



Q1. Explain the difference between computing methodology of India's Gross Domestic Product (GDP) before the year 2015 and after the year 2015. (Answer in 150 words)

APPROACH

Introduction:

- Briefly define the meaning of GDP.

Body:

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

Conclusion:

- Conclude by emphasizing on the importance of GDP.

Introduction:

- GDP is a measure primarily used as a yardstick to gauge the growth of a country. Our government has stressed the GDP growth as one of the measures of its success. GDP is an abbreviation for Gross Domestic Product. GDP is defined as a measure of the value of economic activity within a country. In layman's terms, GDP is the sum of the final prices of goods and services produced in an economy during a given period.

Difference between GDP calculations in the year 2005 and 2015:

In 2005	In 2015
<ul style="list-style-type: none"> • The base year for GDP calculation in this year was 2004-05. For eg: With the change to the new base year, the economy's growth rate for 2013-14 was estimated to be 6.9 percent, up from 4.7 percent in 2004-05. • The calculation of GDP was done at Factor cost. • IIP was used to measure manufacturing and trading activity in this system. • GDP was estimated using IIP data and then updated using ASI data (Annual Survey of Industries). ASI accounted only for those firms which were registered under the Factories Act. • The previous method employed a Labor Input (LI) method, which employs a benchmark-indicator process and then computes output as the estimated labor input multiplied by the value added per worker. • In this farm produce was used as a proxy for calculating agricultural 	<ul style="list-style-type: none"> • The base year for GDP calculation in this year was changed by government to 2011-12. For eg: The 2012-13 growth rate was revised up to 5.1 percent from 4.5 percent. • A new data series, MCA-21, was used for the organized private sector. It contained information on all companies registered with the Ministry of Corporate Affairs, and each was assigned a unique 21-digit code, thus MCA-21. Furthermore, the new database is far more comprehensive, covering financial institutions as well as regulatory bodies such as SEBI, PFRDA, and IRDA. • The calculation of GDP from this year onwards is done at Market price. • The concept of GVA (Gross Value Added) is used in the newer methodology to measure the value addition done to the economy. • The new method employed the Effective Labor Input (ELI) method,



<p>income.</p> <ul style="list-style-type: none"> In the previous system, very few mutual funds and NBFCs were considered when evaluating financial activity. 	<p>which differentiates workers based on productivity by assigning weights to various worker categories.</p> <ul style="list-style-type: none"> The new methodology has broadened the scope for calculating value addition in agriculture. The new methodology broadens the coverage by including stockbrokers, asset management funds, pension funds, stock exchanges, and so on.
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GVA Vs GDP

- Gross value added (GVA) is defined as the value of output less the value of intermediate consumption. It is used to measure the output or contribution of a particular sector. When such GVAs from all sectors (\sum GVA) are added together and adding taxes (product) and reducing subsidies (product), we can get the GDP (at market price). GVA thus shows the production contribution of a particular sector.

Technically,

$\text{GDP at Market Prices} = \sum \text{GVA at basic prices} + \text{product taxes} - \text{product subsidies.}$
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In this context, when GVA from all sectors are added together and necessary adjustment for taxes and subsidies are made, we will get the GDP for the economy.

- GVA is for a particular sector
- \sum GVA is for the economy
- GDP is for the economy

When the value of taxes on products (less subsidies on products) is added to the gross value added, the sum of gross value added for all resident units gives the value of gross domestic product (GDP). Thus, Gross Domestic Product (GDP) of any nation represents the sum total of gross value added (GVA) in all the sectors of that economy during the said year after adjusting for taxes and subsidies.

Conclusion:

- The shift in the method of GDP calculation depicts dynamism in the growth calculation as paves a way for inclusion of new industries and sectors like coaching. Today, targeted inclusion is the need of the hour to portray correct picture of Indian Economy.



Q2. Distinguish between Capital Budget and Revenue Budget. Explain the components of both these Budgets. (Answer in 150 words)

APPROACH

Introduction:

- Define what is budget.

Body:

- Mention about revenue and capital budget.
- Discuss about the components of Revenue and capital budget.

Conclusion:

- Conclude by mentioning the difference between both.

Introduction:

- According to Article 112 of the Indian Constitution, the Union Budget of a year is referred to as the Annual Financial Statement (AFS). It is a statement of the estimated receipts and expenditure of the Government in a financial year (which begins on 01 April of the current year and ends on 31 March of the following year).
- Capital Budget: Capital Budget consists of capital receipts and payments. It also incorporates transactions in the Public Account. Capital receipts are loans raised by the government from the public (which are called market loans), borrowings by the government from the Reserve Bank and other parties through sale of treasury bills, loans received from foreign bodies and governments, and recoveries of loans granted by the Central government to state and Union Territory governments and other parties.
- Revenue Budget: The Revenue Budget consists of the Government of India's revenue receipts and the expenditure that is met using said revenue. It gives the details of the sources from where the government's revenue is coming. Revenue receipts can be further classified into tax revenue and non-tax revenue.

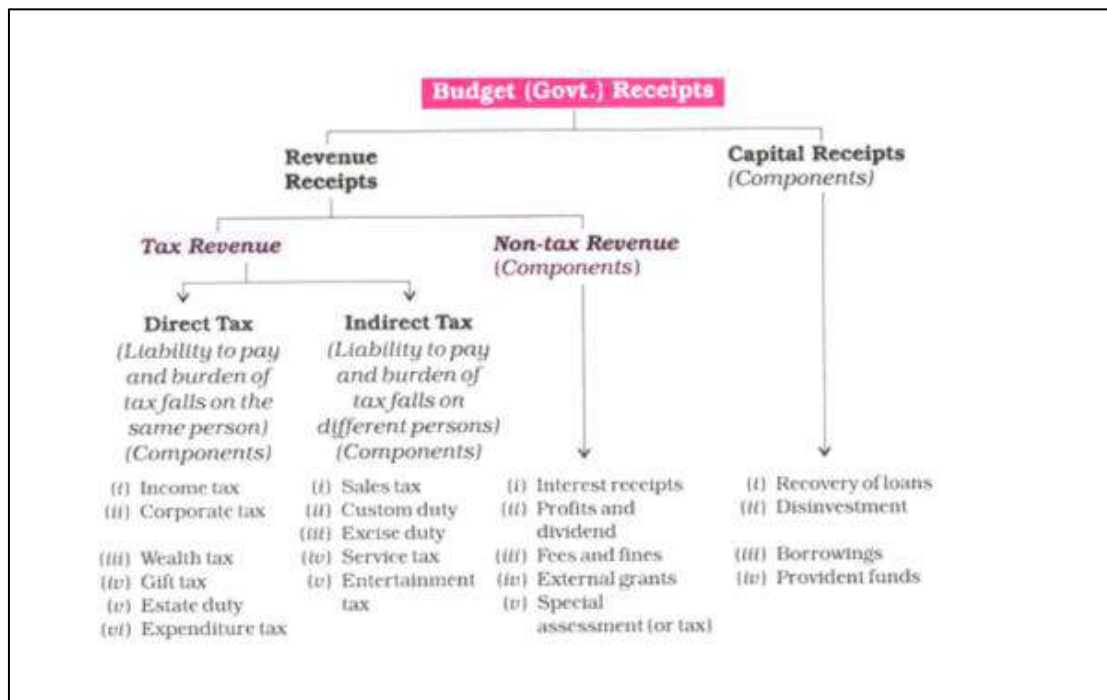


Fig: Budget receipts

Components of Capital and revenue budget:

- Revenue Budget: It consists of the Revenue Expenditure and Revenue Receipts.
- Revenue Receipts: It can be defined as those receipts which neither create any liability nor cause any reduction in the assets of the government. They are regular and recurring in nature and the government receives them in the normal course of activities.
- It includes the proceeds from taxes and other duties levied by the Centre; the interest and dividend it receives on its investments; and the fees and charges the government receives for its services.
- Revenue Expenditure: It is that part of government expenditure that does not result in the creation of assets. Payment of salaries, wages, pensions, subsidies and interest fall in this category as revenue expenditure examples. Also, note that revenue expenses are incurred by the government for its operational needs.
- For example, this includes salaries, interest payments, pension, and administrative expenses.
- Capital Budget: It includes the Capital Receipts and Capital Expenditure.
- Capital Receipts: Capital receipts are receipts that create liabilities or reduce financial assets. They also refer to incoming cash flows. Capital receipts can be both non-debt and debt receipts. Loans from the general public, foreign governments and the Reserve Bank of India (RBI) form a crucial part of capital receipts.
- Capital expenditure: Capital expenditure is the money spent by the government on the development of machinery, equipment, building, health facilities, education, etc. It also includes the expenditure incurred on acquiring fixed assets like land and investment by the government that gives profits or dividend in future.

Conclusion:

- The difference between capital budget and revenue budget is a distinct one with capital budget forecasting the future cash inflows and outflows of capital projects and revenue



budget estimating sales revenue. Making investments should be done after considering both quantitative and qualitative factors properly. Capital budgeting techniques only take into account the financial viability of an investment; thus they should not be the sole criteria for decision making. Furthermore, qualitative factors should also be considered in revenue budgeting in relation to competitor prices and market share.

Q3. How did land reforms in some parts of the country help to improve the socio-economic conditions of marginal and small farmers? (Answer in 150 words)

APPROACH

Introduction:

- Write about land reforms in India.

Body:

- Discuss about significant impact of land reforms in India.
- Discuss how it helped in improvement of socio-economic conditions of marginal and small farmers.
- Discuss the lacunas/challenges associated with land reforms in India.

Conclusion:

- Conclude by saying that an egalitarian society cannot be created until land reforms are undertaken efficiently.

Introduction:

- Land reforms refers to a wide variety of specific programmes and measures to bring about more effective control and use of land for the benefit of the community as a whole. The main objective of the land reforms is to do away with the existing inequalities in the system of landholding and to increase the agricultural productivity. The Five Year Plans aimed to remove the impediments for increase in agricultural production and elimination of exploitation and social injustice within the agrarian system so as to achieve equality and providing opportunities for all sections of the rural society.

Significant impact of land reforms in India:

- Abolition of Zamindari: This reform in the 1950s abolished the zamindari system and acknowledged the 'occupancy rights'(person to whom the land actually belongs) of the peasants. However, it failed to recognize the tiller's rights.
- Tenancy rights: The subsequent land reforms recognised the rights of tenants. According to the Second Five Year Plan, abolition of intermediary tenures and bringing the tenants into direct relations with the state would give the tiller of the soil his rightful place in the agrarian system and provide him with full incentives for increasing agricultural production.
- Land ceiling: The term 'ceiling on land holdings' refers to the legally stipulated maximum size beyond which no individual farmer or farm household can hold any land. Like all other land reforms measures, the objective of such a ceiling is to promote economic growth with social justice.



- Land Consolidation: The term 'Consolidation of holdings' refers to amalgamation and redistribution of the fragmented land with a view to bringing together all plots of land of a cultivator in one compact block.

How Land Reform improved socio-economic conditions of marginal and small farmers:

- Changing over to Market Economy: During the British period, the agrarian and social structure tended to perpetuate a primitive and backward type of agriculture. It put the economy in the state of stagnation for decades together.
- Concentration of Land with Big Landowners: The concentration of land in the hands of big landowners has not undergone any change during the last four decades. It means disparities have not been reduced in the distribution of land holdings but it has enhanced the disparities in property ownership at village level.
- End of Feudalism: According to report of National Commission, "as a result of land reform the feudal and semi- feudal classes have lost their domination over the agrarian Indian economy."
- Growth of Agricultural Labour: Another striking feature of land reforms is that it has led to the rapid growth of landless agricultural labourers. This constitutes about 25 per cent of the agricultural population in the country.
- Leasing of Land owners: One of the important impact of land reforms is that it has paved the way to change the subsistence farming into commercial farming. Commercial and modern agriculture has led to leasing of land by big farmers from small cultivators.

Lacunae/issues of land reforms in India:

- Changes in Land-Use: Apart from the diversion of lands from cultivation to industry, housing, tourism and other nonagricultural uses and the extensive damage to cultivation due to industrial waste, pollution, water extraction by the industries, townships etc., there is a diversion of lands to chemical intensive cultivation due to the growth of agro-processing companies and export oriented cultivation by rich land owners.
- Enhanced demand of agricultural land for non-agricultural purposes, such as infrastructure development, industrialization, and urbanization, as well as tribal lands in hills and forests for mining, mega projects, and industries.
- Displacement of people in the hills and forests caused by development projects: The Scheduled Tribes (STs) and other traditional forest dwellers have customary usufructuary land rights. But because technically and legally, they do not own such land, it is acquired by the government without consulting, compensating and rehabilitating them.
- Complexities of Common Property Regimes: Resources, both natural and manmade, controlled and managed as common property present another challenge in the context of land-related issues. Besides private property or property owned and controlled by the state, common property such as forests, grazing lands, water, and fisheries can also be held and managed through a community resource management system.
- Land Degradation. Patterns of land use also have an impact on soil erosion and land degradation. Given the fragile nature of the ecosystem and land quality that has resulted from such a dependency on chemical inputs, over exploitation of groundwater care must be exercised in determining land-use patterns in the future.

Conclusion:

- An egalitarian society cannot be created until land reforms are undertaken efficiently. With increasing farmer distress, falling productivity levels, and rising suicides, land reforms



provide a means to alleviate rural distress. However, this agenda is still unfinished and needs to be effectively revisited and fairly implemented.

**Q4. How and to what extent would micro-irrigation help in solving India's water crisis?
(Answer in 150 words)**

APPROACH

Introduction:

- Define micro irrigation and give some facts/statistics related to it.

Body:

- Discuss benefits of micro irrigation in solving India's water crisis.
- Mention the challenges in including technologies.

Conclusion:

- Conclude by defining the potential of micro irrigation.

Introduction:

- Micro-irrigation is considered as a prudent Irrigation technology promoted nationally and Internationally to achieve higher cropping Intensity and irrigation Intensity through more focused application of water to crops. As the agriculture sector consumes 80% of the freshwater in India, micro-irrigation is often promoted by central and state governments as a way to tackle the growing water crisis. This is because drip and sprinkler irrigation delivers water to farms in far lesser quantities than conventional gravity flow irrigation.

Facts related to water availability and micro irrigation in India:

- India is facing the twin challenge of water scarcity and population explosion. The ongoing water crisis has affected nearly 600 million people and is expected to only worsen: The country's population is touted to increase to 1.6 billion by 2050.
- The agriculture sector is the largest consumer of water in India. It accounts for approximately 90 per cent of 761,000 billion litres of annual freshwater withdrawals in the country. Per capita consumption of water in agriculture sector ranges from 4,913 to 5,800 kilolitre per capita per year.
- The impact of climate change is much more evident in Indian agriculture, where around 85 per cent farmers are small and marginal and 60 per cent agriculture is dependent upon the vagaries of monsoon. The role of irrigation, therefore, takes the front seat.

How micro irrigation will help in solving India's water crisis:

- Increase in water use efficiency: Micro irrigation helps in significant reduction of water conveyance losses, runoff, evaporation losses, and seepage & deep percolation losses. This ensures higher water use efficiency up to 50-90%.
- Energy Efficiency: Micro irrigation requires minimum pressure and low flow rate only. Hence, this ensures energy consumption saving up to 30.5%. Even small wells and tanks can also be used as a source of water. Since this system requires very low pressure, off-grid farmers can use solar pumps or diesel pumps.



- **Fertilizer Use Efficiency:** Proper mixing of fertilizers and water, control of optimum dosage and direct application of fertilizers to the root zone result in the saving in fertilizer consumption up to 28.5%.
- **Productivity increase:** The crop yield (quantity and quality) is increased and the enhancement of productivity is estimated for fruits & crops up to 42.4 % and for vegetables up to 52.7%. This ensures good economic return for the better yields.
- **Irrigation cost saving:** This technology reduces the overall cost of irrigation due to decrease in labour requirement for irrigation, weeding and fertilizer application. Irrigation cost saving is up to 31.9%.
- **Increase in farmers' income:** The average income of all beneficiaries in all 13 districts was found to be increased up to 42%. More focused and judicious use of water and nutrients result in good quality produce and increase in farmers' income. Moreover, the reduction in spacing between the plants can accommodate more number of plants.

Issues related to inclusion of technology:

- **Electricity:** Uninterrupted availability of electric power is required. The electricity unavailability in India affects the timing and supply of water to crops because the crop water requirement in farms neither coincides nor follows India's timing of power availability or unscheduled power outages.
- **Expensive:** The second impediment to micro-irrigation in India is the expense of the system itself. The adoption of this technology has high initial costs.
- **Declining landholdings and farm income:** The data on India's operational landholdings shows that the average size of landholdings has halved since the 1960s. The meagre farm income from declining landholdings challenges the sustainability of expensive micro-irrigation on Indian farms.
- **Maintenance:** Micro-irrigation systems normally have greater maintenance requirements. Soil particles, algae, or mineral precipitates can clog the emission devices.
- **Water availability:** Though the average water availability in India remains more or less fixed according to the natural hydraulic cycle, per capita availability is reducing progressively owing to the increasing population.

Conclusion:

- Total water demand from agriculture sector is around 80%, any effort for saving irrigation water will contribute to water use efficiency. There are many benefits of micro irrigation which can be listed as increase in water use efficiency, optimum dosage of fertilizer and proper mixing, reduction in the cost of cultivation, reduce drudgery, conserve water resources etc. Increase in the quantity and quality of crop yield is another notable benefit. Proper mixing and the direct application of fertilizers to the root zone results in the saving in fertilizer consumption.



Q5. How is S-400 air defence system technically superior to any other system presently available in the world? (Answer in 150 words)

APPROACH

Introduction:

- Briefly introduce about the S-400 defence system.

Body:

- Mention how it is superior to any other system present in the world.

Conclusion:

- Conclude by writing how India has planned to include it in the defence system.

Introduction:

- It is Russia's most advanced new generation surface-to-air missile system capable of intercepting intercontinental ballistic missiles (ICBM). It can also target hypersonic cruise missiles and can intercept ballistic missiles within a range of 600kms. It can be deployed easily and has an airborne engagement range of 400-500km.

How it is superior to any other system presently available in the world:

- Capable of handling multiple objects: It is capable of simultaneously tracking numerous incoming objects including aircraft, missiles and UAVs in a radius of a few hundred kilometres and launching appropriate missiles to neutralise them.
- It is capable of protecting its air defence bubble against rockets, missiles, cruise missiles and even aircraft. It is capable of engaging any target over a long range of 400kms at 27kms altitude. It also, has the capacity to simultaneously engage 36 targets.
- Radars: It has radars that can pick up an incoming object up to a distance of 1,000 kilometres, track several dozen incoming objects simultaneously, distribute the targets to missile systems and ensure a high success rate. While, its radars are capable of detecting low-signature targets, it comes with an electronic counter-counter measures to thwart any jamming attempts by the enemies.
- Range of targets: S-400 has been specifically designed to detect and destroy a range of targets including strategic bombers, aircraft used for electronic warfare, early warning, and reconnaissance; and even fighter jets such as F-16 and F-22.
- Cost: While it is a fraction of the cost of its western counterparts such as THAAD or patriot, it can protect a much larger area, as compared to Iron Dome used by Israel.
- Capability: Another capability of S-400 is its "fire-and-forget capability" which does not require further guidance after the launch and can hit the target without the launcher being in line-of-sight of the target.
- Mobility: The S-400 is fully mobile and each system has a 3D phased array acquisition radar that can track around 300 targets up to 600 km.



India inks S-400 Triumpf deal with Russia

India has signed a \$ 5.43 billion (about ₹ 40,000 crore) deal with Russia to procure five S-400 Triumpf advanced air defence missile systems

S-400 Triumpf Features

Can engage all types of aerial targets including aircraft, unmanned aerial vehicles and all types of missiles

Locates targets at 600 km and can destroy them at 400 km range, up to an altitude of 30 km

The system can engage multiple targets simultaneously

Integrates:

- Multifunction radar
- Anti-aircraft missile systems
- Launchers
- Autonomous detection and targeting systems
- Command and control centre

Range of missiles:

Capable of firing different types of missiles to create a layered defence shield

• 40N6: 400 km	• 9M96E2: 120 km
• 48N6: 250 km	• 9M96E: 40 km

Fig: S-400

Conclusion:

- India and the US have a comprehensive global strategic partnership” and “India has a special and privileged strategic partnership with Russia”, so it can be said that “India has always pursued an independent foreign policy. This also applies to our defence acquisitions and supplies which are guided by our national security interests.

Q6. Explain the purpose of the Green Grid Initiative launched at World Leaders Summit of the COP26 UN Climate Change Conference in Glasgow in November, 2021. When this idea was first floated in the International Solar Alliance (ISA)? (Answer in 150 words)

APPROACH

Introduction:

- Give brief introduction about Green grid initiative.

Body:

- Mention the purpose of it.
- Mention when this idea was first floated in ISA.
- Discuss challenges associated with it.

Conclusion:

- Conclude on a positive note.

Introduction:

- The Green Grids Initiative aims to interconnect solar energy infrastructure. That is, under the initiative trans national electricity grids will be developed to deliver solar power. The grid built under the initiative is called One Sun One World Grid or Green Grids Initiative One



Sun One World Grid. It was launched at the COP26 summit in Glasgow in November 2021. The initiative was launched jointly by India and UK.

Purpose of Green grid initiative:

- GGI-OSOWOG will provide technical, commercial, and scientific collaboration to assist enable cross-border renewable power transfer projects, which will give OSOWOG its worldwide infrastructure.
- It targets to interconnect solar energy infrastructure under the initiative of trans-national electricity grids that will be developed to deliver solar power.
- It aims to bring together the financial organizations, an international coalition of national governments, and power system operators.
- It will accelerate the construction of new infrastructures such as the electricity interconnectors, charging points, and flexible grids that are needed to deliver affordable, reliable, and secure power across the globe.
- A transnational grid would allow countries to source solar power from regions where it is daytime to meet their green energy needs even when their own installed solar capacity is not generating energy.
- OSOWOG initiative is a possible solution for driving down the need for storage, which in effect will reduce the costs of the energy transition.

The idea for the single global grid for solar was first outlined at the first assembly of International Solar Alliance in the late 2018 by the Indian Prime Minister 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.

Challenges associated with Green grid initiative:

- The transmission of power across vast distances would require large capital investment to set up long transmission lines.
- The first step of OSOWOG would be solar power transfer between neighbouring countries.
- India, Bhutan, Bangladesh, Myanmar and Nepal already share transmission capacity for energy transfer across borders which can be expanded further and utilised for the transfer of solar power between these countries.
- The International Solar Alliance has commissioned a study the feasibility of the OSOWOG project.
- The study will make an assessment on a country-by-country basis, examining projected power demand and supply as well as the renewable energy resource potential.

Conclusion:

- The move is the key to future renewable-based energy systems globally because regional and international interconnected green grids can enable sharing and balancing of renewable energy across international borders. It allows grabbing opportunities to learn quickly from global developments and share renewable energy resources to reduce the global carbon footprint and insulate the societies from pandemics. Institution building is key to fulfilling the ambitions of a multi-country grid project.



Q7. 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? (Answer in 150 words)

APPROACH

Introduction:

- Give brief introduction about the WHO and its guidelines.

Body:

- Mention facts related to pollution in India.
- Mention the key points of revised Global Air Quality Guidelines.
- Differentiate between 2005 and 2021 guidelines.
- Mention the changes required in NCAP as per the guidelines.

Conclusion:

- Conclude accordingly.

Introduction:

- The World Health Organisation (WHO) in its first-ever update since 2005 has tightened global air pollution standards in a recognition of the emerging science in the last decade that the impact of air pollution on health is much more serious than earlier envisaged.

Facts related to pollution in India:

- India continues to remain one of the most polluted areas in the world, with pollutant levels several times higher than recommended levels.
- For example, a Greenpeace study found the average concentration of PM_{2.5} in New Delhi in 2020 to be nearly 17 times higher than the recommended levels.
- In Mumbai, pollution levels were eight times higher; in Kolkata, over nine times higher; and in Chennai, over five times higher.
- According to experts of Global Burden of Disease study, over 95% of India's population already lived in areas where pollution levels were higher than WHO's 2005 norms.
- India's own national air quality standards are much more lenient, even compared to WHO's 2005 norms.
- For example, the recommended PM_{2.5} concentration over a 24-hour period is 60 micrograms per cubic metre, compared to 25 micrograms advised by WHO's 2005 guidelines.

Key points of WHO revised Global Air Quality Guidelines (AQGs):

- WHO's Global Air Quality Guidelines (AQGs) outlines the recommended air quality levels to protect the health of populations based on the latest scientific evidence from across the world.
- In 2021 WHO announced limits for six pollutant categories —particulate matter (PM) 2.5 and 10, ozone (O₃), nitrogen dioxide (NO₂) sulphur dioxide (SO₂) and carbon monoxide (CO) – and tightened global air pollution standards.
- WHO's latest move in 2021 tightening norms sets the stage for eventual shifts in policy in the government towards evolving newer stricter standards. I.e., this will soon become part



of policy discussions — much like climate targets to reduce greenhouse gas emissions keep getting stricter over time.

- Once cities and States are set targets for meeting pollution emission standards, it could lead to overall changes in national standards.
- The move doesn't immediately impact India as the National Ambient Air Quality Standards (NAAQS) don't meet the WHO's existing standards.

Difference between the new guidelines from 2005 guidelines:

Pollutants		WHO New AQG (2021)	WHO Old AQG (2005)
PM2.5, µg/m ³	Annual	5	10
	24-hour	15	25
PM10, µg/m ³	Annual	15	20
	24-hour	45	50
O ₃ , µg/m ³	Peak season	60	
	8-hour	100	120
NO ₂ , µg/m ³	Annual	10	40
	24-hour	25	
SO ₂ , µg/m ³	24-hour	40	40
CO, mg/m ³	24-hour	4	

Fig: WHO vs NAAQS

Changes required in National clean Air programme:

- Need stronger mandate: It is necessary to create a firm mandate with a strong legal back up for cities and regions to implement NCAP in a time bound manner for effective reduction.
- Higher ambitions: It needs to be told with a clear rider that NCAP should not become only a top-down prescriptive approach.
- The NCAP will have to create enough room for tighter action that can be even stronger than the common minimum national programme as defined by NCAP.
- Need litmus test for effectiveness: NCAP has certainly helped kick start the much-awaited good practice of setting air pollution reduction targets.
- It is necessary to find and outline our very own regulatory and market-based solutions without being draconian.
- Need fiscal strategy: NCAP cannot be sustainable nor can it gain strength or make a difference on a longer-term basis if it does not have a clear fiscal strategy.

Conclusion:

- Air pollution is a threat to health in all countries, but it hits people in low- and middle-income countries the hardest. WHO's new Air Quality Guidelines are an evidence-based and practical tool for improving the quality of the air on which all life depends.



Q8. 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. (Answer in 150 words)

APPROACH

Introduction:

- Start by appreciating facts related to India's vulnerability towards earthquakes.

Body:

- Discuss the geographical angle of the earthquakes in India, its vulnerability and risks.
- Explain the salient feature of major disaster caused by earthquake in different parts of India.

Conclusion:

- Conclude with way forward.

Introduction:

- India has a very high frequency of great earthquakes. The reasons of high magnitude earthquakes in India are hidden in the tectonic setting of India. India is currently penetrating into Asia at a rate of approximately 45 mm/year and rotating slowly anticlockwise. Since Tibet is extending east-west, there is a convergence across the Himalaya that results in the development of potential slip available to drive large thrust earthquakes beneath the Himalaya at roughly 1.8 m/century.

Vulnerability of India to earthquake and related hazards:

- As per the latest seismic zone map, around 59 per cent of India's land area is vulnerable to moderate or severe seismic hazard, implying that it is prone to shaking of MSK intensity VII and above. In the recent past, most Indian cities have witnessed the phenomenal growth of multi-storied buildings, super malls, luxury apartments and social infrastructure as a part of the process of development.
- According to BIS, more than 58.6 percent of the landmass is prone to earthquakes of moderate to very high intensity. The occurrence of the Killari earthquake in 1993 resulted in revision of the seismic zoning in India with the low hazard zone or Seismic Zone I being merged with Seismic Zone II.
- The rapid expansion of the built environment in moderate or high-risk cities makes it imperative to incorporate seismic risk reduction strategies in various aspects of urban planning and construction of new structures.
- Andaman & Nicobar Islands frequently experience damaging earthquakes due to being situated on an inter-plate boundary.
- Increasing use of high-technology equipment, susceptible to small vibrations, in industry and academia, or underground utilities for electricity, internet etc. have increased susceptibility to disruption from relatively moderate ground shaking
- Regions in Himalayan foothills are vulnerable to liquefaction and landslides due to earthquakes.



Fig: Vulnerability zones in India

Salient features of major disasters caused by earthquakes over last 3 decades:

- 1993 Latur: 6.2 magnitude; relatively shallow depth caused large surface damage; causes remain debatable due to lack of plate boundaries in the region.
- 1999 Chamoli: Caused by thrust fault; resulted in landslides, changes in surface water flow, surface rupture and disconnected valleys.
- 2001 Bhuj: An earthquake measuring 7.7 on the Richter scale hit Gujarat in 2001 killed more than 13,000 people lost their lives in the first 82 seconds itself.
- 2004 Tsunami: On December 26, 2004, one of the world's deadliest tsunamis killed over 2,30,000 people in 14 different countries, mostly in Indonesia. It originated in the Indian Ocean and wreaked havoc on multiple countries including India. Minutes after the earthquake, the waves hit Andaman and Nicobar islands. In mainland India, Tamil Nadu and Andhra Pradesh were worst affected and the death toll in India itself crossed 18,000.
- 2005 Kashmir: 7.6 magnitude; Caused by severe upthrust of Indian plate against Eurasian plate, it created multiple after-shocks. Infrastructure and communication were disrupted.

Conclusion:

- India's vulnerability to various earthquake hazards requires astute handling and long-term planning. The reconstruction at Bhuj after the 2001 earthquake is an instructive example.



Q9. 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. (Answer in 150 words)

APPROACH

Introduction:

- Start the answer by writing the link between money laundering and globalization.

Body:

- How globalization impacts money laundering.
- Mention the measures taken to tackle problem of money laundering at national and international level.

Conclusion:

- Conclude on a positive note.

Introduction:

- According to Interpol General Secretariat Assembly in 1995, money laundering is any act or attempted act to conceal or disguise the identity of illegally obtained proceeds so that they appear to have originated from legitimate sources. India is extensively gripped under crime of money laundering. Money laundering is usually used by criminals to hide money made through illegal act. It is the process by which huge amount of money obtained unlawfully, from drug trafficking, terrorist activity or other severe crimes.

Impact of emerging technologies on Money laundering:

- Rapid developments in financial information, technology and communication allow money to move anywhere in the world with speed and ease. This makes the task of combating money-laundering more urgent than ever.
- Visibility and Auditing of customer activities, customer information, unregular activities for analysis and comparison .Encrypted conversations facilitate exchange of information about money laundering. For eg: Whatsapp encrypted conversations etc.
- Large volume of digital transactions at online market places is used to disguises the structured chunks of layered money. Eg: Cryptocurrency, Blockchain technology etc.
- Identity theft through hacking of credit card information etc. Is used to layer illegitimate money under untraceable identities.

Impact of Globalisation on Money laundering:

- The deeper "dirty money" gets into the international banking system, the more difficult it is to identify its origin. Because of the clandestine nature of money-laundering, it is difficult to estimate the total amount of money that goes through the laundry cycle.
- There have been a number of developments in the international financial system that have made the three F's-finding, freezing and forfeiting of criminally derived income and assets-all the more difficult.
- These are the "dollarization" (i.e. the use of the United States dollar in transactions) of black markets, the general trend towards financial deregulation, the progress of the Euromarket and the proliferation of financial secrecy havens.



- Fuelled by advances in technology and communications, the financial infrastructure has developed into a perpetually operating global system in which “megabyte money” (i.e. money in the form of symbols on computer screens) can move anywhere in the world with speed and ease.

Measures taken to tackle problems of money laundering:

At international level:

- The Vienna Convention: This convention laid down the groundwork for efforts to combat money laundering by obliging the member states to criminalize the laundering of money from drug trafficking. It promotes international cooperation in investigations and makes extradition between member states applicable to money laundering.
- The financial action task force (FATF): India is a full-fledged member of FATF. It will help India to build the capacity to fight terrorism and trace terrorist money and to successfully investigate and prosecute money laundering and terrorist financing offences.
- Basel Committee’s Statement of Principles: It seeks to deny the banking system to those involved in money laundering by the application of the four basic principles namely, identifying the customer, compliance with the laws, cooperation with Law Enforcement Agencies and adherence to the Statement.

At national level:

- Prevention of Money: laundering Act, 2002 amended in 2005, 2009, 2012, and 2018: The Act and Rules impose obligation on banking companies, financial institutions, and intermediaries to verify identity of clients, maintain records and furnish information in prescribed form. It seeks to
 - Prevent and control money laundering
 - Confiscate and seize the property obtained from the laundered money; and
 - Deal with any other issue connected with money laundering in India.
- Financial Intelligence Unit: India (FIU-IND): FIU-IND is a central agency of a Government of India, that: receives financial information pursuant to country's anti-money laundering laws; analyses and processes such information; and disseminates the information to appropriate national and international authorities, to support anti-money laundering efforts.
- The Black money (undisclosed foreign income and assets) and Imposition of Tax Act, 2015: To deal with the menace of the black money existing in the form of undisclosed foreign income and assets by setting out the procedure for dealing with such income and assets.
- Benami Transactions (Prohibition) Amendment Bill, 2015: It aims to expand the definition of Benami Transactions and specifies the penalty to be imposed on a person entering into a Benami transaction.
- Anti-money laundering/counter financing of terrorism (AML/CFT): guidelines for general insurers, 2013: Each insurance company has to establish and implement policies, procedures, and internal controls/audit in its AML/CFT program. Insurers are also required to maintain records of their transactions under these guidelines.

Conclusion:

- The evolving threats through the evils of money laundering can be effectively supported by emerging technologies, big data and artificial intelligence. Both international and national stakeholders need to come together by strengthening data sharing mechanisms and adopting a multilateral approach to effectively eliminate the problem of money laundering. Money laundering plays a role in multiplying the criminal activities as it gives economic



power to criminals. There needs to be Continuous up-gradation and dissemination of information is necessary.

Q10. Keeping in view India's internal security, analyse the impact of cross-border cyber attacks. Also discuss defensive measures against these sophisticated attacks. (Answer in 150 words)

APPROACH

Introduction:

- Start by mentioning the recent facts/data related to cyber attack.

Body:

- Analyse the impact of cross border cyber attacks.
- Discuss the measures to tackle these attacks.

Conclusion:

- Conclude on a positive note.

Introduction:

- India is the third most vulnerable country to Cyber attacks according to Internet Security Threat report published by Symantec. According to EY's latest Global Information Security Survey (GISS) 2018-19 – India edition, one of the highest number of cyber threats have been detected in India, and the country ranks second in terms of targeted attacks. Although Banking and Telecom are the most attacked sectors but Manufacturing, Healthcare, and Retail have also faced a significant number of cyber attacks.

Recent cross border cyber attacks in India:

- Recently, the power ministry has shed light on the attempts of 'Red Echo' – a Chinese hacker group, to target Indian critical information technology infrastructure including the control centre of power systems in India.
- India's national airline Air India has said a cyber-attack on its data servers affected about 4.5 million customers around the world. The breach was first reported to the company in February 2021.
- Nearly 1.16 million cases of cyberattacks were reported in 2020, up nearly three times from 2019 and more than 20 times compared to 2016, according to government data. On an average, 3,137 cyber security-related issues were reported every day in 2020.
- More than 4,000 fraudulent portals emerged within two months, and on a typical day in April 2020, Google alone blocked 240 million spam messages and 18 million phishing scams.
- In 2016, banks had reportedly announced a leak of personal information of 3.2 million debit cards.
- In 2018, Pune-based Cosmos Bank lost Rs 94 crore in a malware attack. In 2019, the Kudankulam plant was attacked using malware.



Impact of cross-border cyber attack in India:

- According to the Data Security Council of India, India has been the second most cyber attacks affected country where Cyber crimes in India have caused Rs 1.25 lakh crore loss in 2019.
- Affects the Confidentiality, Integrity and Availability of information.
- Cyber attacks on these critical information infrastructure can bring the entire country to a grinding halt.
- Affect the National Security and peace and stability of a country.
- As in case of the Individuals personal information and privacy faces the most dangerous situation.
- Companies possessing crucial data and information on their systems in times of an cyber attack may lead to loss of competitive information, loss of employees/customers private data resulting into complete loss of public trust on the integrity of the organization.
- A local, state or central government maintains huge amount of confidential data related to country (geographical, military strategic assets etc.) and citizens. Unauthorized access to the data can lead to serious threats on a country.
- There are certain inherent vulnerabilities that cannot be removed.
- The effect of the attack too can outpace the defence technology, security of the country.

Defensive measures against the sophisticated attacks:

- The International Telecommunication Union (ITU) released Global Cyber Security Index in 2017 where India was placed at 23rd rank among 165 countries. The relatively higher ranking of India shows that India has taken adequate measures for the protection of cyber space.
- National Cyber Security Policy 2013 Established National Critical Information Infrastructure Protection Centre (NCIIPC) to improve the protection and resilience of the country's critical infrastructure.
- CERT-IN: has an objective of securing Indian cyberspace. The purpose of CERT-In is to respond to computer security incidents, report on vulnerabilities and promote effective IT security practices throughout the country.
- Cyber Surakshit Bharat Initiative: spreads awareness about cybercrime and building capacity for safety measures for Chief Information Security Officers (CISOs) and frontline IT staff across all government departments.
- The National Cyber Coordination Centre (NCCC): It seeks to generate necessary situational awareness of existing and potential cyber security threats and enable timely information sharing for proactive, preventive and protective actions by individual entities.
- The Information Security Education and Awareness Project (ISEA) where there is Training of personnel to raise awareness and to provide research, education and training in the field of Information Security.

Conclusion:

- Despite having so many challenges Indian government stand strong and there is a need for the Appointment of Chief Information Security Officer in all the Organisations and upgrading the security system to secure cyber ecosystem.



Q11. Do you agree that the Indian economy has recently experienced V- shapes recovery? Give reasons in support of your answer. (Answer in 250 words)

APPROACH

Introduction:

- Begin by defining what V-shaped recovery is.

Body:

- Give data and draw a graph to show that India has had a V-shaped recovery after the Impact of COVID19 in the years 2020 and 2021.
- Suggest a few steps that India can take to mitigate the impact of COVID and ensure growth in the economy.

Conclusion:

- Conclude with a relevant way forward.

Introduction:

- A V-shaped recovery occurs when an economy that has experienced a sharp economic decline experiences a rapid and strong rebound. Such recoveries are typically accompanied by a significant shift in economic activity as a result of a rapid re-adjustment of consumer demand and business investment spending. A V-shaped recovery can be thought of as the best-case scenario for an economy in recession because of the economy's rapid adjustment and quick recovery in the major metrics of macroeconomic performance.

Yes, India has experienced V-shaped recovery:

- As per to the Economic Survey 2020-21, the Indian economy is on its way to a significantly faster growth recovery following the 'once-in-a-century' Covid-19 disaster. After the epidemic destroyed all important sectors of growth and disrupted demand, the survey predicts a 'V-shaped' economic recovery for the country.
- As per the study, India's economic growth will be 7.7 percent, in keeping with past government advanced forecasts of growth. Despite an annual decrease, India's efforts enabled the country greatly reduce the impact of Covid-19 on economic growth.
- Infrastructure: Demand-side initiatives were announced in a measured manner during the unlock phase. A public investment programme centered on the National Infrastructure Pipeline is likely to hasten this demand drive and further the recovery.
- Social reforms: Another important point raised in the Economic Survey was the need for structural reforms to alleviate supply-side concerns. "As part of the Atmanirbhar Bharat Mission, India started a spate of multi-sectoral supply-side structural changes to add flexibility and resilience to supply chains."



V-SHAPED RECOVERY

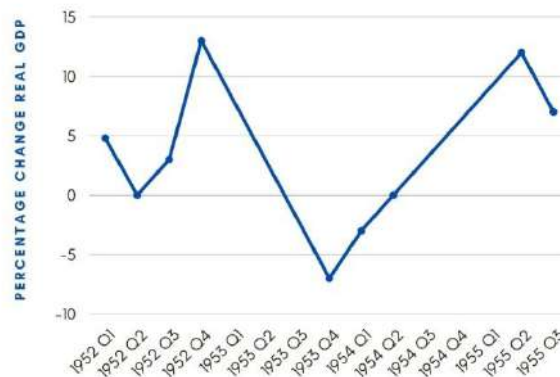
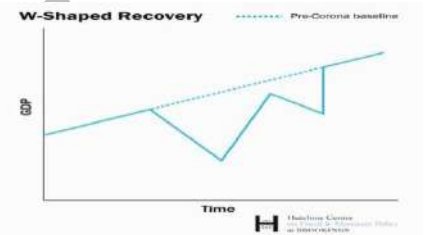


Fig: V-shaped recovery

No, India has not experienced V-shaped recovery:

- Method used: The government claimed that India was experiencing a V-shaped recovery by using the Year-on-Year (Y-o-Y) comparison method, which indicated that GDP expanded by 20% in Q1 this year compared to Q1 last year. Critics of the administration adopted the Quarter-On-Quarter (Q-o-Q) approach, which revealed that the economy fell by 17 percent in Q1 this year compared to Q4 (January, February, and March) of the previous fiscal year, to suggest that the economy was rapidly losing momentum.
- Non-uniform spread of COVID-19: The spatial and temporal spread of the pandemic has varied with varied impact on different regions and different sectors of economy. For instance, non-aggressive spread in eastern states helped sustain growth of agriculture
- Instead K shaped recovery: Many economists also suggest that India is witnessing K shaped recovery post lockdown. Following a recession, different areas of the economy recover at different speeds, times, or magnitudes, resulting in a K-shaped recovery. This is in contrast to a consistent, uniform recovery throughout sectors, industries, or populations.
- External factors: Strong integration of the Indian economy with the global economy in addition to skewed import dependence of Indian economy has impacted domestic recovery in different sectors in peculiar ways, such as disruptions from slowdown in import of raw goods and export of finished products.



Conclusion:

- This far-sighted policy response will generate productivity gains in the medium to long term. These reforms primarily focus on strengthening the potential of primary and secondary sectors of the economy to create jobs.

Mains marks maximize:

- W-shaped recovery: A W-shaped recovery is a dangerous creature. In this, growth falls and rises, but falls again before recovering, thus forming a W-like chart. The double-dip depicted by a W-shaped recovery can be due to the second wave of the pandemic.



- L-shaped recovery: In this, the economy fails to regain the level of GDP even after years go by. The shape shows that there is a permanent loss to the economy's ability to produce.

Q12. "Investment in infrastructure is essential for more rapid and inclusive economic growth." Discuss in the light of India's experience. (Answer in 250 words)

APPROACH

Introduction:

- Start with key data on the current status of infrastructure in the country.

Body:

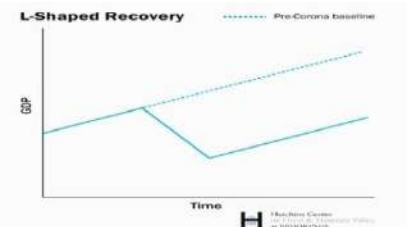
- Give a brief outline of India's Infrastructure journey (e.g. key schemes of the government and its benefits).
- Discuss briefly the challenges India is facing.
- Then in detail give how investment in Infrastructure will bring about economic and inclusive growth e.g. creation of jobs, more entrepreneurship, increasing value of assets and thus income, benefits for farmers, etc.

Conclusion:

- Conclude with the way forward.

Introduction:

- Infrastructure sector is a key driver for the Indian economy. The sector is highly responsible for propelling India's overall development and enjoys intense focus from Government for initiating policies that would ensure time-bound creation of world class infrastructure in the country. Infrastructure sector includes power, bridges, dams, roads, and urban infrastructure development.



Investment in infrastructure is essential for more rapid and inclusive economic growth:

- Creates employments and reduces poverty: Infrastructure development promotes inclusive growth and poverty reduction by creating new jobs and economic activities; lowering production and transportation costs through improved transportation and connectivity; increasing overall production capacity; connecting markets and other economic facilities that may extend beyond the country; and improving access to key facilities such as health, education, and other basic services.
- Reduces income disparity: It should be highlighted that good quality infrastructure is critical not only for faster economic growth but also for inclusive growth. By inclusive growth, we mean that the advantages of growth are shared by the majority of a country's inhabitants. As a result, inclusive growth will alleviate poverty and reduce income disparity in the country.
- Building enterprises: Micro, small, and medium-sized enterprises (MSME) are dispersed throughout the economy, and their production and growth require access to quality and dependable infrastructure services in order to compete efficiently with large-scale enterprises, which can often build some of their own infrastructure, such as installing their own small power plants or generators.



- **Transportation and accessibility:** Furthermore, large-scale businesses might position themselves near ports and transportation hubs where the necessary infrastructure is accessible.
- **Empower small scale industries:** Small businesses are extensively spread across the economy and must rely on the provision of general infrastructure amenities. Thus, constructing general infrastructural facilities enables small businesses to compete successfully with big-scale companies, while being labor-intensive generates a significant number of job possibilities. This will aid in the alleviation of poverty in developing countries.
- **Farmer infrastructure and investment:** Infrastructure expansion, such as irrigation, rural electrification, highways, and road transport, would encourage agricultural growth and the establishment of agro-processing enterprises. These general infrastructure facilities will assist farmers and owners of processing companies in obtaining raw materials, fertilizers, and other inputs at a low cost, as well as in transporting their goods to markets in large towns and cities.

Government initiative in Infrastructure sector:

- The initiative 'Infrastructure for Resilient Island States' (launched in November 2021) will give India a huge opportunity to contribute to the betterment of other vulnerable countries in the world.
- Cabinet of India approved the PM GatiShakti National Master Plan—including implementation, monitoring and support mechanism—for providing multi-modal connectivity.
- Government initiatives such the National Infrastructure Pipeline, National Monetisation Pipeline, Bharatmala Pariyojana, changes in the Hybrid Annuity Model (HAM) and fast pace of asset monetization to boost road construction.
- In August 2021, the Government of India, the Central Water Commission (CWC), government representatives from 10 participating states and the World Bank signed a US\$ 250 million project to support the Indian government's long-term dam safety programme and improve safety and performance of existing dams across various states.

Conclusion:

- Infrastructure is a key driver of the overall development of Indian economy. It is seen that investments in infrastructure equal to 1% of GDP will result in GDP growth of at least 2% as infrastructure has a "multiplier effect" on economic growth across sectors. The recent headway made in developing transport infrastructure will prove to be the biggest enabler for growth. An efficient infrastructure is the biggest enabler for growth. India's growth story should no longer be impeded by a lack of infrastructure, and the fruits of this growth should reach everyone in the remotest part of the country.



Q13. What are the salient features of the National Food Security Act, 2013? How has the Food Security Bill helped in eliminating hunger and malnutrition in India? (Answer in 250 words)

APPROACH

Introduction:

- Give brief introduction about NFSA.

Body:

- Discuss salient features of NFSA 2013.
- Mention how it has helped in eliminating hunger and malnutrition in India.

Conclusion:

- Conclude on a positive note.

Introduction:

- India has made rapid strides in improving rates of under- and malnutrition. Between 2006 and 2016, stunting in children below five years declined from 48% to 38%. Yet, India continues to have one of the world's highest child undernutrition rates, impacting the child's health and development, performance in school and productivity in adult life.
- The objective is to provide for food and nutritional security in human life cycle approach, by ensuring access to adequate quantity of quality food at affordable prices to people to live a life with dignity.

Salient features of the National Food Security Act, 2013:

- Coverage and entitlement under Targeted Public Distribution System (TPDS): Up to 79.56% of the rural population and 64.43% of the urban population will be covered under TPDS, with uniform entitlement of 5 kg per person per month.
- State-wise coverage: Corresponding to the all India coverage of 75% and 50% in the rural and urban areas, State-wise coverage will be determined by the Central Government. Planning Commission has determined the State-wise coverage by using the NSS Household Consumption Survey data for 2011-12.
- Subsidised prices under TPDS and their revision: Food-grains under TPDS will be made available at subsidised prices of Rs. 3/2/1 per kg for rice, wheat and coarse grains for a period of three years from the date of commencement of the Act.
- Identification of Households: Within the coverage under TPDS determined for each State, the work of identification of eligible households is to be done by States/UTs.
- Maternity Benefit: Pregnant women and lactating mothers will also be entitled to receive maternity benefit of not less than Rs. 6,000.
- Women Empowerment: Eldest woman of the household of age 18 years or above to be the head of the household for the purpose of issuing of ration cards.
- Grievance redressal Mechanism: Grievance redressal mechanism at the District and State levels. States will have the flexibility to use the existing machinery or set up separate mechanism.
- Transparency and Accountability: Provisions have been made for disclosure of records relating to PDS, social audits and setting up of Vigilance Committees in order to ensure transparency and accountability.



Role of Food security bill in eliminating hunger and Malnutrition:

- Decrease in undernourishment: As per the UN report number of undernourished people in India has declined by 60 million between 2006 to 2019.
- Food grains: Improved access to food grains has improved the hunger outcomes amongst the poor and underprivileged.
- Resilience: Wide coverage of the 2/3rd population have increased resilience in the poor against income shocks.
- Stunting decreased: Stunting in children under 5 years of age, according to the UN report have decreased from 47.8% in 2012 to 34.7% in 2019.
- Healthy food: Monetary compensation has compensated against wage loss during pregnancy. PWLM can now access to healthier food options like fruits, vegetables etc.
- Asha worker: The awareness generated by the Asha workers have increased the number of infants who were exclusively breastfed from 11.2 million in 2012 to 13.9 million in 2019.

Conclusion:

- The basic concept of food security globally is to ensure that all people, at all times, should get access to the basic food for their active and healthy life and is characterized by availability, access, utilization and stability of food. Though the Indian Constitution does not have any explicit provision regarding right to food, the fundamental right to life enshrined in Article 21 of the Constitution may be interpreted to include right to live with human dignity, which may include the right to food and other basic necessities.

Q14. What are the present challenges before crop diversification? How do emerging technologies provide an opportunity for crop diversification? (Answer in 250 words)

APPROACH

Introduction:

- Give brief introduction about crop diversity in India and related facts.

Body:

- Write about the challenges before crop diversification in India.
- Mention about the emerging technologies for crop diversification.

Conclusion:

- Conclude by including the importance of crop diversification.

Introduction:

- India is a country of about one billion people. More than 70 percent of India's population lives in rural areas where the main occupation is agriculture. Indian agriculture is characterized by small farm holdings. The average farm size is only 1.57 hectares. Around 93 percent of farmers have land holdings smaller than 4 ha and they cultivate nearly 55 percent of the arable land.
- Crop diversification refers to the addition of new crops or cropping systems to agricultural production on a particular farm taking into account the different returns from value-added crops with complimentary marketing opportunities. It refers to the crops, crop sequences and management techniques used on a particular agricultural field over a period of years.



Challenges before crop diversification:

- Impact of Green Revolution: There has been shift towards Mono cropping of wheat and rice at cost of coarse grains (Government policy of MSP).
- Monsoon Dependence: Around 55% of India's Cultivable Land is Rain-fed with heavy dependence on monsoon.
- Fragmented land holding: It makes it difficult to use efficient modern technology on large scale, raises cost of land boundary management, land disputes etc.
- Shift from Food crops to Commercial Crops: This especially includes Cotton in Deccan belt; and Sugarcane in Green revolution belt and Krishna-Godavari basin.
- Human factors: Heavy Population Pressure on agriculture and continuation of subsistence farming
- Technical Factors: Lack of High Yielding Varieties (HYV) of seeds, usage of old implements, lack of weather forecasting usage amongst others.
- Institutional factors: It includes defective land tenure system (leading to land fallowing), improper marketing and processing of perishable products (e.g vegetables, fruits).
- Infrastructural Factors: Poor basic infrastructure like rural roads, power, transport, communications etc. Along with inadequate post-harvest processing infrastructure.

Emerging Technologies and opportunities provided by them:

- Soil and Water Sensors: These sensors can monitor moisture and nitrogen levels, and the farm can use this information instead of relying on a predetermined timetable to determine when to irrigate and fertilize. This not only saves money by making better use of resources, but it also helps the farm be more environmentally friendly by conserving water, controlling erosion, and lowering fertilizer levels in local rivers and lakes.
- Weather Tracking: Farmers can use this technology to get enough prior notice of frost, hail, and other weather events so that they can take preparations to protect their crops or at the very least limit losses.
- Satellite Imaging: Crop imagery allows a farmer to inspect crops as if he or she were standing there, but without having to do so. Even analysing photographs once a week can save a farm a significant amount of time and money. Additionally, this technology can be combined with crop, soil, and water sensors to provide farmers with notifications as well as suitable satellite imagery when danger thresholds are exceeded.
- Vertical Farming: Vertical farming is a growing trend in agriculture. The process of producing food in vertically stacked layers is known as vertical farming, and it is a kind of urban agriculture. This has numerous advantages. The capacity to grow in urban surroundings, and hence having fresher meals available faster and at cheaper rates, is perhaps the most obvious.
- Mini-chromosomal Technology: A mini-chromosome is a small structure within a cell that contains relatively little genetic material but can retain a lot of information in layman's terms. Agricultural geneticists can add dozens, if not hundreds, of features to a plant using mini-chromosomes. Drought tolerance and nitrogen utilisation are two examples of complicated characteristics.

Conclusion:

- India, being a vast country of continental dimensions, presents wide variations in agroclimatic conditions. Such variations have led to the evolution of regional niches for various crops. Historically, regions were often associated with the crops in which they specialize for various agronomic, climatic, hydro-geological, and even, historical reasons.



But, in the aftermath of technological changes encompassing bio-chemical and irrigation technologies, the agronomic niches are undergoing significant changes.

Q15. What are the research and developmental achievements in applied biotechnology? How will these achievements help to uplift the poorer sections of the society? (Answer in 250 words)

APPROACH

Introduction:

- Give a brief introduction about biotechnology.

Body:

- Mention about the research and development in applied biotechnology.
- Mention how it will help in uplifting the poorer section of the society.

Conclusion:

- Conclude on a positive note.

Introduction:

- Biotechnology deals with the application of biological knowledge and techniques pertaining to molecular, cellular and genetic processes to develop significantly improved products and services. Biotechnology products and processes have ensured ease of living, improved health care, agriculture output and created livelihood opportunities, etc. India is ranked amongst the top 12 biotech destinations in the world and ranks 3rd in Asia. The Indian biotech industry is likely to experience significant growth due to increasing economic prosperity, health consciousness and a billion-plus population base.

Recent research and developmental achievements in applied Biotechnology:

- Genetically Modified Organisms (GMO): Plants, bacteria, fungi and animals whose genes have been altered by manipulation are called Genetically Modified Organisms (GMO).
- Stem Cell Research: Stem cells can keep dividing infinitely and have the capacity to differentiate into different types of body cells during the early development of an organism. In a laboratory, researchers can program these stem cells to differentiate into specific types of cells. This is where the innovation of biotechnology steps in.
- Targeted Cancer Therapies: Currently, established standard chemotherapies are toxic for healthy cells. Targeted cancer therapies are drugs that work either by interfering with the function of specific molecules or by only targeting known cancerous cells, in order to minimize damage to healthy cells.
- According to the National Cancer Institute, “Eventually, treatments may be individualized based on the unique set of molecular targets produced by the patient’s tumor.”
- CRISPR technology: Clustered Regularly Interspersed Short Palindromic Repeats (CRISPR) is a relatively new gene-editing system that has been hailed as a groundbreaking tool in medical research. Of its many uses, HIV research is one of them. Researchers can now keep up with the constant genetic mutations by actively testing newly found mutations and constantly editing them to tweak targeted therapies.
- 3D Printed Organs: Artificial limbs have been in use for centuries, and there has been a steady improvement in the mobility and versatility of bionic limbs. Now new advances in



bionic technology and 3D printing have taken it even further. It has made it possible to artificially construct internal organs like heart, kidney, and liver.

- m-RNA Vaccine: The vaccine delivers molecules of antigen-encoding mRNA into immune cells, which use the designed mRNA as a blueprint to build foreign protein that would normally be produced by a pathogen (such as a virus) or by a cancer cell. These protein molecules stimulate an adaptive immune response that teaches the body to identify and destroy the corresponding pathogen or cancer cells.

How will these achievements help to uplift the poorer sections of the society?

- Farmers income: Biotechnology is helping to increase the income of marginal farmers by increasing crop yield and making them climate and pest resilient.
- Improvement in healthcare: The development of medicines using Biotech is reducing healthcare expenditure for the poor.
- For E.g; the cost of Insulin has come down.
- Waste to wealth: Biotechnology is also helping in the conversion of waste into assets for the poor.
- For E.g.; Bio-composting turns waste into valuable fertilizer.
- Reduce pollution: The poor suffer the most from pollution. Biotechnology also helps in reducing pollution and thus alleviates their suffering.
- For E.g.; Bioremediation techniques help clean landfills around slums.
- Increasing shelf life: Biotechnology also helps in increasing the shelf life of food products which in turn keeps their price in check for the poor.

Conclusion:

- Application of biotechnology could be a major tool for development in all countries. Entwined with culture and socio-ethical values, biotechnology could be utilised in solving future problems like food and water insecurity that impede national development and threaten peace in the developing world.

Q16. 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? (Answer in 250 words)

APPROACH

Introduction:

- Briefly introduce about the Blue LEDs.

Body:

- Discuss about its impact in everyday life of human beings.
- Discuss challenges associated with it.

Conclusion:

- Conclude by emphasizing on the importance of LEDs.

Introduction:

- Blue LEDs are semiconductor diodes that produce light. Blue LEDs are used in many situations because of their high efficiency and low power requirements. They are used as



indicators, digital displays, backlight devices for liquid crystal displays, and tinted windows. Isamu Akasaki, Hiroshi Amano and Shuji Nakamura are rewarded for inventing a new energy efficient and environment-friendly light source – the blue light-emitting diode (LED).

Impact of Blue LEDs in everyday life of human beings:

- LED lamps are thus flexible light sources, already with several applications in the field of illumination millions of different colours can be produced; the colours and intensity can be varied as needed. Colourful light panels, several hundred square metres in size, blink, change colours and patterns.
- The possibility to control the colour of light also implies that LED lamps can reproduce the alternations of natural light and follow our biological clock. Greenhouse-cultivation using artificial light is already a reality.
- The LED lamp also holds great promise when it comes to the possibility of increasing the quality of life for the more than 1.5 billion people who currently lack access to electricity grids, as the low power requirements imply that the lamp can be powered by cheap local solar power.
- In countries where many people are dependent on solar panels for electricity, efficient white lighting from blue LEDs is desirable since it allows them to take full advantage of their limited electricity.
- Some other uses of LED's in everyday life of humans: Used for TV back-lighting, Used in displays, Used in Automotives, LEDs used in the dimming of lights, etc.

Challenges associated with LEDs:

- Blue hazard: There is a concern that blue LEDs and cool-white LEDs are now capable of exceeding safe limits of the so-called blue-light hazard as defined in eye safety specifications such as ANSI/IESNA RP-27.1-05: Recommended Practice for Photobiological Safety for Lamp and Lamp Systems.
- Light quality: Most cool-white LEDs have spectra that differ significantly from a black body radiator like the sun or an incandescent light. The spike at 460 nm and dip at 500 nm can cause the color of objects to be perceived differently under cool-white LED illumination than sunlight or incandescent sources, due to metamerism, red surfaces being rendered particularly badly by typical phosphor-based cool-white LEDs.
- Blue pollution: Because cool-white LEDs (i.e., LEDs with high color temperature) emit proportionally more blue light than conventional outdoor light sources such as high-pressure sodium lamps, the strong wavelength dependence of Rayleigh scattering means that cool-white LEDs can cause more light pollution than other light sources.
- High initial price: LEDs are currently more expensive, price per lumen, on an initial capital cost basis, than most conventional lighting technologies. The additional expense partially stems from the relatively low lumen output and the drive circuitry and power supplies needed.

Conclusion:

- LEDs are extremely energy efficient and consume up to 90% less power than incandescent bulbs. Since LEDs use only a fraction of the energy of an incandescent light bulb there is a dramatic decrease in power costs. Also, money and energy is saved in maintenance and replacement costs due to the long LED lifespan.



Q17. 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? (Answer in 250 words)

APPROACH

Introduction:

- Give brief introduction about 26th COP to UNFCCC.

Body:

- Discuss about the major outcomes of Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC).
- Mention the commitments made by India in the conference.

Conclusion:

- Conclude accordingly.

Introduction:

- The Conference of Parties comes under the United Nations Climate Change Framework Convention (UNFCCC) which was formed in 1994. The UNFCCC was established to work towards “stabilisation of greenhouse gas concentrations in the atmosphere.” The Glasgow meeting was the 26th session of the Conference of Parties to the UN Framework Convention on Climate Change, or COP26. These meetings are held every year to construct a global response to climate change. Each of these meetings produce a set of decisions which are given different names. In the current case, this has been called the Glasgow Climate Pact.

Four goals of UNFCCC, 26th COP:

- Secure global net-zero by mid-century and keep 1.5 degrees within reach.
- Adapt to protect communities and natural habitats.
- Mobilise finance: To deliver on our first two goals, developed countries must make good on their promise to mobilise at least \$100bn in climate finance per year by 2020.
- ‘Finalise the Paris Rulebook’: Leaders will work together to frame a list of detailed rules that will help fulfil the Paris Agreement.

Outcomes of conference of parties:

- Mitigation: The Glasgow agreement has emphasised that stronger action in the current decade was most critical to achieving the 1.5-degree target.
- Adaptation: Most of the countries, especially the smaller and poorer ones, and the small island states, consider adaptation to be the most important component of climate action. These countries, due to their lower capacities, are already facing the worst impacts of climate change, and require immediate money, technology and capacity building for their adaptation activities.
- Finance: Every climate action has financial implications. It is now estimated that trillions of dollars are required every year to fund all the actions necessary to achieve the climate targets.
- Loss and Damage: The frequency of climate disasters has been rising rapidly, and many of these cause largescale devastation. The worst affected are the poor and small countries,



and the island states. There is no institutional mechanism to compensate these nations for the losses, or provide them help in the form of relief and rehabilitation.

- Carbon Markets: Carbon markets facilitate the trading of emission reductions. Such a market allows countries, or industries, to earn carbon credits for the emission reductions they make in excess of their targets. These carbon credits can be traded to the highest bidder in exchange of money.
- Over hundred countries have agreed to launch Adaptation Research Alliance which will catalyse and scale investment in action-oriented research and innovation for adaptation that strengthens resilience in communities most vulnerable to climate change.
- A group of 11 countries led by Ireland, France, Denmark, and Costa Rica among others created the Beyond Oil and Gas Alliance (BOGA), first-of-its kind alliance to set an end date for national oil and gas exploration and extraction.
- At least 13 nations also committed to end the sale of fossil fuel powered heavy duty vehicles by 2040.
- Leaders from over 120 countries, representing about 90 per cent of the world's forests, pledged to halt and reverse deforestation by 2030.

India's commitment at COP-26:

- India announced a Panchamitra (a mixture of five elements) of climate actions. It raised the targets for two of its existing climate targets, announced two new ones, and also promised to turn net-zero by the year 2070. India announced that its net zero target is to be achieved by 2070.
- The Government of India has launched 'E-Amrit', a web portal on electric vehicles (EVs), in COP-26. The portal will encourage adoption of EV and bust myth regarding it.
- India did not join methane pledge as it would have negatively impacted India's agriculture.
- India will fulfil 50% of its energy requirement through renewable energy by 2030.
- India will reduce 1 billion tonnes of carbon emissions by 2030.

Conclusion:

- India is the 3rd largest emitter in terms of net emissions whereas it has the lowest per capita emission among the major economies of the world (17% of the world population emitting just 5% of total). India has announced its net-zero targets in COP26 s accordance with the Paris agreement of 2015. Under the Paris agreement, countries were bound to submit carbon-cutting plans and updates by the end of 2020.

Q18. Describe the various causes and the effects of landslides. Mention the important components of the National Landslide Risk Management Strategy. (Answer in 250 words)

APPROACH

Introduction:

- Give brief introduction about the landslide. Quote some recent fact.

Body:

- Explain the concept of landslide and its types.
- Discuss the impact of landslides.
- Suggest some measures to mitigate the disaster.



Conclusion:

- Conclude on a positive note.

Introduction:

- A landslide is defined as the movement of a mass of rock, debris, or earth, down a slope due to the action of gravity. Areas with steep slopes, for example, mountainous regions, are particularly susceptible to landslide hazards. Earth flow, mass movement, mudflow, rotational slip, and avalanches are all examples of landslides.

Types of Landslides:

- Falls: It happens due to the abrupt movements of the mass of geologic materials, such as rocks and boulders, that become detached from steep slopes or cliffs.
- Topples: It happens due to the forward rotation of a unit or units about some pivotal point, under the actions of gravity and forces exerted by adjacent units or by fluids in cracks.
- Slides: In this type, rocks, debris, or soil slide through slope forming material.
- Spread: It usually occurs on very gentle slopes or flat terrain.

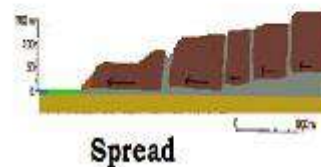
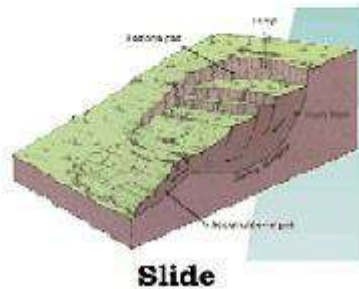
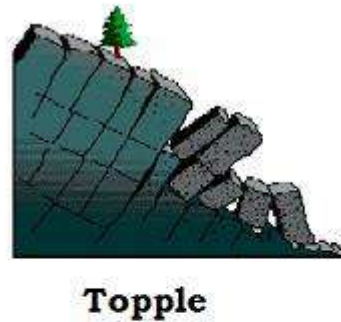


Fig: landslide types

Causes behind Landslides:

- Natural causes
- Earthquakes: They cause a sudden shaking of earth's crust which creates stress on materials, thus leading to landslides.
- Heavy Rainfall: The occurrence of heavy or continuous rainfall may lead to heavy landslides in the areas of steep slopes. Water works as a lubricating agent and loosens up the material. For instance, the 2013 Uttarakhand Cloudburst brought immense landslides in the region.
- Anthropogenic causes
- Infrastructure Development: The creation of roads, railways, dams, etc. in the mountainous region can result in landslides. For instance, the development of Konkan Railways in



western ghats is considered a significant reason behind the frequent occurrence of landslides in the region.

- Mining: It involves removing the surface of the earth for mineral exploration, which loosens the grip of material. Further explosions are also a part of mining, which may result in landslides.
- Deforestation: Trees are cut for agricultural and industrial activities which loosens the soil grip and makes the region more vulnerable to landslides.
- Unsustainable Tourism: The rising tourist influx in the Himalayan region puts greater pressure on land as more infrastructure and amenities are needed to accommodate them. This leads to more construction and greater landslides.

Effects of landslides:

- Loss of Lives: The most traumatizing impact of a landslide is the loss of precious human and animal lives. For eg: In the recent Kinnaur Landslide, already 14 confirmed deaths have been reported.
- Restricts Movement: The mud, rocks, and debris moving down the slope create a barrier on critical transportation routes like highways, railway lines, etc. This restricts the movement of goods and people.
- Infrastructural Damage: Several houses, buildings, roads, and other infrastructure get damaged whenever a landslide occurs.
- Economic Losses: A significant amount is spent on reconstructing the lost infrastructure, rehabilitating of masses, and providing relief support to the impacted people.
- Jeopardize Water Availability: When landslides occur on the slopes of a river valley, the sliding mass may reach the bottom of the valley and cause partial or complete blockage of the river channel. This accumulated mass of landslide debris resulting in the blockage of a river is commonly termed as a Landslide dam. It may impair the availability of water for nearby people.

Components of the National Landslide Risk Management Strategy:

- Landslide Hazard Zonation: It covers aspects of reliability and validation of landslide zoning maps in Indian scenario and proposes future plan of activities for landslide zoning.
- Awareness Programmes: The strategy spells out need of awareness programmes, review of past work and best practices, identification of gaps, as well as recommendations and implementation strategies.
- Capacity Building and Training of Stakeholders: Strategy document highlights the past work, gaps, implementation strategy, financial implications and monitoring mechanism for capacity building and training in landslides.
- Stabilization and Mitigation of Landslide and Creation of Special Purpose Vehicle (SPV) for Landslide Management.
- Preparation of Mountain Zone Regulations and Policies.
- Generation of User-Friendly Landslide Hazard Maps.
- Development of Landslide Monitoring and Early Warning System.

Steps taken for Landslide Management in India:

- National Landslide Risk Management Strategy (2019): It addresses all the components of landslide disaster risk reduction and management, which includes:
 1. hazard mapping, monitoring, and early warning system, awareness programs,



2. capacity building, training, regulations, and policies, stabilization and mitigation of landslides, etc.
- National Disaster Management Authority (NDMA) Guidelines on Landslide Hazard Management (2009): It tells measures that should be taken to avoid or mitigate the risk posed by landslide hazards. Some guidelines:
 1. Delineating areas susceptible to landslide hazards
 2. Encouraging implementation of successful landslide remediation and mitigation technologies.
- Developing institutional capacity and training for geoscientists, engineers, and planners is necessary for the effective management of the landslide hazard.
- National Institute of Disaster Management (NIDM): It is a premier institute that provides Capacity Building support to various National and State level agencies in the field of Disaster Management & Disaster Risk Reduction.

Conclusion:

- Increasing human interference with nature has led to rise in the number of natural disasters. However, the National Disaster Response Force under The Disaster Management Act, 2005 have conducted several successful rescue operations by providing aid and assistance to the affected state, including deploying, at the State's request, of Armed Forces, Central Paramilitary Forces, and such communication, air and other assets. They have also worked to increase the awareness among people to reduce the effect of such natural calamities by organising preparedness campaigns.

Q19. Analyse the multidimensional 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. (Answer in 250 words)

APPROACH

Introduction:

- Give brief introduction about who constitute external state and non-state actors.

Body:

- Explain about external non state actors – Non-state actors are individuals or organizations that have powerful economic, political or social power and are able to influence at a national and sometimes international level but do not belong to or allied themselves to any particular country or state.
- Discuss the threat that they pose to internal security in India such as insurgency, terrorism, cyber security, communalism, counterfeit currency etc.
- Discuss how India should deal with such challenges.

Conclusion:

- Conclude with solutions and ways to address the problems.

Introduction:

- India's internal security problems are a manifestation of internal weaknesses and external attempts at waging a proxy war. Inadequate socio-economic development, apathy towards the genuine grievances of the people, political brinkmanship amongst other reasons, has created internal contradictions, which have led to decades of internal strife. Similarly, a number of internal security challenges faced today are fuelled and controlled from Pakistan.



Challenges posed by External State Actors:

- Pakistan: The issues in Jammu and Kashmir and Terrorism in the hinterland are a direct manifestation of Pakistan's influence. It is part of Pakistan's state policy to bleed India through a thousand cuts, given its obvious disadvantages on the conventional war fighting front. The use of non-state actors is essentially the employment of a proxy element, which gives the state of Pakistan a degree of deniability.
- China: Historically, China has provided financial support, arms and sanctuaries to Naga, Mizo and Meitei extremists to fuel instability in India's internal security. China has its interests in the North-East as well as Left- Wing extremism in India, and uses it's as a leverage to brew internal security challenges in the India.
- Bangladesh: The issue of illegal migration has been the source of communal and ethnic tension in India, resulting in large scale demographic changes in the North-East region. The trans-border relocation has been the cause of social and economic insecurity for the local communities, which has often erupted in communal violence.

Challenges posed by Non-State actors:

- Drug Trafficking: Proximity to the largest producers of heroin and hashish-the Golden Triangle and Golden Crescent (Afghanistan-Pakistan-Iran) -has made India's border vulnerable to drug trafficking. Trafficking of drugs takes place overwhelmingly through land borders followed by sea and air routes.
- Human Trafficking: Human trafficking in India, although illegal under Indian law, remains a significant problem. People are frequently illegally trafficked through India for the purposes of commercial sexual exploitation and forced/bonded labour. Although no reliable study of forced and bonded labour has been completed, NGOs estimate this problem affects 20 to 65 million Indians.
- Left-Wing Extremism: It is one of the major security threats faced by the nation, which prevents developmental processes in the least developed regions of the country and misguide the people through its propaganda.
- Insurgency in the Northeast: Inter-tribal conflicts, unemployed youth, and illegal migration from across the border has provided a breeding ground for non-state actors to run insurgency like an industry in the region.
- Terrorism: South Asia Terrorism Portal has listed 180 terrorist groups that have operated within India over the last 20 years, many of them co-listed as transnational terror networks operating in or from the neighbouring South-Asian countries such as Bangladesh, Nepal and Pakistan.

Steps taken by Government to deal with such issues:

- Enabling a strong legislation framework:
- NIA Act, 2019: The NIA is now empowered to investigate offences related to Human trafficking, offences related to counterfeit currency or bank notes, manufacture or sale of prohibited arms, cyber-terrorism, and offences under the Explosive Substances Act, 1908.
- Institutional framework to tackle terrorism:
- NATGRID: It seeks to become the one-stop destination for security and intelligence agencies to access database related to immigration entry and exit, banking and telephone details of a suspect on a "secured platform".
- National Cyber Coordination Centre (NCCC) has been established as a cyber security and surveillance agency in India.



- Combating Terror Finance:
- Strengthening the provisions in the Unlawful Activities (Prevention) Act, 1967 to combat terror financing by criminalizing the production or smuggling or circulation of high quality counterfeit Indian currency as a terrorist act and enlarge the scope of proceeds of terrorism to include any property intended to be used for terrorism.
- A Terror Funding and Fake Currency (TFFC) Cell has been constituted in National Investigation Agency (NIA) to conduct focused investigation of terror funding and fake currency cases.
- India's Involvement at the UN:
- India has prioritised the adoption of an intergovernmental framework to combat terrorism. India introduced the Comprehensive Convention on International Terrorism (CCIT) in 1996 that denied terrorism and enhanced "normative processes for the prosecution and extradition of terrorists."

Conclusion:

- It is necessary for India to effect changes in its internal security architecture and further empower its intelligence and investigation agencies for enhanced preparedness, along with some diplomatic measures to counter terrorism in the whole of the sub -continent.

Q20. 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. (Answer in 250 words)

APPROACH

Introduction:

- Explain the rising challenge of terrorism and innovative ways used by terrorists which forces law agencies to upgrade themselves.

Body:

- Explain about the complexities and major challenges in tackling terrorism in India.
- Suggest measures such as Capacities of the state police forces should be increased, cyber security and intelligence gathering and dissemination requires improvement (NATGRID) etc.

Conclusion:

- Emphasize on the need for beefing up our counterterrorism efforts and end with way forward.

Answer:

- Terrorism is an offence to intimidate a population or to compel a government or an international organisation to do or abstain from doing any act, which causes:
 1. Death or serious bodily injury to any person.
 2. Serious damage to public or private property, including a place of public use, a State or government facility, a public transportation system, an infrastructure facility or the environment.
 3. Damage to property, places, facilities, or systems resulting in or likely to result in a major economic loss.



4. It encompasses a range of complex threats like organized terrorism in conflict zones, foreign terrorist fighters, radicalised 'lone wolves', etc.

Challenges associated with terrorism in India:

- It poses a major threat to international peace and security and undermines the core values of humanity, peace and growth.
- In addition to the devastating human cost of terrorism, in terms of lives lost or permanently altered, terrorist acts destabilise governments and undermine economic and social development.
- Terrorist acts often defy national borders.
- Terrorist attacks using CBRNE materials (Chemical, Biological, Radiological, Nuclear and Explosives) have catastrophic consequences on communities and infrastructure.

Linkages associated with terrorism in India:

- In Punjab, drug trafficking is rampant to fund terrorism. Drugs and smuggling, Illicit trafficking, Extortion and Hawala trading etc are the linkages.
- Radicalisation and brain washing by organisation to produce a certain kind of version of what is honest and real.
- The introduction of the internet has made the youth the most vulnerable amongst all the groups as they are widely recruited to fulfil the brutish objectives.
- They try to breach the security of the country using secessionist means.
- The terrorism is emerging fast as a competitive industry that uses land, labor, capital and entrepreneurship to use it to meet their illegitimate demands and desires.

Steps Taken by India:

- India has been at the forefront of global action against terrorism and has always played an active role in the global promotion and protection of human rights. India, which has been a victim of cross-border terrorism, took cognizance of the threat long before the major world powers.
- It is a crime against humanity and violates the most Fundamental Human Right, namely the Right to Life (Article 21).
- India has taken steps for setting up Joint Working Groups (JWGs) on counter-terrorism/security matters with countries. Bilateral treaties on Mutual Legal Assistance (MLATs) in Criminal matters to facilitate the investigation, collection of evidence, transfer of witnesses, location and action against proceeds of crime, etc. have been signed with other countries.
- In 2018, India highlighted its demand for a Comprehensive Convention on International Terrorism (CCIT) at the 73rd session of the UN General Assembly (UNGA).
- Addressing the UN High-Level Conference on Heads of Counter-Terrorism (2018), India extended a five-point formula.
- In January 2021, at the 20th anniversary of the UN Security Council (UNSC) Resolution 1373, India presented an eight-point action plan to deal with the scourge of terrorism.
- Comprehensive Integrated Border Management System: It vastly improves the capability of Border Security Force (BSF) in detecting and controlling the cross border crimes like illegal infiltration, smuggling of contraband goods, human trafficking and cross border terrorism, etc.



- Unlawful Activities (Prevention) Act, 1967: It enables more effective prevention of certain unlawful activities of individuals and associations and for dealing with terrorist activities, and other related matters.
- National Investigation Agency: It is India's counter-terrorist task force and is empowered to deal with terror related crimes across states without special permission from the states.
- Policy of Zero-Tolerance Against Terrorism: India calls for zero-tolerance against terrorism and focuses on developing a common strategy to curb it.

Various Counter-Terrorism Operations

- Operation Sarp Vinash: Undertaken by Indian army to flush out terrorists in the areas of the Pir Panjal range in Jammu and Kashmir in 2003.
- Operation All Out: Joint offensive launched by Indian security forces to flush out militants and terrorists in Kashmir in 2017.

Suggestions and Way Forward:

- Strong and Reformed Institutions: Multilateral institutions and mechanisms need to be strengthened and reformed to be able to deal with these emerging challenges effectively.
- Concerted Efforts: There should be a concerted effort from the countries affected by the scourge of terrorism to pressurise countries that engage in state-sponsored terrorism.
- Timely and Appropriate Action: Intelligence gathering and sharing are not enough, timely and appropriate action is required on the intelligence received.
- Intelligence agencies have to be empowered both monetarily and through modern infrastructure to be able to respond in time.

Filling and Addressing Gaps: Violation of and gaps in the implementation of human rights should be addressed in a fair and just manner, with objectivity, non-selectivity, transparency and with due respect to the principles of non-interference in internal affairs and national sovereignty.

United Approach and Efforts: The Covid-19 pandemic has complicated the situation in many geographies so there is a need for all to come together to overcome these challenges.

Conclusion:

- The Global Terrorism Index 2019 also places India on the 7th rank in terms of the most-affected country by terrorism. India is trying to push a global intergovernmental convention called the Comprehensive Convention on International Terrorism (CCIT) to counter-terrorism since the late 90s.