



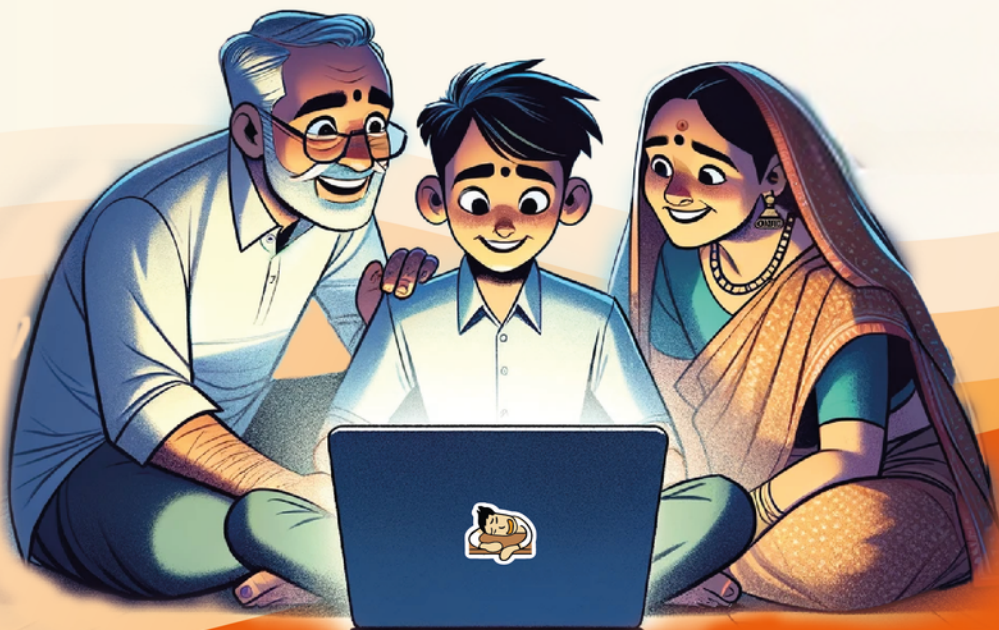
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UPSC MAINS

Solved PYQs

2021

General Studies Paper 3



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How to Maximize Your UPSC Mains Score Using These PYQs

Transform Your Preparation into Your Success Strategy

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

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

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



"I can't finish questions within time limits"

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

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



"My answers lack depth and examples"

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

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



"I don't know which topics to prioritize"

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

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

⚠ Critical Mistake to Avoid

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



Remember: PYQs are your blueprint, not just practice material

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

FREE - GS Mains PYQs Discussion

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



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Economy

1) Explain the difference between computing methodology of India's Gross Domestic Product (GDP) before the year 2015 and after the year 2015.

Structure:

- Introduction: Define GDP with data
- Body: difference between computing methodology of India's Gross Domestic Product (GDP) before the year 2015 and after the year 2015.
- Conclusion: Give appropriate conclusion in this regard

Introduction

- India's Gross Domestic Product (GDP) is a crucial measure of the country's economic health and development. Over time, the methodology for computing India's GDP has evolved to better reflect the changing economic landscape. Before the year 2015, India primarily used the factor cost method, while after 2015, the country shifted to the market price method

Before 2015

- **Factor Cost Method:** Before 2015, India's GDP was computed using the factor cost method, also known as the production approach. This method calculated GDP by summing the value added at each stage of production across sectors, such as agriculture, manufacturing, and services.
- **Base Year:** The base year for computing GDP was periodically updated to capture changes in the economy's structure and consumption patterns. However, the base year before 2015 was relatively outdated, leading to potential inaccuracies in GDP estimates.

After 2015

- **Market Price Method:** Post-2015, India transitioned to the market price method, also known as the expenditure approach, for computing GDP. This method calculates GDP by summing the total expenditure on final goods and services, including consumption, investment, government spending, and net exports.
- **New Base Year:** The introduction of a new base year for GDP calculation was a significant change. The base year was updated to reflect more recent economic data and consumption patterns, providing a more accurate representation of the economy.
- **Inclusion of Informal Sector:** Efforts were made to improve the coverage of the informal sector in GDP estimates. New data sources and methodologies, such as surveys and satellite imagery, were introduced to capture economic activities more comprehensively.

The introduction of the Goods and Services Tax (GST) in 2017 had implications for GDP calculation. GST replaced multiple indirect taxes, making GDP estimation more accurate by reducing tax distortions and improving data availability.

- **Methodological Revisions:** Methodological revisions were implemented to align India's GDP estimation practices with international standards. Changes included adjustments in the classification of economic activities, treatment of subsidies and taxes, and accounting for inflation and price changes.

Calculation of Labor Income

- Pre-2015: All labour inputs were considered equal.
- Post-2015: The new methodology introduced the concept of “effective labour input” and assigned different weights based on whether an individual was an owner, a hired professional, or a helper. This change aimed to provide a more nuanced assessment of labour income.

Value Addition in Agriculture

- Pre-2015: Value addition in agriculture was limited to farm produce.
- Post-2015: The new methodology expanded the scope of value addition in agriculture beyond farm produce. Livestock data became a critical component of the calculation.

Implications

- **Improved Accuracy:** The shift to the market price method and the use of a more recent base year have enhanced the accuracy of GDP estimates. This ensures that GDP figures better reflect the true economic output of the country, leading to more informed policy decisions.
- **Better Representation of Informal Sector:** Including the informal sector more comprehensively in GDP estimates provides a clearer picture of the economy. Policymakers can now understand the contribution of informal economic activities and design policies to support this sector more effectively.
- **Enhanced Comparability:** The new methodology improves comparability of India's GDP with international standards. This allows for better benchmarking against global economic indicators and facilitates international cooperation and trade.

Conclusion

- India's transition in GDP computing methodology from the factor cost method to the market price method has led to significant improvements in accuracy, representation of the informal sector, and comparability with international standards.
- Government policies and initiatives, such as updating the base year, implementing GST, and revising the Economic Census, have played a crucial role in modernizing GDP estimation practices. These changes ensure that India's GDP figures reflect the true economic output of the country, enabling better policy formulation and decision-making.

2) Distinguish between Capital Budget and Revenue Budget. Explain the components of both these Budgets.

Structure:

- **Introduction:** Define Budget with facts
- **Body:**
 - Difference between Capital Budget and Revenue Budget with components
- **Conclusion:**
 - Give appropriate conclusion in this regard

Introduction

- In financial management, budgets are critical tools used by governments and organizations to plan and allocate resources effectively. Two primary types of budgets are capital budgets and revenue budgets. While both are crucial for overall financial management, they serve different purposes and encompass distinct sets of expenditures and revenues.
- Article 112 of the Indian Constitution pertains to the presentation of the annual financial statement, commonly known as the Union Budget, before Parliament. It outlines the procedure and requirements for the presentation of the budget by the President of India on behalf of the Union Government

Aspect	Capital Budget	Revenue Budget
Purpose	Focuses on long-term investments in assets that have a lasting impact on an organization's operations or infrastructure.	Focuses on estimating and planning for the inflow of funds or revenues that an organization expects to receive during a specific period.
Components	Capital expenditures (land, buildings, machinery, equipment, infrastructure)	Tax revenues (income taxes, corporate taxes, sales taxes, property taxes, excise taxes)
	Major projects (construction, renovation, acquisition of equipment, technology upgrades)	Non-tax revenues (fees, fines, licenses, permits, user charges, dividends from state-owned enterprises, asset sales or leases)
	Debt service (repayment of principal, interest payments on loans or bonds)	Grants and transfers (from other government entities, domestic and foreign, for specific purposes like infrastructure, education, healthcare, etc.)

	Capital grants (from external sources like federal/state governments, international agencies, or private donors)	investment income (interest income from bank deposits, dividends from stocks or bonds, returns from other financial assets)
Major Projects	Allocates funds for major projects such as construction of new facilities, renovation or expansion of existing infrastructure, etc.	Focuses on expenditure priorities and financial sustainability based on the forecasted revenue from various sources.
Debt Service	Includes provisions for servicing debt incurred to finance capital investments.	Not applicable as the revenue budget deals with inflow of funds and not with financing arrangements.
Capital Grants	Includes capital grants which are often earmarked for specific purposes and must be used accordingly.	Not applicable as the revenue budget deals with regular income sources and not with specific grants for capital projects.

Conclusion

- Capital budgets and revenue budgets serve different purposes and encompass distinct components. Both budgets are essential for effective financial management, as they help governments and organizations allocate resources efficiently, prioritize spending, and ensure financial sustainability.
- By understanding the differences between capital and revenue budgets and effectively managing both, governments and organizations can achieve their financial objectives and support long-term growth and development

3) How did land reforms in some parts of the country help to improve the socio-economic conditions of marginal and small farmers?

Structure:

- **Introduction:** Land reforms and their role in brief
- **Body:**
 - Explain few examples of some parts of the country about how land reforms helped to improve the socio-economic conditions of marginal and small farmers
- **Conclusion:**
 - Give appropriate conclusion in this regard

Introduction

- Land reforms have been pivotal in transforming the socio-economic landscape of India, particularly for marginalized and small farmers. Through various policies and initiatives, governments have aimed to address historical inequalities in land distribution, empower smallholders, and enhance agricultural productivity.

Land Reforms in Kerala

Redistribution of Land: Kerala implemented comprehensive land reforms in the 1950s and 1960s, including the imposition of land ceilings and redistribution of surplus land.

- Small and marginal farmers, along with landless agricultural labourers, benefited from the redistribution of land, receiving ownership rights and access to cultivable land.

Agricultural Productivity: Land reforms in Kerala aimed to enhance agricultural productivity by consolidating fragmented landholdings and promoting cooperative farming.

- Initiatives such as the formation of agricultural cooperatives and the provision of technical assistance and credit facilities helped small farmers adopt modern farming techniques and improve yields.

Empowerment of Marginalized Communities

- Land reforms empowered marginalized communities, particularly scheduled castes and tribes, by providing them with landownership rights.
- Studies have shown that land redistribution in Kerala contributed to poverty reduction and social empowerment among marginalized groups, leading to improved socio-economic indicators.

Land Reforms in West Bengal

- **Operation Barga:** West Bengal's Operation Barga aimed to provide security of tenure to sharecroppers, covering millions of agricultural labourers.

- Government data suggests that Operation Barga resulted in the recording of over 2.5 million sharecroppers, ensuring their legal rights and protection from eviction.
- **Land Redistribution:** Land reforms in West Bengal included land redistribution through land ceilings and acquisition of surplus land.
 - According to official records, over 2.3 million acres of land were redistributed to landless and marginal farmers in West Bengal, positively impacting their socio-economic conditions.
- **Rural Development Impact:** Land reforms in West Bengal stimulated rural development by empowering smallholders and promoting agricultural productivity.
 - Studies indicate that increased landownership among small farmers led to investments in land improvements, agricultural diversification, and overall rural prosperity.

Land Reforms in Andhra Pradesh

Land Distribution to Dalits

- Andhra Pradesh implemented land reforms to address socio-economic disparities among Dalits and other marginalized communities.
- Government records indicate that over 2.5 million acres of land were distributed to Dalit families, providing them with secure land tenure and livelihood opportunities.
- **Consolidation of Holdings:** Land consolidation measures in Andhra Pradesh aimed to rationalize landholdings and improve agricultural productivity.
 - Data suggests that consolidation of fragmented landholdings led to increased mechanization, irrigation coverage, and adoption of modern farming practices among small farmers.
- **Livelihood Enhancement:** Land reforms in Andhra Pradesh enhanced livelihood opportunities for smallholders through secure land tenure and access to support services.
 - Studies have shown that small farmers' incomes increased significantly post-land reforms, leading to poverty reduction and improved living standards.

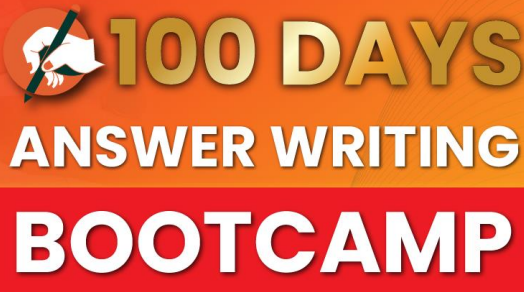
Land Reforms in other states

- **Recording of Rights (RoR) Act:** Odisha introduced the RoR Act to provide secure land rights to farmers and ensure accurate documentation of land holdings. This initiative helps in reducing disputes over land ownership and improving access to credit for farmers.
- **Bhoodan Movement:** Bihar witnessed the Bhoodan (land gift) movement initiated by Vinoba Bhave in the 1950s. The movement encouraged wealthy landowners to voluntarily donate land to landless peasants, aiming at redistributing land and reducing social inequalities.
- **Tenancy Reforms:** Maharashtra implemented tenancy reforms to protect tenants' rights and provide them with security of tenure. These reforms aimed at abolishing exploitative tenancy practices and ensuring fair treatment of tenants.

- **Land to the Tillers:** Assam has implemented various programs under the "Land to the Tillers" policy, aiming to distribute surplus land to landless farmers and improve land tenure security among marginalized communities.

Conclusion

- Land reforms have played a crucial role in uplifting the socio-economic conditions of marginal and small farmers in different parts of India. Examples from Kerala, West Bengal, and Andhra Pradesh demonstrate how redistributive land policies, secure land tenure, and support services have empowered smallholders, enhanced agricultural productivity, and promoted rural development.
- By continuing to prioritize land reforms and implementing targeted policies, India can further advance the socio-economic well-being of its agrarian population, ensuring inclusive growth and poverty reduction across rural areas.



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4) How and to what extent would micro-irrigation help in solving India's water crisis?

Structure:

- **Introduction:** Start with need of micro irrigation and define micro irrigation
- **Body:** Explain How micro-irrigation can help solve India's water crisis.
- **Conclusion:** Give appropriate conclusion in this regard

Introduction

- India faces a severe water crisis characterized by dwindling water resources, unsustainable water management practices, and increasing water scarcity in many regions. Addressing this crisis requires innovative solutions that enhance water use efficiency and promote sustainable agricultural practices.
- Micro-irrigation, also known as drip and sprinkler irrigation, has emerged as a promising technology to mitigate the water crisis by maximizing irrigation efficiency and minimizing water wastage.

How micro-irrigation can help solve India's water crisis:

- **Efficient Water Use:** Micro-irrigation systems deliver water directly to the roots of crops in precise quantities, minimizing water losses due to evaporation, runoff, and percolation. By providing water directly to the root zone, micro-irrigation ensures that plants receive the required moisture for optimal growth while reducing water wastage.
 - This efficient water use can help alleviate the pressure on groundwater resources and surface water bodies, particularly in water-stressed regions.
- **Reduced Water Consumption:** Compared to traditional flood irrigation methods, micro-irrigation systems can significantly reduce water consumption in agriculture. Studies have shown that drip and sprinkler irrigation systems can reduce water usage by up to 50% while maintaining or even improving crop yields.
 - This reduction in water consumption not only conserves precious water resources but also enhances agricultural productivity and resilience to water scarcity.
- **Improved Crop Yields and Quality:** Micro-irrigation facilitates precise water and nutrient management, leading to improved crop yields and quality. By ensuring that crops receive the right amount of water and nutrients at the right time, micro-irrigation systems promote healthier plant growth, reduced stress, and enhanced yield potential.
 - Additionally, the uniform distribution of water and nutrients across the field minimizes variability in crop performance, leading to more consistent and predictable harvests.

Sustainable Agriculture Practices

- Micro-irrigation promotes sustainable agriculture practices by minimizing environmental impacts such as soil erosion, waterlogging, and salinization. By delivering water directly to the root zone, micro-irrigation systems reduce soil erosion and nutrient leaching, preserving soil fertility and structure.
- Furthermore, by avoiding overwatering and waterlogging, micro-irrigation helps prevent the buildup of salts in the soil, promoting long-term soil health and productivity.

Adaptation to Climate Change

- In the face of climate change and unpredictable weather patterns, micro-irrigation offers a flexible and adaptive solution for agricultural water management. By providing precise control over irrigation scheduling and water application rates, micro-irrigation systems enable farmers to adjust to changing climatic conditions and optimize water use efficiency.
- This flexibility is crucial for building resilience to climate variability and mitigating the impacts of droughts and water scarcity on agricultural production.

Policy and Institutional Support

To promote the widespread adoption of micro-irrigation and maximize its potential benefits for addressing the water crisis in India, policymakers and institutions must prioritize the following:

- **Financial Incentives and Subsidies:** Governments should provide financial incentives, subsidies, and credit facilities to encourage farmers to invest in micro-irrigation systems. Targeted support should be provided to smallholder farmers and marginalized communities to ensure equitable access to technology and resources.
- **Capacity Building and Extension Services:** Extension services and training programs should be expanded to educate farmers about the benefits, installation, operation, and maintenance of micro-irrigation systems. Technical assistance and support should be provided to ensure proper implementation and management of these systems.
- **Research and Development:** Continued research and development efforts are needed to innovate and improve micro-irrigation technologies, reduce costs, enhance efficiency, and adapt to local agro-climatic conditions. Public-private partnerships and collaboration between research institutions, universities, and industry stakeholders can drive innovation and technology transfer.
- **Regulatory Reforms and Policy Integration:** Governments should streamline regulatory processes, remove barriers to adoption, and integrate micro-irrigation into broader water resource management policies and strategies. Coordination between central and state governments, irrigation departments, and agricultural agencies is essential to create an enabling policy environment for micro-irrigation promotion.

Conclusion

- Micro-irrigation has the potential to play a significant role in addressing India's water crisis by enhancing water use efficiency, reducing water consumption, improving crop yields, and promoting sustainable agriculture practices.
- However, realizing this potential requires concerted efforts from policymakers, institutions, researchers, and stakeholders to overcome challenges related to affordability, technical expertise, maintenance, and policy support. By investing in micro-irrigation infrastructure, promoting capacity building, and implementing supportive policies, India can harness the benefits of this technology to achieve water security, agricultural sustainability, and inclusive rural development.

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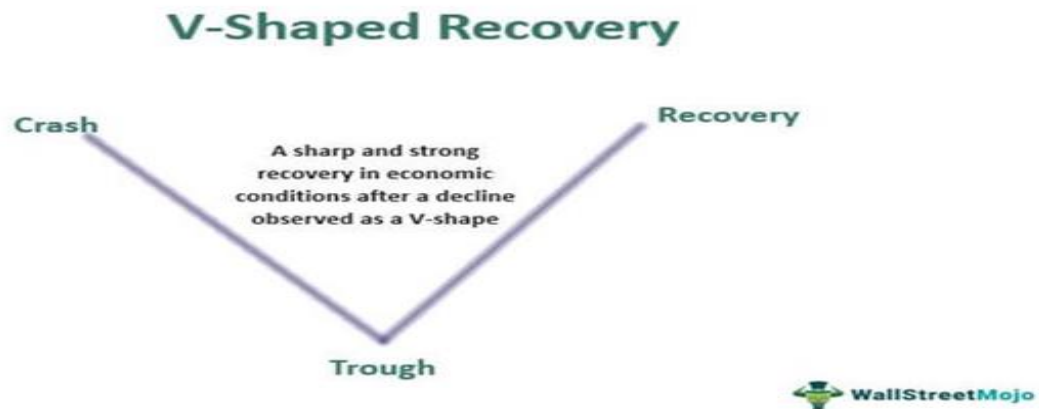
5) Do you agree that the Indian economy has recently experienced V-shaped recovery? Give reasons in support of your answer

Structure:

- **Introduction:** What is V shaped recovery?
- **Body:** Explain Indian economy has recently experienced V-shaped recovery
- Write the challenges faced by the Indian economy despite the signs of a V-shaped recovery
- **Conclusion:** Give appropriate conclusion in this regard

Introduction

- The Indian economy, like many others around the world, faced significant challenges due to the COVID-19 pandemic. Following a sharp contraction in economic activity in the initial phase of the pandemic, there has been much discussion about the shape of the recovery. Some argue that the Indian economy has experienced a V-shaped recovery, characterized by a rapid rebound after the downturn.
- A V-shaped economy refers to a scenario in which an economy experiences a sharp and rapid downturn followed by an equally swift recovery, resembling the shape of the letter "V" when plotted on a graph. In a V-shaped recovery, the economy contracts sharply during a recession or downturn but then rebounds quickly, returning to its pre-recession level of output or even surpassing it within a relatively short period.



Indian economy has recently experienced V-shaped recovery

Rapid Rebound in Economic Indicators: Following the unprecedented contraction in economic activity during the nationwide lockdown imposed to contain the spread of COVID-19 in 2020, several key economic indicators have shown a sharp rebound.

- GDP growth rates have bounced back strongly from negative territory to positive growth, reflecting a quick recovery in economic output. High-frequency indicators such as manufacturing PMI, services PMI, and industrial production have surged, indicating a resurgence in economic activity across sectors.

The quarterly GDP growth rate improved from a historic decline of 23.9% in Q1 2020 to a contraction of 7.5% in Q2. Indian economy grew by 7.5 to 8.5 in FY 2022-23.

Strong Performance of Key Sectors

- Several key sectors of the Indian economy have exhibited resilience and recovered swiftly from the pandemic-induced downturn. Industries such as agriculture, IT services, pharmaceuticals, and FMCG have demonstrated robust growth and contributed significantly to the overall economic recovery.
- Agriculture, in particular, has been a bright spot, with record food grain production and resilient farm incomes driving rural demand and supporting overall economic revival.

Government Stimulus and Policy Support

- The Indian government implemented various fiscal and monetary measures to support the economy during the pandemic and facilitate its recovery. Fiscal stimulus packages, including liquidity injections, credit guarantee schemes, and welfare programs, provided much-needed support to businesses, households, and vulnerable segments of society.
- Additionally, monetary policy measures such as interest rate cuts and liquidity infusion by the Reserve Bank of India (RBI) helped ease financial conditions and stimulate investment and consumption.

Pent-up Demand and Supply Chain Restorations

- The easing of lockdown restrictions and gradual reopening of economic activities unleashed pent-up demand, leading to a surge in consumer spending and investment. With supply chains gradually restoring operations and logistical bottlenecks easing, production and distribution activities regained momentum, contributing to the overall economic recovery.
- Increased mobility, consumer confidence, and business sentiment also played a crucial role in driving economic revival across sectors.

Global Economic Rebound and External Demand

- The synchronized global economic recovery, coupled with robust external demand, provided a tailwind to the Indian economy's rebound. As major economies around the world emerged from recession and resumed growth, India's export-oriented sectors benefited from increased international trade and demand for Indian goods and services.
- The revival of global commodity prices and resurgence in global trade flows further supported India's export-oriented industries and contributed to the overall economic recovery.

The challenges faced by the Indian economy despite the signs of a V-shaped recovery

Persistent Unemployment and Informal Sector Distress

- Challenge: Despite the overall economic rebound, unemployment rates remain elevated, particularly in the informal sector. Small businesses and informal workers continue to face financial distress, job losses, and reduced incomes, exacerbating poverty and inequality.
- Way Forward: The government should focus on creating employment opportunities through infrastructure projects, rural development programs, and skill development initiatives. Targeted support measures such as direct cash transfers, wage subsidies, and social protection schemes can provide relief to vulnerable segments of society.

Fragile Financial Sector and Non-Performing Assets (NPAs)

- Challenge: The banking sector is burdened with a high level of non-performing assets (NPAs) and stressed assets, which impede credit flow to productive sectors of the economy. Weak balance sheets of banks and financial institutions pose systemic risks and hinder the transmission of monetary policy.
- Way Forward: Addressing the issue of NPAs requires a comprehensive approach, including proactive resolution of stressed assets, recapitalization of banks, and structural reforms to improve governance and risk management practices. Strengthening regulatory oversight and enhancing transparency in the financial sector can restore confidence and promote financial stability.

Structural Bottlenecks and Reforms Delay

- Challenge: Structural bottlenecks such as rigid labour laws, bureaucratic red tape, and regulatory hurdles continue to hamper investment, innovation, and productivity growth. The pace of structural reforms has been slow, hindering the economy's long-term growth potential.
- Way Forward: Accelerating structural reforms is essential to unleash the economy's growth potential and enhance its resilience to future shocks. Reforms in areas such as labour market flexibility, land acquisition, taxation, and ease of doing business can improve the business environment, attract investment, and foster entrepreneurship.

Supply Chain Disruptions and Input Cost Pressures

- Challenge: Supply chain disruptions, input cost pressures, and logistics bottlenecks have emerged as significant challenges for businesses, particularly in manufacturing and export-oriented sectors. Rising input costs, including raw materials and energy prices, threaten to erode profit margins and competitiveness.

- Way Forward: Enhancing supply chain resilience and efficiency is crucial to mitigating disruptions and managing input cost pressures. Investing in infrastructure development, digitalization, and logistics networks can streamline supply chains and reduce transaction costs. Moreover, promoting domestic manufacturing and import substitution strategies can reduce dependence on imported inputs and enhance supply chain resilience.

Conclusion

- While the Indian economy has shown signs of a V-shaped recovery, several challenges persist, requiring concerted efforts from policymakers, businesses, and other stakeholders. Addressing these challenges will require a multi-faceted approach that focuses on promoting inclusive growth, enhancing competitiveness, and accelerating structural reforms.
- By implementing targeted policy measures, strengthening institutional capacities, and fostering innovation and entrepreneurship, India can overcome the challenges and emerge stronger from the pandemic-induced crisis, laying the foundation for sustainable and inclusive economic growth in the years to come.

6) Investment in infrastructure is essential for more rapid and inclusive economic growth". Discuss in the light of India's experience.

Structure:

- **Introduction:** What is V shaped recovery?
- **Body:** The significance of infrastructure investment for more rapid and inclusive economic growth
- **Challenges**
- **Conclusion:** Give appropriate conclusion in this regard

Introduction:

- Investment in infrastructure plays a crucial role in fostering economic growth, enhancing productivity, and promoting inclusivity by creating employment opportunities and improving access to essential services. In the context of India, where infrastructure development has been a key policy priority in recent years, examining the impact of infrastructure investment on economic growth and inclusivity is essential.

The government's commitment is evident through its allocation of 3.3% of GDP to the infrastructure sector in the fiscal year 2024, with particular focus on the transport and logistics segments.



The significance of infrastructure investment for more rapid and inclusive economic growth

Infrastructure Investment and Economic Growth: Infrastructure investment contributes to economic growth by providing the physical and institutional framework necessary for economic activities to thrive. Some ways in which infrastructure investment fosters economic growth include:

- **Enhanced Productivity:** Well-developed infrastructure, such as transportation networks, power supply, and communication systems, improves the efficiency of production processes and reduces transaction costs, leading to higher productivity levels across industries.
- **Facilitating Trade and Investment:** Infrastructure development, particularly in transportation and logistics, facilitates trade and investment by reducing transportation costs, improving connectivity, and expanding market access. This fosters domestic and international trade, stimulates investment flows, and promotes economic integration

Infrastructure Investment and Economic Growth

- **Stimulating Demand and Consumption:** Infrastructure projects, such as urban development, housing, and public utilities, create demand for goods and services, spurring economic activity in related sectors. Increased investment in infrastructure also enhances living standards and quality of life, leading to higher consumer spending and economic growth.

Inclusivity and Infrastructure Development

Investment in infrastructure can contribute to inclusive growth by narrowing regional disparities, reducing poverty, and improving access to essential services for marginalized communities. Keyways in which infrastructure investment promotes inclusivity include:

- **Creating Employment Opportunities:** Infrastructure projects, such as road construction, urban development, and public works, generate employment opportunities, particularly for low-skilled and semi-skilled workers, thereby reducing unemployment and poverty levels.
- **Improving Access to Basic Services:** Infrastructure development in sectors such as healthcare, education, water supply, and sanitation improves access to essential services, particularly in rural and underserved areas. This enhances social inclusion, reduces inequalities, and promotes human development outcomes.
- **Empowering Communities:** Infrastructure projects that involve community participation, such as decentralized water supply systems or rural electrification schemes, empower local communities and enhance their capacity to participate in economic activities, decision-making processes, and governance structures.

India's Experience with Infrastructure Investment: Bharatmala and Sagarmala Projects: The Bharatmala and Sagarmala projects aim to develop roadways and maritime infrastructure, respectively, to improve connectivity, reduce transportation costs, and boost trade and commerce.

- **Smart Cities Mission:** The Smart Cities Mission aims to promote sustainable urban development by upgrading infrastructure, enhancing service delivery, and improving quality of life in selected cities across India.
- **Pradhan Mantri Gram Sadak Yojana (PMGSY):** PMGSY aims to provide all-weather road connectivity to rural areas, thereby improving access to markets, healthcare, education, and other essential services.
- **National Infrastructure Pipeline (NIP):** The NIP envisages investments of over INR 100 lakh crore in infrastructure projects over the next few years, focusing on sectors such as energy, transportation, water supply, and digital infrastructure.

India's Experience with Infrastructure Investment

- **Bharatmala and Sagarmala Projects:** The Bharatmala and Sagarmala projects aim to develop roadways and maritime infrastructure, respectively, to improve connectivity, reduce transportation costs, and boost trade and commerce.
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Challenges

- **Funding Constraints:** Mobilizing adequate funding for infrastructure projects remains a challenge due to fiscal constraints, limited private sector participation, and inefficiencies in project financing. Addressing funding gaps requires innovative financing mechanisms, attracting private investment, and improving project appraisal and management.
- **Regulatory and Policy Bottlenecks:** Regulatory hurdles, land acquisition issues, and bureaucratic delays often impede the timely execution of infrastructure projects, leading to cost overruns and delays. Streamlining regulatory processes, enhancing project governance, and promoting public-private partnerships (PPPs) can accelerate project implementation and improve efficiency.

- **Environmental and Social Impacts:** Infrastructure projects often have adverse environmental and social impacts, including land displacement, pollution, and loss of livelihoods. Adopting sustainable and inclusive development practices, conducting comprehensive environmental and social impact assessments, and engaging with stakeholders can mitigate these risks and ensure that infrastructure development benefits all segments of society.

Conclusion

- Investment in infrastructure is critical for fostering more rapid and inclusive economic growth, as demonstrated by India's experience. By enhancing productivity, promoting trade and investment, creating employment opportunities, and improving access to essential services, infrastructure development can contribute to reducing poverty, narrowing inequalities, and promoting social inclusion.
- By prioritizing infrastructure investment and adopting a holistic approach to infrastructure development, India can harness the transformative power of infrastructure to achieve sustainable and inclusive growth.

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7) What are the salient features of the National Food Security Act, 2013? How as the Food Security Bill helped in eliminating hunger and malnutrition in India

Structure:

- **Introduction:** Explain National Food Security Act, 2013 and its aim in brief?
- **Body:**
 - Salient Features of the National Food Security Act, 2013
 - Impact of the Food Security Bill in Eliminating Hunger and Malnutrition
- **Conclusion:** Give appropriate conclusion in this regard

Introduction

- The National Food Security Act (NFSA), 2013, is a landmark legislation enacted by the Government of India with the aim of ensuring food security for all citizens of the country. The
- NFSA represents a significant step towards addressing hunger and malnutrition by providing subsidized food grains to eligible households and implementing various food security measures.



Salient Features of the National Food Security Act, 2013

- **Universal Coverage:** The NFSA aims to provide food security to the entire population of India. It identifies eligible households under three categories: **priority households**, which are entitled to receive subsidized food grains; **general households**, which are eligible for food grains at a price higher than the subsidized rate; and **excluded households**, which are not covered under the Act.

- **Entitlements:** Under the NFSA, priority households are entitled to **receive 5 kilograms of food grains per person per month at subsidized prices.** The subsidized food grains include **rice, wheat, and coarse grains such as millets.** The Act specifies the minimum entitlements for priority households and mandates the state governments to ensure their availability through the Public Distribution System (PDS).
- **Identification of Beneficiaries:** State governments are responsible for identifying eligible households and issuing ration cards to them. The identification criteria are based on parameters such as **socio-economic status, income levels, and vulnerability indicators.** Efforts are made to ensure that the most vulnerable sections of society, including **marginalized communities, women, children, and the elderly, are prioritized for food assistance.**
- **Nutritional Support:** In addition to providing subsidized food grains, the NFSA emphasizes the importance of nutritional support for vulnerable groups such as pregnant women, lactating mothers, children under the age of 6 years, and malnourished individuals. Special nutritional entitlements are prescribed for these groups, including free meals, supplementary nutrition, and nutritional counselling.
- **Child Nutrition and Maternal Health:** The NFSA recognizes the critical importance of child nutrition and maternal health in ensuring food security and addressing malnutrition. **It mandates the provision of hot cooked meals or take-home rations to children in anganwadi centers and schools to supplement their dietary intake and promote healthy growth and development.**
- **Transparency and Grievance Redressal:** The NFSA emphasizes transparency and accountability in the implementation of food security measures. It requires the establishment of transparent grievance redressal mechanisms at the grassroots level to address complaints related to the distribution of food grains, ration cards, and entitlements under the Act.

Impact of the Food Security Bill in Eliminating Hunger and Malnutrition

- **Enhanced Food Access:** The implementation of the NFSA has significantly improved access to food grains for millions of vulnerable households across India. Subsidized food grains provided under the Act have helped alleviate hunger and food insecurity among marginalized communities, particularly in rural areas and urban slums.
- **Reduction in Malnutrition:** By focusing on vulnerable groups such as pregnant women, lactating mothers, and young children, the NFSA has contributed to reducing malnutrition and improving nutritional outcomes. Access to nutritious food grains, supplementary nutrition, and maternal health services has helped address micronutrient deficiencies and promote healthy growth and development.

The State of Food Security and Nutrition in the World, 2023: Around 74% of India's population could not afford a healthy diet, and 39% fell short of a nutrient-adequate one.

According to Global Hunger Index 2023: India's 2023 GHI score is 28.7, considered serious according to the GHI Severity of Hunger Scale

- **Empowerment of Women:** The NFSA recognizes the central role of women in ensuring food security and nutrition outcomes. By targeting special nutritional entitlements for pregnant women and lactating mothers, the Act empowers women to make informed choices about their health and nutrition, thereby contributing to maternal and child well-being.
- **Poverty Alleviation:** The provision of subsidized food grains under the NFSA acts as a social safety net for poor and vulnerable households, helping them cope with food price volatility, income shocks, and economic distress. By reducing household expenditure on food, the Act frees up resources for other essential needs such as education, healthcare, and livelihoods, thereby contributing to poverty alleviation and social development.

The Household Consumption Expenditure Survey (HCES) claimed that India's rural poverty level had declined to 7.2% in 2022-23 from 25.7% in 2011-12, while urban poverty slipped to 4.6% from 13.7% over the same period.

Conclusion

- The National Food Security Act, 2013, represents a significant milestone in India's efforts to eliminate hunger and malnutrition and ensure food security for all citizens. However, challenges such as leakages in the Public Distribution System, inadequate targeting of beneficiaries, and limited access to quality healthcare and sanitation persist and need to be addressed through continued policy interventions, investments in social infrastructure, and community participation. Overall, the NFSA has played a crucial role in advancing the goal of food security and nutrition for all and remains a cornerstone of India's social welfare policies.

8) What are the present challenges before crop diversification? How do emerging technologies provide an opportunity for crop diversification?

Structure:

- **Introduction:** Explain crop diversification and its aim in brief?
- **Body:**
 - Write about present Challenges Before Crop Diversification
 - Explain role of emerging technologies provide an opportunity for crop diversification
 - **Conclusion:** Give appropriate conclusion in this regard

Introduction:

- Crop diversification is a farming practice that involves growing a variety of crops on a piece of land over a specified period. Instead of relying solely on cultivating a single crop, farmers diversify their cropping systems by planting different types of crops in rotation or intercropping multiple crops simultaneously. The aim of crop diversification is to enhance agricultural sustainability, reduce risks associated with mono-cropping, and improve overall farm productivity and resilience.
- However, several challenges hinder the widespread adoption of crop diversification in agricultural systems.



Present Challenges Before Crop Diversification

- **Monoculture Practices:** One of the primary challenges facing crop diversification is the prevalence of monoculture practices, where farmers focus on cultivating a single crop over large areas. **Monoculture leads to soil degradation, pest and disease outbreaks, and reduced biodiversity, limiting the potential benefits of crop diversification.**
- **Market Dynamics:** Farmers often face market challenges in diversifying their crops, including **limited market access, price volatility, and lack of information about market demand for alternative crops.** Uncertain market conditions can deter farmers from adopting crop diversification strategies, as they may perceive it as a risky venture.

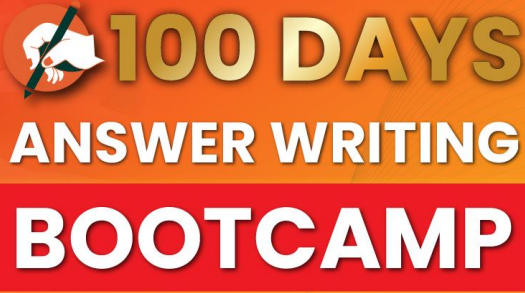
- **Resource Constraints:** Limited access to resources such as **land, water, seeds, and inputs poses a significant challenge to crop diversification, particularly for smallholder farmers.** Competition for land and water resources, coupled with climate variability, can constrain farmers' ability to diversify their cropping systems and adopt new crops.
- **Knowledge and Extension Services:** Inadequate knowledge and extension services related to crop diversification practices and agronomic techniques hinder farmers' capacity to adopt diversified cropping systems. **Lack of awareness about suitable crop varieties, cropping patterns, and best management practices limits the adoption of crop diversification strategies.**
- **Policy and Institutional Support:** The absence of supportive policies, incentives, and institutional mechanisms for promoting crop diversification constrains its adoption at the policy level. **Limited investments in research and development, extension services, and infrastructure for diversified cropping systems further impede progress in this area.**

How Emerging Technologies Provide an Opportunity for Crop Diversification

- **Precision Agriculture:** Emerging technologies such as remote sensing, geographic information systems (GIS), and global positioning systems (GPS) enable precision agriculture, allowing farmers to optimize resource use and management. Precision agriculture techniques help identify suitable areas for crop diversification, optimize inputs, and enhance productivity while minimizing environmental impact.
- **Crop Monitoring and Decision Support Systems:** Advances in sensor technologies, data analytics, and artificial intelligence (AI) enable real-time crop monitoring and decision support systems for farmers. These tools provide valuable insights into crop health, pest and disease outbreaks, weather patterns, and market trends, empowering farmers to make informed decisions about crop selection and management.
- **Climate-Smart Agriculture:** Emerging technologies play a vital role in climate-smart agriculture, which integrates climate-resilient crop varieties, water-efficient irrigation systems, and sustainable farming practices. Climate-smart agriculture promotes crop diversification as a strategy for climate adaptation and mitigation, enabling farmers to cope with changing environmental conditions and reduce their carbon footprint.
- **Digital Extension Services:** Digital platforms and mobile applications offer innovative extension services and advisory support to farmers, disseminating information about crop diversification practices, market opportunities, and agronomic recommendations. Digital extension services bridge the knowledge gap and empower farmers to adopt diversified cropping systems based on local agroecological conditions.
- **Genomic Technologies:** Advances in genomic technologies, including marker-assisted breeding, gene editing, and biotechnology, facilitate the development of crop varieties with enhanced traits such as drought tolerance, disease resistance, and nutritional value. Genomic technologies accelerate the breeding process, enabling the creation of diverse crop varieties suitable for different agroclimatic regions and cropping systems.

Conclusion:

- Crop diversification is essential for sustainable agriculture, food security, and resilience to climate change. However, several challenges, including monoculture practices, market dynamics, resource constraints, knowledge gaps, and policy barriers, hinder the widespread adoption of crop diversification. Emerging technologies offer an opportunity to overcome these challenges by enabling precision agriculture, crop monitoring, climate-smart agriculture, digital extension services, and genomic advancements.
- Overall, integrating emerging technologies into agricultural systems holds promise for achieving sustainable and inclusive crop diversification, thereby ensuring food security and livelihoods for present and future generations.



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Science & Tech

9) How is S-400 air defence system technically superior to any other system presently available in the world?

Approach:

- **Introduction:** Define what S-400 system is.
- **Body:**
 - Highlight its technical superiority by comparing it with other systems of present day and age.
- **Conclusion:** Summarize the answer. Make a passing reference on the importance of S-400 for India.

Answer:

Introduction:

- The S-400, officially known as the "Triumf" or "Triumph", is an advanced long-range air defence system developed by Russia's Almaz Central Design Bureau. It is considered to be one of the most sophisticated, technically superior and powerful air defence systems presently available in the world.



Comparison of S-400 with other systems of present day and age (Patriot PAC-3 of US and HQ-9 of China):

Features:	S-400	Patriot PAC-3	HQ-9
Range and Engagement Capability	It boasts an engagement range of up to 400 kilometres, allowing it to engage targets at a considerable distance. It also has a tracking range of around 600 kilometres.	In general, it has a range of up to 180 kilometres, which is shorter than the S-400, making it less effective against long-range threats.	Its range is around 200 kilometres, placing it between the S-400 and Patriot PAC-3 in terms of range.

		Besides, the latest MIM-104F missile used in PAC-3 only has a range of about 40 km and can reach targets at an altitude of up to 20 km.	engagement distance.
Multi Layered Defence:	It offers a multilayered defence, capable of simultaneously engaging multiple types of threats, even in long range scenarios, including aircraft, drones, ballistic missiles and cruise missiles. It even has the ability to engage 36 targets at once.	It focuses primarily on air and missile defence in shorter-range engagements, making it less versatile for certain types of threats.	It can engage both aircraft and ballistic missiles but has limitations in handling simultaneous and diverse threats.
Radar Systems:	It is equipped with advanced phased-array and long-range radar systems, providing high-resolution tracking and targeting capabilities, and contributing to its effectiveness in engaging a variety of targets. Its radars can also detect objects with low signatures. Besides, it also has electronic countermeasures to tackle any jamming attempts by the enemy.	It also has advanced radar systems, but their range and capabilities do not match those of the S-400.	Its radar systems are advanced, but their performance varies depending on the specific variant.
Mobility and Transportability:	It is highly mobile, enhancing its strategic flexibility. This also makes it ideal for use in a variety of environments, including complex terrain and congested airspace. It can be made ready for operation in 5 minutes.	It is mobile but has limitations in terms of rapid deployment compared to the S-400. Overall deployment takes around 25 minutes.	It is also mobile, but its deployment speed does not match the S-400's capabilities.

Missile Technology:	It utilizes advanced missile technology with various missiles, including the 48N6E3, 40N6, and 9M96E2, known for their precision, speed, and range. Its top speed is around 4.8 km/sec.	It employs the PAC-3 interceptor missile or MIM-104F missile which have smaller ranges. Besides, its top speed is around 1.38 km/sec.	It uses missiles such as FT-2000, which have similar capabilities to the Patriot system.
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Conclusion:

- Considering these differences, the S-400 air defence system can be said to be one of the most advanced air defence systems in the world. The recent deployment of the S-400 to the Pakistan and China borders, in this light, is a significant development. It will give India a significant deterrent capability as well as advantage in terms of air defence, making it ideal for defending against large-scale air attacks or coordinated attacks from multiple directions.

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10) What are the research and developmental achievements in applied biotechnology? How will these achievements help to uplift the poorer sections of the society?

Approach:

- **Introduction:**
 - Start with definition of biotechnology and applied biotechnology.
- **Body:**
 - Discuss the research and developmental achievements in applied biotechnology.
 - Highlight how these developments will help uplift the poorer sections of the society.
- **Conclusion:**
 - Mention the steps taken by the government as well as the way forward.
 - Summarize the answer.

Introduction:

- Applied biotechnology involves the practical application of biotechnological principles and techniques to develop tangible products and processes. It includes the use of biological tools for specific purposes, such as improving crop yields, creating medical treatments and addressing environmental issues.

Research and Developmental Achievements in Applied Biotechnology:

Agriculture:

- Development of GM crops with enhanced traits such as pest resistance, drought tolerance, and improved nutritional content.
 - **Example:** Bt cotton has been engineered to resist certain pests. It has been successfully adopted in several countries, leading to increased yields.
- Integration of biotechnological tools in precision farming for optimized resource use and increased crop productivity.
 - **Example:** Use of bio-sensors and data analytics in India to improve crop management and resource efficiency.

Healthcare:

- Advances in biotechnological methods for vaccine development and therapeutic treatments.
 - **Example:** Development of mRNA vaccine technology, as seen in case of COVID-19 to make vaccines, has revolutionized vaccine production and holds promise for rapid response to emerging diseases.
- Development of cost-effective diagnostic tools for diseases, particularly in resource-limited settings.

- **Example:** Low-cost diagnostic kits for diseases like tuberculosis (by IISC, Bangalore) and malaria have been developed to improve early detection and treatment.

Environmental Sustainability:

- Use of biotechnological processes to clean up environmental pollutants.
 - **Example:** Bioremediation techniques involving microorganisms, such as *Bacillus cereus* A to clear diesel oil spills, are employed to detoxify polluted water and soil, contributing to environmental sustainability.
- Advancements in biofuel production as a sustainable alternative to traditional fuels.
 - **Example:** Research on biofuel production from non-edible oilseed crops, such as *Jatropha*, aims to provide cleaner energy solutions and promote economic opportunities in rural areas.

How These Achievements Help Uplift Poorer Sections of Society:

These achievements can significantly contribute to improving the lives of underprivileged communities:

- **Increased Food Security and Income:** Improved crop yields and resilience will benefit small-scale farmers, enhancing their income and food security. Precision agriculture practices will help them optimize resource use, reducing input costs and improving overall agricultural productivity
- **Affordable Healthcare:** Biopharmaceuticals will provide poor strata adequate access to essential treatment at lower costs. Low-cost diagnostic kits such as FLIPP-NAAT for TB will address healthcare disparities in rural and economically disadvantaged areas.
- **Environmental Sustainability:** Bioremediation, biofuels made from non-edible crops, and waste management solutions will contribute to a cleaner environment as well as alternative source of employment. An example of such is the GOBARDHAN scheme launched by Government of India to generate wealth and energy from cattle and organic waste.
- **Job Creation and Economic Development:** Biotechnology industries will create new employment opportunities, contributing to overall economic growth and poverty reduction.

Conclusion:

- Applied biotechnology achievements have the potential to uplift poorer sections of society by addressing challenges in various sectors, especially agriculture, healthcare and environmental sustainability. By actively aligning such advancements with India's constitutional principles and government initiatives such as "Subka Saath, Subka Vikas", the stakeholders can create a future where its benefits reach every citizen, fostering a more inclusive, equitable, and sustainable India for all.

11) The Nobel Prize in Physics of 2014 was jointly awarded to Akasaki, Amano and Nakamura for the invention of Blue LEDs in 1990s. How has this invention impacted the everyday life of human beings?

Approach:

- **Introduction:** What are LEDs
- **Body:** Impact of blue LEDs
- **Conclusion:** Summation

Solution:

Introduction:

- LEDs, or light-emitting diodes, are semiconductor devices that emit light when an electric current flows through them. The colour of the light emitted by an LED depends on the energy gap of the semiconductor material used.
- The invention of the blue LED was revolutionary because it completed the trio of primary colors (red, green, and blue) needed to produce white LED light. While red and green LEDs had been developed earlier, the absence of blue light had stalled the creation of efficient, bright white light sources.

Impact of Invention:

The invention of blue LEDs in the 1990s by Akasaki, Amano and Nakamura has had a major impact on our everyday lives in a number of ways. They have inherent properties such as:

- **Energy efficiency:** They are much more energy-efficient than traditional incandescent bulbs. This allows savings on energy bills and reduction in overall environmental impact.
- **Durability:** They are also much more durable, last longer and require less maintenance than traditional incandescent bulbs.
- **Versatility:** They can be used to create a wide range of colours of light, including white light. This makes them ideal for a variety of applications, including:
 - **Lighting** including streetlights, headlights, and indoor lighting.
 - **Displays** of TVs, smartphones, smartwatches, and computer monitors etc.
 - **Sensors** of motion detectors and smoke detectors.
 - **Medical devices** such as laser surgery systems and LED therapy lights.
 - **Agricultural applications** such as growing plants under artificial light.
 - **Consumer products** such as smart bulbs and wearable devices

Considering such benefits, Indian government encourages use of LED via schemes such as:

- **UJALA (Unnat Jyoti by Affordable LEDs for All):** The scheme facilitates the distribution of LED bulbs at a subsidized rate to households across India.

- LED Street Lighting National Programme: The objective of the scheme is to replace conventional street lights with energy-efficient LED street lights across urban and rural areas.
- Smart Cities Mission: The scheme involves sustainable practices like adoption of LED lighting in public spaces, buildings, and infrastructure.

Conclusion:

- LEDs are likely to play a major role in the development of new technologies such as self-driving cars, augmented reality and virtual reality as well as new energy technologies, such as solar energy and wind energy. Hence, more research is sine qua non.

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Internal Security

12) Discuss how emerging technologies and globalisation contribute to money laundering. Elaborate measures to tackle the problem of money laundering both at national and international levels.

Teem Framework

T – Role of Emerging Technologies in Money Laundering

- **Cryptocurrencies:** Pseudo-anonymity in Bitcoin, Monero, etc. used for laundering.
- **Dark Web:** Hidden platforms for illegal trade and fund transfers.
- **Shell Companies & Digital Banking:** Easy creation of entities and digital accounts.
- **AI & Deepfake Tech:** Used for identity manipulation and forging KYC data.
- **Layering via digital payment apps:** Fast and untraceable fund transfers.

E – Globalisation’s Contribution to Laundering

- **Cross-border Transactions:** Harder to monitor flows due to global banking.
- **Offshore Tax Havens:** Easy access to jurisdictions with weak enforcement.
- **FDIs & Trade Mispricing:** Used to channel illegal money as legitimate flows.
- **Tourism and Real Estate:** Front sectors used by global criminals.
- **Loss to Exchequer:** Evasion of taxes, weakening public finances.
- **Terror Financing:** Cleaned money funds illicit and terror activities.
- **Destabilisation:** Weakens trust in financial systems and national security.
- **Corruption Proliferation:** Black money fuels political and bureaucratic corruption.

M – Measures to Tackle Money Laundering

At National Level (India)

- **Prevention of Money Laundering Act (PMLA), 2002**
- **Financial Intelligence Unit (FIU-IND)** – Tracks suspicious transactions.
- **Enforcement Directorate (ED)** – Investigates offences under PMLA.
- **Mandatory KYC norms** – Strengthening banking transparency.
- **Banning of high-value cash transactions & linking PAN-Aadhaar.**
- **FATF (Financial Action Task Force)** – Global watchdog, sets AML standards.
- **Egmont Group** – Platform for cooperation between FIUs globally.
- **UNODC** – Helps in capacity building and cross-border coordination.
- **Common Reporting Standard (CRS)** – Global tax info sharing framework.
- **Bilateral treaties** – MLATs for mutual legal assistance.

Introduction	Define money laundering simply. Briefly highlight how emerging technologies and globalisation are transforming it. You can include a real-world hook or a recent FATF observation.
Contribution of Emerging Technologies and Globalisation	<i>Emerging Technologies</i> • Cryptocurrencies and blockchain misuse • Fintech apps and online banking • Dark web and AI-generated identities • Digital shell companies and virtual assets <i>Globalisation</i> • Cross-border fund transfers • Use of tax havens and shell firms • Trade-based laundering (under/over invoicing) • Real estate and tourism fronts across borders
Measures to Tackle Money Laundering	National Level (India) • PMLA, ED, FIU-IND • KYC, PAN-Aadhaar linking, cash limits • RBI & SEBI compliance frameworks International Level • FATF guidelines and black/grey list • Egmont Group, UNODC • Bilateral MLATs, CRS (OECD's Common Reporting Standard) • EU AML Directives, Basel Committee regulations
Conclusion	• Reaffirm the need for international cooperation and tech-based monitoring. • Emphasize a future-ready, adaptive framework with real-time intelligence sharing. <i>Eg: Money laundering is no longer a domestic crime – it's a global financial threat. Strong enforcement, tech-enabled tracking, and global partnerships are essential to counter its evolving nature.</i>

13) Keeping in view India's internal security, analyse the impact of cross-border cyber attacks. Also, discuss defensive measures against these sophisticated attacks.

Introduction	• <u>Context Setting</u>: Briefly outline the growing significance of cyberspace in modern security paradigms, emphasizing India's increasing digitalization (e.g., Digital India initiative, widespread internet penetration). • <u>Define Cross-Border Cyber Attacks</u>: Explain these as malicious cyber activities originating from outside India's borders, targeting critical infrastructure, government systems, private sectors, or citizens. • <u>Objective</u>: State the dual purpose of analyzing the impact on internal security and proposing defensive measures to counter such threats.
Impact Analysis of Cross-Border Cyber Attacks	Economic Impact 1. Disruption of Critical Infrastructure: Discuss how attacks on sectors like banking, energy, or transportation (e.g., ransomware attacks on power grids) can lead to financial losses and economic instability. 2. Loss of Intellectual Property: Highlight how cyber espionage targeting Indian industries (e.g., pharmaceuticals, IT) affects economic competitiveness. 3. Cost of Recovery and Mitigation: Address the financial burden of post-attack recovery, including incident response and system restoration.
Impact Analysis of Cross-Border Cyber Attacks	Social Impact 1. Public Trust and Social Cohesion: Analyze how cyber attacks (e.g., data breaches, fake news campaigns) erode public confidence in government institutions and create societal unrest. 2. Privacy Violations: Discuss the impact of personal data leaks on citizens, leading to identity theft or social engineering attacks.

	Political and Governance Impact 1. Undermining Government Operations: Explain how attacks on government systems (e.g., hacking of defense or administrative networks) compromise national security and governance efficiency. 2. Influence Operations: Highlight the role of state-sponsored cyber campaigns (e.g., disinformation) in manipulating public opinion or destabilizing political processes.
Impact Analysis of Cross-Border Cyber Attacks	National Security Impact 1. Threat to Critical Infrastructure: Discuss vulnerabilities in defense systems, nuclear facilities, or communication networks, which could be exploited by hostile state or non-state actors. 2. Espionage and Intelligence Gathering: Analyze how foreign actors use cyber attacks to steal sensitive military or strategic information. 3. Hybrid Warfare: Explore how cyber attacks complement other forms of warfare (e.g., terrorism, proxy conflicts) to destabilize India.
Defensive Measures Against Sophisticated Cyber Attacks	Policy and Legal Framework 1. Strengthening Cyber Laws: Advocate for robust implementation of the Information Technology Act, 2000, and updates to address emerging threats like AI-driven attacks. 2. International Cooperation: Emphasize India's participation in global cyber norms (e.g., Budapest Convention) and bilateral agreements for cybercrime investigations. 3. National Cybersecurity Policy: Highlight the role of the National Cybersecurity Policy (2013, with updates) in creating a cohesive defense strategy.
Defensive Measures Against Sophisticated Cyber Attacks	Institutional and Organizational Measures 1. Strengthening CERT-In: Discuss the role of the Indian Computer Emergency Response Team (CERT-In) in coordinating responses to cyber incidents.

	2. Cyber Command and Defense Units: Propose the establishment or enhancement of dedicated cyber defense units within the armed forces. 3. Public-Private Partnerships: Encourage collaboration between government, private sector, and academia to share threat intelligence and develop solutions.
Challenges-Resource Constraints:	1. Discuss limitations in funding, skilled manpower, and infrastructure for implementing robust cybersecurity measures. 2. Attribution Challenges: Highlight difficulties in identifying perpetrators of cross-border attacks due to anonymization techniques. 3. Evolving Threat Landscape: Address the challenge of keeping pace with rapidly evolving attack vectors, such as AI-driven malware or quantum computing threats.



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14) Analyse the multi-dimensional challenges posed by external state and non-state actors, to the internal security of India. Also, discuss measures required to be taken to combat these threats.

Introduction

- **Context:** Highlight India's geopolitical significance and vulnerability to threats from external state (e.g., foreign governments) and non-state actors (e.g., terrorists, cybercriminals).
- **Objective:** Analyze multidimensional challenges to internal security and propose measures to counter them.

Multidimensional Challenges

Security Challenges

- **Terrorism:** Cross-border attacks by non-state actors (e.g., 2008 Mumbai attacks) with alleged state support.
- **Cyber Warfare:** State-sponsored cyberattacks on critical infrastructure (e.g., 2020 Mumbai power outage).
- **Border Infiltration:** Arms smuggling and terrorist crossings along India-Pakistan, India-Bangladesh borders.

Political Challenges

- **Disinformation:** State-driven propaganda to destabilize governance or elections.
- **Espionage:** Foreign agencies targeting sensitive government data.

Economic Challenges

- **Sabotage:** Cyberattacks on financial systems or counterfeit currency circulation.
- **Illicit Trade:** Smuggling of narcotics and arms by non-state actors.

Social Challenges

- **Radicalization:** Non-state actors using online platforms to radicalize youth.
- **Communal Tensions:** External actors fueling religious or ethnic conflicts.

Measures to Combat Threats

Policy and Legal Measures

- Strengthen laws like UAPA to address terrorism and cybercrimes.
- Pursue international agreements for intelligence sharing and counter-terrorism.

Security Measures

- Enhance border surveillance with drones and fencing.
- Bolster NIA and CERT-In for counter-terrorism and cyber defense.

Intelligence and Surveillance

- Expand RAW and IB operations for proactive threat detection.
- Use AI-driven analytics for monitoring cross-border activities.

Social and Economic Measures

- Launch counter-radicalization and public awareness campaigns.
- Secure financial systems and curb illicit trade via DRI.

Capacity Building

- Train cybersecurity and counter-terrorism professionals.
- Foster public-private partnerships for indigenous tech solutions.

Challenges in Implementation

- Geopolitical tensions limiting international cooperation.
- Resource constraints in scaling security infrastructure.
- Balancing security measures with civil liberties

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15) Analyse the complexity and intensity of terrorism, its causes, linkages and obnoxious nexus. Also, suggest measures required to be taken to eradicate the menace of terrorism.

Introduction

- **Context:** Define terrorism as deliberate acts of violence to create fear, targeting civilians or infrastructure for political, ideological, or religious goals.
- **Objective:** Analyze the complexity, intensity, causes, and linkages of terrorism, and propose measures to eradicate it.

Analysis of Terrorism

Complexity and Intensity

- **Diverse Forms:** Includes insurgencies, lone-wolf attacks, cyber-terrorism, and state-sponsored terrorism.
- **Global Reach:** Transnational networks (e.g., ISIS, Al-Qaeda) with sophisticated funding, recruitment, and propaganda.
- **Evolving Tactics:** Use of technology (e.g., encrypted communication, drones) and hybrid warfare increases intensity.

Causes

- **Socio-Economic:** Poverty, unemployment, and lack of education fuel radicalization.
- **Political:** Grievances from perceived injustice, state oppression, or geopolitical conflicts.
- **Ideological/Religious:** Extremist ideologies exploiting religious or cultural identities.
- **External Support:** State or non-state actors providing funds, arms, or safe havens.

Linkages and Nexus

- **Terror-Crime Nexus:** Terrorism linked with organized crime (e.g., drug trafficking, money laundering) for funding.
- **State Sponsorship:** Some states provide covert support to terrorist groups for strategic goals.
- **Global Networks:** Cross-border alliances among terrorist groups sharing resources and intelligence.
- **Cyber Linkages:** Use of dark web for recruitment, planning, and propaganda.

Measures to Eradicate Terrorism

- Policy and Legal Measures
- Security and Military Measures
- Socio-Economic and Ideological Measures
- Intelligence and Institutional Measures

16) Explain the purpose of the Green Grid Initiative launched at the World Leaders Summit of the COP26 UN Climate Change Conference in Glasgow in November 2021. When was this idea first floated in the International Solar Alliance (ISA)?

Structure

- **Introduction:**
 - Start with a brief overview of the Green Grid Initiative.
- **Body:**
 - Discuss the primary objectives and goals of the Green Grid Initiative, emphasizing its role in promoting renewable energy, enhancing energy access, facilitating the energy transition, and strengthening climate resilience.
 - Provide background information on when the idea was first floated in the International Solar Alliance (ISA).
 - Highlight the potential challenges which can come up in implementation of the initiative.
- **Conclusion:**
 - Summarize emphasizing the importance of the Green Grid Initiative in accelerating the transition to clean and sustainable energy systems while suggesting some measures to tackle the challenges.

Introduction

- The Green Grid Initiative, also known as the One Sun One World One Grid (OSOWOG), was launched at the World Leaders Summit of the COP26 UN Climate Change Conference in Glasgow in 2021.
- It aims to accelerate the deployment of renewable energy infrastructure, particularly solar power, on a global scale through “green grids”.

GGI

This initiative is to be carried out in 3 phases:

- **In the first phase**, the Indian grid would be connected to the grids of the Middle East, South Asia and South-East Asia to develop a common grid.
- **The second phase** would connect the functional first phase to the pool of renewable resources in Africa.
- **The third phase** would look at achieving true global interconnection with the aim of 2,600 GW of interconnection by 2050. The goal is to integrate as many countries as possible to create a single power grid of renewable energy.

Purpose of Green Grid Initiative

The purpose of the Green Grid Initiative includes:

- **Promoting Renewable Energy:** Encouraging the adoption and expansion of renewable energy sources, such as solar power, to reduce reliance on fossil fuels and mitigate greenhouse gas emissions.
- **Enhancing Energy Access:** Improving access to clean and affordable energy for communities worldwide, particularly in developing countries, to support sustainable development and poverty alleviation efforts.
- **Facilitating Energy Transition:** Supporting the transition towards renewable energy-based electricity systems by providing technical assistance, capacity building, and financial resources to countries and regions.
- **Strengthening Climate Resilience:** Building climate resilience by diversifying energy sources and reducing vulnerability to climate change impacts, such as extreme weather events and energy supply disruptions.

Idea of Green Grid in ISA

- The ISA is an alliance of countries looking to promote solar energy use and development. The idea for this initiative was first proposed by India's Prime Minister during the ISA conference in 2018 to:
 - Initiate a collaborative effort to minimize cost, maximize efficiency and attract investments to build a global green grid.
 - Envision a sustainable and impactful change to lift millions out from poverty through green energy.
- However, this ambitious project faces significant challenges that need to be addressed for successful implementation.

Challenges

- **Technical Hurdles:** Connecting grids across vast distances with varying technical specifications and energy management protocols presents a complex engineering challenge. Standardizing grid infrastructure and protocols will be crucial.
- **Geopolitical Considerations:** Negotiating international agreements on energy transmission rights, pricing structures, and grid security across diverse political landscapes can be challenging. Building trust and fostering international cooperation will be essential.
- **Investment Requirements:** Building the necessary infrastructure for a global grid will require massive investments. Innovative financing mechanisms and public-private partnerships will be needed to bridge the funding gap.
- **Intermittency and Storage Limitations:** Solar energy production is variable, and large-scale storage solutions are still under development. Integrating other renewable sources and developing efficient energy storage technologies will be crucial for grid stability.

Conclusion

- The Green Grid Initiative holds immense potential for accelerating the transition to a clean energy future.
- While challenges exist, they can be overcome through a combination of technological advancements, international collaboration, standardizing the regulations and innovative financing mechanisms.
- By addressing these challenges and fostering global cooperation, the GGI can pave the way for a sustainable and interconnected energy landscape for generations to come

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17) Describe the key points of the revised Global Air Quality Guidelines (AQGs) recently released by the World Health Organisation (WHO). How are these different from its last update in 2005? What changes in India's National Clean Air Programme are required to achieve these revised standards?

Structure

- **Introduction:**
 - Start with a brief overview of the Global Air Quality Guidelines (AQGs) released by the World Health Organization (WHO).
- **Body:**
 - Discuss the key points of Global Air Quality Guidelines (AQGs) released in 2021.
 - Compare the revised AQGs with the previous 2005 update.
 - Identify the changes required in India's National Clean Air Programme (NCAP) to align with the revised AQGs and achieve the recommended air quality standards.
- **Conclusion:**
 - Summarize the key points and reinforce the importance of aligning India's NCAP with the revised standards to advance progress towards the Sustainable Development Goals.

Introduction

- The World Health Organization's (WHO) Global Air Quality Guidelines (AQGs) are a set of recommendations for air quality levels that aim to protect public health.
- These guidelines serve as a benchmark for countries to design and implement air pollution control strategies.
- Recently, the WHO released a significant update to these guidelines, the first since 2005.

Key points of the revised Global Air Quality Guidelines (AQGs)

- **Emphasis on Multiple Pollutants:** The revised guidelines acknowledge the combined health impacts of exposure to multiple air pollutants such as: PM_{2.5}, PM₁₀, ozone, nitrogen dioxide, sulphur dioxide and carbon monoxide.
- **Scientific Basis:** The revision incorporates identification of AQG levels at the lowest levels of exposure for which there is evidence of adverse health effects and a meta-analysis of their overall quantitative effect.
- **Inclusion of Interim targets:** The revised guidelines provide interim targets which are air pollutant levels that are higher than the AQG levels, but which allow authorities in highly polluted areas to develop pollution reduction policies that are achievable within realistic time frames.
- **Recommended AQG levels and interim targets:** The guidelines recommend the following levels:

Pollutant	Averaging time	Interim target				AQG level
		1	2	3	4	
PM_{2.5}, µg/m³	Annual	35	25	15	10	5
	24-hour ^a	75	50	37.5	25	15
PM₁₀, µg/m³	Annual	70	50	30	20	15
	24-hour ^a	150	100	75	50	45
O₃, µg/m³	Peak season ^b	100	70	–	–	60
	8-hour ^a	160	120	–	–	100
NO₂, µg/m³	Annual	40	30	20	–	10
	24-hour ^a	120	50	–	–	25
SO₂, µg/m³	24-hour ^a	125	50	–	–	40
CO, mg/m³	24-hour ^a	7	–	–	–	4

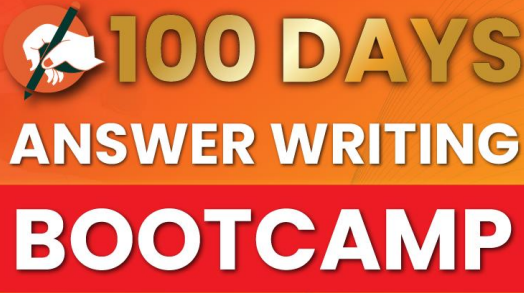
Implications

- **Strengthening Emissions Norms:** The NCAP may need to consider more stringent emission standards for industries, vehicles, construction activities, biomass burning, and household sources, as well as initiatives to promote cleaner fuels, renewable energy and sustainable urban planning. It may even require making it legally binding.
- **Focus on PM2.5:** The NCAP's focus might need to shift towards specifically targeting PM2.5 reduction strategies since as per National Ambient Air Quality Standards annual limit on PM2.5 is 40 µg/m³. Besides, a wider network of air quality monitoring stations, particularly focusing on PM2.5, would be likely required.
- **Investment in Clean Technologies:** The NCAP may need to promote cleaner technologies in industries and transportation sectors.
- **Public Awareness and Behaviour Change:** Raising public awareness about air pollution and encouraging behaviour changes that reduce emissions, like adopting cleaner modes of transport, may be essential under NCAP.
- **Engaging in Collaboration and Partnerships:** Collaborative efforts with government agencies, civil society organizations, academic institutions, and international organizations like WHO may facilitate knowledge sharing, capacity building, and resource mobilization for air quality improvement under NCAP and help accelerate progress towards achieving the revised AQGs.

Conclusion

- The revised Global Air Quality Guidelines (AQGs) underscore the urgent need for stringent measures to address air pollution and safeguard public health.

- Aligning India's National Clean Air Programme with these guidelines is crucial for achieving cleaner air and advancing progress towards the Sustainable Development Goals, particularly SDG 3 (Good Health and Well-being) and SDG 11 (Sustainable Cities and Communities).
- By implementing comprehensive strategies and fostering collaboration, we can create a healthier and more sustainable future for all.





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18) Discuss about the vulnerability of India to earthquake-related hazards. Give examples including the salient features of major disasters caused by earthquakes in different parts of India during the last three decades

Structure

- **Briefly** introduce with disasters caused by earthquakes in different parts of India during the last three decades.
- Discuss about the vulnerability of India to earthquake-related hazards. Give examples including the salient features of major disasters caused by earthquakes.
- **Conclude.**

Introduction

- India's vulnerability to seismic risks resulting from its placement on numerous tectonic plates has been highlighted by several catastrophic earthquakes the nation has suffered during the past three decades.
- Significant earthquakes include the 2001 Bhuj earthquake in Gujarat, the 1993 Latur earthquake in Maharashtra, and the 2015 Gorkha earthquake that affected portions of northern India including Bihar and Uttar Pradesh. Along with long-term financial losses, these incidents resulted in notable death and extensive damage of infrastructure. More lately, the border earthquake in Sikkim-Nepal highlighted the continuous seismic hazards in the Himalayan area.

Vulnerability of India

- **Seismic Zonation and High-Risk Areas:** Based on degree of seismic activity, India is split into four seismic zones: II, III, IV, V. The most vulnerable is Zone V, which comprises areas including sections of Gujarat, Northeast India, and the Himalayas. These areas are quite prone to earthquake because of the tectonic action resulting from the collision between the Indian Plate and the Eurasian Plate. For instance, the 2001 Bhuj earthquake in Gujarat, which happened in Seismic Zone V, was among the worst in India's history and highlighted the area's sensitivity to seismic risks with over 20,000 deaths and extensive damage.
- **Urbanization and Infrastructure Vulnerability:** India's fast urbanisation raises cities' susceptibility to earthquakes-related events, sometimes in disregard of construction rules and seismic-resistant architecture. Especially in highly populated urban regions, poorly built structures are prone to collapse after an earthquake, resulting in great deaths and financial losses.

- **Impact on Critical Infrastructure and Economic Losses:** Severe damage to important infrastructure including transport systems, communication networks, and energy facilities brought on by earthquakes can result in long-term financial disturbances. For instance, the 2015 Gorkha earthquake in Nepal, seriously damaged northern India, especially in Bihar and Uttar Pradesh.
- **Humanitarian Impact and Displacement:** Because homes and communities are devastated, earthquakes often cause extensive population displacement. Loss of life, injuries, psychological anguish, and long-term displacement—which could tax resources and throw off social and economic systems—are among the humanitarian effects. For instance, the 2011 Sikkim earthquake

Examples

- **The Bhuj Earthquake (2001)** in Gujarat, a major disaster with a magnitude of 7.7, killed over 20,000 people and caused extensive infrastructural damage, prompting the government to implement stricter building codes and improved disaster management systems.
- The **Kashmir Earthquake (2005)**, with a magnitude of 7.6, severely affected Jammu and Kashmir, causing over 1,300 deaths on the Indian side and highlighting the need for cross-border cooperation in disaster relief.
- More recently, the **Sikkim Earthquake (2011)** with a magnitude of 6.9, affected the northeastern region, drawing attention to the seismic vulnerability of the Himalayas.
- These disasters emphasised the importance of building resilient infrastructure, enhancing early warning systems, and improving community preparedness in earthquake-prone areas

Conclusion

- India has to give thorough earthquake readiness and mitigating techniques top priority in order to solve its great sensitivity to seismic risks.
- Ensuring that people are informed and ready for possible earthquakes depends critically on public knowledge and community involvement.
- By including these steps into national and state-level disaster management strategies, India can lower the terrible effects of next earthquakes, protect lives, and advance environmentally friendly growth.

19) Describe the major outcomes of the 26th session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC). What are the commitments made by India in this conference?

Approach

- **Introduction:**
 - Provide a brief overview of the United Nations Framework Convention on Climate Change (UNFCCC) as well as the 26th session of the Conference of the Parties (COP26).
- **Body:**
 - Identify and discuss the key outcomes of the COP.
 - Highlight India's commitments announced at the COP.
- **Conclusion:**
 - Summarize the key points discussed in the answer, emphasizing the significance of COP26 outcomes and India's commitments in advancing global climate action.

Introduction

- The 26th session of the COP (COP26), held in Glasgow in November 2021, was a pivotal moment in the fight against climate change.

Major Outcomes of COP26

- **The Glasgow Climate Pact:** This pact reaffirmed the goal of limiting global warming to well below 2°C, preferably 1.5°C, compared to pre-industrial levels. It also included a range of measures to reduce emissions and promote sustainable development.
- **Increased Ambition on NDCs (Nationally Determined Contributions):** Countries were urged to strengthen their national climate action plans (NDCs) to reflect more ambitious emissions reduction targets. China promised to achieve carbon neutrality by 2060, while the European Union pledged to cut its emissions by 55% by 2030.
- **Global Methane Pledge:** Over 100 countries signed a pledge to collectively reduce methane emissions by 30% by 2030 compared to 2020 levels. It was launched by The European Union and the US. Methane is a potent greenhouse gas that has a significant short-term impact on global warming.
- **Commitment to Climate Finance:** Developed countries reaffirmed their commitment to mobilize \$100 billion annually by 2025 to support climate action in developing countries. The Glasgow Financial Alliance for Net Zero (GFANZ) was also launched to mobilize private finance towards the net-zero transition.
- **Deforestation Pledge:** More than 100 countries pledged to halt and reverse deforestation and land degradation by 2030.

- **Infrastructure for Resilient Island States (IRIS):** Recognizing the immense threat climate change poses to Small Island Developing Nations (SIDNs), India launched the IRIS initiative. It involves India's space agency, ISRO, building a dedicated data window to provide island nations with timely information crucial for their survival.

India's Commitments

- **Net-Zero by 2070:** India announced a long-term target of achieving net-zero emissions by 2070. This signifies India's commitment to eventually becoming a carbon-neutral nation.
- **Increased Non-Fossil Fuel Capacity:** India pledged to increase its non-fossil fuel capacity to 500 GW by 2030, reflecting a significant shift towards renewable energy sources.
- **Carbon Intensity Reduction:** India committed to reducing its carbon intensity of GDP by 45% by 2030.
- **Renewable Energy Expansion:** Emphasis was placed on accelerating the deployment of renewable energy sources with an ambitious target of achieving 50% of installed power capacity from renewable sources by 2030.
- **Carbon Emissions Reduction:** India highlighted its efforts to reduce 1 billion tonnes of carbon emissions from the total projected emissions by 2030.

Conclusion

- COP26 is a promising start on emissions reduction, however, the success of COP26 lies in holding countries accountable for their commitments.
- Regular reviews and revisions of NDCs are crucial to ensure progress towards achieving the goals of the Paris Agreement.
- India's ambitious yet achievable targets, if implemented effectively, can significantly contribute to global climate action.

20) Describe the various causes and effects of landslides. Mention the important components of the National Landslide Risk Management strategy.

Structure - IBC

- Introduction about Landslides
- Body
 - Causes of Landslides
 - Effects of Landslides
 - National Landslide Risk Management Strategy
- Conclusion with way forward

Introduction

Definition/Current Event/Data

- A landslide is defined as the rapid movement of a mass of rock, debris, or earth, down a slope under the influence of gravity. They are a natural phenomenon whose frequency has significantly increased due to anthropogenic causes.
- About 12.6% of India's total land area, excluding snow-covered areas, is susceptible to landslide hazards, according to the Geological Survey of India.
- India is considered among the top five landslide-prone countries globally, where at least one death per 100 sq km is reported in a year due to a landslide event

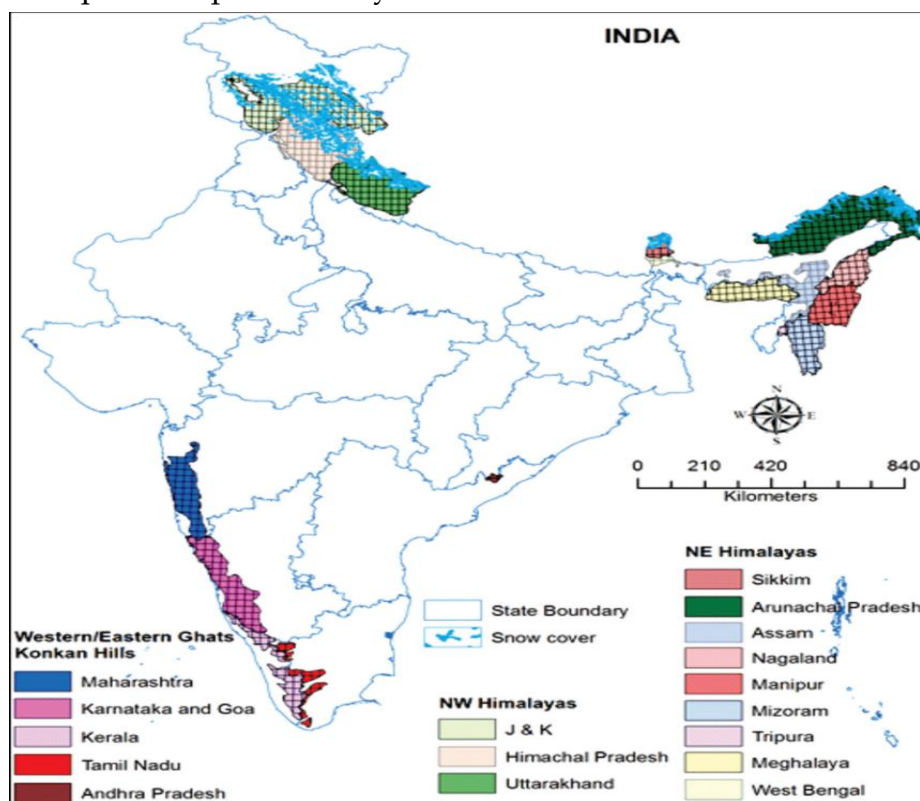


Figure 1: Major landslide prone areas of India (0.42 Million km²)

Body - Causes

- Landslides can be caused by a combination of natural and human-induced factors.
- Often triggered by a combination of factors rather than a single cause.
- Landslides are natural disasters occurring mainly in mountainous terrains where there are conducive conditions of soil, rock, geology and slope.

Natural Causes

- **Geological and Geomorphological Factors** – Steep slopes, weak or unstable rock and soil formations, presence of faults or fractures, and geological processes such as erosion and weathering.
- **Heavy Rainfall and Water Saturation** - Prolonged or intense rainfall can saturate the soil, reducing its stability and triggering landslides.
- **Earthquakes** - Seismic activity can induce landslides, particularly in areas with susceptible geological formations. The ground shaking caused by earthquakes can weaken slopes, leading to slope failures.
- **Volcanic Activity** - Volcanic eruptions can trigger landslides due to the release of ash, gas, and pyroclastic materials.
- **Weathering processes** - for example freeze-thaw reduces the cohesion ('stickiness') between the rock grains.
- **Rock type, Grain shape**, Jointing and orientation of bedding planes and arrangement of the rock layers.

Anthropogenic Causes

- **Improper** land use practices
- Deforestation
- Overgrazing by cattle
- Uncontrolled hillside development
- Construction and mining activities
- Unsustainable Tourism
- Inadequate slope stabilization measures
- Climate change – The rising global temperature has led to extreme rainfall events, and increased melting of glaciers; as a result, more water flows over the steep slope.

Body - Effects

- Loss of Life and Injury
- Displacement of Communities
- Damage to Infrastructure
- Environmental Damage - Landslides can result in the destruction of ecosystems, loss of vegetation cover, and soil erosion

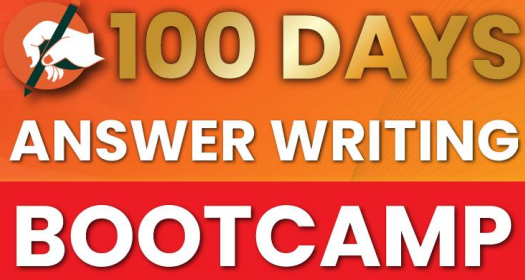
- Economic Losses - The repair and reconstruction of damaged infrastructure, loss of livelihoods, and disruption to economic activities

Body - National Landslide Risk Management Strategy

- Generation of User-Friendly Landslide Hazard Maps
- Development of Landslide Monitoring and Early Warning System
- Awareness Programmes
- Capacity Building and Training of Stakeholders
- Preparation of Mountain Zone Regulations & Policies
- Stabilization and Mitigation of Landslides and Creation of Special Purpose Vehicle (SPV) for Landslide Management.

Conclusion

- India is highly susceptible to landslides, and it is challenging for the government to completely prevent their occurrence.
- However, significant efforts can be made to minimize their adverse effects by fostering strong resilience.



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