APPSC GROUP-1 STRATEGIC REVISION FOR MAINS

TEST SERIES - 2026

SECTIONAL TEST-8_PAPER-1

INDIAN ECONOMY- II

MODEL ANSWERS

Q.1 (A). Inclusive growth is increasingly viewed as the cornerstone of India's development strategy. Examine the major causes of economic and social exclusion in India and critically evaluate the strategies adopted to achieve inclusive growth.

Demand of the Question

- Examine the **major causes of economic and social exclusion** in India.
- Critically evaluate the **strategies adopted by the Government** to achieve inclusive growth.

The **World Bank** defines **inclusive growth** as growth that creates **productive employment, reduces poverty and ensures equitable access to opportunities**. Despite being one of the world's fastest-growing major economies, India continues to face challenges of **income inequality, regional disparities and social exclusion**, making inclusive growth the central pillar of its development strategy.

Major Causes of Economic and Social Exclusion

1. Economic Factors

- **Poverty and income inequality** restrict access to education, healthcare and financial services.
- **Unemployment and underemployment**, particularly among youth and women.
- Dominance of the **informal sector** with low wages and lack of social security.
- Limited access to **institutional credit, markets and productive assets**.

2. Social Factors

- **Caste-based discrimination** affecting access to education, employment and economic opportunities.
- **Gender inequality** reflected in lower Female Labour Force Participation Rate (FLFPR), wage gaps and unequal asset ownership.
- Marginalisation of **Scheduled Castes (SCs), Scheduled Tribes (STs), minorities and persons with disabilities**.
- Poor educational attainment and inadequate skill development.

3. Regional Disparities

- Uneven industrialisation and infrastructure development.
- Persistent backwardness of **aspirational districts, tribal and hilly regions**.
- Rural-urban divide in employment opportunities and access to public services.

4. Institutional & Digital Exclusion

- Limited access to quality healthcare, education and public services.
- **Digital divide** affecting access to e-governance, online education and financial inclusion.
- Governance deficits and implementation gaps in welfare programmes.

Strategies Adopted for Inclusive Growth:

Strategy	Contribution
Poverty Alleviation	PM Garib Kalyan Anna Yojana, National Food Security Act (NFSA), National Social Assistance Programme (NSAP) provide food and social security.
Employment Generation	MGNREGS, PM Vishwakarma and PM Employment Generation Programme (PMEGP) create livelihood opportunities.
Financial Inclusion	PM Jan Dhan Yojana, JAM Trinity and Digital Payments expand access to banking and DBT.
Human Capital Development	NEP 2020, PM POSHAN, Ayushman Bharat and Skill India improve education, health and employability.
Women Empowerment	SHGs under DAY-NRLM, Lakhpati Didi Initiative and Beti Bachao Beti Padhao promote economic participation.
Regional Development	Aspirational Districts Programme, PM Gati Shakti and Bharatmala reduce regional imbalances.

Critical Evaluation

Achievements

- Significant decline in **multidimensional poverty** over the past decade.
- Expansion of **financial inclusion** through Jan Dhan accounts and Direct Benefit Transfer (DBT).
- Improved access to healthcare, sanitation, electricity and drinking water.
- Increased digital inclusion through **Aadhaar, UPI and Digital Public Infrastructure (DPI)**.
- Better targeting and transparency in welfare delivery.

Challenges

- Rising **income and wealth inequality**.
- Low quality of employment and persistent informalisation.
- Regional disparities continue despite targeted interventions.
- Gender gaps in labour force participation and wages.
- Uneven learning outcomes and healthcare quality.
- Climate change disproportionately affects poor and vulnerable communities.

Way Forward

- Promote **labour-intensive manufacturing** and MSME-led employment.
- Strengthen **quality education, skilling and healthcare**.
- Enhance women's workforce participation through supportive policies.
- Bridge the **digital divide** through universal digital infrastructure and literacy.
- Increase investment in **backward regions and rural infrastructure**.
- Adopt **green and climate-resilient growth** that creates sustainable livelihoods.

Inclusive growth is not merely about achieving **higher economic growth**, but about ensuring that **every section of society has equitable access to opportunities, resources and the benefits of development**. A development model that combines **economic efficiency with social justice and human capability enhancement** will create a more equitable, resilient and prosperous India.

Value Addition:

Constitutional Vision: The **Preamble**, **Articles 38 & 39**, and **Article 46** mandate the State to reduce inequalities and promote the welfare of weaker sections.

Economic Survey Insight: The Survey emphasises that **inclusive growth requires a virtuous cycle of employment generation, human capital formation and social protection**, supported by **Digital Public Infrastructure (DPI)** and targeted welfare delivery.

NITI Aayog: The **Aspirational Districts Programme** uses **real-time data, convergence and competition** to improve governance and human development outcomes in the country's most underdeveloped districts.

SDG Linkage: Inclusive growth advances **SDG 1 (No Poverty), SDG 5 (Gender Equality), SDG 8 (Decent Work & Economic Growth), SDG 10 (Reduced Inequalities)** and **SDG 16 (Inclusive Institutions).**

Q.1 (B). Financial inclusion has evolved from merely providing access to banking services to creating a comprehensive digital financial ecosystem. Discuss the progress made by India in financial inclusion and examine the challenges that still hinder inclusive economic development.

Demand of the Question

- Discuss the **progress made by India in financial inclusion**, particularly through digital financial systems.
- Examine the **challenges** that continue to hinder inclusive economic development.

The **Reserve Bank of India (RBI)** defines **financial inclusion** as ensuring access to affordable financial products and services for vulnerable and low-income groups. In recent years, India has transformed financial inclusion from a **bank account-centric approach** to a **Digital Public Infrastructure (DPI)-driven financial ecosystem**, integrating banking, payments, credit, insurance and welfare delivery.

Progress Made in Financial Inclusion:

1. Universal Banking Access

- **Pradhan Mantri Jan Dhan Yojana (PMJDY)** has significantly expanded access to banking, especially among women and rural households.
- Banking Correspondents (BCs) and digital banking have improved last-mile connectivity.
- Expansion of bank branches and India Post Payments Bank has enhanced outreach.

2. Digital Financial Ecosystem

- **JAM Trinity (Jan Dhan–Aadhaar–Mobile)** has enabled seamless Direct Benefit Transfers (DBT).
- **Unified Payments Interface (UPI)** has revolutionised low-cost, real-time digital payments.
- **Aadhaar Enabled Payment System (AePS)** facilitates banking services in rural areas.
- Digital platforms have reduced transaction costs and increased transparency.

3. Financial Security & Social Protection

- **Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY)** and **Pradhan Mantri Suraksha Bima Yojana (PMSBY)** expanded insurance coverage.
- **Atal Pension Yojana (APY)** strengthened old-age income security for the unorganised sector.
- DBT has improved efficiency in subsidy delivery and reduced leakages.

4. Access to Credit

- **PM Mudra Yojana** supports micro and small entrepreneurs.
- **Stand-Up India** promotes entrepreneurship among SCs, STs and women.
- Digital lending and fintech innovations have expanded access to formal credit.

Challenges Hindering Inclusive Economic Development:

Economic Challenges -

- Limited access to **formal credit**, particularly for MSMEs, tenant farmers and informal workers.
- Regional disparities in banking and financial services.
- Low insurance and pension penetration among vulnerable groups.

Digital Challenges -

- Digital divide due to inadequate internet connectivity and smartphone access.
- Low digital and financial literacy, especially among the elderly and rural populations.
- Increasing instances of cyber fraud and digital financial scams.

Social & Institutional Challenges -

- Dormant Jan Dhan accounts and limited usage of formal financial services.
- Gender gap in financial decision-making and access to formal credit.
- Documentation and KYC barriers for migrant workers and informal labour.
- Low financial awareness affecting savings, investment and insurance uptake.

Government Initiatives:

Initiative	Contribution
Pradhan Mantri Jan Dhan Yojana (PMJDY)	Universal access to banking services and financial inclusion.

Initiative	Contribution
JAM Trinity	Integrates Jan Dhan, Aadhaar and Mobile for efficient welfare delivery.
Unified Payments Interface (UPI)	Enables secure, real-time digital payments across the country.
Direct Benefit Transfer (DBT)	Transfers subsidies directly into beneficiaries' bank accounts, reducing leakages.
PM Mudra Yojana	Provides collateral-free loans to micro enterprises.
Digital India Mission	Expands digital infrastructure and promotes digital financial services.

Critical Evaluation

Achievements

- India has emerged as a **global leader in digital payments** through UPI.
- Financial inclusion has expanded significantly through **PMJDY and JAM**.
- DBT has enhanced transparency and reduced subsidy leakages.
- Fintech innovations have improved access to payments, savings and credit.
- Greater financial participation of women through Jan Dhan accounts and Self-Help Groups.

Challenges:

- Financial inclusion has not always translated into **financial empowerment**.
- Credit access remains inadequate for MSMEs and informal workers.
- Cybersecurity and data privacy concerns are increasing.
- Digital exclusion persists in remote and vulnerable regions.
- Financial literacy remains relatively low.

Financial inclusion has evolved from **opening bank accounts to empowering citizens through a comprehensive digital financial ecosystem**. The next phase must focus on **universal access, responsible digital finance, enhanced financial literacy and equitable credit availability**, ensuring that every individual can participate meaningfully in India's economic growth and development.

Value Addition:

Economic Survey Insight: India's **Digital Public Infrastructure (DPI)**—built on **Aadhaar, UPI and DBT**—has transformed financial inclusion by making financial services **accessible, affordable and transparent**.

RBI's Financial Inclusion Index (FI-Index): Measures financial inclusion across **Access, Usage and Quality**, indicating that inclusion is no longer measured merely by bank accounts but by meaningful financial participation.

Global Recognition: India's **UPI** has emerged as one of the world's largest real-time digital payment systems and is increasingly being adopted for cross-border payment linkages.

Q.2 (A). Poverty alleviation, employment generation, education and healthcare are mutually reinforcing pillars of inclusive growth. Analyse the effectiveness of major government interventions in achieving these objectives.

Demand of the Question

- Analyse the role of **poverty alleviation, employment, education and healthcare** in achieving inclusive growth.
- Evaluate the effectiveness of **major government interventions** in these sectors.

Inclusive growth is achieved when the benefits of economic development are **broad-based, equitable and accessible to all sections of society**. Recognising that **poverty, unemployment, poor education and inadequate healthcare reinforce one another**, India has adopted a multi-dimensional strategy focusing on **human capital development, livelihood generation and social protection**.

Major Government Interventions:

Pillar	Major Interventions	Contribution
Poverty Alleviation	**National Food Security Act (NFSA), PM Garib Kalyan Anna Yojana (PMGKAY), National Social Assistance Programme (NSAP)**	Ensures food security and social assistance for vulnerable sections.
Employment Generation	**MGNREGS, PM Vishwakarma, PM Employment Generation Programme (PMEGP), Deendayal Antyodaya Yojana (DAY-NRLM/NULM)**	Creates wage employment, promotes self-employment and strengthens rural livelihoods.
Education	**NEP 2020, Samagra Shiksha, PM POSHAN, PM SHRI Schools**	Improves access, quality and equity in education while enhancing learning outcomes.
Healthcare	**Ayushman Bharat (PM-JAY & HWCs), National Health Mission (NHM), Jan Aushadhi Scheme**	Expands affordable healthcare, primary care and financial protection against medical expenses.

Effectiveness of Government Interventions:

1. Poverty Alleviation -

Achievements

- Significant decline in **multidimensional poverty** through targeted welfare programmes.
- Improved food security through **NFSA** and **PMGKAY**.
- **Direct Benefit Transfer (DBT)** has reduced leakages and improved transparency.

Challenges

- Persistent income inequality and regional disparities.
- Continued vulnerability of informal workers and migrant labour.
- Limited graduation from welfare to sustainable livelihoods.

2. Employment Generation -

Achievements

- **MGNREGS** provides wage employment and acts as a social safety net during distress.
- Skill development and entrepreneurship schemes encourage self-employment.
- MSME support programmes have expanded livelihood opportunities.

Challenges

- High youth unemployment and underemployment.
- Predominance of informal employment with low productivity.
- Skill mismatch between education and labour market demand.

3. Education -

Achievements

- Increased school enrolment and improved gender parity.
- **NEP 2020** promotes multidisciplinary education, foundational literacy and skill development.
- Mid-day meals (PM POSHAN) improve nutrition and school attendance.

Challenges

- Learning outcome gaps despite higher enrolment.
- Digital divide affecting access to quality education.
- Regional disparities in educational infrastructure.

4. Healthcare

Achievements

- **Ayushman Bharat** has improved access to affordable secondary and tertiary healthcare.
- Expansion of **Health & Wellness Centres** has strengthened primary healthcare.
- Immunisation programmes have reduced child mortality and vaccine-preventable diseases.

Challenges

- Low public expenditure on health.
- Shortage of healthcare professionals in rural areas.
- High Out-of-Pocket Expenditure (OOPE) despite insurance expansion.

Overall Assessment

Strengths

- Shift towards **multi-dimensional poverty reduction**.
- Better targeting through **JAM Trinity and DBT**.
- Greater focus on **human capital formation**.
- Improved convergence among welfare programmes.

Areas for Improvement

- Generate more **quality, formal-sector employment**.
- Improve learning outcomes and healthcare quality.
- Reduce regional and social disparities.
- Enhance monitoring, outcome-based implementation and fiscal efficiency.

Poverty alleviation, employment generation, education and healthcare are **mutually reinforcing pillars of human development and inclusive growth**. While India's welfare architecture has substantially improved access to basic services, the next phase of reforms should focus on **quality outcomes, productive employment and human capability enhancement**, ensuring that economic growth translates into **lasting social and economic empowerment** for all.

Value Addition:

Economic Survey Perspective: Sustainable inclusive growth requires simultaneous investment in **human capital, productive employment and social protection**, rather than isolated welfare interventions.
Multidimensional Poverty: NITI Aayog's National Multidimensional Poverty Index (MPI) measures deprivation across **Health, Education and Standard of Living**, reflecting a broader understanding of poverty.

Constitutional Vision: Articles 38, 39, 41, 45 and 47 direct the State to promote social justice, education, employment and public health as part of the welfare state.

SDG Linkage: These interventions advance **SDG 1 (No Poverty), SDG 2 (Zero Hunger), SDG 3 (Good Health), SDG 4 (Quality Education), SDG 8 (Decent Work)** and **SDG 10 (Reduced Inequalities).**

Q 2 (B). Women-led development has emerged as a key pillar of India's inclusive growth strategy. Examine the role of women empowerment initiatives, Self-Help Groups (SHGs), and DWCRA in promoting socio-economic transformation.

Demand of the Question
- Explain the significance of **women-led development** in India's inclusive growth strategy.
- Examine the role of **women empowerment initiatives, SHGs and DWCRA** in promoting socio-economic transformation.

The shift from **"women's development" to "women-led development"** reflects a paradigm change in India's development approach, where women are viewed not merely as beneficiaries but as **leaders, entrepreneurs and agents of socio-economic change**. By enhancing access to **finance, skills, livelihoods and decision-making**, women empowerment has become a key driver of **inclusive and sustainable development**.

Role of Women Empowerment Initiatives:

1. Economic Empowerment -

- Enhances women's participation in entrepreneurship and the workforce.
- Expands access to **credit, skills and markets**.
- Improves household income and financial independence.

2. Social Empowerment
- Promotes education, health and nutritional outcomes.

- Reduces gender discrimination and strengthens social inclusion.
- Enhances participation in community institutions and local governance.

3. Political Empowerment

- Greater representation in **Panchayati Raj Institutions (PRIs)** and local bodies.
- Strengthens leadership, decision-making and grassroots governance.

Role of Self-Help Groups (SHGs):

- Promote **financial inclusion** through savings and affordable credit.
- Encourage **micro-enterprises and livelihood diversification**.
- Improve women's bargaining power within households and communities.
- Facilitate **financial literacy, digital literacy and skill development**.
- Act as effective platforms for implementing government welfare programmes.

Role of DWCRA (Development of Women and Children in Rural Areas)

- Organises poor rural women into **income-generating groups**.
- Provides financial assistance, revolving funds and capacity building.
- Promotes self-employment through micro-enterprises.
- Improves nutritional security and family welfare.
- Laid the foundation for today's SHG movement, particularly in Andhra Pradesh.

Major Government Initiatives:

Initiative	Contribution
Deendayal Antyodaya Yojana–National Rural Livelihoods Mission (DAY-NRLM)	Strengthens SHGs through credit linkage, skill development and livelihood promotion.
Lakhpati Didi Initiative	Supports SHG women to achieve sustainable annual household incomes through enterprise development.
PM Mudra Yojana	Provides collateral-free loans for women entrepreneurs.
Stand-Up India	Promotes entrepreneurship among women through institutional credit.
Beti Bachao Beti Padhao (BBBP)	Encourages education, protection and empowerment of the girl child.
Mission Shakti	Integrates women's safety, protection and empowerment initiatives.

Critical Evaluation:

Achievements

- SHGs have significantly improved **financial inclusion and livelihood opportunities**.
- Enhanced participation of women in entrepreneurship and local governance.
- Improved household savings, income and social status.

- Andhra Pradesh's **SERP–SHG model** has emerged as a national best practice in community-based poverty reduction.
- Greater convergence between SHGs and rural development programmes.

Challenges

- Limited access to **high-value markets and technology**.
- Small-scale enterprises often face low productivity and profitability.
- Gender wage gaps and low Female Labour Force Participation Rate (FLFPR) persist.
- Uneven access to digital and financial literacy.
- Social norms continue to constrain women's economic participation.

Women-led development represents a **transformative approach to inclusive growth**, where empowered women become **producers, entrepreneurs, decision-makers and community leaders**. Strengthening **SHGs, expanding livelihood opportunities and removing structural barriers** will not only accelerate women's empowerment but also foster **inclusive, equitable and sustainable socio-economic transformation**.

Value Addition:

Economic Survey Perspective: Women-led development enhances **labour productivity, household welfare and long-term economic growth**, making gender equality an economic imperative.
Andhra Pradesh Model: The **Society for Elimination of Rural Poverty (SERP)** is internationally recognised for leveraging **SHGs and community institutions** to reduce rural poverty and empower women.

Constitutional Basis: Articles 14, 15(3), 16 and 39(a), 39(d) provide the foundation for gender equality, equal opportunity and equal pay for equal work.

SDG Linkage: Advances **SDG 1 (No Poverty), SDG 5 (Gender Equality), SDG 8 (Decent Work & Economic Growth)** and **SDG 10 (Reduced Inequalities).**

Q 3 (A). Food security extends beyond food production to ensuring affordability, accessibility and nutritional security. Discuss the role of the Public Distribution System (PDS) in achieving food security and suggest reforms for improving its efficiency.

Demand of the Question

- Discuss the role of the **Public Distribution System (PDS)** in ensuring food security.
- Suggest reforms to improve the **efficiency and effectiveness** of the PDS.

The **National Food Security Act (NFSA), 2013** transformed India's food security framework from a **welfare programme to a legal entitlement**, ensuring access to subsidised food grains for nearly **two-thirds of the population**. As one of the world's largest food security programmes, the **Public Distribution System (PDS)** plays a crucial role in ensuring **availability, affordability, accessibility and nutritional security**, particularly for vulnerable households.

Role of PDS in Achieving Food Security:

1. Ensures Food Availability

- Procures food grains through **Minimum Support Price (MSP)** operations.
- Maintains buffer stocks for food security and emergencies.
- Stabilises food grain availability during natural disasters and crises.

2. Enhances Affordability

- Supplies food grains at highly subsidised prices under the **NFSA**.
- Reduces household expenditure on food, especially for poor families.
- Protects vulnerable households against food inflation.

3. Improves Accessibility

- Extensive network of **Fair Price Shops (FPSs)** across rural and urban areas.
- Supports remote, tribal and vulnerable populations.
- **One Nation One Ration Card (ONORC)** enables nationwide portability for migrant workers.

4. Promotes Nutritional Security

- Supports calorie security through subsidised cereals.
- Converges with schemes such as **PM POSHAN** and **Integrated Child Development Services (ICDS)/Saksham Anganwadi & POSHAN 2.0** to improve child and maternal nutrition.
- Contributes to reducing hunger and malnutrition.

5. Social Protection

- Acts as a safety net during economic shocks, pandemics and disasters.
- Strengthens livelihood security by ensuring minimum food consumption.

Major Reforms Undertaken -

Reform	Contribution
National Food Security Act (NFSA), 2013	Legal entitlement to subsidised food grains.
One Nation One Ration Card (ONORC)	Nationwide portability of ration cards for migrant beneficiaries.
Aadhaar-based Authentication	Reduces duplicate and fake beneficiaries.
End-to-End Computerisation	Improves transparency in procurement, storage and distribution.
Direct Benefit Transfer (DBT) (Pilot)	Enhances beneficiary choice and reduces leakages in selected areas.
Smart Fair Price Shops	Use of e-PoS devices for real-time authentication and monitoring.

Challenges -

- Leakage and diversion of food grains in some regions.
- Inclusion and exclusion errors in beneficiary identification.
- High food subsidy and storage costs.
- Inadequate storage and logistics infrastructure leading to wastage.
- PDS remains **cereal-centric**, with limited focus on nutrition diversification.
- Digital authentication failures occasionally exclude genuine beneficiaries.

Suggested Reforms:

- **Diversify the food basket** by including millets, pulses and fortified foods to improve nutritional security.
- Regularly update beneficiary databases using **Socio-Economic Caste Census (SECC)** and dynamic inclusion mechanisms.
- Strengthen storage through **modern silos, cold chains and scientific warehousing**.
- Expand **DBT** where appropriate while preserving food security safeguards.
- Improve grievance redressal, social audits and community monitoring.
- Leverage **AI, GIS and real-time supply chain tracking** to minimise leakages and improve accountability.

Critical Evaluation -

Strengths

- One of the world's largest rights-based food security programmes.
- Significant reduction in hunger and food insecurity among vulnerable households.
- Digital reforms have improved transparency and portability.
- Effective during crises such as the COVID-19 pandemic through expanded food grain distribution.

Concerns

- Focus remains largely on **food grain security rather than nutritional security**.
- Fiscal burden of food subsidies continues to rise.
- Persistent operational inefficiencies and regional disparities.
- Long-term sustainability requires greater efficiency and dietary diversification.

The Public Distribution System remains the **backbone of India's food security architecture**, ensuring that millions of vulnerable households have access to affordable food. Going forward, transforming the PDS into a **technology-enabled, nutrition-sensitive and beneficiary-centric system** will be essential to achieve **food and nutrition security** while making the system more efficient, transparent and sustainable.

Value Addition:

Constitutional Basis: Article 47 directs the State to raise the level of nutrition and improve public health, while **Article 21** has been judicially interpreted to include the **Right to Food** as part of the Right to Life.

Economic Survey Perspective: The Survey highlights that India's food security architecture must evolve from **ensuring calorie sufficiency to promoting nutritional security**, supported by technology-driven reforms and efficient supply chains.

Supreme Court: In **People's Union for Civil Liberties (PUCL) vs Union of India (Right to Food Case)**, the Court recognised access to food as an integral component of the **Right to Life under Article 21**.

Q.3 (B). Integrated Rural Development requires convergence of agriculture, infrastructure, finance and livelihood opportunities. Discuss the importance of integrated rural development in reducing regional disparities in India.

Demand of the Question

- Explain the concept and importance of **Integrated Rural Development (IRD)**.
- Discuss how it helps in **reducing regional disparities** in India.

The **Economic Survey 2025-26** emphasizes that **rural transformation cannot be achieved through agriculture alone** but requires convergence of **agriculture, infrastructure, human capital, financial inclusion and non-farm employment**. Integrated Rural Development (IRD) adopts this holistic approach to improve livelihoods, reduce poverty and bridge regional imbalances, particularly in backward and aspirational districts.

Importance of Integrated Rural Development -

1. Enhances Agricultural Productivity

- Promotes irrigation, mechanisation, quality inputs and extension services.
- Encourages crop diversification, allied sectors and value addition.
- Strengthens farmers' income through better market access and agri-infrastructure.

2. Expands Rural Infrastructure

- Development of **roads, electricity, digital connectivity, warehouses and irrigation** improves economic opportunities.
- Reduces transaction costs and integrates rural areas with national markets.
- Facilitates access to education, healthcare and public services.

3. Promotes Financial Inclusion

- Expands access to **banking, institutional credit, insurance and digital payments**.
- Supports entrepreneurship through SHGs, Farmer Producer Organisations (FPOs) and MSMEs.
- Strengthens resilience against income and climate-related shocks.

4. Generates Sustainable Livelihoods

- Diversifies employment through **MSMEs, food processing, handicrafts, dairy, fisheries and rural tourism**.
- Reduces disguised unemployment and dependence on agriculture.
- Encourages skill development and rural entrepreneurship.

5. Strengthens Human Capital

- Improves access to **quality education, healthcare, nutrition and sanitation**.
- Enhances labour productivity and long-term economic mobility.
- Empowers women and vulnerable communities through inclusive development.

Role in Reducing Regional Disparities

- Accelerates development in **backward, tribal, hilly and Aspirational Districts**.
- Narrows the **rural-urban divide** in infrastructure and public services.

- Reduces inter-state disparities by promoting balanced regional development.
- Limits distress migration through local employment generation.
- Ensures equitable access to markets, finance and digital infrastructure.
- Promotes inclusive growth by integrating marginalized communities into the mainstream economy.

Major Government Initiatives:

Initiative	Contribution
MGNREGS	Creates rural employment while developing durable community assets.
DAY-NRLM	Promotes SHGs, women's empowerment and livelihood diversification.
PMGSY	Improves all-weather rural road connectivity.
PM Krishi Sinchayee Yojana (PMKSY)	Expands irrigation and improves water-use efficiency.
PM Gati Shakti	Integrates multimodal infrastructure and rural connectivity.
Digital India & BharatNet	Expands digital connectivity and access to e-governance.
Aspirational Districts Programme (ADP)	Improves governance and human development in the most backward districts.
National Rural Livelihood Mission (NRLM)	Enhances rural livelihoods through skill development and enterprise promotion.

Critical Evaluation:

Achievements

- Significant expansion of **rural connectivity, electrification and digital infrastructure**.
- Improved financial inclusion through **JAM Trinity and DBT**.
- SHGs have strengthened women's economic participation and community institutions.
- Better convergence of agriculture, infrastructure and livelihood programmes.
- Decline in multidimensional poverty in several backward regions.

Challenges

- Persistent regional inequalities across states and districts.
- Low agricultural productivity in rain-fed and tribal areas.
- Limited non-farm employment opportunities in rural regions.
- Infrastructure gaps in healthcare, education and logistics.
- Weak convergence among departments and implementation bottlenecks.
- Climate change threatens rural livelihoods and agricultural sustainability.

Way Forward

- Promote **cluster-based rural industrialisation** and agro-processing.
- Strengthen **Farmer Producer Organisations (FPOs)** and value chains.
- Expand digital infrastructure and rural skill development.
- Encourage **climate-resilient agriculture** and sustainable natural resource management.

- Improve convergence among agriculture, rural development, finance and infrastructure departments.

Integrated Rural Development is **not merely a rural welfare strategy but a catalyst for balanced regional development**. By converging **agriculture, infrastructure, finance, human capital and livelihood opportunities**, it can unlock the economic potential of rural India, reduce regional disparities and create **self-reliant, resilient and prosperous rural communities**.

Value Addition:

Constitutional Vision: Article 38 mandates the State to minimise inequalities, while **Article 40** promotes local self-government and **Article 46** directs the State to protect the economic interests of weaker sections.

Economic Survey Perspective: Rural development must move **beyond agriculture** by integrating **infrastructure, digital connectivity, skilling, rural enterprises and human capital** to achieve sustainable and inclusive growth.

NITI Aayog: The **Aspirational Districts Programme (ADP)** follows the **3Cs Approach—Convergence, Collaboration and Competition**—to accelerate development in lagging districts through data-driven governance.
SDG Linkage: Supports **SDG 1 (No Poverty), SDG 2 (Zero Hunger), SDG 8 (Decent Work & Economic Growth), SDG 9 (Industry, Innovation & Infrastructure), SDG 10 (Reduced Inequalities)** and **SDG 11 (Sustainable Communities).**

Q.4 (A). Although agriculture's share in GDP has declined over the years, its contribution to India's economy remains significant. Analyse the multidimensional role of agriculture in economic development.

Demand of the Question

- Analyse the **multidimensional role of agriculture** in India's economic development.
- Explain why agriculture remains significant despite its **declining share in GDP**.

According to the **Economic Survey 2025–26**, agriculture contributes around **16–18% of India's Gross Value Added (GVA)**, yet it continues to support **nearly 45% of the workforce**. Beyond its direct contribution to output, agriculture remains the **foundation of food security, rural livelihoods, industrial development and macroeconomic stability**, making it indispensable to India's inclusive and sustainable growth.

Multidimensional Role of Agriculture in Economic Development

1. Ensures Food & Nutritional Security

- Provides food grains, pulses, fruits, vegetables, milk and other essential commodities.
- Supports national food security through **buffer stocks and the Public Distribution System (PDS)**.
- Contributes to nutritional security by promoting crop diversification and horticulture.

2. Source of Employment & Livelihood

- Largest source of livelihood for rural households.
- Supports employment in farming and allied sectors such as **dairy, fisheries, poultry and horticulture**.
- Acts as a safety net during periods of economic slowdown.

3. Contributes to Economic Growth

- Supplies raw materials to agro-based industries such as textiles, sugar, food processing and paper.
- Generates demand for industrial goods including fertilisers, machinery and consumer products.
- Creates multiplier effects across manufacturing and services.

4. Promotes Rural Development

- Enhances rural incomes and reduces poverty.
- Stimulates investment in irrigation, roads, storage and rural infrastructure.
- Supports balanced regional development by strengthening the rural economy.

5. Supports External Sector

- Agricultural products contribute significantly to India's merchandise exports.
- Exports of rice, spices, tea, coffee, marine products and cotton earn valuable foreign exchange.
- Strengthens India's global position in agri-trade.

6. Strengthens Financial Stability

- Generates rural savings and expands financial inclusion.
- Supports rural credit, insurance and cooperative institutions.
- Stabilises rural demand, which sustains overall economic activity.

7. Promotes Environmental Sustainability

- Natural farming, organic farming and climate-resilient agriculture conserve natural resources.
- Supports carbon sequestration, biodiversity conservation and sustainable land management.
- Advances climate adaptation through efficient water and soil management.

Major Government Initiatives:

Initiative	Contribution
PM Krishi Sinchayee Yojana (PMKSY)	Expands irrigation and improves water-use efficiency.
PM-KISAN	Provides direct income support to farmers.
National Mission on Natural Farming (NMNF)	Promotes sustainable and low-input agriculture.
Agriculture Infrastructure Fund (AIF)	Strengthens post-harvest infrastructure and value chains.
e-NAM	Creates a unified national agricultural market.
PM Fasal Bima Yojana (PMFBY)	Provides crop insurance against production risks.
Digital Agriculture Mission & AgriStack	Promotes precision farming, digital land records and farmer-centric services.

Critical Evaluation:

Achievements

- India has achieved **self-sufficiency in food grain production**.
- Agriculture has remained resilient during economic crises, including the COVID-19 pandemic.
- Strong growth in allied sectors such as dairy, fisheries and horticulture.
- Increased digitalisation and infrastructure investment have improved market access.

Challenges

- Low productivity compared to global standards.
- Fragmented landholdings and disguised unemployment.
- Dependence on monsoon and climate variability.
- Limited value addition and agro-processing.
- Low farm incomes and inadequate private investment.

Way Forward:

- Promote **crop diversification and high-value agriculture**.
- Expand irrigation and climate-resilient farming practices.
- Strengthen **Farmer Producer Organisations (FPOs)** and agri-value chains.
- Increase investment in agricultural R&D, mechanisation and extension services.
- Develop agro-processing industries and export-oriented agriculture.
- Improve market reforms, logistics and digital agriculture.

Agriculture is **far more than a contributor to GDP—it is the backbone of India's rural economy and a catalyst for inclusive development**. Its enduring role in **food security, employment, industrial linkages, environmental sustainability and rural prosperity** makes agricultural transformation essential for achieving balanced and resilient economic development.

Value Addition:

Economic Survey 2025–26: Agriculture recorded the **highest average annual growth (4.5%)** among major sectors during **2015–16 to 2024–25**, highlighting its resilience and importance to the economy.

Economic Diversification: While agriculture's share in GVA has declined with structural transformation, its role in **employment, food security and rural demand** remains disproportionately high.

Constitutional Vision: Article 48 directs the State to organise agriculture on modern and scientific lines, while **Article 39(b)** advocates equitable distribution of material resources for the common good.

SDG Linkage: Agriculture contributes directly to **SDG 1 (No Poverty), SDG 2 (Zero Hunger), SDG 8 (Decent Work & Economic Growth), SDG 12 (Responsible Consumption & Production)** and **SDG 13 (Climate Action).**

Q.4 (B). Indian agriculture is witnessing a gradual transition from the Green Revolution model towards sustainable and climate-resilient farming. Discuss this shift with reference to dryland farming, organic farming and sustainable agriculture.

Demand of the Question

- Explain the **shift from the Green Revolution model** to sustainable and climate-resilient agriculture.
- Discuss this transition with reference to **dryland farming, organic farming and sustainable agriculture**.

The **National Commission on Farmers (Swaminathan Committee, 2006)** observed that the future of Indian agriculture lies in making farming **"economically viable, ecologically sustainable and socially equitable."** With increasing challenges such as **climate change, groundwater depletion, soil degradation and declining farm profitability**, India is gradually transitioning from the input-intensive Green Revolution model towards a more **sustainable, resilient and resource-efficient agricultural system**.

Why is the Shift Necessary?

Limitations of the Green Revolution -

- Overdependence on **rice-wheat monoculture**.
- Excessive use of **chemical fertilisers and pesticides** leading to soil degradation.
- Groundwater depletion due to water-intensive irrigation.
- Rising cost of cultivation and declining profitability.
- Increased vulnerability to climate change and extreme weather events.
- Regional imbalance, with benefits concentrated in a few states.

Transition Towards Sustainable & Climate-Resilient Agriculture:

1. Dryland Farming

- Focuses on farming in **rainfed regions**, which account for nearly **half of India's net sown area**.
- Promotes **drought-tolerant crops** such as millets, pulses and oilseeds.
- Encourages watershed development, rainwater harvesting and moisture conservation.
- Reduces dependence on groundwater and improves climate resilience.

Key Initiatives

- Watershed Development Component of **PM Krishi Sinchayee Yojana (PMKSY)**
- **National Mission on Natural Farming (NMNF)** (resource-efficient practices)
- Promotion of **Shree Anna (Millets)** after the International Year of Millets (2023)

2. Organic & Natural Farming

- Eliminates or minimises synthetic fertilisers and pesticides.
- Improves soil organic carbon, biodiversity and long-term soil health.
- Enhances export opportunities for organic products.
- Reduces environmental pollution and chemical residues.

Key Initiatives

- **National Mission on Natural Farming (NMNF)**
- **Paramparagat Krishi Vikas Yojana (PKVY)**
- **Mission Organic Value Chain Development for North Eastern Region (MOVCDNER)**

3. Sustainable Agriculture

- Balances **productivity, profitability and environmental conservation**.
- Promotes integrated farming systems combining crops, livestock, fisheries and horticulture.
- Encourages precision agriculture, micro-irrigation and digital technologies.
- Improves resource-use efficiency and climate adaptation.

Key Initiatives

- **PM Krishi Sinchayee Yojana (Per Drop More Crop)**
- **Soil Health Card Scheme**
- **PM Fasal Bima Yojana (PMFBY)**
- **Digital Agriculture Mission & AgriStack**
- **Agriculture Infrastructure Fund (AIF)**

Policy & Committee Support for Sustainable Agriculture:

Committee/Policy	Key Recommendation / Contribution
National Commission on Farmers (Swaminathan Committee), 2006	Advocated **"Evergreen Revolution"**—productivity growth without ecological harm; recommended sustainable resource management, climate resilience and income security.
Committee on Doubling Farmers' Income (Ashok Dalwai Committee, 2018)	Recommended shifting from **production-centric to income-centric agriculture** through diversification, value addition, FPOs, post-harvest infrastructure and market reforms.

Committee/Policy	Key Recommendation / Contribution
National Mission for Sustainable Agriculture (NMSA)	Promotes climate-resilient technologies, integrated farming and efficient resource use.
Economic Survey 2025–26	Emphasises productivity enhancement through **R&D, climate resilience, sustainable resource use, private investment and diversification into horticulture, dairy and fisheries**.

Critical Evaluation:

Achievements

- Growing adoption of **micro-irrigation and precision farming**.
- Expansion of natural and organic farming practices.
- Increased cultivation and consumption of **millets and climate-resilient crops**.
- Better crop risk management through PMFBY and weather advisories.
- Rising focus on digital agriculture and sustainable value chains.

Challenges

- Lower yields during the transition to organic farming.
- Limited certification, branding and market access for organic produce.
- Climate variability continues to threaten rainfed agriculture.
- Small and fragmented landholdings hinder technology adoption.
- Inadequate investment in agricultural R&D and extension services.

Way Forward:

- Promote the **Evergreen Revolution** through sustainable productivity enhancement.
- Scale up **climate-smart agriculture**, precision farming and AI-based advisory services.
- Strengthen **Farmer Producer Organisations (FPOs)** and organic value chains.
- Increase investment in agricultural research, seed innovation and extension services.
- Incentivise ecosystem services such as carbon sequestration and water conservation.
- Develop district-specific climate adaptation strategies for rainfed regions.

India's agricultural transition is **not a departure from the Green Revolution but its evolution into an "Evergreen Revolution."** By integrating **dryland farming, natural and organic farming, climate-smart technologies and income-centric reforms**, India can build an agricultural system that is **productive, profitable, climate-resilient and environmentally sustainable**, securing both **farmers' livelihoods and national food security**.

Value Addition:

Swaminathan Committee (2006): Coined the concept of the **"Evergreen Revolution"**—achieving productivity growth **without ecological or social harm**, making farming **economically viable, ecologically sustainable and socially equitable**.

Ashok Dalwai Committee (Committee on Doubling Farmers' Income): Argued that agricultural policy should move from **maximising production to maximising farmers' income** through diversification, value addition, efficient markets and lower production costs.

Economic Survey 2025–26: Recommends **productivity enhancement, climate resilience, sustainable resource management, stronger R&D, food processing and private investment** as the pillars of future agricultural transformation.

Q.5 (A). Agricultural marketing and remunerative prices remain critical determinants of farmers' income. Evaluate the effectiveness of the Minimum Support Price (MSP) system and suggest measures for comprehensive agricultural marketing reforms.

Demand of the Question:

- Evaluate the effectiveness of the **Minimum Support Price (MSP)** system in ensuring remunerative prices.
- Suggest **comprehensive agricultural marketing reforms** to enhance farmers' income.

The **Committee on Doubling Farmers' Income (Ashok Dalwai Committee)** observed that **higher production alone cannot improve farmers' welfare unless it is supported by efficient markets and remunerative prices**. While the **Minimum Support Price (MSP)** has provided an important price safety net, sustainable income growth requires a **competitive, transparent and integrated agricultural marketing system**.

Role & Effectiveness of the MSP System:

1. Price Assurance

- Protects farmers from distress sales during bumper harvests.
- Provides a **minimum remunerative price** for notified crops.
- Reduces market uncertainty and production risk.

2. Ensures National Food Security

- MSP-based procurement supports **buffer stocks** and the **Public Distribution System (PDS)**.
- Facilitates strategic food grain management during emergencies.

3. Incentivises Agricultural Production

- Encouraged adoption of high-yielding varieties during the Green Revolution.
- Contributed significantly to India's food grain self-sufficiency.

4. Income Stability

- Provides assured returns for farmers where procurement is effective.
- Improves access to institutional credit by reducing price risk.

Limitations of the MSP System:

- **Procurement is concentrated** mainly in wheat and paddy, benefiting a few states.
- Most farmers selling pulses, oilseeds, fruits and vegetables receive **market prices below MSP**.
- Encourages **rice-wheat monoculture**, causing groundwater depletion and soil degradation.
- High procurement and storage costs impose a substantial fiscal burden.
- Small and marginal farmers often lack effective access to procurement centres.

Comprehensive Agricultural Marketing Reforms:

1. Strengthen Market Infrastructure

- Expand **warehouses, cold chains, grading, sorting and scientific storage**.
- Improve rural logistics through PM Gati Shakti and Agriculture Infrastructure Fund.

2. Promote Competitive Markets

- Strengthen **e-NAM** for transparent price discovery.
- Liberalise agricultural markets while ensuring adequate farmer safeguards.
- Encourage private investment in agricultural marketing.

3. Strengthen Farmer Producer Organisations (FPOs)

- Aggregate produce to improve bargaining power.
- Facilitate direct linkage with processors, exporters and organised retailers.
- Reduce transaction and marketing costs.

4. Diversify Beyond MSP Procurement

- Encourage cultivation of **millets, pulses, oilseeds and horticultural crops**.
- Promote value addition through food processing and agro-industries.
- Develop export-oriented agricultural value chains.

5. Improve Market Intelligence

- Provide real-time price information through digital platforms.
- Expand AI-based advisory services and demand forecasting.

Major Government Initiatives:

Initiative	Contribution
Minimum Support Price (MSP)	Provides assured minimum prices for notified crops.
e-NAM	Facilitates transparent and competitive national agricultural markets.
Agriculture Infrastructure Fund (AIF)	Develops warehouses, cold storage and post-harvest infrastructure.
Formation & Promotion of 10,000 FPOs	Strengthens collective marketing and bargaining power.
PM Kisan SAMPADA Yojana	Promotes food processing and value addition.
Digital Agriculture Mission	Improves market information, traceability and digital services.

Critical Evaluation:

Strengths

- MSP has been instrumental in achieving **food security and price stability**.
- Reduced distress sales in procurement-intensive regions.
- Procurement supports strategic food reserves and welfare programmes.
- Digital platforms are gradually improving market transparency.

Concerns

- Benefits are **unevenly distributed** across crops and regions.
- Marketing infrastructure remains inadequate for perishables.
- Limited integration with domestic and global value chains.
- Price support alone cannot ensure sustainable farmer incomes.

Way Forward:

- Shift from **price support to income enhancement**, as recommended by the **Ashok Dalwai Committee**.
- Expand procurement of **nutri-cereals, pulses and oilseeds** in suitable regions.
- Modernise APMC markets while promoting competitive marketing channels.
- Strengthen FPOs, warehousing, cold chains and food processing.
- Integrate farmers with **digital markets, exports and agri-value chains**.
- Encourage climate-smart crop diversification through suitable pricing incentives.

The future of Indian agriculture lies **not in replacing MSP, but in complementing it with efficient, competitive and farmer-centric markets**. A marketing ecosystem that combines **assured prices, robust infrastructure, digital platforms, value addition and strong farmer institutions** will enable farmers to realise **higher and more stable incomes**, making agriculture both **profitable and globally competitive**.

Value Addition:

National Commission on Farmers (Swaminathan Committee, 2006): Recommended that MSP should be **at least 50% above the comprehensive cost of cultivation (C2 + 50%)** and emphasised **farmer-centric marketing reforms** rather than price support alone.

Committee on Doubling Farmers' Income (Ashok Dalwai, 2018): Recommended transitioning from a **production-centric** to an **income-centric** agricultural strategy through diversification, value addition, efficient markets, FPOs and lower transaction costs.

Shanta Kumar Committee (2015): Suggested **targeted procurement, FCI reforms, greater private sector participation, decentralised procurement and modern supply chains** to improve marketing efficiency.

Economic Survey 2025–26: Stresses that raising farmers' incomes requires **higher productivity, stronger market linkages, post-harvest infrastructure, food processing and private investment**, alongside efficient price support mechanisms.

Q.5 (B). The Swaminathan Commission continues to influence India's agricultural policy debates. Examine its major recommendations and assess their relevance in improving farmers' welfare.

Demand of the Question

- Examine the **major recommendations** of the **National Commission on Farmers (Swaminathan Commission)**.
- Assess their **relevance in improving farmers' welfare** in the present context.

The **National Commission on Farmers (NCF)**, chaired by **Dr. M.S. Swaminathan**, submitted its reports between **2004 and 2006** with the vision of making farming **"economically viable, ecologically sustainable and socially equitable."** Many of its recommendations continue to shape India's agricultural policies on **income security, sustainability, market reforms and climate resilience**, making it one of the most influential policy documents in Indian agriculture.

Major Recommendations of the Swaminathan Commission:

1. Remunerative Prices & Income Security

- Recommended **Minimum Support Price (MSP) at least 50% above the comprehensive cost of cultivation (C2 + 50%)**.
- Ensure timely procurement and effective price support.
- Reduce farmers' vulnerability to price fluctuations.

2. Sustainable Agriculture (Evergreen Revolution)

- Advocated an **"Evergreen Revolution"**—higher productivity without ecological degradation.
- Promote balanced fertiliser use, soil health restoration and efficient water management.
- Encourage climate-resilient and resource-conserving farming practices.

3. Water Resource Management

- Improve irrigation efficiency through watershed development and micro-irrigation.
- Prioritise rainfed and dryland agriculture.
- Promote participatory groundwater management.

4. Credit, Insurance & Risk Management

- Expand institutional credit to small and marginal farmers.
- Reduce dependence on informal moneylenders.
- Strengthen crop insurance and disaster risk management.

5. Agricultural Marketing Reforms

- Modernise agricultural markets and improve market infrastructure.
- Promote Farmer Producer Organisations (FPOs), value addition and agro-processing.
- Strengthen storage, grading and rural logistics.

6. Land & Livelihood Security

- Protect agricultural land from indiscriminate diversion.
- Secure tenancy rights and improve land records.
- Improve access to land and productive assets for smallholders.

7. Research & Extension

- Increase public investment in agricultural R&D.
- Bridge the gap between research institutions and farmers.
- Promote location-specific technologies and climate-smart innovations.

Relevance in Improving Farmers' Welfare:

Economic Relevance

- MSP debates continue to revolve around the Commission's recommendation on **remunerative prices**.

- Focus on **income security**, rather than production alone, aligns with current agricultural reforms.
- Expansion of FPOs, food processing and value chains reflects its market-oriented vision.

Environmental Relevance

- Climate change has reinforced the need for the **Evergreen Revolution**.
- Growing emphasis on **natural farming, organic farming, micro-irrigation and millets** reflects the Commission's sustainability approach.

Social Relevance

- Continues to guide policies for **small and marginal farmers**, who constitute nearly **86% of operational holdings**.
- Promotes inclusive development through improved credit, insurance and institutional support.

Institutional Relevance

- Influenced programmes relating to soil health, irrigation, crop insurance, digital agriculture and market reforms.
- Forms the conceptual basis for several recommendations of the **Committee on Doubling Farmers' Income (Ashok Dalwai Committee)**.

Implementation Status:

Recommendation	Present Status
MSP reforms	MSP announced annually for 23 crops; procurement remains concentrated in a few crops and states.
Sustainable agriculture	NMNF, PMKSY, Soil Health Card Scheme and climate-smart agriculture initiatives underway.
Credit & Insurance	Expansion of Kisan Credit Card (KCC) and PM Fasal Bima Yojana (PMFBY).
Marketing reforms	e-NAM, Agriculture Infrastructure Fund and FPO promotion launched.
Irrigation	PM Krishi Sinchayee Yojana improving irrigation coverage and water-use efficiency.

Critical Evaluation

Achievements

- Shifted policy discourse from **food security to farmer welfare and income security**.
- Inspired sustainable agriculture and climate-resilient farming initiatives.
- Strengthened focus on smallholders, rainfed agriculture and natural resource conservation.
- Influenced reforms in agricultural marketing, irrigation and institutional credit.

Limitations

- **C2 + 50% MSP recommendation** has not been fully implemented in its original form.
- Procurement continues to be concentrated in wheat and paddy.
- Regional disparities in irrigation, markets and extension services persist.
- Public investment in agricultural R&D and extension remains below desirable levels.

Nearly two decades after its submission, the **Swaminathan Commission remains the intellectual foundation of India's agricultural reforms**. Its emphasis on **remunerative incomes, sustainable resource management, efficient markets and farmer-centric policies** continues to provide a comprehensive roadmap for improving farmers' welfare and building a **resilient, profitable and sustainable agricultural sector**.

Value Addition:

Vision Statement: The Commission envisioned agriculture that is **"economically viable, ecologically sustainable and socially equitable."**

Evergreen Revolution: Coined by **Dr. M.S. Swaminathan**, it advocates **sustainable productivity growth** without ecological degradation—an evolution beyond the Green Revolution.

Committee on Doubling Farmers' Income (Ashok Dalwai, 2018): Reinforced the Commission's philosophy by recommending a shift from **production-centric** to **income-centric** agricultural policies through diversification, value addition and efficient markets.

SDG Linkage: Advances **SDG 1 (No Poverty), SDG 2 (Zero Hunger), SDG 8 (Decent Work & Economic Growth), SDG 12 (Responsible Consumption & Production)** and **SDG 13 (Climate Action).**

Q.6 (A). The Industrial Policy of 1991 fundamentally transformed the structure of the Indian economy. Analyse its achievements and limitations with respect to industrial growth, employment and regional development.

Demand of the Question:

- Analyse the impact of the **Industrial Policy of 1991** on India's industrial sector.
- Evaluate its **achievements and limitations** with respect to **industrial growth, employment and regional development**.

The **New Industrial Policy (NIP), 1991**, launched as part of the broader **Liberalisation, Privatisation and Globalisation (LPG) reforms**, marked a paradigm shift from a **state-controlled industrial regime to a market-oriented economy**. By dismantling the **Licence-Permit-Quota Raj**, encouraging private enterprise and opening the economy to global competition, it transformed India's industrial landscape and accelerated economic growth.

Major Reforms under Industrial Policy, 1991:

- **Industrial delicensing** for most industries.
- Reduction of industries reserved for the **public sector**.
- Liberalisation of **Foreign Direct Investment (FDI)**.
- Amendment of the **MRTP Act** to encourage competition.
- Greater autonomy and disinvestment in Public Sector Enterprises (PSEs).
- Promotion of technology transfer and global competitiveness.

Achievements

1. Accelerated Industrial Growth

- Expanded the role of the private sector in manufacturing and services.
- Improved industrial productivity through competition and technology adoption.
- Attracted substantial **FDI**, enhancing capital formation and technology transfer.
- Strengthened globally competitive sectors such as **automobiles, pharmaceuticals, telecommunications and IT**.

2. Greater Global Integration

- Integrated India into global value chains.
- Increased exports of manufactured goods and engineering products.
- Improved competitiveness through access to modern technologies and global markets.

3. Growth of Entrepreneurship

- Rapid expansion of the startup ecosystem and MSMEs.
- Increased private investment and innovation.
- Emergence of India as a global hub for information technology and business services.

4. Infrastructure & Industrial Ecosystem

- Encouraged development of industrial corridors, SEZs and logistics infrastructure.
- Enhanced ease of doing business through regulatory reforms.

Limitations

1. Employment Generation

- Industrial growth has been relatively **capital-intensive**, leading to **jobless growth**.
- Manufacturing employment has not expanded proportionately despite higher output.
- Large informal workforce with limited social security continues to persist.

2. Regional Imbalances

- Industrial investment remains concentrated in a few states and urban centres.
- Backward, tribal and northeastern regions continue to lag in industrial development.
- Uneven infrastructure has widened interstate disparities.

3. Manufacturing Challenges

- Manufacturing's share in GVA has remained around **16–18%**, below the long-term aspiration of 25%.
- MSMEs continue to face constraints relating to credit, technology and market access.
- Limited integration into high-value global manufacturing.

4. Social & Environmental Concerns

- Industrialisation has contributed to environmental degradation in several regions.
- Land acquisition and rehabilitation issues have delayed industrial projects.
- Rising income inequality and regional disparities remain concerns.

Post-1991 Policy Measures to Address the Gaps:

Initiative	Objective
Make in India	Promote manufacturing and attract investment.
Production Linked Incentive (PLI) Scheme	Boost domestic manufacturing and global competitiveness.
National Manufacturing Policy (2011)	Increase manufacturing share and employment generation.
PM Gati Shakti	Improve multimodal infrastructure and logistics efficiency.
National Logistics Policy	Reduce logistics costs and improve supply chains.
MSME Support Initiatives	Enhance credit access, technology adoption and market competitiveness.

Critical Evaluation

Achievements

- Ended the **Licence Raj** and improved business competitiveness.
- Increased FDI inflows and private investment.
- Created globally competitive industries.
- Accelerated economic growth and export diversification.

Challenges

- Manufacturing-led employment has remained below expectations.
- Regional concentration of industries persists.
- MSMEs require stronger policy support.
- India needs deeper integration into global manufacturing value chains.

The **Industrial Policy of 1991** fundamentally reshaped India's economic structure by replacing a **control-oriented industrial regime with a competitive market economy**. While it successfully accelerated industrial growth, investment and global integration, the next generation of industrial reforms must prioritise **employment-intensive manufacturing, balanced regional development, MSME competitiveness and sustainable industrialisation** to ensure that industrial growth becomes both **inclusive and resilient**.

Value Addition:

National Manufacturing Policy (2011): Envisioned increasing the manufacturing sector's share to **25% of GDP** and generating **100 million additional manufacturing jobs**.

Economic Survey 2025–26: Highlights that manufacturing competitiveness depends on **ease of doing business, logistics reforms, technological upgrading, MSME development and stronger global value chain integration**.

Constitutional Vision: Article 39(b) advocates equitable distribution of material resources, while **Article 43** encourages promotion of cottage industries and rural industrialisation.

SDG Linkage: Advances **SDG 8 (Decent Work & Economic Growth), SDG 9 (Industry, Innovation & Infrastructure), SDG 10 (Reduced Inequalities)** and **SDG 12 (Responsible Consumption & Production).**

Q 6 (B). Industrial development in India increasingly depends on improving the competitiveness of MSMEs and manufacturing. Discuss the challenges faced by MSMEs and evaluate the effectiveness of recent policy initiatives such as Make in India, Startup India and the National Manufacturing Policy.

Demand of the Question:

- Discuss the **major challenges affecting the competitiveness of MSMEs and manufacturing**.
- Evaluate the effectiveness of **Make in India, Startup India and the National Manufacturing Policy** in addressing these challenges.

The **Abid Hussain Committee (1997)** recommended that Indian MSMEs should move from **protection to competitiveness**, while the **U.K. Sinha Committee (2019)** emphasised that improving access to **finance, technology and digitalisation** is essential for globally competitive enterprises. Reflecting this vision, India's industrial strategy increasingly focuses on strengthening MSMEs as the foundation of **manufacturing, employment, innovation and exports**.

Challenges Faced by MSMEs & Manufacturing

1. Credit & Financial Constraints

- Inadequate access to institutional finance.
- High collateral requirements and working capital shortages.
- Delayed payments affecting liquidity.

2. Low Productivity & Technology Adoption

- Obsolete technology and low automation.
- Limited investment in R&D and innovation.
- Slow adoption of Industry 4.0 technologies.

3. Infrastructure & Logistics Bottlenecks

- High logistics costs reducing competitiveness.
- Inadequate industrial infrastructure and common facilities.
- Supply chain inefficiencies, especially for small enterprises.

4. Market & Export Challenges

- Limited integration with **Global Value Chains (GVCs)**.
- Weak branding, quality certification and export competitiveness.
- Competition from low-cost imports.

5. Regulatory & Human Resource Issues

- Compliance burden despite simplification efforts.
- Skill shortages and productivity gaps.
- Low levels of formalisation among micro enterprises.

Evaluation of Major Policy Initiatives:

Initiative	Achievements	Limitations
Make in India (2014)	Increased FDI, strengthened manufacturing sectors such as electronics, defence and automobiles, and improved ease of doing business.	Manufacturing share in GVA remains around **16–18%**; employment generation has been below expectations.
Startup India (2016)	Fostered innovation, entrepreneurship, incubation and access to funding; created one of the world's largest startup ecosystems.	Startup concentration remains largely urban and service-sector oriented; manufacturing startups are comparatively fewer.
National Manufacturing Policy (2011)	Targeted **25% manufacturing share** and **100 million additional jobs** through National Investment & Manufacturing Zones (NIMZs).	Implementation has been uneven, with infrastructure and land constraints slowing progress.
Production Linked Incentive (PLI) Scheme	Enhanced domestic manufacturing and exports in strategic sectors such as electronics, pharmaceuticals and telecom.	Benefits concentrated in selected sectors and relatively larger firms.
MSME Reforms *(Udyam Registration, TReDS, ECLGS)*	Improved formalisation, digital credit access and liquidity support.	Credit gaps, delayed payments and technology deficits persist.

Critical Evaluation:

Achievements

- Significant improvement in the **startup and innovation ecosystem**.
- Higher FDI inflows and private investment in manufacturing.
- Greater formalisation through **GST, Udyam Registration and digital platforms**.
- PLI schemes have strengthened strategic manufacturing sectors.
- Improved ease of doing business and digital governance.

Challenges

- MSMEs continue to face **credit and cash-flow constraints**.
- Manufacturing productivity remains below global benchmarks.
- Limited participation in high-value global manufacturing networks.

- Industrial development remains regionally concentrated.
- Employment generation has not matched the pace of industrial growth.

Way Forward:

- Expand **cash flow-based lending**, invoice financing and TReDS.
- Promote **cluster-based industrial development** with common facility centres.
- Increase investment in **R&D, design and Industry 4.0 technologies**.
- Strengthen MSME integration into **Global Value Chains (GVCs)**.
- Improve logistics through **PM Gati Shakti** and the **National Logistics Policy**.
- Foster stronger industry-academia collaboration and demand-driven skilling.

India's industrial transformation depends on building **globally competitive, technology-driven and resilient MSMEs**. While initiatives such as **Make in India, Startup India and the National Manufacturing Policy** have strengthened the industrial ecosystem, sustained success will require **easier finance, technological upgrading, efficient logistics and seamless integration into global value chains**, enabling MSMEs to become the engines of **employment, exports and inclusive industrial growth**.

Value Addition:

Prime Minister's Task Force on MSMEs (T.K.A. Nair, 2010): Identified **credit, infrastructure, technology, skill development and delayed payments** as the principal constraints affecting MSME growth.

Economic Survey 2025–26: Manufacturing competitiveness depends on **innovation, logistics efficiency, skilled workforce, R&D, MSME formalisation and deeper integration into Global Value Chains (GVCs).**

MSME Significance: MSMEs contribute **~30% of GDP, ~36% of manufacturing output and ~45% of India's exports**, making them indispensable for industrialisation and employment.

National Manufacturing Policy (2011): Envisaged increasing the manufacturing sector's share to **25% of GDP** and creating **100 million additional manufacturing jobs**.

Q.7 (A). Infrastructure development is both an economic necessity and a driver of inclusive growth. Examine the role of transport, digital and energy infrastructure in accelerating India's economic development.

Demand of the Question

- Examine the role of **transport, digital and energy infrastructure** in economic development.
- Explain how infrastructure promotes **inclusive growth**.

The **Economic Survey 2025–26** identifies **quality infrastructure as a key driver of productivity, competitiveness and long-term economic growth**. Complementing this, the **National Infrastructure Pipeline (NIP)** and **PM Gati Shakti National Master Plan** recognise that integrated infrastructure development is essential for **reducing logistics costs, enhancing connectivity and ensuring balanced regional development**.

Role of Infrastructure in Accelerating Economic Development:

1. Transport Infrastructure – Backbone of Economic Activity

- Reduces logistics and transaction costs, improving industrial competitiveness.
- Facilitates movement of goods, services and labour across regions.
- Enhances domestic trade and export competitiveness.
- Promotes tourism, investment and regional integration.
- Generates large-scale employment during construction and operation.

Key Initiatives

- **PM Gati Shakti National Master Plan**
- **Bharatmala Pariyojana**
- **Sagarmala Programme**
- **UDAN Scheme**
- **Dedicated Freight Corridors (DFCs)**
- **PMGSY** for rural connectivity

2. Digital Infrastructure – Foundation of the Digital Economy

- Enables Digital Public Infrastructure (DPI) for efficient governance.
- Expands financial inclusion through **Aadhaar, UPI and DBT**.
- Supports e-commerce, digital entrepreneurship and startups.
- Improves access to online education, telemedicine and e-governance.
- Enhances transparency and ease of doing business.

Key Initiatives

- **Digital India Mission**
- **BharatNet**
- **IndiaAI Mission**
- **ONDC**
- **DigiLocker**
- **AgriStack**

3. Energy Infrastructure – Powering Growth

- Ensures reliable electricity for industries, agriculture and services.

- Improves energy security and attracts manufacturing investment.
- Accelerates green growth through renewable energy.
- Supports electric mobility and clean industrialisation.
- Expands rural electrification and quality of life.

Key Initiatives

- **National Green Hydrogen Mission**
- **PM Surya Ghar: Muft Bijli Yojana**
- **Revamped Distribution Sector Scheme (RDSS)**
- **National Smart Grid Mission**
- **National Solar Mission**

Contribution to Inclusive Growth

- Bridges **rural-urban and regional disparities** through improved connectivity.
- Enhances market access for farmers, MSMEs and rural enterprises.
- Promotes financial inclusion and digital empowerment.
- Creates employment across infrastructure and allied sectors.
- Improves access to education, healthcare and public services.
- Attracts private investment into backward and aspirational districts.

Critical Evaluation

Achievements

- Significant expansion of **roads, railways, airports and ports**.
- India has emerged as a global leader in **Digital Public Infrastructure (DPI)**.
- Rapid growth in renewable energy capacity and near-universal village electrification.
- Improved logistics planning through **PM Gati Shakti**.
- Strong multiplier effect on investment, manufacturing and employment.

Challenges

- High infrastructure financing requirements.
- Delays due to land acquisition and regulatory clearances.
- Regional disparities in infrastructure quality.
- Last-mile connectivity gaps in remote and tribal areas.
- Financial stress in the power distribution (DISCOM) sector.

Way Forward

- Accelerate **multimodal infrastructure integration** under PM Gati Shakti.
- Expand Public-Private Partnerships (PPPs) and infrastructure financing.
- Strengthen maintenance and asset management.
- Promote green and climate-resilient infrastructure.
- Improve last-mile digital, transport and energy connectivity in underserved regions.
- Enhance state capacity and project execution through digital monitoring.

Infrastructure is **not merely a physical asset but an engine of productivity, competitiveness and inclusive development**. By integrating **transport, digital and energy infrastructure**, India can strengthen economic resilience, enhance regional connectivity and create an enabling ecosystem for **investment, innovation and sustainable economic transformation**.

Value Addition:

National Infrastructure Pipeline (NIP): Envisions coordinated investment across transport, energy, urban and digital infrastructure to support high and sustainable economic growth.

PM Gati Shakti: Integrates infrastructure planning through a **GIS-based digital platform**, improving multimodal connectivity, reducing logistics costs and accelerating project implementation.

Economic Survey 2025–26: Highlights that **transport efficiency, Digital Public Infrastructure (DPI), energy transition and logistics reforms** are essential for improving productivity, manufacturing competitiveness and private investment.

National Logistics Policy (2022): Seeks to reduce logistics costs, improve supply chain efficiency and strengthen India's competitiveness in global trade.

Q.7 (B). Public-Private Partnership (PPP) has become an important model for infrastructure development in India. Critically examine its advantages, challenges and the reforms required for improving its effectiveness.

Demand of the Question

- Explain the importance of the **Public-Private Partnership (PPP) model**.
- Critically examine its **advantages and challenges**.
- Suggest reforms to improve its effectiveness.

Recognising the massive infrastructure financing requirements, the **Vijay Kelkar Committee (2015)** observed that **PPP should evolve from a model of private participation to one of genuine public-private partnership**, supported by balanced risk-sharing and robust institutional mechanisms. Echoing this, the **Economic Survey 2025–26** highlights that well-designed PPPs can mobilise private capital, improve efficiency and accelerate infrastructure creation.

Advantages of PPP in Infrastructure Development:

1. Mobilises Private Investment

- Reduces pressure on public finances.
- Bridges the infrastructure financing gap.
- Attracts long-term domestic and foreign investment.

2. Enhances Efficiency

- Brings managerial expertise and innovation.
- Ensures timely project execution.
- Promotes life-cycle cost optimisation.

3. Better Quality of Infrastructure

- Improves service delivery through performance-based contracts.

- Encourages adoption of modern technology and global best practices.

4. Risk Sharing

- Allocates project risks to the party best equipped to manage them.
- Improves project sustainability and operational efficiency.

5. Economic & Social Benefits

- Generates employment and investment.
- Improves connectivity and regional development.
- Enhances ease of doing business and economic competitiveness.

Challenges in PPP Implementation:

1. Risk Allocation Issues

- Unbalanced allocation of commercial and regulatory risks.
- Traffic and demand projections often prove unrealistic.

2. Regulatory & Contractual Bottlenecks

- Delays in land acquisition and environmental clearances.
- Frequent policy changes affecting investor confidence.
- Weak contract enforcement and lengthy dispute resolution.

3. Financial Constraints

- Difficulty in raising long-term infrastructure finance.
- Stressed balance sheets of infrastructure developers.
- Limited availability of patient capital.

4. Institutional Weaknesses

- Weak project preparation and feasibility studies.
- Limited technical capacity in implementing agencies.
- Inadequate monitoring and contract management.

5. Limited Sectoral Success

- PPPs have performed relatively well in airports and ports but have faced significant challenges in highways, urban infrastructure and water supply.

Reforms Required:

1. Improve Project Preparation

- Strengthen feasibility studies and demand assessment.
- Ensure land acquisition and statutory clearances before project award.

2. Balanced Risk Sharing

- Allocate risks according to the capacity of each partner.
- Promote hybrid financing models where appropriate.

3. Strengthen Institutional Framework

- Enhance capacity of PPP cells and implementing agencies.
- Standardise concession agreements and monitoring systems.

4. Improve Financing Ecosystem

- Expand infrastructure investment through **National Bank for Financing Infrastructure and Development (NaBFID)**, Infrastructure Investment Trusts (InvITs) and Development Finance Institutions (DFIs).
- Deepen corporate bond and infrastructure debt markets.

5. Faster Dispute Resolution

- Strengthen independent regulators and arbitration mechanisms.
- Promote transparent contract management and accountability.

Critical Evaluation:

Achievements

- Accelerated infrastructure development with private participation.
- Improved efficiency and innovation in several sectors.
- Reduced fiscal burden on governments.
- Successful implementation in airports, ports and renewable energy.

Challenges

- Decline in private investment following stressed PPP projects.
- Delays due to contractual disputes and regulatory uncertainty.
- Inadequate institutional capacity for project management.
- Uneven performance across sectors and states.

Public-Private Partnerships have emerged as a **strategic instrument for bridging India's infrastructure gap**, but their long-term success depends on **transparent governance, balanced risk sharing, sound project preparation and strong institutional capacity**. A reformed PPP ecosystem will be crucial for building **resilient, high-quality and sustainable infrastructure** that supports India's long-term economic development.

Value Addition:

Kelkar Committee on Revisiting & Revitalising PPP Model (2015): Recommended **renegotiation frameworks, balanced risk allocation, independent regulators, a 3P India institution** and improved project preparation to revive investor confidence.

Economic Survey 2025–26: Emphasises that successful PPPs require **credible institutions, transparent regulation, robust dispute resolution and innovative financing mechanisms**.

National Infrastructure Pipeline (NIP): Recognises PPPs as an important mechanism for mobilising private investment to meet India's long-term infrastructure requirements.

PM Gati Shakti: Enhances the viability of PPP projects through integrated infrastructure planning and improved project coordination.

SDG Linkage: Supports **SDG 8 (Decent Work & Economic Growth), SDG 9 (Industry, Innovation & Infrastructure), SDG 11 (Sustainable Cities & Communities)** and **SDG 17 (Partnerships for the Goals).**

Q.8 (A). Rapid urbanisation has increased the demand for sustainable infrastructure and efficient urban governance. Discuss the significance of Smart Cities, digital governance, solid waste management and resilient urban infrastructure in India's development.

Demand of the Question:

- Explain the need for **sustainable urban infrastructure** due to rapid urbanisation.
- Discuss the significance of **Smart Cities, digital governance, solid waste management and resilient urban infrastructure**.

Recognising cities as the **engines of economic growth**, the **High-Powered Expert Committee (HPEC) on Urban Infrastructure (2011)** highlighted the need for massive investment in urban infrastructure to sustain rapid urbanisation. Building on this vision, the **Economic Survey 2025–26** emphasises that **technology-driven governance, resilient infrastructure and sustainable urban planning** are essential for improving urban productivity and quality of life.

Significance of Sustainable Urban Infrastructure:

1. Smart Cities – Improving Urban Liveability

- Promotes integrated urban planning and efficient public service delivery.
- Improves mobility through Intelligent Transport Systems (ITS).
- Enhances water supply, sanitation and energy efficiency.
- Encourages data-driven governance and citizen participation.
- Attracts investment, innovation and skilled workforce.

Key Initiative

- **Smart Cities Mission**

2. Digital Governance – Enabling Smart Administration

- Enhances transparency and accountability.
- Delivers citizen-centric public services through digital platforms.
- Facilitates online grievance redressal and municipal service delivery.
- Improves tax collection and municipal financial management.
- Enables evidence-based urban planning using GIS and data analytics.

Key Initiatives

- **Digital India Mission**
- **National Urban Digital Mission (NUDM)**
- **e-Municipality**
- **DigiLocker**
- **Aadhaar-enabled service delivery**

3. Solid Waste Management (SWM) – Towards Circular Economy

- Improves urban sanitation and public health.
- Reduces pollution and greenhouse gas emissions.
- Promotes recycling, composting and resource recovery.
- Generates green employment and supports the circular economy.

- Prevents landfill expansion and groundwater contamination.

Key Initiatives
- **Swachh Bharat Mission (Urban) 2.0**
- **Solid Waste Management Rules, 2016**
- **Garbage Free Cities Initiative**

4. Resilient Urban Infrastructure
- Enhances preparedness against floods, heatwaves and other climate risks.
- Improves urban drainage and stormwater management.
- Strengthens climate-resilient housing and transport systems.
- Ensures uninterrupted essential services during disasters.
- Supports sustainable and low-carbon urban development.

Key Initiatives
- **AMRUT 2.0**
- **National Disaster Management Plan**
- **Climate Smart Cities Assessment Framework (CSCAF)**

Critical Evaluation
Achievements
- Improved urban service delivery through Smart City projects.
- Expansion of digital governance and online municipal services.
- Better sanitation and waste processing under SBM-U.
- Increased focus on climate-resilient and sustainable urban infrastructure.
- Enhanced citizen participation through digital platforms.

Challenges
- Rapid urbanisation continues to outpace infrastructure creation.
- Poor segregation and scientific disposal of municipal waste.
- Financial constraints and weak capacity of Urban Local Bodies (ULBs).
- Urban flooding, congestion and pollution remain persistent concerns.
- Digital divide limits equitable access to smart governance.

Way Forward

- Strengthen financial autonomy and capacity of **Urban Local Bodies (ULBs)**.
- Promote integrated land-use and transport planning.
- Adopt **circular economy** principles in urban waste management.
- Expand GIS-based urban planning and AI-enabled governance.
- Invest in climate-resilient infrastructure and nature-based solutions.
- Encourage citizen participation through digital governance platforms.

As India urbanises rapidly, the focus must shift from **expanding cities to building smarter, greener and more resilient urban ecosystems**. Strengthening **smart governance, sustainable infrastructure, scientific waste management and climate resilience** will enable cities to become engines of **inclusive economic growth, environmental sustainability and improved quality of life**.

Value Addition:

High Powered Expert Committee (HPEC) on Urban Infrastructure (2011): Recommended large-scale investment in urban infrastructure, stronger municipal finances and governance reforms to meet India's urbanisation needs.

Economic Survey 2025–26: Highlights that **digital governance, resilient infrastructure, efficient municipal services and sustainable urban planning** are essential for enhancing urban productivity and improving quality of life.

74th Constitutional Amendment Act (1992): Strengthened **Urban Local Bodies (ULBs)** by promoting decentralised urban governance and assigning municipalities responsibilities under the **Twelfth Schedule**.

NITI Aayog: Advocates **technology-enabled, citizen-centric and climate-resilient urban development** through integrated planning and digital innovation.

Q.8 (B). Climate change has increased the importance of weather forecasting and disaster-resilient infrastructure. Analyse how technological advancements and infrastructure planning can strengthen disaster management and sustainable development in India.

Demand of the Question
- Analyse how **technological advancements** improve disaster management.
- Explain the role of **disaster-resilient infrastructure** in achieving sustainable development amidst climate change.

The **IPCC Sixth Assessment Report (AR6)** warns that **every increment of global warming increases the frequency and intensity of extreme weather events**, making adaptation and resilience imperative. In response, the **Economic Survey 2025–26** underscores the need for **technology-enabled weather forecasting and climate-resilient infrastructure**, while initiatives such as **Mission Mausam** and the **Coalition for Disaster Resilient Infrastructure (CDRI)** reflect India's transition from **reactive disaster response to proactive risk reduction**.

Role of Technological Advancements in Disaster Management

1. Advanced Weather Forecasting

- Enables accurate prediction of cyclones, floods, heatwaves and heavy rainfall.
- Facilitates timely evacuation and preparedness.
- Minimises loss of life, property and livelihoods.

Key Initiatives
- **Mission Mausam**
- **Doppler Weather Radar (DWR) Network**
- **IMD Numerical Weather Prediction Models**
- **Integrated Early Warning Systems**

2. Space & Geospatial Technologies

- Remote sensing for hazard mapping and vulnerability assessment.
- Satellite monitoring of cyclones, floods, droughts and forest fires.
- GIS enables real-time planning, evacuation and post-disaster assessment.

Key Institutions

- **ISRO**
- **National Remote Sensing Centre (NRSC)**
- **India Meteorological Department (IMD)**

3. Digital Technologies

- AI and Big Data improve forecasting accuracy.
- Mobile-based early warning alerts enhance last-mile communication.
- Drones support rapid damage assessment, search-and-rescue and relief delivery.
- Digital platforms strengthen coordination among disaster management agencies.

Role of Disaster-Resilient Infrastructure:

1. Climate-Resilient Urban Infrastructure

- Flood-resilient drainage systems.
- Heat-resilient buildings and urban planning.
- Sustainable water supply and sanitation infrastructure.

2. Resilient Transport Infrastructure

- Disaster-resistant roads, bridges and railways.
- All-weather connectivity for evacuation and relief operations.
- Improved logistics during emergencies.

3. Resilient Energy Infrastructure

- Smart grids and underground cabling in vulnerable areas.
- Renewable energy systems ensuring uninterrupted critical services.
- Decentralised energy improves disaster resilience.

4. Nature-Based Infrastructure

- Mangrove restoration to reduce cyclone impacts.
- Watershed development for drought mitigation.
- Urban forests and wetlands reducing flood and heat risks.

Contribution to Sustainable Development:

- Reduces disaster-related economic losses.
- Protects critical infrastructure and productive assets.
- Strengthens climate adaptation and community resilience.
- Supports food, water and energy security.
- Promotes sustainable urbanisation and balanced regional development.

Critical Evaluation:

Achievements

- India has significantly improved cyclone forecasting and early warning capabilities, leading to substantial reductions in disaster mortality.
- Expansion of Doppler Weather Radar coverage and satellite-based monitoring.
- Growing adoption of AI, GIS and drone technologies in disaster management.
- Global leadership through **CDRI** in promoting resilient infrastructure.

Challenges

- Last-mile dissemination of early warnings remains uneven.
- Limited forecasting precision for localised extreme weather events.
- Climate-resilient infrastructure remains inadequate in many cities and vulnerable regions.
- Financial and institutional capacity constraints at the local level.
- Climate risks are increasing faster than adaptation efforts.

Way Forward

- Expand **Mission Mausam** and modernise India's weather observation network.
- Integrate AI, GIS, satellite data and IoT into multi-hazard early warning systems.
- Mainstream **climate resilience** into infrastructure planning and public investment.
- Strengthen disaster preparedness at the community and Urban Local Body (ULB) levels.
- Scale up **nature-based solutions** alongside engineered infrastructure.
- Promote resilient infrastructure through **PM Gati Shakti**, **CDRI** and climate-resilient building standards.

As climate change intensifies disaster risks, **weather forecasting, digital technologies and resilient infrastructure must become integral components of development planning rather than emergency responses**. By aligning **scientific innovation, resilient infrastructure and climate-informed governance**, India can strengthen disaster resilience while advancing **sustainable, inclusive and climate-resilient development**.

Value Addition:

NDMA Guidelines: Advocate a shift from **post-disaster relief to proactive disaster risk reduction**, emphasising multi-hazard early warning systems and resilient infrastructure.

Economic Survey 2025–26: Highlights **Mission Mausam**, expansion of **Doppler Weather Radars**, advanced forecasting systems and climate-resilient infrastructure as key pillars of India's climate adaptation strategy.

Coalition for Disaster Resilient Infrastructure (CDRI): An Indian-led global initiative promoting infrastructure capable of **withstanding climate and disaster risks**.

Sendai Framework (2015–2030): Prioritises **understanding disaster risk, strengthening governance, investing in resilience and "Build Back Better."**