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## **INSTA SECURE SYNOPSIS** **MAINS MISSION - 2022**

**GS-III**

**FEBRUARY 2022**



**NOTE:** Please remember that following ‘answers’ are NOT ‘model answers’. They are NOT synopsis too if we go by definition of the term. What we are providing is content that both meets demand of the question and at the same time gives you extra points in the form of background information.



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

Highlighting the rationale behind the government's move to monetize assets of state-owned companies, discuss some of the challenges and measures that need to be taken to overcome them. (250 Words)

*Difficulty level: Tough*

*Reference: Live Mint, Insights*

**Why the question:**

*The government will launch SPV for the planned monetization of land and non-core assets of state-owned companies. Also, the government launched National Monetization Pipeline last year.*

**Key Demand of the question:**

*To write about the need and challenges of asset monetization.*

**Directive word:**

**Discuss** – This is an all-encompassing directive – you have to debate on paper by going through the details of the issues concerned by examining each one of them. You have to give reasons for both for and against arguments.

**Structure of the answer:**

**Introduction:**

*Start by defining what is asset monetization and give current context to it for the Indian Economy.*

**Body:**

*Enumerate rationale behind asset monetization e.g. Government PSU is one of the largest owners of land and if monetization well, they can be used for government revenues as well as generating growth.*

*Also, mention how the assets will be monetized.*

*Discuss some lacuna with this policy as well as challenges it will face.*

*Then go on to list government steps in this direction e.g. National monetization pipeline. Also, suggest what more should be done.*

**Conclusion:**

*Conclude with a way forward.*

**Introduction**

Prime minister of India last year announced investment opportunities worth ₹2.5 trillion in the national asset monetisation pipeline mentioned in the Budget through sale of around 100 assets of central public sector enterprises (CPSEs).

**Body:**

**National monetisation Pipeline**

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- The target is to monetize around 100 assets in oil, gas, port, airport, railways and power sectors to raise about Rs 90,000 crore in the current financial year. For instance, the Indian Railways has approximately 43,000 hectares of vacant land across the country and many road projects are in the pipeline for monetization as well.
- The government is increasingly looking to monetize physical assets such as land, buildings and brownfield operational assets like roads, railways stations, pipelines, mobile towers, etc. to raise resources in recent times.
- In addition, the Ministry of Shipping is in the process of recycling 11 assets, including 10 berths and the International Cruise Terminal at Goa Port. While in the telecom sector, BSNL and MTNL towers are planned to be monetized.

#### Review of previous asset monetization exercises

- **Learnings from past success:** Since 2016, the National Highways Authority of India (NHAI) has been deploying the Toll-Operate-Transfer (TOT) model for asset monetization in the highways sector.
  - Furthermore, the Airports Authority of India (AAI) has already completed the privatization of six identified airports (Ahmedabad, Mangalore, Lucknow, Thiruvananthapuram, Jaipur, and Guwahati).
  - The railway station redevelopment program was among the initial projects which involved monetization of physical assets.
  - As part of this initiative, Habibganj and Gandhinagar railway stations are being redeveloped into airport-like world class stations by the Indian Railways Station Development Corporation (IRSDC)
- **Learnings of the past failures:** The government has faced many challenges in its asset monetization efforts in the past.
  - Lack of proper maintenance of asset register and title and encroachment issues have adversely affected the Indian Railways' plan to monetize its land.
  - Furthermore, the progress of the flagship railway station redevelopment program has been marred by improper planning including land unavailability, delayed approvals and clearances, policy constraints and lack of coordination among stakeholders.
  - The current market conditions and legacy real estate industry issues could further impact the progress.
  - In the roads sector, refinancing remains an issue considering the long-term nature of the TOT concessions despite the model providing more certainty of cash flows to the investors than under the greenfield projects.
  - So far, the TOT model has witnessed limited participation in all its previous packages or bundles.
  - Further, the unprecedented situation caused by COVID-19 which has severely impacted the toll collections could delay the asset monetization plan of NHAI.



- Clarity on the number, size and type of assets that would come to the market would instil confidence among investors who are looking to acquire a specific package or category of assets.

#### Measures to make National Monetization Pipeline a success

- NITI Aayog has therefore suggested the creation of an Empowered Group of Secretaries for fast approval and clearances under the railway station redevelopment program.
- An underlying objective of asset monetization is to raise resources for future investments into the sector. The Infrastructure Investment Trust (InvIT) model which provides a way for recycling of capital invested in operational assets in an efficient manner, could be adopted to achieve the desired objective.
- In the power sector, the Cabinet Committee of Economic Affairs (CCEA) has recently approved monetization of the transmission assets of the state-owned Power Grid Corporation of India (PGCIL) through InvIT model.
- Another advantage of this model is that it would attract both domestic and global investors, including sovereign wealth funds, retail investors and institutional investors such as pension funds.

#### Conclusion:

Monetization of public assets is a complex and rigorous process that involves stakeholders' management, efficient coordination, and detailed due diligence of the technical, operational and financial aspects of the assets. Successful implementation of the monetization exercise will ease the burden on existing projects, enable asset value unlocking, and propel economic growth. As a way forward, asset monetization could be a game changer for the infrastructure investment in India.

Discuss the need for monetization of state owned assets. Will it amount to privatization? Argue (150 Words)

Reference: *Live Mint, Insights*

#### Introduction

Prime minister of India last year announced investment opportunities worth ₹2.5 trillion in the national asset monetisation pipeline mentioned in the Budget through sale of around 100 assets of central public sector enterprises (CPSEs).

#### Body:

##### National monetisation Pipeline

- The target is to monetize around 100 assets in oil, gas, port, airport, railways and power sectors to raise about Rs 90,000 crore in the current financial year. For instance, the Indian Railways has approximately 43,000 hectares of vacant land across the country and many road projects are in the pipeline for monetization as well.
- The government is increasingly looking to monetize physical assets such as land, buildings and brownfield operational assets like roads, railways stations, pipelines, mobile towers, etc. to raise resources in recent times.



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#### Review of previous asset monetization exercises

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  - The current market conditions and legacy real estate industry issues could further impact the progress.
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- An underlying objective of asset monetization is to raise resources for future investments into the sector. The Infrastructure Investment Trust (InvIT) model which provides a way for recycling of capital invested in operational assets in an efficient manner, could be adopted to achieve the desired objective.
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India is witnessing a unicorn revolution. How can India effectively regulate these start-ups to maintain efficiency, transparency as well as promote innovation. Comment. (150 words)

Reference: *New Indian Express*

### Introduction

In the venture capital industry, the term **unicorn** refers to any startup that reaches the **valuation of \$1 billion. The term was first coined by venture capitalist Aileen Lee in 2013.** Mostly, all the unicorns have brought a disruption in the field they belong to. Uber, for example, changed the way people commuted. Airbnb changed the way people planned their stay while travelling and Snapchat disrupted the usage of the social media network etc.

**India currently stands third** in the global list of the number of companies that have attained unicorn status.

### Body

#### Benefits of a unicorn

- The Indian start-up ecosystem is nothing short of a revolution with \$106-billion worth of value-creation by 44 unicorns, in turn creating **4 million direct and indirect jobs.**
- Start-ups have helped **women entrepreneurs** to contribute immensely to the start-up ecosystem
- It's increasingly seen as a sign that the Indian economy is reaching a turning point and that its **entrepreneurial culture is maturing.**
- **Ancillary industries** rise up creating more avenues of innovation, growth and employment.
- The unicorns like ola, flipkart which are consumer centric have **created an alternate gig economy for workers**, which gives them much needed flexibility.



- Due to competition among unicorns, consumers are benefited through competitive pricing.
- It has created an ecosystem in cities such as Bengaluru and Delhi, which has paved way for more capital and investments flowing into the nation.

### Challenges faced by unicorns in India

- **Capital:** For running a company from being startup to unicorn, a significant amount of working capital is required. Many startups, especially at early stages, are bootstrapped, i.e. self-funded through the founders' own savings, or using capital from friends and family.
- **Complex regulatory environment:** The government of India has introduced policies that aim to ease the business environment for startups.
  - However, **the present regulatory framework** in which startups/unicorns operate is widely seen as **difficult, inefficient and unpredictable**.
- **Bureaucratic process:** Companies in India often feel encumbered by bureaucratic processes, which **appear to lack underlying standards**.
  - They have insufficient possibilities to find information, and there is little planning security about how long processes can take.
  - In addition, regulations can suddenly change or startups receive random notices.
  - As a result, startups have to find frustrating workarounds, waste valuable time or pivot their business model.
- A further challenge for startups is to **take their products to the market as Indian markets** appear difficult to penetrate.
  - **Competitive landscape:** Often, many firms are already present and many more enter the market, including copycats.
  - A second reason is that **startups are at a disadvantage compared to large companies**.
  - **Huge uncertainty:** Recently, the biggest-ever initial public offering (IPO) in India **fell flat on its face on the first day of its listing** in the stock exchange, with shares being traded at prices less than 27% of the IPO price.
    - On the one hand, this is due to the fact that **big market players are more capable of dealing with bureaucratic regulations**.
      - On the other hand, **public procurement** is seen as weak and government prefers to sign contracts with established companies.
    - For many job-seekers, **joining a startup as an employee** is **not an attractive** career option, due to the inherent risk that the startup might fail.

### Need for proper regulatory mechanism

- The factors enabling the rise of unicorns comprise the availability of **private equity funds, increasing Internet penetration and digital payments, more robust infrastructure** and the rising pool of skilled talent.



- Considering the focus on creating an Aatmanirbhar Bharat, however, the nation's policymakers, risk-taking corporates and funding agencies need to foster a conducive climate for ensuring **easier availability of domestic capita**
- As business models get more complex and interlinked, the regulators have to play a more proactive role in **formulating appropriate regulations that encourage innovation and support** emerging business models rather than hindering innovation.
- Besides promoting local funding, the **government and corporate entities may need to invest** in a big way **through leading academic institutions** to de-risk start-up investments in the long run.
- It appears that **corporations and valuation experts overestimate** the Indian economy's potential to consume services by assuming exponential demand growth over longer time periods.
- Firms spend a lot of money to offer huge discounts to clients in the hopes that people would become so used to these platforms that they will continue to use them even if the prices are raised. This could lead to **cartelization and market monopoly** on a long run.

### Conclusion

By providing the “**minicorns**” (a start-up with \$1 million-plus valuation) and “**soonicorn**s” (funded by angel investors or venture capitalists and likely to soon join the unicorn club) the right regulatory ambience and local sources of funding, India can create a **truly innovative and resilient economy**.

Highlighting the objectives of health data retention plan discuss the risk associated with it regarding right to privacy. 250 words

### Introduction

Data retention is the practice of **storing and managing personal health data and records for a designated period and typically**, the policies pertain to **data type, format, duration, deletion mechanism, ownership**, and procedure for violation or breach of the policy.

In a welcome development, the **National Health Authority (NHA)** which is the body responsible for administering the Ayushman Bharat Digital Mission (ABDM), has initiated a consultation process on the retention of health data by health-care providers in India. The consultation paper asks for feedback on what data is to be retained, and for how long.

### Body

#### Objectives and benefits of data retention

- The aim of data retention is described in terms of benefits to the individual and the public at large.
- Individuals benefit through **greater convenience and choice**, created through **portability** of health records.
- The broader public **benefits through research and innovation**, driven by the availability of more and **better data to analyse**.
- The purpose of formulation and implementation of a Health Data Retention Guideline/Policy for India is to **ensure uniformity in a manner**, which ensures that every healthcare facility



implements **record retention and compliance with all applicable regulations** / guidelines / laws in India.

- The proposed Health Data Retention Guideline/Policy has been envisioned to **minimize risks associated with personal health data** and to maximize benefits from usage of this data by ensuring that data retention guidelines are in sync with all applicable legal and regulatory compliances.
- Several lines of evidence show that nations, which have developed strong health data governance systems, have safely and securely used health data for strengthening healthcare and public health delivery systems

#### Risk to privacy due to data retention

- **Risk of over-collection:** A simple classification system, as suggested in the consultation paper, exposes individuals to harms arising from over-collection and retention of unnecessary data.
- At the same time, this kind of **one-size-fits-all system** can also lead to the under-retention of data that is genuinely required for research or public policy needs. Instead, we should seek to classify data based on its use.
- The Supreme Court of India has clarified that privacy is a fundamental right, and any interference into the **right must pass a four-part test: legality; legitimate aim; proportionality, and appropriate safeguards.**
  - Storing sensitive data say heart problems etc violates the above principles.
  - This **data** may also be **misused** to **increase insurance premiums** or even **deny** coverage to **pre-existing diseases.**
- The **mandatory retention of health data is one such form of interference** with the right to privacy.

#### Way forward

- **Clear and specific case for retention:** The test for retaining data should be that a clear and **specific case has been identified for such retention**, following a rigorous process run by suitable authorities.
- **Anonymise data:** A second safeguard would be to **anonymise data that is being retained** for research purposes, again, unless a specific case is made for keeping personally identifiable information. If neither of these is true, the data should be deleted.
- **Express and informed consent:** An alternate basis for retaining data can be the express and **informed consent of the individual in question.**
- **User-based classification process:** Health-care service providers and everyone else will have to **comply with the data protection law**, once it is adopted by Parliament.

#### Conclusion

A privacy-centric process is needed to determine what data to retain and for how long. The need for guidelines on data retention for personally identifiable information (PII), or personal health information (PHI) stems from the emerging landscape and thinking and on the need for protection of



sensitive data while ensuring effective usage of such information in clinical decision-making by healthcare professionals. This leads to improvement in overall quality of healthcare delivery and which is possible only if longer retention periods are mandated for certain types of health data while ensuring privacy and anonymity where possible.

Creation of quality employment opportunities has remained an Achilles heel for India despite a growing economy in the last decade. Analyze (250 Words)

Reference: *Indian Express*

**Why the question:**

*Unemployment in India has been rising especially after the slowdown induced by COVID19. Also, unemployment in youth, women, and educated is especially high in comparatively rich states such as Punjab, Haryana, etc.*

**Key Demand of the question:**

*Analyse the issue of unemployment in India and the reasons behind it.*

**Directive:**

**Analyse** – When asked to analyse, you have to examine methodically the structure or nature of the topic by separating it into component parts and present them as a whole in a summary.

**Structure of the answer:**

**Introduction:**

*Start with the basics status of unemployment in India.*

**Body:**

*Explain the major reasons behind it by structuring it in different subheadings e.g. Policy lacuna: the skills picked up by the youth as they study are grossly mismatched with those needed in the job market.*

*Suggest solutions for increasing the rate of gainful unemployment using the structure of long-term measures, medium-term and short term.*

**Conclusion:**

*Conclude by including suggestions by this year's economic survey e.g., there is a need for robust and authentic data on unemployment.*

**Introduction**

Unemployment has become a chronic problem of India and in the recent years the situation has only worsened. **The Centre for Monitoring Indian Economy (CMIE)** recently released the unemployment status report of India which showed the unemployment rate in the country was 7.91% in December 2021. It was 7% in November 2021.

**Body**

**Unemployment crisis in India**

- With migrant labourers retreating to their native places, the impact seems to be more severe in urban areas where the unemployment rate is now reaching 10 per cent.
- With 73.5 lakh job losses in April, the number of employees (both salaried and non-salaried) fell from 39.81 crore in March to 39.08 crore in April for the third straight month.
- In April 2020, which was the first full month of the national lockdown last year, the unemployment rate had zoomed to 23.5%.
- Women tend to face a double challenge, with lower labour participation and a higher unemployment rate for females compared with males (for ages above 15).



- For the January-April 2021 period, urban female LPR was 7.2% compared with the urban male's 64.8%, while urban female unemployment was 18.4% against the urban male unemployment rate of 6.6%, CMIE data showed.

#### Causes for the sharp decline in the jobs in India

- The labour force is the sum of the employed and those unemployed who are seeking employment.
- A shrinking of the labour force is most unusual in an economy with a growing population, and thus a growing working age cohort.
- **Low education and lack of skills** lead to loss of many job opportunities. On the other hand, the share of young adults in higher education in India has more than doubled over the years.
- **Discouraged-worker effect:** A section of those hitherto willing to work may have simply dropped out of an already challenged labour market.
- **Demonetization** has caused demoralisation among a section of the already unemployed who may have given up all hope of finding employment.
- About **90% of Indian Workforce is in the unorganized sector** which was majorly affected during Demonetization and GST introduction.
- **Declining Capital formation** which is not backed by Public and Private Investment.
- **Low female LFPR to the tunes of 24%** also adds to high unemployment rate.
- **Automation and IR4.0** is a looming threat to many jobs which have repeated work or sequential work.
- Socially disadvantaged groups do not get enough exposure in the job market like the general castes and Other Backward Classes.
- Labour laws in India are complex and relatively strict. Employment protection legislation is restrictive, compared with other emerging economies and OECD countries. Thus, corporates in India tend to rely more on **temporary contract labour**, stay small or substitute labour for capital to avoid strict labour laws.

#### Measures suggested

- **Increase public spending in education:**
  - At 3.8% of GDP, public spending on education in India is lower than countries like Brazil and Malaysia.
  - The focus of the government needs to shift to spending on enhancing the quality of education and vocational training.
- Similarly, allowing foreign investment in sectors like legal and accountancy services will create employment as more foreign firms will move to India.
- Infrastructure investment can also be utilised as an engine of job-creation.



- Investing in people through healthcare, quality education, jobs and skills helps build human capital, which is key to supporting economic growth, ending extreme poverty, and creating more inclusive societies.
- **Educated unemployment:**
  - Besides promoting technical education, the government needs to focus more on creation of jobs and demand for workers since industries are unable to create sufficient job opportunities for all the technically educated people
  - Policies should ensure that the education systems prepare young people for the skill demands of employers through outreach programmes, training, apprenticeships, and access to job-search assistance measures.
  - More businesses should recognise the opportunity, and need, to invest in young people so that they can help in developing the qualities necessary for education and future employment.
  - **NGOs** should engage collectively in **policy advocacy on youth** They should also partner with companies to develop skills and training programmes to tackle youth unemployment.
  - Singapore has launched certain programmes to establish partnerships between domestic and foreign universities to promote tertiary education. India could learn from such initiatives.
  - New age sectors like defence **and aerospace, education and healthcare, and burgeoning green sectors like solar energy and wind**, present another massive opportunity to identify 'upcoming jobs' and prepare talent accordingly. India's ambition to create more than **one million new jobs in the green energy sector by 2022** is encouraging.
- **Educated unemployment:**
  - There should be **cluster development to support job creation in micro, small and medium enterprises (MSMEs)**. Most of the **unorganised sector employment** is in MSMEs, which tend to be concentrated in specific geographic locations.
  - Private sector leaders should build capacity among unskilled and semi-skilled workers to ensure sustainability of renewable energy projects and provide opportunities to rural communities.
  - Government officials should create public training programmes to prepare the poor and less educated people especially semi-skilled and unskilled for employment in the clean-energy sector.
  - People need to be made self employed by providing training in skills and latest technologies for agriculture and other avenues especially in rural areas.
  - Women in rural areas who are left behind by men due to migration need to look into other sources of livelihood other than agriculture like animal husbandry etc..

## Conclusion



In 2020, although the economy was in a very poor state following the deleterious effects of demonetisation, the rural economy was faring reasonably well on the back of two good monsoons.

However, after a year of distress, and with some part of the workforce still not having returned to their work places, rural incomes are expected to be under pressure. Economists say they are already seeing signs of sluggishness in rural consumption.

### **Value-addition**

#### **Steps taken by government in recent times**

- **Dedicated Shram Suvidha Portal:** That would allot Labor Identification Number (LIN) to units and allow them to file online compliance for 16 out of 44 labor laws.
- **Random Inspection Scheme:** To eliminate human discretion in selection of units for inspection, and uploading of Inspection Reports within 72 hours of inspection mandatory.
- **Universal Account Number:** Enables 4.17 crore employees to have their Provident Fund account portable, hassle-free and universally accessible.
- **Apprentice Protsahan Yojana:** Government will support manufacturing units mainly and other establishments by reimbursing 50% of the stipend paid to apprentices during first two years of their training.
- **Revamped Rashtriya Swasthya Bima Yojana:** Introducing a Smart Card for the workers in the unorganized sector seeded with details of two more social security schemes.
- **The National Career Service** is being implemented as a mission mode project to provide various job-related services information on skills development courses, internships etc

What is disguised unemployment? How does it impact the economy? Suggest steps to overcome it. (250 words)

Difficulty level: Moderate

Reference: Live Mint

#### **Why the question:**

Last month witnessed protests in several parts of north India by students who had appeared for the Non-Technical Popular Categories exam conducted by the Railway Recruitment Board. This was to fill up 35,000 posts for which 12.5 million candidates had applied. While the RRB's decision to set up a committee to examine the issue may have pacified students for the time being, it is unlikely to offer any solution for the bigger problem of employment and earnings in the Indian economy.

#### **Key Demand of the question:**

To write about disguised unemployment and steps needed to overcome it.

#### **Structure of the answer:**

##### **Introduction:**

Begin by defining disguised unemployment. Give an example to substantiate.

##### **Body:**

First, mention the impact of disguised unemployment on the Indian economy –does not affect aggregate economic output, productivity is low and too many workers are filling too few jobs etc. Next, suggest measures to overcome disguised unemployment – creating additional employment with proper wages, security of tenure and social protection, upskilling and reskilling of labor force etc.

##### **Conclusion:**



*Conclude by writing a way forward.*

## Introduction

**Disguised unemployment** exists when part of the labour force is either left without work or is working in a redundant manner such that **worker productivity is essentially zero**. It is unemployment that does not affect aggregate output. An economy demonstrates disguised unemployment when **productivity is low** and **too many workers are filling too few jobs**.

## Body

### Impact of disguised unemployment on the economy

- It can be **distinguished by low productivity** and mostly follows informal labour markets and agricultural labour markets, capable of consuming large labour quantities.
- The productive capacity of labour is **not translating into economic output**. This is because the worker is **not being utilised to his full potential**.
- It may show **many as employed** but that would still **not effect India's growth** and can remain stagnated.

### Steps to overcome disguised unemployment

- **Population control:** Educating the masses for the population control measure through family planning programmes. BIMARU states still account for 23% of population and these are mostly out-migrant states.
- **Utilising demographic dividend:** Making credit available to the people for self-employment. Providing skill development and entrepreneurship programmes.
- **Shifting to labour intensive industry:** Encouraging mobility of the workforce from rural to urban areas.
  - There are number of labour-intensive manufacturing sectors in India such as **food processing, leather and footwear, wood manufacturers and furniture**, textiles and apparel and garments.
  - Special packages, individually designed for each industry are needed to create jobs.
- **Decentralisation of Industrial activities** is necessary so that people of every region get employment.
- **Women labour force:** Concrete measures aimed at removing the social barriers for women's entry and their continuous participation in the job market is needed.
- **Vocational education:** Government needs to keep a strict watch on the education system and should try to implement new ways to generate skilled labour force. This is being implemented in the **New Education Policy**.
- **National Employment Policy (NEP) :** There is a need for National Employment Policy (NEP) that would encompass a set of **multidimensional interventions** covering a whole range of social and economic issues affecting many policy spheres and not just the areas of labour and employment.



- The policy would be a critical tool to contribute significantly to achieve the goals of the **2030 Agenda for Sustainable Development**.

### Conclusion

Disguised unemployment leads to trapping the economy in the lower growth without actual diagnosis of what is ailing the economy. It leads to non-usage of full potential of the demographic dividend that could otherwise reap rich benefits to the society and make it inclusive. Hence governments must soon shift jobs from agriculture to more labour intensive and productive sectors with high growth potential.

Examine the factors for the increasing rate of inflation in the economy and suggest steps that are needed to balance it. (250 words)

*Difficulty level: Moderate*

*Reference: The Hindu , New Indian Express*

#### **Why the question:**

*India's inflation based on the consumer price index quickened to 6.01% in January, breaching the central bank's upper tolerance limit of 6%. While the headline number was no surprise given that the RBI had forecast the acceleration, the official data merit scrutiny.*

#### **Key Demand of the question:**

*To write about the adverse effects of climate change on the planet.*

**Elucidate** – Give a detailed account as to how and why it occurred, or what is the context. You must be defining key terms wherever appropriate and substantiate with relevant associated facts.

#### **Structure of the answer:**

##### **Introduction:**

*Begin by developing a link a between inflation and economic growth and how central bank is tasked with balancing it.*

##### **Body:**

*First, mention the reasons for low interest rates by the RBI – spurring growth, overcoming impact of the pandemic, higher demand by consumers and investments by corporations, leading to higher GDP growth and job creation.*

*Next, write about the impact of keeping the policy rate low – increasing inflation, lack of monetary policy transmission, increased inequality etc.*

*Next, mention the reasons for increasing trends in inflation and suggest steps to overcome the same.*

##### **Conclusion:**

*Conclude by writing a way forward.*

##### **Introduction**

India's inflation based on the **consumer price index quickened to 6.01% in January, breaching the central bank's upper tolerance limit of 6%**. Though the RBI had been expected to start normalising its pandemic-era policy stance in February's monetary policy meeting and reaffirm its resolve to contain inflation, the central bank retained the status quo in order to support economic growth.

##### **Body**

#### **Reasons to keep lower interest rates**

- **Low interest** rates are supposed to help **spur growth**. The theory is that low rates will **encourage governments, businesses and consumers** to borrow and spend more freely.
- This will result in higher demand by consumers and investments by corporations, leading to **higher GDP growth and job creation**. This leads to a **virtuous cycle in the economy**—



higher GDP growth and job creation will lead to increased income, which will lead to higher consumption and so on and so forth.

- Maintaining **price stability** is the foremost objective of the monetary policy committee of RBI. However, during the pandemic, **growth has taken centre stage** and RBI has **rightly cut interest rates**.
- But now it is taking a **neutral stance in the wake of rising inflation**.
- Traditionally, **raising interest rates** can lead to **decline in prices** by **making credit more expensive** and this is the tool that RBI employs.
- However, just raising interest rates to combat inflation **may kill any incipient signs of recovery**. So, RBI may prefer a wait-and-watch mode at least for now.

#### Impact of keeping interests rates low

- Low rates are terrible for savers. A combination of high inflation and low rates will rapidly erode the value of money kept in a bank.
  - For much of last year, this has been exactly the case—the interest rates have been lower than inflation.
- It has **hit the retired and the poor**, who primarily keep much of their money in bank fixed deposits and savings accounts.
- Low real interest rates will not automatically increase investment, consumption or GDP growth.
  - Other factors come in like **capacity utilisation may be too low for fresh investment** in new factories.

#### Factors for the high rate of inflation in the Indian economy

- **Fuel prices:** The government has increased taxation of energy to raise resources.
  - Since energy is used for all production, prices of all goods and services tend to rise and push up the rate of inflation.
  - Further, **this is an indirect tax, it is regressive and impacts the poor disproportionately** It also makes the RBI's task of controlling inflation difficult.
- **Supply shortage:** The lockdowns **disrupted supplies** and that added to shortages and price rise.
  - **Prices of medicines and medical equipment rose dramatically.**
  - Prices of items of day-to-day consumption also rose.
  - Fruits and vegetable prices rose since these **items could not reach the urban markets**.
- **International factors:** Most major economies have recovered and demand for inputs has increased while supplies have remained disrupted (like chips for automobiles).
  - So, **commodity and input prices** have risen (like in the case of metals).



- Businesses claim increase in input costs underlies price rise.
- **Data collection and methodology:** In April and May 2020, data on production and prices could not be collected due to the strict lockdown.
  - So, the current data on prices for April to July 2021 are not comparable with the same months of 2020.
  - As such, the official inflation figures for these months in 2021 do not reflect the true picture.
- **Weak Rupee:** The weakening of the rupee also added to inflation.

### Measures to keep the inflation under control

- **Commodity prices: Govt needs to remove supply side bottlenecks.** For example, Govt can immediately offload 10-20% of its pulses stock with NAFED in the open market.
  - Stocks are currently at 14.6 lakh MT. This may immediately cool down pulses' price.
- **Fuel prices:** The prices of petrol, diesel and LPG has increased drastically crossing Rs 100/- and states/Centre are buck passing the responsibility of cutting taxes.
  - Bringing them under GST would reduce the prices by at least 30 rupees.
  - GST council must agree to this with haste.
- **Policy measures:** Navigating out of this will need a fiscal stimulus to shore up consumer spending, an investment revival to increase the productive capacity of the economy, and a careful management of inflationary expectations.
  - Concomitantly, the government will also need to **pursue redistribution of income** to reduce the widening disparity.
  - This also calls for **fiscal prudence to cut wasteful spending, find new revenue through asset sales, mining and spectrum auctions, and build investor confidence.**

### Conclusion

Economists have pointed at India's K-shaped recovery where a few have benefitted while others have fallen sharply behind. Big companies have benefitted and increased market share, revenues and profits sharply. They have also taken advantage of low interest rates to decrease the cost of their borrowings. Small and medium companies, struggling with falling revenues and cash flows, have not been able to take advantage of the rates. Hence inflation must also be controlled while growth is focussed upon.

Inflation control is a legitimate objective of economic policy given the correlation between inflation and macro-economic stability. Inflation targeting is needed, in a nation where there are 21% poor people. However, this must be tweaked sufficiently to match the needs of an economy such as India.

The fallout from the Ukraine crisis will directly and indirectly impact the Indian economy. Analyze. What steps are needed to protect the Indian economic interests? (250 words)

*Difficulty level: Moderate*



Reference: Indian Express , Live Mint

**Why the question:**

India's trade with Russia has not yet been severely impacted by the rising tensions in the border region of Russia and Ukraine, but there is looming prospect that it could be impacted if wider sanctions on Russia are announced.

**Key Demand of the question:**

To write about economic impact due to the Ukraine crisis and steps needed to mitigate it.

**Directive word:**

**Analyse** – When asked to analyse, you must examine methodically the structure or nature of the topic by separating it into component parts and present them in a summary.

**Structure of the answer:**

**Introduction:**

Begin by giving context regarding the economic fallout from the Ukraine crisis.

**Body:**

First, direct impact from the crisis – fuel prices, India's gas requirements and price fluctuations.

Next, write about indirect impact from the crisis – Indian exports to Russia, Indian investments in Russia and impact of sanctions etc.

Next, write about the systemic measures that India must take to mitigate and reduce the negative fallouts from the crisis.

**Conclusion:**

Conclude with way forward.

**Introduction**

As Russia declares war on Ukraine, the impact will also be on the recovering economies around the world, including India, which is still struggling with the pandemic. India's trade with Russia has not yet been severely impacted by the rising tensions in the border region of Russia and Ukraine, but there is looming prospect that it could be impacted if wider sanctions on Russia are announced.

**Body**

**Impact on Indian economy**

- **Erosion of household savings:** The crisis will send **cooking gas, petrol and other fuel bills** soaring for Indian households and businesses.
  - **Crude prices could remain above \$100 per barrel** in the near to medium term unless the Opec decides to increase output materially.
- **Inflation:** Retail inflation quickened to **01% in January**, breaching the upper tolerance level set by New Delhi. And for the 10th straight month, **wholesale inflation** remained in double digits, coming in at **12.96% for January**.
  - The war will put more pressure on already high inflation.
- **Fiscal calculations:** Depending on how long global oil prices remain elevated, the tensions could put a question mark on the **RBI's credibility in making inflation projections** and upset the government's budget calculations. Fiscal deficit will widen largely.
- **Investment climate:** For investors, the world markets are already taking a knocking, and an all-out war will freeze investment and growth.
- **India's defence requirements:** Though India has cut back on Russian arms imports, **Moscow** is still at the top.



- **Curtailing of defence supplies** will impact India's ability to respond to China.

#### Measure to be taken to mitigate the crisis

- **Diversifying crude basket:** India must diversify its crude oil basket and try to reach out to Latin American nations which are not a part of OPEC cartel.
- **Reducing taxes:** Governments both Central and State must cut the VAT on fuel to ease pressure of rising prices on households.
- **Diplomatic trust:** As both Russia and Ukraine are reaching out to India, India can take a lead in making the nations negotiate peace terms without a full-fledged war.
- **Reducing fiscal deficit through disinvestment:** Governments must achieve their targets of disinvestment by strategic sale of government companies. Government has no business in doing business as per the Prime Minister himself.
- **Trade helpdesk:** This has already been done by **DGFT** to ensure smooth movement of cargo between India-Russia and India-Ukraine.

#### Conclusion and way forward

- By ordering a full-scale invasion of Ukraine, Russia might be planning a unilateral restructuring of Russia's external environment, focused squarely on Ukraine.
- If Russia can succeed in dismembering and destabilizing Ukraine, it might emerge from this war satisfied that Russia has been made somewhat more secure, powerful, and feared across Europe.
- Russia may still be determined to impose a wide-ranging settlement on the West that includes its maximalist goals of limiting NATO deployments and barring future expansion.
- Today, the balance of power is once again in flux, and as China develops a strategic partnership with Russia, the future of the West-led global order will be defined by how effectively it responds to the crisis in Ukraine.

A multi-lingual approach to education with foundational learning in mother tongue would create new opportunities for learning and leading to creation of opportunities in skill development and employment. Critically examine. (250 words)

*Difficulty level: Moderate*

*Reference: The Hindu*

**Why the question:** Tapping technology for multilingual learning: As the theme of International Mother Language Day 2022, it has much relevance in reshaping Indian higher education.

**Key Demand of the question:** To explain in detail how multi-lingual approach especially Mother tongue is critically important for cognitive, psychological and personality development, education and learning.

**Structure of the answer:**

**Directive:**

**Critically examine** – When asked to 'Examine', we have to look into the topic (content words) in detail, inspect it, investigate it and establish the key facts and issues related to the topic in question. While doing so we should explain why these facts and issues are important and their implications. When 'critically' is suffixed or prefixed to a directive, one needs to look at the good and bad of the topic and give a fair judgment.

**Structure of the answer:**

**Introduction:**

Start with importance of language in general.

**Body:**

Discuss the significance of mother tongue in personality development. Present the issues due to lack of emphasis on mother tongue such as – Difficult learning: Incomplete first language skills often make learning other languages more difficult. Cognitive conflict: when a child finds a discrepancy between what he thinks the world should be and what he finds it as, emanating from forced situation of learning in a second language etc. Mention about NEP 2020 stand in this regard.

Next, write about the limitations of multi-lingual approach – lack of proficiency in English, opportunity costs, competition etc.

**Conclusion:**

Conclude by writing a way forward.

**Introduction**

**Mother tongue or mother language** refers to the language which a person has grown up speaking from early childhood. India is a land of linguistic diversity and the languages differ in their dialects every 100 kms. There have been many arguments and dissatisfaction over having a single national language (Hindi) for entire country.

The National Education Policy (NEP) approved by the Union Cabinet on July 29, 2020, says that wherever possible the medium of instruction in schools until Grade V — preferably until Grade VIII — should be the mother tongue or the local or regional language..

**Body:****Importance of Mother Tongue as foundational language:**

- Mother tongue is the very first language that one hears, understands and gets familiar with. Thus, it plays important role in shaping feelings, emotions and thought processes.
- Several psychological, social and educational experiments proved that learning through the mother tongue is deeper, faster and more effective. A child understands his mother tongue and hence if he/she is instructed in that language itself, his transition to school education is smooth and easy.
- Much of a child's future social and intellectual development hinges on the milestone of mother tongue.
- Incomplete first language skills often make learning other languages more difficult. Understanding the subject matter would boost the confidence of the student and propel him/her to continue with his/her schooling thus lowering the drop-out rate.
- Mother tongue is critically important for cognitive, psychological and personality development, education and learning.
- Psychologists say it's important that expressions and vocabulary are chosen with care when we talk to children.
- Research shows how the brain differently absorbs and recalls languages learnt in early childhood and later life.
- Educating children in their mother tongue will also build a strong home-school partnership in their learning. Parents will be able to participate their child's education and make the experience of learning for the students more wholesome.



- It will also benefit the primary school teachers as many of them find it difficult to express themselves in English and hence are not able to transfer as much knowledge as they would like to, thus creating a knowledge deficit.

#### Challenges faced in using mother language as means of education:

- It might not be possible for all languages to become the medium of instruction and it might not be possible for large parts of the country to implement this.
- The commonest criticism of the policy to use the mother tongue in schools is that it widens the divide between those who can communicate in English and those who cannot.
- Providing education especially technical education in regional languages requires **teachers proficient** in undertaking classes **in the vernacular medium along with English, textbooks and reference materials** in regional languages, besides **technological assistance** such as audio translation aids.
- It might not be financially viable because of the lack of funds and lack of trained staff.
- The initial investment in bilingual programmes can be high because of the additional cost of developing new learning material especially for languages that have not been standardised or do not have a script. It would also require teachers trained to teach in a multilingual classroom and new teachers fluent in these languages.
- Evidence from Guatemala and Senegal in 1999 estimated that producing local language material would cost about 1% of the education budget with decreasing investment as time passes.
- Another challenge is selecting which mother tongues become the medium of instruction in a school and which do not. For instance, students who speak local languages such as Rabha, Santhali and Nepali attend Assamese-medium schools in the Kokrajhar and Chirang areas.

#### Way forward

- The need to build an effective **multilingual education system** across diverse streams and disciplines becomes all the more imperative.
- In this context, the collaboration between the AICTE and IIT Madras to translate some courses on the central government's e-learning platform, **Study Webs of Active Learning for Young Aspiring Minds (SWAYAM)** into eight regional languages such as Tamil, Hindi, Telugu, Kannada, Bengali, Marathi, Malayalam and Gujarati, is commendable. Such tech-led initiatives will serve to democratise higher education.
- At the same time, the decision of the AICTE to permit **Tech programmes in 11 native languages**, in tune with the NEP, is a historic move.
- Our policy-planners, educators, parents and opinion leaders must bear in mind that when it comes to education in mother tongue and local languages, we can take the cue from **European countries as well as Asian powers such as Japan, China and Korea, among others**.

#### Conclusion:



Co-existing over centuries, borrowing from and nurturing each other, our languages are interwoven with our individual, local and national identity. The need today is to respect, protect and nurture diversity of our nation so that unity is ensured.

#### **Value addition**

#### **Way forward to preserve mother languages:**

- *With the help of technology, every mother language can be maintained. Google's Project Navlekha in India is an example. The project is aimed at increasing the online content in Indian local languages.*
- *People should be made aware of the professional viability of pursuing degrees in native languages. With a degree in a native language, one can take up professions like Language Expert, Translators, and Tourist-Guide etc.*
- *Also to maintain any native language, it is necessary that it is spoken. Use of native languages at homes, schools, and offices should be encouraged.*
- *The Upper House of India has an arrangement for interpretation of 22 languages i.e. members are encouraged to speak in their native languages.*
- *Countries like France, Germany, Italy, China have developed their mother languages as a powerful medium. Other countries need to learn from these to preserve their cultural and linguistic identity.*

### **Effects of liberalization on the economy, changes in industrial policy and their effects on industrial growth.**

By adopting e-commerce, MSMEs stand to gain significant advantages such as increased revenues, improved market reach and customer acquisition. Examine. (250 words)

*Difficulty level: Moderate*

*Reference: Live Mint*

#### **Why the question:**

*As India's economic recovery remains fragile, it would be prudent to help fast-track India's e-commerce sector and the onboarding of MSMEs, which account for an estimated 30% of India's gross domestic product (GDP) and constitute more than 40% of exports.*

#### **Key Demand of the question:**

*To write the various benefits from MSME's adopting e-commerce.*

#### **Directive word:**

**Examine** – When asked to 'Examine', we must investigate the topic (content words) in detail, inspect it, investigate it and establish the key facts and issues related to the topic in question. While doing so we should explain why these facts and issues are important and their implications.

#### **Structure of the answer:**

##### **Introduction:**

*Begin by stating statistic regarding the importance of MSME to the Indian economy.*

##### **Body:**

*First, mention the adverse impact of the pandemic and current difficulties faced by MSME's.*

*Next, write about the impact that e-commerce can have in MSME's – economic stability, growth and security, even the smallest MSMEs to showcase their products in any part of the world, removing*



barriers, providing a large customer base and consequently, ensuring increased revenues, transformation at minimal costs, investment and innovation etc.

Next, write about various obstacles for MSME's to adapt e-commerce and suggest steps to overcome them.

#### **Conclusion:**

Conclude with a way forward to address these issues.

#### **Introduction**

Covid has caused a tectonic shift in all spheres of our lives, economy, businesses, entertainment, kids' education, travel, etc, apart from healthcare. The only common thread taking us through it has been digitalization and e-commerce. Businesses and services depend ever more on technology.

**Micro, small and medium enterprises (MSMEs)** could also survive with technology and digitization of their processes, inventory management and interface with markets, either directly or via the e-commerce ecosystem.

#### **Body**

As India's economic recovery remains fragile, it would be prudent to help fast-track India's e-commerce sector and the onboarding of **MSMEs**, which account for an **estimated 30% of India's gross domestic product (GDP)** and constitute more than **40% of exports**. However, currently less than **10% of Indian MSMEs sell online** and 85% are unregistered.

#### **Advantages to MSME's on joining e-commerce**

- **Increase revenues and profit margins:** Improved timeliness of marketing, global client base and flexible business conduct can aid MSMEs to increase revenues and provide specific e-commerce benefits such as online referral systems to acquire more customers, knowledge-based customisation to improve customer acquisition and use service & feedback channels to enhance the future sales experiences.
- **Reduce spend on marketing and distribution costs:** Because of increased competition in this space, e-commerce players are heavily spending on digital and traditional media to improve site traffic, gain customers, establish customer relationships and boost sales.
  - In addition, digital channels provide a cost-effective and efficient Infomedia space to advertise and communicate with target audiences, wherein most e-commerce platforms provide links on social media channels, which is then used by their partners to create awareness about their products and services.
- **Use data analytics to understand, engage and retain customers:** Through their portals/websites, **most B2B e-commerce players generate, store and analyse customer data** including products, prices and technical details accessed, time spent on every page, orders placed and purchases made over a period.
- **Building a global reputation:** Online transactions create an auditable history of a company's performance and reliability. Often consumers depend on these records to identify companies that are most likely to provide a satisfactory service.
- **Access to foreign markets:** One of the biggest challenges with traditional export channels is the inability of small enterprises to participate in that process.



- To overcome this, e-commerce platforms provide a level playing field for all types of businesses that seek access to foreign markets.

#### Issues onboarding MSME's to e-commerce

- The current GST Rules provide that **any offline seller with annual turnover under ₹40 lakh** and engaged in **intra-state sales must obtain GST registration to sell online**.
  - Additionally, offline sellers under ₹1.5 crore annual turnover with intra-state sales **cannot continue with simplified GST compliance processes** under the **composite GST scheme if they want to sell online**.
  - Accordingly, even where an **MSME's turnover does not cross the threshold**, it would be **required to register itself under GST** and fulfil all subsequent compliance requirements.
- Under the current GST framework, many small businesses may not be able to transition from conventional sales to e-commerce platforms because their GST registration under the composition scheme may not be adequate, posing a hurdle in small business owners' efforts to access the large customer base that global e-commerce majors and several others may offer.
- Moreover, MSMEs operating through online platforms are burdened with cumbersome and **time-consuming periodical compliance needs** like registration and the monthly filing of returns, which further **dissuades** them from **registering** under the **GST Network**.
- Yet, we must proactively get MSMEs selling online, as also artisans and farmer-producer organizations scattered across India, and provide them marketing support.

#### Measures to overcome the issues

- It may be prudent to provide an enabling GST ecosystem in the interest of all suppliers, online as well as offline.
- In the spirit of empowering small retailers and not placing online platforms at a disadvantage to brick-and-mortar businesses, MSMEs should be liable for GST only at the threshold value, irrespective of whether they sell offline or online.
- Enabling GST parity between offline and online sellers with respect to registration would be logical and help in integrating small business owners in the country with the e-commerce ecosystem.
- Also, amending the rules to allow small offline sellers to sell online (with intra-state restrictions) without needing a GST registration will increase GST and income tax collections for the government, increase control and transparency, and improve efficiency of tax collection.

#### Conclusion

India's e-commerce sector is projected to reach \$80 billion by 2021 and \$300 billion by 2030. For MSMEs, e-commerce is rightly synonymous with economic stability, growth and security; and is a channel that allows even the smallest MSMEs to showcase their products in any part of the world without having to shell out on expansion or changing locations. These platforms have empowered small businesses by removing barriers, providing a large customer base and consequently, ensuring



increased revenues. For growth and development of MSMEs, e-commerce marketplaces are perhaps the best catalysts for directing their transformation at minimal costs, investment and innovation. A collaborative effort between the government, the private sector, industry groups, training organisations and SMEs is the most efficient way to support MSMEs.

Privatisation of Public Sector Enterprises (PSE) is not always the panacea and must always be done strategically, while the proceeds from it must be utilised in an objective manner to create further assets. Comment. (250 words)

*Difficulty level: Moderate*

*Reference: The Hindu*

**Why the question:**

*India's fiscal deficit (for the Centre) in FY22 is expected to be 6.8% of the GDP, or in layman's terms about ₹15.06 lakh crore. When considering the debts of States as well, this jumps to about 12.7% of the GDP (as of FY21). In comparison, the budgetary outlay for MGNREGA in FY22 was ₹73,000 crore, while the Ministry of Defence was allocated ₹4.78 lakh crore for FY22. Every year, the shortfall grows wider.*

**Key Demand of the question:**

*To write about strategic privatisation of PSE's and objective utilisation of their funds.*

**Directive word:**

**Comment**— here we must express our knowledge and understanding of the issue and form an overall opinion thereupon.

**Structure of the answer:**

**Introduction:**

*Start the answer by defining privatisation and give recent examples of privatisation.*

**Body:**

*In the first part, write about the reasons due to which the government undertakes privatisation.*

*Next, write about the need to privatise strategically and factors that must be considered before going ahead for privatisation.*

*Next, talk about the objective utilisation of the proceeds from privatisation to be invested in creation of more assets rather than engaging in populist measures.*

**Conclusion:**

*Conclude with a way forward.*

**Introduction**

Due to the poor performance of several PSEs and the consequent huge fiscal deficits, the issue of privatisation has come to the forefront. **Privatisation** is ought to infuse efficiency by bringing PSEs to the competition in the market.

The term 'privatisation' is used in different ways, ranging from 'transition to private legal forms' to 'partial or complete denationalization of assets.'

**Body**

In India, privatisation is sought to be achieved through two measures:

- The disinvestment of the government's equity in public sector undertakings.
- The opening up of hitherto closed areas to private participation

Categories of public sector enterprises

- Sick for long time and beyond redemption



- Financially troubled but can be turned around
- Profitable enterprises

### Challenges in Privatisation

- First, the number of Indian private firms which can buy out public sector firms are very few.
- Their limited financial and managerial resources would be better utilised in taking over the large number of private firms up for sale through the bankruptcy process.
- Then, these successful large corporates need to be encouraged to invest and grow both in brownfield and Greenfield modes in the domestic as well as international markets.
- Sale at fair or lower than fair valuations to foreign entities, firms as well as funds, has adverse implications from the perspective of being 'Atma Nirbhar'.
- Again, Greenfield foreign investment is what India needs and not takeovers.
- Public sector enterprises provide for reservations in recruitment.
- With privatisation, this would end and unnecessarily generate social unrest.

### Way Forward

#### For Sick for long time and beyond redemption

- The Government should close these in a time-bound manner with a generous handshake for labour.
- After selling machinery as scrap, there would be valuable land left.
- Prudent disposal of these plots of lands in small amounts would yield large incomes in the coming years.
- All this would need the creation of dedicated efficient capacity as the task is huge and challenging.
- These enterprises may be taken away from their parent line Ministries and brought under one holding company.
- This holding company should have the sole mandate of speedy liquidation and asset sale.

#### For financially troubled but can be turned around

- Air India should ideally be made debt free and a new management should have freedom permitted under the law in personnel management to get investor interest.
- As valuation rises, the Government could reduce its stake further and get more money.
- If well handled, significant revenues would flow to the Government.

#### For Profitable enterprises

- The Government can continue to reduce its shareholding by offloading shares and even reducing its stake to less than 51% while remaining the promoter and being in control.



- Calibrated divestment to get maximum value should be the goal instead of being target driven to get a lower fiscal deficit number to please rating agencies.
- In parallel, managements may be given longer and stable tenures, greater flexibility to achieve outcomes, and more confidence to take well-considered commercial risks.

### Conclusion

The time has come to take a relook at privatisation. Simply pursuing this path, while utilising such proceeds for loan write-offs or populist giveaways in the election cycle will not do. A hunt for immediate revenue should not overshadow the long-term interest of the ordinary Indian.

### Government Budgeting.

India's progress in payment systems will provide a useful backbone to make a state-of-the-art central bank digital currency (CBDC) available to its citizens and financial institution. But given its impact on macroeconomic policy making, it is necessary to test comprehensively so that they have minimal impact on monetary policy and the banking system. Discuss. (250 words)

*Difficulty level: Easy*

*Reference: Live Mint, moneycontrol.com*

#### **Why the question:**

*In her Budget 2022 speech on Tuesday, Finance Minister Nirmala Sitharaman announced the Reserve Bank of India (RBI) will launch its own digital rupee in the new financial year. The Digital Rupee is a central bank digital currency (CBDC) that will be launched in 2022-23, the FM said.*

#### **Key Demand of the question:**

*To explain about CBDC, the technology behind it, its potential benefits and challenges.*

#### **Directive word:**

**Discuss** – This is an all-encompassing directive – you have to debate on paper by going through the details of the issues concerned by examining each one of them. You have to give reasons for both for and against arguments.

#### **Structure of the answer:**

##### **Introduction:**

*Start by explaining the concept central bank digital currency (CBDC)*

##### **Body:**

*In the first part, explain the technology behind CBDC – Blockchain giving rise to secure digital instruments. Also, mention from where CBDC will derive its value from. Mention the growing acceptance of CBDC in India.*

*Next, write about potential benefits that India can accrue from CBDC. financial inclusion, the cashless society, decrease the cost of printing, expanding the digital economy and empowering citizens etc.*

*Next, write about potential challenges with regards to CBDC. User adoption, security, complexity, domination by Chinese and Opportunity cost due to RBI's reluctance etc.*

##### **Conclusion:**

*Conclude with way forward as to how India should step up to CBDC.*

##### **Introduction**

A **Central Bank Digital Currency (CBDC)**, or **national digital currency**, is simply the digital form of a country's fiat currency. Instead of printing paper currency or minting coins, the central bank issues electronic tokens. This token value is backed by the full faith and credit of the government.

##### **Body**



## Background

- The **Reserve Bank of India** is likely to soon kick off pilot projects **to assess the viability of using digital currency** to make wholesale and retail payments to help calibrate its strategy for introducing a full-scale **central bank digital currency (CBDC)**.
- Union Finance Minister in the budget speech said the Reserve Bank of India (RBI) will launch a central bank digital currency (CBDC) in 2022-23, marking the first official statement from the Union government on the launch of much-awaited digital currency.

## Need for a CBDC:

- The growth of cryptocurrencies such as Bitcoin, Ethereum etc has raised challenges to fiat currencies.
- Along with their other vulnerabilities made the central bank of each country explore the possibility of introducing their own digital currencies.
- A **2021 BIS survey of central banks**, which found that 86% were actively researching the potential for such currencies, 60% were experimenting with the technology, and 14% were deploying pilot projects.
- The need for inter-bank settlement would disappear as it would be a central bank liability handed over from one person to another.

## Potential of a CBDC:

- An official digital currency would reduce the cost of currency management while enabling real-time payments without any inter-bank settlement.
- India's fairly high currency-to-GDP ratio holds out another benefit of CBDC — to the extent large cash usage can be replaced by CBDC, the cost of printing, transporting and storing paper currency can be substantially reduced.
- As the currency in digital form, it can provide an efficient way for financial transaction. Further, digital currency also solves the challenges with Cash and coins. Cash and coins require expenses in storage and have inherent security risks like the recent heist in the RBI currency chest.
- There are about 3,000 privately issued [cryptocurrencies](#) in the world. According to IMF, the key reason for considering national digital currency is to counter the growth of private forms of digital money.
- There is a possibility of these companies going bankrupt without any protection. This will create a loss for both investor and creditor. But the National Digital currency has government backing in case of any financial crisis.
- As the state-backed digital currency can provide investor/consumer protection, the private can confidently invest in the associated infrastructure without any doubts over its regulation. This will improve the services to people.
- The national digital currency will be regulated by the RBI. So, there will be less volatility compared to other digital currencies.



- Current RBI's work on inflation targeting can be extended to national digital currency also. Since India is planning to ban other cryptocurrencies, the RBI can better regulate digital and fiat currency. Thus, upgrading to digital currency and balancing the macroeconomic stability.
- With the introduction of CBDC in a nation, its central bank would be able to keep a track of the exact location of every unit of the currency, thereby **curbing money laundering**.
- **Criminal activities** can be easily spotted and ended such as terror funding, money laundering, and so forth

#### Concerns posed:

- India is already facing many cyber security threats. With the advent of digital currency, cyberattacks might increase and threaten digital theft like Mt Gox bankruptcy case.
- According to the Digital Empowerment Foundation in 2018 report, around 90% of India's population is digitally illiterate. So, without creating enough literary awareness introduction of digital currency will create a host of new challenges to the Indian economy.
- Introduction of digital currency also creates various associated challenges in regulation, tracking investment and purchase, taxing individuals, etc.
- The digital currency must collect certain basic information of an individual so that the person can prove that he's the holder of that digital currency. This basic information can be sensitive ones such as the person's identity, fingerprints etc.

#### Conclusion:

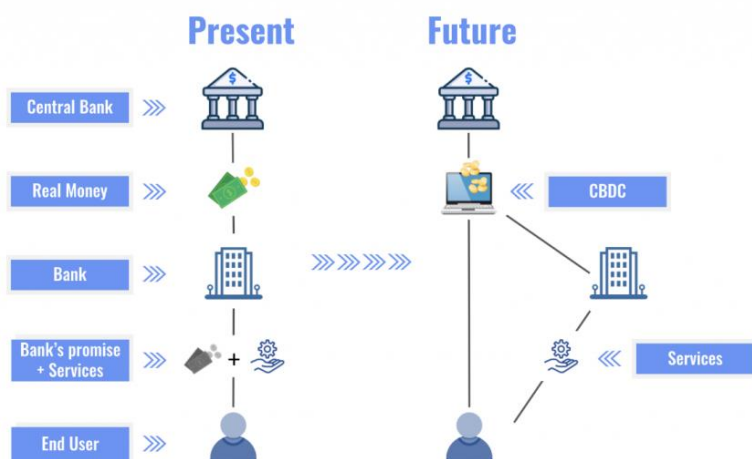
There are crucial decisions to be made about the design of the currency with regards to how it will be issued, the degree of anonymity it will have, the kind of technology that is to be used, and so on. There is no doubt that the introduction of National Digital currency prevents the various threats associated with the private-owned cryptocurrencies and take India the next step as a digital economy. But the government has to create necessary safeguards before rolling out. India needs to move forward on introducing an official digital currency.

#### Value addition

##### Global situation of CBDC

According to the **Bank for International Settlements**, more than 60 countries are currently experimenting with the CBDC. There are few Countries that already rolled out their national digital currency. Such as,

- **Sweden** is conducting real-world trials of their digital currency (**krona**)
- **The Bahamas** already issued their digital currency "**Sand Dollar**" to all citizens
- **China** started a trial run of their digital currency **e- RMB** amid pandemic. They plan to implement pan-China in 2022. This is the first national digital currency operated by a major economy.



### Working of CBDC:

- A central bank digital currency is the legal tender issued by a central bank in digital form.
- It is the same as a fiat currency but the form is different and is exchangeable one-to-one with the government-issued money.
- In other words, CBDC is the same as the legal currency we use. Just that it's in a digital form.
- A CBDC is the digital form of fiat currency and will ease transactions.
- An RBI report had earlier described CBDC as something that will provide a safe, robust, and convenient alternative to physical cash.
- Depending on various design choices, it can also assume the complex form of a financial instrument, the RBI report said.
- A CBDC is not a crypto currency. CBDC is the digital form of a legal tender but private virtual currencies are entirely different.
- CBDCs use **distributed ledger technology (DLT)**, which is typically deployed in a hybrid architecture i.e. existing central bank and payment infrastructure + DLT for movement, transparency, workflow and audit trail or tracing of funds (value).
- This technology helps in efficiency (speed), security (encryptions) and also other aspects like smart contracts which execute buy and sell transactions based on a pre-defined criteria and opens up the possibility of 'programmable' money.

What is capital expenditure? Analyse what impact the emphasis on capital expenditure in the Union Budget will have on the Indian economy. (250 words)

Difficulty level: Easy

Reference: [Indian Express](#)

Why the question:



*This year's Budget seeks to boost public investment by 35.4% at current prices over last year to raise its share in GDP to 2.9% from 2.2% last year. With grant-in-aid for state investments, the Budget hopes to increase public investment share to over 4% of GDP.*

**Key Demand of the question:**

*To write about the impact of increased capital expenditure on the economy of India.*

**Analyse** – *When asked to analyse, you must examine methodically the structure or nature of the topic by separating it into component parts and present them in a summary.*

**Structure of the answer:**

**Introduction:**

*Begin by defining a capital expenditure as part of the budget.*

**Body:**

*First, write about the various measures proposed in the Budget 2022 to boost capital expenditure in India.*

*Next, write about the positive impact the increased capital expenditure will have on the economy of India – speedy and sustainable revival, crowding in private investment, boost to investment activity and support economic growth in the next year etc.*

*Next, write the downside of increased capital expenditure – higher inflation, higher fiscal deficit etc.*

**Conclusion:**

*Conclude by writing a way forward to have a prudent increase in capital expenditure whilst adhering to fiscal limits of borrowing.*

**Introduction**

Government expenditure is of two types—revenue expenditure and capital expenditure. Expenditure incurred by the government for operational expenses and liabilities is revenue expenditure. Salaries, wages, pensions, subsidies, interest on loans, grants made to state governments, etc., fall under this. **Capital expenditure** is money spent to create or acquire fixed assets—machinery, equipment, land, building, investment in shares, health facilities, education, purchase of new weaponry, etc. While capital expenditure creates assets for the future, revenue expenditure is recurring in nature.

**Body**

**Background**

- The Union Budget sought to step up public investment by raising capital expenditure by 35.4% to Rs 7.5 lakh crore, or 2.9% of the GDP, in the next financial year to **kickstart a “virtuous cycle of investment” and crowd in private investment.**
- Together with grants in aid for creation of capital assets (including MNREGA works), the effective capital expenditure for the next year is budgeted at Rs 10.67 lakh crore, 27 per cent more than the RE of 2021-22 at Rs 8.40 lakh crore.
- Furthermore, taking into account the Capex investment with the provision made for creation of capital assets through Grants-in-Aid to States, the ‘Effective Capital Expenditure’ is estimated at Rs 10.68 lakh crore in 2022-23, which will be about 4.1 per cent of GDP.
- Capex is concentrated in eight ministries and departments, with atomic energy accounting for 1.9% of the total capex, telecommunications 7.2%, defence 20.3%, transfer to states 14.9%, police 1.4%, housing and urban affairs 3.6%, railways 18.3% and road transport and highways 25.0%.



## RISING GOVERNMENT CAPEX

(in ₹ trn)



Note: \*ongoing

Source: Budget documents

### Impact of emphasis on capital expenditure in the Union Budget will have on the Indian economy

- Capital expenditure, which leads to the creation of assets are long-term in nature and allow the economy to **generate revenue** for many years by **adding or improving production facilities and boosting operational efficiency**.
- Capital asset creation leads to value creation and has a **multiplier effect on the economy**.
- It also **increases labour participation**, takes stock of the economy and raises its capacity to produce more in future.
- The hike in capital expenditure will be a **huge boost for the economy** and for **crowding in private investment to spur job creation**.
- Virtuous cycle of investment expected to revive on the back of capex and crowd in private investment
- Capital investments play a huge role in **ensuring speedy and sustained economic revival** and consolidation by creating employment opportunities, inducing **enhanced demand for manufactured inputs from large industries and MSMEs, services from professionals, and helping farmers through better agri-infrastructure**.
- Increased government spending by way of awarding increased contracts also gives an **impetus to private capital expenditure**.
- Along with the creation of assets, repayment of loan is also capital expenditure, as it reduces liability.
- However, the government has to be cautious with the expenditure.

### Conclusion

However, States also have an equally important role in capital expenditure. They carry a greater responsibility on capital formation than the central government. For public investment to flourish, States' capital expenditure too has to grow.

### Value addition

**Capital spending** is associated with investment or development spending, where expenditure has benefits extending years into the future. Capital expenditure includes money spent on the following:

- *Acquiring fixed and intangible assets*
- *Upgrading an existing asset*



- *Repairing an existing asset*
- *Repayment of loan*

Critically examine the potential of the Union Budget 2022-23 to create meaningful employment and long-term sustainable growth. (250 words)

*Difficulty level: Tough*

*Reference: Indian Express*

**Why the question:**

*A crisis is also a crucible of reform. The Union budget 2022-23 strives to enact economic reforms for the country that is recovering from the pandemic and pave the pathway for its robust rise in the coming years. It speaks of an outlook for India@100 in preparation for a post-Covid world order.*

**Key Demand of the question:**

*To write about the potential of Union budget to create employment and growth in India.*

**Directive word:**

**Discuss** – This is an all-encompassing directive – you have to debate on paper by going through the details of the issues concerned by examining each one of them. You have to give reasons for both for and against arguments.

**Structure of the answer:**

**Introduction:**

*Start by giving statistic related to current scenario of employment and growth in India.*

**Body:**

*In the first part, mention the various announcements in the union budget aimed at stimulation employment and growth – Rs 7.5 trillion as capital expenditure, incentivised state governments, special emphasis on Economic infrastructure, Social infrastructure and digital infrastructure. Next, write about potential benefits that India can accrue from the above and also the limitation of the same.*

**Conclusion:**

*Conclude with way forward as to how India should overcome the above limitations to have a robust growth and employment.*

**Introduction**

The Union budget 2022-23 strives to enact economic reforms for the country that is recovering from the pandemic and pave the pathway for its robust rise in the coming years. It speaks of an outlook for **India@100 in preparation for a post-Covid world order**. Union budget has demonstrated commitment towards supply-side reforms. It strives to initiate a dynamic growth engine that shall sustain itself. The **Budget proposals on capital expenditure, MSME sector, and digital banking will boost growth and promote job creation.**

**Body**

**Background**

- India's economic growth in the current year (2021-22) is estimated to be 9.2% of GDP, the highest among all large economies.
- The revised Fiscal Deficit in the current year is estimated at 6.9% of GDP (Gross Domestic Product) as against 6.8% projected in the Budget Estimates.
- According to data from the Centre for Monitoring Indian Economy (CMIE), India's **unemployment rate touched a four-month high of 7.9% in December 2021.**

**Budget 2022-23: Creating meaningful employment and growth**



- **Boost to MSME sector:** Budget continues to provide much-needed relief to the COVID-hit MSME sector. **The revival of MSMEs is critical both from growth and employment perspective,** and these measures are geared towards building a vibrant MSME sector.
  - There are a host of measures aimed at small business, ranging from credit guarantee schemes to improving the ease of doing business, that help MSMEs navigate economic uncertainty.
  - India's MSME sector will be greatly benefited by the **reservation of 68 per cent of the Defence Capital Budget for the domestic industry. Rs 7.5 lakh crore** worth of public investment will give a new push to the economy and create new opportunities for small and other industries.
- **PM Gati Shakti:** PM Gati Shakti will **pull forward the economy** and will lead to more jobs and opportunities for the youth.
  - **It is a National Master Plan for Multimodal Connectivity in October 2021.** This is a digital platform that aims to bring 16 Ministries including Railways and Roadways together for **integrated planning and coordinated implementation of infrastructure connectivity projects.**
- **Production Linked Incentive (PLI) Scheme** for achieving Aatmanirbhar Bharat has received an excellent response, with potential to **create 60 lakh new jobs and additional production of 30 lakh crore** during next five years.
- **Benefitting farmers:** Measures such as a **special fund for encouraging new agriculture start-ups** and package for **food processing industry** will help in increasing income of farmers.
- **Skill Development:** Digital Ecosystem for Skilling and Livelihood (DESH-Stack e-portal) will be launched to empower citizens to skill, reskill or upskill through on-line training.
  - This will lead to meaningful jobs for the youth entering the workforce.
- **Sunrise Opportunities:** Government contribution to be provided for R&D in Sunrise Opportunities like Artificial Intelligence, Geospatial Systems and Drones, Semiconductor and its eco-system, Space Economy, Genomics and Pharmaceuticals, Green Energy, and Clean Mobility Systems.
- **States as vehicles of development:** The **enhanced outlay for 'Scheme for Financial Assistance to States for Capital Investment':**
  - From Rs. 10,000 crores in Budget Estimates **to Rs. 15,000 crore in Revised Estimates for the current year.**
  - Allocation of **1 lakh crore in 2022-23 to assist the states in catalysing overall investments in the economy:** fifty-year interest-free loans, over and above normal borrowings.

#### Persisting issues

- Take off of **Gati Shakti and NIP requires huge efforts and investments from States and private sector. Mobilising resources is not spelt out** in the budget.



- Though opportunities exist for MSME sectors, **issue of subsidising the dwarf industries that take away most subsidies still persists. These dwarfs employ less** and take more incentives without growing up the ladder.
- Though defence outlay is reserved for domestic industries **their export potential is not guaranteed.**
- State governments were **yet to get their GST arrears** and Centre has not made them available to states on time.

### Conclusion

The success of the budget can be assessed post-facto once the schemes kick in and take off in a large-scale manner. It has been called as the **AatmanirbharBharatKaBudget**, which brings with it new energy and strength to our development trajectory, especially at a time when we are courageously fighting a once-in-a-lifetime global pandemic. This Budget is supposed to bring more infra, more investment, more growth and more jobs taking India to newer heights.

Major crops cropping patterns in various parts of the country, different types of irrigation and irrigation systems storage, transport and marketing of agricultural produce and issues and related constraints; e-technology in the aid of farmers

The transformation of Indian agriculture towards chemical free, natural farming needs a structured a roadmap with government as an active partner to generate demand, sustain production and manage supply chains. Discuss. (250 words)

*Difficulty level: Moderate*

*Reference: Indian Express*

#### **Why the question:**

*In her budget speech, Finance Minister Nirmala Sitharaman reaffirmed the Centre's commitment to natural, chemical-free, organic and zero-budget farming. It is the third time in the last four budget speeches where (zero budget) natural farming finds a mention.*

#### **Key Demand of the question:**

*To write about the measures needed to transform Indian agriculture towards natural farming.*

#### **Directive word:**

**Discuss** – This is an all-encompassing directive – you must debate on paper by going through the details of the issues concerned by examining each one of them. You must give reasons for both for and against arguments.

#### **Structure of the answer:**

##### **Introduction:**

*Begin the answer by defining natural farming and its features.*

##### **Body:**

*Firstly, give brief about the drawbacks and limitations of conventional farming and advantages of natural farming over it.*

*Next, mention the steps that are required to achieve this transformation towards chemical free, natural farming – promoting natural farming in rainfed areas, insurance penetration and promote microenterprises that produce inputs for chemical-free agriculture etc.*

##### **Conclusion:**

*Conclude by writing a way forward to leverage natural farming in India.*



## Introduction

**Zero Budget Natural Farming (ZBNF)** is a set of farming methods, and also a grassroots peasant movement, which has spread to various states in India. It has attained wide success in southern India, especially the southern Indian state of **Karnataka where it first evolved**. The movement in Karnataka state was born out of collaboration between **Mr Subhash Palekar**, who put together the ZBNF practices, and the state farmers association Karnataka Rajya Raitha Sangha (KRRS).

## Body



## About Zero budget natural farming

- The “four wheels” of ZBNF are ‘Jiwamrita’, ‘Bijamrita’, ‘Mulching’ and ‘Waaphasa’.
- **Jiwamrita** is a fermented mixture of cow dung and urine (of desi breeds), jaggery, pulses flour, water and soil from the farm bund. This isn’t a fertiliser, but just a source of some 500 crore micro-organisms that can convert all the necessary “**non-available**” nutrients into “**available**” form.
- **Bijamrita** is a mix of desi cow dung and urine, water, bund soil and lime that is used as a seed treatment solution prior to sowing.
- **Mulching**, or covering the plants with a **layer of dried straw or fallen leaves**, is meant to conserve soil moisture and keep the temperature around the roots at 25-32 degrees Celsius, which allows the microorganisms to do their job.
- **Waaphasa**, or providing water to maintain the **required moisture-air balance**, also achieves the same objective.
- Palekar also advocates the use of special ‘Agniastra’, ‘Bramhastra’ and ‘Nemastra’ concoctions again based on desi cow urine and dung, plus pulp from leaves of neem, white datura, papaya, guava and pomegranates for controlling pest and disease attacks.

## Need for a structured roadmap to Natural farming

Telegram: <https://t.me/insightsIAStips>

Youtube: <https://www.youtube.com/channel/UCpoccbCX9GEIwaile4HLjwA>

Facebook: <https://www.facebook.com/insightsonindia>



- ZBNF has innumerable benefits to the farmers.
- ZBNF can also help in **prevent over-extraction of groundwater**, enable aquifer recharge, and eventually contribute to increasing water table levels.
- Zero budget natural farming requires only 10% water and 10% electricity than what is required under chemical and organic farming.
- It might help to reduce the leaching of nitrogen and phosphorous from the soil into groundwater or surface water, and eventually into rivers and oceans.
- The Finance Minister reaffirmed the Centre's commitment to natural, chemical-free, organic and zero-budget farming. It is the **third time in the last four budget speeches** where natural farming finds a mention.
- However, there have been no specific allocations have been made to the Ministry of Agriculture and Farmers Welfare in lieu of Natural farming.
- The currently-operational schemes such as the Paramparagat Krishi Vikas Yojana and the National Project on Organic Farming did not find any mention in the budget.

#### Structured roadmap for ZBNF

- Focus on promoting natural farming in rainfed areas beyond the Gangetic basin where around 50% of India's farmers in rainfed regions use only a third of the fertilisers per hectare compared to the areas where irrigation is prevalent. The shift to chemical-free farming will be easier in these regions.
- Enabling automatic enrolment of farmers transitioning to chemical-free farming into the government's crop insurance scheme, PM Fasal Bima Yojana (PMFBY) as any new transitions in agriculture raises farmer's risks.
- Promoting microenterprises that produce inputs for chemical-free agriculture thereby curbing the lack of readily available natural inputs to farmers.
- Leveraging NGOs and champion farmers who have been promoting and practising sustainable agriculture across the country.
- Beyond evolving the curriculum in agricultural universities, upskill the agriculture extension workers on sustainable agriculture practices.
- Leveraging community institutions for awareness generation, inspiration, and social support.
- The government should facilitate an ecosystem in which farmers learn from and support each other while making the transition.
- Support monitoring and impact studies to ensure an informed approach to scaling up sustainable agriculture.
- Dovetailing the ambition on millet promotion with the aim to promote sustainable agriculture.

#### Conclusion

The implementation of this project at scale will impact a multitude of stakeholders, and also help India progress towards achieving the Sustainable Development Goals (SDGs) set by the United



Nations (UN) to facilitate the post-2015 development agenda. Agricultural scientists in India have to rework their entire strategy so that farming is in consonance with nature. The dominant paradigm of chemical-based agriculture has failed and **regenerative agriculture is the emerging new science.**

Farmers Producers Organisations (FPO's) play a vital role to enhance productivity through efficient and cost-effective methods ensuring sustainable income-oriented farming. Discuss. (150 words, 10 marks)

### Introduction

Farmers' Producer Organisation (**FPO**), also known as farmers' producer company (FPC), is an entity formed by primary producers including farmers, milk producers, fishermen, weavers, rural artisans, and craftsmen. An FPO can be a Producer Company, a Cooperative Society or any other legal form. FPOs are basically the hybrids of cooperatives and private companies. The participation, organisation and membership pattern of these companies are more or less similar to the cooperatives.

### Body

#### Background

- There are a total of 14,213 producer companies on the rolls of the Ministry of Corporate Affairs as on 31.03.2021.
- Around 11,715 producer companies got registered after 2016–17.
- The total outlay is to the tune of Rs 3,000 crore to be spent over next three years, bringing together approximately 3 million farmers across the country.

#### Need for and significance of FPOs:

- Nearly 86% of farmers are small and marginal with average land holdings in the country being less than 1.1 hectares.
- These small, marginal and landless farmers face tremendous challenges during agriculture production phase such as for access to technology, quality seed, fertilizers and pesticides including requisite finances.
- FPOs can engage farmers in collective farming and address productivity issues emanating from small farm sizes.
- Further, this may also result in additional employment generation due to the increased intensity of farming.
- FPO can help farmers compete with large corporate enterprises in bargaining, as it allows members to negotiate as a group and can help small farmers in both input and output markets.
- FPOs help in the collectivization of such small, marginal and landless farmers in order to give them the **collective strength to deal with such issues.**
- The FPO can provide low-cost and quality inputs to member farmers. For example, loans for crops, purchase of machinery, input agri-inputs (fertilizers, pesticides, etc.) and direct marketing after procurement of agricultural produce.



- This will enable members to save in terms of time, transaction costs, distress sales, price fluctuations, transportation, quality maintenance, etc.
- Social capital will develop in the form of FPOs, as it may lead to improved gender relations and decision-making of women farmers in FPOs.
- This may reduce social conflicts and improved food and nutritional values in the community.

#### Challenges faced by FPOs:

- Liability of newness: New ventures have high probability to fail since they have to battle multiple problems at a time.
- Lack of distinctiveness: With no novelty to offer, it is often challenging for FPOs to compete in the market.
- Audience diversity: FPOs need to derive support from different group of stakeholders (farmer, government, buyers, NGOs etc) which is crucial to understand their expectations.
- Lack of clarity on the market category – FPOs may fail to meet the demand of buyers in terms of quantity requirement leading to a weak inter-organisational relationship.
- FPOs, often in a hurry, would make unrealistic promises to members to increase their membership which could lead to mismatch in expectations.
- Multiple thresholds for success: Measuring the success of FPOs varies according to the stakeholder
- Farmer may be look at receiving timely credit from the FPO as the vital indicator for success while corporate buyer may look upon the quality of the product.

#### Way forward

- Collectives must do the requisite homework on issues such as modalities of the conduct of boards meetings, technical expertise for better procurement, identifying potential buyers, etc.
- Focus on multiple stakeholders including farmers , buyers and regulators can accommodate audience diversity.
- Need informational clarity regarding the process and market conditions.
- Collective effort of all stakeholders is crucial for the success of an FPO
- Appropriate curriculum and career pathways should be designed that would periodically train potential FPO leaders in human resource management, demand-aggregation, logistical planning and financial management.
- The government should identify reputed institutional partners like IIMs, IRMA, etc., to deliver content and certify successful candidates. This will make the job aspirational for rural educated youth and incentivise their participation in the national project.
- such a mammoth exercise in social experimentation in the agrarian sector can only succeed if various departments of the Centre and states come together on a common platform.



- Cutting through departmental silos, orientation and training of key officials manning relevant departments and timely inter-departmental coordination are key to the success of the governmental intervention.
- A mechanism to ensure integrity of such certificates should be worked out to provide comfort to officers of the Registrar of Companies.

### Conclusion

The FPOs as new-age farmer collectives have immense transformative potential for a country like India. If implemented with the right intentions and active involvement of various public and private stakeholders, this will not just boost agriculture productivity but also create an enabling ecosystem for the value chains associated with each agri-commodity. India can thus become an important player in the global food value chain.

### Value addition

#### Government's Support to Farmers Producers Organisation

- *The government has launched a new dedicated Central Sector Scheme titled "Formation and Promotion of Farmer Producer Organizations (FPOs)" with a clear strategy and committed resources to form and promote 10,000 new FPOs to ensure economies of scale for farmers over the next five years. Support for each FPO is continued for 5 years from its year of inception.*
- *Small Farmers Agri-business Consortium (SFAC)*
- *National Cooperative Development Corporation (NCDC)*
- *National Bank for Agriculture and Rural Development (NABARD).*
- *States may also if so desire, nominate their Implementing Agency in consultation with DAC&FW.*

Issues related to direct and indirect farm subsidies and minimum support prices; Public Distribution System- objectives, functioning, limitations, revamping; issues of buffer stocks and food security; Technology missions; economics of animal-rearing.

What is climate smart agriculture? Delineate the scope of climate smart agriculture in India. Can it solve the twin crisis of achieving food security and tackling climate change? Critically analyse. (250 words)

*Difficulty level: Moderate*

*Reference: New Indian Express*

#### **Why the question:**

*Women from 18 villages from Nayagarh painted pots filled with seeds for Kharif season & promoted revival of traditional practice of growing indigenous crops that are adaptive to climate disturbance.*

#### **Key Demand of the question:**

*To write about climate smart agriculture, its scope in India and its potential to solve food security and climate change mitigation.*

**Directive word:**

**Critically analyze** – When asked to analyse, you must examine methodically the structure or nature of the topic by separating it into component parts and present them in a summary. When ‘critically’ is suffixed or prefixed to a directive, one needs to look at the good and bad of the topic and give a balanced judgment on the topic.

**Structure of the answer:****Introduction:**

Begin by defining climate smart agriculture.

**Body:**

First, write about the major features of climate smart agriculture.

Next, write about scope of climate smart agriculture pan India with examples – organic farming in Sikkim, climate smart agriculture in Odisha, zero budget natural farming etc. mention Various government initiatives to promote climate smart agriculture.

Next, mention the potential of climate smart agriculture in solving food security and climate change mitigation. Tie examples and statistic to substantiate your arguments.

**Conclusion:**

Conclude by writing a way forward to further mains stream climate smart agriculture.

**Introduction**

**Climate change** directly affects agricultural production as this sector is inherently sensitive to climatic conditions and is one of the most vulnerable sectors at the risk and impact of global climate change.

**FAO defines Climate-smart agriculture (CSA)** as “agriculture that sustainably increases productivity, enhances resilience (adaptation), reduces/removes GHGs (mitigation) where possible, and enhances achievement of national food security and development goals”

**Body****India’s vulnerability: Scope of CSA in India**

- India’s agricultural ecosystem is distinguished by high monsoon dependence and with 85% small and marginal landholdings, it is highly sensitive to weather abnormalities.
- There has been less than normal rainfall during the last four years, with 2014 and 2015 declared as drought years.
- There are also reports of an **escalation in heat waves**, which in turn affecting crops, aquatic systems and livestock.
- The Economic Survey 2017-18 has estimated **farm income losses between 15% and 18% on average, which could rise to 20%-25% for unirrigated areas** without any policy interventions.
- These projections underline the need for strategic change in dealing with climate change in agriculture.
- There will be an increased **risk of pests and diseases due to change in the pattern** of host and pathogen interaction. For every two-degree rise in temperature, the agriculture GDP of India will reduce by five percent.
- The recent **locust attack** is also attributed to climate change, which can have highly disastrous effect on food security.



- Poor agricultural performance can lead to inflation, farmer distress and unrest, and larger political and social disaffection, all of which can hold back the economy. It will force farmers to either adapt to challenges of climate change or face the risk of getting poorer.

#### **Climate Smart Agriculture: Solving food security and climate change problems**

- **Increased productivity:** Produce more food to improve food and nutrition security and boost the incomes of 75 percent of the world's poor who live in rural areas and mainly rely on agriculture for their livelihoods.
- **Enhanced resilience:** Reduce vulnerability to drought, pests, disease, and other shocks; and improve capacity to adapt and grow in the face of longer-term stresses like shortened seasons and erratic weather patterns.
- **Reduced emissions:** Pursue lower emissions for each calorie or kilo of food produced, avoid deforestation from agriculture and identify ways to suck carbon out of the atmosphere.
- The climate-smart agriculture approach **seeks to reduce trade-offs to make crop and livestock systems, forestry, and fisheries and aquaculture more productive** and more sustainable.
- Climate-smart agriculture explicitly looks for where there are synergies and trade-offs among food security, adaptation and mitigation. Climate smart agriculture works through several dimensions to **reorient agricultural development and management** to take climate change into account.
- Management of farms, crops, livestock, aquaculture and capture fisheries to balance near-term food security and livelihoods needs with priorities for adaptation and mitigation.
- **Ecosystem and landscape management to conserve ecosystem services** that are important for food security, agricultural development, adaptation and mitigation.

#### **Way forward and Conclusion**

- Farmers, especially smallholder farmers, need handholding during their scaling up to adopt CSA.
- Mobile telecommunication systems are increasingly cost-effective and an efficient way of delivering weather-based agro-advisories to farmers at a large scale. Radio (especially community radio), television, newspapers, folk media, and village level public address systems will also need to be used to bridge this "communication divide."
- Weather-based agro-advisories must be locale-specific, crop-and farmer-specific; need to also recommend soil, water, and biodiversity conservation practices. Integrating this with Soil Health Card scheme will be a good step forward.
- Build adaptive capacities to climate variability and strengthen the sustainability of farming systems.
- On-site training and awareness campaigns, technology demonstrations, farmer-specialist interactions, and engagement with local governance bodies.
- Soil health and need-based irrigation management need to be addressed adequately.



- Closer collaboration between public, civil society, and private technology and financial service providers so that farmers get access to accurate information, and affordable technologies.

The minimum support price (MSP) regime is fraught with limitations which affects the price realization by the farmers and thus is in need for reforms to make it more robust and effective. Analyse. (250 words)

*Difficulty level: Moderate*

*Reference: The Hindu*

**Why the question:**

*The ongoing struggle of farmers is not for political power. It is a struggle to transform Indian agriculture and the livelihoods of the farming majority which are in ruins in most parts of the country.*

**Key Demand of the question:**

*To write about additional measures that are required for price realisation to make MSP more effective.*

**Directive word:**

**Analyse** – When asked to analyse, you must examine methodically the structure or nature of the topic by separating it into component parts and present them in a summary.

**Structure of the answer:**

**Introduction:**

*Start by writing about MSP, its aims and objectives.*

**Body:**

*Next, mention the limitations associated with MSP. Non-realisation of Price, Lack of procurement, only beneficial for selected crops, Lack of quality control and payment immediacy etc.*

*Next, write about the systemic measures that are needed for farmers to get remunerative prices. Increasing procurement efficacy, increasing awareness level of farmer and considering price deficiency payments etc.*

**Conclusion:**

*Conclude with way forward.*

**Introduction**

**Minimum Support Price (MSP)** is the rate at which the government buys grains from farmers.

Currently, it fixes MSPs for 23 crops grown in both Kharif and Rabi seasons. The government recently hiked the MSP for wheat by Rs. 40 to Rs. 2,015 per quintal and for mustard seed by Rs. 400 to Rs. 5,050 per quintal for the current crop year in order to boost crop area as well as income of farmers.

**Body**

**Yes, MSP helps farmers to an extent**

- MSP has been beneficial in transferring incomes to rural areas and to counter farm level inflation.
- It can also counter the agricultural distress brought on by natural hazards in the country. It gives farmers hope of earning more in the new sowing season.
- In the last few years, India has become a net importer of pulses. Massive hike in the MSP of these crops will encourage the farmers to grow nutritional crops. It will help in changing the cropping pattern which was long due.
- A higher MSP regime will also help in achieving the Government's target of doubling farmer's income by 2022.



- It also acts as an incentive for farmers to produce the crop which is in short supply.
- Higher profits for the farmer will also help them to invest in necessary infrastructure and equipment.
- The MSP to some extent will protect the farmer by guaranteeing a minimum floor price so that they can plan in advance for the next season.

### However, MSP is fraught with limitations

The trouble with MSP is that while it is touted as an all-important factor for farmers promising an instant rise in their income and stability, it also has many drawbacks in implementation. This affects the price realisation of farmers, in reality for several reasons.

- **Methodology:** MSP covers numerous costs such as the **cost of sowing (A2) and labour (FL)**. These considerations are controversial with suggestions that it should be based on **comprehensive costs (C2), which also include land rent costs**.
- **Inflation:** Too much of a hike on MSP either paves way for **inflationary effects** on the economy, with a rise in prices of food grains and vegetables, or loss to government treasury if it decides to sell at a lower price as compared to the higher MSP it bought at.
- **Diverse factors:** MSP is a nationwide single price policy. However, the **actual costing for production varies from place to place**, more severely so in areas lacking irrigation facilities and infrastructure. Thus, not all farmers have equal benefits.
- **Procurement at MSP is flawed:** First, procurement of wheat and paddy for meeting the requirement of the public distribution system (PDS) is undertaken largely by state governments.
  - Of the total procurement of wheat and paddy from farmers, the Food Corporation of India's (FCI's) share is less than 10%.
  - In the **north-east and many other states, procurement operations are almost non-existent** and farmers are forced to sell below MSP.
  - As the experiences of these schemes show, the benefit of higher MSPs for kharif crops or rabi, is unlikely to be available to most farmers as the states lack adequate storage capacity, working capital and manpower for undertaking large-scale procurement of all commodities.
  - The MSP-based procurement system is also **dependent on middlemen, commission agents and APMC officials, which smaller farmers find difficult** to get access to.
- **Agri-Infrastructure:** Hiking the MSP **without investing in infrastructure is just a short-term play**. While it does deliver immediate results, long-term developments to back-it up are also important.
- **Environmental harm:** It degrades the soil because of irrespective of the soil condition, some crops are preferred which have MSP over them which results in exploitation of group water resources, alkalinity, decrease in the production of the crops in long run and much harm to environment.

### Conclusion



The government should shift its focus from providing only price support to farmers and focus on building better infrastructure, minimizing the gap between farmers and the market, land reforms, policy reforms to increase flow of credit to farmers, establishing food-processing industries for perishable goods, providing better irrigation facilities etc so, that agriculture emerges as a viable means of sustenance.

### Food processing and related industries in India- scope and significance, location, upstream and downstream requirements, supply chain management.

Dairy development and livestock can be an instrument of promoting socio-economic development of rural people, particularly the poor and landless labour. Discuss in the light of recent measures undertaken for dairy development in India. (150 words)

*Reference: Down to Earth*

#### Introduction

The huge increase in milk supply through concerted efforts on a cooperative level is known as the **White Revolution**. Forty-eight years after **Operation Flood** – that made India the world's largest milk producer – India continues to be on the lookout for the next breakthrough in agricultural produce and productivity. White Revolution 2.0 has effectuated dairy firms' marketing strategy for milk and milk products, resuscitating the outlook of product-market mix.

#### Body

##### Milk production in India:

- India emerged as the largest milk producer and consumer in 2019.
- Niti Aayog estimates that the country is expected to increase its milk production to 330 million metric tonnes (mt) in 2033–34 from the current level of 176 mt.
- Currently India has 17% of world output of dairy products, surpassing USA in 1998 as world's largest producer of dairy. All this was achieved by operation Flood which was launched in 1970's.
- According to market research company IMARC, the milk and dairy products industry reached Rs7.9 lakh crore in 2017.
- In 2016, the milk sector alone was valued at Rs3 lakh crore and is projected to scale Rs7.3 lakh crore by 2021.
- The per capita milk availability in India has gone up from 126 gm per day in 1960 to 359 gm per day in 2015.

##### Government initiatives for the dairy sector:

- National Programme for Bovine Breeding
- Rashtriya Gokul Mission
- National Bovine Genetic Centre
- Quality Mark



- National Kamdhenu Breeding Centres
- E-Pashuhaat portal
- National Programme for Dairy Development (NPDD)
- Dairy Entrepreneurship Development Scheme (DEDS)
- National Dairy Plan-I (NDP-I)
- Dairy Processing and Infrastructure Development Fund (DIDF)
- Supporting Dairy Cooperatives and Farmer Producer Organizations engaged in dairy activities (SDCFPO)

**Challenges faced:**

- Indian cattle and buffaloes have among the lowest productivity.
- Similarly, there is a shortage of organized dairy farms and there is a need of high degree of investment to take dairy industry to global standards.
- Improving productivity of farm animals is one of the major challenges
- Crossbreeding of indigenous species with exotic stocks to enhance genetic potential of different species has been successful only to a limited extent.
- The sector will also come under significant adjustment pressure to the emerging market forces. Though globalization will create avenues for increased participation in international trade, stringent food safety and quality norms would be required.
- Access to markets is critical to speed up commercialization. Lack of access to markets may act as a disincentive to farmers to adopt improved technologies and quality inputs.

**Measures needed:**

- Increase in the market share depends on how dairy firms' capabilities and their resources are utilised given the opportunities and threats emanating from emerging markets economies.
- Contract/corporate dairying and emerging global dairy trade are required to rope in dairy supply chains stakeholders in order to expand their outreach and "on-the-go" product positioning into the target segment.
- Digital technology-enabled dairy firms need to identify their compatible partners and competitors for co-creation through product-process innovation via relationship/value-based marketing.
- Freshness in milk, and convenience to store milk or milk products can be a technology innovation brought in by large dairy firms in association start-ups.
- Education and Training at Panchayat level for small and medium size farmers
- Subsidizing cattle production and encouraging cattle markets
- Facility of logistics for produced milk
- Improved Veterinary facility specially in artificial insemination of cattle



- Encouraging private sector firm to procure dairy produced at rural level
- Low interest loans for small and medium scale farmers for cattle purchase
- Encouraging rural women to take up animal husbandry
- Insurance of cattle against diseases like Anthrax, Foot and Mouth, Peste des Ruminantes, etc.
- Nurture dairy entrepreneurs through effective training of youth at the village level coupled with dedicated leadership and professional management of farmers' institutions.
- Agricultural practices, sanitation, quality of drinking water & fodder, type and quality of pipelines – all of these need to be aligned to the goal of healthy milk

### Conclusion

The Government initiatives can ensure sustainable growth of the dairy sector as well as boost incomes of millions of small and marginal dairy farmers. Linking the animal husbandry with food processing industry, agriculture, researches & patents has all the possible potential to make India a nutritional power house of the world. Animal husbandry is the imperative hope, definite desire and urgent panacea for India as well as the world.

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

The national hydrogen policy is a step in the right direction to harness the potential of green hydrogen but removing production bottlenecks and incentivising production can be game-changer for the energy security of India. Comment. (250 words)

*Difficulty level: Moderate*

*Reference: Hindustan Times , Financial Express*

#### **Why the question:**

*Releasing the first part of India's National Green Hydrogen Policy, the government on Thursday announced some incentives for potential manufacturers, generation companies (gencos) and distribution licensees (discoms) to boost large scale indigenous production of green hydrogen.*

#### **Key Demand of the question:**

*To write importance of green hydrogen on India's energy security.*

**Comment**– here we must express our knowledge and understanding of the issue and form an overall opinion thereupon.

#### **Structure of the answer:**

##### **Introduction:**

*Begin by aims and objectives of national hydrogen policy.*

##### **Body:**

*First, mention the properties of Hydrogen that makes it a favourable alternative to present day fossil fuels.*

*Next, write about the various bottlenecks to overcome in terms of technology, storage, transportation, new materials research, safety standards etc.*

*Next, mention the incentives that can be provided – PLI, keeping GST zero on green hydrogen etc.*

##### **Conclusion:**

*Conclude by writing a way forward.*

##### **Introduction**



**Green hydrogen** — also referred to as ‘clean hydrogen’ — is produced by using electricity from renewable energy sources, such as solar or wind power, to split water into two hydrogen atoms and one oxygen atom through a process called electrolysis. The Union Government recently notified the **green hydrogen and green ammonia policy aimed at boosting the domestic production of green hydrogen to 5 million tonnes by 2030** and making India an export hub for the clean fuel.

## Body

### Significance of Green Hydrogen:

- Green hydrogen energy is vital for India to meet its Nationally Determined Contribution (INDC) Targets and ensure regional and national energy security, access and availability.
- Green Hydrogen can act as an energy storage option, which would be essential to meet intermittencies (of renewable energy) in the future.
- In terms of mobility, for long distance mobilisations for either urban freight movement within cities and states or for passengers, Green Hydrogen can be used in railways, large ships, buses or trucks, etc.
- India’s total hydrogen demand is expected to touch 11.7 million tonnes by 2029-30.
- In 2021, the government announced the **National Hydrogen Mission** in order to promote the generation and adoption of cleaner energies, including green hydrogen.

### The national hydrogen policy: a step in the right direction

- The Centre’s new policy offers 25 years of free power transmission for any new renewable energy plants set up to supply power for green hydrogen production before July 2025.
- This means that a green hydrogen producer will be able to set up a solar power plant in Rajasthan to supply renewable energy to a green hydrogen plant in Assam and would not be required to pay any inter-state transmission charges.
- The move is likely going to make it more economical for key users of hydrogen and ammonia such as the oil refining, fertilizer and steel sectors to produce green hydrogen for their own use.
- These sectors currently use **grey hydrogen or grey ammonia** produced using natural gas or naphtha.
- The government is set to provide a single portal for all clearances required for setting up green hydrogen production as well as a facility for producers to bank any surplus renewable energy generated with discoms for upto 30 days and use it as required.
- Under the policy port authorities will also provide land at applicable charges to green hydrogen and green ammonia producers to set up bunkers near ports for storage prior to export.
- The policy will aid in India’s energy transition and achieving the target of becoming carbon neutral by 2070.

## Limitations



- One of the biggest challenges faced by the industry for using hydrogen commercially is the economic sustainability of extracting green or blue hydrogen.
- The technology used in production and use of hydrogen like Carbon Capture and Storage (CCS) and hydrogen fuel cell technology are at nascent stage and are expensive which in turn increases the cost of production of hydrogen.
- Maintenance costs for fuel cells post-completion of a plant can be costly.
- The commercial usage of hydrogen as a fuel and in industries requires mammoth investment in R&D of such technology and infrastructure for production, storage, transportation and demand creation for hydrogen.

### Way forward

- As India is scaling up to the target of having 450 GW of renewable energy by 2030, aligning hydrogen production needs with broader electricity demand in the economy would be critical.
- The industrial sectors like steel, refining, fertilizer & methanol sectors are attractive for Green Hydrogen adoption as Hydrogen is already being generated & consumed either as a chemical feedstock or a process input.
- The public funding will have to lead the way in the development of green hydrogen, but the private sector has significant gains too to be made by securing its energy future.
- India requires a manufacturing strategy that can leverage the existing strengths and mitigate threats by integrating with the global value chain.
- The green hydrogen has been anointed the flag-bearer of India's low-carbon transition as Hydrogen may be lighter than air, but it will take some heavy lifting to get the ecosystem in place.

Distributed renewable energy projects have greater scalability and offer substantive livelihood benefits. Comment in the light of Draft Policy Framework for developing and promoting Decentralized Renewable Energy (DRE) Livelihood Application. (250 words)

*Difficulty level: Moderate*

*Reference: DownToEarth*

**Why the question:** The Union Ministry of New and Renewable Energy (MNRE) released a draft policy framework February 14, 2022 for DRE livelihood applications. The ministry intended to achieve its objective of a decentralised and distributed renewable energy supply in the country, particularly for rural populations with little or no access to power.

**Key Demand of the question:** To write about the advantages of Distributed renewable energy projects.

**Directive word:**

**Comment**– here we must express our knowledge and understanding of the issue and form an overall opinion thereupon.

**Structure of the answer:**

**Introduction:**

Start by defining Distributed renewable energy (DRE)

**Body:**

First, give contexts regarding Draft Policy Framework for developing and promoting Decentralized Renewable Energy (DRE) Livelihood Application.

Next, write about the pros of DRE's in India – scalability, livelihood improvement, cost effectiveness, easy maintenance, improving rural incomes.

Next, write about the limitations of DRE's – capacity addition, procurement, lack of uniform policy etc.

**Conclusion:**

Conclude with way forward to harness the true potential of DRE's.

**Introduction**

The Union Ministry of New and Renewable Energy (MNRE) **released a draft policy framework** February 14, 2022 for DRE livelihood applications. The ministry intended to achieve its objective of a **decentralised and distributed renewable energy supply** in the country, **particularly for rural populations with little or no access to power.**

**Body****About Decentralised Renewable energy**

- **Distributed renewable energy (DRE) systems** like power, cooking, heating and cooling systems **that generate and distribute services independently of any centralised system**, in both urban and rural areas of the developing world.
- They already provide energy services to millions of people, and numbers continue to increase annually.
- DRE systems can serve as a complement to centralised energy generation systems, or as a substitute.

**Draft Policy Framework for developing and promoting DRE Livelihood Application**

The objective of Decentralized Renewable Energy (DRE) framework is to develop an enabling market ecosystem to ensure widespread adoption of DRE for sustainable livelihood creation in the country. It has following objectives: –

- Enable a **market-oriented ecosystem to attract private sector** for development and deployment of DRE based livelihood applications.
- Unlock easy access to **end user finance to increase adoption of DRE based livelihood solutions** by linking DRE to existing financing schemes or through new innovative financial instruments.
- Leverage quality control standards and a strong monitoring and evaluation framework to ensure **long-term performance sustainability of DRE based livelihood solutions** and to assess their impact on different populations including marginalized groups and women.
- Promote skill development for strengthening the service infrastructure at the local level. Encourage innovation and RD to develop efficient and cost-effective DRE livelihood applications.
- Collaborate with other ministries to include DRE based livelihoods applications in their programmes.



- Support creation of livelihood opportunities in technology innovation value chain of DRE applications.
- Support and incentivize adoption of DRE livelihood technologies among women and other marginalized sections such as Scheduled Caste and Scheduled Tribes.

#### Advantages of Decentralized Renewable Energy framework

- DRE and its downstream applications **offer an opportunity to not only meet India's climate and energy access targets**, but also provide attractive returns to financial investors.
- It also **provides pathways for India to reduce import-dependence on crude oil** as well as create economic growth and jobs in the long run.
- In addition, addressing existing policy and financing gaps would **not only allow for better targeting and risk-hedging of government spending programs**, but would also **allow capital to be recycled efficiently**, thereby enhancing both the duration and magnitude of the impact.

#### Limitations of DRE

- **Lack of Technology:** In order to **use renewable energy in their livelihoods**, people need access to technology and financing, which are **not available to most rural households** in India despite the existence of several technology options to deploy small-scale renewable energy-based livelihood applications.
  - **Local communities** in the villages often **find it difficult to pay upfront for these innovations**.
- **Unique Challenge for Women: Microbusinesses, under-represented groups and women face unique challenges** when it comes to acquiring assets.
  - As a result, businesses that use operating expense-based financial models, such as pay-as-you-go or leasing, may be eligible for credit facilitation.
- **Others: Lack of proper financing channels, consumer awareness, consumer affordability** and quality products / standards are some of the **major challenges facing DRE in India**.

#### Conclusion and way forward

- **End-user and Corporate Financing:** Financial institutions may **consider developing financing options** that do not require collateral. Other **state nodal agencies such as the state rural livelihood missions might use their existing institutional architecture** to give financial assistance to the members of women self-help groups.
- **Considering both Upstream and Downstream Livelihoods:** Upstream livelihoods affect local manufacturing and technical service providers to design, install and maintain DRE systems. This leads to **differentiating between DRE technologies** to see what can actually be manufactured locally and providing capacity-building services to both newcomers and existing service providers.



- **Promote Awareness: Awareness campaigns will help in increasing trust and adoption** of these products by end-users and financiers, as these technologies are new for many consumers.

Post de-regulation, the geospatial sector in the country is rightly positioned for investment. However, it needs the creation of an enabling ecosystem for its maximum potential to be utilised. Analyse. (250 words, 15 marks)

### Introduction

**Geospatial technologies** is a term used to describe the range of modern tools contributing to the geographic mapping and analysis of the Earth and human societies.

India has a robust ecosystem in geospatial, with the Survey of India (SoI), the Indian Space Research Organisation (ISRO), remote sensing application centres (RSAC)s, and the National Informatics Centre (NIC) in particular, and all ministries and departments, in general, using geospatial technology. However, the full benefits have yet to percolate to the public; neither is there much contribution to the nation's GDP.

### Body

#### Background

- Till recently, the government had a near-monopoly regarding the collection, storage, use, sale, dissemination of geo-spatial data and mapping. This was because of concerns over internal as well as external security threats.
- Only government-run agencies such as the **Survey of India, Defence and Home Ministries** were allowed to use geospatial data.
- Whereas, the private companies needed approval from different departments of the government as well as the defence and Home Ministries. Then only, they were able to collect, create or disseminate geospatial data.
- The lack of private participation led to the underdevelopment of the **Geographic Information System (GIS) mapping**.
- The Kargil war highlighted the dependence on foreign data and the need for indigenous sources of data. Only, after the **Kargil war**, the government heavily invested in Geographic Information System (GIS) mapping.

#### De-regulation of geospatial sector

- This system of acquiring licenses or permission has delayed projects for both private companies and government agencies.
- The deregulation **eliminates the requirement of permissions** as well as scrutiny, even for security concerns.
- Indian **companies now can self-attest**, conforming to government guidelines without actually having to be monitored by a government agency.
- There is also a **huge lack of data in the country** which impedes planning for infrastructure, development and businesses which are data-based.



- The mapping of the entire country, that too with high accuracy, by the Indian government alone could take decades. Therefore, opening up the sector and incentivising the private sector will **speed up the process of mapping**.
- Large amounts of geo-spatial data are also **available on global platforms**, which makes the regulation of data that is freely available in other countries, untenable.

#### Limitations and hurdles in using geo-spatial data

- **Market size:** Among the most prominent hurdles is the **absence of a sizable geospatial market** in India.
  - There is **no demand for geospatial services** and products on a scale linked to India's potential and size.
- **Demand:** This lack of demand is mainly a consequence of the **lack of awareness among potential users** in government and private sectors.
- **Skilled manpower:** The other hurdle has been the **lack of skilled manpower** across the entire pyramid.
- **Data quality and sharing:** The **unavailability of foundation data**, especially at high-resolution, is also a constraint.
  - The **lack of clarity on data sharing** and collaboration prevents co-creation and asset maximisation.
  - Additionally, there are still **no ready-to-use solutions** especially built to solve the problems of India.
- **No professional training:** Though India has many who are trained in geospatial this is mostly either through a master's level programme or on-job training.
  - Unlike the West, **India lacks a strata of core professionals** who understand geospatial end-to-end.

#### Conclusion

The geospatial sector in the country is rightly positioned for investment. However, clarity on the issues discussed and the creation of an enabling ecosystem are essential. By the time India celebrates the 10th anniversary of the liberalisation of this sector, it should have achieved the projected market volume and have Indian entrepreneurs stand out internationally.

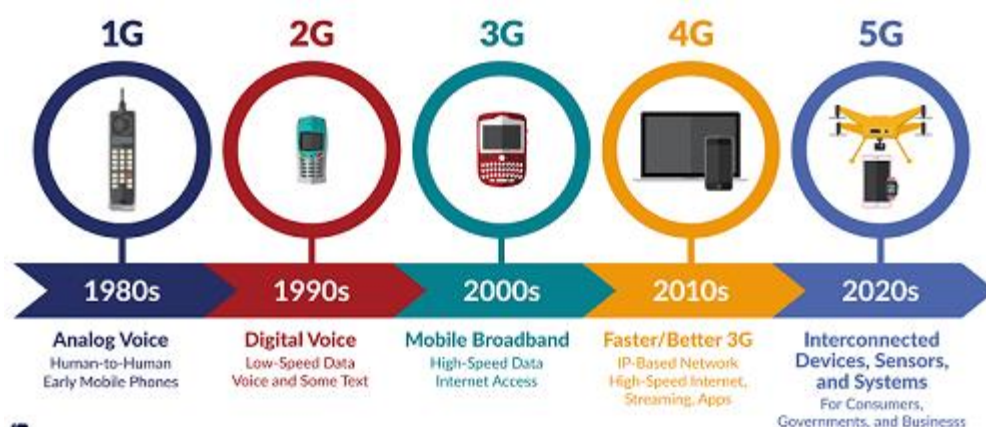
With the imminent rollout of 5G services by the end of 2022, there are security implications that need be considered and addressed especially with respect to involvement of China. Examine. (250 words, 15 marks)

#### Introduction

Government named 13 cities that are likely to see the launch of **5G services** in the country, next year. The Trials for **5G services** that were scheduled to include the Chinese companies including **Huawei and ZTE, were delayed** on the back of modalities such as pricing and tenure. Post the 'Doklam' incident followed by tension along the Chinese border, there has been no further statement or clarification regarding **5G** by GoI till this announcement.



## Body



## Potential benefits of 5G

- **5G is the next generation of mobile broadband** that will eventually replace, or at least augment 4G LTE connection.
  - Department of Telecommunication (DoT) in 2017 setup a 5G steering committee headed by **AJ Paulraj**.
- The committee submitted the report and suggest important steps. In 2018, India planned to start 5G services but it has not yet materialized.
- Operate in **the millimeter wave spectrum (30-300 GHz)** which have the advantage of sending large amounts of data at very high speeds.
- Operate in **3 bands**, namely low, mid and high frequency spectrum.
- **Reduced latency** will support new applications that leverage the power of 5G, the Internet of Things (IoT), and artificial intelligence.
- **Increased capacity** on 5G networks can minimize the impact of load spikes, like those that take place during sporting events and news events.

## Issues with roll out of 5G

- **Security issues:** China is preparing to dominate the world by rolling out its **5G technology warfare** across countries. By deploying the 5G in India without indigenisation of technology will make India vulnerable to China. This will make the data of individuals, groups or even security agencies at risk.
- **Risks:** Risks associated with **increased data transfers and the proliferation of poorly secured IoT devices** that will appear alongside 5G.
  - If the implementation and use of 5G lead to a greater number of connections and a larger amount of data being transferred, it follows that the attack surface area will increase alongside it.
  - Greater use simply brings more opportunities for hackers to find a way in.



- **Privacy:** 5G proponents tout the wonder of having all household appliances and systems connected to the internet wirelessly in order to give people remote access via cellphone or computer.
  - What is not considered is the power to eavesdrop on users without their knowledge when there is proliferation of electronic devices connected to internet and collecting data.
- **Huge investment needed:** The introduction of 5G will involve a heavy upfront investment and have a long payback period. Thus, the viability of 5G after the introduction is a major challenge.

### Conclusion

The shift from 4G to 5G is not incremental, but transformational. Skipping of 5G is not a choice India can afford. The economic impact of 5G in India is expected to be over \$1 trillion by 2035 according to the report of KPMG. The Sooner the deployment of 5G in India is the better for India. **India has to work on Indigenous 5G technology.** This will also help bring down the cost of 5G technology and benefit the end users especially addressing the security and privacy risks.

### Science and Technology- developments and their applications and effects in everyday life; Achievements of Indians in science & technology; indigenization of technology and developing new technology.

India appears to be making a major push to increase its presence in the semiconductor manufacturing sector. These efforts must be targeted to address the need for huge capital investments, high risk and long gestation periods for expanding its capabilities in the critical semiconductor industry. Elaborate. (250 words)

*Difficulty level: Easy*

*Reference: The Hindu*

#### **Why the question:**

*India has invited applications from 100 domestic companies, startups and small and medium enterprises to become a part of the design-linked incentive (DLI) scheme. Along with it the IT ministry has sought proposals from academia, start-ups and MSMEs to train 85,000 qualified engineers on semiconductor design and manufacturing.*

#### **Key Demand of the question:**

*To write about the way to achieve strategic self-sufficiency in semiconductor production in India.*

#### **Directive:**

**Elaborate** – Give a detailed account as to how and why it occurred, or what is the context. You must be defining key terms wherever appropriate and substantiate with relevant associated facts.

#### **Structure of the answer:**

##### **Introduction:**

*Begin by mentioning strategic importance of semiconductors and cite statistic regarding semiconductor production in India.*

##### **Body:**

*In the first part, mention the various applications of Semiconductors and reasons for their shortage. Next, write about various measures taken by the government to push semiconductor manufacturing – India Semiconductor Mission, semiconductor Fabs and Display Fabs etc and how it will help us achieve self-sufficiency.*

*Next, write about the limitations of the above and measures to overcome them.*

**Conclusion:**

Conclude by way forward.

**Introduction**

The Union Cabinet's decision to set aside ₹76,000 crore for supporting the development of a 'semiconductors and display manufacturing ecosystem' is a belated but welcome acknowledgment of the strategic significance of integrated circuits, or chips, to a modern economy.

The Cabinet decision to simultaneously establish an **India Semiconductor Mission helmed by 'global industry experts'** to drive long-term strategies for the sustainable development of the chip and display industry is therefore a step in the right direction.

**Body****Various applications of Semiconductors and reasons for their shortage**

- Semiconductors and displays are the foundation of modern electronics driving the next phase of digital transformation under Industry 4.0. Semiconductors and display manufacturing is **very complex and technology-intensive sector** involving huge capital investments, high risk, long gestation and payback periods, and rapid changes in technology, which require significant and sustained investments.
- The program will give an **impetus to semiconductor** and display manufacturing by facilitating capital support and technological collaborations.
- The **basic building blocks** that serve as the **heart and brain** of all modern electronics and information and communications technology products, the ubiquitous chips are now an integral part of contemporary automobiles, household gadgets such as refrigerators, and essential medical devices such as ECG machines.
- The COVID-19 pandemic has dramatically thrown into sharp relief the vulnerability that a range of manufacturing industries and, by extension, national economies are exposed to in the face of disruptions in the supply of these **vital semiconductors**.
- The **pandemic-driven push** to take sizeable parts of daily economic and essential activity online, or at least digitally enable them, has also highlighted the centrality of the chip-powered computers and smartphones in people's lives.
- With the bulk of semiconductor manufacturing and supply capability concentrated in a handful of countries including Taiwan, South Korea, U.S., Japan and, more recently, China, governments worldwide have realised that it is in the **national interest to treat chip manufacturing as a strategic imperative**.

**Measures taken by the government**

- **Semiconductor Fabs and Display Fabs:**
  - It would provide **fiscal support of up to 50% of the project cost** for setting up semiconductor and display fabrication units.
  - The Union government will work with the States to **set up high-tech clusters with the required infrastructure** such as land and semiconductor-grade water.
- **Semi-conductor Laboratory (SCL):**



- MeitY will take requisite steps for modernization and commercialization of Semiconductor Laboratory (SCL).
- MeitY will explore the possibility for the Joint Venture of SCL with a commercial fab partner to modernise the brownfield fab facility.
- **Compound Semiconductors:**
  - It will support fiscal support of **30% of capital expenditure to approved units.**
  - At Least **15 such units** of Compound Semiconductors and Semiconductor Packaging **are expected to be established** with Government support under this scheme.
- **Semiconductor Design Companies:**
  - The **Design Linked Incentive (DLI) Scheme shall extend product design linked incentive of up to 50%** of eligible expenditure and product deployment linked incentive of 6% – 4% on net sales for five years.
  - **Support will be provided to 100 domestic companies** of semiconductor design for Integrated Circuits (ICs), Chipsets, System on Chips (SoCs), Systems & IP Cores and semiconductor linked design.
- **India Semiconductor Mission:**
  - In order to drive the long-term strategies for developing a sustainable semiconductors and display ecosystem, a **specialised and independent India Semiconductor Mission (ISM) will be set up.**
  - ISM will be **led by global experts in the semiconductor and display industry.** It will act as the nodal agency for efficient and smooth implementation of the schemes on Semiconductors and Display ecosystem.
- **Production Linked Incentives:**
  - Incentive support to the tune of Rs.55,392 crore (7.5 billion USD) have been approved under **PLI** for Largest Scale Electronics Manufacturing, PLI for IT Hardware, SPECS Scheme and **Modified Electronics Manufacturing Clusters (EMC 2.0) Scheme.**
  - In addition, PLI incentives to the quantum of Rs.98,000 crore (USD 13 billion) are approved for allied **sectors comprising ACC battery, auto components, telecom & networking products, solar PV modules and white goods.**

#### **Limitations of the above and measures to overcome them.**

- For one, the **level of fiscal support** currently envisioned is **minuscule** when one considers the scale of investments typically required to set up manufacturing capacities in the various sub sectors of the semiconductor industry.
- A semiconductor fabrication facility, or fab, can **cost multiples of a billion dollars** to set up even on a relatively small scale and lagging by a generation or two behind the latest in technology.



- Even granting that **India's Production Linked Incentive scheme** intends to give only 50% of the cost of setting up at least two greenfield semiconductor fabs by way of fiscal support, not much of the current scheme outlay of approximately \$10 billion is likely to be left to support other elements including display fabs, packaging and testing facilities, and chip design centres.
- Chip fabs are also very thirsty units **requiring millions of litres of clean water and extremely stable power supply.**
- India has a decent chip design talent but it never built up chip fab capacity. The ISRO and the DRDO have their respective fab foundries but they are primarily for their own requirements and also not as sophisticated as the latest in the world.
- It may be best if the new mission **focuses fiscal support**, for now, on other parts of the chip-making chain including design, where surely India already has considerable talent and experience.

#### Way Forward:

- Given the long gestation periods and rapid technology changes, **India must out-strategize on design and functionality** as the end product will be out only after three-four years from the moment work begins, by which point the prevailing chip shortage would have been resolved, while technology would have advanced further.
- India needs to push for a **Quad Supply Chain Resilience Fund** to immunise the supply chain from geopolitical and geographic risks
- India and Taiwan have started negotiations for a **free-trade agreement and setting up a semiconductor manufacturing hub in an Indian city**, signalling their resolve to further expand the two-way economic engagement.

#### Conclusion

The program will usher in a new era in electronics manufacturing by providing a globally competitive incentive package to companies in semiconductors and display manufacturing as well as design. The program will promote **higher domestic value addition in electronics manufacturing** and will contribute significantly to achieving a **USD 1 Trillion digital economy and a USD 5 Trillion GDP by 2025**. This shall pave the way for India's technological leadership in these areas of strategic importance and economic self-reliance.

Accelerate Vigyan (AV) strives to provide a big push to high-end scientific research and prepare scientific manpower which can venture into research careers and knowledge-based economy. Discuss. (250 words)

*Difficulty level: Moderate*

*Reference: Down to Earth*

#### **Why the question:**

*Science and Engineering Research Board (SERB), an autonomous body of the Department of Science & Technology (DST), Union Ministry of Science & Technology, the Government of India, has invited applications under 'ABHYAAS', a program of 'Accelerate Vigyan' scheme, for summer season. In a recent notification, the call for applications under components of "KAARYASHALA" and "VRITIKA" for the summer season (May 2022-July 2022) is extended till 28 February 2022.*



**Key Demand of the question:**

To write about the role of Accelerate Vigyan (AV) in enhancing scientific capabilities and promoting knowledge-based economy.

**Discuss** – This is an all-encompassing directive – you must debate on paper by going through the details of the issues concerned by examining each one of them. You must give reasons for both for and against arguments.

**Structure of the answer:**

**Introduction:**

Begin by mentioning the aims and objectives of Accelerate Vigyan (AV).

**Body:**

First, write about the various components of AV and what they seek to achieve – Karyashala (High-End Workshops), Vritika (Research Internships) and Sangoshthi (Seminar & Symposia).

Next, link as to how the above will result in creation of scientific manpower and knowledge-based economy in India.

Next, write the bottlenecks towards the implementation of the scheme and suggest steps to overcome the same.

**Conclusion:**

Conclude by writing a way forward.

**Introduction**

“Accelerate Vigyan” (AV) scheme was launched by the **Science and Engineering Research Board (SERB)** to **provide a single platform for research internships, capacity building programs, and workshops across the country**. This scheme is primarily to focus on young potential researchers with an aim to give an opportunity to them to spend quality time in the pre-identified premier institution, labs / organizations and empower them through best practices and environment, so that they acquire the requisite skills and vision for undertaking future research assignments requiring high standards.

**Body**

**Objective & Vision of AV**

- The primary objective of this inter-ministerial scheme is to give more thrust on encouraging high-end scientific research and preparing scientific manpower, which can lead to research careers and knowledge-based economy.
- Recognizing that all research has its base as development of quality and well-trained researchers, AV will initiate and strengthen mechanisms of identifying research potential, mentoring, training and hands-on workshop on a national scale.
- The vision is to expand the research base, with three broad goals, namely, consolidation / aggregation of all scientific programs, initiating high-end orientation workshops, and creating opportunities for research internships for those who do not have access to such resources / facilities,

**Components**

- **ABHYAAS Programme**
  - It is an attempt to **boost research and development** in the country by **enabling and grooming potential PG/PhD students** by means of developing their research skills in selected areas across different disciplines or fields.



- It has two components: High-End Workshops i.e. **KARYASHALA** and Research Internships i.e.
- **SAMMOHAN**: It has been sub-divided into SAYONJIKA and SANGOSHTI.
  - **SAYONJIKA** is an **open-ended program** to catalogue the capacity building activities in **science and technology** supported by all government funding agencies in the country.
  - **SANGOSHTI** is a pre-existing program of SERB for the organisation of workshops.

### Significance of AV scheme

- AV scheme helps those researchers who have limited opportunities, access to facilities and infrastructure.
- The components of the AV aims towards branding and aggregation of all the scientific workshops and training programs conducted in the country under a common roof and logo of “Accelerate Vigyan”.
- The database of skilled manpower developed across different disciplines through all the sub-components of the AV would help in capacity building.
- The scheme also seeks to garner the social responsibility of the scientific community in the country.
- The AV will work on mission mode, particularly with respect to its component dealing with consolidation/aggregation of all major scientific events in the country.
- It will also initiate mechanisms of mentoring, training and hands-on workshops on a national scale.

### Conclusion

In a nutshell, Accelerate Vigyan is expected to be a game changer for developing career paths and providing support to catalogue the skilled manpower development.

Global competitiveness will be increasingly determined by the quality of science and technology, which in turn will depend on dynamicity of research and development ecosystem aided by budgetary allocation. Analyse. (150 words, 10 marks)

### Introduction

**India spends only 0.66 percent of its GDP** on Research and Development as per latest figures. This is below the expenditure of countries like the US (2.8), China (2.1), Israel (4.3) and Korea (4.2). A quick analysis of the allocations to various R&D organisations in the recently presented 2022-23 budget shows continued stagnation. This does not augur well for the future.

Government expenditure, almost entirely the Central Government, is the driving force of R&D in India which is in contrast to the advanced countries where the private sector is the dominant and driving force of R&D spend.

### Body

#### Link between R&D vis-a-vis nation's development and competency



- Research and Development of new products are **key drivers of economic performance and social well-being**. **Solutions to diseases, new technology to overcome obstacles** in various sectors are hallmark of having good ecosystem.
- It is important to **inculcate scientific temper among masses** in order to **fight superstitions, distorted truth and religious fanaticism** that has been crippling India
- **Innovation** and technological improvement have become essential to **combat and adapt to climate change and promote sustainable development**.
- It is imperative for **combating national security threats** ranging from **cyber warfare to autonomous military systems** such as **drones**.
- Investing in research and providing adequate incentives **leads to creation of jobs, especially for the pool of engineers and researchers** in the society. Under the 'Make in India' program, the government has targeted to create 100 million jobs from the manufacturing sector by 2022.

### Improving R&D ecosystem in India

- The growth in research and development (R&D) expenditure should be commensurate with the economy's growth and **should be targeted to reach at least 2% of the Gross Domestic Product (GDP) by 2022**.
- The line ministries at the Centre could be mandated to **allocate a certain percentage** of their budget for research and innovation for developing and deploying technologies as per the priorities of the respective ministries.
- To stimulate **private sector's investment in R&D from current 0.35% of GDP**, it is suggested that a minimum percentage of turn-over of the company may be invested in R&D by medium and large enterprises registered in India.
- To help and keep the industry enthused to invest in R&D, the **weighted deduction provisions on R&D investment should continue**.
- The **states can partner Centre** to jointly fund research and innovation programmes through socially designed **Central Sponsored Schemes (CSS)**.
- The report also pitched for **creating 30 dedicated R&D Exports Hub** and a corpus of **Rs 5,000 crore for funding mega projects** with cross cutting themes which are of national interest.

### Conclusion

There is a need for greater participation of State Governments and the private sector in overall R&D spending in India especially in application-oriented research and technology development. There is a need to encourage investor-led research. In this direction, the Science and Engineering Research Board (SERB) has already been established. It is a promising start that needs to expand with more resources and creative governance structures.

### Value Addition

### R&D Statistics



- **PhDs in STEM:** In comparison to China, there are less than half Indian STEM Ph.D students in the US. Fewer students have been enrolling for such degrees either due to lucrative career options after master's degree or rising work visa challenges.
  - However, there has been an increase in the no. of Ph.D enrolments in India. In 2014, 56.4% of total PhDs awarded were from science and technology disciplines.
- **Publications:** According to SCOPUS and Scientific Citation Index (SCI) data base growth rates of publications in India stand at 13.9% and 7.1% for the period 2009-2013 against the global average of 4.4% and 4.1%, respectively.
  - SCOPUS has ranked **India sixth in the world in the number of scientific publications**, ahead of France, Spain and Italy during 2013.
- **Patents:** According to WIPO, India is the seventh largest patent filing office in the world. However, India produces fewer patents per capita

Explaining the diverse applications of semiconductors in India, mention the ways in which the government can create a thriving domestic semiconductor industry, complete with all backward linkages. (250 words)

Difficulty level: Moderate

Reference: Live Mint

**Why the question:**

The government forecasts that India would need \$63 billion worth of semiconductors by 2026.

**Key Demand of the question:**

To write about applications of semi-conductors and how the government can create a thriving domestic semiconductor industry.

**Directive word:**

**Explain** – Clarify the topic by giving a detailed account as to how and why it occurred, or what is the context. You must be defining key terms wherever appropriate and substantiate with relevant associated facts.

**Structure of the answer:**

**Introduction:**

Begin by giving a statistic highlighting strategic significance of semiconductors in India.

**Body:**

In the first part, discuss the various applications of semiconductors – computers, phones, server farms, missiles and in their guidance systems, warplanes, submarines, aircraft carriers, satellites etc. Next, write about the steps need to create a robust domestic industry for semiconductors – tackling R&D problems, funding, solving intellectual property issues. Mention various measures already initiated by the government in this regard.

**Conclusion:**

Conclude with a way forward.

**Introduction**

The Union Cabinet's decision to set **aside ₹76,000 crore for supporting the development of a 'semiconductors and display manufacturing ecosystem'** is a belated but welcome acknowledgment of the strategic significance of integrated circuits, or chips, to a modern economy.



The Cabinet decision to simultaneously establish an **India Semiconductor Mission helmed by 'global industry experts'** to drive long-term strategies for the sustainable development of the chip and display industry is therefore a step in the right direction.

## Body

### Various applications of Semiconductors

- Semiconductors and displays are the foundation of modern electronics driving the next phase of digital transformation under Industry 4.0.
- The **basic building blocks** that serve as the **heart and brain** of all modern electronics and information and communications technology products, the ubiquitous chips are now an integral part of contemporary automobiles, household gadgets such as refrigerators, and essential medical devices such as ECG machines.
- Semiconductors are the building blocks of today's technology. For instance, they control the computers we use, the phones and mobile devices we use to communicate, the cars and planes that get us from place to place, the machines that diagnose and treat illnesses, the military systems that protect us, and the electronic gadgets we use to listen to music, watch movies and play games.

### Ways to create a thriving domestic semiconductor industry

- **India Semiconductor Mission:**
  - In order to drive the long-term strategies for developing a sustainable semiconductors and display ecosystem, a **specialised and independent India Semiconductor Mission (ISM) will be set up.**
  - ISM will be **led by global experts in the semiconductor and display industry.** It will act as the nodal agency for efficient and smooth implementation of the schemes on Semiconductors and Display ecosystem.
- **Production Linked Incentives:**
  - Incentive support to the tune of Rs.55,392 crore (7.5 billion USD) have been approved under **PLI for Largest Scale Electronics Manufacturing, PLI for IT Hardware, SPECS Scheme and Modified Electronics Manufacturing Clusters (EMC 2.0) Scheme.**
  - In addition, PLI incentives to the quantum of Rs.98,000 crore (USD 13 billion) are approved for allied sectors comprising **ACC battery, auto components, telecom & networking products, solar PV modules and white goods.**
- **Semiconductor Fabs and Display Fabs:**
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  - The Union government will work with the States to **set up high-tech clusters with the required infrastructure** such as land and semiconductor-grade water.
- **Semi-conductor Laboratory (SCL):**



- *MeitY will take requisite steps for modernization and commercialization of Semiconductor Laboratory (SCL).*
- *MeitY will explore the possibility for the Joint Venture of SCL with a commercial fab partner to modernise the brownfield fab facility.*
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  - *Support will be provided to 100 domestic companies of semiconductor design for Integrated Circuits (ICs), Chipsets, System on Chips (SoCs), Systems & IP Cores and semiconductor linked design.*

### Way Forward

- *Given the long gestation periods and rapid technology changes, India must out-strategize on design and functionality as the end product will be out only after three-four years from the moment work begins, by which point the prevailing chip shortage would have been resolved, while technology would have advanced further.*
- *Apart from incentivising more FDI in electronics to deepen our supply chains through incentive schemes, we need to focus on encouraging Indian manufacturers and start-ups to enter and master complex R&D and manufacturing verticals.*
- *We can then ensure that valuable Intellectual Property is created and owned by Indian companies.*
- *The semiconductor industry is changing fast as new-age technologies require innovation at the design, material, and process levels.*
- *Indian engineers have contributed immensely to this area in multinational companies. We must encourage them to set up their design start-ups with handsome government grants and tax incentives.*
- *Premier research institutions such as the Indian Institute of Science should also be asked to work aggressively on R&D in chip designing and manufacturing.*
- *Further, the government must focus on emerging technologies like LiDAR and Phased Array in which incumbents do not have a disproportionate advantage and the entry barrier is low.*
- *By working aggressively in new cutting-edge technologies, India can ensure that it becomes Aatmanirbhar.*



- India needs to push for a **Quad Supply Chain Resilience Fund** to immunise the supply chain from geopolitical and geographic risks
- India and Taiwan have started negotiations for a **free-trade agreement and setting up a semiconductor manufacturing hub in an Indian city**, signalling their resolve to further expand the two-way economic engagement.

### Conclusion

The program will usher in a new era in electronics manufacturing by providing a globally competitive incentive package to companies in semiconductors and display manufacturing as well as design. The program will promote **higher domestic value addition in electronics manufacturing** and will contribute significantly to achieving a **USD 1 Trillion digital economy and a USD 5 Trillion GDP by 2025**. This shall pave the way for India's technological leadership in these areas of strategic importance and economic self-reliance.

Women have been historically under-represented in higher academic sciences. It is pertinent to promote and retain women in science, thereby making science inclusive and sensitive. Comment. (250 words)

Difficulty level: Moderate

Reference: Indian Express

#### Why the question:

Historically, academies have been male bastions with the significant exclusion of women scientists, irrespective of their contributions and work. Efforts to ensure gender equity should not be limited to the academies. All stakeholders must get involved.

#### Key Demand of the question:

To write about how higher academic sciences could be made more inclusive and sensitive.

#### Directive word:

**Comment**— here we must express our knowledge and understanding of the issue and form an overall opinion thereupon.

#### Structure of the answer:

##### Introduction:

Begin by giving a statistic about the representation of women in higher academic sciences.

##### Body:

In the first part, mention how historically gender norms and patriarchal attitudes continue to affect women in academic sciences.

Next, write about the measures that are needed make higher science inclusive and sensitive – promoting awareness, giving choice, continuous academic support, re-inclusion after a break, policy support etc.

##### Conclusion:

Conclude by writing a way forward.

#### Introduction

Science, technology, engineering, and medicine –together known as '**STEM**' fields –suffer from lack of women, especially in India. In school exam results, we hear of how girls have outshone boys, but when it comes to those who take up research in later life, the number of women is minuscule. This means that many of our best brains that showed the maximum potential do not pick research as a career.

Since independence, successive governments in India have taken many steps in bringing gender empowerment. However, various developmental indices reflect that still, a lot needs to be done in



this regard. One such area of improvement is increasing gender participation in STEM (Science, Technology, Engineering, and Mathematics) fields.

### Body

India tops world rankings in producing female graduates in STEM with 43% but employs only 14% of them. In comparison, Sweden produces 35% female STEM graduates and employs 34% of them.

### Status of Women in STEM Fields

- About 43% of STEM graduates in India may be women, which is the highest in the world, but women's share in STEM jobs in India is a mere 14%.
- Most of the women STEM graduates in India either pursue another career or do not work at all. Women across the world face the 'leaky pipeline' problem in STEM fields.
- Women leave the workforce, due to the absence of supportive institutional structures during pregnancy, safety issues in fieldwork and the workplace.
- The STEM field is so perpetuated with gender stereotypes. It has a very strong male-dominated culture. Further, there is a lack of role models for girls and women.
- Not just societal norms but issues related to poor education and healthcare access are responsible for a lesser number of women in these fields.

### Reasons for this gender gap

- When highly qualified women drop out of the workforce, it results in considerable depletion of national resources in science and technology.
- Stereotypes encountered by girls to the family-caring responsibilities.
- Patriarchal society.
- Women face bias when choosing a career.
- Women continue to face the same kind of discrimination at work as they face in society.
- According to a recent Accenture research report, the gender pay gap in India is as high as 67 percent.
- Various studies have found that girls excel at mathematics and science-oriented subjects in school, but boys often believe they can do better, which shapes their choices in higher studies.
- In 2015, an analysis of PISA scores by OECD found that the difference in math scores between high-achieving boys and girls was the equivalent of about half a year at school.
- But when comparing boys and girls who reported similar levels of self-confidence and anxiety about mathematics, the gender gap in performance disappeared — when girls were more anxious, they tended to perform poorly.

### Government Initiatives so far to bridge the gender gap in STEM:

- **Vigyan Jyoti scheme:**
  - Announced in the 2017 budget for the Ministry of Science and Technology.



- The scheme aims to arrange for girl students of classes 9, 10 and 11 meet women scientists, with the IITs and the Indian Institutes of Science Education and Research.
- It is intended to create a level-playing field for the meritorious girls in high school to pursue Science, Technology, Engineering, and Mathematics (STEM) in their higher education
- It also offers exposure for girl students from the rural background to help to plan their journey from school to a job of their choice in the field of science.
- **GATI Scheme:**
  - The Gender Advancement for Transforming Institutions (GATI) will develop a comprehensive Charter and a framework for assessing Gender Equality in STEM.
- **Inspire-MANAK (Million Minds Augmenting National Aspiration and Knowledge)**
  - Attract talented young boys and girls to study science and pursue research as a career.
- **Unnat Bharat Abhiyan programme**
  - Launched by the Ministry of Human Resource Development in 2014.
  - Connect India's elite institutes with local communities and address their developmental challenges with appropriate technological interventions.
- Indo-US fellowship for women in science, technology, engineering, mathematics and medicine to participate in international collaborative research in premier institutions in America
- Women-centric programmes under the **Knowledge Involvement in Research Advancement through Nurturing (KIRAN)** initiative
- **Bio-technology Career Advancement and Reorientation (Bio-Care)**

### Way Forward

- Promote gender equality as an explicit human right.
- Identify and eliminate practices that create systemic and structural impediments to the advancement of women in science.
- Support the empowerment of women to enable them to flourish in the scientific profession.
- Identify potential risks and hindrances to women in their pursuit of science and implement strategies to eliminate them.
- Engage with the Government of India, scientific institutions and the civil society to promote and support gender equality in general, and in science in particular.
- **Replicating ISRO Model:** The role of women engineers in the launch of the Indian Space Research Organisation's second moon mission, Chandrayaan-2 shows that how social shackles pertaining to women are loosening. Thus, there is a need for emulating ISRO's model in STEM fields.



- **Bringing Behavioural Change:** Subdued gender participation emanates from social-economic issues, which can be treated by bringing behavioural change. For this, the contributions of women in the STEM sector should be highlighted in textbooks. This may motivate the next generation of girls to be leaders in the STEM sector.
- Women's participation in STEM should be encouraged from primary school level rather only in higher studies.
- Awareness about gender inequality and its outcome has to be increased and the community should be supportive and understanding of career prospects for women.
- Companies can provide more internship opportunities for women and give STEM scholarships to meritorious yet economically backward girls.
- India's forthcoming **Science, Technology, and Innovation Policy (STIP)** should focus on the thrust on gender equity and inclusion. **Digital India** too provides an opportunity to impart education in the STEM field to women.


### Conclusion

A research report by McKinsey said that narrowing the gender gap in STEM can lead to an increase of \$12-28 trillion in the global economy. Thus, India should look at Gender equality as an essential facet of the development perspective.



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Awareness in the fields of IT, Space, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights.

What is Quantum Key Distribution? What are the various applications of Quantum Technology? Evaluate the steps taken to promote Quantum technology in India. (250 words)

*Difficulty level: Easy*

*Reference: Indian Express*

**Why the question:**

*In a crucial development for quantum technology in India, a joint team of experts from the Defence Research and Development Organisation (DRDO) and Indian Institute of Technology (IIT) Delhi demonstrated Quantum Key Distribution (QKD) link for a distance of over 100 kilometres.*

**Key Demand of the question:**

*To write about the applications of Quantum Technology and evaluate the steps taken to promote it.*

**Directive word:**

**Evaluate** – When you are asked to evaluate, you have to pass a sound judgement about the truth of the given statement in the question or the topic based on evidence. You must appraise the worth of the statement in question. There is scope for forming an opinion here.

**Structure of the answer:**

**Introduction:**

*Begin by defining is Quantum Key Distribution and its application.*

**Body:**

*First, write about the various applications of is Quantum technologies – Cybersecurity, Drug Development, Financial Modeling, weather Forecasting and Climate Change and Solar Capture etc. Next, write about steps taken to promote Quantum technology in India – Quantum-Enabled Science & Technology (QuEST), National Mission for Quantum Technologies and Applications (NM-QTA) and Quantum Key Distribution (QKD) solution etc.*



Next, write about the pros and cons of the above steps in furthering Quantum technology in India.

**Conclusion:**

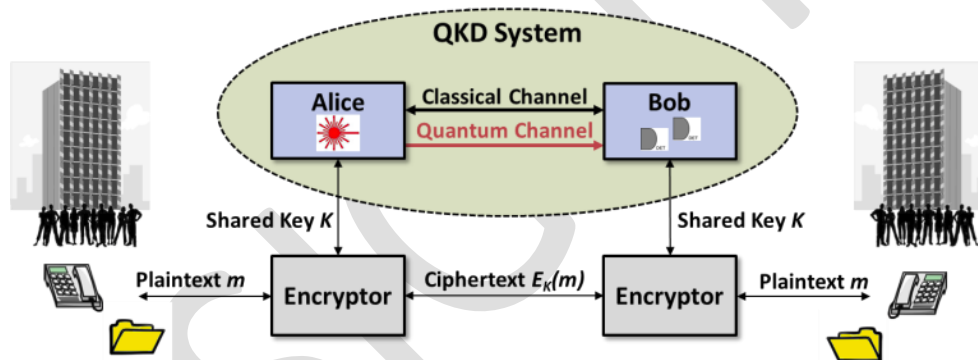
Conclude with way forward to overcome limitations to enable growth of Quantum technology in India.

**Introduction**

**Quantum computing** refers to a new era of faster and more powerful computers, and the theory goes that they would be able to break current levels of encryption. **Quantum Key Distribution (QKD)** works by **using photons** — the particles which transmit light — to transfer data. QKD allows two distant users, who do not share a long secret key initially, to produce a common, random string of secret bits, called a **secret key**. Using the one-time pad encryption this key is proven to be secure to encrypt and decrypt a message, which can then be transmitted over a standard communication channel.

Recently, a joint team of experts from the Defence Research and Development Organisation (DRDO) and Indian Institute of Technology (IIT) Delhi demonstrated **the Quantum Key Distribution (QKD)** link for a distance of over 100 kilometres.

**Body**



**Significance of QKD**

- QKD is essential to address the threat that rapid advancement in Quantum Computing poses to the security of the data being transported by various critical sectors through the current communication networks.
- It will enable security agencies to plan a suitable quantum communication network with indigenous technology backbone.

**Applications of Quantum technology**

**Applications:**

- **Secure Communication:**



- China recently demonstrated secure quantum communication links between terrestrial stations and satellites.
- This area is significant to satellites, military and cyber security among others as it promises unimaginably fast computing and safe, unhackable satellite communication to its users.
- **Research:**
  - It can help in solving some of the fundamental questions in physics related to gravity, black hole etc.
  - Similarly, the quantum initiative could give a big boost to the Genome India project, a collaborative effort of 20 institutions to enable new efficiencies in life sciences, agriculture and medicine.
- **Disaster Management:**
  - Tsunamis, drought, earthquakes and floods may become more predictable with quantum applications.
  - The collection of data regarding climate change can be streamlined in a better way through quantum technology. This in turn will have a profound impact on agriculture, food technology chains and the limiting of farmland wastage.
- **Pharmaceutical industry:**
  - India's interest in the pharmaceutical and healthcare industry is huge.
  - Quantum computing could reduce the time frame of the discovery of new molecules and related processes to a few days from the present 10-year slog that scientists put in.
  - For instance, tracking protein behaviour or even modelling new proteins with the help of quantum computers could be made easier and faster.
  - Tackling chronic diseases like cancer, Alzheimer's and heart ailments is a big possibility of the technology.
- **Augmenting Industrial revolution 4.0:**
  - Quantum computing is an integral part of Industrial revolution 4.0.
  - Success in it will help in Strategic initiatives aimed at leveraging other Industrial revolution 4.0 technologies like the Internet-of-Things, machine learning, robotics, and artificial intelligence across sectors will further help in laying the foundation of the Knowledge economy.

#### Steps taken to promote Quantum technology in India

- In 2018, the Department of Science & Technology unveiled a programme called **Quantum-Enabled Science & Technology (QuEST)** and committed to **investing Rs. 80 crore** over the next three years to accelerate research.



- The government, in its Budget 2020, had announced a **National Mission on Quantum Technologies & Applications (NM-QTA)** with a total budget outlay of Rs 8000 Crore for a period of five years to be implemented by the Department of Science & Technology (DST).
- In December 2021, the Indian Army, with support from the National Security Council Secretariat (NSCS) established the Quantum Lab at Military College of Telecommunication Engineering, Mhow to spearhead research and training in this key developing field.
- In 2021, Government also **inaugurated C-DOT's Quantum Communication Lab** and unveiled the **indigenously developed Quantum Key Distribution (QKD) solution**.
- The Ministry of Defence (MoD) said Wednesday that a joint team of scientists and engineers from DRDO and IIT Delhi successfully demonstrated Quantum Key Distribution (QKD) link for a distance of over 100 km between Prayagraj and Vindhyachal in Uttar Pradesh.

### Way forward

- Both private funding and philanthropic funding should be attracted towards quantum computing. For example, Funds can be used to attract and retain high quality manpower and to build international networks.
- Connections with Indian industry from the start would help quantum technologies to become commercially successful.
- Investing manpower and retaining them as quality human resource is very mobile.
- Participate in development of global standards and requirements for quantum computers.

### Conclusion

It would be prudent to develop a regulatory framework for quantum computing before it becomes widely available. It will be better to regulate it or define the limits of its legitimate use, nationally and internationally before the problem gets out of hand like nuclear technology. Further, connections with Indian industry from the start would also help quantum technologies become commercialised successfully, allowing Indian industry to benefit from the quantum revolution. We must encourage industrial houses and strategic philanthropists to take an interest and reach out to Indian institutions with an existing presence in this emerging field.

## Conservation, environmental pollution and degradation, environmental impact assessment

Despite the rising carbon footprint of Digital technologies, the same technologies are likely to be crucial to any move to a low-carbon world. Elaborate (250 words)

*Difficulty level: MOderate*

*Reference: Indian Express*

**Why the question:**

*Digital Technologies have a high carbon footprint but the link is understudied.*

**Key Demand of the question:**

*The carbon cost of digital use and how the same technology is important for carbon reduction aims.*

**Directive word:**

**Elaborate** – Give a detailed account as to how and why it occurred, or what is the particular context. You must be defining key terms where ever appropriate, and substantiate them with relevant associated facts.

**Structure of the answer:****Introduction:**

Give an overview of how digital technologies such as AI have a carbon cost.

**Body:**

Enumerate various ways in which digital technologies create a carbon footprint. Give, data/examples to support your answer. E.g. in **2020**, digital technologies accounted for between **1.8 percent and 6.3 per cent** of global emissions.

Next, write about the various digital technologies being used to offset carbon emissions. E.g. use of zoom calls and meetings has reduced the traveling cost and time.

**Conclusion:**

Give a balanced view about the use of digital technologies but in an environmentally sustainable way.

**Introduction**

The digital transformation has brought many benefits that also have a positive impact on the fight against climate change and reduce CO<sub>2</sub> emissions. However, the production, use and data transfer of digital devices causes more CO<sub>2</sub> emissions than one might expect. These emissions are summarised under the terms “digital CO<sub>2</sub> footprint” or “digital carbon footprint”.

**Body****Background: Rising carbon footprint of Digital technologies**

- Each action we perform online has an environmental impact, every time we send an email, use the Internet or social media, a small amount of carbon is emitted.
- Digital technologies are responsible for 4% of greenhouse gas emissions (GHG), and its energy consumption is increasing by 9% a year.
- The internet emits 1.6 billion annual tons of greenhouse gas emissions.
- The communications industry will represent 20% of all the world’s electricity consumption by 2025
- More than 50 million tons of e-waste were produced in 2019 alone, a number that’s expected to rise by 8% each year.

**Digital technologies to offset carbon emissions**

- **As per Exponential Climate Action Roadmap, digital technologies could already help reduce global carbon emissions by up to 15% – or one-third of the 50% reduction required by 2030 – through solutions in energy, manufacturing, agriculture and land use, buildings, services, transportation and traffic management.**
- The real game-changer will be **electric and driverless cars and trucks**. Driverless vehicles will accelerate a shift in the traditional business model of vehicle ownership towards mobility and transportation as a service.
  - This means fewer people will own a car, instead ordering shared rides from driverless electric vehicles or catching a driverless bus.



- Industry players say artificial intelligence, for example, could help make **electric transmission grids more efficient**.
- **Blockchain technology** could allow concerned citizens to track corporate carbon emissions.
- The use of satellites can be further enhanced in monitoring environmental changes including activities such as **illegal logging, mining and waste dumping, at sea or on land**.
- **Online meetings (zoon calls), work from home** has already reduced the commute to office and travel for business. These have reduced significant amount of emissions.
- Next comes **5G, AI, IoT and drones**, which all depend on **connectivity and open up completely new opportunities**. With the right policy frameworks and strong climate leadership, these technologies will be instrumental to **moving society towards a circular and lean economy, focused on growing service value while reducing waste and pollution**.

### Conclusion

Only digital technologies move at the speed and scale necessary to achieve the kind of dramatic reduction in emissions that we need to see in the next 10 years. Over and above this, e-waste that is being generated must be recycled and reused to reduce the emissions from toxic metals. Taken together, this will require nothing short of a global economic transformation and climate leadership at all levels from cities, countries and corporations.

India's journey towards carbon neutrality will depend on the timely availability of minerals whose supplies are constrained by geopolitics. How can India secure its place in this new energy order? (250 Words)

*Difficulty level: Moderate*

*Reference: Live Mint*

#### **Why the question:**

*Geopolitics of mineral resources are changing and UPSC too asked a related Qn on this in this year's mains.*

#### **Key Demand of the question:**

*How critical minerals are important for clean energy transition and how India can secure it.*

#### **Structure of the answer:**

##### **Introduction:**

*Give an overview of India's carbon neutrality aim.*

##### **Body:**

*Explain how the geopolitics of energy resources are changing e.g. china owns over 80% of the supply of critical minerals necessary for clean energy transitions.*

*Enumerate steps India can take to secure its energy security e.g. fostering innovation and investment across the entire chain of power generation, storage, and supply, use of 3R formula: Reuse, Recycle, Repurpose.*

##### **Conclusion:**

*Suggest the need for the world to collaborate and share resources and technology to meet the climate goals as well as ensure sustainable use of resources.*

### Introduction

At the onset of CoP-26 in Glasgow, developed countries led the push for a net-zero world. **India has shown determination by setting a target of carbon neutrality by 2070**. Reducing emissions is as vital to the effort as removing carbon. A transition from fossil-fuel-based energy to renewable sources holds the key.



Currently, nearly 40% of India's installed power capacity and 25% of electricity generation is non-fossil-fuel based, with renewable energy (including large hydro plants) at 37% and 22%. Yet, multiple hurdles lie in the country's path from coal-based to clean renewable energy.

## Body

### Geopolitics of resources

- India's transition to cleaner energy aimed at carbon neutrality is **contingent on the timely and adequate availability of these minerals**.
- In the short run, the **supply of minerals is limited by existing knowledge of mines and technologies for extraction**, which makes them **price inelastic**.
- Indeed, their prices are **expected to skyrocket** as more countries speed up their energy transition.
- Further buoyancy in expectations of a global energy transition and the **concentration of many minerals' production (like lithium, neodymium and graphite mainly in China)**, may drive up demand and prices, creating bottlenecks for climate action.
- With **developed countries as front-runners of net-zero emission plans**, India must avert the risks of being a late adopter to ensure smooth availability.
- **China's extractionary foreign policy in Africa** and other **Central Asian nations** show the need for India to fasten its partnership to secure the supply of mineral resources. Especially when China and Pakistan are antagonistic neighbours.

### India securing a place in the new energy order

- A long-run solution to finite mineral reserves and mounting price pressures would be a **3R formula: Reuse, Recycle, Repurpose**. This idea is to effectively shift the dependency of our energy transition from primary minerals (freshly mined and processed) to secondary minerals.
- The **steel industry**, for example, has **identified ways to recycle steel**, reduce its dependence on iron ore and **shrink the carbon footprint** of steel production.
- The recycling of other minerals like copper and aluminium at affordable costs is also crucial, as demand for these soars.
- Also, the recycling of solar panels, wind turbine blades and electric batteries would ensure that renewable energy remains clean from start to end, by saving us the hassle of waste disposal from clean energy systems.
- From electric vehicles to solar cells, India is doubling down for 'green' and renewable energy sources to reduce its dependence on carbon-intensive sources like coal.
- - From electric vehicles to solar cells, India is doubling down for 'green' and renewable energy sources to reduce its dependence on carbon-intensive sources like coal.



- India also has an **agreement with the Lithium triangle nations** of Latin America Chile, Bolivia and Argentina for supply of Lithium. This is aimed at ensuring at least 30% vehicles are electric vehicles in India by 2030.
- A whopping **₹86,200.65 crores budget that has been allocated to the Ministry of Atomic Energy** this year in what appears to be an effort to combat carbon emissions.

### Conclusion

The reuse and repurposing of what exists could enhance our energy storage capacity. Innovation must be encouraged to discover ways to reuse and repurpose batteries. Key minerals like lithium need to be conserved. India's journey towards carbon neutrality requires a holistic approach in fostering innovation and investment across the entire chain of power generation, storage and supply.

The issue of shortage of land to increase forest cover could be overcome by increasing tree cover outside forests. Discuss in the light of Agro-forestry and social forestry. (250 words)

*Difficulty level: Moderate*

*Reference: Indian Express*

#### **Why the question:**

*The recently released India State of Forest Report (ISFR) 2021 shows the total forest and tree cover in India is 80.9 million hectares, which is 24.62 per cent of the geographical area of the country. Between 2019 and 2021, the forest and tree cover rose by 2,261 sq km.*

#### **Key Demand of the question:**

*To write about methods to increase forest cover outside forests.*

#### **Directive word:**

**Discuss** – This is an all-encompassing directive – you must debate on paper by going through the details of the issues concerned by examining each one of them. You must give reasons for both for and against arguments.

#### **Structure of the answer:**

##### **Introduction:**

*Start by mentioning context regarding India's obligation to increase its forest cover.*

##### **Body:**

*Next, by citing statistic mention the progress achieved so far with respect to forest cover and limitations associated with traditional ways for forest generation.*

*Next, write about the scope of Agro-Forestry and Social forestry as means to increase forest cover in India. Its scope and potential to be implemented as well as its limitations.*

##### **Conclusion:**

*Conclude with way forward to further mainstream these concepts.*

### Introduction

**Agroforestry** is a sustainable management for the land that increases overall production, combines agricultural crops, tree crops, forest plants and animals simultaneously and applies management practices that are compatible with the cultural patterns of the local population. Agroforestry can be classified into Agrosilvicultural systems, Silvipastoral systems and Agrisilvipastoral systems.

**Social forestry** can be described as "Forestry of the people, by the people and for the people". Social forestry means management and protection of the forests as well as afforestation of barren lands aimed at helping in environmental, social and rural development as against the traditional objective of securing revenue.



## Body

### Forest cover in India

- The recently released India State of Forest Report (ISFR) 2021 shows the total forest and tree cover in India is 80.9 million hectares, which is 24.62 per cent of the geographical area of the country.
- Between 2019 and 2021, the forest and tree cover rose by 2,261 sq km.

### Scope of Agro and social forestry in India

- Reduction of pressure on natural forests.
- More efficient recycling of nutrients by deep rooted trees on the site
- Better protection of ecological systems
- Reduction of surface run-off, nutrient leaching and soil erosion through impeding effect of tree roots and stems on these processes
- Improvement of microclimate, such as lowering of soil surface temperature and reduction of evaporation of soil moisture through a combination of mulching and shading
- Increment in soil nutrients through addition and decomposition of litterfall.
- Improvement of soil structure through the constant addition of organic matter from decomposed litter.

### Challenges

#### Challenges faced by Agroforestry in India

- There is **lack of uniformity** in the policies and regulations relating to felling and transporting farm-grown timber and other products in different states.
- The agroforestry produce is **lacking coverage under agricultural insurance schemes** and are finding it difficult to marketing support.
- The banks are also **reluctant towards granting loans** to farmers for agroforestry.
- The non-availability or **scarcity of saplings** of suitable tree species required for agroforestry.
- There is **seasonal occurrence** of plant and animal diseases and **inadequate compensation** for damaged crops.
- There is **lack of knowledge** regarding agroforestry among the stakeholders and farmers use inadequate harvesting and processing techniques.

#### Way forward:

- **Encourage and expand tree plantation** in complementarity and integrated manner with crops and livestock to improve productivity, employment, income and livelihoods of rural households, especially the small holder farmers.
- **Protect and stabilize ecosystems**, and promote resilient cropping and farming systems to minimize the risk during extreme climatic events.



- Meet the **raw material requirements of wood based industries** and reduce import of wood and wood products to save foreign exchange.
- **Supplement the availability of agroforestry and social forestry products (AFPs)**, such as the fuel-wood, fodder, non-timber forest produce and small timber of the rural and tribal populations, thereby reducing the pressure on existing forests.
- **Complement achieving the target** of increasing forest/tree cover to promote ecological stability, especially in the vulnerable regions.
- Effective implementation of National Agricultural Policy.

### Conclusion

To realize the vision of doubling farmers' income (DFI) by 2022, **agro-forestry can play an extremely supportive role** by improving livelihoods of poor communities.

Enumerate the steps taken by India to tackle plastic pollution in the country. Do you think a legally binding global treaty on plastics and plastic pollution is the way forward? Critically examine. (250 words)

*Difficulty level: Moderate*

*Reference: Down to Earth*

#### **Why the question:**

*The upcoming United Nations Environment Assembly presents an opportunity to the world to agree to a global treaty on plastics and plastic pollution, as per United Nations Environment Programme (UNEP).*

#### **Key Demand of the question:**

*To write about India's measures against plastic pollution and the need for a legally binding global treaty on plastics and plastic pollution.*

#### **Directive word:**

**Critically examine** – When asked to 'Examine', we have to look into the topic (content words) in detail, inspect it, investigate it and establish the key facts and issues related to the topic in question. While doing so we should explain why these facts and issues are important and their implications. When 'critically' is suffixed or prefixed to a directive, one needs to look at the good and bad of the topic and give a fair judgment.

#### **Structure of the answer:**

##### **Introduction:**

*Begin by giving statistic about level of plastic in India and globally.*

##### **Body:**

*In the first part, write about measures taken by India – notified phasing out of selected single-use plastic items from July 1, 2022. It has also notified the draft EPR regulations in the subcontinent, which focus on collection targets, recycling targets, reuse and use of recycled content in packaging etc.*

*Next, write about the pros and cons of having a legally binding global treaty on plastics and plastic pollution,*

##### **Conclusion:**

*Conclude by writing a balanced opinion on legally binding global treaty on plastics and plastic pollution.*

### Introduction

In 2019, the Union government in a bid to free India of single-use plastics by 2022, had laid out a multi-ministerial plan to discourage the use of single-use plastics across the country. In this



direction, the Environment Ministry recently issued draft rules that mandate producers of plastic packaging material to collect all of their produce by 2024 and ensure that a minimum percentage of it be recycled as well as used in subsequent supply.

## Body

### Plastic waste scenario in India

- According to the **Central Pollution Control Board (CPCB)**, India generates close to 26,000 tonnes of plastic a day and over 10,000 tonnes a day of plastic waste remains uncollected.
- According to a **Federation of Indian Chambers of Commerce and Industry (FICCI)** study the plastic processing industry is estimated to grow to 22 million tonnes (MT) a year by 2020 from 13.4 MT in 2015 and nearly half of this is single-use plastic.
- India's **per capita plastic consumption** of less than 11 kg, is nearly a tenth of the United States of America (109 kg).

### Measures taken so far to tackle plastic pollution

- India recently released a draft resolution to address plastic pollution, a month ahead of the fifth United Nations Environment Assembly (UNEA 5.2) to be held in Nairobi. India's framework proposed a voluntary approach rather than a legally binding one, unlike drafts presented by some other countries.
- In 2019, the Union government in a bid to **free India of single-use plastics by 2022**, had laid out a multi-ministerial plan to discourage the use of single-use plastics across the country.
- Currently, the **Plastic Waste Management Rules, 2016**, prohibits manufacture, import, stocking, distribution, sale and use of carry bags and plastic sheets less than 50 microns in thickness in the country.
- The Environment Ministry has notified the **Plastic Waste Management Amendment Rules, 2021**.
- These rules prohibit specific single-use plastic items which have "**low utility and high littering potential**" by 2022.
- The permitted thickness of the plastic bags, currently 50 microns, will be increased to 75 microns from 30th September, 2021, and to 120 microns from the 31st December, 2022.
- At the policy level, the **concept of Extended Producer Responsibility (EPR)**, already mentioned under the 2016 Rules, has to be promoted.
- The **Central Pollution Control Board**, along with state pollution bodies, will **monitor the ban**, identify violations, and **impose penalties** already prescribed under the **Environmental Protection Act, 1986**.
- The Central Pollution Control Board has reported that 22 States have, in the past, announced a ban on single-use plastic, but this has had little impact on the crisis of waste choking wetlands and waterways and being transported to the oceans to **turn into microplastic**.



- So far, 22 States and Union Territories have joined the fight to beat the plastic pollution, announcing a ban on single-use plastics such as carry bags, cups, plates, cutlery, straws and thermocol products.
- India has also won global acclaim for its “Beat Plastic Pollution” resolve declared on World Environment Day last year, under which it pledged to eliminate single-use plastic by 2022.

#### Pros of a legally binding global treaty on plastics

- An uniform set of laws applies to all countries thereby boosting the cumulative effort across globe to tackle plastic pollution.
- Strengthens the global drive to curb the plastic pollution of all types – land, marine etc.
- Helps build a financial mechanism to boost the efforts towards fighting plastic pollution.

#### Cons:

- Not all countries could be able to abide by the treaty as alternative to plastic may be unaffordable or inaccessible or unavailable.
- Goes against the common but differentiated responsibilities principle.

#### Way forward

- As consumers, we should ensure that all plastic waste leaving our homes is segregated and is not contaminated with food waste.
- Managing plastic waste requires effective knowledge, not only among those who produce the plastic but also among those who handle it.
- The brand owner and manufacturer should try and understand the fates a plastic packaging material would meet after its purpose of packaging has been served.
- Citizens have to bring behavioral change and contribute by not littering and helping in waste segregation and waste management.
- To encourage innovation in development of alternatives to identified single use plastic items and digital solutions to plastic waste management, the India Plastic Challenge – Hackathon 2021, has been organized for students of Higher Educational Institutions and start-ups recognized under Start-up India Initiative.

#### Conclusion

The **pressure on producers to streamline the collection, recycling and processing** of all forms of plastic is **bound to grow**. **Individuals and organizations** should now **actively remove plastic waste from their surroundings** and municipal bodies must arrange to collect these articles. **Startups and industries should think of newer ways of recycling plastic.**

#### Value addition

##### Impact of Plastic Waste

- **Economic Losses:** *Plastic waste along shoreline has a negative impact on tourism revenue (creates an aesthetic issue).*



- For example, the Andaman and Nicobar Islands, are under the plastic threat and facing the aesthetic issue because of the **international dumping of plastic waste** at the island.
- **Implications for Animals:** Plastic wastes have profoundly affected animals in aquatic, marine, and terrestrial ecosystems.
  - **Plastic ingestion** upsets or fills up the digestive systems of the animals thus contributing to their death due to intestinal blockage or starvation.
  - Marine animals can also be **trapped in plastic waste** where they are exposed to predators or starve to death.
  - The plastics may also contain **toxic chemicals** which can harm the animal's vital organs or biological functions.
- **Implications for Human Health:** The chemicals leached from the plastics contain compounds, like polybrominated diphenyl ether (anti-androgen), bisphenol A (mimics the natural female hormone estrogen) and phthalates (also known as anti-androgens), impact human health leading to various hormonal and genetic disorders.
  - These chemicals can interfere with the functioning of the **endocrine system** and **thyroid hormones** and can be very destructive to women of reproductive age and young children.
- **Land Pollution:** Plastics leach hazardous chemicals on land, resulting in the destruction and decline in quality of the earth's land surfaces in terms of use, landscape and ability to support life forms.
- **Air Pollution:** Plastic burning releases poisonous chemicals into the atmosphere impacting general well-being and causing **respiratory disorders in living beings**.
- **Groundwater Pollution:** Whenever plastics are dumped in landfills, the hazardous chemicals present in them seep underground when it rains. The **leaching chemicals** and toxic elements **infiltrate** into the aquifers and water table, indirectly affecting groundwater quality.
- **Water Pollution:** Many lakes and oceans have reported alarming cases of plastic debris floating on water surfaces, affecting a great number of aquatic creatures. It leads to dreadful consequences to marine creatures that swallow the toxic chemicals. In 2014, United Nations report estimated the annual impact of plastic pollution on oceans at US\$ 13 billion.
- **Interference with the Food Chain:** Studies determine that the chemicals affect the **biological and reproduction process** resulting in reduced numbers of offspring thus disrupting the food chain.
  - When the smaller animals (planktons, molluscs, worms, fishes, insects, and amphibians) are intoxicated by **ingesting plastic**, they are passed on to the larger animals disrupting the interrelated connections within the food chain.
- **Poor Drainage:** Drainage system clogged with plastic bags, films, and other plastic items, causes flooding.



- **Impact on Habitats:** Seafloor plastic waste sheets could act like a blanket, inhibiting gas exchange and leading to **anoxia or hypoxia** (low oxygen levels) in the aquatic system, which in turn can adversely affect the marine life.
- **Invasive Species:** Plastic waste can also be a mode of transport for species, potentially increasing the range of certain marine organisms or introducing species into an environment where they were previously absent. This, in turn, can cause subsequent **changes in the ecosystem of the region**.

## Disaster and disaster management.

Enumerate the causes for the rising instances of forest fires in India. What measures are needed to mitigate the adverse impacts of forest fires? (250 words)

*Difficulty level: Moderate*

*Reference: Down to Earth*

### **Why the question:**

*The United Nations Environment Programme (UNEP) February 23, 2022, called on global governments to adopt a new 'Fire Ready Formula,' as it warned that incidences of wildfires would rise in the future.*

### **Key Demand of the question:**

*To write about causes of forest fires in India and measures need to mitigate them.*

### **Structure of the answer:**

#### **Introduction:**

*Start by defining forest fires and statistic regarding rising instances of forest fires in India.*

#### **Body:**

*Draw a small illustrative diagram showing major forest fire prone areas.*

*Discuss first the reasons of forest fires; Thunderstorms are the most likely natural cause for forest fires. Slash and burn techniques etc. The reasons are mainly manmade, particularly in cases where people visit forests and leave burning bidis, cigarette stubs or other inflammable materials.*

*Next, explain the concerns posed by it. Explain why they are difficult to control.*

*Next, discuss the efforts that are needed to be taken in this direction.*

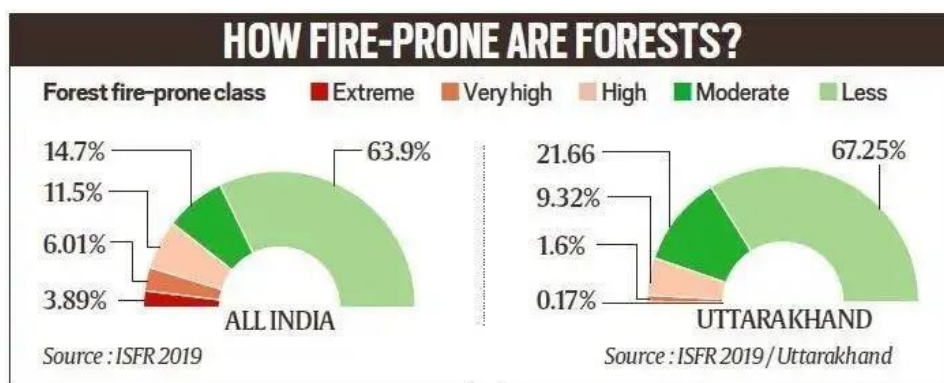
#### **Conclusion:**

*Conclude with way forward.*

#### **Introduction**

**Forest fires** are considered as one of the most widespread hazards in a forested landscape. They have a serious threat to forest and its flora and fauna. Forest fires essentially are 'quasi-natural', which means that they are not entirely caused by natural reasons (like volcanoes, earthquakes and tropical storms), but are caused by human activities as well. In India's case, a combination of hot weather, oxygen and dry vegetation is a potent recipe for forest fires.

#### **Body**



### Forest fires: A regular phenomenon in India

- Every year large areas of forests are affected by fires of varying intensity and extent.
- Since the start of 2021, there has been a series of forest fires in Himachal Pradesh, Nagaland-Manipur border, Odisha, Madhya Pradesh, and Gujarat, including in wildlife sanctuaries.
- At least 5,291 forest fires were recorded in Odisha between February 22 and March 1, 2021 — the highest in the country for the same period, according to FSI biennial report.
- Telangana recorded the second-highest fires in the country at 1,527 during the same period, followed by Madhya Pradesh (1,507) and Andhra Pradesh (1,292), according to FSI data.
- Around 95 percent of the forest fires in India are on account of human activity.
- Around 21 percent of the total forest cover is highly to extremely fire prone, adds the latest forest survey.
- Based on the forest inventory records, **40% of forests in India are exposed to occasional fires, 7.49% to moderately frequent fires and 2.405 to high incidence levels while 35.71% of India's forests** have not yet been exposed to fires of any real significance.

### Reasons for increasing frequency of forest fires

- Forest fires can be caused by a number of natural causes, but officials say many major fires in India are triggered mainly by human activities.
- Emerging studies link climate change to rising instances of fires globally, especially the massive fires of the Amazon forests in Brazil and in Australia in the last two years.
- Fires of longer duration, increasing intensity, higher frequency and highly inflammable nature are all being linked to climate change.
- In India, forest fires are most commonly reported during March and April, when the ground has large quantities of dry wood, logs, dead leaves, stumps, dry grass and weeds that can make forests easily go up in flames if there is a trigger.
- Under natural circumstances, extreme heat and dryness, friction created by rubbing of branches with each other also have been known to initiate fire.
- In Uttarakhand, the lack of soil moisture too is being seen as a key factor.



- In two consecutive monsoon seasons (2019 and 2020), rainfall has been deficient by 18% and 20% of the seasonal average, respectively.

### Measures to control forest fires

- **Forest fire line:** Successive Five-Year Plans have provided funds for forests fighting. During the British period, fire was prevented in the summer **through removal of forest litter** all along the forest boundary. This was called “Forest Fire Line”.
  - This line used to prevent fire breaking into the forest from one compartment to another.
  - The collected litter was burnt in isolation.
- **Firebreaks:** Generally, the fire spreads only if there is continuous supply of fuel (Dry vegetation) along its path. The best way to control a forest fire is therefore, to prevent it from spreading, which can be done by creating firebreaks **in the shape of small clearings of ditches in the forests.**
- Forest Survey of India monitors forest fire events through satellites on two platforms– **MODIS and SNPP-VIIRS**, both in collaboration with the U.S. National Aeronautics and Space Administration (NASA) and Indian Space Research Organization (ISRO).
  - While the **SNPP-VIIRS** identifies, alerts and tracks fire incidents on real time data at 375X375 sq meter pixel, the older version MODIS detects it in the range of 1kmX1km.
  - Forest fire suppression relies very heavily on “dry” firefighting techniques because of poor water availability.
- **Integrated forest protection:** The main objective is to control forest fires and strengthen the forest protection. The works like Fireline clearing, **assistance to Joint Forest Management committees**, creating water bodies, purchase of vehicles and communication equipment, purchase of firefighting tools, etc., needs to be undertaken.
- **Prevention of human-caused fire** through education and environmental modification. It will include silvicultural activities, engineering works, people participation, and education and enforcement. It is proposed that more emphasis be given to people participation through Joint Forest Fire Management for fire prevention.
- **Prompt detection** of fires through a well-coordinated network of observation points, efficient ground patrolling, and communication networks. Remote sensing technology is to be given due importance in fire detection. For successful fire management and administration, a National Fire Danger Rating System (NFDRS) and Fire Forecasting System are to be developed in the country.
- **Introducing a forest fuel modification system** at strategic points.
- **National Action Plan on Forest Fires (NAPFF):** It was launched in 2018 to minimize forest fires by informing, enabling and empowering forest fringe communities and incentivizing them to work with the State Forest Departments.

### Conclusion



It is important to prevent the lungs of the nation from ravages of fire. With climate change and global warming on the rise, India must prevent human-made disaster to ensure our carbon sinks are protected.

Challenges to internal security through communication networks, role of media and social networking sites in internal security challenges, basics of cyber security; money-laundering and its prevention.

What do you understand by grey zone conflict? How does it impact India's security? Evaluate India's preparedness to deal with it. (250 words)

*Difficulty level: Tough*

*Reference: New Indian Express*

**Why the question:**

*The manner in which the Ukraine standoff is progressing, with opinion expressed by US President Joe Biden almost every day about an impending Russian invasion and the equally prompt denials by Moscow, is one of the best modern-day conflict situations to understand the power of hybrid conflict, somewhat euphemistically referred to today as grey zone conflict.*

**Key Demand of the question:**

*To write about grey zone conflict, its impact and ways to deal with it.*

**Directive:**

**Evaluate** – When you are asked to evaluate, you have to pass a sound judgement about the truth of the given statement in the question or the topic based on evidence. You must appraise the worth of the statement in question. There is scope for forming an opinion here.

**Structure of the answer:**

**Introduction:**

*Begin by defining a grey zone conflict.*

**Body:**

*In the first part, write various features of the grey zone conflict – pursuing political objectives through carefully designed operations, remaining below escalatory thresholds and military intimidation. Cite examples to substantiate.*

*Next, write about the impact that grey zone conflict can have on India's security.*

*Next, write about India's measures to deal with grey zone conflict and their strengths and weaknesses.*

**Conclusion:**

*Conclude by writing a way forward.*

**Introduction**

**Grey zone challenges** are defined as **competitive interaction among and within state and non-state actors** that fall between the traditional war and peace duality. They are characterized by **ambiguity about the nature of the conflict, opacity of the parties involved, or uncertainty about the relevant policy** and legal frameworks.

The **Russian intimidatory military build-up on Ukraine's borders** is accompanied by extreme rhetoric, demands from the country's legislature and employment of diplomacy to project international linkages of advantage (such as Moscow-Beijing).

**Body**



### Impact on India's security

- **China's aggression:** A situation manifested along India's northern borders since April 2020 i.e **military intimidation in Eastern Ladakh**, attempted **salami slicing by the Chinese PLA** by activation of friction points, high-intensity propaganda with wolf-warrior diplomacy, and continuous nuances of psychological warfare.
  - China takes 5 steps inside India and retreats 3 steps, thus gaining ground and land. Especially where border settlement is under dispute.
- **Indo-Pak friction:** The third among examples that exemplify today's dynamics of grey zone threats is from the Indo-Pak realm. **From 1977, the Zia Doctrine came into play**, with the recognition that India could only be **tackled through the asymmetric route with extreme hybridity** adopted into a tailor-made campaign. Tackling J&K was only just a part of the strategy that spread deep and wide across India.
- **Hacking PowerGrid by Chinese Hackers:** The cyber-attack on the Mumbai power grid started from October 10, 2020 onwards. The first power grid that supplies electricity to Mumbai was shut on the day following a 'technical failure'. Two days later, the circuit of another transmission line tripped

### Measures to deal with grey zone conflict

- Strategic wisdom lies in the anticipation of and preparation for future wars.
  - To instil desired capabilities in India, there is a requirement for an **in-depth study of several alternative future security environments**.
- **Comprehensive National Power (CNP)** will directly bear on our ability to withstand any challenge in the grey zone. The recommended approach in various domains of CNP is, firstly, political and diplomatic dexterity to ensure fail-proof alliances while continuing to engage with China at the desired level, backed up by sound military diplomacy.
- **Military diplomacy needs to be scaled up** to project desirable military signals at the intended target audiences.
- **The information age** has already stepped into new realities of **machine learning, artificial intelligence, and robotics**. The strong **software base in India needs to be supported** by indigenous **hardware design and production capability**
  - Given the growth lag in this sector, India should collaborate with countries like Singapore and South Korea as an offset to trade negotiations.
  - Related challenges of attracting and retaining talent for the national cause need to be dealt with comprehensively.
- **The safety of our information infrastructure and critical data needs** to be ensured by creating backup and reducing redundancy in communications, power transmission, aviation and railways.
- **Cyber-attacks are a reality that needs refined**, comprehensible, and easy-to-execute crisis management plans along with indigenous offensive capability to escalate cyber deterrence.



- Lastly, **the offensive Space capability** needs to be developed on a priority basis. Any defensive architecture is prone to get breached unless the adversary is also conscious that his infrastructure and national systems can also be targeted significantly, if not comprehensively

### Conclusion

There is no model or formula for warfare, but rather each scenario is markedly unique and requires a tailored approach. Therefore, we need to evolve our own solutions both for offence and defence in the grey zone. There will be a **requirement of greater synergy between all security architecture** components, which needs to be **dovetailed in our Foreign Policy Objectives** in real time to meet the grey zone threat. **To ensure a credible deterrence** and responsive capability against emergent grey threats, there is a need to **institutionalise the whole nation's approach** to the national security matters. Thus, the national security strategy in the grey zone should constitute – **Conflict Prevention, Conflict Management, and Conflict Termination Strategy**.

What influence does money laundering have on economic development? Examine the recent steps taken by India to counter money laundering. (250 words)

*Difficulty level: Moderate*

*Reference: The Hindu , Insights on India*

#### **Why the question:**

*The government on Wednesday informed the Supreme Court that ₹18,000 crore was confiscated under the Prevention of Money Laundering Act (PMLA) from fugitive businessmen Vijay Mallya, Nirav Modi and Mehul Choksi, and returned to banks.*

#### **Key Demand of the question:**

*To write about the adverse effects of money laundering on economic development and steps taken to counter it.*

#### **Directive word:**

***Examine** – When asked to ‘Examine’, we must investigate the topic (content words) in detail, inspect it, investigate it and establish the key facts and issues related to the topic in question. While doing so we should explain why these facts and issues are important and their implications.*

#### **Structure of the answer:**

##### **Introduction:**

*Begin by defining money laundering.*

##### **Body:**

*First, mention in brief as to how money laundering works and its impact on economic development of the nation – economic vulnerability, integrity of the banking and financial services, increased volatility of international capital flows and exchange rates due to unanticipated cross-border asset transfers, increased crimes etc.*

*Next, write about the statutory and institutional measures that have been developed to tackle the menace of money laundering. Write about their effectiveness in dealing with the menace of money laundering.*

##### **Conclusion:**

*Conclude by writing a way forward to further make anti-money laundering measures more robust.*

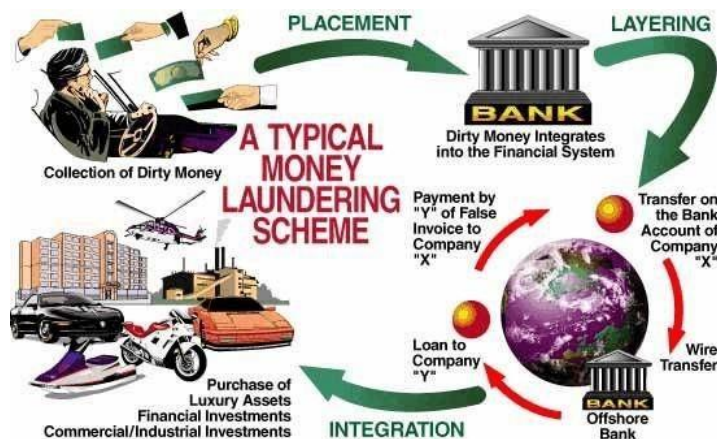
##### **Introduction**

**Money laundering** is the process of creating the appearance that large amounts of money obtained from criminal activity, such as drug trafficking or terrorist activity, originated from a legitimate source. The money from the illicit activity is considered dirty, and the process “launders” the money to make it look clean.



The Center informed the Supreme Court that the total proceeds of crime in PMLA cases pending before the top court is ₹67,000 crore. Centre also told that the number of PMLA cases investigated by the Enforcement Directorate (ED) has varied in five years, from 111 to 981 in 2015-16 and 2020-21, respectively.

**Body:**



**Impact of Money laundering on economic development**

- Money laundering harms financial sector institutions critical to economic growth. Money laundering promotes crime and corruption that slows economic growth and decreases productivity in the real sector economy.
- Money laundering can damage a country’s financial sector’s soundness and financial institutions’ stability, such as banks. The negative consequences, commonly defined as reputational, operational, legal, and concentration risks, are interrelated, and each has certain costs.
- As it becomes difficult for the government to generate income from the related transactions, which are frequent in the informal economy, it decreases tax revenues, which causes a serious negative impact on the economy.
- Money laundering criminals use shell companies because shell companies are commercial companies that appear legitimate but are actually controlled by criminals.
- This increases the potential for monetary instability due to improper allocation of resources from artificial distortions in asset prices. It also provides a way to avoid taxation and thus deprive the country of income.
- Money launderers threaten the economies of many countries through privatization. These criminal organizations may surpass legitimate buyers of former state-owned businesses.
- When illegal revenues are invested in this way, criminals increase their potential to commit more criminal activity and corruption and deprive the country of what it should be a legal, market-based, tax-paying enterprise.
- Seeing a country as a money-laundering haven is likely to attract criminals and encourage corruption.



- *Foreign financial institutions can limit their transactions with institutions from money laundering heavens, stop their investments, make transactions more expensive, and be subject to extra scrutiny.*

### **Efforts of Government of India to address money laundering:**

#### **Statutory framework:**

*In India, before the enactment of Prevention of Money Laundering Act, 2002 (PMLA) the major statutes that incorporated measures to address the problem of money laundering were:*

- **PMLA Act:**
  - *It prescribes obligation of banking companies, financial institutions and intermediaries for verification and maintenance of records of the identity of all its clients and also of all transactions and for furnishing information of such transactions in prescribed form to the Financial Intelligence Unit-India (FIU-IND).*
  - *It empowers the Director of FIU-IND to impose fine on banking company, financial institution or intermediary if they or any of its officers fails to comply with the provisions of the Act as indicated above.*
  - *PMLA envisages setting up of an Adjudicating Authority to exercise jurisdiction, power and authority conferred by it essentially to confirm attachment or order confiscation of attached properties.*
- **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.*

#### **Institutional framework:**

- **Enforcement directorate:**
  - *PMLA empowers certain officers of the Directorate of Enforcement to carry out investigations in cases involving offence of money laundering and also to attach the property involved in money laundering.*
- **Financial Intelligence Unit:**
  - *It was established in India in 2004 as the central national agency responsible for receiving, processing, analyzing and disseminating information relating to suspect financial transactions.*
  - *FIU-IND is also responsible for coordinating and strengthening efforts of national and international intelligence, investigation and enforcement agencies in pursuing the global efforts against money laundering and related crimes.*



- *FIU-IND is an independent body reporting directly to the Economic Intelligence Council (EIC) headed by the Finance Minister.*

### **Way forward**

- *Bringing KYC norms into cryptocurrencies.*
- *Bringing Japan Model where they are provided with licenses and can be easily traceable.*
- *Adhering to FATF guidelines regarding cryptocurrency.*
- *Need to expand capabilities on ways to probe virtual assets and regulate virtual asset provides to prevent money laundering.*
- *A multi-agency or multi-disciplinary agency to work with public and private partnership is key tackling criminal finances.*
- *Strengthening information exchange to dismantle networks.*
- *Enforcing new technologies in criminal finance networks.*
- *Enacting Data Protection Laws, hiring “White Caps” and enabling web audits of money transfer by banks.*
- *Financial stability board: Global watchdog that runs financial regulation for G-20 economies for regulating digital currencies.*
- *United Kingdom: Its Legal to operate currencies but have to register with financial conduct authority and also assure the anti-money laundering and counter terrorism standards.*
- *South Korea: Here it’s not a legal tender but use of anonymous bank accounts for virtual coin trading is prohibited.*

### **Conclusion**

*The evolving threats of money laundering supported by the emerging technologies need to be addressed with the equally advanced Anti-Money Laundering mechanisms like big data and artificial intelligence. Both international and domestic stakeholders need to come together by strengthening data sharing mechanisms amongst them to effectively eliminate the problem of money laundering.*

### **Value addition**

#### **Evolving threats of Money laundering:**

- *Criminals open online accounts with digital currency exchanges, which accept fiat currency from traditional bank accounts. Then, they start a ‘cleansing’ process (mixing and layering), i.e., moving money into the cryptocurrency system by using mixers, tumblers, and chain hopping (also called cross-currency). Money is moved from one cryptocurrency into another, across digital currency exchanges — the less-regulated the better — to create a money trail that is almost impossible to track.*
- *According to the “**Cryptocurrency Anti-Money Laundering Report**,” criminals also use theft and gambling to launder cryptocurrencies.*
- *Since it doesn’t have regulatory authority, it is easy to trade between countries and can cause money laundering in disguise of trading.*



- *Cryptocurrency is highly encrypted and cannot be traced easily.*
- *Creation of **Dark Web or Dark Market** which cause it to exploit users through hacking.*
- *Increasing proliferation of **new non-cash payment methods such as prepaid cards, internet payments, and mobile payments** has opened up new gateways for money launderers.*
- *The **rapid speed of transactions, coupled with minimal face-to-face interaction** between the person initiating the transaction and the service provider, makes these new payment modes vulnerable to money laundering activities.*
- *Money launderers are also taking advantage of the increased need for financial institutions to identify and onboard their customers online.*
- *Trade-Based Money Laundering takes advantage of trade systems complexity, mostly in international contexts where the involvement of multiple parties and jurisdictions make CDD processes and AML checks more challenging.*

## Role of external state and non-state actors in creating challenges to internal security.

India faces new and growing national security threats and challenges as space-based assets became hubs of controlling terrestrial, underwater and aerial combat leading to weaponization of space. Examine. (250 words)

*Difficulty level: Tough*

*Reference: The Hindu*

### **Why the question:**

*China's latest demonstration of physically moving one of its disabled satellites into the graveyard orbit was bringing in newer threats in the race to weaponize the space domain.*

### **Key Demand of the question:**

*To write about the attempts at weaponization of space and its implications for India.*

### **Directive word:**

***Examine** – When asked to 'Examine', we must investigate the topic (content words) in detail, inspect it, investigate it and establish the key facts and issues related to the topic in question. While doing so we should explain why these facts and issues are important and their implications.*

### **Structure of the answer:**

#### **Introduction:**

*Begin by mentioning the race among nations to establish domination in the outer space leading to weaponization of space.*

#### **Body:**

*First, give a few instances of weaponization of space and its impact on India. Especially the Chinese attempts at weaponizing the space domain.*

*Next, mention about the threats to India from the weaponization of space and steps that India should take to protect its interests.*

**Conclusion:**

Conclude by writing a way forward.

**Introduction**

Delhi's new strategic interest in outer space is based on a recognition of two important trends. One is the centrality of emerging technologies in shaping the 21st-century global order. The other is about the urgency of **writing new rules for the road to peace and stability in outer space.**

There is **proliferation of space exploratory** missions today, raising issues of **space debris, weaponization and also space dominance** turning space into tragedy of commons problem.

**Body****Challenges due to increasing space-based assets**

- **Astro politics:** The US has traditionally dominated outer space in the commercial domain. Its military competition with Russia set the norms in the security field.
  - **China's emergence as a major space power** — in both civilian and military is reshaping **Astro politics.**
- **China factor:** The dramatic **expansion of Chinese space capabilities** and Beijing's ambition to dominate outer space have lent a **new urgency for democratic powers** to come together to secure their national interests as well as **promote sustainable order in the skies**
- **No global rules: Space is a common,** where any nation's decision to **test an anti-satellite weapon,** in the process creating gobs of junk, is **unpunishable.**
- **Multiple entities and debris:** Both **private and government** satellite owners have an incentive to protect their equipment while it's operating—but not thereafter.
  - **Space junk is pollution,** and as we have learned on earth there must be a clear line of responsibility for pollution, or public spaces will be ruined.
- **National and commercial interests** are increasingly **tied to space** in political, economic and military arenas.
  - Beyond fanciful notions of solar energy satellites, fusion energy and orbiting hotels, contemporary political issues such as **nuclear non-proliferation, economic development, cybersecurity and human rights** are also intimately **tied to outer space.**

**Need for space legislation in India**

- India has invested enormous resources in its space programme through the Indian Space Research Organisation.
- More importantly, our space assets are crucial for India's development.
- The proposed involvement of private players and the creation of an autonomous body IN-SPACe for permitting and regulating activities of the private sector are welcome efforts.
- However, the space environment that India faces requires us to go beyond meeting technical milestones.



- We need a space legislation enabling coherence across technical, legal, commercial, diplomatic and defence goals.

### Conclusion

As outer space becomes a location for lucrative business as well as a site of military competition between states, the salience of space cooperation needs to increase in the coming years. The scale of the challenges and opportunities in outer space, however, demand more urgent and sweeping reform. That can only be mandated by the highest political level.

Space must be used only for peaceful purposes and any weaponisation of Outer Space cannot be tolerated in the larger interest of people. The safety and security of space-based assets should be ensured through international cooperation.

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