in innovation, sustainability, and employment generation. A "LPG 2.0" approach — balancing openness with resilience — is essential for realizing the goal of becoming a global manufacturing hub.

Acronyms
Positive Effects of Liberalization
"GLOBAL"

- **G** – GDP growth accelerated (post-1991 ~6–7%)
- **L** – Liberal trade & FDI inflows increased
- **O** – Outsourcing & IT boom (India as global hub)
- **B** – Business environment improved (end of License Raj)
- **A** – Access to technology & global markets
- **L** – Living standards improved (rising middle class, consumption)

Negative Effects of Liberalization
"RISKS"

- **R** – Regional & sectoral disparities widened
- **I** – Informal sector dominance continued
- **S** – Small-scale industries suffered (competition from imports)
- **K** – K-shaped growth → inequality between rich & poor
- **S** – Service-led growth → manufacturing lag, jobless growth

3. Impact on Industrial Growth
"BOOST" (mixed results)

- **B** – Barriers reduced (FDI, trade liberalization)
- **O** – Opportunities for private sector expanded
- **O** – Output increased but concentrated in few sectors
- **S** – Structural changes (shift to services over industry)
- **T** – Technology transfer but dependence on MNCs grew

UNIT 5 Infrastructure: Energy, Ports, Roads, Airports, Railways etc.

Navigating the Syllabus: What You Need to Know

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

- Introduction
- Energy Infrastructure
  - India's Energy Landscape
  - Challenges in Energy Infrastructure
  - Government Initiatives in Energy Infrastructure
  - National Green Hydrogen Mission
- Transport Sector
  - a) Roads and Highways
    - Current Status
    - Key Challenges
    - Major Government Initiatives
  - b) Railways
    - Current Status
    - Key Challenges
    - Major Government Initiatives
    - Kavach System
    - Regional Rapid Transit System (RRTS)
  - c) Ports and Shipping
    - Overview
    - Key Challenges
    - Major Government Initiatives
    - National Maritime Vision 2030
  - d) Airports and Aviation
    - Overview
    - Key Challenges
    - Major Government Initiatives
- National Infrastructure Pipeline (NIP)

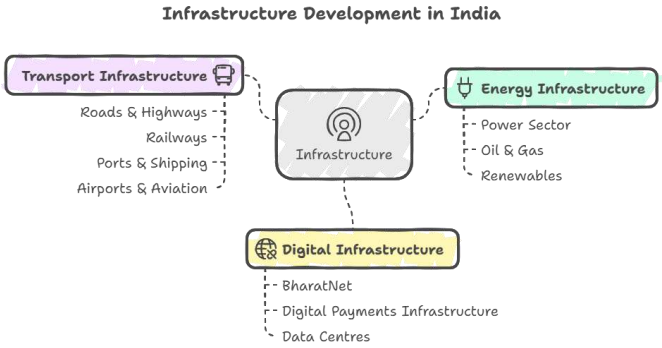
UPSC Previous Year Questions

Question	Nature of Question	Core Demand
Why is Public Private Partnership (PPP) required in infrastructural projects? Examine the role of PPP model in the redevelopment of Railway Stations in India. (2022)	PPP + Infrastructure + Railways	Explain rationale for PPP in infrastructure and assess its role in railway redevelopment
Do you think India will meet 50 percent of its energy needs from renewable energy by 2030? Justify your answer. How will the shift of subsidies from fossil fuels to renewables help achieve the above objectives? Explain. (2022)	Renewable Energy + Subsidy Reform + Energy Transition	Evaluate feasibility of 50% renewables by 2030 and explain role of subsidy shift

"Access to affordable, reliable, sustainable and modern energy is the sine qua non to achieve Sustainable Development Goals (SDGs)". Comment on the progress made in India in this regard. (2018)	Energy Access + SDGs + Sustainable Development	Assess India's progress in providing affordable, reliable and sustainable energy
What are 'Smart Cities'? Examine their relevance for urban development in India. Will it increase rural-urban differences? Give arguments for 'Smart Villages' in the light of PURA and RURBAN Mission. (2016)	Smart Cities + Urban Development + Rural-Urban Divide	Define Smart Cities, assess urban impact, and argue for Smart Villages via PURA/RURBAN
To what factors can the recent dramatic fall in equipment costs and tariff of solar energy be attributed? What implications does the trend have for the thermal power producers and the related industry? (2015)	Solar Energy + Cost Reduction + Thermal Power Impact	Identify reasons for solar cost fall and discuss implications for thermal sector
Write a note on India's green energy corridor to alleviate the problems of conventional energy. (2013)	Green Energy Corridor + Renewable Integration + Transmission	Explain green corridor project and its role in addressing conventional energy issues
Adaptation of PPP model for infrastructure development of the country has not been free from criticism. Critically discuss the pros and cons of the model. (2013)	PPP + Infrastructure + Critical Analysis	Critically evaluate advantages and disadvantages of PPP model in infrastructure

Introduction

- Infrastructure forms the backbone of a nation's economy, shaping its productivity, competitiveness, and quality of life. For a country like India, with its vast geography and growing population, infrastructure is not just about building roads, power plants, or airports ; it is about creating the pathways for inclusive growth, regional balance, and global competitiveness. Robust energy systems ensure industrial and domestic needs, efficient transport networks connect markets and people, and modern digital infrastructure drives innovation in the knowledge economy.
- Over the years, India has moved from piecemeal projects to holistic strategies such as the **National Infrastructure Pipeline (NIP)** and **PM Gati Shakti**, which integrate energy, transport, logistics, and digital connectivity into a unified development vision. As India aims to become a **developed nation by 2047**, infrastructure investment and innovation will be central to achieving sustainable and inclusive growth.



1.Energy Infrastructure

India's Energy Landscape (Data Source - Ministry of Power)

- India's energy sector has undergone a massive transformation over the last decade, shifting from shortages and dependency to self-reliance, diversification, and sustainability. As of June 2025, India has become the world's 3rd largest energy consumer and is playing a central role in the global energy transition.
- **Brief overview**
  - **Installed Power Capacity (June 2025):** 476 GW
    - Thermal Power: 240 GW (50.5%)
    - Renewables: 226.9 GW (47.7%)
    - Nuclear: 8.8 GW (1.8%)
  - **Record Renewable Share:** Non-fossil fuels now account for **49% of capacity**.
  - **Per Capita Consumption:** Increased by 45.8% from 957 kWh (2013–14) → 1,395 kWh (2023–24).
  - **Power Shortages:** Reduced from 4.2% (2013–14) → 0.1% (2024–25).
  - **Village & Household Electrification:** 100% villages electrified (2018); 2.8+ crore households connected under Saubhagya.
- **India's Global Standing (2025)**
  - 4th in Renewable Energy capacity (IRENA 2025).
  - 3rd in Solar Power capacity.
  - 4th in Wind Power capacity.
  - Among top global investors in the clean energy transition.

Challenges in Energy Infrastructure

- **Power Sector Challenges**
  - **Financial stress in DISCOMs**: Huge outstanding debts (over ₹6 lakh crore), poor billing efficiency, and heavy subsidy burdens keep distribution companies loss-making.
  - **High AT&C losses**: Around 17–18% compared to global benchmark of 6–8%, mainly due to theft and leakages.
  - **Tariff distortions**: Industrial users cross-subsidise agriculture and domestic users, which raises costs and reduces competitiveness.
  - **Aging transmission and distribution network**: Outdated infrastructure leads to frequent outages, low reliability, and poor quality of supply.
  - **Low private sector participation**: Regulatory uncertainty and delayed payments to power producers discourage investment.
  - **Coal dependence**: Nearly 70% of electricity generation still comes from coal, leading to air pollution, import dependence, and risk of stranded assets.
  - **Low per capita energy consumption**: India's per capita electricity consumption is only about 1,200 units annually, which is far below the global average of 3,500 units. This reflects both inadequate access and underdeveloped infrastructure.

- **Oil and Gas Sector Challenges**
  - **High import dependence**: Around 85% of crude oil and 55% of natural gas are imported, which makes India vulnerable to global disruptions.
  - **Price volatility**: Global crude price swings directly affect inflation, fiscal deficit, and current account deficit.
  - **Low domestic production**: Exploration policies like NELP and HELP have not significantly raised production, leaving output stagnant.
  - **Infrastructure gaps**: Inadequate gas pipeline network, insufficient LNG terminals, and limited storage capacity.
  - **Subsidy burden**: LPG and kerosene subsidies strain government finances despite direct benefit transfers.
  - **Energy transition risks**: Oil companies may face stranded assets in the future as the world shifts to electric vehicles, hydrogen, and renewables.
- **Renewables and Alternatives Challenges**
  - **Intermittency of supply**: Solar and wind power depend on weather and time of day, making grid stability difficult.
  - **Storage technology gap**: Affordable, large-scale battery and storage solutions are still lacking.
  - **Land acquisition and environmental concerns**: Large solar and wind projects often face land conflicts, displacement issues, and ecological damage.
  - **Transmission bottlenecks**: Renewable-rich states like Rajasthan, Gujarat, and Tamil Nadu lack sufficient transmission capacity to supply power to demand centres.
  - **High initial costs and financing issues**: Despite falling tariffs, long-term financing and investor confidence remain challenges.
  - **Policy and regulatory uncertainty**: Contract renegotiations, tariff disputes, and delays in payments to developers reduce investor trust.

Government Initiatives in Energy Infrastructure

Sector	Initiative	Explanation
Power Sector	Saubhagya Scheme (2017)	Achieved near-universal household electrification; provided last-mile connectivity to villages and homes.
	Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY)	Focused on strengthening rural distribution networks and feeder separation for agriculture and households.
	UDAY Scheme (2015)	Restructured DISCOM debts and aimed to improve efficiency, though results were mixed.
	Integrated Power Development Scheme (IPDS)	Strengthened sub-transmission and distribution networks in towns, including IT-enabled systems.
	Revamped Distribution Sector Scheme (RDSS, 2021)	₹3 lakh crore programme to modernise DISCOMs, install smart meters, and reduce AT&C losses.
	Electricity Amendment Bill (proposed)	Aims to allow multiple distribution licensees, increase competition, and enforce renewable obligations.
Oil & Gas Sector	Hydrocarbon Exploration and Licensing Policy (HELP, 2016)	Introduced open acreage licensing, simplified contracts, and gave pricing and marketing freedom.
	Pradhan Mantri Ujjwala Yojana (PMUY, 2016)	Provided free LPG connections to BPL women, reducing indoor air pollution; over 9 crore connections given.
	PAHAL (DBT for LPG)	Direct transfer of LPG subsidy to beneficiaries to reduce leakages and duplication.
	Strategic Petroleum Reserves	Created underground reserves at Visakhapatnam, Mangaluru, and Padur to ensure energy security; expansion under Phase II.
	Pradhan Mantri Urja Ganga Project	Developing a gas pipeline network across eastern India to promote clean

		energy access.
	Ethanol Blending Programme	Target of 20% ethanol blending in petrol by 2025 to cut import bill and reduce emissions.
Renewables & Alternatives	National Solar Mission (2010)	Part of National Action Plan on Climate Change; target of 100 GW solar capacity.
	National Wind-Solar Hybrid Policy (2018)	Promotes hybrid projects to optimise land and transmission infrastructure use.
	National Green Hydrogen Mission (2023)	Aims to produce 5 MMT green hydrogen annually by 2030; supported with ₹20,000 crore budget.
	Renewable Energy Development Targets	India committed to 500 GW non-fossil fuel capacity by 2030 (COP26 pledge).
	Solar Parks & Ultra Mega Solar Projects	Large-scale solar plants to ensure economies of scale and lower tariffs.
	International Solar Alliance (ISA, 2015)	India-led global coalition of over 100 countries to promote solar energy adoption and financing.

National Green Hydrogen Mission

Introduction

- Hydrogen is often called the "fuel of the future" because it can be a clean, versatile, and sustainable energy carrier.
- India launched the National Green Hydrogen Mission (NGHM) in January 2023, with an outlay of ₹19,744 crore, to position India as a global hub for production, usage, and export of green hydrogen.
- It directly links with India's Panchamrit commitments at COP26, including 500 GW non-fossil capacity and Net Zero by 2070.

What is Green Hydrogen?

- **Hydrogen**: The most abundant element but not freely available; produced by splitting compounds like water (H_2O).
- **Green Hydrogen**: Produced using renewable energy (solar, wind, hydro) to split water into hydrogen and oxygen via electrolysis.
- **Comparison**:
  - **Grey Hydrogen:** From fossil fuels (CO_2 intensive).
  - **Blue Hydrogen**: Fossil fuels + carbon capture.
  - **Green Hydrogen:** 100% renewable, near-zero emissions.

Key Features of the National Green Hydrogen Mission

- **Production Targets**:
  - Aim to produce **5 million metric tonnes (MMT) of green hydrogen annually by 2030**.
  - Associated renewable energy capacity addition of **125 GW**.
- **Financial Outlay**:
  - Total: ₹19,744 crore.
  - **Strategic Interventions for Green Hydrogen Transition (SIGHT)** Programme: ₹17,490 crore for incentives to electrolyser manufacturing and green hydrogen production.
  - ₹1,466 crore for pilot projects (steel, mobility, shipping, etc.).
  - ₹400 crore for R&D.
  - ₹388 crore for skill development and awareness.
- **Focus Areas**:
  - Domestic demand creation in **fertilisers, refineries, steel, mobility, and shipping**.
  - Support for R&D in electrolysers, fuel cells, and hydrogen storage.
  - Development of green hydrogen hubs and export opportunities.
- **Institutional Mechanism**:
  - **Ministry of New and Renewable Energy (MNRE)** as nodal ministry.
  - Mission coordination group involving industry, academia, and states.

Significance of the Mission

- **Energy Security :** India imports ~85% crude oil and ~55% natural gas. Green hydrogen reduces fossil fuel dependence.

- **Decarbonisation :** Hard-to-abate sectors like steel, cement, and fertilisers can cut emissions significantly.
- **Economic Growth:**
  - Estimated investment of over **₹8 lakh crore by 2030**.
  - Potential to create **6 lakh+ jobs**.
- **Export Potential:** Europe, Japan, and Korea are potential markets. India can become a key supplier.
- **Climate Commitments**:
  - Supports India's **Net Zero 2070** target.
  - Aligns with global climate goals and COP26 pledges.

Challenges Ahead

- **High Production Cost:** Current green hydrogen costs: **$4–6 per kg**, compared to grey hydrogen at **$1.5–2 per kg**.
- **Technology Gaps:** Electrolyser efficiency, cost reduction, and scaling up domestic manufacturing.
- **Infrastructure Deficit:** Lack of hydrogen storage, pipelines, and refuelling stations.
- **Policy and Regulatory Framework:** Need clarity on standards, safety, carbon credits, and trading mechanisms.
- **Global Competition:** Countries like the USA (Inflation Reduction Act), EU (Hydrogen Strategy), and Japan are investing heavily, creating competition.

Way Forward

- **Scaling Up Electrolyser Manufacturing:** Support under PLI-like schemes to reduce costs.
- **Public-Private Partnerships:** Encourage large industry consortia in steel, transport, and shipping sectors.
- **International Collaborations:** Tie-ups with EU, Japan, Gulf nations for export markets.
- **R&D and Innovation:** Focus on next-gen electrolysers, fuel cells, and storage technologies.
- **Green Financing:** Mobilise funds via green bonds, multilateral banks (World Bank, AIIB, ADB).
- **Phased Implementation:** Start with blending hydrogen in refineries and fertilisers, later scale to steel, transport, and exports.

2.Transport Sector

- Transport infrastructure is often described as the backbone of economic growth. A well-connected and efficient transport system reduces logistics costs, improves trade competitiveness, creates employment opportunities, and enhances regional integration.
- In India, logistics costs are estimated at 13–14% of GDP, significantly higher than the 8–9% in developed economies, which makes exports less competitive. Recognising this gap, the government has prioritised large-scale infrastructure programmes such as Bharatmala (roads), Sagarmala (ports), Dedicated Freight Corridors (railways), and PM Gati Shakti (integrated connectivity) to modernise the sector and bring efficiency.
- **India's transport sector can be broadly categorised into:**
  a) Roads and Highways
  b) Railways
  c) Ports and Shipping
  d) Airports and Aviation

a) Roads and Highways

Current Status

- India now boasts the world's largest road network at over 6.62 million km (as of December 2024), carrying more than 70 % of freight and 85% of passenger traffic.
- As of March 2025, the total length of National Highways in the country was 146,204 km.
- Road transportation has gradually increased over the years with improvement in connectivity between cities, towns and villages in the country.

Key Challenges in Road Infrastructure

- **Land Acquisition Issues**
  - Delays due to disputes over compensation, rehabilitation, and environmental clearances.
  - Leads to time and cost overruns in major projects.
  - As per NITI Aayog report, the road sector faces **40% of all infrastructure-related project delays** in India.
- **Funding Constraints**
  - Decline in private sector participation in PPP models.

- Heavy reliance on government borrowing and budgetary support.
- **Poor Maintenance**
  - Many rural and state highways suffer from poor upkeep.
  - High vehicle operating costs due to potholes, weak pavements, and poor drainage.
  - As per the World Bank report Poor road quality increases logistics costs by 25–30%.
- **Urban Congestion**
  - Rapid rise in vehicle ownership outpaces road capacity in cities.
  - Leads to traffic jams, higher travel time, and air pollution.
- **Road Safety**
  - India accounts for nearly **11% of global road deaths** (WHO).
  - Causes include poor design, lack of enforcement, and unsafe driving practices.
- **Environmental and Social Concerns**
  - Road expansion often results in deforestation, habitat loss, and displacement of communities.
  - Resistance from local populations and ecological groups delays projects.
- **Regional Imbalances**
  - Highways and expressways are concentrated in developed states.
  - Backward and border regions still lack adequate connectivity.

Major Government Initiatives for Road Infrastructure

- **Bharatmala Pariyojana (2017)**
  - Flagship highway development programme.
  - Phase-I targets construction of 34,800 km of highways including economic corridors, border roads, feeder routes, and coastal connectivity.
  - Aims to reduce logistics cost and improve efficiency in freight movement.
- **National Highways Development Project (NHDP)**
  - Launched in 1998, it laid the foundation for modern highway expansion.
  - Achievements include the **Golden Quadrilateral**, **North-South and East-West Corridors**, and port connectivity projects.
- **Expressway Development**
  - India is building world-class expressways such as the **Delhi–Mumbai Expressway**, **Purvanchal Expressway**, **Dwarka Expressway**, and **Ganga Expressway**.
  - These aim to reduce travel time, improve logistics efficiency, and connect industrial hubs.
- **Pradhan Mantri Gram Sadak Yojana (PMGSY)**
  - Launched in 2000 to provide all-weather rural road connectivity.
  - Has connected over 3.5 lakh km of roads, enhancing rural mobility and access to markets, education, and healthcare.
- **Tolling Reforms**
  - Introduction of **FASTag** for electronic toll collection has reduced congestion at toll plazas.
  - GPS-based tolling is being developed to make toll collection seamless and distance-based.
- **Financing and PPP Models**
  - Use of **Build–Operate–Transfer (BOT)**, **Hybrid Annuity Model (HAM)**, and **Toll–Operate–Transfer (TOT)** models to attract private investment.
  - Monetisation of existing highways by leasing them to private players for revenue generation.
- **PM Gati Shakti (2021)**
  - A GIS-based digital platform for integrated infrastructure planning.
  - Aims to improve coordination between roads, railways, ports, and airports for seamless multi-modal connectivity.
- **National Infrastructure Pipeline (NIP, 2020–25)**
  - Road sector is one of the largest beneficiaries under this ₹111 lakh crore plan.
  - Focus on financing, asset monetisation, and accelerated project completion.

b) Railways

Current Status

- Indian Railways is the fourth-largest railway network in the world, covering over 68,000 route km.

- It carries around 12 billion passengers annually and moves about 27% of India's freight traffic.
- Railways are a low-cost, energy-efficient, and environmentally friendly mode of transport compared to roads and aviation.
- Plays a vital role in regional integration, affordable mass transport, and economic development.

Key Challenges

- **High Operating Ratio**
  - Operating ratio remains ~98%, leaving little surplus for investment.
  - Cross-subsidisation of passenger fares by freight leads to inefficiencies.
- **Safety Concerns**
  - Derailments, collisions, and accidents due to outdated signalling and human error.
  - Need for advanced safety systems like Kavach (Train Collision Avoidance System).
- **Funding Constraints**
  - Mega projects like DFC and bullet train face cost overruns and funding delays.
  - Heavy dependence on budgetary support and loans.
- **Slow Pace of Modernisation**
  - Compared to global peers like Japan and China, India lags in high-speed rail adoption and modern passenger amenities.
- **Freight Share Decline**
  - Rail freight share has reduced to ~27% (from ~80% in 1950s) due to slow transit time and last-mile connectivity issues.
- **Land Acquisition Issues**
  - Particularly in bullet train and DFC projects, leading to cost escalation and delays.

Major Government Initiatives in Railways Infrastructure

- **Dedicated Freight Corridors (DFCs)**
  - Eastern and Western DFCs under implementation, covering around 3,300 km.
  - Aim: segregate freight and passenger traffic to improve efficiency.
  - Freight trains' average speed to rise from 25 kmph to 70 kmph.
  - Expected to cut logistics costs by ₹50,000 crore annually (NITI Aayog).
  - Will reduce road congestion and shift cargo from road to rail, lowering emissions.
  - Future plan: East-West, North-South, and East-Coast corridors.
- **Electrification and Net Zero Target**
  - Target: 100% electrification of broad-gauge routes by 2030.
  - Already over 80% of routes are electrified (2023 data).
  - Makes Indian Railways the world's largest green rail network in the making.
  - Aim: Net Zero Carbon Emissions by 2030.
  - Reduces dependence on imported fossil fuels
  - Helps India meet its COP26 commitments.
- **High-Speed Rail Projects**
  - Mumbai–Ahmedabad Bullet Train Project: India's first, 508 km long, with speed of **320 kmph**.
  - Funded with Japanese assistance (JICA), using Shinkansen technology.
  - Trial runs expected in sections by 2026.
  - Other planned corridors: Delhi–Varanasi, Delhi–Ahmedabad, Mumbai–Nagpur.
  - Aims to cut travel time drastically and provide world-class passenger experience
  - Boosts technology transfer, domestic manufacturing, and skill development.
- **Station Redevelopment**
  - Amrit Bharat Station Scheme launched to redevelop 1,200+ stations.
  - Features: modern passenger amenities, world-class waiting lounges, digital signage, retail spaces, and better accessibility.
  - Redevelopment of New Delhi, Ahmedabad, Gandhinagar, Bengaluru already underway.
  - Gandhinagar station (Gujarat) redeveloped with an in-station hotel and commercial spaces.
  - Focus on improving safety, aesthetics, and passenger comfort.
- **Privatisation and PPP Participation**
  - Private participation allowed in passenger trains (e.g., Tejas Express by IRCTC).
  - PPPs being used in station redevelopment, freight terminals, and modern service delivery.

- Monetisation of freight corridors and existing assets through Public-Private Partnership models.
- Encourages efficiency, modernisation, and attracts private investment.

- **Digital and Technological Upgradation**
  - Kavach System: India's indigenous Train Collision Avoidance System for safety.
  - Use of Artificial Intelligence and data analytics for predictive maintenance and scheduling.
  - The IRCTC e-ticketing system handles millions of transactions daily.
  - Rail Madad app for quick passenger grievance redressal.
  - Bio-toilets installed in coaches for sanitation.
  - Smart ticketing and digital freight booking systems are being expanded.

Kavach System

Introduction

- **Kavach** is India's **indigenous Train Collision Avoidance System (TCAS)** developed by the **Research Designs and Standards Organisation (RDSO)** in collaboration with Indian industry.
- It is part of the government's effort to modernise rail safety and reduce accidents under the **'Atmanirbhar Bharat' initiative**.
- Acts as a safety shield to **prevent collisions, control overspeeding, and ensure safe operations**.

Key Features of Kavach

- **Collision Avoidance :** Automatically applies brakes if two trains come dangerously close.
- **Automatic Braking System :** If a loco pilot does not respond to danger signals, Kavach intervenes and halts the train.
- **Signal Protection :** Ensures trains do not cross red signals (Signal Passed at Danger – SPAD prevention).
- **Speed Regulation :** Restricts speed to 30 km/h in case of foggy weather or when approaching caution signals.
- **Technology Used :** Based on **RFID tags**, GPS, and high-frequency radio communication between trains, tracks, and signals.
- **Interoperability :** Works across locomotives, regardless of the manufacturer, ensuring smooth integration.
- **Cost-Effective :** Developed at **one-third the cost** of similar global systems (like ETCS Level 2).

Implementation Status

- Pilot projects tested on South Central Railway since 2016.
- As of 2023, **1,455 route km and 121 locomotives** equipped with Kavach.
- Government target: roll out across **34,000 route km** of High-Density and Highly Utilised Networks by 2030.

Significance

- **Safety**: Reduces risk of accidents due to human error (e.g., signal jumping, overspeeding).
- **Reliability**: Improves punctuality of trains by allowing safer, closer headways.
- **Indigenous Technology**: Boosts self-reliance and reduces dependence on costly foreign systems.
- **Cost Saving**: Affordable compared to imported safety systems, saving foreign exchange.
- **Public Confidence**: Enhances passenger trust in rail travel.

Challenges

- **High Cost of Nationwide Rollout**: Estimated at over ₹30,000 crore.
- **Slow Implementation Pace**: Limited progress beyond pilot zones.
- **Technology Upgradation**: Needs continuous R&D to match global systems like ETCS-3.
- **Skilling Needs**: Training of loco pilots and maintenance staff is essential.
- **Integration Issues**: Retrofitting older locomotives and routes is complex.

Way Forward

- Accelerate deployment in high-density and accident-prone corridors.
- Provide dedicated funding and use PPPs for faster rollout.
- Continuous R&D for advanced versions of Kavach.
- Skill development and capacity building for railway staff.

- International collaboration for standardisation and export potential.

Regional Rapid Transit System (RRTS)
Introduction

- The Regional Rapid Transit System (RRTS) is a high-speed, high-frequency commuter rail network being developed in the National Capital Region (NCR).
- Implemented by the National Capital Region Transport Corporation (NCRTC), it is India's first-of-its-kind project designed for inter-city regional mobility.
- Aim: To provide fast, reliable, and comfortable public transport for people commuting between Delhi and nearby cities, thereby reducing congestion and pollution.

Key Features

- **Speed**: Designed for a speed of **180 kmph**, with average operational speed of 100 kmph.
- **Frequency**: Trains every 5–10 minutes, ensuring high service availability.
- **Capacity**: Each train can carry around 750 passengers, with both standard and premium class coaches.
- **Technology**:
  - Modern rolling stock with driverless train technology potential.
  - Automatic train control and modern signalling.
- **Integration**: Seamless connectivity with metro systems, airports, and bus services.
- **Green Mobility**: Energy-efficient operations, use of regenerative braking, and solar integration.

Corridors under Implementation

- **Delhi–Ghaziabad–Meerut (82 km)**
  - First RRTS corridor, under construction.
  - Expected to cut travel time between Delhi and Meerut from 3 hours to less than 1 hour.
  - "Namo Bharat" branded trains launched on the priority section (Sahibabad–Duhai, 17 km) in 2023.
- **Other Planned Corridors**
  - **Delhi–Panipat (103 km)**
  - **Delhi–Alwar (164 km)**
  - Future extensions planned for better regional integration.

Significance

- **Decongestion**: Reduces pressure on Delhi Metro and road networks by shifting commuters to faster regional transit.
- **Economic Growth**: Enhances connectivity between NCR towns, boosting regional development and real estate.
- **Time-Saving**: Cuts travel time drastically, making daily inter-city commuting feasible.
- **Environment-Friendly**: Promotes modal shift from private vehicles to public transport, reducing emissions.
- **Urban Planning**: Encourages polycentric growth in NCR, reducing excessive pressure on Delhi.

Challenges

- **High Cost**: The Delhi–Meerut corridor alone costs over ₹30,000 crore.
- **Land Acquisition**: Delays in acquiring land and rehabilitation of affected families.
- **Funding and Financing**: Dependence on multilateral loans (ADB, AIIB) raises fiscal concerns.
- **Integration Issues**: Need for smooth coordination with Delhi Metro, Indian Railways, and state transport.
- **Public Awareness**: Adoption depends on affordability, accessibility, and last-mile connectivity.

Way Forward

- Ensure timely completion of all three priority corridors with strict monitoring.
- Develop seamless last-mile connectivity through feeder buses, e-rickshaws, and metro integration.
- Expand RRTS to other metro regions (Mumbai, Bengaluru, Chennai) for balanced urbanisation.
- Promote public-private partnerships for station development and commercial exploitation.
- Keep fares affordable while ensuring financial sustainability.

c) Ports and Shipping
Overview

- India has a 7,500 km long coastline with 12 major ports and 200+ non-major ports.

- Handles 95% of India's trade by volume and 70% by value.
- Plays a critical role in export competitiveness, reducing logistics cost, and supporting the Blue Economy.
- Coastal and inland shipping is more fuel-efficient and eco-friendly compared to road and rail transport.

Key Challenges in Ports and Shipping Infrastructure

- **Under-utilisation of Capacity**
  - Many ports operate below their designed handling capacity.
  - Poor hinterland connectivity and competition from non-major ports lead to inefficiencies.
- **Global Competitiveness Gap**
  - Average turnaround time at Indian ports is around 2–3 days, compared to less than 1 day at advanced ports like Singapore and Shanghai.
  - High logistics costs reduce export competitiveness.
- **Infrastructure Deficit**
  - Lack of mechanisation, modern container handling equipment, and deep-draft facilities for larger vessels.
  - Limited cold storage and specialised cargo handling facilities.
- **Poor Hinterland Connectivity**
  - Road and rail linkages between ports and industrial hubs are often weak.
  - Increases dwell time and transport costs for cargo movement.
- **Low Share of Coastal Shipping and Inland Waterways**
  - Only about 6–7% of freight moves via waterways in India, compared to over 25% in countries like China.
  - Limited infrastructure and lack of awareness restrict usage.
- **Environmental Concerns**
  - Port expansion and dredging impact coastal ecosystems, mangroves, and fisheries.
  - Rising pollution from ships and port activities.
- **Regulatory and Policy Bottlenecks**
  - Overlapping jurisdiction of central and state agencies slows approvals.
  - Frequent tariff disputes between port authorities and private operators.
- **Regional Imbalances**
  - Non-major ports (like Mundra, Krishnapatnam) are often more efficient than many major ports, leading to uneven development.

Major Government Initiatives in Ports & Shipping

- **Sagarmala Programme (2015)**
  - Flagship programme for port-led development.
  - Components: port modernisation, new port development, coastal economic zones (CEZs), and coastal community development.
  - Aims to reduce logistics costs and turnaround time through mechanisation and efficiency.
  - Around 800+ projects worth ₹5.5 lakh crore identified under Sagarmala.
- **Major Port Authorities Act (2021)**
  - Replaced the Major Port Trusts Act, 1963.
  - Provides greater autonomy to major ports in tariff setting and investment decisions.
  - Aims to make ports more competitive and efficient, on the lines of global benchmarks.
- **Inland Waterways Development**
  - National Waterways Act, 2016 declared 111 waterways as National Waterways.
  - Jal Marg Vikas Project (on NW-1: Ganga) with World Bank assistance to enable large-scale cargo movement between Haldia and Varanasi.
  - Development of NW-2 (Brahmaputra), NW-16 (Barak), and other key inland routes.
  - Encourages modal shift to fuel-efficient and eco-friendly waterways.
- **Port Community System (PCS 1x)**
  - A single-window digital platform to integrate stakeholders (shipping lines, customs, ports, exporters).
  - Reduces paperwork, ensures faster clearance, and lowers dwell time.
  - Linked to National Logistics Portal–Marine (NLP-Marine).

- **Direct Port Delivery (DPD) and Direct Port Entry (DPE)**
  - Allows importers to take delivery of containers directly from terminals, bypassing storage at container freight stations.
  - Enables exporters to directly move containers into ports.
  - Reduced average dwell time and costs.
- **Private Sector Participation (PPP Model)**
  - PPPs encouraged in cargo handling, container terminals, and logistics parks.
  - Non-major ports like Mundra, Krishnapatnam, and Dhamra showcase successful private participation.
  - Asset monetisation through Toll–Operate–Transfer (TOT) model for existing port assets.
- **National Maritime Vision 2030**
  - Long-term plan to develop world-class port infrastructure.
  - Focus on reducing logistics cost to 8–9% of GDP (from current 13–14%).
  - Emphasis on green ports, digitalisation, and international competitiveness.
- **Coastal Shipping Promotion**
  - Incentives and policy push for using coastal shipping for domestic cargo movement.
  - Part of the government's focus on reducing dependence on road transport.
  - Special focus on Roll-on/Roll-off (Ro-Ro) services to transport vehicles and trucks via sea routes.

National Maritime Vision 2030

Introduction

- The National Maritime Vision 2030 (NMV 2030) is a strategic blueprint launched by the Ministry of Ports, Shipping and Waterways.
- It lays down a 10-year roadmap (2020–2030) for developing world-class port infrastructure, efficient logistics, and sustainable maritime growth.
- It aligns with the Sagarmala Programme, PM Gati Shakti, and India's vision of becoming a $5 trillion economy with global trade competitiveness.

Key Objectives

- **Reduce Logistics Cost :** Target: Bring logistics cost down to **8–9% of GDP** (currently ~13–14%).
- **Capacity Expansion :** Expand total cargo handling capacity of Indian ports to **over 3,300 MTPA by 2030** (from ~1,750 MTPA in 2023).
- **Global Competitiveness :** Position Indian ports among the **top 25 globally** in terms of efficiency and ease of doing business.
- **Promote Coastal Shipping & Inland Waterways :** Increase modal share of waterways and coastal shipping to **12–15% by 2030**.
- **Private Sector Participation :** Enhance PPP share in port capacity creation from 50% to around 70%.
- **Sustainability & Green Ports :** Focus on renewable energy, electrification, and reducing carbon emissions.

Key Focus Areas

- **Port Modernisation and New Port Development**
  - Expansion of existing major ports.
  - Development of new mega ports such as Vadhavan (Maharashtra).
- **Enhancing Connectivity**
  - Strengthening road, rail, and inland waterways linkages to ports.
  - Integration with **PM Gati Shakti National Master Plan** for multimodal logistics.
- **Digitalisation and Efficiency**
  - Port Community System (PCS 1x), blockchain-based documentation, AI-driven cargo tracking.
  - Target: Reduce **average turnaround time to less than 24 hours**.
- **Boosting Coastal Shipping and Inland Water Transport (IWT)**
  - Developing **National Waterways** and roll-on/roll-off (Ro-Ro) ferry services.
  - Special focus on passenger and cargo movement via waterways.
- **Shipbuilding and Ship Repair Industry**
  - Promote domestic shipbuilding under **Atmanirbhar Bharat**.
  - Develop India as a global hub for ship repair and recycling (e.g., Alang, Gujarat).
- **Green and Sustainable Ports**

- Solar and wind-powered port operations.
- Shore power supply to ships, electrification of cargo handling equipment.
- Adoption of **IMO (International Maritime Organisation) standards** for emission reduction.

- **Maritime Skill Development and R&D**
  - Training seafarers, promoting maritime universities and research centres.
  - Focus on automation, robotics, and AI in maritime logistics.

d) Airports and Aviation

Overview

- India is the 3rd largest domestic aviation market in the world (after the US and China).
- Air transport carries 1% of freight volume but nearly 35% of freight value – crucial for high-value, time-sensitive goods.
- Plays a key role in regional connectivity, tourism, business growth, and global integration.
- Directly linked to employment: airports and airlines generate jobs in construction, ground services, hospitality, logistics, and tourism.

Key Challenges in Airports & Aviation Infrastructure

- **Airport Congestion**
  - Metro airports like Delhi, Mumbai, and Bengaluru are operating near or above capacity.
  - Delays in expansion projects due to land acquisition and environmental clearances.
- **High Aviation Turbine Fuel (ATF) Costs**
  - ATF in India is among the most expensive in the world due to high state taxes.
  - Accounts for 30–40% of airlines' operating costs, making tickets costlier.
- **Financial Stress of Airlines**
  - Chronic losses, high debt, and thin profit margins.
  - Bankruptcy of major carriers like Kingfisher and Jet Airways highlights sectoral fragility.
  - COVID-19 worsened the crisis, with many airlines struggling to recover.
- **Regional Imbalance in Connectivity**
  - Air traffic still concentrated in metro cities.
  - Northeastern states, hilly regions, and tier-3 towns remain underserved despite UDAN.
- **Infrastructure Gaps**
  - Limited number of world-class international hubs compared to global competitors like Dubai, Singapore, or Doha.
  - Shortage of parking bays, runways, and cargo handling facilities.
  - Weak Maintenance, Repair, and Overhaul (MRO) ecosystem → dependence on foreign facilities.
- **Policy and Regulatory Challenges**
  - Frequent policy changes and overlapping regulatory authorities (DGCA, BCAS, AERA).
  - PPP model issues: disputes over revenue sharing and tariff regulations.
- **Environmental Concerns**
  - Aviation contributes to greenhouse gas emissions and noise pollution.
  - Land acquisition for new airports often faces resistance due to displacement and ecological impact.
- **Human Resource and Skill Gaps**
  - Shortage of trained pilots, technicians, and ground handling staff.
  - Dependence on foreign training and expertise increases costs.

Major Government Initiatives in Aviation

- **UDAN (Ude Desh ka Aam Nagrik) – Regional Connectivity Scheme (2016)**
  - Launched under the National Civil Aviation Policy, 2016.
  - Aim: Make air travel affordable and improve regional connectivity.
  - Provides viability gap funding (VGF) to airlines for operating on unserved and underserved routes.
  - Over 450 routes operationalised, connecting 70+ new airports/heliports/water aerodromes.
  - Target: Connect tier-2 and tier-3 cities to major metros.
- **Airport Expansion and Modernisation**
  - Metro airports (Delhi, Mumbai, Bengaluru, Hyderabad) expanded with world-class facilities.
  - Greenfield airports being developed at Jewar (Noida), Navi Mumbai, Mopa (Goa), and Hollongi (Arunachal Pradesh).

- India has 148 operational airports (2023); target 220+ airports by 2025.
- AAI (Airports Authority of India) investing heavily in upgrading regional airports.

- **Public-Private Partnership (PPP) Model in Airports**
  - Delhi, Mumbai, Hyderabad, Bengaluru airports successfully developed under PPP.
  - In 2019, six more airports (Lucknow, Ahmedabad, Jaipur, Mangaluru, Guwahati, Thiruvananthapuram) were privatised and awarded to Adani Group.
  - Encourages private investment in airport operations, cargo handling, and commercial services.
- **National Civil Aviation Policy (2016)**
  - Focus on regional connectivity, ease of doing business, safety, and promoting aviation hubs.
  - Liberalised **Open Sky Policy** for foreign airlines.
  - Route Dispersal Guidelines (RDG) to ensure air services to remote regions.
- **Air Cargo and Logistics Push**
  - Development of dedicated air cargo complexes and cold storage facilities.
  - Aim: Make India a hub for international cargo, e-commerce, and perishable exports.
  - Krishi Udaan Yojana launched to support farmers in transporting perishable agri-produce by air.
- **Digital Initiatives**
  - DigiYatra introduced for seamless, paperless boarding using biometric facial recognition.
  - e-freight initiatives for digitalising cargo handling and reducing paperwork.
  - Online ticketing and mobile apps integrated with passenger and cargo services.
- **MRO (Maintenance, Repair, and Overhaul) Development**
  - India spends over $2 billion annually on MRO abroad.
  - Government announced tax incentives, land allocation, and policy support to make India a **regional MRO hub**.
  - Focus on attracting domestic and foreign players to reduce dependence on foreign facilities.
- **Skill Development and Human Resource Initiatives**
  - National Aviation University (Uttar Pradesh) established for training pilots, engineers, and ground staff.
  - Partnerships with global institutes for skill enhancement in aviation management and safety.
- **Green Airport Initiatives**
  - Push for carbon-neutral airports with solar energy and energy-efficient designs.
  - Cochin International Airport became the world's first airport fully powered by solar energy.
  - Similar models being implemented at airports in Delhi, Hyderabad, and Kochi.

National Infrastructure Pipeline (NIP)
Introduction

- The National Infrastructure Pipeline (NIP) was launched in 2019 after PM's Independence Day 2019 announcement of a ₹100 lakh crore infrastructure investment plan.
- It is a first-of-its-kind whole-of-government exercise to provide a structured pipeline of infrastructure projects to boost growth, generate employment, and attract investment.
- Implemented under the Department of Economic Affairs (Ministry of Finance) with active involvement of NITI Aayog and states.

Key Features

- **Investment Outlay**:
  - Initial target: **₹111 lakh crore (2020–25)**.
  - Covers projects across **23 sectors** including energy, roads, railways, ports, urban infra, digital, and social sectors (health, education).
- **Sectoral Distribution**:
  - Energy: ~24%
  - Roads: ~19%
  - Railways: ~13%
  - Urban Infrastructure: ~16%
  - Digital Infrastructure: ~3%
  - Others (social, irrigation, ports, airports, etc.) make up the rest.
- **Funding Pattern**:
  - Centre: ~39%
  - States: ~40%

- Private sector: ~21% (to be increased via PPPs).
- **Digital Infrastructure Pipeline**:
  - Projects listed on a digital dashboard for real-time monitoring and transparency.
- **Alignment with PM Gati Shakti**:
  - NIP projects integrated with the **PM Gati Shakti National Master Plan** for multimodal connectivity and better coordination.

Objectives

- Provide world-class infrastructure to improve India's competitiveness.
- Reduce logistics costs to global standards (8–9% of GDP).
- Boost employment generation and income growth through construction activity.
- Facilitate private sector participation via PPP models.
- Achieve the $5 trillion economy vision by strengthening the backbone of growth.

Significance

- **Economic Multiplier**: Every ₹1 spent on infrastructure creates 2.5–3.0 times value addition in GDP.
- **Job Creation**: Construction and allied industries provide large-scale employment.
- **Private Investment Revival**: Pipeline provides visibility and confidence to investors.
- **Regional Balance**: Focus on both urban and rural infrastructure.
- **Transparency & Monitoring**: Digital dashboard ensures accountability and reduces delays.

Challenges

- **Financing Gap**: Estimated annual infra investment requirement is ~7–8% of GDP; actual is 4–5%.
- **Private Sector Hesitation**: Limited participation due to weak PPP framework, regulatory uncertainties, and past failures.
- **Centre–State Coordination Issues**: Implementation bottlenecks due to overlapping jurisdictions.
- **Land Acquisition & Clearances**: Delays increase costs and discourage investment.
- **Banking & NBFC Stress**: Limits long-term funding for infrastructure projects.
- **COVID-19 Impact**: Reduced fiscal space and delayed project timelines.

Way Forward

- **Innovative Financing**: Use of Infrastructure Investment Trusts (InvITs), Real Estate Investment Trusts (REITs), and green bonds.
- **De-risking Projects**: Government to provide guarantees and viability gap funding to attract private players.
- **Asset Monetisation**: Recycling operational assets to generate resources for new projects (National Monetisation Pipeline).
- **Strengthening PPPs**: Clear contract enforcement, dispute resolution, and risk-sharing.
- **Integrated Planning**: Ensure synergy between NIP, PM Gati Shakti, Sagarmala, Bharatmala, and Smart Cities Mission.

Value Addition

Keywords : National Infrastructure Pipeline, PM Gati Shakti, Renewable Energy, National Green Hydrogen Mission, DISCOM Reform, AT&C Losses, RDSS, Bharatmala Pariyojana, Sagarmala Programme, Dedicated Freight Corridors, Kavach System, Regional Rapid Transit System (RRTS), UDAN Regional Connectivity, National Maritime Vision 2030, Greenfield Airports, Asset Monetisation, Infrastructure Investment Trusts (InvITs), Maintenance Repair Overhaul (MRO), Logistics Cost, Multimodal Connectivity

<u>Mains Question for Practice :</u>

Q1. Infrastructure is often called the backbone of economic growth. Discuss the challenges and opportunities in India's core infrastructure sectors.
Q2. Evaluate the role of public–private partnerships (PPP) in bridging India's infrastructure deficit, with reference to energy, transport, and logistics.
Q3. "Transport infrastructure is not just an economic driver, but a tool for regional equity." Critically analyze in the context of roads, railways, and ports.
Q4. Examine the challenges in achieving sustainable energy infrastructure in India. How do renewable energy initiatives align with India's climate commitments?

Q5. Despite multiple policy interventions like Bharatmala, Sagarmala, and Gati Shakti, India continues to face an infrastructure gap. Discuss.

Ready-Made Intro and Conclusion
Intros

- India's infrastructure deficit — in energy, roads, railways, ports and airports — is a binding constraint on growth; closing it requires coordinated capital spending, institutional reform and private participation.
- Energy security and transition define the infrastructure challenge: balancing coal-dependence with rapid renewable capacity addition, grid modernisation and emergent technologies like green hydrogen.
- Road and highway expansion under Bharatmala aims to cut logistics costs and link production to markets, but land, financing and maintenance remain critical bottlenecks.
- Modernising railways — through Dedicated Freight Corridors, electrification and safety systems like Kavach — is essential to regain freight share and reduce carbon intensity.
- Port-led growth via Sagarmala and National Maritime Vision 2030 targets lower turnaround times and greater coastal shipping to improve export competitiveness.
- Aviation infrastructure needs capacity augmentation, regional connectivity (UDAN) and a robust MRO ecosystem to turn India into an aviation and cargo hub.
- The National Infrastructure Pipeline and PM Gati Shakti provide the architecture for integrated, multimodal planning — their success depends on financing innovation and centre–state coordination.
- Public–private partnerships and asset-monetisation are pivotal to bridge the funding gap, but require sound risk allocation, contract enforcement and strong regulatory frameworks.

Conclusions

- Building world-class infrastructure will raise productivity and competitiveness only if investments are coupled with governance reforms, maintenance culture and demand-side readiness.
- India's energy transition must prioritise DISCOM reform, transmission expansion and storage solutions so renewables and green hydrogen can scale without grid instability.
- Roads and highways will deliver returns only with sustained maintenance funding, land reforms and last-mile connectivity to avoid premature asset deterioration.
- A freight-focused, electrified and digitalised railway system will lower logistics cost and emissions — scaling Kavach and DFCs is central to that objective.
- Port modernisation, hinterland connectivity and digitisation can cut dwell time and logistics cost, thereby enhancing India's global trade competitiveness.
- Aviation growth should be matched by regional airport capacity, ATF tax rationalisation and a domestic MRO push to reduce external dependence.
- NIP and PM Gati Shakti offer a blueprint for integrated infrastructure; success requires predictable financing (InvITs/REITs/green bonds), de-risking instruments and timely clearances.
- Ultimately, inclusive and sustainable infrastructure demands a mix of public capital, private efficiency and strong institutions — only then will infrastructure become an engine of equitable growth.

Acronyms
1. Energy Infrastructure – Challenges
"POWER"

- **P** – Pricing distortions (subsidies, losses of DISCOMs)
- **O** – Overdependence on fossil fuels & imports
- **W** – Weak transmission & distribution networks
- **E** – Environmental concerns (coal, emissions)
- **R** – Renewable integration challenges (storage, grid stability)

2. Ports & Shipping – Challenges
"PORTS"

- **P** – Poor last-mile connectivity (roads/rail to ports)
- **O** – Overcrowding & capacity constraints at major ports
- **R** – Regulatory hurdles & slow clearances
- **T** – Technology gaps (automation, digital

tracking)
- **S** – Stiff competition from global hubs (Singapore, Colombo)

3. Roads & Highways – Challenges
"ROADS"
- **R** – Rising costs & land acquisition issues
- **O** – Over-reliance on public funding
- **A** – Accident-prone, poor safety standards
- **D** – Delays in execution & contractor disputes
- **S** – Sustainability issues (maintenance, green norms)

4. Airports & Aviation – Challenges
"FLYER"
- **F** – Financial stress of airlines (high ATF costs)
- **L** – Limited regional connectivity (beyond metros)
- **Y** – Yawning infrastructure gap (cargo, MRO facilities)
- **E** – Environmental concerns (emissions, land use)
- **R** – Regulatory bottlenecks (DGCA, policy delays)

5. Railways – Challenges
"TRACK"
- **T** – Technology upgradation lagging (automation, signaling)
- **R** – Revenue losses & cross-subsidization (freight vs passenger)
- **A** – Ageing infrastructure (tracks, rolling stock)
- **C** – Capacity crunch (congestion on high-density routes)
- **K** – Knowledge gaps in logistics integration (ports, freight corridors)

UNIT 6 Investment Models

Navigating the Syllabus: What You Need to Know

Investment Models

- Introduction
- Key Indicators of Investment in the Economy
- Various Types of Investment Models
  - Public Investment Models
  - Private Investment Models
  - Public–Private Partnership (PPP) Models
  - Asset Monetisation Models
  - Social Sector Investment Models
  - Innovative & Emerging Investment Models

UPSC Previous Year Questions

Question	Nature of Question	Core Demand
Examine the developments of Airports in India through Joint Ventures under Public-Private Partnership (PPP) model. What are the challenges faced by the authorities in this regard. (2017)	Airports + PPP Model + Infrastructure Development	Assess PPP-based airport development progress and identify key implementation challenges
There is a clear acknowledgement that Special Economic Zones (SEZs) are a tool of industrial development, manufacturing and exports. Recognizing this potential, the whole instrumentality of SEZs requires augmentation. Discuss the issues plaguing the success of SEZs with respect to taxation, governing laws and administration. (2015)	SEZs + Industrial Development + Policy Issues	Explain role of SEZs and analyze challenges in taxation, legal framework, and governance
Explain how private public partnership agreements, in longer gestation infrastructure projects, can transfer unsuitable liabilities to the future. What arrangements need to be put in place to ensure that successive generations' capacities are not compromised? (2014)	PPP + Long Gestation Projects + Intergenerational Liabilities	Discuss risks of PPP liabilities and suggest safeguards for future generations
National urban transport policy emphasizes on moving people instead of moving vehicles. Discuss critically the success of various strategies of the government in this regard. (2014)	Urban Transport Policy + Public Mobility + Infrastructure	Evaluate policy focus on people-centric transport and assess success of implemented strategies

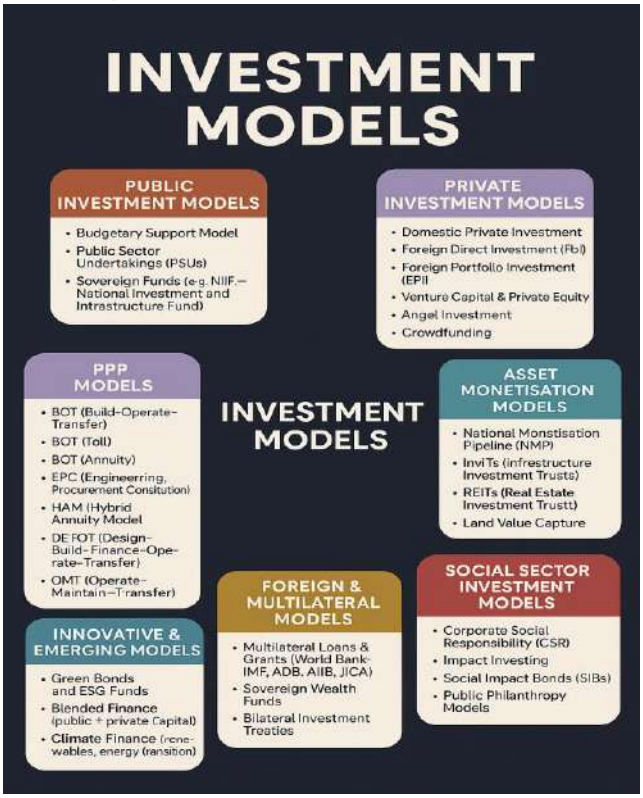
Introduction

- Investment is the **engine of economic growth**. It creates productive assets, generates employment, enhances competitiveness, and drives innovation. For a developing economy like India, which aspires to become a **$5 trillion economy**, efficient investment models are crucial to bridge the gaps in infrastructure, social development, and green transition.
- **Investment models** refer to the different frameworks through which resources are mobilised and managed , whether by the public sector, private sector, or through partnerships. For a country like India, which faces huge developmental needs and limited fiscal space, adopting **diverse and innovative investment models** is essential to meet future goals.

Key Indicators of Investment in the Economy

Indicator	Definition / Explanation
Gross Fixed Capital Formation (GFCF)	Measures the net increase in fixed assets such as machinery, equipment, and infrastructure. It reflects long-term productive capacity. In India, GFCF is 29.61% of GDP in 2024 and shows a strong growth trend.
Gross Domestic Capital Formation (GDCF)	Broader measure that includes GFCF, inventories, and valuables (like precious metals). It indicates overall capital creation in the economy.
Foreign Direct Investment (FDI)	Long-term capital inflows where foreign entities invest directly in Indian businesses or assets. Indicator of investor confidence and policy stability.
Foreign Portfolio Investment (FPI)	Short-term investment by foreign investors in stocks, bonds, and financial markets. Highly volatile but boosts liquidity and market depth.
Domestic Private Investment	Investment by Indian corporates and entrepreneurs in manufacturing, services, infrastructure, and startups. Signals private sector confidence in economic prospects.
Public Sector Investment	Government capital expenditure on infrastructure, social and economic assets. Reflected in budget allocations (e.g., **₹10 lakh+ crore capex in Union Budget 2024–25**).
Savings Rate & Investment–Savings Gap	Domestic savings fund domestic investment. India's gross savings ~30% of GDP. When investment needs exceed savings, foreign capital (FDI/FPI) fills the gap.
Credit Growth & Bank Lending	Expansion of credit to industry and services is a proxy for investment activity. Revival in bank credit growth (~15% in 2022–23) signals investment recovery.

Various types of investment Models



A.Public Investment Models

Public investment is when the **government directly finances, builds, owns, and operates projects**. It is crucial for sectors where private participation is low due to low profitability but high social value.

1. Budgetary Support Model

- **Definition**: Projects fully funded by the Union or State government through budgetary allocations.
- **Examples**:
  - Schools, hospitals, rural roads under **PMGSY**.
  - Defence infrastructure and border roads.
- **Significance**: Ensures social welfare, regional equity, and access to essential services.
- **Limitations**: High fiscal burden, delays due to bureaucratic procedures.

2. Public Sector Undertakings (PSUs) Model

- **Definition**: Government-owned enterprises invest in sectors of strategic or commercial importance.
- **Examples**:
  - ONGC, NTPC, GAIL in energy.
  - Indian Railways in transport.
  - SAIL in steel.
- **Significance**: Ensures self-reliance in critical sectors, employment generation, and revenue for government.
- **Limitations**: Issues of inefficiency, overstaffing, and financial stress (Air India before privatisation).

3. Sovereign Funds Model

- **Definition**: Investment through government-created funds that pool capital for long-term projects.
- **Examples**:
  - **National Investment and Infrastructure Fund (NIIF, 2015)**: India's sovereign wealth fund with ~₹40,000 crore corpus; invests in roads, airports, renewable energy.
  - Dedicated funds for renewable energy and urban infrastructure.
- **Significance**: Attracts global co-investors, provides patient capital for long-gestation projects.
- **Limitations**: Limited scale compared to global sovereign wealth funds (e.g., Norway, Singapore).

B.Private Investment Models

Private investment refers to capital mobilised by **individuals, corporations, domestic investors, or foreign investors** into productive activities. It supplements public investment and is critical for **innovation, growth, employment, and global competitiveness**.

1. Domestic Private Investment

- **Definition**: Investment by Indian corporates, industries, MSMEs, startups, and individuals.
- **Examples**: Tata Group investing in EV battery plants; Reliance in green hydrogen; Infosys in IT campuses.
- **Significance**:
  - Main driver of growth and jobs.
  - Reflects business confidence in the economy.
- **Limitations**: Often held back by regulatory uncertainty, high borrowing costs, and demand slowdown.

2. Foreign Direct Investment (FDI)

- **Definition**: Long-term investment by foreign entities in Indian businesses/assets with significant control or management.
- **Examples**: Walmart's investment in Flipkart; Apple setting up manufacturing units; global firms in solar parks.
- **Significance**:
  - Brings capital, technology, managerial skills.
  - Boosts India's integration into global value chains.
- **Data**: India recorded approximately USD 81.04 billion in FDI during the fiscal year 2024-25, a 14% increase from the previous year's USD 71.28 billion..
- **Limitations**: Sensitive to policy stability, global economic shocks.

3. Foreign Portfolio Investment (FPI)

- **Definition**: Short-term investment in India's stock market, bonds, mutual funds by foreign institutional investors (FIIs).
- **Examples**: Global funds investing in Sensex, Nifty, or G-Secs.
- **Significance**:
  - Enhances liquidity and depth of capital markets.
  - Helps rupee stability when inflows are strong.
- **Limitations**: Highly volatile, quick to exit ("hot money"), can destabilise markets.

4. Venture Capital (VC) & Private Equity (PE)

- **Definition**: Funds invested in startups and high-growth firms by VC/PE funds in exchange for equity.
- **Examples**: SoftBank, Sequoia, Accel, Tiger Global investing in Indian unicorns like Byju's, Zomato, Paytm.
- **Significance**:
  - Fuels innovation, risk-taking, entrepreneurship.
  - Supported India's 100+ unicorns.

- **Limitations**: Exit challenges (IPO market dependency), valuation bubbles, concentration in metros.

5. Angel Investment

- **Definition**: Early-stage funding by wealthy individuals ("angels") in startups.
- **Examples**: Kunal Shah (Cred), Ratan Tata investing in startups.
- **Significance**: Provides critical seed funding for innovation at idea/prototype stage.
- **Limitations**: High risk, low survival rate of startups.

6. Crowdfunding Models

- **Definition**: Raising small sums of money from a large number of people through online platforms.
- **Types**:
  - Equity crowdfunding (investors get shares).
  - Debt crowdfunding (P2P lending).
  - Donation/reward-based crowdfunding (social/NGO projects).
- **Examples**: Platforms like Ketto, Milaap raising funds for health, education, social causes.
- **Significance**: Democratises investment and reduces entry barriers.
- **Limitations**: Regulatory risks, frauds, lack of investor protection.

C.Public–Private Partnership (PPP) Models

What is the PPP Model ?

- A PPP is a collaborative investment model where the government partners with the private sector to finance, build, and operate projects.
- Aim: combine efficiency of the private sector with social responsibility of the public sector.
- Widely used in infrastructure sectors: roads, railways, ports, airports, power, health, and urban services.

Major PPP Models

1. BOT (Build–Operate–Transfer)

- **Definition**: Private party builds, operates, and transfers asset to the government after concession period.
- **Variants**:
  - **BOT (Toll)**: Private party collects tolls from users.
  - **BOT (Annuity)**: Government pays a fixed annuity to developer → no demand risk.
- **Examples**: Many NHAI highways under NHDP, metro projects.
- **Pros**: Efficient risk sharing, reduces fiscal burden.
- **Cons**: Demand risk in BOT (Toll), disputes in revenue sharing.

2. EPC (Engineering–Procurement–Construction)

- **Definition**: Government fully funds project; private firm only constructs.
- **Examples**: Many rural roads, bridges, irrigation projects.
- **Pros**: Fast execution, no financial risk for private sector.
- **Cons**: Heavy fiscal burden, little incentive for efficiency.

3. HAM (Hybrid Annuity Model, 2016)

- **Definition**: Mix of EPC and BOT. Government pays **40% project cost upfront**, balance 60% by private developer, who is repaid via semi-annual annuities.
- **Examples**: Widely used in Bharatmala highways.
- **Pros**: Reduces risk for private sector; ensures project completion.
- **Cons**: Still relies heavily on public funding.

4. OMT (Operate–Maintain–Transfer)

- **Definition**: Private entity operates and maintains an existing asset for concession period; collects revenue or gets fixed payments.
- **Examples**: NHAI highways leased under OMT model.
- **Pros**: Ensures better maintenance and service delivery.
- **Cons**: Limited private investment in asset creation.

5. TOT (Toll–Operate–Transfer)

- **Definition**: Brownfield PPP model. Completed highways leased to private players for a fixed period in exchange for upfront payment.
- **Examples**: NHAI leasing Delhi–Agra highway under TOT.
- **Pros**: Generates quick revenue for govt; attracts long-term investors.

- **Cons**: Valuation disputes; depends on traffic projections.

6. DBFOT (Design–Build–Finance–Operate–Transfer)

- **Definition**: Private sector handles all aspects (design, build, finance, operate) and transfers after concession.
- **Examples**: Airports, metro systems.
- **Pros**: Full private sector efficiency.
- **Cons**: High financial risk for private player.

7. BOOT (Build–Own–Operate–Transfer)

- **Definition**: Private sector owns asset during concession, then transfers.
- **Examples**: Some power plants, telecom projects.
- **Pros**: Incentive for private innovation.
- **Cons**: Complex legal/regulatory issues.

Advantages of PPP Models

- Mobilises private capital for public needs.
- Improves efficiency, technology adoption, and service delivery.
- Reduces fiscal burden of government.
- Promotes risk-sharing between public and private entities.
- Enables faster project implementation.

Challenges of PPP Models

- Poor contract design and frequent disputes (e.g., highway projects stuck in litigation).
- Risk allocation issues: private sector bears disproportionate risk in many cases.
- Weak dispute resolution mechanisms and regulatory uncertainty.
- Banking/NBFC stress reduces long-term financing capacity.
- Cases of PPP failure in power distribution, water supply, metro projects (due to viability concerns).

Way Forward

- Reform PPP contracts with balanced risk sharing.
- Implement recommendations of Kelkar Committee (2015) on PPPs.
- Strengthen dispute resolution via independent regulators and fast-track arbitration.
- Promote Hybrid models (like HAM, TOT) for better viability.
- Encourage capacity building in govt agencies for contract management.
- Ensure transparency and accountability in bidding and implementation.

Kelkar Committee (2015) on PPPs:

- Set up by the Ministry of Finance to review and revitalize Public-Private Partnership (PPP) framework in India.
- Aimed to reinvigorate private sector participation in infrastructure.
- Recommended balancing risk sharing between public and private partners (move away from “one-sided” contracts).
- Suggested renegotiation framework for PPP contracts to handle stress due to changing circumstances.
- Advocated use of hybrid models (like Hybrid Annuity Model) for better risk allocation.
- Proposed independent regulators in key infrastructure sectors.
- Highlighted the need for institutional capacity building and a national-level PPP policy.
- Recommended strengthening the Project Preparation Phase (feasibility, clearances, risk assessment).
- Emphasized transparency and dispute resolution mechanisms (independent tribunals).
- Suggested creation of a 3P India institution for supporting PPPs with expertise and knowledge sharing.

D.Asset Monetisation Models

What meant by Asset Monetisation

- Asset monetisation means unlocking the value of existing (brownfield) public assets by involving private sector investment.
- The aim is to generate upfront capital from underutilised or operational assets, which can then be reinvested in new (greenfield) infrastructure projects.
- Based on the principle of “Asset recycling”: using mature assets to fund new growth.

Key Asset Monetisation Models in India

1. Toll–Operate–Transfer (TOT) Model

- **Definition**: Government leases operational highway stretches to private players for a fixed concession period.
- **How it works**: Private entity collects tolls in exchange for upfront lump-sum payment.

- **Example**: NHAI monetising Delhi–Agra highway; TOT bundles awarded to global investors (Macquarie, Cube Highways).
- **Pros**: Unlocks immediate cash for govt; attracts long-term investors.
- **Cons**: Valuation disputes; depends on traffic projections.

2. InvITs (Infrastructure Investment Trusts)

- **Definition**: SEBI-regulated investment vehicles similar to mutual funds, pooling money from investors to own/operate infrastructure projects.
- **How it works**: Investors receive units (like shares) and regular dividends.
- **Examples**: NHAI InvIT, PowerGrid InvIT listed on stock exchanges.
- **Pros**: Attracts institutional investors (pension funds, insurance). Improves liquidity.
- **Cons**: Market-dependent returns; limited retail investor awareness.

3. REITs (Real Estate Investment Trusts)

- **Definition**: Investment trusts that own, manage, and operate income-generating real estate assets (commercial, retail, office spaces).
- **Examples**: Embassy REIT (India's first, listed 2019), Brookfield REIT.
- **Pros**: Provides small investors access to large real estate assets.
- **Cons**: Limited mainly to real estate, not broader infra.

4. National Monetisation Pipeline (NMP, 2021)

- **Launched by**: NITI Aayog and Ministry of Finance.
- **Target**: ₹6 lakh crore monetisation by FY 2025.
- **Assets covered**: Roads, railways, power transmission lines, gas pipelines, airports, ports, telecom towers, stadiums, warehouses.
- **Principle**: Ownership stays with government; private sector only operates under lease/PPP.
- **Pros**: Transparent project pipeline gives certainty to investors.
- **Cons**: Execution delays, valuation challenges, state govt reluctance.

5. Land Value Capture (LVC)

- **Definition**: Financing urban infrastructure by capturing the rise in land/property values due to public investment.
- **Examples**: Delhi Metro, Hyderabad Metro using land leasing, TOD (Transit-Oriented Development).
- **Instruments**: Betterment levy, impact fee, land auctions, joint development.
- **Pros**: Generates non-fare revenue, reduces pressure on govt finances.
- **Cons**: Politically sensitive, depends on real estate cycles.

Significance of Asset Monetisation Models

- Generates **non-tax revenue** for government.
- Attracts private capital without losing asset ownership.
- Reduces fiscal stress while funding new infrastructure.
- Enhances efficiency through private operation.
- Aligns with **Atmanirbhar Bharat** and **$5 trillion economy goal**.

Challenges

- Valuation disputes – risk of underpricing public assets.
- Private sector reluctance – regulatory uncertainties, long concession periods.
- Political opposition – fear of "privatisation" of public assets.
- Implementation delays – especially in state-level assets.
- Low awareness of InvITs/REITs among retail investors.

Way Forward

- Transparent valuation using independent agencies.
- Wider use of InvITs and REITs to attract retail + institutional investors.
- Encourage states to adopt monetisation with incentives.
- Strong regulatory framework for dispute resolution.
- Public communication to build trust that ownership stays with the government.

E.Social Sector Investment Models

1. Corporate Social Responsibility (CSR) Model

- **Definition**: Mandatory contribution by companies (2% of average net profits over the last 3 years) towards social development.
- **Legal Basis**: Section 135, Companies Act 2013 – India became the **first country in the world to mandate CSR spending**.

- **Areas Covered**: Health, education, sanitation, environment, rural development, skill development.
- **Examples**:
  - Tata Group in education and healthcare.
  - Reliance Foundation in rural development.
- **Significance**: Creates corporate accountability, supplements govt efforts in social sector.
- **Challenges**: Box-ticking compliance, uneven distribution across regions, sometimes seen as philanthropy rather than sustainable investment.

2. Impact Investing

- **Definition**: Investments made with the intention to generate **measurable social and environmental impact alongside financial returns**.
- **Sectors**: Clean energy, microfinance, healthcare, education, financial inclusion.
- **Examples**:
  - Acumen Fund investing in affordable healthcare startups.
  - Aavishkaar Capital in rural enterprises.
- **Significance**: Bridges gap between charity and profit-oriented investment.
- **Challenges**: Measuring social outcomes, balancing financial vs social returns.

3. Social Impact Bonds (SIBs) / Development Impact Bonds (DIBs)

- **Definition**: Outcome-based financing where private investors fund a social project; if outcomes are achieved, government/ philanthropic donors repay with interest.
- **Example**:
  - India's first DIB (2015): Educate Girls program in Rajasthan, funded by UBS Optimus Foundation, outcome payer was CIFF.
- **Significance**: Encourages innovation, reduces govt risk, ensures accountability (payment linked to results).
- **Challenges**: Complex contracts, outcome measurement difficulties, limited scale.

4. Public Philanthropy Models

- **Definition**: Funding by high-net-worth individuals (HNIs), foundations, or community-based donations for social causes.
- **Examples**:
  - Azim Premji Foundation (education).
  - Shiv Nadar Foundation (higher education).
  - Infosys Foundation (healthcare, rural development).
- **Significance**: Fills gaps in state capacity; highly flexible and locally responsive.
- **Challenges**: Dependence on individual donors, lack of accountability mechanisms.

5. Blended Finance in Social Sector

- **Definition**: Combines concessional public or philanthropic funds with commercial private capital to de-risk social projects.
- **Examples**: Financing rural solar grids, low-cost housing, or healthcare through govt + private + NGO partnerships.
- **Significance**: Attracts large-scale capital to social projects otherwise seen as high-risk.
- **Challenges**: Coordination among diverse stakeholders, sustainability.

F.Innovative & Emerging Investment Models

1. Green Bonds & ESG Funds

- **Definition**: Debt instruments where proceeds are exclusively used for financing **environmentally sustainable projects** (renewable energy, clean transport, afforestation).
- **ESG Funds**: Investment funds screened based on Environmental, Social, Governance (ESG) criteria.
- **Examples**:
  - India issued its **first sovereign green bonds in 2023** worth ₹16,000 crore.
  - HDFC, Axis Mutual Fund launched ESG funds.
- **Significance**: Mobilises capital for India's **Net Zero 2070** target.
- **Challenges**: Risk of "greenwashing", low awareness among domestic investors.

2. Blended Finance

- **Definition**: Combines concessional finance (public/philanthropic) with commercial capital to **de-risk investments**.
- **Examples**:
  - Blended finance used in renewable energy

micro-grids in rural India.
    - World Bank, ADB blending grants with private equity for clean energy.
- **Significance**: Attracts large-scale capital into sectors like healthcare, sanitation, and green infra.
- **Challenges**: Complex coordination, measuring impact.

3. Climate Finance & Energy Transition Funds

- **Definition**: Financing targeted towards climate adaptation, mitigation, and transition to low-carbon economy.
- **Examples**:
    - Green Climate Fund (UNFCCC).
    - India's National Green Hydrogen Mission supported by green financing.
    - International Solar Alliance funding for solar projects.
- **Significance**: Critical for India's commitments under **Paris Agreement** and **SDGs**.
- **Challenges**: Global climate finance pledges ($100 bn annually) remain underdelivered.

4. Startup Financing Models

- **Venture Capital & Private Equity**: Big funds investing in growth-stage startups.
- **Angel Investors**: Early-stage high-risk investments by individuals.
- **Government Support**:
    - Fund of Funds for Startups (FFS) managed by SIDBI.
    - Startup India Seed Fund Scheme (SISFS).
- **Examples**: 100+ unicorns in India, driven by VC/PE investments (e.g., Byju's, Zomato, Paytm).
- **Significance**: Boosts innovation, job creation, digital economy.
- **Challenges**: Overvaluation, funding winters, survival risks for early-stage firms.

5. Fintech-enabled Investment Models

- **P2P (Peer-to-Peer) Lending**: Platforms (like Faircent, Lendbox) connecting borrowers directly with investors.
- **Crowdfunding Platforms**: Small investments pooled digitally for startups or social causes (Ketto, Milaap).
- **Neobanks & Digital Platforms**: Offering micro-loans, digital savings, and investment opportunities.
- **Significance**: Democratises finance, promotes financial inclusion.
- **Challenges**: Cybersecurity risks, frauds, lack of investor protection.

Value Addition

Keywords : Gross Fixed Capital Formation (GFCF), Public Investment, Private Investment, Public–Private Partnership (PPP), Asset Monetisation, InvITs, REITs, National Investment and Infrastructure Fund (NIIF), Foreign Direct Investment (FDI), Venture Capital & Private Equity (VC/PE), Foreign Portfolio Investment (FPI), National Monetisation Pipeline (NMP), Hybrid Annuity Model (HAM), Toll–Operate–Transfer (TOT), Disinvestment, Blended Finance, Green Bonds, Social Impact Bonds (SIBs), Crowdfunding, Fiscal Incentives

<u>Mains Question for Practice :</u>

Q1. Define investment models. Compare and contrast Public Investment, Private Investment, PPP, and FDI in the Indian context.

Q2. Critically evaluate the effectiveness of Public–Private Partnership (PPP) in infrastructure development in India.

Q3. "FDI has been a driver of growth but not always of inclusive development." Examine in the Indian context.

Q4. Discuss the challenges of financing infrastructure through PPPs and suggest reforms for sustainable investment models.

Q5. Evaluate the relative merits and demerits of Foreign Direct Investment (FDI) and Foreign Portfolio Investment (FPI) for India's economic growth.

Acronyms

1. Public Investment – Challenges

"FISCAL"

- **F** – Fiscal deficit constraints
- **I** – Inefficient utilization of funds
- **S** – Subsidy burden crowding out capital expenditure
- **C** – Corruption & leakages in project execution
- **A** – Administrative delays (land, clearances)
- **L** – Low returns on some public projects

2. Private Investment – Challenges

"CREDIT"

- **C** – Credit constraints (NPA burden, low bank lending)
- **R** – Regulatory bottlenecks
- **E** – Economic uncertainty (global & domestic)
- **D** – Demand sluggishness in the market
- **I** – Infrastructure gaps raising costs
- **T** – Taxation & compliance hurdles

3. PPP (Public–Private Partnership) – Issues
"RISK"
- **R** – Revenue sharing disputes
- **I** – Inefficient risk allocation (govt vs private)
- **S** – Stalled projects & delays
- **K** – Knowledge/skill gaps in contract management

4. FDI – Benefits
"GROWTH"
- **G** – GDP boost & capital inflows
- **R** – R&D and technology transfer
- **O** – Opens global market access
- **W** – Workforce skilling & employment
- **T** – Trade competitiveness improves
- **H** – Higher infrastructure investment

5. FPI – Risks
"HOT" (because it's hot money)
- **H** – High volatility (quick entry & exit)
- **O** – Overdependence on foreign portfolio flows
- **T** – Threat to currency stability & stock market fluctuations

UNIT 1

Major Crops & Agricultural Practices

Navigating the Syllabus: What You Need to Know

1.Major Crops - Cropping Patterns in various parts of the country
- Cropping seasons
- Major crop categories
- Types of cropping
- Factors affecting cropping pattern
- Changing trends & challenges

2.Different Types of Irrigation and Irrigation Systems
- Types
- Regional patterns
- Issues
- Government programmes

3.Storage, Transport and Marketing of Agricultural Produce and Issues & Related Constraints
- Storage
- Transport
- Marketing systems
- Regulatory framework
- Constraints

4.E-technology in the aid of farmers (and Technology Missions)

UPSC Previous Year Questions

Question	Nature of Question	Core Demand
Explain the changes in cropping pattern in India in the context of changes in consumption pattern and marketing conditions. (2023)	Cropping Pattern + Consumption Shift + Market Conditions	Explain how demand-side changes (diet diversification, processed foods, export demand) and marketing reforms shaped cropping trends
What are the main bottlenecks in the upstream and downstream process of marketing of agricultural products in India? (2022)	Agri Marketing + Supply Chain	Identify constraints in procurement, storage, logistics, processing, and distribution
What is an Integrated Farming System? How is it helpful to small and marginal farmers in India? (2022)	Integrated Farming + Small Farmer Sustainability	Define IFS and discuss its role in income diversification, risk reduction, and resource efficiency
How and to what extent would micro-irrigation help in solving India's water crisis? (2021)	Irrigation + Water Management	Explain benefits of micro-irrigation (efficiency, conservation, productivity) and its limitations in addressing water stress

What are the present challenges before crop diversification? How do emerging technologies provide an opportunity for crop diversification? (2023)	Crop Diversification + Technology	Highlight constraints (MSP bias, input subsidies, infrastructure) and how technologies (AI, precision farming, biotech) enable diversification
What are the main constraints in transport and marketing of agricultural produce in India? (2020)	Agri Logistics + Marketing	Assess issues in rural transport, cold storage, fragmented markets, middlemen
How far is Integrated Farming System (IFS) helpful in sustaining agricultural production? Elaborate the impact of the National Watershed Project in increasing agricultural production from water-stressed areas. (2019)	IFS + Watershed Management	Assess IFS role in sustainability and explain how watershed projects improved productivity in drought-prone areas
Assess the role of National Horticulture Mission (NHM) in boosting the production, productivity and income of horticulture farms. How far has it succeeded in increasing the income of farmers? (2018)	Horticulture + NHM + Farmer Income	Evaluate achievements and limitations of NHM in productivity and farmer earnings
How has the emphasis on certain crops brought about changes in cropping patterns in recent past? Elaborate the emphasis on millets production and consumption. (2018)	Cropping Pattern + Millets	Explain policy-driven shifts (rice/wheat bias, now millet revival) and discuss nutritional/security benefits of millets
Explain various types of revolutions, took place in Agriculture after Independence in India. How have these revolutions helped in poverty alleviation and food security in India? (2017)	Agricultural Revolutions + Food Security	List revolutions (Green, White, Yellow, Blue, etc.) and explain their impact on poverty reduction and food security
What are the major reasons for declining rice and wheat yield in the cropping system? How crop diversification is helpful to stabilize the yield of the crop in the system? (2017)	Rice & Wheat Yield Decline + Diversification	Explain causes of stagnation (soil health, water stress, input fatigue) and role of diversification in stability
Given the vulnerability of Indian agriculture to vagaries of nature, discuss the need for crop insurance and bring out the salient features of the Pradhan	Crop Insurance + Risk Management	Justify crop insurance necessity and explain PMFBY features (coverage, premium, tech use)

Mantri Fasal Bima Yojana (PMFBY). (2015)		
How can the 'Digital India' programme help farmers to improve farm productivity and income? What steps has the Government taken in this regard? (2015)	Digital Agriculture + ICT + E-Governance	Explain role of ICT (market info, weather, precision farming) and mention schemes like e-NAM, soil health cards, Kisan apps
There is also a point of view that agriculture produce market committees (APMCs) set up under the state acts have not only impeded the development of agriculture but also have been the cause of food inflation in India. Critically examine. (2014)	APMC + Market Reforms + Food Inflation	Critically assess APMC functioning, monopoly issues, and impact on price rise
"In the villages itself no form of credit organisation will be suitable except the cooperative society." – All Indian rural credit survey. Discuss this statement in the background of agriculture finance in India. What constraints and challenges do financial institutions face supplying agricultural finances? How can technology be used to better reach and serve rural clients? (2014)	Agri Finance + Cooperatives + Rural Credit	Examine cooperative role, identify institutional credit constraints, and suggest tech-based solutions (fintech, mobile banking)

1 Major Crops - Cropping Patterns in Various Parts of the Country

Introduction

- India's agriculture is characterised by significant variability in the nature of its crops, largely due to its diverse climate, geography, and soil types. The diverse agro-climatic landscape allows the cultivation of a wide range of crops across different regions, making agriculture a cornerstone of India's economy.
- According to the 2011 Census, 54.6 per cent of the total workforce is engaged in agricultural and allied sector activities, underscoring the sector's critical role in the nation's economic growth and overall development is imperative.
- Cropping pattern refers to the distribution of different crops within a specific area at a given time. It indicates the yearly sequence and spatial arrangement of crops that follow in an area.
- In India, cropping patterns have traditionally been shaped by the monsoons, which determine the agricultural calendar of the country. India's agricultural landscape is broadly divided into Kharif (monsoon), Rabi (winter) and Zaid cropping seasons.

Cropping Seasons in India

1. Kharif Season (June–October)

- **Sowing time**: Begins with onset of southwest monsoon in June–July.
- **Harvesting time**: September–October.
- **Climatic needs**: High temperature, heavy rainfall, and humidity.
- **Major crops**:
  - Rice (main Kharif crop)
  - Maize, Jowar (sorghum), Bajra (millets)
  - Pulses: Arhar (tur), Moong
  - Oilseeds: Groundnut, Soybean
  - Commercial crops: Cotton, Sugarcane
- **Regional spread**:
  - Rice: West Bengal, Uttar Pradesh, Punjab, Bihar, Odisha, Andhra Pradesh
  - Millets: Rajasthan, Maharashtra, Karnataka
- **Production data**:
  - Area under Kharif crops: 378 lakh hectares in 2022–23 (14.1% increase from previous year)
  - Rice production: 1,357.55 lakh tonnes in 2022–23 (record high)
  - Maize: Increasing steadily due to demand for food, fodder, and industry

2. Rabi Season (October–April)

- **Sowing time**: October–November (after monsoon withdrawal).
- **Harvesting time**: March–April.
- **Climatic needs**: Cool winters for growth, dry summers for harvesting. Relies more on irrigation than monsoon.
- **Major crops**:
  - Wheat (main Rabi crop)
  - Barley, Gram, Lentils, Peas
  - Oilseeds: Mustard, Rapeseed, Linseed
- **Regional spread**:
  - Wheat: Punjab, Haryana, Uttar Pradesh, Rajasthan, Madhya Pradesh, Bihar
  - Mustard: Rajasthan, Haryana, Uttar Pradesh, Madhya Pradesh
- **Production data**:
  - Area under Rabi crops: 720.68 lakh hectares in 2022–23 (3.25% increase from 2021–22)
  - Wheat production: 1,105.54 lakh tonnes in 2022–23 (record high)
  - Mustard area: 98.02 lakh hectares in 2022–23 (up from 91.25 lakh ha)
  - Pulses area: 167.86 lakh hectares in 2022–23 (increase from 167.31 lakh ha)

3. Zaid Season (March–June)

- **Sowing time**: Between Rabi harvest and Kharif sowing (March).
- **Harvesting time**: June.
- **Climatic needs**: Warm, dry weather with longer daylight hours. Uses residual soil moisture and irrigation.
- **Major crops**:
  - Watermelon, Muskmelon
  - Cucumber, Pumpkin, Bitter Gourd
  - Fodder crops
- **Production data**:
  - Area under Zaid crops increased 2.7 times, from 29.71 lakh hectares in 2017–18 to 80.46 lakh hectares in 2020–21.

Major Crops in India (by Category)

1. Foodgrains

- **Rice**: Staple food for majority; grown in high rainfall and irrigated areas (West Bengal, UP,

Punjab, Odisha, AP).
- **Wheat**: Main Rabi crop; needs cool climate; grown in Punjab, Haryana, UP, MP, Rajasthan.
- **Maize**: Both Kharif and Rabi crop; used as food, fodder, and industrial input; Bihar, Karnataka, MP.
- **Millets (Nutri-cereals)**: Jowar, Bajra, Ragi; drought-resistant, climate-resilient; grown in Rajasthan, Karnataka, Maharashtra.
- **Pulses**: Gram, Tur (Arhar), Moong, Urad, Masoor; grown across MP, Maharashtra, UP, Rajasthan.

2. Commercial Crops
- **Sugarcane**: Tropical and sub-tropical crop; UP, Maharashtra, Karnataka.
- **Cotton**: Fibre crop; black soil regions; Maharashtra, Gujarat, Telangana.
- **Jute**: Fibre crop; high rainfall and riverine soils; West Bengal, Bihar, Assam.
- **Tobacco**: Andhra Pradesh, Gujarat, Karnataka.

3. Oilseeds
- **Groundnut**: Major Kharif oilseed; grown in Gujarat, Andhra Pradesh, Tamil Nadu.
- **Mustard and Rapeseed**: Grown in Rabi season; Rajasthan, UP, MP.
- **Soybean**: Central India (MP is largest producer).
- **Sunflower, Sesame, Castor seed**: Widely grown in Karnataka, Andhra Pradesh, Gujarat.

4. Plantation Crops
- **Tea**: Assam, West Bengal, Tamil Nadu, Kerala.
- **Coffee**: Karnataka, Kerala, Tamil Nadu.
- **Coconut**: Kerala, Karnataka, Tamil Nadu, Andhra Pradesh.
- **Arecanut**: Karnataka, Kerala.
- **Rubber**: Kerala, Tamil Nadu, NE states.

5. Horticultural Crops
- **Fruits**:
  - Mango (UP, Bihar, AP)
  - Banana (TN, Maharashtra, Gujarat)
  - Apple (HP, J&K, Uttarakhand)
  - Grapes (Maharashtra, Karnataka)
- **Vegetables**: Potato (UP, WB, Bihar), Onion (Maharashtra, Karnataka), Tomato (AP, MP).
- **Spices**: Cardamom, Pepper (Kerala, Karnataka), Turmeric (Telangana, Odisha, TN).

6. Other Crops
- **Fodder crops**: Alfalfa, Napier grass, Berseem (important for the dairy economy).
- **Floriculture**: Rose, Marigold, Jasmine (Maharashtra, Karnataka, TN, WB).
- **Medicinal & Aromatic plants**: Ashwagandha, Aloe vera, Lemongrass, Tulsi (MP, UP, Rajasthan).

Types of Cropping Patterns in India

1. Monocropping or Monoculture
- Growing only one crop on the same piece of land year after year.
- Examples: Wheat, maize, sugarcane in irrigated or semi-arid zones.
- Simple to manage, easy for mechanisation and large-scale farming.
- **Regions**: Predominantly in Punjab, Haryana, Western UP (wheat–rice belt), and parts of MP (soybean monocropping).
- **Concerns**:
  - Leads to nutrient depletion and soil fertility loss.
  - Increases vulnerability to pests and diseases.
  - Promotes groundwater exploitation (e.g., rice in Punjab).
  - Reduces biodiversity and long-term sustainability.

2. Intercropping
- Two or more crops grown together in fixed row arrangement.
- **Example:** Pigeon pea with sorghum, cotton with groundnut.
- **Regions**: Karnataka, Maharashtra, parts of Gujarat and MP.
- **Concerns**:
  - Requires careful crop selection to reduce competition.
  - More labour-intensive.
  - Yield may reduce if crop combinations are not well managed.

3.Mixed Cropping
- Two or more crops grown together without any definite pattern or ratio.
- **Example:** Wheat with mustard, groundnut with sunflower.

- **Regions**: Northern India (wheat + mustard), rainfed regions of MP and Rajasthan.
- **Concerns**:
  - Harvesting becomes difficult.
  - Unequal nutrient uptake may reduce productivity.
  - Yields generally lower compared to monocropping.

4.Sequential Cropping

- Two or more crops grown in succession on the same land within a year.
- Example: Rice–wheat (Punjab, UP), Rice–Rice (Assam, WB), Soybean–Wheat (MP, Maharashtra).
- **Regions**: Indo-Gangetic plains, Central India, coastal AP and TN.
- **Concerns**:
  - Soil exhaustion and overuse of inputs.
  - Heavy reliance on irrigation.
  - Increases stubble burning issues in rice–wheat system.

5.Relay Cropping

- Next crop sown before the previous one is fully harvested.
- **Example:** Potato before maize harvest, radish before potato harvest.
- **Regions**: Eastern UP, Bihar, parts of Odisha and West Bengal.
- **Concerns**:
  - Requires precise timing, otherwise both crops may suffer.
  - Competition for nutrients and moisture.
  - Risk of pest and disease carryover.

6. Mixed Farming

- Combination of crop cultivation with livestock, poultry, fisheries, or beekeeping.
- Ensures diversified income and risk reduction.
- **Regions**: Punjab and Haryana (crop + dairy), West Bengal and Odisha (crop + fisheries).
- **Concerns**:
  - Requires higher management skills.
  - Initial investment cost is higher.
  - Returns may fluctuate depending on multiple factors (markets, disease outbreaks).

Integrated Farming System (IFS)

Concept of Integrated Farming System

- **Definition:** IFS is a resource management strategy that integrates diverse farm enterprises for sustainable productivity and profitability.
- **Key Principle:** "One's waste is another's input" — e.g., crop residues as fodder, livestock manure as organic fertilizer, fishpond silt as soil nutrient.
- **Components:**
  - Crops (cereals, pulses, oilseeds, vegetables, fruits)
  - Livestock (dairy, poultry, goatery, piggery)
  - Aquaculture
  - Agroforestry and horticulture
  - Apiculture, sericulture, mushroom cultivation, etc.

Relevance of IFS in Indian Context

- **Small and marginal farmers (≈85% of holdings):** Diversification enhances income and reduces vulnerability.
- **Nutritional Security:** Provides food, milk, eggs, fruits, and vegetables for household consumption.
- **Employment Generation:** Ensures year-round labor use.
- **Climate Resilience:** Diversified systems are less prone to crop failure.
- **Soil Health:** Integration of organic sources reduces dependence on chemical fertilizers.
- **Doubling Farmers' Income:** By increasing productivity per unit area through multi-enterprise systems.

Advantages of IFS

- **Economic:** Higher and stable income through diversified sources.
- **Ecological:** Efficient recycling of resources reduces pollution.
- **Social:** Improves food security and provides year-round employment.
- **Sustainability:** Restores soil fertility, conserves water, and enhances biodiversity.

Challenges in Implementation

- **Knowledge Gap:** Lack of awareness and technical know-how among farmers.
- **Initial Investment:** Higher upfront costs for

livestock sheds, fishponds, etc.
- **Market Linkages:** Perishables like milk, vegetables, and fish need robust supply chains.
- **Extension Services:** Limited institutional support for integrated models.
- **Policy Gaps:** Current subsidies are crop-centric, not system-oriented.

Government Initiatives Promoting IFS
- **National Mission on Sustainable Agriculture (NMSA):** Focus on integrated farming for climate resilience.
- Mission for Integrated Development of Horticulture (MIDH).
- Rashtriya Krishi Vikas Yojana (RKVY).
- **ICAR's AICRP on Integrated Farming Systems:** Demonstration of location-specific models.

Way Forward
- **Customized Models:** Develop region- and resource-specific IFS models.
- **Capacity Building:** Farmer training, Krishi Vigyan Kendras, digital advisory platforms.
- **Credit & Insurance:** Affordable loans and risk mitigation instruments.
- **Market Infrastructure:** Cold chains, farmer-producer organizations (FPOs).
- **Policy Support:** Shift from crop-centric subsidies to holistic system-based incentives.
- **Research & Innovation:** Emphasis on agro-ecological zoning and climate-smart IFS.

Factors Affecting Cropping Pattern in India

1. Physical Factors
- **Climate**:
  - Temperature, rainfall, and humidity are the most decisive elements.
  - **Example:** Rice requires high temperature (above 20°C) and abundant water, which is why it dominates in eastern and southern states like West Bengal, Odisha, and Tamil Nadu.
  - Wheat, on the other hand, needs cool winters and warm summers, which suit north-western states like Punjab and Haryana.
  - Millets (jowar, bajra, ragi) thrive in semi-arid regions like Rajasthan and Maharashtra because they are drought-resistant.
- **Soil Type**:
  - Black soil of Maharashtra and Gujarat is ideal for cotton.
  - Alluvial soil in the Indo-Gangetic plain supports rice, wheat, and sugarcane.
  - Laterite soil in Karnataka and Kerala is best suited for cashew and plantation crops.
- **Topography**:
  - Flat plains encourage large-scale cultivation of cereals.
  - Hilly areas are better suited for plantation crops like tea and coffee (Assam, Kerala) or temperate fruits like apple (Himachal Pradesh, J&K).
- **Water Availability**:
  - Irrigation facilities determine whether a region grows water-intensive crops or drought-resistant crops.
  - Example: Irrigated areas of Punjab and Haryana focus on rice and wheat, while dryland regions of Rajasthan focus on bajra and pulses.

2. Economic Factors
- **Market Demand and Price**:
  - Farmers naturally prefer crops that have assured demand and good prices.
  - Example: Sugarcane is widely cultivated in UP and Maharashtra due to the sugar industry's demand.
- **MSP and Procurement Policies**:
  - The Minimum Support Price (MSP) system and procurement by FCI have incentivised farmers in Punjab and Haryana to grow rice and wheat, even though these crops are not naturally suited to water-scarce regions.
- **Credit and Insurance Availability**:
  - Crops with higher risks (like cotton or horticulture) require more capital. Access to credit through banks or cooperatives can influence farmers' decisions. Crop insurance (PMFBY) also encourages risk-taking in commercial crops.
- **Infrastructure Support**:
  - Storage, cold chains, and transport availability matter a lot. Farmers near cities often prefer perishable crops like fruits, vegetables, and milk, since they fetch higher returns if storage and logistics are available.

3. Technological Factors

- **High-Yielding Varieties (HYVs)**:
  - During the Green Revolution, the introduction of HYV seeds of wheat and rice shifted cropping patterns drastically in Punjab, Haryana, and UP.
- **Mechanisation**:
  - Labour-intensive crops like sugarcane or cotton are grown in regions with cheap labour, while mechanised areas prefer crops that suit tractors and harvesters.
- **Irrigation Technology**:
  - Drip and sprinkler irrigation made it possible to grow water-demanding crops like sugarcane and cotton in dry regions of Maharashtra and Gujarat.
- **Modern Inputs**:
  - Fertiliser and pesticide use influences crop choices. For instance, paddy and sugarcane cultivation is possible at scale because they are input-intensive.

4. Policy and Institutional Factors

- **Government Schemes**:
  - Missions like NFSM (National Food Security Mission for rice, wheat, pulses), NMOOP (National Mission on Oilseeds and Oil Palm), and MIDH (Mission on Horticulture) directly promote specific crops.
- **Trade Policies**:
  - Export bans or incentives shift crop cultivation. For example, export bans on onion or rice affect cropping in Maharashtra and Andhra Pradesh.
- **Subsidies**:
  - Fertiliser, water, and electricity subsidies have encouraged water-intensive crops like rice in Punjab and sugarcane in Maharashtra.
- **Land Reforms and Tenancy Laws**:
  - In some states, restrictive tenancy laws prevent tenant farmers from investing in long-term commercial crops. In contrast, states with progressive reforms encourage diversification.

5. Social and Cultural Factors

- **Food Habits and Traditions**:
  - Crop choices are influenced by what people eat. Rice dominates in southern and eastern India, wheat in the north, and millets in semi-arid regions.
  - Cultural practices also keep farmers attached to traditional crops even when alternatives exist.
- **Ethnic and Cultural Preferences**:
  - Tea cultivation in Assam, cardamom in Kerala, or saffron in Kashmir have historical and cultural roots beyond mere economics.
- **Labour Availability**:
  - Crops like sugarcane and cotton require more labour; regions with abundant labour (e.g., Bihar, UP) often grow such crops. Labour shortage encourages mechanised alternatives.

6. Environmental and Sustainability Concerns

- **Climate Change**:
  - Changing rainfall and temperature patterns are forcing farmers to shift crops. **Example:** wheat yield decline in heat-stressed north India, promotion of millets as climate-resilient alternatives.
- **Soil and Water Degradation**:
  - Over-cultivation of paddy and sugarcane is depleting groundwater and reducing soil fertility, forcing a rethink on cropping patterns.
- **Sustainability Push**:
  - Government and international agencies now promote pulses, oilseeds, and millets to restore soil health and achieve nutritional security.

Changing Trends in Cropping Patterns in India

- **From Coarse Cereals to Rice-Wheat Dominance:** Post-Green Revolution, there was a marked shift from traditional coarse cereals (millets, sorghum) to rice and wheat, particularly in Punjab, Haryana, and western UP due to assured procurement and irrigation.
- **Rise of Cash Crops:** Increasing commercialization has led to expansion of crops like sugarcane, cotton, tobacco, and oilseeds. For example, Maharashtra has become a hub for sugarcane despite water stress.
- **Horticultural Diversification:** Fruits, vegetables, flowers, spices, and medicinal plants are expanding rapidly. India is now the second-

largest producer of fruits and vegetables globally, reflecting dietary diversification and higher profit margins.

- **Oilseed and Pulse Push:** Government programs like the **Technology Mission on Oilseeds** and **National Food Security Mission on Pulses** have led to some revival, but India still relies on imports.
- **Shift Towards Maize and Non-traditional Crops:** Maize cultivation has increased due to its demand in poultry feed, starch, and ethanol production. Similarly, soybean has expanded in central India.
- **Emergence of Non-food Crops:** Commercial cultivation of biofuel crops (jatropha), floriculture, and medicinal plants is gaining ground.
- **Regional Variations:**
  - Eastern India: push towards rice and maize under programs like **"Bringing Green Revolution to Eastern India" (BGREI)**.
  - Southern India: shift to plantation crops (coffee, tea, spices) and horticulture.
  - Northern drylands: gradual decline in millets, replaced by wheat and mustard.
- **Climate Change and Water Stress:** Farmers are slowly shifting from water-intensive rice and sugarcane towards pulses, oilseeds, and millets in semi-arid areas.
- **Policy and Market Drivers:**
  - MSP regime skewed towards rice and wheat.
  - Contract farming and global demand influencing choices (e.g., basmati rice, cotton).
  - FPOs and agri-startups enabling farmers to diversify into high-value crops.

Challenges in Cropping Patterns

- **Overdependence on Rice-Wheat System:** Green Revolution skewed production towards rice and wheat, leading to monocropping, regional imbalance, and neglect of pulses, oilseeds, and coarse cereals.
- **Water Stress & Unsuitable Cropping Choices:** Expansion of water-intensive crops like sugarcane in drought-prone Maharashtra or paddy in Punjab has led to groundwater depletion, soil salinity, and ecological stress.
- **Decline of Nutri-Cereals:** Traditional crops like millets and sorghum, which are climate-resilient and nutritious, are being replaced, causing dietary imbalance and loss of agro-biodiversity.
- **Regional Imbalances:** Some states dominate in certain crops due to policy and infrastructure (Punjab in paddy-wheat, Maharashtra in sugarcane, Andhra Pradesh in tobacco), while eastern and central India remain underutilized.
- **Market and Policy Distortions:** MSP and procurement are largely limited to rice and wheat, discouraging diversification. Lack of remunerative markets for pulses, oilseeds, and horticulture reduces farmer incentives.
- **Climate Change Vulnerability:** Erratic rainfall, heatwaves, and floods are making existing cropping patterns unsustainable. Traditional crop calendars are being disrupted.
- **Infrastructure Deficit:** Inadequate cold chains, storage, and processing facilities limit diversification into perishables like fruits and vegetables.
- **Pest and Disease Pressure:** Monocropping patterns have increased vulnerability to pests (e.g., whitefly in cotton, locusts in Rajasthan) and reduced natural resistance.
- **Land Fragmentation:** Small and marginal holdings (85% of farmers) restrict adoption of diversified or high-value cropping systems.
- **Input Cost and Resource Inefficiency:** Excessive fertilizer and pesticide use in certain cropping systems has degraded soil fertility and raised costs without proportionate yield benefits.

Way Forward on Cropping Patterns in India

- **Crop Diversification:** Promote pulses, oilseeds, horticulture, and nutri-cereals to reduce overdependence on rice–wheat system.
- **Reform MSP & Procurement:** Expand procurement to include pulses, oilseeds, and millets; incentivize states adopting diversified cropping.
- **Water-Smart Agriculture:** Encourage less water-intensive crops (millets, pulses, oilseeds) in drought-prone areas; promote micro-irrigation under **PMKSY**.
- **Climate-Smart Cropping:** Develop and disseminate resilient crop varieties; promote integrated farming and agroforestry systems.

- **Strengthen Infrastructure & Markets:** Invest in cold chains, storage, food processing, and Farmer Producer Organizations (FPOs) to support horticultural crops.
- **Nutritional Security Orientation:** Integrate millets, pulses, and vegetables into PDS, mid-day meal scheme, and ICDS to shift demand-driven cropping patterns.
- **Soil Health & Resource Efficiency:** Promote organic farming, precision farming, and balanced fertilizer use to sustain diversified cropping.
- **Regional Customization:** Encourage location-specific cropping strategies (e.g., maize in eastern states, pulses in drylands, horticulture in hills).
- **Awareness & Extension Services:** Strengthen Krishi Vigyan Kendras, digital platforms, and farmer training to popularize diversified, profitable cropping systems.

2 Different Types of Irrigation and Irrigation Systems

Introduction

- Irrigation is the artificial application of water to agricultural land to supplement natural rainfall. In a monsoon-dependent country like India, irrigation plays a critical role in ensuring stable agricultural production, as nearly 50% of net sown area is still rainfed and prone to droughts or erratic rainfall.
- The importance of irrigation in India is immense:
  - It supports the cultivation of water-intensive crops like rice, sugarcane, and wheat.
  - It enables multiple cropping and higher yields, which are vital for food security.
  - It reduces dependence on uncertain monsoons, stabilising farmers' incomes.
  - It helps in the spread of new technologies like HYV seeds, fertilisers, and mechanisation, which require assured water supply.
- India has developed diverse irrigation systems ranging from traditional wells and tanks to modern canal networks and micro-irrigation technologies. The choice of irrigation method depends on regional geography, soil type, water availability, and economic feasibility.
- Thus, irrigation is not merely a technical necessity but a backbone of India's agricultural economy, influencing cropping patterns, rural livelihoods, and overall food security.

Types of Irrigation in India

1. Surface Irrigation

- In this method, water flows over the land surface by gravity.
- Sub-types:
  - **Flood irrigation**: Entire field is flooded with water.
  - **Furrow irrigation**: Water allowed to flow in furrows between crop rows.
  - **Basin irrigation**: Water applied in circular/rectangular basins around trees (orchards).
- **Regions**: Widely practiced in Indo-Gangetic plains.
- **Advantages**: Simple, low cost, suitable for large areas.
- **Concerns**: High water wastage, causes waterlogging and salinity, inefficient.

2. Canal Irrigation

- Water diverted from rivers, reservoirs, or dams through canal networks.
- Can be **inundation canals** (directly from rivers) or **perennial canals** (from reservoirs/dams).
- **Examples:** Indira Gandhi Canal (Rajasthan), Upper Ganga Canal (UP), Sarda Canal (UP).
- **Regions**: Punjab, Haryana, UP, Rajasthan.
- **Advantages**: Irrigates vast areas, ensures reliable water supply.
- **Concerns**: High construction/maintenance cost, seepage losses, waterlogging, displacement due to dams.

3. Well Irrigation

- Farmers draw groundwater from dug wells or bore wells using buckets, pumps, or tube wells.
- **Regions**: Uttar Pradesh, Bihar, Tamil Nadu, Karnataka.
- **Advantages**: Local, reliable, and relatively cheap for small farmers.
- **Concerns**: Over-extraction leading to groundwater depletion (Punjab, Haryana).

4. Tube Well Irrigation

- Deep wells fitted with electric/diesel pumps to extract groundwater.
- Became popular during Green Revolution.
- **Regions**: UP, Punjab, Haryana, Bihar.
- **Advantages**: Provides assured irrigation, suitable for intensive cropping.
- **Concerns**: Severe groundwater depletion, high energy demand for pumping.

5. Tank Irrigation

- Water stored in natural or artificial tanks (reservoirs) and used for irrigation.
- Traditional system in peninsular India where rivers are seasonal.
- **Regions**: Tamil Nadu, Karnataka, Telangana, Andhra Pradesh.
- **Advantages**: Low-cost, supports fisheries and livestock too.
- **Concerns**: Decline due to neglect and siltation, limited capacity during droughts.

6. Lift Irrigation

- Water lifted from rivers, wells, or canals using pumps to irrigate higher elevation fields.

- **Regions**: Maharashtra, MP, Karnataka.
- **Advantages**: Useful where gravity-based irrigation is not possible.
- **Concerns**: High energy cost, dependent on electricity/diesel availability.

7. Sprinkler Irrigation (Modern)

- Water sprayed through pipes and sprinklers, simulating rainfall.
- **Regions**: Sandy soils of Rajasthan, Haryana, Karnataka.
- **Advantages**: Saves water, suitable for uneven terrain.
- **Concerns**: High installation and maintenance cost, not suitable for tall crops like sugarcane.

8. Drip Irrigation (Modern)

- Water delivered drop by drop directly to plant roots through pipes and emitters.
- **Regions**: Maharashtra, Karnataka, Gujarat, Tamil Nadu (sugarcane, cotton, horticulture).
- **Advantages**: Saves 30–70% water, increases yields, reduces weeds and fertiliser use.
- **Concerns**: High initial investment, clogging of emitters if water quality poor.

Regional Patterns of Irrigation in India

- **North-West India (Punjab, Haryana, Western UP):**
  - Dominated by canals and tube wells due to perennial rivers and alluvial aquifers.
  - Result of Green Revolution policies and assured procurement.
- **South India (Tamil Nadu, Karnataka, Telangana, Andhra Pradesh):**
  - Tank irrigation is traditional and widespread due to uneven terrain and hard rock geology.
  - Canal irrigation is also significant in Krishna–Godavari basin.
- **Western India (Rajasthan, Gujarat):**
  - Indira Gandhi Canal supports irrigation in Thar desert regions.
  - Well irrigation is limited due to arid climate and saline groundwater.
- **Eastern India (Bihar, West Bengal, Assam, Odisha):**
  - Wells, tube wells, ponds, and tanks are common due to abundant rainfall, fertile soil, and high groundwater table.
- **Central India (Madhya Pradesh, Chhattisgarh, Maharashtra):**
  - Mix of canal, tank, and well irrigation.
  - Lift irrigation schemes used in elevated areas.
- **Himalayan and North-Eastern States:**
  - Irrigation largely rain-dependent with minor use of springs, streams, and tanks.

Issues and Challenges of Irrigation in India

- **Groundwater Depletion:** The rapid expansion of well and tube well irrigation, especially in Punjab, Haryana, and western UP, has caused alarming groundwater decline. Free or subsidised electricity for pumps further incentivises over-extraction. According to CGWB reports, many blocks are already in the "over-exploited" category, threatening long-term water security.
- **Inefficient Water Use:** Flood irrigation, which covers a majority of irrigated land, has water-use efficiency as low as 30–40%. This not only wastes water but also damages soil structure. Despite proven benefits, adoption of micro-irrigation systems like drip and sprinkler remains below 20% of potential.
- **Regional Imbalances:** While north-western states enjoy extensive canal and tube well networks due to Green Revolution policies and assured procurement, eastern and central states like Bihar, Jharkhand, and Odisha have untapped irrigation potential despite abundant rainfall and groundwater. This disparity affects cropping patterns and farmer incomes.
- **Waterlogging and Salinity:** In canal command areas of Punjab, Haryana, and Rajasthan, poor drainage has led to waterlogging, reducing soil aeration and productivity. Seepage from canals also contributes to salinity, rendering large tracts of land unproductive.
- **Decline of Traditional Systems:** Tank irrigation in Tamil Nadu, Karnataka, and Telangana, once the backbone of South Indian agriculture, has declined due to urbanisation, encroachments, and neglect of community management practices. This weakens resilience in drought-prone areas.

- **Energy Dependence:** Lift irrigation and tube wells require electricity or diesel, creating pressure on rural power supply and increasing farmer costs. In states offering free power, unsustainable extraction worsens the groundwater crisis.
- **Climate Change Impact:** Changing rainfall patterns, increasing droughts, and glacial retreat in the Himalayas are disrupting both surface and groundwater resources. Shifts in monsoon timing affect reservoir filling and irrigation planning.
- **Institutional and Governance Issues:** Ineffective water user associations, corruption in irrigation contracts, and weak enforcement of groundwater laws hamper equitable distribution. The Command Area Development Programme has suffered from poor implementation.
- **Financial and Time Overruns:** Major irrigation projects often face delays of decades, escalating costs and reducing returns. The Accelerated Irrigation Benefits Programme (AIBP), for example, has been criticised for poor monitoring and incomplete projects.

Government Initiatives for Irrigation in India

- **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY, 2015):**
  - Umbrella scheme with the motto "Har Khet Ko Pani" (Water to every field) and "More Crop per Drop".
  - Promotes micro-irrigation (drip and sprinkler), watershed management, and efficient water use.
  - Aims at expanding irrigation coverage and improving water-use efficiency at the farm level.
- **Accelerated Irrigation Benefits Programme (AIBP, 1996):**
  - Provides central assistance for completion of major and medium irrigation projects.
  - Later integrated under PMKSY.
  - Designed to reduce delays in project completion, but plagued by time and cost overruns.
- **Atal Bhujal Yojana (Atal Jal, 2020):**
  - World Bank–assisted scheme for sustainable groundwater management in stressed regions (Gujarat, Haryana, Karnataka, MP, Maharashtra, Rajasthan, UP).
  - Focus on community-led water budgeting and demand-side management.
- **National Mission on Micro Irrigation (NMMI, 2010, now part of PMKSY):**
  - Provides subsidies for drip and sprinkler systems.
  - Encourages farmers to shift from flood irrigation to precision irrigation, saving 30–40% of water.
- **Watershed Development Programmes (e.g., Integrated Watershed Management Programme, IWMP):**
  - Promote rainwater harvesting, soil moisture conservation, and groundwater recharge in rainfed regions.
  - Crucial for drought-prone areas and dryland farming.
- **Command Area Development Programme (CADP, 1974):**
  - Ensures equitable water distribution within irrigation command areas.
  - Improves efficiency of canal irrigation through lining, field channels, and participatory management.
- **National Water Mission (under NAPCC):**
  - Aims to improve water-use efficiency by 20%.
  - Promotes integrated water resources management at the basin level.
- **Sub-Mission on Per Drop More Crop (2015):**
  - Part of PMKSY, exclusively focused on micro-irrigation expansion.
  - Provides financial assistance and incentives for adoption of modern irrigation techniques.
- **Other State-level Initiatives:**
  - Telangana's Mission Kakatiya for restoration of traditional tanks.
  - Andhra Pradesh Neeru-Chettu programme for water conservation.
  - Maharashtra Jalyukt Shivar Abhiyan for drought mitigation through decentralized water harvesting.

3 Storage, Transport and Marketing of Agricultural Produce and Issues and Related Constraints

Introduction

- Agriculture in India is not just about production in the fields but also about how efficiently crops are stored, transported, and marketed after harvest. Even though India is the second-largest producer of food grains, fruits, and vegetables in the world, a large part of the harvest never reaches consumers in good condition.
- Studies by the Indian Council of Agricultural Research (ICAR) estimate post-harvest losses of 10–15% in foodgrains and 20–30% in fruits and vegetables due to poor storage, inadequate transportation, and weak marketing infrastructure. This reduces farm incomes, increases consumer prices, and undermines national food security.
- Efficient storage ensures protection of produce from pests, rodents, and spoilage. Reliable transport connects farmers in remote areas to mandis, processing units, and export hubs. Fair and transparent marketing allows farmers to get better prices, reduces the role of middlemen, and improves competitiveness.

Storage of Agricultural Produce in India

- **Importance of Storage**
  - Prevents post-harvest losses (India loses ~10% of food grains annually due to poor storage).
  - Stabilises prices by reducing seasonal fluctuations.
  - Ensures buffer stock management for food security.
  - Facilitates better returns to farmers by enabling them to sell when prices are favourable.
- **Types of Storage**
  - **Traditional Storage Structures:**
    - Kothis, barns, mud bins, underground pits.
    - Low-cost but prone to pest attack, moisture damage, and spoilage.
  - **Modern Storage Structures:**
    - Godowns and warehouses (owned by FCI, CWC, SWCs, private players).
    - Cold storages for perishables like fruits, vegetables, dairy, and fish.
    - Controlled Atmosphere (CA) Storage for apples, grapes, onions, etc.
    - Hermetic storage (airtight bags/silos) reducing insect infestation and spoilage.
- **Issues and Challenges**
  - Inadequate scientific storage facilities in rural areas.
  - Post-harvest losses high in perishables due to poor cold chain.
  - Dependence on FCI godowns leading to overcrowding and wastage.
  - Lack of awareness among farmers about modern storage methods.
  - High costs for establishing cold storages and silos.
- **Government Initiatives**
  - **Food Corporation of India (FCI):** Manages buffer stocks and central pool storage.
  - **Central Warehousing Corporation (CWC) & State Warehousing Corporations (SWCs):** Provide modern warehouses across states.
  - **Gramin Bhandaran Yojana:** Subsidies for rural godowns to enhance decentralized storage.
  - **National Horticulture Mission (NHM):** Supports creation of cold storages for perishables.
  - **Private Entrepreneurs Guarantee (PEG) Scheme:** Encourages private sector in building storage capacity.
  - **E-NAM & Negotiable Warehouse Receipt System (NWRS):** Link storage with marketing and credit facilities.

Transport of Agricultural Produce in India

- **Importance of Transport**
  - Links farmers to markets, consumers, and processing industries.
  - Reduces post-harvest losses, especially for perishables.
  - Enables regional crop specialisation and integration with national and global markets.
- **Issues and Challenges in Transport of Agricultural Produce**
  - **Inadequate Rural Infrastructure:** Many villages lack all-weather roads, especially in rainfed and tribal areas. This hampers

farmers' access to markets and leads to post-harvest losses.
    - **High Logistics Cost:** India's logistics cost is ~14% of GDP (vs. 8–10% in developed countries), making farm produce less competitive. Small farmers bear a disproportionate burden due to fragmented loads.
    - **Lack of Cold Chain Transport:** Only a fraction of perishable produce moves through refrigerated vehicles. Absence of integrated cold chain systems results in 20–25% post-harvest losses in fruits and vegetables.
    - **Delays and Inefficiencies in Rail Transport:** Although railways are efficient for bulk grains, issues like wagon availability, delays, and limited last-mile connectivity make them less farmer-friendly.
    - **Seasonal Bottlenecks:** During harvest seasons, demand for transport spikes, creating shortages, higher freight costs, and wastage due to delayed movement.
    - **Dominance of Middlemen:** Farmers often depend on traders/commission agents who control transport, reducing farmers' bargaining power and farmgate prices.
    - **Air Transport Limitations:** High freight charges make air transport viable only for high-value perishables (flowers, exotic fruits, seafood). Remote and hilly areas still lack affordable cargo facilities despite schemes like Krishi Udan.
    - **Underutilisation of Waterways:** Inland waterways and coastal shipping remain underdeveloped due to poor terminals, slow speed, and lack of integration with road/rail.
    - **Environmental and Energy Concerns:** Over-reliance on diesel trucks raises costs, pollution, and vulnerability to fuel price hikes.
- **Government Initiatives**
    - **Pradhan Mantri Gram Sadak Yojana (PMGSY):** Rural connectivity for villages.
    - **Kisan Rail (2020):** Subsidised refrigerated rail transport for perishables.
    - **Krishi Udan Scheme (2020):** Air cargo subsidies for farm produce from remote areas.
    - **PM Gati Shakti Masterplan:** Integrated infrastructure planning to reduce logistics cost.
    - **E-NAM platform:** Digital market linkage, enabling transport and logistics services.

Agricultural Marketing in India

- Agricultural marketing refers to all activities involved in moving farm produce from the farmer to the consumer including collection, storage, transport, processing, grading, and sale. Efficient marketing is vital for ensuring fair prices to farmers, reducing post-harvest losses, and stabilising consumer prices.
- **Evolution of Agricultural Marketing in India**
    - **Traditional System:** Sale in village markets or to moneylenders/traders; highly exploitative.
    - **Regulated Markets (APMC Acts):** Introduced in 1960s–70s to protect farmers from middlemen and ensure fair trade.
    - **Cooperative Marketing:** Initiatives like Nafed, Amul, HAFED for collective bargaining and fair pricing.
    - **Reforms and Digital Platforms:** Deregulation, contract farming, Farmer Producer Organizations (FPOs), and e-NAM for competitive, transparent marketing.
- **Types of Agricultural Marketing Systems in India**
    - **Village Markets (Primary Markets)**
        - Small, unregulated local markets (haats, shandies, melas).
        - Farmers sell directly to local consumers or petty traders.
        - Convenient but farmers get low prices due to lack of bargaining power.
    - **Regulated Markets (APMC Mandis)**
        - State-controlled markets under Agricultural Produce Market Committee Acts.
        - Ensure standardized weights, transparent auctions, and fair trade practices.
        - Problems: middlemen monopoly, high commission charges, cartelisation.
    - **Cooperative Marketing**
        - Farmers form cooperatives to collectively sell produce.

        - Examples: **Amul** (dairy), **Nafed** (oilseeds, pulses).
        - Helps farmers in price realisation and reducing trader exploitation.
    - **Contract Farming**
        - Farmers enter agreements with buyers (processors, exporters, retailers).
        - Provides assured market, price, and sometimes inputs/technology.
        - Issues: power imbalance between companies and small farmers.
    - **Direct Marketing**
        - Farmers sell directly to consumers, bypassing intermediaries.
        - Examples: Apni Mandis (Punjab, Haryana), Rythu Bazaars (Andhra Pradesh, Telangana), Uzhavar Sandhais (Tamil Nadu).
        - Ensures higher share of consumer price to farmers.
    - **Forward & Futures Markets**
        - Farmers and traders use commodity exchanges (regulated by SEBI) for price discovery and hedging against volatility.
        - Limited farmer participation due to lack of awareness.
    - **Electronic & Digital Platforms**
        - **e-NAM (National Agriculture Market):** Online integration of APMC mandis.
        - Private agri-tech startups (e.g., Ninjacart, DeHaat) provide online trading, logistics, and warehousing.
        - Expanding reach but requires better digital literacy and infrastructure.
    - **Government Procurement System**
        - Through **MSP operations** by FCI, NAFED, Cotton Corporation of India.
        - Provides price support but mainly benefits rice and wheat growers in select states.
- **Issues and Challenges in Agricultural Marketing**
    - **APMC Market Distortions:** Monopoly of middlemen, cartelisation, high commissions, entry barriers for private players.
    - **Fragmented Supply Chains:** Multiple intermediaries raise consumer prices but reduce farmer share (farmers often get only 25–40% of retail price).
    - **Inadequate Infrastructure:** Lack of grading, cold storage, transport, and warehousing increases post-harvest losses (up to 15–20% in perishables).
    - **Regional Imbalances:** Uneven distribution of regulated markets — some states have very few APMCs relative to production.
    - **Price Volatility:** Farmers lack reliable price signals; gluts during harvest season cause distress sales.
    - **Small and Marginal Farmers' Weak Bargaining Power:** Over 85% of farmers have small holdings, producing low surplus, making them dependent on local traders.
    - **Legal and Policy Bottlenecks:** APMC reforms and contract farming laws unevenly implemented across states. The rollback of 2020 farm laws highlights challenges in consensus building.

Regulation of Agricultural Markets in India

Background

- Historically, agricultural markets were dominated by traders and moneylenders, leading to farmer exploitation.
- To address this, the government intervened with regulated markets to ensure transparency, fair prices, and better farmer protection.

Key Mechanisms of Regulation

- **Agricultural Produce Market Committee (APMC) Acts**
    - First introduced in the 1960s–70s.
    - Mandis established under state APMC laws where farmers are required to sell produce.
    - Aimed at eliminating exploitation by middlemen through regulated auctions, standard weights, and minimum prices.
    - **Issues:**
        - Monopoly of commission agents and traders.
        - High mandi fees and commissions.
        - Restriction on private trade and direct farmer-buyer linkages.
- **Essential Commodities Act (ECA), 1955**
    - Empowered the government to regulate production, supply, and distribution of key food items.

    - Used for stock limits, price control, and preventing hoarding.
    - Criticised for discouraging private investment in storage and supply chains.
- **Model APMC Act (2003) & APLM Act (2017)**
    - Allowed direct marketing, contract farming, and private market yards.
    - Encouraged e-trading and single licenses across states.
    - Implementation uneven across states due to federal structure.
- **National Agriculture Market (e-NAM, 2016)**
    - A pan-India electronic platform integrating 1,300+ APMC mandis.
    - Enhances transparency, competitive bidding, and price discovery.
- **Farm Laws (2020)** (later repealed)
    - Aimed at creating one nation–one market by allowing farmers to sell outside APMCs without taxes.
    - Promoted contract farming and eased stock limits under ECA.
    - Rolled back in 2021 due to farmer protests and lack of consensus.
- **Other Regulatory Interventions**
    - **Minimum Support Price (MSP) & Procurement System:** Indirect regulation ensuring price floors.
    - **Commodity Derivatives Market (regulated by SEBI):** Provides forward/futures contracts for price risk management.

Challenges in Regulation

- Over-regulation in APMCs creating inefficiency and rent-seeking.
- Fragmented market structure due to state-level variations.
- Weak enforcement of farmer-centric provisions.
- Resistance to reforms due to political and socio-economic concerns.

4 E-technology in the aid of farmers and various technology Missions

Introduction

- Indian farmers face challenges like low productivity, climate risks, and price volatility, often due to lack of timely information. **E-technology**—through mobile apps, digital platforms, remote sensing, and AI—helps bridge this gap by providing weather forecasts, market prices, crop advisories, credit, and insurance services.
- Alongside, the government has launched several **Technology Missions** such as those on **Oilseeds, Pulses, Cotton, Horticulture, and Sustainable Agriculture**, aimed at spreading modern farming technologies. Together, digital tools and technology missions are driving **digital agriculture in India**, making farming more efficient, profitable, and resilient.

E-Technology in the Aid of Farmers

- **Digital Advisory Services**
  - Kisan Call Centres (KCCs): Toll-free helpline providing expert advice on crops, pests, and weather.
  - mKisan SMS Portal: Sends SMS on weather forecasts, pest advisories, and govt schemes in regional languages.
  - Pusa Krishi Vigyan Portal: Developed by ICAR to share agricultural technologies and practices.
- **Mobile Applications**
  - Kisan Suvidha App: Weather info, market prices, soil health, crop insurance details.
  - Agrimarket App: Real-time mandi prices within 50 km radius.
  - Pusa Krishi App: Provides ICAR-Pusa technologies for farmers.
  - IFFCO Kisan App: Regional language advisory on crops, weather, and livestock.
- **Digital Market Platforms**
  - e-NAM (National Agriculture Market): Pan-India trading portal linking APMC mandis; promotes transparent price discovery.
  - Direct Farmer Markets: Rythu Bazaars (Andhra Pradesh), Uzhavar Sandhai (Tamil Nadu) for farmer-to-consumer sales.
  - Agri-tech Startups: Ninjacart, DeHaat, AgroStar connecting farmers with buyers, suppliers, and logistics.
- **Remote Sensing, GIS, and Drone Use**
  - ISRO's BHUVAN Platform: Satellite-based crop acreage mapping, drought monitoring.
  - Drones: Used for spraying pesticides, monitoring soil moisture, and assessing crop health.
  - GIS mapping: Helps in soil fertility maps, land-use planning.
- **Digital Finance and**
  - Direct Benefit Transfer (DBT): Subsidies for fertilisers, seeds, and other inputs transferred directly to farmer accounts.
  - PM Fasal Bima Yojana (PMFBY): Uses satellite imagery and mobile apps for faster crop loss assessment.
  - Kisan Credit Card (KCC): Digitised and integrated with Aadhaar and Jan Dhan accounts.
- **Precision and Smart Farming**
  - IoT-based soil and water sensors: Optimise irrigation and fertiliser use.
  - AI-driven crop advisory: Predicts pest/disease outbreaks and suggests action
  - Automated irrigation systems: Save water and improve productivity.

Benefits of E-Technology in Agriculture

- **Access to Timely Information**
  - Weather forecasts, pest and disease alerts, and crop advisories reach farmers quickly through SMS, apps, and portals.
  - Reduces uncertainty in farming decisions.
- **Better Market Access and Price Discovery**
  - Platforms like e-NAM, Agrimarket, and startup-led models help farmers access multiple buyers.
  - Reduces dependence on middlemen and ensures fair prices.
- **Financial Inclusion and Risk Management**
  - Direct Benefit Transfers (DBT) ensure transparency in subsidy delivery.
  - Digitised Kisan Credit Cards (KCC) and mobile banking improve access to credit.
  - Crop insurance schemes like PMFBY use remote sensing and mobile apps for faster claim settlement.
- **Improved Productivity and Efficiency**
  - Drones, IoT sensors, and AI tools enable precision farming (efficient water, fertiliser,

and pesticide use).
    - Micro-irrigation with digital automation reduces input costs and improves yields.
- **Reduced Post-Harvest Losses**
    - Digital platforms connect farmers directly with cold storages, warehouses, and logistics providers.
    - Better coordination improves shelf life of perishable crops like fruits, vegetables, and milk.
- **Empowerment of Small and Marginal Farmers**
    - Mobile-based advisory services reach even remote farmers.
    - Language-friendly apps and voice-based services ensure inclusivity.
- **Bridging Research–Farmer Gap**
    - ICAR, KVKs, and agri-universities share research outputs directly with farmers through portals and apps.
    - Helps in quick adoption of improved varieties and technologies.
- **Sustainability and Climate Resilience**
    - Digital tools help farmers adopt climate-smart practices.
    - Promotes crop diversification and sustainable input use.

Challenges in Adoption of E-Technology in Agriculture

- **Digital Divide in Rural India**
    - Smartphone penetration and internet access are still limited among small and marginal farmers.
    - Rural broadband connectivity remains weak despite initiatives like BharatNet.
- **Low Digital Literacy**
    - Many farmers lack the skills to use mobile apps, portals, and advanced digital tools.
    - Language barriers and low awareness reduce effective utilisation.
- **Infrastructure Gaps**
    - Poor electricity supply in villages affects use of digital devices and internet-based services.
    - Lack of affordable devices like smartphones, drones, and sensors.
- **Data Privacy and Security Concerns**
    - Farmers' personal and land data collected by apps may be misused without proper data protection laws.
    - Dependence on private agri-tech startups raises trust issues.
- **High Cost of Advanced Technologies**
    - Tools like drones, IoT sensors, and AI-based services are expensive for small farmers.
    - Credit and subsidy support are limited for digital adoption.
- **Fragmented and Small Landholdings**
    - Precision farming tools and mechanisation are less effective on tiny plots.
    - Collective adoption through FPOs and cooperatives is still at a nascent stage.
- **Limited Regional Customisation**
    - Many apps and platforms are not available in local languages or tailored to region-specific crop practices.
    - Advisory often generic rather than location-specific.
- **Lack of Integration Across Platforms**
    - Multiple apps and schemes exist, but they are not well integrated.
    - Farmers may get conflicting advice from different sources.
- **Skepticism and Resistance to Change**
    - Older farmers often rely on traditional knowledge rather than digital advisories.
    - Trust deficit towards technology-driven solutions.

Technology Missions in Indian Agriculture

- **Technology Mission on Oilseeds (TMO) – 1986**
    - Launched to address India's heavy dependence on edible oil imports.
    - Aimed to improve productivity and area under oilseed crops like mustard, groundnut, sunflower, soybean.
    - Later expanded as **Technology Mission on Oilseeds, Pulses and Maize (TMOPM)**.
    - Components included: quality seed supply, research and extension, price support, processing and marketing.
    - **Significance**: Led to the "Yellow Revolution" and helped India move towards self-sufficiency in oilseeds in the 1990s, though imports have again increased in recent years.
- **Technology Mission on Cotton (TMC) – 2000**
    - Launched to improve cotton productivity

and fibre quality.
    - Focus on four Mini-Missions:
        - **MM-I:** Research (high-yielding and pest-resistant varieties, including Bt cotton).
        - **MM-II:** Transfer of technology and extension services.
        - **MM-III:** Modernisation of ginning and pressing units.
        - **MM-IV:** Market reforms and better cotton trading.
    - **Significance**: Bt Cotton adoption made India the world's largest cotton producer; improved export competitiveness.
- **National Mission on Sustainable Agriculture (NMSA) – under NAPCC (2010)**
    - Focuses on **climate-resilient agriculture**.
    - Components: Rainfed Area Development, Soil Health Management, On-Farm Water Management, Climate Change Adaptation.
    - Encourages integrated farming systems (crops + livestock + horticulture).
    - **Significance**: Aligns agriculture with climate goals, promotes efficient input use and organic farming.
- **Mission for Integrated Development of Horticulture (MIDH) – 2014**
    - Umbrella scheme integrating National Horticulture Mission, NHB (National Horticulture Board), and others.
    - Promotes horticultural crops: fruits, vegetables, flowers, spices, plantation crops.
    - **Focus:** Production, post-harvest management, cold storages, value addition, marketing.
    - **Significance**: India has become the **second-largest producer of fruits and vegetables** in the world. Horticulture production has surpassed foodgrain production.
- **National Mission on Agricultural Extension and Technology (NMAET) – 2014**
    - **Objective:** Strengthen **extension services** using ICT.
    - Components:
        - Sub Mission on Agriculture Extension (SMAE).
        - Sub Mission on Seed and Planting Material (SMSP).
        - Sub Mission on Agricultural Mechanisation (SMAM).
        - Sub Mission on Plant Protection and Plant Quarantine (SMPP).
            - **Significance**: Bridges the gap between lab research and farm practice through digital tools, Kisan Call Centres, and apps.
- **National Mission on Oilseeds and Oil Palm (NMOOP) – 2014**
    - Replaced the earlier TMOPM.
    - Aims to boost oilseed production and expand oil palm cultivation in NE states and Andaman & Nicobar.
    - Focus on reducing edible oil imports by encouraging domestic cultivation.
    - **Significance**: Supports "Atmanirbhar Bharat" in edible oils; aligns with Oil Palm Mission launched in 2021.
- **National e-Governance Plan in Agriculture (NeGP-A) – 2010**
    - Uses ICT to provide farmers with information on weather, soil health, crop advisories, market prices, insurance, credit.
    - Developed **mobile apps, portals, and SMS-based platforms** like mKisan, Kisan Suvidha.
    - States developed customised portals under NeGP-A.
    - **Significance**: Promoted the concept of "Digital Agriculture"; integrated with e-NAM and DBT in agriculture.

Value Addition

Keywords : Cropping Pattern, Rice-Wheat System, Crop Diversification, Millets Revival, Integrated Farming System (IFS), Groundwater Depletion, Micro-Irrigation (Drip & Sprinkler), PMKSY, Precision Farming, Soil Health Card, Post-Harvest Losses, Cold Chain & Cold Storage, Warehouse Receipt System (NWRS), e-NAM, Kisan Rail, Farmer Producer Organisations (FPOs), APMC Reforms, MSP & Procurement, PMFBY (Crop Insurance), Climate-Smart Agriculture

Mains Question for Practice :

Q1. Discuss the factors responsible for variations in cropping patterns across different regions of India.

Q2. Critically examine the challenges in India's irrigation system. How far have schemes like PMKSY

and micro-irrigation addressed them?
Q3. "Poor storage and marketing infrastructure is a bigger challenge for Indian agriculture than production itself." Examine.
Q4. Evaluate the role of e-technology (like e-NAM, Kisan Credit Card, Digital Extension services) in transforming agricultural marketing and extension in India.
Q5. Major crops like rice and sugarcane are criticized for being resource-intensive. How can India balance crop choice with sustainability?

Ready - Made Introduction and Conclusion
Intros

- India's cropping patterns reflect its diverse agro-climatic zones, ranging from rice in the east to millets in the arid west, making agriculture both a livelihood base and a food security pillar.
- Irrigation in India is not merely about water supply but about resilience — ensuring stability in a monsoon-dependent farming system.
- The efficiency of Indian agriculture is shaped as much by storage, transport, and marketing systems as by production in the fields.
- E-technology and technology missions are transforming Indian farming by integrating digital tools with traditional practices, bridging the gap between lab research and farm use.

Conclusions

- Sustainable cropping patterns must go beyond cereals to embrace pulses, oilseeds, millets, and horticulture for nutritional security and ecological balance.
- Water-smart irrigation, grounded in efficiency and equity, will determine whether India achieves resilient agricultural growth under climate stress.
- Strengthening storage, logistics, and marketing will shift Indian agriculture from subsistence-oriented to income-oriented farming.
- The convergence of digital agriculture and technology missions offers India a chance to make farming more profitable, inclusive, and climate-resilient.

Acronyms
1.Cropping Patterns – Determinants
"CROP"

- **C** – Climate & rainfall
- **R** – Resource availability (soil, irrigation)
- **O** – Output demand (MSP, market, exports)
- **P** – Policy push (Green Revolution, subsidies)

2. Irrigation – Challenges
"WATER"

- **W** – Wastage & overuse (flood irrigation, free power)
- **A** – Access inequality (large vs small farmers)
- **T** – Technology adoption low (drip, sprinkler)
- **E** – Efficiency poor (canal losses, seepage)
- **R** – Regional imbalance (north vs east/south)

3. Storage, Transport & Marketing – Issues
"FARM"

- **F** – Fragmented supply chains & middlemen dominance
- **A** – Access to storage (cold chains, warehouses) limited
- **R** – Rural connectivity gaps (roads, rail, logistics)
- **M** – Market distortions (APMC, MSP dependency)

4. E-Technology in Agriculture – Benefits
"TECH"

- **T** – Transparency in markets (e-NAM, DBT)
- **E** – Extension services (m-Kisan, Kisan Call Centres)
- **C** – Credit & insurance access (KCC, PMFBY apps)
- **H** – High productivity via precision farming (AI, drones, IoT)

5. Resource-Intensive Crops – Concerns
"RICE"

- **R** – Rising water stress (paddy & sugarcane overuse)
- **I** – Input subsidies distort crop choices
- **C** – Climate vulnerability (monsoon dependence)
- **E** – Environmental degradation (soil salinity, groundwater depletion)

Farm Subsidies, MSP & Food Security

Navigating the Syllabus: What You Need to Know

1.Issues related to Direct and Indirect Farm Subsidies and Minimum Support Prices;
- Types of Agricultural Subsidies in India
- Types of Agricultural Subsidies on the Basis of Mode of Payment
- Major Issues Associated with Agriculture Subsidy in India
- Issues with the MSP System

2.Food Security
- Legal and Policy Framework for Food Security
- Public Distribution System Objectives, Functioning, Limitations, Revamping;
- Issues of Buffer Stocks

5.Economics of Animal-Rearing.

UPSC Previous Year Questions

Question	Nature of Question	Core Demand
Explain the changes in cropping pattern in India in the context of changes in consumption pattern and marketing conditions. (2023)	Cropping Pattern + Consumption Shift + Market Conditions	Explain how demand-side changes (diet diversification, processed foods, export demand) and marketing reforms shaped cropping trends
What are the main bottlenecks in the upstream and downstream process of marketing of agricultural products in India? (2022)	Agri Marketing + Supply Chain	Identify constraints in procurement, storage, logistics, processing, and distribution
What is an Integrated Farming System? How is it helpful to small and marginal farmers in India? (2022)	Integrated Farming + Small Farmer Sustainability	Define IFS and discuss its role in income diversification, risk reduction, and resource efficiency
How and to what extent would micro-irrigation help in solving India's water crisis? (2021)	Irrigation + Water Management	Explain benefits of micro-irrigation (efficiency, conservation, productivity) and its limitations in addressing water stress
What are the present challenges before crop diversification? How do emerging technologies provide an opportunity for crop diversification? (2023)	Crop Diversification + Technology	Highlight constraints (MSP bias, input subsidies, infrastructure) and how technologies (AI, precision farming, biotech) enable diversification
What are the main constraints in transport and marketing of agricultural produce in India? (2020)	Agri Logistics + Marketing	Assess issues in rural transport, cold storage, fragmented markets, middlemen
How far is Integrated Farming System (IFS) helpful in sustaining agricultural production? Elaborate the impact of the National Watershed Project in increasing agricultural production from water-stressed areas. (2019)	IFS + Watershed Management	Assess IFS role in sustainability and explain how watershed projects improved productivity in drought-prone areas

Assess the role of National Horticulture Mission (NHM) in boosting the production, productivity and income of horticulture farms. How far has it succeeded in increasing the income of farmers? (2018)	Horticulture + NHM + Farmer Income	Evaluate achievements and limitations of NHM in productivity and farmer earnings
How has the emphasis on certain crops brought about changes in cropping patterns in recent past? Elaborate the emphasis on millets production and consumption. (2018)	Cropping Pattern + Millets	Explain policy-driven shifts (rice/wheat bias, now millet revival) and discuss nutritional/security benefits of millets
Explain various types of revolutions, took place in Agriculture after Independence in India. How have these revolutions helped in poverty alleviation and food security in India? (2017)	Agricultural Revolutions + Food Security	List revolutions (Green, White, Yellow, Blue, etc.) and explain their impact on poverty reduction and food security
What are the major reasons for declining rice and wheat yield in the cropping system? How crop diversification is helpful to stabilize the yield of the crop in the system? (2017)	Rice & Wheat Yield Decline + Diversification	Explain causes of stagnation (soil health, water stress, input fatigue) and role of diversification in stability
Given the vulnerability of Indian agriculture to vagaries of nature, discuss the need for crop insurance and bring out the salient features of the Pradhan Mantri Fasal Bima Yojana (PMFBY). (2015)	Crop Insurance + Risk Management	Justify crop insurance necessity and explain PMFBY features (coverage, premium, tech use)
How can the 'Digital India' programme help farmers to improve farm productivity and income? What steps has the Government taken in this regard? (2015)	Digital Agriculture + ICT + E-Governance	Explain role of ICT (market info, weather, precision farming) and mention schemes like e-NAM, soil health cards, Kisan apps
There is also a point of view that agriculture produce market committees (APMCs) set up under the state acts have not only impeded the development of agriculture but also have been the cause of food inflation in India. Critically examine. (2014)	APMC + Market Reforms + Food Inflation	Critically assess APMC functioning, monopoly issues, and impact on price rise

"In the villages itself no form of credit organisation will be suitable except the cooperative society." – All Indian rural credit survey. Discuss this statement in the background of agriculture finance in India. What constraints and challenges do financial institutions face supplying agricultural finances? How can technology be used to better reach and serve rural clients? (2014)	Agri Finance + Cooperatives + Rural Credit	Examine cooperative role, identify institutional credit constraints, and suggest tech-based solutions (fintech, mobile banking)
How does e-Technology help farmers in production and marketing of agricultural produce? Explain it. (2023)	Digital Agriculture + ICT + Marketing	Explain role of ICT/e-tech (precision farming, e-NAM, apps, weather advisory) in improving production efficiency and market access
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. (2023)	Agri Subsidies + WTO	List input/output subsidies, classify direct/indirect, and explain WTO concerns about trade distortion and amber box classification
What are the major challenges of Public Distribution System (PDS) in India? How can it be made effective and transparent? (2022)	PDS + Food Security	Explain leakages, exclusion errors, corruption, and suggest reforms like DBT, digitisation, Aadhaar linkage, end-to-end computerisation
What are the salient features of the National Food Security Act, 2013? How has the Food Security Bill helped in eliminating hunger and malnutrition in India? (2021)	NFSA + Food Security + Hunger	Explain NFSA provisions (coverage, entitlements, women/children provisions) and critically evaluate its effectiveness in reducing hunger/malnutrition
What are the reformative steps taken by the Government to make food grain distribution system more effective? (2019)	PDS Reforms + Food Distribution	Discuss reforms like digitisation, Aadhaar, end-to-end tracking, One Nation One Ration Card, e-PoS, etc.
What do you mean by Minimum Support Price (MSP)? How will MSP rescue the farmers from the low income trap? (2018)	MSP + Farmer Income	Define MSP, explain its income stabilisation role, limitations, and scope for improving farmers' returns
How do subsidies affect the cropping pattern, crop diversity and economy of farmers? What is the significance of crop insurance, minimum support price and food processing for small and marginal farmers? (2017)	Subsidies + Crop Diversification + Farmer Welfare	Critically examine subsidy impact, and explain complementary role of insurance, MSP, food processing for resilience and income support

Livestock rearing has a big potential for providing non-farm employment and income in rural areas. Discuss suggesting suitable measures to promote this sector in India. (2015)	Livestock + Rural Employment + Diversification	Explain importance of livestock in non-farm income and suggest policy measures like dairy infra, fodder availability, veterinary services
In what way could replacement of price subsidy with Direct Benefit Transfer (DBT) change the scenario of subsidies in India? Discuss. (2015)	Subsidy Reforms + DBT	Explain shortcomings of price subsidies, and assess DBT's potential to reduce leakages, improve targeting, and WTO compliance
Food Security Bill is expected to eliminate hunger and malnutrition in India. Critically discuss various apprehensions in its effective implementation along with the concerns it has generated in WTO. (2013)	NFSA + WTO + Hunger	Critically examine challenges in implementing Food Security Bill (fiscal burden, procurement stress, leakages) and WTO disputes on subsidy classification
What are the different types of agriculture subsidies given to farmers at the national and state levels? Critically analyze the agriculture subsidy regime with reference to the distortions created by it. (2013)	Agricultural Subsidies + Policy Distortions	List major subsidies (fertiliser, power, water, credit, MSP) and critically assess their distortions on efficiency, ecology, fiscal health
India needs to strengthen measures to promote the pink revolution in food industry for better nutrition and health. Critically elucidate the statement. (2013)	Food Processing + Pink Revolution	Explain "Pink Revolution" (meat, poultry, fisheries), assess its nutritional and health benefits, and address concerns (ethics, environment, exports)

1 Agriculture Subsidies & MSP

Introduction

- Agriculture remains the backbone of India's economy, supporting nearly half of the population and contributing to national food security. However, Indian farmers face challenges such as low productivity, high input costs, price volatility, and climate risks. To address these, the government provides agriculture subsidies and guarantees Minimum Support Prices (MSP) for key crops.
- Subsidies on fertilisers, electricity, irrigation, seeds, and credit make farming affordable, while food subsidies ensure access to grains at subsidised rates through the Public Distribution System (PDS). Similarly, MSP provides farmers with an assured price for their produce, protecting them from distress sales and ensuring price stability.
- While these policies have been critical in achieving the Green Revolution, self-sufficiency in foodgrains, and stabilising farmer incomes, they also face criticism for causing fiscal stress, regional imbalances, and ecological damage. Rationalising subsidies and reforming the MSP system is now essential for making Indian agriculture sustainable, inclusive, and market-oriented.

Types of Agricultural Subsidies in India

- ***Input Subsidies***
  - **Fertiliser Subsidy**
    - Provided to fertiliser companies so that farmers can purchase at lower prices.
    - Largest component of farm subsidies (~₹2 lakh crore in Union Budget 2022–23).
    - Criticism: encourages overuse of urea, soil degradation, fiscal burden.
  - **Power (Electricity) Subsidy**
    - Free or subsidised electricity for irrigation pumps, especially in Punjab, Haryana, and Andhra Pradesh.
    - Leads to over-extraction of groundwater and wastage.
  - **Irrigation Subsidy**
    - Heavily subsidised water charges in canal-irrigated areas.
    - Benefits large farmers disproportionately; contributes to waterlogging and salinity.
  - **Seed Subsidy**
    - Distribution of high-yielding, hybrid, and quality seeds at subsidised rates.
    - Implemented through schemes like National Food Security Mission (NFSM) and Rashtriya Krishi Vikas Yojana (RKVY).
- ***Price Support Subsidies***
  - **Minimum Support Price (MSP) & Procurement Subsidy**
    - Assures farmers a fixed price, irrespective of market fluctuations.
    - Mainly benefits rice and wheat growers in north-west India.
    - Leads to cropping pattern distortions (paddy in water-scarce Punjab).
- ***Credit Subsidies***
  - **Interest Subvention Scheme**
    - Farmers get short-term crop loans at subsidised interest rates (4–7%).
    - Implemented through Kisan Credit Card (KCC) and NABARD refinancing.
    - Challenge: benefits often cornered by large farmers.
- ***Crop Insurance Subsidy***
  - **Pradhan Mantri Fasal Bima Yojana (PMFBY)**
    - Farmers pay a small premium (2% for Kharif, 1.5% for Rabi).
    - Balance premium shared by Centre and State governments.
    - Protects against yield loss due to natural calamities.
- ***Export & Marketing Subsidies***
  - Transport, storage, and export incentives for agri-produce.
  - **Example: Operation Greens (TOP Scheme)** for tomato, onion, potato price stabilisation.
- ***Others***
  - **Food Subsidy:** Given through PDS/TPDS under NFSA, indirectly benefiting farmers through procurement.
  - **Machinery Subsidy:** Provided under Sub-Mission on Agricultural Mechanisation (SMAM) for tractors, harvesters, drip irrigation sets, etc.

- **Organic Farming Subsidy:** Paramparagat Krishi Vikas Yojana (PKVY) offers financial support for chemical-free farming.

Types of Agricultural Subsidies on the Basis of Mode of Payment

- **Direct (Explicit) Subsidies**
  - Subsidies directly given to farmers or beneficiaries.
  - **Examples:**
    - Direct transfer of fertiliser subsidy to farmers (pilot DBT scheme).
    - PM-KISAN (though technically an income support scheme, it works like a direct subsidy).
    - Direct interest subvention on crop loans.
  - **Advantages:**
    - Transparent, reaches the farmer directly.
    - Reduces leakages and corruption by bypassing middlemen.
    - Empowers farmers with freedom of choice in spending.
    - Improves fiscal accountability and targeting.
    - Can be integrated with JAM trinity (Jan Dhan, Aadhaar, Mobile) for efficiency.
  - **Limitations:**
    - Requires strong identification & digital infrastructure.
    - Risk of excluding tenant farmers, landless labourers, and women due to land record issues.
    - Delayed transfers can affect timely input use.
    - Funds may be diverted for non-agricultural purposes.
    - Implementation challenges in remote/rural areas with poor connectivity.
- **Indirect (Implicit) Subsidies**
  - Subsidies not given directly to farmers but embedded in the system. Farmers benefit indirectly through cheaper access to inputs and services.
  - **Examples:**
    - Fertiliser subsidy paid to companies, allowing farmers to buy below cost.
    - Power subsidy (free/low-cost electricity for irrigation pumps).
    - Irrigation subsidy (low or nominal charges for canal water).
    - Food subsidy (procurement at MSP and distribution at low cost via PDS).
  - **Advantages:**
    - Easy to implement, widespread coverage.
    - Provides immediate relief by reducing input costs.
    - Encourages adoption of modern inputs (HYVs, fertilisers, irrigation).
    - Supports food security by enabling procurement and PDS.
    - Politically feasible and popular among farmers.
  - **Limitations:**
    - Prone to leakages, diversion, and black marketing (e.g., urea).
    - Benefits often cornered by large farmers with more land and resources.
    - Encourages overuse of inputs → soil degradation, groundwater depletion.
    - Creates regional imbalances (Punjab & Haryana benefit more from MSP, irrigation, and power subsidies than eastern states).
    - Adds significantly to the fiscal burden of the government.
- **Cross-Subsidies**
  - Costs of one group are subsidised by charging higher prices from another group.
  - **Examples:**
    - Higher industrial power tariffs used to subsidise agricultural electricity.
    - Rail freight cross-subsidisation where passenger fares support cheaper transport of food grains.
  - **Advantages:**
    - Reduces fiscal burden on government by shifting costs.
    - Politically acceptable way of keeping farm input costs low.
    - Ensures affordability of essential services for farmers.
    - Provides some price stability for agricultural inputs.
  - **Limitations:**

    - Creates inefficiency and distorts resource allocation.
    - Industries and other consumers face higher costs, reducing competitiveness.
    - Hidden subsidies lack transparency in accounting.
    - Encourages inefficient resource use (e.g., overuse of cheap electricity).
    - Hampers investment in infrastructure (railways, power sector) due to distorted pricing.

Major Issues Associated with Agriculture Subsidy in India

- **Fiscal Burden on Government**
    - Subsidies (fertilizer, electricity, irrigation, MSP procurement, loan waivers) consume a large share of India's budget.
    - They reduce fiscal space for long-term investments in infrastructure, research, and rural development.
- **Inefficient Resource Use**
    - **Fertilizer subsidies** (especially on urea) encourage overuse, leading to soil degradation and nutrient imbalance.
    - **Power subsidies** make electricity almost free, leading to **over-extraction of groundwater**.
    - **Water subsidies** promote flood irrigation, wasting water and reducing efficiency.
- **Environmental Concerns**
    - Excessive urea and pesticides : soil infertility, declining yields over time.
    - Free/cheap power : falling water tables in Punjab, Haryana, parts of Maharashtra.
    - MSP-driven monoculture (rice-wheat in North India) : biodiversity loss, stubble burning, and air pollution.
- **Inequitable Distribution**
    - Rich and large farmers benefit more from subsidies (especially MSP procurement and irrigation).
    - Small and marginal farmers often lack access to procurement centres or irrigation facilities, so they **don't benefit equally**.
- **Distortion of Crop Choices**
    - Subsidies + MSPs incentivize farmers to grow water-intensive crops (paddy, sugarcane) even in unsuitable regions.
    - This worsens **regional imbalances** in cropping patterns and water stress.
- **Leakages and Inefficiency**
    - Subsidized fertilizers, seeds, and power often get diverted to **black markets**.
    - Corruption and middlemen reduce the effectiveness of subsidies.
- **Short-Term Relief vs. Long-Term Growth**
    - Subsidies provide **immediate political gains** but discourage investment in:
        - Agricultural R&D
        - Modern irrigation systems (drip, sprinkler)
        - Climate-resilient crops
    - This traps farmers in low-productivity farming.
- **Policy Rigidity & Populism**
    - Subsidy schemes are often politically motivated (loan waivers, free power promises).
    - Difficult to roll back subsidies due to electoral backlash, even if they harm long-term sustainability.

Agriculture Subsidies and WTO

- The World Trade Organization (WTO) regulates subsidies under the **Agreement on Agriculture (AoA)**.
- Subsidies are divided into three "boxes":
    - **Green Box** : Allowed, as they cause little or no trade distortion (e.g., research, rural development, crop insurance).
    - **Amber Box** : Restricted, as they distort trade (e.g., price support like MSP, input subsidies).
    - **Blue Box** : Allowed with conditions, for production-limiting programs.
- WTO allows developing countries like India a subsidy limit of **10% of the value of agricultural production**.
- India faces criticism, especially for:
    - **Minimum Support Price (MSP)** procurement of rice and wheat.
    - **Public Stockholding programs** (like PDS and food security schemes).
- India argues that subsidies are necessary for **food security, livelihood support, and poverty reduction**.
- At WTO, India has demanded a **"permanent**

solution" for public stockholding of food grains, so that its food security programs are not challenged.

Minimum Support Price (MSP)

- **Definition**
  - MSP is the pre-announced price at which the government assures farmers to procure their produce, even if the market price falls below it.
  - It acts as a **safety net against price fluctuations** and protects farmers from distress sales.
- **Who decides MSP?**
  - Recommended by the **Commission for Agricultural Costs and Prices (CACP)**, a statutory body.
  - Final approval given by the **Cabinet Committee on Economic Affairs (CCEA)**.
- **Crops Covered under MSP**
  - Currently announced for **23 crops**:
    - 7 cereals (paddy, wheat, maize, sorghum, pearl millet, barley, ragi)
    - 5 pulses (gram, tur, urad, moong, lentil)
    - 7 oilseeds (groundnut, soybean, sunflower, rapeseed-mustard, sesame, safflower, niger seed)
    - 4 commercial crops (cotton, sugarcane, copra, jute)
  - In addition, **Fair and Remunerative Price (FRP)** is fixed for sugarcane.
- **Criteria for Fixing MSP (by CACP)**
  - Cost of production (A2+FL or C2 formula).
  - Demand and supply situation.
  - Price trends in domestic and international markets.
  - Inter-crop price parity.
  - Effect on consumers (inflation) and overall economy.
- **Procurement Mechanism**
  - Mainly rice and wheat procured by **FCI and state agencies** for PDS buffer stock.
  - Limited procurement of pulses and oilseeds under schemes like **Price Support Scheme (PSS)** and **PM-AASHA**.
- **Importance of MSP**
  - Ensures farmers a minimum return for their crops.
  - Supports the Public Distribution System (PDS) and food security.
  - Encourages production of essential crops and stabilises markets.
  - Promotes adoption of high-yielding varieties and modern farming.

Issues with the MSP System

- **Limited Coverage of Farmers and Crops**
  - Although MSP is announced for **23 crops**, effective procurement is mainly for **rice and wheat**.
  - Less than **6% of farmers** benefit from MSP procurement (Shanta Kumar Committee, 2015).
  - Pulses, oilseeds, and coarse cereals see little to no procurement.
- **Regional Imbalances**
  - Procurement is highly concentrated in **Punjab, Haryana, western UP, MP, and parts of AP**
  - Farmers in eastern states (Bihar, Odisha, Bengal) and most of South India get little MSP benefit despite being major producers.
  - Widening inequality between states with assured procurement vs. others.
- **Distorted Cropping Patterns**
  - MSP-driven procurement encourages **rice–wheat dominance** in north-west India.
  - Farmers shift to **water-intensive crops** like paddy and sugarcane even in water-scarce areas.
  - Leads to **groundwater depletion, soil degradation, and stubble burning**.
- **Fiscal Burden**
  - Food subsidy bill has become unsustainable: **₹2.8 lakh crore in 2022–23**.
  - Large expenditure on procurement, storage, and distribution crowds out investment in agri-infrastructure.
- **Storage and Wastage Issues**
  - FCI godowns face **overstocking**, with foodgrain stocks far above buffer norms.
  - Poor storage facilities lead to wastage and rotting of grains while hunger persists.
- **Inflation and Market Distortions**
  - High MSPs push food inflation and make exports uncompetitive.

- Open-ended procurement by government reduces private sector participation.
- **Exclusion of Small and Marginal Farmers**
  - Most small and marginal farmers (86% of holdings) sell in local markets at below-MSP prices due to lack of access to procurement centres
  - Middlemen capture much of the MSP benefit.
- **Demand for Legal Guarantee**
  - Farmer protests (2020–21) demanded a **legal right to MSP**.
  - Experts caution that legalising MSP for all crops could distort markets further, raise food inflation, and create an unsustainable fiscal burden.
- **Climate Unsustainability**
  - Rice procurement in Punjab and Haryana has led to severe **groundwater depletion** and environmental crisis.
  - Sugarcane MSP has encouraged expansion in drought-prone Maharashtra,

Way Forward for MSP System

- **Broaden the Coverage Beyond Rice & Wheat**
  - Strengthen procurement of **pulses, oilseeds, and millets**.
  - Align with nutrition security and the **International Year of Millets (2023)** push.
  - Reduce over-reliance on rice–wheat cycle.
- **Promote Regional Diversification**
  - Expand procurement in **eastern states (Bihar, Odisha, WB)** and tribal areas.
  - Encourage climate-suitable crops (e.g., millets in arid regions, pulses in rainfed areas).
- **Adopt Price Deficiency Payment (PDP) Models**
  - Example: MP's **Bhavantar Bhugtan Yojana**.
  - Government pays farmers the difference if market price falls below MSP.
  - Reduces need for physical procurement and storage.
- **Integrate MSP with Direct Income Support**
  - Combine MSP with schemes like **PM-KISAN**.
  - Provide cash transfers instead of massive input subsidies and unsustainable procurement.
- **Strengthen PM-AASHA Scheme**
  - Ensures a mix of procurement, price deficiency payments, and private participation.
  - Needs better implementation and awareness.
- **Link MSP to Sustainable Cropping Patterns**
  - Incentivise climate-resilient crops through higher MSP support.
  - Example: Pulses, oilseeds, and millets that use less water and enrich soil.
- **Use Technology for Transparent Procurement**
  - Expand **e-NAM and digital platforms** for price discovery.
  - Use **blockchain and remote sensing** for real-time procurement and stock monitoring.
- **Reform Food Subsidy & PDS Linkages**
  - Rationalise procurement quantities to reduce excess stocks.
  - Invest savings in **storage, food processing, and rural infrastructure**.
- **Strengthen Farmer Producer Organisations (FPOs)**
  - Enable collective bargaining, direct market access, and better price realisation.
  - Reduce overdependence on government procurement.
- **Adopt Shanta Kumar Committee Recommendations**
  - Limit MSP procurement to PDS requirements.
  - Encourage cash transfers/DBT in place of input-heavy subsidies.
  - Improve efficiency of FCI.
  - worsening water stress.

Demand for Legal Guarantee for MSP

Background :

- **MSP (Minimum Support Price)** is the rate at which the government promises to buy crops from farmers.
- Farmers say that MSP is only **on paper** for many crops, and actual procurement happens only for a few like wheat and rice.
- They demand a **legal guarantee** that no trader can buy below MSP, so that their income is protected.

Reasons Behind the Demand

- Farmers face **low and fluctuating market**

prices, often below MSP.

- Rising **input costs** (seeds, fertilizer, fuel) make farming unprofitable without assured returns.
- MSP procurement is limited to certain states and crops, leaving many farmers outside its reach.
- Farmers fear that without MSP, they will be at the mercy of private players and big corporations.

Challenges with Legal Guarantee

- The government would have to **procure a very large quantity** of crops, which is costly and difficult to store.
- If private traders are forced to buy only at MSP, it may **distort markets** and increase food prices for consumers.
- WTO rules may be violated, as such large subsidies are seen as trade-distorting.
- Risk of encouraging **overproduction** of certain crops (like wheat, rice) while ignoring diversification to pulses, oilseeds, and millets.

2 Food Security

Introduction

- Food security means ensuring availability, accessibility, affordability, and nutritional adequacy of food for all. India moved from the "ship-to-mouth" crisis of the 1960s to becoming self-sufficient in foodgrains after the Green Revolution.
- The National Food Security Act (2013) provides legal right to food for about 80 crore people, making it the largest food security programme in the world. The system is supported by the Public Distribution System (PDS), buffer stocks, and nutrition schemes like ICDS and PM Poshan.
- However, India faces a paradox: despite surplus grain stocks, malnutrition (35.5% children stunted, NFHS-5), hidden hunger, regional imbalances, subsidy burden, and climate risks continue to threaten food security. The focus must now shift from cereal security to nutrition security and sustainability.

Legal and Policy Framework for Food Security

- **Legal Framework for Food Security in India**
  - The constitutional basis lies in Article 47 (DPSP), which directs the State to raise nutrition levels, and Article 21 (Right to Life), interpreted by the Supreme Court to include the Right to Food.
  - The **National Food Security Act (NFSA), 2013** gives legal right to food to nearly 80 crore people, ensuring 5 kg foodgrains per person per month at subsidised prices, with special provisions for women and children.
  - Judicial interventions, particularly the PUCL vs Union of India (2001) case, further expanded this right and mandated strengthening of schemes like ICDS and Mid-Day Meals.
- **Policy Framework for Food Security in India**
  - The **Public Distribution System (PDS)** aims to provide foodgrains at affordable prices to vulnerable groups, protect against inflation, and act as a safety net. It functions through centralised procurement and state-level distribution but suffers from leakages, targeting errors, regional imbalances, and high fiscal burden. Revamping efforts include digitisation, Aadhaar seeding, ePoS, the One Nation One Ration Card (ONORC) scheme, and diversification into pulses, millets, and fortified rice.
  - **Buffer stocks** are maintained to stabilise prices, supply the PDS, and meet emergencies, but face issues of excess procurement of rice and wheat, high FCI costs, wastage, and ecological stress. Reforms proposed include modern silos and cold chains, decentralised procurement by states, diversification into pulses and millets, and aligning stock distribution with nutrition goals.

Public Distribution System (PDS)

Background

- The Public Distribution System (PDS) is a mechanism for distributing essential commodities such as wheat, rice, sugar, and kerosene at subsidized prices through Fair Price Shops (ration shops).
- It was originally designed as a scarcity management tool but has now become an important part of India's food security policy.
- PDS is supplemental in nature, meaning it provides only part of a household's food requirements.
- Responsibilities are shared between the Union and State governments:
  - The Central Government, through the Food Corporation of India (FCI), handles procurement, storage, transportation, and bulk allocation.
  - The State Governments are responsible for identifying beneficiaries, issuing ration cards, allocating food grains within the state, and supervising Fair Price Shops.
- Some states also distribute additional commodities like pulses, edible oils, salt, and spices through PDS outlets.

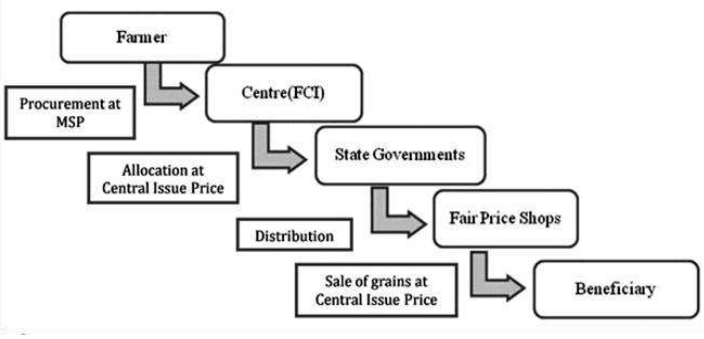
Evolution of PDS in India

- Introduced during World War II as a wartime rationing measure.
- Before the 1960s, PDS was largely dependent on food grain imports.
- In the 1960s, PDS expanded due to frequent food shortages; the government established the Agricultural Prices Commission (now CACP) and

the Food Corporation of India (FCI) for procurement and storage.
- By the 1970s, PDS evolved into a universal scheme providing subsidized food to all consumers.
- Till 1992, it remained a general entitlement scheme without specific targeting.
- In 1992, the Revamped Public Distribution System (RPDS) was launched to strengthen coverage in remote, hilly, tribal, and difficult areas.
- In 1997, the Targeted Public Distribution System (TPDS) was introduced, dividing beneficiaries into two groups: Below Poverty Line (BPL) and Above Poverty Line (APL).
- In 2000, the Antyodaya Anna Yojana (AAY) was launched to provide highly subsidized food grains to the poorest of the poor.
- In 2013, the National Food Security Act was passed, relying on TPDS to deliver food grains as a legal right to nearly two-thirds of the population.

Objectives of PDS
- To ensure food security for vulnerable sections of society by providing essential commodities at subsidized prices.
- To stabilize food prices and protect poor households from inflation in essential goods.
- To make food grains accessible to people in all regions, including remote and difficult areas.
- To reduce poverty and hunger by supplementing household consumption of food.
- To maintain buffer stocks for use during emergencies, natural calamities, or seasonal shortages.
- To discourage hoarding and black marketing of food grains.
- To support farmers indirectly through procurement of crops like wheat and rice at Minimum Support Prices (MSP).

Functioning of PDS
- **Procurement**
  - The **Central Government**, through the **Food Corporation of India (FCI)**, procures food grains (mainly rice and wheat) from farmers at the **Minimum Support Price (MSP)**.
  - Procurement is concentrated in states like Punjab, Haryana, Madhya Pradesh, Chhattisgarh, and Andhra Pradesh.
- **Storage**
  - The procured food grains are stored in FCI godowns and state-level warehouses.
  - Buffer stocks are maintained for food security and emergency needs.
  - Allocation
  - The Central Government allocates food grains to states and Union Territories based on their population and requirements.
  - Allocation is done under different categories such as Priority Households and Antyodaya Anna Yojana (AAY) households under the NFSA.
- **Transportation**
  - Food grains are transported from FCI godowns to state depots and then to Fair Price Shops (FPS) through the state's distribution system.
- **Identification of Beneficiaries**
  - State Governments identify eligible households (Priority and AAY) based on socio-economic criteria.
  - Beneficiaries are issued ration cards, which serve as proof for claiming entitlements.
- **Distribution through Fair Price Shops (FPS)**
  - Fair Price Shops act as the last-mile delivery point.
  - Beneficiaries purchase food grains at highly subsidized rates fixed by the government (₹3/kg rice, ₹2/kg wheat, ₹1/kg coarse grains under NFSA).
  - Some states also provide additional commodities like pulses, edible oil, and salt.
- **Monitoring and Grievance Redressal**
  - Monitoring is done by both central and state authorities.
  - Grievance redressal mechanisms, including State Food Commissions, help address complaints.
  - Technology such as Aadhaar seeding, digitized ration cards, and electronic Point of Sale (e-PoS) machines is being used to reduce leakages and diversion.



Limitations of PDS

- **Leakages and Diversion**: A large share of subsidized food grains gets diverted to the open market or black market instead of reaching beneficiaries.
- **Inclusion and Exclusion Errors**: Many genuine poor households are left out (exclusion), while ineligible families often get benefits (inclusion).
- **Regional Imbalance in Procurement**: Procurement is concentrated in a few states like Punjab, Haryana, and Andhra Pradesh, causing over-dependence and neglect of other states.
- **Quality Concerns**: Food grains supplied through Fair Price Shops are often of poor quality, leading to low trust in the system.
- **Corruption and Malpractices**: Fake ration cards, over-charging, and irregularities by Fair Price Shop dealers reduce the efficiency of PDS.
- **High Fiscal Burden**: Food subsidy takes up a very large portion of the Union budget, leaving less space for other development programs.
- **Storage and Wastage Issues**: Poor storage infrastructure and overstocking in FCI godowns lead to wastage of food grains.
- **Limited Nutritional Value**: PDS focuses mainly on rice and wheat, ignoring pulses, millets, and proteins, which are crucial for nutrition security.
- **Poor Monitoring and Accountability**: Weak grievance redressal systems and lack of transparency affect service delivery.
- **Dependence on Centralized System**: Centralized procurement and distribution reduce efficiency and delay reforms at the state level.

Revamping Measures for Public Distribution System (PDS)

- **Targeting and Coverage**
  - **Targeted Public Distribution System (TPDS, 1997):** Divided beneficiaries into **Below Poverty Line (BPL)** and **Above Poverty Line (APL)** categories.
  - **Antyodaya Anna Yojana (AAY, 2000):** Focused on the **poorest of the poor**, giving them highly subsidized food grains.
  - **National Food Security Act (NFSA, 2013):** Made food a **legal entitlement** for nearly two-thirds of the population.
- **Technology-driven Reforms**
  - **Digitization of Ration Cards:** To weed out fake and duplicate beneficiaries.
  - **Aadhaar Seeding and Biometric Authentication:** Ensures only genuine beneficiaries get subsidized grains.
  - **Electronic Point of Sale (e-PoS) devices:** Installed in Fair Price Shops to track real-time transactions.
  - **End-to-End Computerization:** Monitoring movement of food grains from FCI to FPS.
- **Portability and Access**
  - **One Nation, One Ration Card (ONORC):** Allows beneficiaries to lift ration from any FPS across the country, benefiting migrant workers.
  - **Integrated Management of PDS (IM-PDS):** A central portal for tracking ration distribution and enabling portability.
- **Diversification and Nutrition Security**
  - Some states have started distributing **pulses, edible oils, iodized salt, and millets** through PDS to improve nutrition.
  - Promotion of **nutri-cereals (millets)** in PDS to combat malnutrition.
- **Transparency and Accountability**
  - **Online grievance redressal mechanisms** and social audits introduced.
  - **GPS tracking of trucks** carrying food grains to check diversion.
  - **SMS alerts** to beneficiaries about allocation and delivery of grains.
- **Strengthening Supply Chain**
  - **Modern Silos and Warehousing:** For better storage and reduced wastage.
  - **Decentralized Procurement System (DCP):** States procure food grains locally to reduce transport costs and improve efficiency.

National Food Security Act (NFSA), 2013

- ***Background***
  - India has long struggled with food insecurity, malnutrition, and hunger despite being a food-surplus nation.
  - To address these issues, Parliament enacted the **National Food Security Act (NFSA), 2013**.
  - It is a **rights-based approach**, making access to food a **legal entitlement** rather than a welfare scheme.
- ***Key Provisions***
  - **Coverage**: About two-thirds of the Indian population (75% rural and 50% urban).
  - **Entitlements**:
    - **Priority Households**: 5 kg of food grains per person per month at subsidized prices (₹3/kg rice, ₹2/kg wheat, ₹1/kg coarse grains).
    - **Antyodaya Anna Yojana (AAY) households**: 35 kg per household per month at subsidized prices.
  - **Special Provisions**:
    - Pregnant and lactating women: free meals during pregnancy and 6 months after childbirth, plus maternity benefit of at least ₹6,000.
    - Children: free meals through **Integrated Child Development Services (ICDS)** and **Mid-Day Meal Scheme** up to class VIII.
  - **Nutritional Standards**: Defined under Schedule II of the Act for children, pregnant women, and lactating mothers.
  - **Role of Governments**:
    - Central Government: procurement, storage, transport, and allocation of food grains.
    - State Governments: identification of beneficiaries, distribution through PDS, and grievance redressal.
  - **Grievance Redressal Mechanism**: State Food Commissions and District Grievance Redressal Officers.
  - **Technology Use**: Aadhaar-based identification, digitized ration cards, and ICT to reduce leakages.
- ***Objectives***
  - To ensure food and nutritional security by providing adequate quantity of quality food at affordable prices.
  - To reduce hunger, malnutrition, and poverty.
  - To empower women and protect vulnerable groups.
- ***Achievements***
  - Legal recognition of the **Right to Food**.
  - Wider coverage compared to earlier schemes.
  - Special focus on vulnerable groups such as children, pregnant women, and the poorest households.
  - Helps stabilize food consumption and reduce extreme hunger.
- ***Challenges and Criticisms***
  - **Fiscal Burden**: Food subsidy bill is very high (over ₹2 lakh crore annually), leading to fiscal stress.
  - **Operational Inefficiency**: Leakages, diversion, and corruption in PDS remain.
  - **Targeting Issues**: Errors in identifying beneficiaries – both inclusion (non-poor included) and exclusion (poor left out).
  - **Storage and Infrastructure**: FCI godowns face overstocking and wastage.
  - **Limited Nutrition Impact**: Focus is mainly on cereals; pulses, millets, and protein sources get little attention.
  - **Dependence on Procurement States**: Heavy procurement of rice and wheat from Punjab, Haryana, and a few others, leading to regional imbalance and environmental damage (groundwater depletion, stubble burning).
  - **WTO Pressure**: Concerns that India's procurement and subsidy policies may violate global trade rules.
- ***Way Forward***
  - **Improve Targeting**: Better identification of beneficiaries using SECC data and Aadhaar.
  - **Diversify Food Basket**: Include pulses, oilseeds, and millets to address malnutrition.
  - **Reform PDS**: Shift to **Direct Benefit Transfer (DBT)** or food coupons in urban areas to reduce leakages.

- **Strengthen Storage and Supply Chains**: Modern silos, cold chains, and decentralized procurement.
- **Promote Nutrition Security**: Integrate NFSA with health and sanitation schemes.
- **Sustainable Agriculture**: Encourage diversification away from rice-wheat dominance.
- **Periodic Review**: Update coverage and entitlements based on latest population data and nutritional needs.

Buffer Stocks and Food Security

- **Buffer stock** refers to the reserve of food grains maintained by the government to ensure food security and price stability.
- In India, buffer stocks are maintained by the **Food Corporation of India (FCI)** on behalf of the government.
- **Objectives of Buffer Stocks**
  - **Food Security**: Ensure availability of food grains during droughts, floods, or other emergencies.
  - **Price Stability**: Control rise in food grain prices by releasing stocks during shortages and prevent prices from crashing by procuring during surplus.
  - **Support to PDS/NFSA**: Maintain regular supply of food grains for the **Public Distribution System (PDS)** and **National Food Security Act (NFSA)** entitlements.
  - **Farmer Protection**: Support farmers by purchasing food grains at **Minimum Support Price (MSP)**, giving them assured income.
  - **Emergency Reserve**: Act as a safeguard for unforeseen situations like wars, natural disasters, or pandemics.
  - **Nutritional Programs**: Provide grains for welfare schemes like Mid-Day Meals and Integrated Child Development Services (ICDS).
  - **Market Intervention**: Reduce dependence on imports and stabilize the domestic food economy.
- **Creation and Maintenance of Buffer Stocks**
  - Buffer stocks are created mainly through **procurement of food grains** by the government.
  - The **Food Corporation of India (FCI)**, along with state agencies, procures rice, wheat, and other crops from farmers at the **Minimum Support Price (MSP)**.
  - Procurement is carried out during harvest seasons to protect farmers from distress sales and to build reserves for future needs.
  - Procurement is concentrated in states like Punjab, Haryana, Madhya Pradesh, Chhattisgarh, and Andhra Pradesh.
  - The procured food grains are stored in **FCI godowns, state warehouses, and modern silos**.
  - The government fixes **buffer stock norms** (minimum quantities of wheat and rice to be maintained at the beginning of each quarter) to ensure food security.
  - Stocks are regularly monitored and rotated (old stock is released through PDS while new stock is procured) to prevent damage.
  - Grains from buffer stocks are used for:
    - **Public Distribution System (PDS)** and **NFSA entitlements**.
    - **Welfare schemes** like Mid-Day Meals and ICDS
    - **Market intervention** to stabilize prices during shortages.
    - **Emergency relief** during natural disasters or crises.
- **Role of Buffer Stocks in Food Security**
  - **Ensures Availability of Food Grains**
    - Provides a steady supply of wheat and rice through the **Public Distribution System (PDS)** and **National Food Security Act (NFSA)** entitlements.
    - Helps the poor and vulnerable sections access food at affordable prices.
  - **Protects Against Emergencies**
    - Acts as a safeguard during **droughts, floods, natural disasters, or pandemics**, ensuring no large-scale hunger.
    - Provides relief supplies during crises.
  - **Stabilizes Prices**
    - Maintains price stability by releasing stocks during shortages and procuring during surpluses.
    - Prevents extreme inflation for consumers and distress sales by

farmers.
    - **Supports Welfare Schemes**
        - Supplies food grains for **Mid-Day Meal Scheme**, **Integrated Child Development Services (ICDS)**, and other nutrition programs.
        - Plays a key role in addressing **malnutrition**.
    - **Farmer Protection**
        - Procurement at **Minimum Support Price (MSP)** ensures farmers have a guaranteed market and income security.
    - **Strategic Reserve**
        - Maintains a stockpile for **national food security** and for use during wars or large-scale disruptions in supply chains.
- **Challenges of Buffer Stocks**
    - **Overstocking and High Carrying Costs**
        - FCI often holds food grains much above buffer stock norms.
        - This leads to heavy financial burden due to storage, transport, and interest costs.
    - **Storage Problems and Wastage**
        - Limited and outdated storage capacity in FCI godowns.
        - Poor quality warehouses and open storage (CAP storage) cause rotting, pilferage, and pest infestation.
    - **Regional Imbalance in Procurement**
        - Procurement is concentrated in a few states like Punjab, Haryana, MP, and Chhattisgarh.
        - This creates dependence on certain regions and neglects farmers in other states.
    - **Environmental Stress**
        - Incentivizes overproduction of rice and wheat, leading to water depletion, soil degradation, and stubble burning.
    - **Nutritional Concerns**
        - Focus on cereals (mainly wheat and rice), ignoring pulses, oilseeds, and millets.
        - Limits ability to address malnutrition.
    - **Fiscal Burden**
        - Subsidies on procurement, storage, and distribution create a very high food subsidy bill, straining government finances.
    - **Operational Inefficiency**
        - Delays in procurement and distribution.
        - Leakages, corruption, and diversion of grains in the supply chain.
    - **WTO Pressure**
        - Large-scale procurement and subsidies raise concerns under global trade rules, inviting criticism and disputes.

Food Corporation of India (FCI)

Background

- Established in 1965 under the Food Corporations Act, 1964.
- Headquarters: New Delhi.
- Plays a central role in India's food security system by managing procurement, storage, and distribution of food grains.
- Works closely with the Ministry of Consumer Affairs, Food and Public Distribution.

Objectives of FCI

- To implement the Minimum Support Price (MSP) policy and ensure farmers get remunerative prices.
- To maintain buffer stocks of food grains for food security and price stability.
- To supply food grains to the Public Distribution System (PDS) and welfare schemes like Mid-Day Meals and ICDS.
- To stabilize food grain prices in the open market by balancing supply and demand.
- To ensure distribution of food grains across states and regions, especially to deficit areas.

Functions of FCI

- **Procurement**: Purchases wheat, rice, and other food grains from farmers at MSP.
- **Storage**: Maintains large stocks in warehouses, silos, and state godowns.
- **Transportation**: Moves food grains from surplus to deficit states.
- **Distribution**: Supplies grains to states for PDS, NFSA entitlements, and welfare schemes.
- **Market Intervention**: Releases or procures stocks to stabilize prices when required.
- **Quality Control**: Ensures scientific storage and quality maintenance of food grains.

Achievements

- Helped India move from a **food-deficit to a food-surplus nation**.
- Ensures stable availability of food during crises like droughts, floods, and pandemics.
- Provides assured income to farmers through procurement.
- Backbone of schemes like NFSA, Mid-Day Meals, and ICDS.

Challenges

- **High carrying costs** due to overstocking and prolonged storage.
- **Storage losses** from rotting, pilferage, and outdated warehouses.
- **Operational inefficiency** and rising subsidy burden.
- **Regional imbalance in procurement**, with concentration in Punjab, Haryana, and a few other states.
- **Environmental concerns**: Incentivizes water-intensive crops like rice and wheat.
- **WTO pressures** due to large-scale procurement and subsidies.

Reforms and Way Forward

- **Decentralized Procurement System (DCP):** Empower states to procure directly for PDS.
- **Modern Storage Solutions:** Shift to steel silos and cold chain infrastructure.
- **Diversification of Procurement:** Include pulses, oilseeds, and millets to address nutrition and reduce environmental stress.
- **End-to-End Digitization:** Improve transparency in procurement, storage, and distribution.
- **Rationalization of Subsidy:** Move towards Direct Benefit Transfer (DBT) to reduce fiscal stress.

Shanta Kumar Committee on FCI Restructuring (2015)

Background

- Set up in **August 2014** by the Government of India to suggest reforms in the **Food Corporation of India (FCI)**.
- Headed by **Shanta Kumar**, former Union Minister.
- **Objective:** To restructure and modernize FCI and make India's food management system **efficient, transparent, and farmer- as well as consumer-friendly**.

Key Recommendations

- **On Food Security and Subsidy**
  - Reduce coverage of **National Food Security Act (NFSA)** from **67% to 40%** of the population to reduce fiscal burden.
  - Shift from physical distribution of food grains to **Direct Benefit Transfer (DBT)** so beneficiaries can buy food from the open market.
- **On Procurement and Farmers**
  - Restrict FCI procurement to **food-deficit states** and let states with surplus handle procurement on their own.
  - MSP should mainly serve as a **floor price**, and procurement should be need-based.
  - Encourage diversification towards **pulses, oilseeds, and millets** instead of excessive rice and wheat procurement.
- **On PDS Reforms**
  - Make PDS more **targeted and efficient**.
  - Use **Aadhaar, digitization, and technology** to identify genuine beneficiaries and reduce leakages.
  - Consider **cash transfers/food coupons** in place of subsidized grain distribution in urban areas.
- **On FCI Functioning**
  - Limit FCI's role to maintaining a **national buffer stock** and food security reserves.
  - Encourage **decentralized procurement system (DCP)** by empowering states.
  - Outsource grain storage and movement to the **private sector** to reduce costs.
  - Modernize storage infrastructure through **silos and modern logistics**.
- **On Fertilizer Subsidy**
  - Suggested **Direct Benefit Transfer (DBT)** of fertilizer subsidy directly to farmers instead of routing through companies.

3 Economics of Animal-Rearing.

Introduction

- Animal rearing is an integral part of India's rural economy, closely linked with agriculture and rural livelihoods. It contributes about **5% to India's GDP** and nearly **30% of agricultural GDP**, providing food, nutrition, employment, and supplementary income to millions of farmers, especially small and marginal ones. India today is the **largest producer of milk**, the **third-largest producer of eggs**, and among the top meat and fish producers globally.
- Beyond food security, animal husbandry supports exports, women's empowerment, and diversification of farmer incomes. With rising demand for dairy, poultry, fisheries, and allied products, the economics of animal rearing plays a crucial role in achieving **doubling of farmer incomes, sustainable agriculture, and rural development**.

Significance of Animal Rearing in India

- **Contribution to GDP**
  - Livestock sector contributes about **5% to India's GDP** and nearly **30% to agricultural GDP**.
  - Serves as a driver of rural economic growth.
- **Livelihood Security**
  - Provides employment and income to over **100 million households**, mainly small and marginal farmers, landless labourers, and women.
  - Acts as a daily/weekly source of cash unlike seasonal crops.
- **Food and Nutrition Security**
  - Ensures supply of milk, eggs, meat, fish, honey, and other animal products.
  - Helps tackle malnutrition by providing protein-rich diets.
- **Risk Diversification**
  - Acts as a buffer against crop failure, droughts, and price shocks.
  - Reduces dependence on only crop-based income.
- **Women Empowerment**
  - Women play a central role in dairy, poultry, and goat rearing.
  - Provides them with financial independence and strengthens household nutrition.
- **Exports and Foreign Exchange**
  - Meat, dairy, leather, and marine products are major export earners.
  - Contributes significantly to India's agri-exports basket.
- **Complementary Role in Agriculture**
  - Provides manure for crops, draught power for farming, and supports mixed farming systems.
  - Enhances resource recycling and sustainability.
- **Inclusive Growth**
  - Livestock rearing is relatively more equitable as it supports smallholders and landless farmers, reducing rural poverty.

Economics of Animal Rearing

- **Cost Components**
  - **Feed and Fodder:** Accounts for nearly **60–70% of total cost** in dairy and poultry.
  - **Veterinary Care:** Vaccinations, medicines, and regular health check-ups.
  - **Infrastructure:** Sheds, equipment, cold storage, ponds (in fisheries).
  - **Labour:** Family labour or hired labour, especially in dairy and poultry.
- **Returns and Revenue Streams**
  - **Sale of Products:** Milk, eggs, meat, wool, fish, honey, silk.
  - **Sale of By-products:** Hides, bones, dung (used as manure or biogas).
  - **Value Addition:** Processed milk, cheese, fish products, poultry feed, leather goods.
- **Profitability Factors**
  - **Breed Quality:** Indigenous vs. crossbred animals, disease resistance.
  - **Feed Efficiency:** Balanced nutrition reduces cost per unit of output.
  - **Market Access:** Nearby cooperatives (like Amul) or organised players (Suguna, Nandini) increase returns.
  - **Govt Support:** Subsidies, insurance, veterinary services, and credit schemes.
- **Risk Management**
  - Provides regular income flow compared to seasonal crops.
  - Diversifies farmer income sources, reducing vulnerability to monsoon failure.

- Insurance and vaccination reduce risks of disease outbreaks.
- **Smallholder**
  - Livestock is often reared on small plots, using crop residues as fodder.
  - Ensures supplementary income for landless and marginal farmers.
  - Daily income (milk, eggs) improves household liquidity and consumption.

Key Sub-Sectors of Animal Rearing in India

- **Dairy Sector**
  - India is the largest producer of milk in the world (~146.3 million tonnes in 2014-15 to 239.2 million tonnes in 2023-24).
  - Cooperative models like Amul (Gujarat) and government schemes (Operation Flood, NPDD) revolutionised milk production.
  - Provides regular income for smallholders; women form a major workforce.
  - **Challenge:** low productivity of indigenous breeds, fodder shortage.
- **Poultry Sector**
  - Among the fastest-growing livestock sectors with 8–10% annual growth.
  - India ranks 3rd in egg production and 5th in broiler meat production.
  - Features contract farming models with private integrators (e.g., Suguna, Venky's).
  - **Challenge:** fluctuating feed costs, disease outbreaks (bird flu).
- **Fisheries and Aquaculture**
  - India is the 2nd largest fish producer globally, contributing ~8% of world fish production.
  - The sector contributes to nutrition, exports, and employment in coastal/rural areas.
  - Supported by Blue Revolution and Pradhan Mantri Matsya Sampada Yojana (PMMSY).
  - **Challenge:** overfishing, inadequate cold chain, climate vulnerability.
- **Sheep, Goat, and Piggery**
  - Important for dryland and tribal farmers with low input requirements.
  - Goat is called the "poor man's cow" due to low cost and high adaptability.
  - Provides meat, wool, skin, and manure.
  - **Challenge:** low veterinary coverage, traditional rearing practices.
- **Sericulture (Silk Production)**
  - India is the 2nd largest silk producer after China.
  - Provides supplementary income in states like Karnataka, West Bengal, Assam.
  - Supported under Integrated Sericulture Development Project.
  - **Challenge:** poor market linkages, dominance of China in exports.
- **Apiculture (Beekeeping)**
  - Provides honey and wax, supports pollination of crops, boosting yields.
  - Supported under National Beekeeping and Honey Mission (NBHM).
  - Growing importance in organic farming and export markets.

Issues and Challenges with Animal Rearing in India

- **High Cost of Feed and Fodder**
  - Feed accounts for ~70% of production cost in dairy and poultry.
  - Shortage of green fodder and rising cost of concentrate feed affect profitability.
- **Low Productivity of Animals**
  - Average milk yield of Indian cattle is much lower than global standards.
  - Limited adoption of improved breeds and modern rearing practices.
- **Veterinary Infrastructure Gaps**
  - Shortage of veterinary doctors, para-vets, and diagnostic labs.
  - Weak animal health coverage increases risks from diseases.
- **Disease Burden**
  - Frequent outbreaks (foot and mouth disease, avian flu, swine fever) cause heavy losses.
  - Limited vaccination coverage and weak surveillance.
- **Fragmented and Smallholder Dominance**
  - Majority of livestock rearers are small and marginal farmers with limited capital.
  - Poor economies of scale and weak bargaining power in markets.
- **Market and Price Fluctuations**
  - Instability in milk, meat, and egg prices reduces farmer confidence.
  - Lack of assured procurement and organised

value chains.

- **Infrastructure Deficiency**
  - Poor cold chain, storage, and transport facilities for milk, fish, and meat.
  - Processing sector underdeveloped compared to crop agriculture.
- **Credit and Insurance Constraints**
  - Limited access to institutional credit and livestock insurance.
  - High vulnerability to losses due to diseases, droughts, and disasters.
- **Environmental Concerns**
  - Methane emissions from cattle contribute to greenhouse gases.
  - Overgrazing leads to land degradation in dry regions.
- **Social and Cultural Issues**
  - Cattle slaughter bans and restrictions affect livestock economy in some states.
  - Gendered workload: women play a major role in rearing but lack recognition and ownership.

Government Policies & Support in Animal Rearing

- **National Livestock Mission (NLM)**
  - Focuses on feed and fodder development, breed improvement, and extension services.
  - Promotes sustainable livestock farming practices.
- **Rashtriya Gokul Mission (RGM)**
  - Launched in 2014 to conserve and develop **indigenous cattle breeds**.
  - Supports breed improvement, semen banks, and Gokul Grams (cattle care centres).
- **National Programme for Dairy Development (NPDD)**
  - Modernises milk collection, chilling, and processing infrastructure.
  - Improves quality and marketability of milk.
- **Dairy Entrepreneurship Development Scheme (DEDS)**
  - Provides back-end capital subsidy for dairy farms, chilling units, and cold storage.
  - Promotes self-employment in dairy sector.
- **Pradhan Mantri Matsya Sampada Yojana (PMMSY)**
  - Flagship scheme for fisheries under the **Blue Revolution**.
  - Aims to increase fish production, improve cold chain, and enhance exports.
- **National Beekeeping and Honey Mission (NBHM)**
  - Promotes scientific beekeeping to increase income, crop pollination, and honey exports.
- **Livestock Insurance Scheme**
  - Provides insurance coverage to farmers against loss of cattle.
  - Protects smallholders from economic shocks due to animal deaths.
- **e-Pashuhaat Portal**
  - Online platform to connect breeders and farmers for transparent trade in livestock germplasm.
- **Support through Cooperatives**
  - **Operation Flood (1970–1996):** White Revolution that made India the largest milk producer.
  - Strengthening dairy cooperatives (Amul model, NDDB initiatives).
- **Other Recent Initiatives**
  - **Animal Husbandry Infrastructure Development Fund (AHIDF):** ₹15,000 crore fund for dairy, meat processing, and animal feed infrastructure.
  - **National Animal Disease Control Programme (NADCP):** 100% centrally funded scheme for Foot-and-Mouth Disease (FMD) and Brucellosis eradication.

Value Addition

Keywords : Power Subsidy, Irrigation Subsidy, Seed Subsidy, MSP (Minimum Support Price), PM-AASHA, Price Deficiency Payment (PDP), Shanta Kumar Committee, WTO Amber Box, Food Subsidy, PDS (Public Distribution System), NFSA 2013, Buffer Stocks, FCI Reforms, One Nation One Ration Card (ONORC), DBT in Subsidies, Leakages & Diversion, Nutritional Security, Animal Husbandry, Blue Revolution, White Revolution

Mains Question for Practice :

Q1. Critically examine the effectiveness of direct and indirect farm subsidies in addressing agrarian distress in India.

Q2. Discuss the significance of Minimum Support Prices (MSP) in ensuring farmers' welfare. Should India move towards income support instead of price

support?
Q3. The Public Distribution System (PDS) has ensured food security but suffers from leakages and inefficiencies. Suggest reforms.
Q4. Evaluate the role of buffer stocks in India's food security strategy. How can excess stocks be managed without distorting markets?
Q5. Technology missions in agriculture have achieved mixed results. Critically analyze their impact with examples.
Q6. Examine the economic significance of animal rearing in rural livelihoods. How can productivity and sustainability in this sector be improved?

Ready - Made Introduction and coclusion
Intros

- Farm subsidies and MSPs have been central to India's agrarian transition—stabilising incomes and food supply—but they now pose fiscal, ecological and distributional dilemmas.
- The MSP-procurement-PDS nexus underpins India's food security architecture, even as it skews cropping patterns and strains public finances.
- Direct transfers and DBT pilots aim to replace price-based subsidies, signalling a shift from input-subsidies to farmer-centric income support.
- Buffer stocks and FCI were historic instruments for crisis management; today their role must be balanced against storage costs, wastage and WTO pressures.
- Food security in India has moved from scarcity management to a rights-based paradigm (NFSA), necessitating a pivot from calories to nutrition.
- Leakages, inclusion/exclusion errors and archaic logistics remain the Achilles' heel of PDS despite digitisation and One Nation One Ration Card reforms.
- MSP, if narrowly implemented, creates regional distortions and groundwater stress; reorientation toward price-deficiency and local procurement can reduce such distortions.
- Animal-rearing is an essential complement to crop agriculture—offering income diversification, nutrition gains and rural employment—and must be integrated into food security planning.

Conclusions

- Rational subsidy reform—targeted DBT, phased fertilizer and power reforms, and reinvestment of savings into public goods—can reconcile farmer welfare with fiscal sustainability.
- MSP should be preserved as a safety net but redesigned (PDPs, decentralised procurement, crop-basket expansion) to promote diversification and ecological sustainability.
- PDS must evolve from cereal-centred distribution to a nutrition-sensitive system with decentralised procurement, better storage and inclusion safeguards.
- Modernising buffer management—using silos, decentralised stocks, and real-time digitised monitoring—will reduce wastage and fiscal drag while ensuring emergency readiness.
- WTO-compatible food policies require transparent accounting of subsidies, greater reliance on Green-Box measures, and diplomatic efforts for a permanent public-stock solution.
- Strengthening veterinary services, feed security and market linkages will unlock the full potential of livestock for rural incomes and nutritional outcomes.
- Policy coherence—linking MSP, subsidies, PDS and climate-sensitive agriculture—will determine whether food security is achieved sustainably and equitably.
- Ultimately, protecting farmers' livelihoods and ensuring citizens' nutrition calls for pragmatic fiscal reforms, technology-led delivery, and politics that favour long-term resilience over short-term populism.

Acronyms
1. Farm Subsidies – Issues
FARM
F – Fiscal burden (high subsidy bill)
A – Allocation inefficiency (large farmers benefit more)
R – Resource misuse (water, fertilizer overuse)
M – Market distortion (crop choices skewed)

2. MSP – Challenges
PRICE
P – Paddy and wheat bias, ignoring other crops
R – Regional imbalance in procurement
I – Inflationary impact if MSP too high
C – Cost vs. market mismatch

E – Environmental stress (overproduction, groundwater depletion)

3. Public Distribution System (PDS) – Issues
FOOD
F – Fraud and leakages (diversion, ghost beneficiaries)
O – Overlapping schemes, inefficiency
O – Outdated coverage (based on old census data)
D – Distribution delays and corruption

4. Buffer Stocks & Food Security – Issues
STOCK
S – Surplus leading to wastage (rotting grains)
T – Trade distortion (WTO concerns, export bans)
O – Over-storage costs (FCI burden)
C – Carrying cost high, fiscal stress
K – K-shaped demand mismatch (urban surplus, rural deficit)

5. Technology Missions – Significance
CROP
C – Commercialization of agriculture (cotton, oilseeds, horticulture)
R – Research and development boost
O – Output and productivity increased
P – Processing and value addition improved

6. Economics of Animal Rearing – Issues
DAIRY
D – Disease management gaps (FMD, avian flu)
A – Access to veterinary and breeding services limited
I – Infrastructure deficit (cold chains, processing)
R – Rising feed and fodder shortages
Y – Yield and productivity low vs global standards

UNIT 3 Food Processing and Related Industries in India

Navigating the Syllabus: What You Need to Know

Food Processing and Related Industries in India-

- Scope' and Significance,
- Location,
- Upstream and Downstream Requirements,
- Supply Chain Management.

UPSC Previous Year Questions

Question	Nature of Question	Core Demand
Elaborate the scope and significance of the food processing industry in India. (2022)	Food Processing + Economic Significance	Explain growth potential, value addition, employment, exports, farmer income, and nutrition benefits of food processing
What are the challenges and opportunities of the food processing sector in the country? How can income of the farmers be substantially increased by encouraging food processing? (2020)	Food Processing + Farmer Income	Identify constraints (infrastructure, cold chain, credit, technology) and opportunities (exports, value-addition, employment) with link to farmer income
Elaborate the policy taken by the Government of India to meet the challenges of the food processing sector. (2019)	Food Processing Policy + Government Schemes	Explain measures like Mega Food Parks, PM Kisan SAMPADA Yojana, cold chain, FDI, Make in India initiatives
Examine the role of supermarkets in supply chain management of fruits, vegetables and food items. How do they eliminate the number of intermediaries? (2018)	Supply Chain + Retail + Intermediaries	Discuss supermarkets' role in direct procurement, logistics, cold storage, contract farming, and impact on farmer–consumer link
What are the reasons for poor acceptance of cost effective small processing units? How can the food processing unit be helpful to uplift the socio-economic status of poor farmers? (2017)	Small Processing Units + Rural Development	Explain barriers (credit, scale, technology, marketing) and role in income generation, employment, rural development
What are the impediments in marketing and supply chain management in developing the food processing industry in India? Can e-commerce help in overcoming these bottlenecks? (2015)	Food Processing + Supply Chain + E-commerce	Identify bottlenecks (fragmented markets, cold chain gaps, intermediaries) and evaluate role of e-commerce in improving efficiency and farmer access

Introduction

- Food processing refers to the transformation of raw agricultural produce into value-added products such as packaged foods, beverages, dairy items, meat products, and ready-to-eat meals. It plays a vital role in linking farm to fork, reducing post-harvest losses, creating rural employment, and boosting exports.
- India is the second-largest producer of food in the world, yet less than 10% of its agricultural produce is processed, compared to 60–70% in developed countries. The sector contributes nearly 12% to manufacturing GDP and is a key driver for doubling farmers' incomes, ensuring nutrition security, and promoting Atmanirbhar Bharat. With growing urbanisation, rising incomes, and changing food habits, the scope of food processing industries in India is immense, making it a sunrise sector for inclusive and sustainable growth.

Scope and Significance of Food Processing Industries in India

- **Economic Contribution**
  - Contributes ~**12% of manufacturing GDP** and ~**13% of India's total exports**.
  - Expected to grow into a **$535 billion industry by 2025–26** (IBEF).
- **Employment Generation**
  - Labour-intensive sector providing direct employment to ~1.8 million people and indirect jobs to millions more.
  - High potential for rural job creation, especially for women and youth.
- **Farmer Welfare & Income Security**
  - Provides assured markets and better prices for farm produce.
  - Reduces dependence on middlemen and minimises distress sales.
  - Key to **doubling farmers' incomes** through value addition.
- **Reduction of Post-Harvest Losses**
  - India loses ~**₹92,000 crore annually** due to wastage of food, especially perishables.
  - Processing helps reduce wastage by improving storage, packaging, and shelf life.
- **Nutrition & Food Security**
  - Enhances dietary diversity through processed dairy, cereals, fruits, vegetables, and fortified foods.
  - Supports government programmes on **food fortification, mid-day meals, and ICDS**.
- **Export Potential**
  - India's processed food exports include marine products, rice, spices, meat, and dairy.
  - Growing demand for ready-to-eat, organic, and ethnic Indian foods in global markets.
- **Support to Allied Sectors**
  - Boosts dairy, fisheries, poultry, sericulture, and horticulture by creating demand and supply chains.
  - Encourages diversification of agriculture beyond cereals.
- **Link to Atmanirbhar Bharat & Make in India**
  - Identified as a **sunrise sector** with huge potential under Make in India.
  - Supported through FDI, Production Linked Incentive (PLI), and schemes like PM Kisan SAMPADA Yojana.
- **Sustainability and Innovation**
  - Promotes by-product utilisation (biofuels, animal feed, compost).
  - Encourages R&D in packaging, cold chains, and organic/fortified products.

Location of Food Processing Industries in India

- Food processing industries (FPI) convert raw agricultural products into value-added goods such as packaged foods, beverages, dairy, meat, and marine products.
- India has a **large raw material base** (fruits, vegetables, cereals, dairy, fisheries, livestock), which shapes the location of FPIs.
- Their distribution depends on **availability of raw materials, infrastructure, market access, and government policies**.
- **Factors Influencing Location**
  - **Raw Material Availability**
    - Proximity to agriculture and horticulture zones reduces transport costs.
    - Example: Mango processing in Andhra Pradesh and Maharashtra; Tomato processing in Karnataka.
  - **Agro-Climatic Regions**
    - Specific crops grow best in certain regions, encouraging industry clusters.

        - Example: Tea in Assam and West Bengal; Coffee in Karnataka, Kerala, Tamil Nadu.
    - **Market Proximity**
        - Industries locate near urban centers with high demand for packaged foods.
        - Example: Dairy plants near Delhi, Mumbai, Bengaluru.
    - **Infrastructure and Connectivity**
        - Ports, cold chains, transport networks, and industrial estates attract industries.
        - Example: Seafood processing in Kerala, Gujarat, Andhra Pradesh due to ports.
    - **Government Policies**
        - Food Parks, Mega Food Parks, and SEZs influence clustering.
        - Example: Mega Food Park in Tumkur (Karnataka), Satara (Maharashtra).
    - **Labor and Skills**
        - Regions with availability of skilled and semi-skilled labor encourage setting up of units.
- **Major Food Processing Industry Locations in India**
    - **Cereal-based industries**:
        - Rice mills in West Bengal, Punjab, Andhra Pradesh.
        - Wheat flour mills in Uttar Pradesh, Punjab, Madhya Pradesh.
    - **Fruit and vegetable processing**:
        - Mango: Andhra Pradesh, Maharashtra, Uttar Pradesh.
        - Banana: Tamil Nadu, Gujarat, Maharashtra.
        - Tomato: Karnataka, Andhra Pradesh.
    - **Dairy industry**:
        - Gujarat (Amul – Anand pattern), Uttar Pradesh, Maharashtra, Punjab.
    - **Meat and poultry processing**:
        - Uttar Pradesh, Maharashtra, Andhra Pradesh, Telangana.
    - **Fisheries and marine products**:
        - Kerala, Andhra Pradesh, Tamil Nadu, Gujarat, Odisha, West Bengal.
    - **Beverages**:
        - Tea: Assam, West Bengal, Tamil Nadu.
        - Coffee: Karnataka, Kerala, Tamil Nadu.
    - **Sugar industry (linkage with food processing)**:
        - Maharashtra, Uttar Pradesh, Karnataka, Tamil Nadu, Gujarat.
    - **Spices processing**:
        - Kerala (pepper, cardamom), Rajasthan (chillies, coriander), Andhra Pradesh.

Upstream and Downstream Requirements in Food Processing Industry

1. Upstream Requirements (Inputs and Pre-Processing Needs)

These are requirements **before or at the start of food processing**. They ensure steady supply of raw materials and basic infrastructure.

- **Raw Material Supply**
    - Regular, assured availability of agricultural produce (cereals, fruits, vegetables, milk, fish, meat).
    - Quality consistency in terms of grade, size, and safety.
- **Cold Chain & Storage**
    - Pre-cooling facilities, cold storages, warehouses, silos.
    - Essential for perishable goods like dairy, fish, fruits, and vegetables.
- **Infrastructure & Logistics**
    - Rural roads, connectivity to mandis, pack houses, and transport networks.
    - Energy supply for cold storage and processing units.
- **Technology & R&D**
    - Modern equipment for sorting, grading, and primary processing.
    - Innovations in preservation and shelf-life extension.
- **Finance & Institutional Support**
    - Affordable credit for processors and farmers.
    - Crop insurance and livestock insurance to reduce raw material risks.
- **Skill Development**
    - Training for farmers, workers, and entrepreneurs in hygiene, quality control, and processing.

2. Downstream Requirements (Outputs and Post-Processing Needs)

These are requirements **after food processing**, focusing on distribution, value addition, and consumer reach.

- **Packaging**
  - Scientific, hygienic, and eco-friendly packaging to maintain shelf life and consumer appeal.
  - Innovations like vacuum packaging, bio-based packaging.
- **Distribution & Retail**
  - Efficient transport to wholesale markets, supermarkets, and exports.
  - Integration with e-commerce and modern retail chains.
- **Marketing & Branding**
  - Building brand value for Indian processed foods (organic, ethnic, ready-to-eat).
  - GI tagging and international certifications for exports.
- **Export Facilitation**
  - Support from agencies like **APEDA** (Agricultural & Processed Food Products Export Development Authority).
  - Meeting global food safety standards (Codex, WTO-SPS).
- **Waste Management & By-products**
  - Utilisation of processing waste for biofuel, compost, cattle feed.
  - Circular economy approach in food processing.

Supply Chain Management in Food Processing

- **Importance of Supply Chain in Food Processing**
  - Ensures timely flow of raw materials from farmers to processors.
  - Maintains quality and reduces post-harvest losses.
  - Provides efficient linkages between producers, processors, retailers, and consumers.
  - Enhances competitiveness of Indian food products in global markets.
- **Challenges in India's Food Supply Chain**
  - **Fragmented Production Base :** Small and marginal farmers dominate; weak collective supply reduces bargaining power.
  - **Post-Harvest Losses :** Nearly **30–40% of fruits and vegetables** wasted due to poor handling and storage.
  - **Cold Chain Deficiency :** Limited cold storages, pack houses, reefer trucks; most facilities concentrated in a few states.
  - **Poor Logistics and Infrastructure**
    - High logistics cost (13–14% of GDP vs 8–9% in developed countries).
    - Inadequate rural roads and weak last-mile connectivity.
  - **Multiple Intermediaries :** Long supply chains with many middlemen reduce farmers' share of consumer rupee.
  - **Quality and Safety Issues :** Lack of grading, sorting, and standardisation; weak adherence to food safety norms.
  - **Market Volatility :** Price fluctuations discourage farmers from linking with processors.
- **Best Practices and Reforms in Supply Chain Management**
  - **Contract Farming and FPO Linkages**
    - Direct tie-ups between farmers and processors ensure quality and steady supply.
    - **Example:** PepsiCo's potato supply chain in Punjab.
  - **Integrated Cold Chain and Warehousing**
    - Development of cold storages, silos, and pack houses for perishable crops.
    - Subsidies under schemes like PM Kisan SAMPADA Yojana.
  - **ICT and Digital Platforms**
    - E-Choupal, DeHaat, and Ninjacart connect farmers directly with buyers.
    - Blockchain for traceability and quality assurance.
  - **Public–Private Partnerships (PPP)**
    - Mega Food Parks and Agro-Processing Clusters provide shared infrastructure.
    - Encourages private investment in logistics and retail.
  - **Export-Oriented Supply Chains**
    - APEDA support for GI-tagged and organic foods.
    - Streamlined certification for global standards (Codex, HACCP).
  - **Waste Reduction & By-product Utilisation**
    - Efficient use of crop residues and processing waste for biofuels, compost, animal feed.

Issues and Challenges in Food Processing Industry

- **Supply-Side Issues**
  - **Low Level of Processing :** Only about 10% of agricultural produce is processed; very low compared to developed countries.
  - **Post-Harvest Losses :** 20–30% of fruits and vegetables wasted due to poor handling, lack of cold chain, and storage.
  - **Fragmented Supply Chain :** Multiple intermediaries reduce farmers' share and increase costs.
  - **Raw Material Shortages :** Seasonal availability of crops, quality variations, and lack of contract farming linkages.
- **Infrastructure Bottlenecks**
  - **Cold Chain Deficit :** Insufficient refrigerated transport, warehouses, and pack houses.
  - **Inadequate Storage :** Poor warehousing and outdated infrastructure lead to spoilage.
  - **Transport Constraints :** Lack of rural roads and high logistics cost (India's logistics cost is ~14% of GDP vs 8–10% globally).
- **Regulatory and Policy Issues**
  - **Complex Regulatory Framework :** Overlapping rules under FSSAI, state regulations, and export standards.
  - **Food Safety Standards :** Compliance with domestic and international standards (like EU/US) is costly for small processors.
  - **Policy Uncertainty :** Frequent changes in export bans, MSP policies, and taxation affect investment.
- **Financial and Investment Barriers**
  - **High Capital Requirement :** Setting up processing units and cold storage needs heavy investment.
  - **Credit Access :** Small and medium enterprises (SMEs) face difficulty in getting affordable loans.
  - **Low FDI Utilization :** Despite 100% FDI allowance, investment inflows remain limited due to structural challenges.
- **Demand-Side and Market Issues**
  - **Weak Domestic Demand for Processed Food :** Rural consumers prefer fresh produce; low awareness about processed foods.
  - **Export Challenges :** Strict sanitary and phytosanitary (SPS) measures, poor branding, and packaging standards reduce competitiveness.
  - **Price Volatility :** Raw material prices fluctuate, affecting production costs.
- **Skill and Technology Gaps**
  - **Low Adoption of Technology :** Many units still use outdated methods with low productivity.
  - **Skill Shortages :** Lack of trained manpower in processing, packaging, and quality control.
  - **R&D Deficit :** Weak research in value-added products, preservation techniques, and food innovations.

Government Policies & Initiatives for Food Processing in India

- **Policy Support**
  - **FDI Policy**
    - 100% FDI allowed under automatic route in food processing.
    - 100% FDI in food retail for products manufactured and produced in India.
  - **Production Linked Incentive (PLI) Scheme for Food Processing**
    - ₹10,900 crore outlay to boost global competitiveness of Indian food brands.
    - Focus on ready-to-eat foods, fruits, marine products, and organic foods.
- **Major Schemes by Ministry of Food Processing Industries (MoFPI)**
  - **Pradhan Mantri Kisan SAMPADA Yojana (PMKSY)**
    - Umbrella scheme for modernisation of food processing sector.
    - Components include Mega Food Parks, Integrated Cold Chains, Agro-Processing Clusters, Creation of Forward and Backward Linkages.
  - **Mega Food Parks Scheme**
    - Provides modern infrastructure and common facilities for processing, packaging, cold storage, and logistics.
    - Each park brings together farmers, processors, retailers, and exporters.
  - **Integrated Cold Chain and Value Addition Infrastructure Scheme**

        - Ensures preservation, transport, and storage of perishable produce from farm gate to retail.
    - **Agro-Processing Clusters**
        - Sets up cluster-based infrastructure for SMEs in food processing.
    - **Operation Greens (TOP to TOTAL)**
        - Initially focused on Tomato, Onion, Potato to stabilise prices.
        - Expanded to cover all perishable fruits and vegetables.
- **Other Relevant Initiatives**
    - **Agriculture Infrastructure Fund (AIF) :** ₹1 lakh crore fund for cold storage, warehouses, and processing units.
    - **APEDA Support :** Promotes export of processed food products; supports branding and certification.
    - **Mission for Integrated Development of Horticulture (MIDH) :** Promotes production and post-harvest management of fruits, vegetables, and spices.
    - **Enablers for Ease of Doing Business**
        - Single Window Clearance system.
        - Simplified norms by **FSSAI** for food safety compliance.

Pradhan Mantri Kisan Sampada Yojana (PMKSY)
Background

- Launched in 2017 by the Ministry of Food Processing Industries (MoFPI).
- Aims to develop modern infrastructure for food processing, reduce wastage of agricultural produce, and create a robust supply chain from farm to retail.
- It is an umbrella scheme, combining several ongoing and new schemes for holistic development of the food processing sector.

Objectives

- To reduce post-harvest losses of agricultural produce.
- To create modern food processing and preservation infrastructure.
- To integrate farmers with markets through food processing and value addition.
- To generate employment opportunities, especially in rural areas.
- To boost exports of processed foods and increase farmers' income.

Components of PMKSY

The scheme includes **seven key components**:

- **Mega Food Parks**
    - Cluster-based approach with common infrastructure (cold chains, warehouses, packaging, testing labs).
    - Brings together farmers, processors, and retailers.
- **Integrated Cold Chain and Value Addition Infrastructure**
    - Development of cold chains from farm gate to consumer.
    - Includes pre-cooling, refrigerated transport, cold storage, and value addition.
- **Creation/Expansion of Food Processing & Preservation Capacities (CEFPPC)**
    - Support for setting up or expanding processing units with modern technology.
- **Infrastructure for Agro-Processing Clusters**
    - Development of processing clusters in production areas to reduce logistics cost.
- **Creation of Backward and Forward Linkages**
    - Financial assistance for supply chain projects linking farmers to processors and markets.
- **Food Safety and Quality Assurance Infrastructure**
    - Testing laboratories and certification facilities to meet domestic and international standards.
- **Human Resources and Institutions**
    - Training and skill development for entrepreneurs, workers, and institutions in the sector.

Achievements

- Helped in setting up **Mega Food Parks** across different states.
- Strengthened cold chain infrastructure, reducing post-harvest wastage.
- Promoted entrepreneurship in food processing sector.
- Contributed to employment generation in rural areas.
- Supported India's growing **food export sector**.

Challenges

- Implementation delays in Mega Food Parks due to land acquisition and clearances.
- Low awareness among farmers and small entrepreneurs about schemes.
- Need for better coordination between Centre, States, and private sector.
- Financing difficulties faced by small and medium enterprises.

Way Forward

- Speed up completion of Mega Food Parks and ensure proper utilization.
- Strengthen outreach and awareness programs for farmers and entrepreneurs.
- Improve integration of PMKSY with other government programs like **Operation Greens**, **Make in India**, and **Atmanirbhar Bharat**.
- Encourage private investment and foreign direct investment (FDI) in food processing.
- Promote value addition in pulses, oilseeds, and millets to address nutrition and export potential.

Value Addition

Keywords : Sunrise Sector, Value Addition, Agro-Processing, Post-Harvest Management, Cold Chain Infrastructure, Mega Food Parks, PM Kisan SAMPADA Yojana, Operation Greens, Integrated Supply Chain, Backward and Forward Linkages, Food Safety Standards Authority of India (FSSAI), Production Linked Incentive (PLI) Scheme, Export Competitiveness, Nutritional Security, Doubling Farmers' Income, Atmanirbhar Bharat, Rural Employment, E-Commerce Integration, APEDA Certification, Circular Economy in Food Processing

Mains Question for Practice :

Q1. Discuss the scope and significance of food processing industries in achieving inclusive and sustainable growth in India.

Q2. Examine the locational factors influencing the food processing industry in India. How do they differ from traditional manufacturing industries?

Q3. Critically analyze the upstream and downstream linkages of food processing industries with Indian agriculture.

Q4. What are the major challenges in supply chain management of food processing industries? Suggest policy measures to strengthen it.

Q5. Evaluate the role of government schemes like PM Kisan Sampada Yojana and Mega Food Parks in promoting food processing industries.

Acronyms

1. Scope & Significance of Food Processing

FOOD

F – Farmers' income enhancement through value addition

O – Opportunities for employment (especially rural, women)

O – Overseas markets via exports and brand India

D – Diversification of agriculture into high-value crops

2. Location Factors

PLACE

P – Proximity to raw materials (perishable crops, milk, fisheries)

L – Logistics and connectivity (roads, rail, ports)

A – Availability of skilled labour and technology

C – Cold chain and storage infrastructure

E – Energy and utilities access (power, water)

3. Upstream & Downstream Linkages

FARM

F – Forward linkages with markets and exports

A – Agro-based industries support (packaging, cold chains)

R – Rural industrialization and SME growth

M – Modernization of agriculture through demand pull

4. Supply Chain Challenges

CHAIN

C – Cold chain gaps and post-harvest losses

H – High wastage of perishables (fruits, vegetables)

A – Absence of integration (farm to fork disconnect)

I – Infrastructure deficits (warehouses, processing units)

N – Non-uniform quality standards and certification issues

5. Policy Measures & Reforms

VALUE

V – Value addition through Mega Food Parks, clusters

A – Access to finance via NABARD, Agri-infra fund

L – Linkages under PM Kisan Sampada Yojana

U – Upgradation with technology and R&D

E – Export promotion, branding, GI tagging

UNIT 4 Land Reforms in India.

Navigating the Syllabus: What You Need to Know

Land Reforms in India

- Land Reforms in India
- Phases of Land Reforms in India
- Achievements of Land Reforms in India
- Factors Responsible for the Success of Land Reforms in India
- Limitations of Land Reforms in India
- Contemporary Land Reform Issues

UPSC Previous Year Questions

Question	Nature of Question	Core Demand
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. (2023)	Land Reforms + Land Ceiling	List land reform objectives/measures and critically assess land ceiling policy from an efficiency, equity, and productivity lens
How did land reforms in some parts of the country help to improve the socio-economic conditions of marginal and small farmers? (2021)	Land Reforms + Socio-Economic Impact	Explain how tenancy reform, redistribution, and abolition of intermediaries improved equity, income, and social justice
Discuss the role of land reforms in agricultural development. Identify the factors that were responsible for the success of land reforms in India. (2016)	Land Reforms + Agricultural Growth	Examine link between land reforms and productivity, and explain why success was uneven (political will, state variation, records, implementation)
In view of the declining average size of land holdings in India which has made agriculture non-viable for a majority of farmers, should contract farming and land leasing be promoted in agriculture? Critically evaluate the pros and cons. (2015)	Landholding Size + Contract Farming + Land Leasing	Assess viability issues, examine benefits (efficiency, income) and drawbacks (corporate control, farmer exploitation) of leasing/contract farming

The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 has come into effect from 1 January 2014. What implication would it have on industrialization and agriculture in India? (2014)	Land Acquisition + R&R Act + Industrialization	Explain provisions of LARR 2013 and discuss impact on industrial projects, farmers, and balance between development & displacement
Establish the relationship between land reform, agriculture productivity and elimination of poverty in the Indian Economy. Discuss the difficulty in designing and implementation of the agriculture-friendly land reforms in India. (2013)	Land Reforms + Productivity + Poverty	Link land reforms with growth and poverty reduction, and highlight administrative/political/structural challenges in implementation

Introduction

Land reforms in India refer to measures aimed at restructuring land ownership and land relations to ensure **equity, productivity, and rural development**. Emerging from the exploitative colonial systems like **Zamindari and Ryotwari**, post-Independence reforms focused on **abolition of intermediaries, tenancy regulation, land ceilings, and consolidation of holdings**. While they weakened feudal structures and empowered some tenants, uneven implementation and loopholes limited their impact. Land reforms remain crucial today for **inclusive growth, food security, and sustainable agriculture**.

Objectives of Land Reforms in India

- **Social Justice**: Abolish feudal intermediaries and reduce inequality in land ownership.
- **Equity and Redistribution**: Provide land to the landless and ensure fair access to agricultural resources.
- **Tenancy Security**: Protect tenants from eviction, regulate rents, and grant ownership rights where possible.
- **Increase Agricultural Productivity**: Consolidate fragmented holdings, encourage investment, and improve efficiency.
- **Optimum Land Use**: Prevent concentration, absentee landlordism, and underutilisation of land.
- **Poverty Reduction & Livelihood Security**: Empower small and marginal farmers, landless labourers, and rural poor.
- **Foundation for Rural Transformation**: Support growth of Green Revolution, cooperatives, and rural development.

Phases of Land Reforms in India

- **Abolition of Intermediaries (late 1940s–1950s)**: Zamindari, Jagirdari, and Inamdari systems were abolished; ownership rights transferred to actual tillers, ending feudal exploitation.
- **Tenancy Reforms (1950s–1960s)**: Focused on regulating rents, providing security of tenure, and granting ownership rights to tenants; successful in states like Kerala and West Bengal.
- **Ceilings on Landholdings (1960s–1970s)**: Laws fixed maximum land a family could hold, with surplus to be redistributed; poor implementation and loopholes reduced effectiveness.
- **Consolidation of Holdings (1960s onwards)**: Aimed at reducing land fragmentation for efficiency and mechanisation; worked well in Punjab, Haryana, western UP but lagged in eastern India.
- **Cooperative Farming (1960s–1970s)**: Encouraged pooling of land and resources to improve scale of farming; largely unsuccessful due to lack of trust and weak institutional support.

Achievements of Land Reforms in India

- **Abolition of Intermediaries**: Ended exploitative Zamindari and Jagirdari systems; nearly **2 crore tenants** gained direct ownership of land.
- **Tenant Empowerment**: Tenancy reforms in states like Kerala and West Bengal (Operation Barga) provided ownership/security to millions of sharecroppers.
- **Redistribution of Land**: Ceiling laws redistributed some surplus land to the landless, giving them livelihood security and reducing rural inequality.
- **Foundation for Green Revolution**: Secure land rights and consolidation of holdings in Punjab, Haryana, and western UP enabled adoption of HYVs, irrigation, and mechanisation.
- **Reduction in Feudal Power**: Land reforms weakened feudal landlords, empowering small farmers and enhancing rural democracy.
- **Social Justice**: Improved equity in land distribution, supported rural poor, and created opportunities for inclusive growth.

Factors Responsible for the Success of Land Reforms in India

- **Strong Political Will**: States like Kerala and West Bengal saw success due to committed political leadership (e.g., Left governments driving tenancy reforms).
- **Active Peasant Movements**: Grassroots mobilisation by farmers' unions and peasant struggles (e.g., Tebhaga Movement in Bengal, Kayyur Movement in Kerala) created pressure for reform.
- **Supportive Bureaucracy**: In some states, proactive district administration ensured proper identification of surplus land and redistribution.

- **Judicial Backing**: Early constitutional amendments (1st, 4th, 17th) placed land reforms in the **9th Schedule**, protecting them from judicial review and ensuring smooth implementation.
- **Land Records Availability**: States with better-maintained land records (Kerala, West Bengal, Punjab) could implement reforms effectively.
- **Homogeneous Agrarian Structure**: Where the landlord–tenant divide was sharp and feudalism dominant, reforms had greater impact (e.g., Bengal, Kerala).
- **Political Stability**: Continuous rule by reform-oriented parties in certain states provided long-term consistency to land reform policies.

Limitations of Land Reforms in India

- **Uneven Implementation**: Success varied across states; Kerala and West Bengal saw strong reforms, but states like Bihar, UP, and Odisha lagged due to weak political will.
- **Loopholes in Ceiling Laws**: Landlords evaded ceilings by benami transactions, partitioning land among family members, or manipulating records.
- **Weak Tenancy Reforms**: In many states, tenancy was banned instead of regulated, pushing tenancy underground and denying tenants legal rights.
- **Poor Land Records**: Outdated and inaccurate land records hampered redistribution and tenant protection.
- **Limited Redistribution Impact**: Of surplus land identified, only a portion was actually distributed; plots were often too small to ensure viable livelihoods.
- **Neglect of Women's Land Rights**: Most reforms ignored gender equity; women rarely got ownership despite being major contributors to farming.
- **Resistance from Elites**: Political and social dominance of landed elites slowed or diluted reforms.
- **Continued Fragmentation**: Inheritance laws and population pressure led to re-fragmentation of holdings, undermining consolidation efforts.

Contemporary Land Reform Issues

- **Digitisation of Land Records**:
  - Many states still maintain outdated, paper-based land records.
  - The **Digital India Land Records Modernization Programme (DILRMP)** aims to computerise records, cadastral mapping, and ensure transparency, but progress is uneven.
- **Land Leasing and Tenancy Laws**:
  - In many states, leasing is either banned or highly restrictive, leading to insecure informal tenancy.
  - The **Model Land Leasing Act, 2016 (NITI Aayog)** proposes legalising and formalising land leasing to bring idle land into productive use and protect tenants.
- **Land Acquisition vs. Farmers' Rights**:
  - Conflicts over compensation and rehabilitation continue under the **Land Acquisition, Rehabilitation and Resettlement Act (LARR), 2013**.
  - Balancing industrialisation/infrastructure development with farmers' rights remains a challenge.
- **Fragmentation of Holdings**:
  - Successive inheritance divisions lead to smaller, uneconomic holdings.
  - Consolidation efforts remain weak outside Punjab, Haryana, and western UP.
- **Gender and Land Rights**:
  - Women form a large share of agricultural workers but own less than **13% of landholdings**.
  - Need for joint pattas, inheritance rights, and women-friendly land policies.
- **Corporate and Contract Farming**:
  - Growing role of agri-businesses in leasing land raises concerns of farmer exploitation, corporate monopolisation, and displacement.
  - Requires balanced regulation to protect smallholders while ensuring investment.
- **Environmental and Climate Concerns**:
  - Over-cultivation of small plots degrades soil and groundwater.
  - Climate-smart land reforms needed to promote sustainable farming and crop diversification.

Value Addition

Keywords : Abolition of Zamindari, Tenancy Reforms, Land Ceiling Acts, Operation Barga, Cooperative Farming, Consolidation of Holdings, Redistribution of Land, Agrarian Justice, Rural Transformation, Benami Transactions, Land Record Modernisation, Digital India Land Records Modernization Programme (DILRMP), Model Land Leasing Act 2016, Right to Fair Compensation and Transparency in Land Acquisition Act (LARR) 2013, Women's Land Rights, Social Equity, Agrarian Movements, Political Will, Judicial Protection (9th Schedule), Inclusive Growth, Climate-Smart Land Reforms

Mains Question for Practice :

Q1. Trace the evolution of land reforms in India since independence. Why have they achieved only partial success?

Q2. Critically examine the effectiveness of land ceiling laws in addressing inequality and agrarian distress.

Q3. Discuss the significance of tenancy reforms in ensuring security of tenure and increasing agricultural productivity.

Q4. How far has digitization of land records (like Digital India Land Records Modernization Programme) addressed challenges in land governance?

Q5. "Without effective land reforms, inclusive rural development is a distant dream." Comment.

Acronyms

1.Objectives of Land Reforms

LAND

L – Limit concentration of land (equity, social justice)
A – Access to land for landless & small farmers
N – National food security through productivity gains
D – Democratic rural development & poverty reduction

2. Major Components of Land Reforms

CEIL

C – Ceiling on landholdings
E – Elimination of intermediaries (zamindars, jagirdars)
I – Improvement of tenancy rights (security, fair rent)
L – Land records modernization (digitization, transparency)

3. Issues in Implementation

FARM

F – Fragmentation of holdings reducing productivity
A – Administrative bottlenecks & weak political will
R – Resistance from elites, loopholes in laws
M – Manipulation of records, benami transactions

4. Recent Reforms & Way Forward

SOIL

S – Secure land titles through digitization (DILRMP, SVAMITVA)
O – One Nation One Land Record for uniformity
I – Inclusive access for women, Dalits, tribals
L – Legal reforms for tenancy & contract farming

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