INSTA SECURE SYNOPSIS

MAINS 2020

GS-III

JUNE 2020
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.

What are social stock exchanges? Discuss its need and potential in India. (250 words)

Reference: The Hindu

Why the question:
A working group constituted by the Securities and Exchange Board of India (SEBI) on social stock exchanges has recommended allowing non-profit organisations to directly list on such platforms while allowing certain tax incentives to encourage participation on the platform. Thus the question.

Key Demand of the question:
Explain the concept of Stock exchanges; highlight its importance and potential for India.

Directive:
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 social exchanges are.

Body:
The idea of a social stock exchange (SSE) for listing of social enterprise and voluntary organisations was mooted by Finance Minister Nirmala Sitharaman while presenting the Union Budget 2019-20. According to a release issued by the capital markets regulator, the group has recommended allowing non-profit organisations to directly list through issuance of bonds while recommending a range of funding avenues, including some of the existing mechanisms such as Social Venture Funds (SVFs) under Alternative Investment Funds (AIFs). There is a great opportunity to unlock funds from donors, philanthropic foundations and CSR spenders, in the form of zero coupon zero principal bonds. These bonds will be listed on the SSE. The group has also suggested a new minimum reporting standard for organisations that raise funds on social stock exchanges. The working group has also suggested that the social stock exchange can be housed within the existing national bourses like the BSE and the National Stock Exchange.

Conclusion:
Conclude with importance of it in the current situation facing the country.

Introduction:
A social stock exchange (SSE) is a platform on which social enterprises, volunteer groups and welfare organisations will be listed so that they can raise capital. It will bring together social enterprises and impact investors on a common platform. Finance Minister announced that the government plans to create a social stock exchange (SSE) in the budget 2019. The SSE in India will be under the ambit of SEBI.

Body:

Background:
- The idea of a social stock exchange (SSE) for listing of social enterprise and voluntary organisations was mooted by Finance Minister while presenting the Union Budget 2019-20.
- A working group constituted by the Securities and Exchange Board of India (SEBI) on social stock exchanges has submitted its recommendations.
- The panel was set up by Sebi in September 2019 under the Chairmanship of Ishaat Hussain to suggest possible structures and regulations for creating SSE to facilitate listing and fund-raising by social enterprises as well as voluntary organisations.
Key recommendations of the panel:

- Allow direct listing of non-profit organisations through the issuance of bonds and a range of funding mechanisms.
- Funding mechanisms suggested include some of the existing mechanisms such as Social Venture Funds (SVFs) under the Alternative Investment Funds.
- A new minimum reporting standard has also been proposed for organisations which would raise funds under social stock exchanges (SSE).
- Profit social enterprises can also list on SSE with enhanced reporting requirement. To encourage, giving culture some tax incentives have also been suggested.

Need for Social Stock Exchanges:

- Social enterprises are playing a very significant role in solving real problems in education, healthcare and financial inclusion.
- The Electronic Fundraising Platform acknowledges the problem of investment fundraising for such organizations
- It sends a positive signal that the government is bothered about the sector.
- It will help companies to have greater visibility and raise capital. For instance, if an entrepreneur can go to a single platform which he knows will be touched by a hundred investors, it becomes easier for him
- Listing on an exchange can be a viable alternative for impact startups to raise funding
- In India, the social impact startups are growing at 20 per cent annual rate while there are more than 400 such startups

Potential of Social Stock Exchanges:

- The proposal has attracted much attention, and social entrepreneurs, among others, have said that the move can have a revolutionary effect on how they tap investors for capital.
- The exchange would help social and voluntary organisations which work for social causes to raise capital as equity, debt or a unit of mutual fund.
- It’s good for the government to put in some resources in the creation of what should be viewed as a facilitating institution
- With the government distrustful of foreign donations to nonprofits, the exchange might help the sector generate more capital
- The proposal would be a radical experiment in a country characterised by stark inequality and rapid economic growth.
- If created, the exchange could provide new and cheaper sources of financing for social welfare projects, while showcasing India’s independence from foreign aid as it seeks to enhance its position on the world stage.
- SSEs exist in several countries in various forms but there is no clarity about the Indian version yet on trading, tax benefit transferability and accountability of third parties
Social enterprises:

- A social enterprise is a revenue-generating business.
- Its primary objective is to achieve a social objective, for example, providing healthcare or clean energy.
- This in no way means that a social enterprise can’t be highly profitable. In fact, most social enterprises look and operate like traditional businesses.
- The only catch is that the profit these entities generate is not necessarily used for payouts to stakeholders, but reinvested into their social programmes.
- Forus Health, a social enterprise manufacturing medical devices, with the larger vision of eliminating preventable blindness
- ImpactGuru is a donation-based crowdfunding startup serving NGOs, social enterprises, startups and individuals.

Global examples:

- **UK**: The Social Stock Exchange in London functions more as a directory connecting social enterprises and potential investors. Launched in 2013, it only accepts companies that pass its independent assessment on social impact.
- **Kenya**: The Kenya Social Investment Exchange, launched in 2011, connects vetted social enterprises with impact investors, both foreign and domestic. A listed social enterprise has to demonstrate social impact as well as financial sustainability beyond the funding period.
- **Canada**: Backed by the Ontario government, the SVX is an online platform that allows investments in Canadian companies and funds that have “a positive social or environmental impact”. Retail investors are also allowed to participate.
- **Singapore**: The Impact Investment Exchange runs a social stock exchange in partnership with the Stock Exchange of Mauritius, which is open to limited accredited investors who want to invest.

Challenges:

- In a survey of Indian social enterprises by Brookings India, 57% identified access to debt or equity as a barrier to growth and sustainability.
- Lack of clarity of Social Enterprise in India.
- There is less clarity about how a stock exchange will help raise capital for “voluntary organisations”.
- Social startups possibly lack the flexibility in raising capital from angel or venture capital investors, unlike a regular technology startup.

Way forward:

- The first thing the government needs to decide is how to distinguish between a social enterprise and a normal enterprise.
- It would be innovative if corporate social responsibility funds could be routed to social enterprises through the exchange
• This can help reduce misuse of CSR funds and help companies route funds through a more viable route

Conclusion:

The Social stock exchange is a step in the right direction to help the cash starved social startups. This will further the cause of socio-economic development with much transparency and accountability.

Do you think MGNREGA has become more relevant than ever in its utility in the current times? Analyse. (250 words)

Reference: Indian Express

Why the question:
The question is amidst the current ongoing pandemic situation. The article throws light upon the utility of MGNREGA.

Key Demand of the question:
One has to discuss the relevance of MGNREGA in the current times of the pandemic and how it is more relevant than ever before.

Directive:
Analyze – 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:
Briefly explain the coming of MGNREGA scheme into action.

Body:
The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), is Indian legislation enacted on August 25, 2005. The MGNREGA provides a legal guarantee for one hundred days of employment in every financial year to adult members of any rural household willing to do public work-related unskilled manual work at the statutory minimum wage. Discuss the key facts of MGNREGA. Explain why the scheme is more relevant than ever in the current conditions. Present case study if required.

Conclusion:
Conclude with way forward.

Introduction

MGNREGA is, perhaps, the world’s largest social welfare programme, with about 120 million beneficiaries. With unemployment figures at a 45-year high, and with the added economic destruction caused by the novel coronavirus pandemic, MGNREGA will have more importance in providing livelihood to migrant workers in coming times.

Body

Utility of MGNREGA in current context

• A record 4.89 crore persons belonging to 3.44 crore households sought work under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in May.
  • This is against 3.18 crore persons from 2.26 crore households for the same month last year, when large parts of India were experiencing drought-like conditions.
  • The current surge in MGNREGA work demand reflects a drought, not of water, but of jobs and incomes.
Reverse Migration: The demand for work is mainly from migrant workers returning to their villages from cities and industrial centres post the COVID lockdown.

- Proof of it is the states where the number of households registering demand has shown the highest increase: Uttar Pradesh (299.3 per cent in May 2020 over May 2019), West Bengal (214.5 per cent), Odisha (113.5 per cent), Chhattisgarh (68.9 per cent), Madhya Pradesh (65.1 per cent) and Bihar (62.1 per cent).
- These are all labour exporting states.

Need to widen the scope: The objective of MGNREGA was to provide jobs to landless agriculturists and farmers in the lean period.

- However, with the shattered economy not everyone can be engaged gainfully in agriculture.
- The scheme’s scope will have to be widened. To start with, the number of days of guaranteed employment to adult members of any rural household needs to be expanded beyond the existing 100 days.
- MGNREGA labour can be used even to undertake railway or national highway work

Stimulus: The government made an allocation of an additional Rs 40,000 crore as part of the stimulus package.

- An allocation of Rs 1 lakh crore for FY 2020-21 would mean that approximately Rs 84,000 crore is available for employment generation this year. This will still be the highest allocation for MGNREGA in any year since the passage of the law.

Issues with MGNREGA

- Over the last few years, MGNREGA had begun to face an existential crisis.
- Successive governments capped its financial resources, and turning it into a supply-based programme.
- Workers had begun to lose interest in working under it because of the inordinate delays in wage payments.
- With very little autonomy, gram panchayats had begun to find implementation
- Barring a few exceptions, state governments were only interested in running the programme to the extent funds were made available from the Centre.
- Allocating work on demand, and not having enough funds to pay wages on time was bound to cause great distress amongst the workers and eventually for the state too.
- As a result, state governments had begun to implement MGNREGA like a supply-driven scheme, instead of running it like a demand-based guarantee backed by law.

Need of the hour

- The state governments must ensure that public works are opened in every village.
- Workers turning up at the worksite should be provided work immediately, without imposing on them the requirement of demanding work in advance.
- The local bodies must proactively reach out to returned and quarantined migrant workers and help those in need to get job cards.
• Most importantly, at the worksite, adequate facilities such as soap, water, and masks for workers must be provided free of cost. For reasons of health safety, MGNREGA tools should not be shared between workers.

• The government should provide a tool allowance to all workers — some states are already providing such an allowance.

• The pandemic has demonstrated the importance of decentralised governance.
  ▪ Gram panchayats and elected representatives need to be provided with adequate resources, powers, and responsibilities to sanction works, provide work on demand, and authorise wage payments to ensure there are no delays in payments.

• Finally, there needs to be flexibility in the kinds of work to be undertaken, while ensuring that the community and the workers are the primary beneficiaries.

Conclusion

With nearly eight crore migrant workers returning to their villages, and with an additional allocation for the year, this could be a moment for the true revival of MGNREGA. A revival led by workers themselves.

Discuss the trends of recession faced by India in the past and explain how the upcoming recession is different from the past downturns? (250 words)

Reference: Business Today

Why the question:
The article brings to us a detailed view of Recessions faced by India in the past and the one possibly that India would face owing to multiple factors.

Key Demand of the question:
Student must explain the trends of recession faced by India in the past and explain how the upcoming recession is different from the past downturns.

Directive:
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 what you understand by Recession. Define and clarify upon the concept of Recession in the introduction. Recession is generally defined as a fall in the overall economic activity for two consecutive quarters (six months) accompanied by a decline in income, sales and employment.

Body:
Start by explaining the trends – Since independence, India has witnessed four recessions. As per Reserve Bank of India (RBI), the recessions occurred in 1958, 1966, 1973 and 1980. Throw light on India’s past recessions; discuss the causes that led to such situations, explain how India handled them and recovered out of it. Take hints from the article and draw upon the trends of the past, explain the upcoming recession too. The current recession staring at India brings a new set of challenges. The crisis has emerged out of the blue as the country is in a lockdown, severely hampering economic activity. For India this is estimated to be the worst ever contraction of GDP growth.

Conclusion:
Conclude with way forward.

Introduction
The NBER defines a recession as a significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production, and wholesale-retail sales.

Recessions are visible in industrial production, employment, real income, and wholesale-retail trade. The working definition of a recession is two consecutive quarters of negative economic growth as measured by a country’s gross domestic product (GDP)

Body

India’s past recessions

- **1958 – Balance of Payment (BoP) crisis**: Weak monsoon adversely affected agricultural production, which led to increase in prices.
  - During 1957-58, India encountered its first drop in economic growth when a negative GDP growth of 1.2 per cent was recorded.
  - The reason behind it was a ballooning import bill which swelled by more than 50 per cent between 1955 and 1957
- **1966 – Severe Drought**: India which had fought wars with China in 1962 and more recently with Pakistan in 1965 was in a recovery stage.
  - The very next year, two severe droughts affected Indian economy (during 1966 & 1967).
  - In FY1966, due to drought, food grain production fell 20 per cent.
  - It targeted nations that were supporting Israel during the ongoing “yom kippur” war.
  - As a result, in a short while, oil prices shot up 400 per cent from $3 to $12.
  - Consequently, India’s oil import bill rose from $414 million in 1972-73 to $900 million till 1973-74.
  - This was twice the amount of foreign exchange reserves present at that time.
- **1980 – Oil Shock leading to BoP crisis**: The world witnessed a second oil shock during 1979-80 because of Iranian Revolution.
  - It occurred due to a decrease in oil production and led to increase in oil prices.
  - During this time, India’s exports also took a hit as it contracted by 8%, which led to a balance of payment crisis. India import bill doubled and hence BOP crisis was caused.

Current slump in economic growth due to pandemic

The current recession staring at India brings a new set of challenges. The crisis has emerged out of the blue as the country is in a lockdown, severely hampering economic activity.

- **Unprecedented contraction**: For India this is estimated to be the worst ever contraction of GDP growth.
- **Negative GDP**: RBI in its MPC meet acknowledged that this year’s GDP will be in negative territory but refrained from giving any numbers.
• However other agencies predict a sharp contraction in the range of 5%-6.8% in FY21, with the bulk of the fall estimated to be in Q1 of FY21 when quarterly GDP may contract by nearly half.

• **Efficacy of Stimulus:** India’s 20 lakg crore stimulus is only the 15th largest in the world
  • It costs Indian government just 1% of the GDP, while the top economies have invested 4-5% of GDP.
  • It does no resolve immediate issues of credit for the poor and the farmers, which may impact future food security and nutrition in the country.

• **Poverty:** India has an estimated 812 million poor people, which could **increase to 915 million**, due to the impact of COVID pandemic

• **Impact on economic demand** - The **rise in unemployment** and fall in incomes could lead to reduced spending and consumption.
  • As per the latest report of Centre for Monitoring Indian Economy (CMIE), India’s **unemployment rate** surged to **11% for the week ended May 3**.
  • Many people in agriculture sector would be affected by falling prices due to decline in demand in urban areas over time.

• **Uncertainty over the disease** – as the number of cases continue to increase and consequently the lockdown was extended twice.
  • With 80% asymptomatic patients and lack of vaccination, the magnitude of the crisis at hand still remains uncertain for the government.

• **Constrained financial resources** – as public finances at both central and state levels have been under considerable strain. It makes it difficult for the government to put more cash in the hands of the distressed.

**Way Forward**

• **Policies to support firms:** includes providing grants and wage subsidies to firms to minimize layoffs and supporting micro and small enterprises through measures such as tax exemptions, delays, or waivers targeted to small firms, soft loans, and grants.

• **Active labor market programs** to facilitate the transition of workers who have lost jobs that are not coming back into training or new jobs.

• **Increase in coverage of existing safety net programs** to new beneficiaries based on geography (e.g. the areas with the highest levels of community transmission and/or economic disruptions), or sector of employment, or focusing on at-risk categories (e.g. families with young children, pre-existing health conditions, and elderly family members).

**Discuss the impact of recent change in definition of MSME as a part of Atmanirbhar package on the growth of the industries. (250 words)**

*Reference:* Live Mint

*Why the question:*
As part of its Atmanirbhar Bharat package, the Indian government announced several far-reaching reforms. One of them was a change in definition of micro, small and medium enterprises (MSME).

*Key Demand of the question:*
The question is straightforward and one has to discuss the impact of recent change in definition of MSME as a part of Atmanirbhar package on the growth of the industries.

*Directive:*
**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:
Introduce by quoting key facts of the MSME industry. One can present facts.

Body:
Start by explaining the importance of MSMEs for Indian Economy; MSME is 2nd largest employment provider after agriculture sector. It provides 80% of jobs in the industry with just 20% of the investment. They also check rural-urban migration by providing people living in isolated areas with a sustainable source of employment.

Then move onto explain the impact of the recent change in the definition of the MSME. Highlight both positives and negatives.

Conclusion:
Conclude with a fair and balanced opinion.

Introduction:
The Union Cabinet headed by Prime Minister officially revised the MSME definition. The recent changes in the definition of micro, small, and medium-sized enterprises made as a part of the Atmanirbhar Bharat Abhiyaan relief package were approved. The investment and turnover figures were changed to larger values, thereby resulting in a larger number of medium-sized enterprises.

Body:

Importance of MSME in India:

- According to a RBI report, the MSMEs are amongst the strongest drivers of economic development, innovation and employment.
- Looking back at data since 2000-01, MSME sector growth has almost every year outstripped overall industrial growth in the country.
- The MSME sector also contributes in a significant way to the growth of the Indian economy with a vast network of about 63.38 million enterprises.
- Of these, nearly 14% are women-led enterprises, and close to 60% are based in rural areas.
- The sector contributes about 8% of India’s GDP, 45% to manufacturing output, more than 40% of exports, over 28% of the GDP while creating employment for about 111 million people, which in terms of volume stands next to agricultural sector.
- However, the RBI report also noted that at present the sector is “exceedingly heterogeneous in terms of size of the enterprises and variety of products and services, and levels of technology employed”.
- It has the potential to grow at a much faster rate. One of the key attractions of this sector is that it huge employment generation potential at relatively lower capital investment.

New definition of MSME:
Impact of changes of definition:

- The definition has been widened in line with industry suggestions.
- The new definition will bring about many benefits that will aid MSMEs to grow in size.
- This was made under Aatmanirbhar Bharat Abhiyaan Economic Package to assuage India’s economic predicament amidst the pandemic.
- It will help a wider section of companies to avail various sops announced for the sector.
- The enhanced turnover limit brings relief to many companies that were worried that they would not be eligible for MSME status.
- Moreover, MSMEs, thanks to their small scale of operations and informal organisation, MSMEs don’t always maintain proper books of accounts. This essentially results in their not being classified as MSMEs.
- The change of definition is likely to improve the ease of doing business for MSMEs, and in the process, make it easier for them to pay taxes, attract investments and create more jobs.
- The clear and unambiguous definition – that is also in consonance with global norms and learns from the best practices across countries – is the starting point to reforming this crucial sector of the economy.

Conclusion:

Having created 11 crore job opportunities in India while contributing to the GDP by 29%, we can say that MSMEs are the heart of the Indian economy. And the change in the definition will enable Indian enterprises to carry out their businesses better.

India has abundant varieties of food products used by tribals which if manufactured at an industrial level can provide both employment and livelihood to them. Explain the steps taken by the Government in context of the above statement. (250 words)

Reference: DD NEWS

Why the question:
The article talks about new jobs, organic products in offing as KVIC taps Indian Palm Industry.
Key Demand of the question:
Discuss in detail how food products used by tribals can be manufactured at industrial levels and thus can secure employment opportunities to the natives and tribals of the country.

Directive:
Explain – Clarify the topic by giving 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 with relevant associated facts.

Structure of the answer:
Introduction:
Explain the fact India has abundant varieties of food products used by natives and tribals which if manufactured at an industrial level can provide both employment and livelihood to tribal population.

Body:
Discuss various tribal and native pockets in the country; highlight the kind of food products that can be used, manufactured at industrial levels. Discuss the measures, suggestion in this direction being taken by the government; suggest more steps and measures that can be taken.

Conclusion:
Conclude with importance.

Introduction:
Indigenous people are those who retain knowledge of the land and food resources rooted in historical continuity within their region of residence. The food systems of indigenous people often include “traditional foods”; that is, those that are not purchased but obtained locally from the natural environment. They are chiefly procured either through farming or wild harvesting and utilized based on traditional wisdom and knowledge. It is well recognized that traditional foods and dietary diversity within an ecosystem can be powerful sources of nutrients and thus are better for health. Traditional foods of indigenous communities can be explored as a sustainable means of addressing undernutrition.

Body:
Potential of the traditional food:

- The tribal communities in India are a good example of indigenous populations with a vast diversity in their cultures, traditions, and environments.
- The numerous indigenous foods that exist in the Indian tribal environment reflect the rich biodiversity of India that can be potentially used to promote food security, nutrition, and health.
- Some of these indigenous foods have been analyzed and documented from different regions across India.
- The plants and animals part used are rich in heterogeneous dietary components like protein, carbohydrates, vitamins and minerals.
- Besides, the resources are locally available and also cheaper than other food resources brought from outside.
- The tribal food is distinct and differ from tribe to tribe and common concept of fermentation, smoke drying, sun drying, etc.
- The indigenous crops of India include several varieties of rice such as colored rice, aromatic rice, and medicinal rice varieties: millets, wheat, barley, and maize.
- The indigenous varieties of rice and millets are resistant to drought, salinity, and floods. For example, Dharical, Dular, and Tilak Kacheri of Eastern India are adaptable to different topology, climate, and soils.
- The coarse cereals include sorghum, pearl millet, maize, barley, finger millet, and small millets like barnyard millet, foxtail millet, kodo millet, proso millet, and little millets
Varieties of products are being prepared from meat and fish with locally available vegetables, herbs, and spices.

Among them, indigenously produced blood sausage, animal by-products with rice flour, maize, or fruits, dry meat powder with herbs, and special preparation from animal fats preserved in dry gourd or bamboo containers are important.

With the increase in the population of working women in the urban sector, demand for processed products has increased to counter the time constraints of women for food preparation at home. Hence, commercialization of ethnic food products can meet new consumer demands.

A step forward can be taken for commercialization of traditional meat products by taking active initiatives on certain aspects such as screening and assessing the outstanding foods from the existing platter, refining them through subsequent secondary or tertiary processing and value addition, setting up location-specific industries and enterprises, and facilitating marketing network through cooperative societies, private sectors, and self-help groups.

Such an initiative will require the formal involvement of private sectors, scientific institutions, and financial support from government, NGOs, and banks.

However, before taking such initiatives, certain criteria require substantial input at the ground level for successful commercialization.

**Challenges faced in commercialization:**

In spite of possessing innumerable advantages, the traditional meat products have a number of shortcomings which act as constraints for commercialization at a broader level. These include:

- Lack of quality control and hygiene by food handlers/producer
- Lack of standardization uniform – protocol which is acceptable taste for larger population
- Lack of adequate logistics for scaling up to large production
- Lack of knowledge on proper packaging materials and transport system
- Lack of institutional support mechanism
- Lack of branding and trademark in manufactured products
- Lack of market networking
- Lack of availability and accessibility of meat processing equipment and technical know-how on handling
- Lack of training for skill development of entrepreneurs interested in setting up processing units
- Lack of managerial and marketing skills for entrepreneurship development.

**Steps taken by Government of India:**

- The Ministry of Food Processing Industries, Government of India, supports initiatives in meat processing by providing integrated cold chain and preservation infrastructure facilities without any break from the farm gate to the consumer.
- It covers pre-cooling facilities at production sites, reefer vans, mobile cooling units as well as value addition centers which includes infrastructural facilities like Processing/Multi-line Processing/Collection centers.
- Small Farmer Agri-Business Consortium also provides assistance to setting up of cold storage by giving subsidies.
- APEDA has taken up steps to promote the processed traditional food products to global areas.
- State Governments and other stakeholders are encouraged to hold food stalls in tourism related activities like Bharat Parv and Paryatan Parv etc.
- Financial support is given to private organizers for holding street food stalls facilitating tourists.
To promote local and regional food, government has created guidelines for organizing safe and hygienic food festivals.

Guidelines for declaration of clean street food hub have been framed including upgrading of infrastructure of existing food streets of the country to popularize and promote local and regional cuisines.

Launch of book focusing on regional cuisine of India.

Conclusion:
The richness of indigenous India in traditional cuisine of natural origin is immense. When showcased in a common platform, the extensive potential of the products for commercialization becomes evident. Commercialization of these indigenous food products will help in converting the local market into a global industry which will generate employment and self-sustainability in the region. It is important to orient their export policies to other border states. The commercialization of these products will enhance entrepreneurship development and ensure quality ethnic products to the consumer across India and the globe.

Enumerate the steps taken by the Government of India towards effective utilization of natural resources available with respect to mines and minerals. (250 words)

Reference: pib.gov.in

Why the question:
Shri Pralhad Joshi, Union Minister for Coal, Mines and Parliamentary Affairs launched SATYABHAMA (Science and Technology Yojana for Atmanirbhar Bharat in Mining Advancement) Portal for Science and Technology Programme Scheme of Ministry of Mines on 15th June 2020.

Key Demand of the question:
The question is straightforward and is about enumerating the steps taken by the Government of India towards effective utilization of natural resources available with respect to mines and minerals.

Directive:
Enumerate – 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 with relevant associated facts.

Structure of the answer:
Introduction:
Start by explaining the importance of effective utilization of natural resources available with respect to mines and minerals.

Body:
The question is straightforward and one has to list down the policies and programs taken by the government in this direction. Discuss the projects like SATYABHAMA, NGO Darpan Portal etc. that are key policies in the mining and the mineral sector. Use a map of India to highlight the presence of natural minerals and mines, present the spatial dimension and list the policies associated around each region.

Conclusion:
Conclude with significance of these policies in effective utilization of natural resources.

Introduction
India produces 95 minerals— 4 fuel-related minerals, 10 metallic minerals, 23 non-metallic minerals, 3 atomic minerals and 55 minor minerals (including building and other minerals). India holds a fair advantage in cost of production and conversion costs in steel and alumina. Its strategic location enables convenient exports to develop as well as the fast-developing Asian markets. The Centre has taken a number of steps for the development of mining sector in the country, including formulating a new mineral policy in 2019.
Body

India Mines and Minerals Market

- India is the third largest producer of coal. Coal production in the country stood at 688.8 million tonnes in FY18. India’s coal production in FY19 to reach 739.36 million tonnes.
- India ranks fourth in terms of iron ore production globally. Production of iron ore in FY19 (up to Feb 19) stood at 187.60 million tonnes. India has around eight per cent of world’s deposits of iron ore.
- India became the world second largest crude steel producer in 2018 with output 106.5 million tonnes.
- According to Ministry of Mines, India has the 7th largest bauxite reserves – around 2,908.85 million tonnes in FY18.
- Aluminium production stood at 2.25 MT in FY19 (up to February 2019).

Steps by Government to improve mining sector

- Mines and Mineral (Development and Regulation) (MMDR) Act, 1957 was amended with effect from January 12, 2015 and auction has been introduced as a method of allocation of mining leases to bring greater transparency in the mining sector.
  - National Mineral Exploration Trust has been constituted under Section 9(C) of the MMDR Act for taking up detailed and regional exploration and studies for mineral development.
- Satyabhama portal: The Ministry of Mines has launched a portal “SATYABHAMA (Science and Technology Yojana for Atmanirbhar Bharat in Mining Advancement)” with an aim to promote research and development in the mining and minerals sector.
  - Under the Science and Technology Programme Scheme, the Ministry of Mines promotes research in applied geosciences, mineral exploration, mining and allied areas, mineral processing, optimum utilization and conservation of the mineral resources of the country.
  - This portal will allow online submission of project proposals along with monitoring of the same and utilisation of funds.
  - The portal has been designed, developed and implemented by the National Informatics Centre (NIC).
  - The portal is also integrated with NGO Darpan Portal of NITI Aayog.
  - It will lead to sustainable mining sector development in future while addressing the issues of project affected persons especially those residing in tribal areas.
  - The Policy also mentions rationalize reserved areas given to PSUs which have not been used and to put these areas to auction, which will give more opportunity to private sector for participation.
  - The Policy also mentions to make efforts to harmonize taxes, levies & royalty with world benchmarks to help private sector.
The (GSI) and the Mineral Exploration Corporation Limited (MECL) have been entrusted the work of exploration in mining sector. Various Central and state government agencies have been notified under section 4 of MMDR Act for undertaking exploration.

Project “Sudoor Drishti”: IBM has signed a MoU with National Remote Sensing Centre (NRSC), ISRO on 21.01.2016 to undertake a pilot project on “monitoring of mining activities using satellite imagery and capacity building of IBM officers for three years including technical support for setting up of remote sensing laboratory in IBM.

Star rating of mining leases to establish a sustainable development framework for the Indian mining sector.

An MoU was signed between the Indian Bureau of Mines (IBM) and the National Remote Sensing Centre (NRSC), ISRO in January 2016 to undertake a pilot project on “monitoring of mining activities using satellite imagery” to deter illegal mining.

The Mining Surveillance System (MSS) is launched to check illegal mining through automatic remote sensing detection technology.

District Mineral Foundation Fund (DMF) was established for the welfare of mining-affected people and areas under Pradhan Mantri Khanij Kshetra Kalyan Yojana [PMKKKY].

The National Mineral Exploration Policy has been released to attract private exploration agencies.

100% FDI permitted via automatic route for mining and exploration of metal and non-metal ores. And approval route for mining of titanium bearing minerals and its ores.

Way Forward

Ease of Doing mining: There is a need for an expedition of the clearance process for the judicious utilisation of mineral resources.

Clamp down on illegal mining: Stringent implementation of mining-related rules is needed especially regarding the ban on Rat-Hole and unscientific mining to prevent mine-related accidents.

Accountability: Ensure transparency in block allocations and rule-based order should be established.

Leverage Technology: Use of technology for a better way of mineral exploration and surveillance systems.

Ensuring Sustainable mining: Proper rehabilitation of the displaced population, the tribal rights need to be respected in accordance with the law.

Proper environmental impact assessment (EIA) and social impact assessment (SIA) must be conducted before allocating the projects.

Utilisation of DMF to construct physical & social infrastructure and efforts should be made for the integration of the local population in the process.

Protect forests: A proper regulatory framework for the implementation of the NGT guidelines for the protection of forest and the least damage to the environment.
Adopting global practices in operations and ensuring safe working conditions for workers in the mining sector. Undertake measures to avoid occupational hazards.

Conclusion

There is significant scope for new mining capacities in iron ore, bauxite and coal and considerable opportunities for future discoveries of sub-surface deposits. Infrastructure projects continue to provide lucrative business opportunities for steel, zinc and aluminium producers. Considering these factors, the schemes will prove highly progressive to aid the mines and minerals sector in India.

Discuss the ‘guns, germs and steel’ crisis that India is facing and suggest measures to address the same. (250 words)

Reference: The Hindu

Why the question:
The article narrates in detail on the ‘Guns, Germs and the steel crisis’ There are Chinese “guns” on the borders. There are coronavirus “germs” in our bodies. There are “steel” makers and other businesses on the verge of bankruptcy.

Key Demand of the question:
Explain the crisis India is facing in detail and suggest suitable solutions to address the same.

Directive:
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:
Briefly explain the crisis and why it’s a big concern to India.

Body:
Explain that this is the gravest confluence of military, health and economic crises threatening our nation in more than a generation. Each of these would qualify as an independent, large crisis by itself, warranting a specific resolution.

Discuss what needs to be done to overcome this challenge.

Conclusion:
Conclude with solutions to address the issue.

Introduction:
The ‘guns, germs and steel’ is the title of Jared Diamond’s classic book on the evolution of societies and nations, “Guns, Germs, and Steel: The Fates of Human Societies”. India is said to be going through the ‘guns, germs and steel’ crisis. It is used as a euphemism due to the fact that India is currently tackling a bloody, military border crisis with Chinese (Chinese “guns”) on the borders. To add to that the coronavirus “germs” are spreading rampantly in India and there are “steel” makers and other businesses on the verge of bankruptcy. Each of these would qualify as an independent, large crisis by itself, warranting a specific resolution.

Body:
This is the gravest confluence of military, health and economic crises threatening our nation in more than a generation.

Military standoff with China – “Guns crisis”:

• Standing up to a military threat by a superpower neighbour will pose an inevitable drain on the finances of the government.
India’s war against Pakistan in Kargil in May 1999 provides hints of the financial burden of a military threat.

India’s defence expenditure in the war year shot up by nearly 20% from the previous year.

It also forced the then government to increase India’s defence budget for the next financial year to 2.7% of nominal GDP, the highest in decades.

China is a far mightier power than Pakistan.

In the current stand-off, India is bound to assert its rights, which will necessitate higher expenditure.

India’s defence budget has been whittled down to just 2% of GDP for the financial year 2021.

China’s defence budget is nearly four times larger.

In all likelihood, the Chinese conflict will stretch central government finances by an additional one to two percentage points of GDP, as India wards off the current threat and shores up its defence preparedness.

Health care – “Germs crisis”:

- The health pandemic has exposed India’s woefully inadequate health infrastructure.
- The combined public health expenditure of States and the central government in India is a mere 1.5% of GDP, compared to China’s at 3% and America’s at 9%.
- With COVID-19 expected to linger on until a suitable vaccine is available at large, there is no option other than to significantly ramp up India’s health expenditure.
- Many public health experts are of the opinion that the central government will need additional funds of the equivalent of at least one percentage point of GDP to continue the fight against COVID-19.

Dwindling Economy – “Steel crisis”:

- The extreme national lockdown has thrown India’s economy into utter disarray.
- India’s economy has four major drivers — people’s spending on consumption, government spending, investment and external trade.
- Spending by people is the largest contributor to India’s economic growth every year. For every ₹100 in incremental GDP, ₹60 to ₹70 comes from people’s consumption spending. The lockdown shut off people from spending for two full months, which will contract India’s economy for the first time in nearly five decades; regardless of a strong agriculture performance.
- Even prior to COVID-19 when the global economy was robust, India’s trade levels had fallen from 55% of nominal GDP in 2014 to 40% in 2020. Now, with the global economy in tatters, trade is not a viable alternative to offset the loss from consumption.
- Investment is also not a viable option at this stage since the demand for goods and services has fallen dramatically.
- The Chinese military threat calls for immediate and strategic action by our defence and foreign affairs establishments.
- The COVID-19 health epidemic is here to stay and needs constant monitoring by the Health Ministry and local administration.
- The economic collapse is an enormous challenge that needs to be overcome with prudent policy.

Measures needed to overcome the crisis:

- The Chinese military threat calls for immediate and strategic action by our defence and foreign affairs establishments.
The COVID-19 health epidemic needs constant monitoring by the Health Ministry and local administration.

The economic collapse is an enormous challenge that needs to be overcome with prudent policy.

The common thread across these is that its resolution requires significant financial resources.

The government needs to spend an additional eight percentage points of GDP while revenues will be lower by two percentage points of GDP, a combined gap of 10% of GDP.

Potential new sources of revenue such as a wealth tax or a large capital gains tax are ideas worth exploring for the medium term but will not be of much immediate help.

To fulfil its obligation, the government needs is to borrow copiously.

Conclusion:

It is possible that with rising debt levels, international ratings agencies will likely downgrade India’s investment rating to “junk”, which will then trigger panic among foreign investors. However, care must be taken that this is avoided. India thus faces a tough “Dasharatha” dilemma — save the country’s borders, citizens and economy or prevent a “junk” rating. The government’s choices are either to be bold and embark on a rescue mission, or do nothing and hope the situation resolves itself.

How realistic is the target of 5 trillion economy for India now? Given the current crisis India is facing? Explain. (250 words)

Reference: Indian Express

Why the question:
The question is amidst the challenges the Indian economy is facing owing to the COVID-19 situation across the world.

Key Demand of the question:
One has to analyse the possibilities of achieving the dream of 5 trillion economy for India amidst the current situation.

Directive:

Explain – Clarify the topic by giving 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 with relevant associated facts.

Structure of the answer:
Introduction:
Define the goal of 5 trillion economy of India. India is, currently, a $2.8 trillion economy; to reach the $5 trillion mark by 2024, the economy would require nominal growth in dollar terms of over 12% a year.

Body:

Explain how the goal can still be achieved given the fact that the current situation has led to several long impending reforms and they along with several others which are in pipeline can make it possible. But the concern should not only be quantitative achievement but also inclusion and more equitable growth.

Discuss the existing concerns and challenges and suggest solutions to address them.

Conclusion:

Conclude with a fair and balanced opinion.

Introduction:

The Indian government has set itself a big target, namely, that the Indian economy will have an aggregate income or gross domestic product (GDP) of $5 trillion by 2024-25. India’s GDP is currently estimated at around USD 2.8 trillion. Stating that the economy is in a bad shape, former
Reserve Bank of India (RBI) governor C Rangarajan recently said reaching the $5-trillion Gross Domestic Product (GDP) target by 2025 is “simply out of question” at the current growth rate.

Body:

Current challenges faced by the Indian Economy:

- In the last financial year 2018-19, India recorded growth at a mere 6.8 per cent, which was a five-year record low. The country is still in the middle of an economic slowdown, plagued by demand woes and low private investments.
- India's economic growth crashed to a 69-quarter low of 3.1 per cent in Q4 of 2019-20. For the entire year, the growth rate was down to 4.2 per cent, an eleven-year low.
- Some of the problems staring in the face are the problems of widening inequality, agricultural stress, high unemployment, low human development record, rotting financial system, environmental degradation, communal strife and low manufacturing growth.
- Inequality will greatly increase and there will be 113 billionaires by 2024 from 104 in 2019. Ultra high net worth individuals will reach 10,354 by 2024 from 5,986 in 2019. According to OXFAM, India's one per cent owns 73 per cent of the wealth.
- Rural stress cannot be wished away and only if farmers' incomes double during this period can some relief be expected. Much has to be done to relieve agriculture of its deep-rooted malaise.
- There has been a slowdown in manufacturing growth and exports over the last few years. India needs more FDI to go into manufacturing, but foreign investors have become more discerning.
- The financial system is not in order also as the recent collapse of Yes Bank amply shows. The bigwigs siphoned off crores of public money for their own benefit. There is a serious problem of governance in the banking sector. Lending by public sector banks is still not back to normal.
- Most big cities have huge number of slum clusters. Unless the government's affordable housing project really takes off, India will not be on par with developed countries regarding its urban infrastructure.
- Poor human capital:
  - India has a rank of 129 out of 189 countries according to Human Development Index (2019).
  - India accounts for 28 per cent of the 1.3 billion multi-dimensional poor in the world. One third of the children are undernourished and half the pregnant women are anemic.
  - The undernourished children grow up to be incapable of handling school curriculum and drop out and remain poor throughout life.
  - Anemic women are susceptible to problems during childbirth. India’s high maternal mortality rate shows it.

Possibility of $5 trillion economy:

- The experts are of the view that for India to reach $5 trillion mark, the economy would have to grow at over 11.5 per cent.
- Experts opine that the target could get pushed forward by at least two years even if the economy were to grow by an optimistic 7.5% a year after FY21.
- This is based on the assumption of 4.5 per cent inflation rate that the economic survey for 2019-20 talked about, in order to achieve the GDP target.
- This also assumes an exchange rate of Rs 75 to the dollar, around which the rupee is currently hovering.
• The Economic Survey of 2018-19 says the economy needs to grow by eight per cent, assuming inflation rate at four per cent (the target given by the Monetary Policy Framework) to get to the $5 trillion mark by 2024-25.

Measures needed:
• The Economic Survey 2019-20 extols the virtues of wealth creation; everyone knows how vital it is to make a country prosperous and rich. India’s rich have benefited from crony capitalism, and through their connections in power centres, they have accumulated wealth.
• Rural wages have to rise and rural indebtedness has to be resolved.
• Non-farm jobs have to increase to give employment to women. Only with higher incomes can rural demand rise.
• Infrastructure development as an enabler for growth, creating new and upgrading existing infra projects with Rs 111 lakh crore investment will be key to raising India’s competitiveness and achieving USD 5 trillion economy goal by 2025.
• Infrastructure creation is also labour absorbing, which boosts employment and income generation in the economy and further spurs domestic demand. Improved infrastructure capacities also create efficiency gains through improved logistics and networks, which would improve the competitiveness of the economy.
• Investing in cities’ housing is very important at this juncture for attracting investment.
• The government has to have many more welfare schemes for women in order to promote gender equality and empowerment and increase their earning power to reduce the hold of patriarchy.
• From being the most dangerous country for women, the government should ensure safety for women by spending on lighting the streets and having more police patrolling.
• Last but not the least, there should be communal harmony and the government has to support the minority communities fully by spending on their education, training and job creation. India has to dispel the impression of becoming a majoritarian state.

Conclusion:
With strong measures and executions, the centre can manage to achieve its targets. This task would be achieved by one-year delay if the economy remains flat or contracts by five per cent in the current financial year. However, if it contracts by seven per cent, it would still be a two-year delay to meet the prime minister’s goal of making India a $5 trillion economy by 2024-25.

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
There is need for a long-term plan and adequate deployment of resources to handle the locust swarms and protect the agricultural sector. (250 words)
Reference: Business standard

Introduction
In the worst locust attack in India in 27 years, large swarms have spread over Rajasthan, Madhya Pradesh, Gujarat, Uttar Pradesh and several other states in north India, triggering alarm among farmers and authorities.
With their population becoming denser, they form swarms and keep moving across areas damaging the crops. These swarms attacking crops and thereby devastating the entire agricultural economy is what is commonly referred to as locust plague.

Body

About Locust

- There are four types of locusts that create a plague – desert locust, migratory locust, Bombay locust, and tree locust.
- When the locusts get a suitable environment and absorb behavioural changes, they change colour and often grow larger.
- They transform themselves from solitary animals into animals that increasingly start breeding, which results in millions of swarms.
- This majorly happens after a series of strong rain or amid damp environment conditions.

Need for long-term plan to manage locust swarm

- The potential for locusts’ exponential growth and crop devastation has jeopardized the food and economic security of arid and semi-arid regions as well as agricultural powerhouses.
- Concerns are intensifying as the sowing period for kharif or monsoon crops like rice, maize, millet, pulses, soybean, and groundnut approaches in June.
- They feed voraciously on almost all types of crops; a large swarm can eat as much as about 35,000 people in one day.
  - Locusts also breed rapidly, with a single female desert locust laying 60-80 eggs thrice during its roughly 90-day life cycle.
  - With such aggressive growth, one square kilometer of land could hold up to 40-80 million of these insects.
  - They also travel great distances, covering up to 150 km daily.
- The migratory pests also penetrated into Tanzania, Uganda, and South Sudan, wiping out entire fields of maize, sorghum, and wheat crops.
  - This puts Indian sowing season and kharif crops in peril.
- Locust attacks are thus jeopardizing the agricultural economy of several Indian states. Villages in India’s western states of Gujarat and Rajasthan, which border neighboring Pakistan’s desert areas, are especially vulnerable to locust invasions.

What needs to be done?

- The official adds that awareness campaigns have also been launched across affected states to sensitize farmers.
- Pamphlets and stickers are being distributed to highlight pest prevention measures and messages are being hand painted on the walls of offices and warehouses and granaries across affected states to drive home the point.
• Given the risk posed by continued locust invasions, the Indian government has also invested heavily in drones and specialist equipment as well as holding consultations with international experts.

• India has placed an order of 50 ultra-low volume sprayers with the UK to control the menace of migratory locust, which is looming large this kharif season.

• Commonly used organophosphate pesticides like Malathion (96 per cent ultra-low volume aerial application) is used to control the pest.

• Mounted sprayers are used to treat areas of infestation with the chemical. India, at present, has 50 such vehicles and have placed orders of 60 or more such sprayers, which are expected to arrive soon.

• The Ministry of Civil Aviation has approved “conditional exemption to government entity (DPPQS) for use of Remotely Piloted Aircraft System for anti-locust operations”.
  ▪ Two firms have been finalised for the use of drones to spray pesticides for locust control.

• Controlling Global Warming: Beyond chemicals, pesticides, and drones, it is imperative to tackle the root cause of global warming and invest in upgrading climate resilience and adaptation techniques.
  ▪ An expensive and complex process, this will require global cooperation and coordination.
  ▪ But it has to be done. Else, as these pernicious pests have demonstrated, the costs will be staggering and recurring.

Conclusion

The government has further issued an alarm and said, new swarms will migrate to the summer breeding areas along both sides of the Indo-Pakistan border as well as to Sudan and West Africa. As vegetation dries out, more groups and swarms will form and move from these areas to the summer breeding areas along both sides of the Indo-Pakistan border. Good rains are predicted during the first half of June along the Indo-Pakistan border that would allow more egg-laying.

Account for the use of chemical pesticides, insecticides and fertilizers in Indian agriculture and its impact on human health. (250 words)

Reference: Indian geography by Majid Hussain

Why the question:
The question is straightforward and aims to analyse the impact of chemical fertilizers and chemical agri inputs on the Indian agriculture and the human health.

Key Demand of the question:
One must Account in detail for the use of chemical pesticides, insecticides and fertilizers in Indian agriculture and its impact on human health.

Directive:
Account – Weigh up to what extent something is true. Persuade the reader of your argument by citing relevant research but also remember to point out any flaws and counter-arguments as well. Conclude by stating clearly how far you are in agreement with the original proposition.

Structure of the answer:
Introduction:
Start by explaining the fact that chemical inputs are key infrastructure to the agriculture production.

Body:
Best way to Account for the use of chemical pesticides, insecticides and fertilizers in Indian agriculture and its impact on human health is to present the case of Green revolution program in India.

One can also present the case of GM Cotton, explain how intensive chemical fertilizers, pesticide usage led to degradation of the land fit for agriculture.

Discuss what the other options available are to address the ill impacts of heavy usage of chemicals, suggest alternatives to it.

**Conclusion:**
Conclude with solutions to address such concerns and issues.

**Introduction:**

The “Green Revolution” in the 1970s, ushered in an era of rapid agricultural production, foodgrains in particular. One of the catalytic agents for the revolution was chemical fertilizers. India was gravely short of foodgrains, and this agricultural shift came in handy. With massive inputs of chemical fertilizers, pesticides and water, high crop yields were achieved. The ‘Green’ Revolution may have saved the day but it was far from safeguarding the future.

**Body:**

The 29th report, called “Impact of chemical fertilizers and Pesticides on agriculture and allied sectors in the country”, was tabled in Parliament by the parliamentary standing committee on agriculture in 2016. Some of the key findings are:

- **Consumption of fertilizers:**
  - consumption of chemical fertilizers in the country has been increasing along with the level of agricultural production.
  - Agricultural production increased from 83 million tonnes in the 1960s to 252 million tonnes in 2014-15.
  - Use of chemical fertilizers (such as those containing nitrogen, phosphorus and potassium) increased from one million tonnes to 25.6 million tonnes in the same period.

- **Availability of fertilizers:**
  - While the consumption of chemical fertilizers in the country has increased from 17.4 million tonnes in 2001-02 to 25.5 million tonnes in 2012-13, the domestic availability has only increased from 14.5 million tonnes to 16.1 million tonnes.
  - This indicates that there has been an increase in the import of fertilizers.

- **Imbalance in use of fertilizers:**
  - The Committee observed that currently, 292 out of the 525 districts (56%) in the country account for 85% of its fertilizer use.
  - In addition, the ratio of consumption of fertilizer has been skewed towards nitrogen.
  - The ratio of usage of nitrogen, phosphorus and potassium fertilizers is 6.7:2.4:1, as compared to the recommended usage ratio of 4:2:1.

- **Excessive use of pesticides:**
The Committee observed that the consumption of chemical pesticides in the country increased from 55,540 tonnes in 2010-11 to 57,353 tonnes in 2014-15, while their imports increased from 53,996 tonnes to 77,376 tonnes in the same period.

The Committee noted that excessive use of pesticides may have a deteriorating effect on the health of both humans and animals.

Impacts on human health:

- Agrochemicals are considered as a powerful weapon or magic bullets in the developing countries in order to enhance the agriculture productivity.
- However, it has been observed that agrochemicals are causing serious hazards and certain pesticides may affect the human endocrine and immune systems and may promote the development of cancer.
- It has been administered that farmers do not use the safety masks, gloves and other protective gears during the spraying of pesticides which results into the access of pesticides in the blood stream through inhalation and dermal exposure which can adversely affect their eyes, skin and the respiratory system.
- Pesticide poisoning has been a consistent killer with the state reporting as many as 272 deaths in the last four years.
- The exposed spray farmers usually report maximum acute signs and symptoms like burning/stinging of eyes, blurred vision, skin redness/itching, excessive sweating/shortness of breath, dry sore throat and burning of nose.
- As pesticides are applied over the vegetable which are directly entered into human or livestock bodies.
- Excessive use of fertilizers may pollute the underground water with nitrate and it is so much hazardous to humans or livestock.
- Nitrate concentrated water can immobilize some of hemoglobin in blood.
- **Organophosphate pesticides** have increased in application, because they are both less persistent and harmful for environment than **organochlorine pesticides**.
- But, they are associated with acute health problems, such as abdominal pain, dizziness, headaches, nausea, vomiting, as well as skin and eye problems. There have been many studies intending to establish cancer – pesticides association.
- **Organophosphate pesticides** used in the vegetables gradually get deposit into human body and has a link with cancer.
- Contamination of soil and water with toxic agrochemicals (e.g., phosphate fertilizer contaminated with heavy metals, pesticides and herbicides etc.) are a particular concern.
- These pollutants in water generally are in small quantities, and thus, cannot be seen or tasted.
- Therefore, their harmful effects do not manifest in humans for several years but led to the escalation of deadly disease like chronic kidney disease.
- In term of human health, DDT is the cause of many kinds of cancer, acute and persistent injury to the nervous system, lung damage, injury to the reproductive organs, dysfunction of the immune and endocrine systems, birth defects.

Way forward:

- A comprehensive study should be undertaken to measure the impact of chemical fertilizers and pesticides on soil fertility and general health.
- The existing fertilizer subsidy policy should be revised, and a new policy which is more favourable to Indian conditions should be formulated.
• Promotion of organic fertilizers.
• A Policy should be put in place to incentivize the use of bio-fertilizers. Farmers should be provided with financial and technical support to enable them to switch to organic farming on a large scale.
• Legal action for using banned pesticides like DDT for agriculture.
• A **Fertilizer Development and Regulating Authority** should be established to streamline the process of certification, quality checks, innovations, and fixing prices of fertilizers.
• A **Pesticides Development and Regulation Authority** should also be created to regulate the manufacturing, import and sale of pesticides in the country.
• Balanced use will also reflect in reduced water consumption, while at the same time protecting water bodies from run-off pollution.
• Farmer awareness about balanced fertilization should be stepped up through the coordinated efforts of the departments of agriculture, cooperation & farmers’ welfare and fertilizers, besides the network of the Indian Council of Agricultural Research’s Krishi Vigyan Kendras.

**Conclusion:**

The need of the hour is to switch priorities and subsidies from chemical to organic farming as shown by the State of **Sikkim, Andhra Pradesh** launched a 'Zero Budget Natural Farming' Project to phase out chemicals by 2024. The government should divert the undeserved subsidies from the chemical farming sector to the organic farming sector and assist/train farmers across the country to make the transition to organic farming practices and thereby enhance their livelihoods, and protect their lives.

**Stressing on the need for Participatory Irrigation Management (PIM) in India, discuss the limitations in implementing it.** (250 words)

**Reference**

**Why the question:**
The question is based on the concept of for Participatory Irrigation Management (PIM).

**Key Demand of the question:**
One has to explain the need of such a technique – Participatory Irrigation Management (PIM) and its relevance to the Indian system of agriculture, also discuss the constraints associated with its implementation.

**Directive:**
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:**
Define what you understand by Participatory Irrigation Management (PIM). Participatory irrigation management (PIM) refers to the co-operation and involvement of farmers in Operation, management, and maintenance of the irrigation systems by organizing themselves in formal bodies at various levels.

**Body:**
Discuss the key features of PIM.

Then explain the need for Participatory Irrigation Management (PIM) in India – to increase in Agricultural Productivity, to reduce the operations cost of irrigation facility and others.

Discuss then the constraints in implementing the PIM – Lack of legal backup and policy changes, lacunae in the system, Uncertainty of water availability, Fear of financial viability.

**Conclusion:**
Conclude with significance of such ideas and policy initiatives and also suggest measures to overcome the challenges associated in its implementation.

Introduction:

Participatory irrigation management (PIM) refers to the participation of irrigation users, i.e., farmers, in the management of irrigation systems not merely at the tertiary level of management but spanning the entire system. It is crucial for management of irrigation projects for conserving and optimal utilization of resources. Water Users’ Association (WUA) has been registered for the purpose of PIM in various states in India.

The concept of involvement of Farmers in irrigation management accepted as a policy by Government of India and included in National Water Policy adopted in 1987. Government of India started campaigns to promote Participatory Irrigation Management through National Seminars and Workshops during 1990s.

Body:

Important facets of PIM:

- Participation should not be construed as consultation alone.
- The concept of PIM refers to management by irrigation users at all levels of the system and in all aspects of management. This is the simplicity and flexibility of PIM.
- There can be different forms of participation at different levels in the system with varying degrees of accountability and responsibility.
- Management by irrigation users, rather than by a government agency, is often the best solution.
- Contrary to the traditional concept that irrigation management requires a strong public-sector role, the PIM approach starts with the assumption that the irrigation users themselves are best suited to manage their own water.

Need for PIM:

- The irrigation sector in the country has been afflicted by several problems.
- Lack of understanding about scarcity of water, its life sustaining and economic value results in its mismanagement, pollution, wastage, reduction of flows below minimum ecological needs and inefficient use.
- There are inequities in distribution and lack of a unified perspective in planning, management and use of water resources.
- Inadequate maintenance leading to poor operation of irrigation systems.
- Management and operation of the irrigation system by the irrigation department as per normal administrative procedures.
- Wide cognitive distance between the farmers and the irrigation agency leading to a mismatch of objectives.
- The level of coordination between various government departments is minimal.

Limitations in implementation of PIM:
• **Lack of legal back up and policy changes:** In many States, there is no or very little legal back up and clear-cut policy decision at the Government level to take up PIM, which is a big impediment in implementation of PIM. For the actual irrigation management transfer and operation of PIM in an irrigation project, policy changes and legal back up are essential. The concept of water user is deeply ingrained in Indian culture as the one who owns the land.

• **System deficiency:** In older projects, there are many problems like deterioration of old control and measuring structures, leakages and seepage at various places, erosion of banks and beds, siltation and weed infestation. These are serious problems, hindering farmers to take over the system management on technical and financial considerations.

• **Uncertainty of water availability:** This is another important aspect, as farmers will understandably be reluctant to take on the responsibility for managing the system unless deliveries of water are made reliable, flexible, practical and responsive to need.

• **Fear of financial viability:** Maintenance and operation of the system demands huge finances. Farmers have got the apprehension that in absence of surety of finance, it would be difficult for them to fulfill the requirement of funds for operation and maintenance.

• **Lack of technical knowledge:** Apart from the financial uncertainty, lack of technical input is one of the inhibiting factors to take over the system.

• **Lack of leadership:** On account of limited exposure of the farmers to the rest of the world and PIM in particular, potent leadership is lacking, rather on account of limiting knowledge.

• **Lack of publicity and training:** Seeing is believing; and knowledge brings confidence in people. This aspect is lacking and there is a constraint to adoption of PIM.

• **Demographic diversity:** Due to variation in economic, ethnic, education levels etc. diversity of farmers, PIM is taking much time in this country.

• **WUAs v/s Panchayats:** In many of the areas, where WUAs have been formed, there is a clash of interest among Panchayats and WUAs on who is to own the system, particularly when watershed schemes are being handed over to the Panchayats.

• **Gender issues:** Rules for membership in Water Users Groups are problematic as patriarchy and male dominance. Although women have legal rights to inherit, and own land, the practice is different. Women particularly, landless aren’t perceived as water users and therefore not perceived as eligible as members of water user’s associations.

**Way forward:**

Planning, development and management of water resources need to be governed by common integrated perspective considering local, regional, State and national context, having an environmentally sound basis, keeping in view the human, social and economic needs. Water needs to be managed as a common pool community resource held, by the state, under public trust doctrine to achieve food security, support livelihood, and ensure equitable and sustainable development for all.
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 are the reformative steps taken by the government to make food grain distribution system more effective? (250 words)

Reference: Previous Year UPSC CSE question

Key Demand of the question:
The question is straightforward and aims to discuss the reformative steps taken by the government to make food grain distribution system more effective.

Structure of the Answer:

Introduction

The Public Distribution System (PDS) under Food Security Act is one of the major initiatives taken by the government to address one of the basic needs of the citizens. Over the years various steps have been taken to make the initiative more efficient.

Body

One can directly start by explaining steps taken by the government to make PDS efficient. Explain the policies of linking of Aadhaar, Biometric system integration, Portable ration card, Home delivery system etc. Explain the importance of making the distribution system more effective, its impact on overall economy.

Conclusion

Conclude with significance.

Introduction:

The Public Distribution System (PDS) is an Indian food security system which evolved as a system for distribution of food grains at affordable prices and management of emergency situations. It distributes subsidized food and non-food items to India’s poor. This scheme was launched in June 1947. It functions through a network of Fair Price Shops at a subsidized price on a recurring basis.

Body:

Importance of PDS:

- Food grains to the poor, at prices lower than the price of food grains at private shops.
- Food grains are directly purchased from farmers, assuring farmers with a greater price.
- Make goods available to consumers, especially the disadvantaged /vulnerable sections of society at fair prices.
- Rectify the existing imbalances between the supply and demand for consumer goods. Check and prevent hoarding and black marketing in essential commodities.
- Ensure social justice in distribution of basic necessities of life.
- Even out fluctuations in prices and availability of mass consumption goods.
- Support poverty-alleviation programmes, particularly, rural employment programmes, (SGRY/SGSY/IRDP) Mid-day meals, ICDS, DWCRA, SHGs and Food for Work and educational feeding programmes.

Challenges faced by PDS:

Procurement:
Open-ended Procurement: All incoming grains accepted even if buffer stock is filled creating a shortage in the open market.

The recent implementation of Nation food security act would only increase the quantum of procurement resulting in higher prices for grains.

The gap between required and existing storage capacity.

The provision of minimum support price has encouraged farmers to divert land from production of coarse grains that are consumed by poor, to rice and wheat.

Storage:

- Inadequate storage capacity with FCI.
- Food grains rotting or damaging on the CAP or Cover & Plinth storage.
- The storage of foodgrains inculcates high carrying costs on the government.

Allocation of food grains:

- Identification of poor by the states is not fool proof. A large number of poor and needy persons are left out and a lot of fake cards are also issued.
- Illicit Fair Price shops: The shop owners have created a large number of bogus cards or ghost cards (cards for nonexistent people) to sell food grains in the open market.

Transportation:

- Leakage and diversion of food grains during transportation.
- Uneven distribution of Food generations, procurement and distribution. For example: north eastern states are very far from Punjab and Haryana, from where wheat is procured. To transport food grains from Punjab to far flung areas in North east will entail cost and time both.

Other issues:

- Many times, good quality food grains are replaced with poor quality cheap food grains.
- Public distribution system includes only few food grains such as wheat and rice, it does not fulfil the requirement of complete nutrition.
- Fair Price Shop owner gets fake Ration cards and sell the food grains in the open market.

PDS Reforms undertaken by Government:

- **Aadhaar Linked and digitized ration cards**: This allows online entry and verification of beneficiary data. It also enables online tracking of monthly entitlements and off-take of foodgrains by beneficiaries.
- **Computerized Fair Price Shops**: FPS automated by installing ‘Point of Sale’ device to swap the ration card. It authenticates the beneficiaries and records the quantity of subsidized grains given to a family.
- **DBT**: Under the Direct Benefit Transfer scheme, cash is transferred to the beneficiaries’ account in lieu of foodgrains subsidy component. They will be free to buy food grains from anywhere in the market. For taking up this model, pre-requisites for the States/UTs would be to complete digitization of beneficiary data and seed Aadhaar and bank account details of beneficiaries. It is estimated that cash transfers alone could save the exchequer Rs. 30,000 crore every year. Direct benefit transfer in the **account of female member of house** so that benefit could directly reach to beneficiary without any discrimination.
- **Diversification of commodities**: The list of items which are distributed under PDS system have been extended to meet the day-to-day requirements of the ordinary man.

- **Door-to-door delivery**: Provisions of door-to-door delivery are being made to ensure that right amount of material reaches the beneficiary at the right time, at the right place.

- **Automation of the supply chain management** (delivery orders, release orders, truck chalans, gate passes, receipts and issuance of foodgrains, monitoring of stock positions, payments and SMS alerts when opted for) as seen in 20 states and/or UTs.

- **Use of GPS technology**: Use of Global Positioning System (GPS) technology to **track the movement of trucks carrying foodgrains** from state depots to FPS which can help to prevent diversion.

- **SMS-based monitoring**: Allows monitoring by citizens so they can register their mobile numbers and send/receive SMS alerts during dispatch and arrival of TPDS commodities

- **Use of web-based citizens’ portal**: Public Grievance Redressal Machineries, such as a toll-free number for call centers to register complaints or suggestions.

- **Innovative schemes**: Innovative schemes like use of electronic Cash Transfer, Food Coupons, smart cards, and last-mile tracking have further increased the relevance of this scheme in the present scenario.

- **Panchayats, self-help groups and cooperative societies** to play an important role while registering any fair price shop and they need to keep a watch upon them.

**Way forward:**

- Primacy should be given to ensuring that the functioning of FCI is streamlined and fast paced as per recommendations of the **Shanta Kumar Committee**.

- For subsidised grain, there are 186.6 million ration cards, 23 million AAY and 163.5 million PHH. If these are digitised and seeded with Aadhaar numbers, duplication is reduced; ghost ration cards are eliminated.

- 100 lakh ton silo storage capacity must be created in the country. For this, RITES has been assigned the task of changing the silo model and they will give their recommendations in 90 days to FCI.

- **End to end digitalization using ICT** will try to minimise the bureaucratic influence and enhances the transparency in the system.

- At present, there are 3 types of labourers in FCI namely Departmental, Daily Payment System (DPS) and No work no pay workers along with contractual labour. Government of India is deliberating to finish the 3 different arrangements and bring all workers of FCI under a single, uniform system which will bring stability of tenure and secured wages for all.

- To improve the usage of Information Technology in FCI, a **Human Resource Management System (HRMS)** must be implemented.

- Support to **local public distribution models and grains banks** should be provided.

**Conclusion:**

PDS has helped bring about the socio-economic justice by helping alleviate hunger, malnutrition, anaemia among poorest of the poor, BPL citizens, women and children. The use of ICT to reduce the touch-points will further increase the efficiency of PDS.
Do you think shifting to DBT for food and fertilizer subsidies may do more to bridge the gap with the doubling of farmers’ income goal? Give your opinion with suitable justifications. (250 words)

Reference: Financial Express

Why the question:
The explains that the latest reforms are a significant step forward, but shifting to DBT for food & Fertiliser subsidies may do more to bridge the gap with the DFI goal.

Key Demand of the question:
Explain the idea of shifting to DBT for food and fertilizer subsidies and in what way it may lead to better achievement of the goal of doubling farmer’s income in the country.

Structure of the answer:
Introduction:
Start by explaining the recent reforms and steps taken by the government amidst the current lockdown situation owing to the pandemic woes.

Body:
First explain the importance of agriculture to the country. Agriculture matters not just for food security, but also for the good of the large masses of this country, given almost 44% of the country’s labour force are engaged in agriculture. Highlight the issues pointed out by the author in the current proposed reforms by the government. Discuss the idea of shifting to the DBT methods in food and fertilizer subsidies; explain the advantages of switching to such methods.

Conclusion:
Conclude with way forward.

Introduction:
India has successfully conducted direct benefit transfer in case of LPG and now it wants to expand to fertilizer as well. So far DBT in fertilizers has been rolled out in 19 States and Union Territories and 12 States are expected to come on board. DBT in fertilizers is expected to expand its footprint in the entire country.

Body:

Benefits of Direct Benefit Transfer Scheme:

- Food:
  - Reduces the need for large physical movement of food grains,
  - Given the wide inter-State and intra-State variations in food consumption habits, the DBT provides “greater autonomy” to beneficiaries to choose their consumption basket and enhance dietary diversity, and
  - It reduces the leakage in the PDS system.

- Fertilizers:
  - DBT in fertilizer envisages transfer of subsidy to manufacturers upon authentication of purchase by farmers. This restricts diversion and brings about greater transparency, accountability and efficiency.
  - Given the complex nature of fertilizer subsidies, with multiple producers and varying cost structures, this was perhaps the best option to begin with.
- Quick subsidy payments on a daily basis is expected to end delays in companies receiving their dues from the government, besides leaving an electronic trail of every transaction with all relevant details.
- It will plug leakages and save huge amount of money to the exchequer.
- Sales of neem-coated Urea have already stopped illegal diversion of fertilizer for non-agriculture applications like in plywood and textile sectors or for milk adulteration.
- New system will completely put this practice to an end when companies will have to provide details of end users.
- Once the system functions fully, it will lead to better soil health management, balanced fertilization, and better productivity.
- Based on NITI Aayog findings:
  - 85% of farmers received transaction receipts and the grievance redress mechanism has improved and 79% retailers are satisfied. A majority of farmers (and retailers) prefer the DBT system.

**Demerits:**

- **Food subsidy:**
  - The inadequacy of transfers to maintain pre-DBT consumption levels,
  - Insufficiency of last-mile delivery mechanisms, and
  - Weak grievance redressal system.
- **Fertilizer subsidy:**
  - Introduction in the fertilizer sector seems a gigantic task as the beneficiaries and their entitlements are not clearly defined at this present.
  - Different inputs – urea, phosphatic and potassic fertilizers – have different rates of subsidies. Besides, it would be premature to accept that all the farmers would be able to buy their requirements of fertilizers at market rate and wait for 15 days or a month to get the subsidies.
  - A major concern is of some dealer attrition, which is probably on account of declining margins and reduced possibility of diversion or sale at a higher price.
  - Under DBT scheme, dealers will have to pay at least two to three times more. This will require greater deployment of working capital. If banks do not lend more, many of them will be forced to leave this business, This will in turn affect sales.

**Measures to Strengthen DBT**

- **Food Subsidy:**
  - States with lower literacy levels, higher portion of BPL populations and relatively high child malnutrition could first strengthen the existing PDS through Information and Communication Technologies-based in-kind transfers before embarking on ICT-based DBT cash transfers.
Selective implementation in a few districts that exhibit diverse food habits and market infrastructure may be undertaken by states which have fulfilled the pre-conditions and feedback from these districts can be used to extend this programme further.

To sum up, the PDS has been undergoing transformation and the state governments may have to be ready to adjust to the change to improve the efficiency of expenditure on providing food security to their people.

**Fertilizer Subsidy:**

- Subsidy should be linked to productivity which will remove fertilizer companies from the game.
- The momentum for these changes has to be created through robust policies.
- State Governments and Central Government need to work in tandem to encourage farmers for ecological farming. Particularly in western UP and Punjab, the farmers need to move away from wheat and rice because the ground water has depleted.
- Farmers have to be educated and taught to change their cropping pattern and move to multiple cropping.
- There is a need to improve the organic content of the soil through organic farming or compost.
- To secure long term fertilizer supplies from locations where energy prices are cheap, it might be worth encouraging Indian firms to locate plants in countries such as Iran following the example of the Fertilizer Ministry’s joint venture in Oman, which allowed India to import fertilizer at prices almost 50 per cent cheaper than the world price.
- Fertilizer is a good sector to pursue JAM because of a key similarity with the successful LPG experience: the centre controls the fertilizer supply chain.

**Conclusion:**

Thus, DBT will save domestic resource costs (DRCs) in production of urea in excess of ‘real’ demand as farmers would not over use urea. Pulses, for instance, being self-nitrogen fixing crops, do not require use of urea. At the same time, soil health will improve and productivity levels will augment considerably. Secondly, it will address the issue of ‘inequity’ as marginal farmers need more assistance compared to other farmers. Thirdly, the total bill on account of fertilizers subsidy can be contained, at least for next few years. It will be a ‘win-win’ situation if the Government walks the last mile in fully implementing DBT in case of fertilizers subsidy.

Discuss the aspects of moving away from a price-based support structure for the farm sector to direct income support for farm households. (250 words)

**Reference:** Financial Express

**Why the question:**

The article talks about the recent reforms that were brought out in the farm sector and the new changes that need to be made.

**Key Demand of the question:**

One must explain in detail the idea of the aspects of moving away from a price-based support structure for the farm sector to direct income support for farm households.

**Directive:**
**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:**
First explain the recent actions in terms of policies taken by the govt. to address the farm distress in the country.

**Body:**
Discuss the removal of restrictions under the Essential Commodities Act (ECA) and how it has helped the sector. This initiative should help attract private investment into agriculture, and help farmers of cereals, pulses, oilseeds, onion and potato, who were severely hampered so far. Explain first the need to address the severe hit to incomes of farmers and rural laborers and then explain that in addition to the package, we need certain reforms. It is perhaps time to consider moving away from a price-based support structure for the farm sector and towards direct income support for farm households.

Take hints from the article and suggest measures.

**Conclusion:**
Conclude with importance of such changes approach in the agrarian sector.

**Introduction:**
The impact of the COVID pandemic has hit almost all the countries. India, being an agrarian economy has been impacted to a great extent. The package of measures for agriculture announced by the finance minister, as part of the third tranche of the stimulus package on May 15 2020, is very encouraging. Many policy decisions that are long overdue have been taken. These would be positive steps for long-term growth of agriculture, if implemented well.

**Body:**

**Some of the recent policy decisions undertaken:**
- The removal of restrictions under the Essential Commodities Act (ECA) is, by far, the most important measure.
- This initiative should help attract private investment into agriculture, and help farmers of cereals, pulses, oilseeds, onion and potato, who were severely hampered so far.
- The enactment of a central law to allow interstate trade is also positive, but states’ concerns need to be addressed for it to succeed.
- The third-most important measure is the setting up of a Rs 1 lakh crore fund for improvement of farm-gate infrastructure for post-harvest operations.
- Farmers of perishable crops should benefit immensely from this. Inclusion of all fruits and vegetables in the Operation Greens scheme should also help this segment.
- Extension of Rs 2 lakh crore credit to farmers of PM-KISAN, fishermen and animal husbandry.
- Provision of Rs 30,000 crore of additional refinancing facility by NABARD.
- several measures for animal husbandry, fisheries, etc.

**Short-comings of the package:**
- However, despite these long-term measures, some of the more immediate concerns have been overlooked in the package.
- The most serious problem, at present, is the severe hit to incomes of farmers and rural labourers.
Although farmers are provided such payments under PM-KISAN, the quantum of assistance is inadequate to cover the loss of income in the current rabi season and for meeting the expenses for the upcoming kharif season.

This is particularly true for farmers of perishable crops such as fruits and vegetables.

Although the credit facility to PM-KISAN farmers may provide some relief, it will only cover the expenses for the next season and there will be some time lag before the guidelines are evolved.

The other important issue is of providing employment to the migrants returning to rural areas.

With the upcoming kharif season, this labour force could be gainfully employed in agricultural operations.

However, MGNREGA guidelines do not permit the labour to be employed on private lands.

Although the allocation for the MGNREGA has been increased by Rs 40,000 crore in the sixth tranche (on May 17) of the stimulus package, the guidelines have not been revised.

Most of the long-term measures announced in the stimulus package relate to the product and credit markets.

Sugar, pulses and cotton have some mechanisms in place, but have proven largely inadequate.

The deficiency payments system devised for oilseeds and pulses under PM-AASHA in 2018 has also not yielded the desired results.

Importance of Direct Transfers:

Technological innovations, along with price support measures and the supply of subsidized key inputs like irrigation, fertilizer, and electricity, have played an important role in the growth of Indian agriculture.

A policy shift from price to income support under the Direct Benefit Transfer (DBT) program is deemed better as it would incentivize farmers as money is transferred to their bank accounts and bring in much needed efficiency in input use.

Farmers, without undergoing the hassles of authentication, would be able to make independent decisions on the application of fertilizers.

Besides, DBT will help in reducing the transaction cost in the creation of digital infrastructure, the burden of retailers to maintain records, and errors that often appear in use of the Aadhaar card.

Such an income support measure would be financially sustainable in the long run, and also fully compatible with the WTO provision on domestic support.

To this end, direct payments to farmers and MGNREGA active job-card holders would be useful.

Direct income transfer is a better policy instrument to ensure a minimum income to farmers, compared to indirect instruments such as output price, which are mainly useful in resource allocation.

In case of fiscal constraints, covering even half or two-thirds of the cost could be considered.

Direct transfers also have the additional advantage of kick-starting the demand in rural areas immediately.

Way forward:

Land lease market reforms:

- Tenancy reforms need to be implemented immediately to enable easier land leasing.
- States must be actively encouraged to adopt the Model Agricultural Land Leasing Act 2016.
- This will allow small and marginal farmers to augment their landholdings through leasing, thereby reaping the advantages of scale.
• Public support to agriculture:
  ▪ For a long time, MSP cum procurement has been the main plank of our public support programmes.
  ▪ In the current as well as earlier food crises in 1975 and 2008, India’s buffer stock system served the country exceedingly well.
  ▪ Considering the usefulness of this system and the volatility of international grain markets (rice), the MSP-procurement system may need to be continued for staple foodgrains and extended to pulses.
  ▪ A different approach is needed for non-staple commodities, for which MSPs are announced with little or no procurement.

• Payment Assistance to farmers:
  ▪ Currently, a uniform assistance of Rs 6,000 per annum is made to a farm family, which is not adequate.
  ▪ The quantum of assistance should be linked to the cost of cultivation in the region.
  ▪ The payment should be delinked from marginal production (production in the current year), and only be based on average production of last three years.
  ▪ This will ensure a basic income to the farmer that is commensurate with costs but does not distort the market price.

• Convergence of programmes for better outcomes:
  ▪ There should be functional and financial convergence across the ministries of agriculture and rural development.
  ▪ The wage employment programmes (MGNREGA) and livelihoods programmes (NRLM) of the rural development ministry should be dovetailed with agriculture and related activities of the region, like irrigation, food processing, transportation, storage, etc.

• Infrastructure Development:
  ▪ Rural infrastructure such as rural roads, market yards, procurement centres, milk collection centres and dal mills can also be built by synergising the functions and resources of these ministries under their various flagship programmes.

Conclusion:
Complementary reforms in the factor markets are also needed to realise the full potential of the steps taken. These complementary reforms are not confined to agriculture alone, but cover the overall rural development strategy. A holistic approach integrating agricultural growth, farm and non-farm employment is urgently needed to stem the large-scale migration. The measures announced are in the right direction for the long-term growth of the agricultural sector, but can be more effective if supplemented with direct transfers in the short-term and with a few structural reforms in the long-term.
“India needs a ‘next generation’ right to food legislation to address failings in food security.” Examine the statement in the context of nutritional security in India. Also enumerate the measures taken by the government in this regard. (250 words)

Reference: The Hindu

Why the question:
The question talks about the significance and need of the right to food legislation to address failings in food security in the country.

Key Demand of the question:
Discuss in detail the reasons for failing food security in the country and in what way recognising the right food legislations can ensure greater food security in the country.

Directive:
Examine – When asked to ‘Examine’, we must 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.

Structure of the answer:
Introduction:
Briefly explain what you understand by nutritional security of the country.

Body:
First quote relevant facts about India’s current nutritional security aspects. Discuss the policies of the government in this direction, highlight why the policies don’t suffice the food security aspects of the country. Explain the importance and need for ‘next generation’ right to food legislation. List the existing policies in this direction and state what needs to be done.

Conclusion:
Conclude with way forward.

Introduction
The right to food is a well-established principle of international human rights law. It has evolved to include an obligation for state parties to respect, protect, and fulfil their citizens’ right to food security. Our current understanding of food security includes the four dimensions of access, availability, utilisation and stability.

As a state party to the Universal Declaration of Human Rights and the International Covenant on Economic, Social and Cultural Rights, India has the obligation to ensure the right to be free from hunger and the right to adequate food.

Body
Food and nutrition security in India
- India became a food grain surplus nation due to Green Revolution and increase in food production.
- This focus on access culminated in India in a 2001 case brought by the People’s Union for Civil Liberties, in which the Supreme Court evolved a right to food and read it into the right to life provisions of the Constitution.
- It, ultimately resulted in the 2013 National Food Security Act (NFSA), which has been lauded for guaranteeing a quantitative “right to food” to all Indians.
  - However, the NFSA suffers from serious lacunae in its drafting, which severely undermine its stated objective of giving legal form to the right to food in India.
• India, currently has the largest number of undernourished people in the world. Around 195 million.

• Nearly 47 million or 4 out of 10 children in India do not meet their full human potential because of chronic undernutrition or stunting.

• Agricultural productivity in India is extremely low.
  ▪ According to World Bank figures, cereal yield in India is estimated to be 2,992 kg per hectare as against 7,318.4 kg per hectare in North America.

• The composition of the food basket is increasingly shifting away from cereals to high-value agricultural commodities like fish, eggs, milk and meat. As incomes continue to rise, this trend will continue and the indirect demand for food from feed will grow rapidly in India.

India needs a next generation legislation entailing ‘Right to food’

The existing law does not comprehensively cover all aspects of food security. Experts have highlighted the gaps in the existing system.

• The NFSA surprisingly does not guarantee a universal right to food. Instead, it limits the right to food to those identified on the basis of certain criteria.

• It then goes on to further restrict the right to 75% of the Indian population.

• It also specifies that a claim under the Act would not be available in times of “war, flood, drought, fire, cyclone or earthquake” (notably, it is within the Central government’s remit to declare whether such an occasion has arisen).

• Given that a right to food becomes most valuable in exactly these circumstances, it is questionable whether the Act is effective in guaranteeing the right that it is meant to.

• Another problematic aspect of the NFSA is its embrace of certain objectives that are to be “progressively realised”.
  ▪ These provisions include agrarian reforms, public health and sanitation, and decentralised procurement, but they make no mention of the need to reconsider fundamental assumptions about our agricultural systems and look at food security in a more comprehensive manner.

• Finally, while the NFSA addresses issues of access, availability and, even tangentially, utilisation, it is largely silent on the issue of stability of food supplies — a startling omission given India’s vulnerability to climate change impacts, to name one impending threat to food security. Eg: Prices of food spike in November, as noted by Economic Survey 2019.

Measures taken by Government for nutrition and food security

• National Food Security Mission: It aims to increase production of rice, wheat, pulses, coarse cereals and commercial crops, through area expansion and productivity enhancement.
  ▪ It works toward restoring soil fertility and productivity at the individual farm level and enhancing farm level economy.
  ▪ It further aims to augment the availability of vegetable oils and to reduce the import of edible oils.
• **POSHAN Abhiyaan:** The Abhiyaan aims to reduce malnutrition in the country in a phased manner, through a life cycle approach, by adopting a synergised and result oriented approach.
  ▪ Target is to bring down stunting of the children in the age group of 0-6 years from 38.4% to 25% by the year 2022.
  ▪ The goals of POSHAN Abhiyaan are to achieve improvement in nutritional status of children from 0-6 years, adolescent girls, pregnant women and lactating mothers in a time bound manner during the three years with fixed targets as under:

• **Rashtra Krishi Vikas Yojana (RKVY):** It was initiated in 2007, and allowed states to choose their own agriculture and allied sector development activities as per the district/state agriculture plan.
  ▪ It was converted into a Centrally Sponsored Scheme in 2014-15 also with 100% central assistance.
  ▪ Rashtra Krishi Vikas Yojana (RKVY) has been named as Rashtra Krishi Vikas Yojana-Remunerative Approaches for Agriculture and Allied Sector Rejuvenation (RKVY-RAFTAAR) for three years i.e. from 2017-18 to 2019-20.
  ▪ **Objectives:** Making farming a remunerative economic activity through strengthening the farmer’s effort, risk mitigation and promoting agri-business entrepreneurship. Major focus is on pre & post-harvest infrastructure, besides promoting agri-entrepreneurship and innovations.

• Integrated Schemes on Oilseeds, Pulses, Palm oil and Maize (ISOPOM)

• **E-marketplace:** The government has created an electronic national agriculture market (eNAM) to connect all regulated wholesale produce markets through a pan-India trading portal.

• **Massive irrigation and soil and water harvesting programme** to increase the country’s gross irrigated area from 90 million hectares to 103 million hectares by 2017.

• The government has also taken significant steps to combat under- and malnutrition over the past two decades, through
  ▪ The introduction of **mid-day meals** at schools. It is a Centrally-Sponsored Scheme which covers all school children studying in Classes I-VIII of Government, Government-Aided Schools.
  ▪ **Anganwadi systems** to provide rations to pregnant and lactating mothers,
  ▪ **Subsidised grain** for those living below the poverty line through a public distribution system.
  ▪ Food fortification in salt. The same is to be made mandatory in rice flour, sugar among others.

**Way Forward**

• Thus, there is a need to frame a “third generation” food security law and recognise and mainstream issues including **increasing natural disasters and climate adaptation.**

• Such a framework would robustly address the challenges facing the country’s food security across all four dimensions and make a coordinated effort to resolve them instead of the piecemeal efforts that have characterised such attempts so far.
• Food security brings together diverse issues such as inequality, food diversity, indigenous rights and environmental justice.
• Given the current crises in India, it is time we prepare a third generation right to food legislation that recognises that a climate-as-usual scenario no longer exists.
• Such a legislation would ideally be rooted in the principle of a right to food security in its true spirit and not merely as a sound bite.
• Amidst the pandemic ravaging the nations supplies, it is even more imperative to ensure Right to Food.

Agriculture still forms the backbone of development in India. In this light, critically analyse how Genetically Modified Crops could help India and its farming community? (250 words)

Reference: Indian Express, downtoearth.org.in

Why this question:
In the current kharif season, farmers would undertake mass sowing of Genetically Modified (GM) seeds for maize, soyabean, mustard brinjal and herbicide tolerant (Ht) cotton, although these are not approved. Farmers had carried out a similar movement last year, too.

Key demand of the question:
The answer must weigh the pros and cons of GM crops and use of such technology in doubling farmer’s income. One must justify in what way using GM crops is more of a boon than bane.

Directive:
Critically analyze – When asked to analyze, 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. 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 judgement.

Structure of the answer:
Introduction:
Describe first the context of question.

Body:
The answer discussion should have the following aspects discussed in detail:
How do GM crops increase yield? How do GMOs benefit farmers? Can GMOs improve food security? What are the roles of GMO in agricultural industry? Explain if GM Crops Increase Farmer Profits and Environmental Sustainability? Quote facts and figures from various reports and form a balanced and fair opinion.

Conclusion:
Conclude with a way forward.

Introduction:
Genetic engineering aims to transcend the genus barrier by introducing an alien gene in the seeds to get the desired effects. The alien gene could be from a plant, an animal or even a soil bacterium. In most cases, the aim is to introduce a new trait to the plant which does not occur naturally in the species.

Last week, Shetkari Sanghatana announced fresh plans in its agitation for use of genetically modified seeds. In the current kharif season, farmers would undertake mass sowing of GM seeds for maize, soyabean, mustard brinjal and herbicide tolerant (Ht) cotton, although these are not approved. Farmers had carried out a similar movement last year, too.

Body:
Examples in food crops include resistance to certain pests, diseases, or environmental conditions, reduction of spoilage, or resistance to chemical treatments (e.g. resistance to a herbicide), or improving the nutrient profile of the crop. Examples in non-food crops include production of pharmaceutical agents, biofuels, and other industrially useful goods, as well as for bioremediation.

Advantages of GM Crops other than pest resistance:

- **Food Security:** Given the increased growth of global population and increased urbanisation, GM crops offer one of the promising solutions to meet the world’s food security needs.
- **Improved Stress Tolerance:** Genes that give greater tolerance of stress, such as drought, low temperatures or salt in the soil, can also be inserted into crops. This can extend their range and open up new areas for food production.
- **Faster Growth:** Crops can be altered to make them grow faster, so that they can be cultivated and harvested in areas with shorter growing seasons. This again can extend the range of a food crop into new areas or perhaps allow two harvests in areas where only one is currently practical.
- **More Nutritious Crops:** Plants and animals can be engineered to produce larger amounts of essential vitamins and minerals, such as iron, helping to solve nutrition problems in some parts of the world. They can also be altered to change the amounts of protein, carbohydrates, and saturated and unsaturated fats that they contain. This could lead to the production of foods designed specifically for a healthy diet for all consumers.
- **Production of Medicines and Vaccines by Crops:** It may be possible to have plants and animals produce useful medicines and even vaccines, so that prevention and treatment of human diseases in some places can be achieved cheaply and efficiently through the diet.
- **Resistance to Herbicides:** Crops can be modified to be resistant to specific herbicides, making it much easier to control troublesome weeds. Farmers can simply apply the weed killer to a crop field, killing the unwanted plants and leaving the food crop unaffected. For example, GM oilseed rapeseed – the source of canola oil – is resistant to one chemical that’s widely used to control weeds.
- **Better Tasting Foods:** Foods can be engineered to taste better, which could encourage people to eat healthier foods that are currently not popular because of their taste, such as broccoli and spinach. It may be possible to insert genes that produce more or different flavours as well.
- **Economic benefits:** GM crops can increase yield and thus income. Genetically modified foods have a longer shelf life. This improves how long they last and stay fresh during transportation and storage.

Concerns/Challenges associated with GM Crops:

- **Human Health Risks:**
  - Potential impact on human health including allergens and transfer of antibiotic resistance markers.
  - The impact of growing GM crops poses risks to human health as their resistance to antibiotics can turn medicines ineffective and may result in the formation of new toxins and allergens.
  - Toxins produced by GM crops can not only affect non-target organisms but also pose the danger of unintentionally introducing allergens and other anti-nutrition factors in foods.
- **Bio safety concerns:**
  - They can reduce species diversity.
• For example, Insect-resistant plants might harm insects that are not their intended target and thus result in destruction of that particular species.

• Cross-pollination in GM crops paves the way for herbicide-resistant super weeds that can further threaten the sustenance of other crops and pests because of its uncontrolled growth.

• GM technology could also allow the transfer of genes from one crop to another, creating “super weeds”, which will be immune to common control methods.

• Viral genes added to crops to confer resistance might be transferred to other viral pathogens, which can lead to new and more virulent virus strains.

• **Implications on Farmers and Consumers:**
  
  • Critics claim that *patent laws give developers* of the GM crops a *dangerous degree of control over the food supply*. The concern is over domination of world food production by a few companies.

  • *National Institute of Agricultural Economics and Policy Research’s* anticipation that Bt brinjal’s high yield and increased shelf life will benefit consumers and farmers owing to cut in retail price of brinjals ignores the scenario that companies might charge premium prices for Bt brinjal seeds, in which case farmers may not benefit at all.

• **Economic Concerns:**
  
  • Introduction of a GM crop to market is a *lengthy and costly process*. It has not resulted in high yields as promised.

  • For instance, the highest yields in mustard are from the five countries which do not grow GM mustard — U.K., France, Poland, Germany and Czech Republic — and not from the GM-growing U.S. or Canada.

• **Inefficient Regulatory system:**
  
  • Seeing the lapses in the regulatory system and irregularities in the assessment of Bt brinjal (in terms of labelling and unapproved and illegal sowing of GM crops) Parliamentary Standing Committee on Agriculture and the Committee on Science & Technology, Environment and Forests recommended:

  • A thorough probe by a team of eminent independent scientists and environmentalists for commercialization of GM crops.

  • Endorsed labelling GM foods to protect a consumer’s right to know.

• **Ethical Concerns:**
  
  • Violation of natural organisms’ intrinsic values by mixing among species.

  • There have also been objections to consuming animal genes in plants

**Way Forward:**
  
  • The government must take decisions on GM technologies on the basis of scientific evidence.

  • Need to start cultivating an environment of openness and transparency to allay genuine fears.

  • The government should adopt a participatory approach to bring together all stakeholders to develop regulatory protocols that restore trust in the process.
There is a significant uncertainty over their safety, so precautionary principle is that country shall wait till a broader scientific consensus is achieved.

- Need for better policy, pricing and to rationalize the input costs
- GEAC needs to be a transparent body. It should put it in the public domain that on what grounds it has approved GM mustard
- There has to be strong liability laws if there are any environmental hazards or if something goes wrong in future
- Agriculture is a state subject; therefore, it is important for the Centre to take into consideration the views of State Governments as well.

The Food and Agriculture Organization (FAO) has rightly pointed out in 2004, “Science cannot declare any technology completely risk free. Genetically engineered crops can reduce some environmental risks associated with conventional agriculture, but will also introduce new challenges that must be addressed”.

Conclusion:

Clearly, there can be no credible argument against scientific experiments in agriculture that advance the goal of developing plant varieties that can withstand drought, resist pests and raise yields to feed the growing world population. But this should be done through a transparent regulatory process that is free of ethical conflicts. All this underscores the need for a cautious approach — one that fosters scientific inquiry, allows for scrutiny and is underpinned by regulation. Enacting a comprehensive law that covers all aspects of GM crops should be a priority.

“Recent reforms for food security taken by the government have both positives and negatives and there is a need for more structural reforms to increase resilience of farmers”. Comment. (250 words)

Reference: The Hindu

Why the question:
COVID-19 forced government to announce various agrarian reforms. Thus the context of the question.

Key Demand of the question:
One has to analyse the recent food security and agrarian reforms taken by the government and their impact.

Directive:
Comment—here we have to express our knowledge and understanding of the issue and form an overall opinion thereupon.

Structure of the answer:

Introduction:
Discuss the dimensions of Agricultural crisis, food security and recent reforms. One can start by quoting relevant facts/statistics.

Body:
Discuss first the announced reforms – Amendments have been made to the Essential Commodities Act, 1955. The Finance Minister has urged States to dismantle the Agricultural Produce Market Committees. The Finance Minister has urged States to dismantle the Agricultural Produce Market Committees. Explain the need for such reforms, what has been the impact of the lockdown. Highlight the status of food security in India; explain the threats to food security in India. Provide for a detailed analysis of steps taken by government for food security

Conclusion:
Suggest what should be the way forward.

Introduction
The world observed World Hunger Day on May 28, 2020. India was ranked 102 out of 117 qualifying countries on the Global Hunger Index. Although agriculture accounts for around 17% of India’s GDP, nearly 50% of the country’s population depends on farm-based income.

**Body**

**Reforms taken by the government regarding agriculture and food security**

The recent fund allocation of **Rs 1 lakh crore** under the third tranche of **Atmanirbhar Bharat Abhiyan** underpins the importance of infrastructural development in the agriculture sector and allied activities, especially in local supply systems.

- **One nation one market reform**: The **Essential Commodities Act, 1955**, will be amended to de-regulate cereals, edible oils, oilseeds, pulses, onion, and potato.
  - Reforms in the **Agri-Marketing** are to be given serious concern to provide adequate choice to farmers for selling their produce at fair prices.
  - **APMC laws** will be amended, so that farmers will be **free to sell their produce anywhere**, even to private players directly.
  - This will encourage **more private mandis to be set up**, where farmers will get better price for their crops without being victim to cartelization.

- **Contract Farming**: Laws to bring in **Contract farming** can help establish forward and backward linkage for agriculture and realisation of better farm incomes. It will help with modern technology adoption as well.
  - The above three reforms will create all India market for farmers to sell their produce.

- **One Nation One Ration Card**: Government is also in process of implementing **One Nation One Ration Card** that will help the migrants immensely in accessing their benefits all over India and have food security during the time of crisis.

- **Agri-Infrastructure**: The agricultural cooperative societies, farmer producer organizations (FPOs), and start-ups will be given funds worth **₹1 lakh crores** to encourage farm-gate infrastructure.
  - This is to develop cold chain storage and other post-harvest management infrastructure at the farm gate and aggregation points.
  - Given that the lack of adequate cold-storage facilities continues to extract a high price on farmers and the agrarian economy by way of post-harvest losses, especially in perishables, the targeted outlay is a welcome step.

- **Hike in MSP**: The government has hiked the MSP of 14 kharif crops. This is on top of the last season MSP when kharif crops were given 1.5 times the production cost as minimum support price.

**Advantages of the reforms**

- Laws to bring in **Contract farming** can help establish **forward and backward linkage** for agriculture and realisation of better farm incomes. It will help with modern technology adoption as well.
Bee-keeping and fisheries (aquaculture and mariculture) will be given impetus to ensure alternate sources of income during non-agricultural season.

Infrastructure such as cold storage and Kisan Rail will help in preservation of perishables and maintain quality during transport.

While the concept of One Nation, One Ration Card has potential, people are concerned about immediate relief for the hungry.

Just as rabi crops were set to be harvested, unseasonal rain and hail arrived at the beginning of the year. Parts of the country reeled under a pernicious locust invasion. Looming loans could push farmers into a tailspin of poverty.

Shortcomings

- **Repackaging of existing schemes:** The third tranche of reforms for Agri-sector was replete with additions to existing schemes or reiterations of the government’s commitment to certain programmes.

- Political scientists pointed out that while the governance reforms of Essential commodities Act and agricultural marketing are good long-term measures, yet the much-spoken Jan Dhan, Aadhaar and Mobile trinity was not of much use to address the distress of the poor.

- **No immediate relief to farmers:** The missing item from the third tranche were measures which could provide immediate relief to farmers that have been hit hard by the curbs on movement and transport of goods.
  - There is no component of compensation in the package either.

- Agri-Economists like Ashok Gulati have criticised government for not raising the PM-KISAN money to 10,000 to aid farmers for the coming cropping season.

- **Law must not be repealed:** The Economic Survey 2020, had recommended jettisoning the “anachronistic” Essential commodities Act (ECA).
  - But the law has nonetheless remained a vital tool in the government’s armoury for protecting consumers from irrational volatility in the prices of essentials by tamping down on black marketeers and hoarders.

Structural Reforms needed for nutrition and resilience of farmers

- **Exempt from cess/tax:** Farmer produce should be exempted from any market fee and other cesses as they will not be using the services of the APMC market yards.

- E-NAM can flourish if grading and dispute settlement mechanisms are put in place.

- **Private mandis** with modern infrastructure need to be promoted in competition with APMCs.

- Another reform pertains to the possibility of another legislation to promote contract farming and linking it to futures commodity markets.

- **Public Distribution System:** On the PDS front, we need to move towards cash transfers that can be withdrawn from anywhere in the country.
• **Growth and prosperity**: Agriculture still engages India’s largest workforce, with nearly 48% population.
  - And it may be the only sector that registers a respectable growth this year as almost all other major sectors may plummet into negative territory.
  - This will help absorb the shock of the coronavirus on extreme poverty and malnutrition.
  - With majority migrant workers returning back to their native states, it is time to focus on “Doubling farm income” with even more vigour.

• **Better inter-state movement** of agricultural commodities will help in creating linkage between deficit and surplus states. Meanwhile it’ll help revive the supply chains and the ancillary activities in the process (transport, warehousing etc.)

• The Reserve Bank of India announced an extension of the moratorium on loan EMIs by three months. Steps must be taken that more farmers borrow from institution to reap the benefits.

**Conclusion**

The farm sector has been the worst hit and the same time also the most essential and crucial sector of the economy that needs handholding. Nations food security is of utmost importance, when India is reeling under hunger even with high food grain production. The recent reforms must ensure that hunger and malnutrition is tackled effectively, while farmer get better income for their produce with adequate handholding.

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

Critically examine the role that private sector investments can play in aggregating the prosperity of Indian Agriculture thus Doubling Farmers Income (DFI). (250 words)

*Reference*: [pib.gov.in](https://pib.gov.in)

*Why the question:* Union Minister of Agriculture & Farmers’ Welfare Sri Narendra Singh Tomar has emphasized on increasing private investment in the field of agriculture recently amidst the current testing times.

*Key Demand of the question:* In detail explain the role that private sector investment can play in aggregating the prosperity of Indian Agriculture thus Doubling Farmers Income (DFI).

*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:* In short, highlight the significance of Agriculture in general to the Indian economy. Indian Agriculture sector forms the backbone of Indian Economic growth with almost 16% of contribution to GDP growth every year.

*Body:*
Explain in what way it is the largest economic sector in India as it provides employment to almost half of Indian workforce. The main reason for increasing private investment in Indian agriculture sector is that it will increase prosperity of agriculture sector. Explain the needs of investment in the sector in detail, list the requirements and underlying reasons. Discuss what will be the positive consequences of increasing the private sector investments.

**Conclusion:**
Conclude that Agriculture Marketing has long been advocated as the silver weapon to deal with fractured Indian Agriculture sector and its time that sufficient investments are brought to fore and progress is made.

**Introduction**
There is often ambivalence about the private sector in agriculture. But successful agricultural growth and transformations are inconceivable without a dynamic private sector serving and driving agriculture, farming and agri-food value chains. The private sector plays decisive roles in India’s agricultural transformation today, fostering productivity improvements and creating jobs and value in supply chains “from farm to fork”.

**Body**

**Role of private sector investments in Agriculture**

- **Technological innovation:** Private agribusiness companies are at the forefront of heavy investment in agricultural R&D and technological innovation.
  
  - Eg: Trithi Robotics uses drone technology to allow farmers to monitor crops remotely.

- **Seed and high yield varieties:** Private sector innovations are dominant in plant genetics and seed (particularly hybrids and biotech traits).

- **Farm products:** They also lead in seed treatment, agricultural chemicals, biologicals, plant growth regulation, animal genetics and health, biofuels, machinery, irrigation, soil analysis and data-intensive precision farming tools.

- **Research:** Private agricultural research, in turn, has flourished over the years. As it is funded from sales proceeds, the research naturally focuses on market opportunities and farmers’ preferences.
  
  - Surveys sponsored by the Syngenta Foundation in 2011 showed that at that time **71 companies were active in research** and agricultural product development in India; 22 in seeds, 19 in agrochemicals, ten each in fertilizer solutions and mechanization (including irrigation), and ten in other endeavors, including agronomic research on specific crops.

- **Dairy sector:** The private sector’s milk processing capacity grew steadily since deregulation, and in 2012-2013 was **70 percent greater than that of cooperatives.**

- **Food processing sector:** Sales of the private processing sector and food services industry are growing rapidly. Performance and market shares of the formal food processing industry exceed those of the more traditional “unorganized”.
  
  - The food processing, wholesale and retail industry offers choice and convenience to consumers. In turn increases demand for quality farm produce, creating a symbiotiv relation.

  - It creates jobs, investment opportunities, **intra-industry linkages and opportunities to link farmers to markets.**
• **Supply chain**: The private sector is the main actor in the current transformation of food supply chains.
  - As a direct buyer and seller, the government accounts for seven percent of the national food economy (25 percent in grains).

**Impact on doubling Farmer’s income**

• **Increase in income**: Farmers captured substantial economic gains from yield increases in these settings and crops. This helped in investing for higher productivity, **mechanization of farms** among others.
• **Better inputs**: Private research has helped India increase exports of crops, technology, and agricultural inputs such as agrochemicals and machinery.
• **Higher productivity**: **Private sector R&D** has benefited not only the better-off but also poorer farmers.
  - This is evidenced, for example, by the spread of improved, **privately developed seeds to poor areas**, the **uptake of vegetable production** by many marginal farmers using proprietary seed, and the **creation of rural employment** that accompanies agricultural intensification.
• **Formalization and access to finance**: The progressive formalization of dairy value chains has also improved farmers’ **access to finance**.
  - Input suppliers, off-takers and financial institutions are willing to lend to farmers against the prospect of steady incomes and loan repayment capacity linked to milk sales.
• **Backward integration of farmers in food processing**: Both parties will benefit: farmers from steady sources of income and the scope for modernization and diversification of their operations, and processors from supplies of the right kinds and quality of raw material at the right time. This will increase in doubling farm income by 2022.
• **Additional employment opportunities**: Workers benefit from employment growth in labor-intensive food processing industries – particularly in low-wage locations in poorer and relatively more agricultural states.
  - This fosters poverty reduction and the agricultural transformation through non-farm jobs.

**Conclusion**
The private sector will continue to drive India’s agricultural transformation. To do its job well – creating value innovatively, 8 competitively and profitably – it needs implicit governmental guidance and enabling support. The government’s challenge is to supply this in the best possible way.

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

Analyse the big picture of India’s Strategic Oil Reserves and Energy Security. (250 words)

Reference: live mint

**Why the question:**
The question is straightforward and is about analyzing the current conditions of India’s Strategic Oil Reserves and Energy Security.
Key Demand of the question:
Present detailed analysis of India’s Strategic Oil Reserves and Energy Security.

Directive:
Analyze – 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:
India, the world’s third largest crude oil importer has an existing storage capacity of 5.3 million tonnes at Visakhapatnam, Mangaluru and Paadoor, built at an investment of $600 million in the first phase.

Body:
This is operational and can support 9.5 days of net imports. In addition, the government has approved the construction of an additional 6.5 million tonnes of strategic crude oil reserves. Strategic crude oil reserves, which are typically state-funded and meant to tackle emergency situations, allow a country to tide over short-term supply disruptions. The rout of crude oil to multi-year lows presents India with a great opportunity to fill up its storage and strategic petroleum reserves (SPRs). Storing oil now at low prices will enhance the country’s energy security, given its high import dependency.

Conclusion:
Conclude with importance.

Introduction:
Strategic petroleum reserves are essentially huge stockpiles of crude oil to keep the wheels of the country running in crunch situations. This is because the government has to stay prepared with emergency stores of crude oil to tide over severe supply shocks of this critical fuel. Many major global oil consumers such as the US, China and Japan have built massive strategic reserves of oil over the years, and India too embarked on the path in the last decade. Taking advantage of low crude prices due to the COVID-19 situation, India filled its strategic reserves to full capacity.

Body:
India’s Plan on strategic Petroleum reserves:

- **Indian Strategic Petroleum Reserves Ltd (ISPRL)**, has constructed three strategic petroleum reserves in huge underground rock caverns at **Visakhapatnam (1.33 MMT)** on the East Coast, and at **Mangaluru (1.5MMT) and Padur (2.5 MMT)** on the West Coast.
- ISPRL is a **wholly owned subsidiary of Oil Industry Development Board (OIDB) under the Ministry of Petroleum & Natural Gas**.
- These facilities, with total capacity of 5.33 million metric tonnes (MMT), can meet about 10 days of India’s crude oil requirements.
- The new facilities approved recently can provide additional supply for about 12 days.
- The government of India is planning to set up two more such caverns at **Chandikhole (Odisha) and Udupi (Karnataka)** as per phase II through Public-Private Partnership.
- This will give an additional 6.5 million metric tons of the oil reserves.
- Thus, a total of 22 days (10+12) of oil consumption will be made available by ISPR.
- Crude oil from underground rock caverns (considered safest for storage of Hydrocarbons) can be supplied to refineries through pipelines and ships.
- Indian refiners also maintain crude oil storage (industrial stock) of 65 days.
- Thus, a total of 87 days (22 by ISPL + 65 by Indian refiners) of oil consumption will be made available in India after completion of Phase II by ISPR. This will be very close to 90 days mandate by the IEA.

**Importance of strategic Petroleum reserve for India:**

- India still needs to import 83% crude oil of its requirement which increase import bill of India which further widens the Current Account Deficit (CAD) of the country.
The fluctuations in the price of the crude oil in the international market create an atmosphere of uncertainty in the country. India is the world’s third largest energy consumer after the US and China. The trouble is India produce very little oil of its own and are dependent on imports for more than 80 per cent of its needs. The chunk of this is from West Asia which is often in the midst some geopolitical face-off or the other. Added to this, there’s always the risk of supply disruption from natural disasters, war or other calamities. India has saved ₹5,000 crore in foreign exchange after it capitalized on the global low oil prices to fill its underground strategic oil storage to shore up insurance against any supply or price disruption. The current petroleum reserves of India are sufficient to fulfill just 13 days oil requirement of the country. But this is not sufficient to tackle any unpredicted event that occurs in the international crude market. So India wants to have petroleum reserves of 90 days. In order to ensure energy security for 90 days, India needs to build up additional petroleum reserves of 13.32 metric tons. Thus strategic petroleum reserves add much-needed heft to the country’s energy security.

Way forward:

As a summary, it can be said that construction of strategic petroleum reserves by India is a great way to secure country’s energy security. These reserves would act like piggy bank for India in the event of war like situation in the gulf countries or other oil importers of India. India wants to develop a transparent market for natural gas where the price is determined on an exchange. The aim is to increase the use of natural gas in India’s total energy mix from 6.5 percent to 15 percent between 2028 and 2030. India must safeguard its renewable energy sector and redouble its efforts to gasify its economy. These continue to be the best bets to power India into a more secure and green future. The present instability in the global oil market further underlines the need to move away from the energy sources of yesterday.

Provide for a detailed analysis of the One Sun One World One Grid project of India. (250 words)

Reference: Financial Express

Why the question:
The Ministry of New and Renewable Energy has issued a request for proposal for developing a long-term vision, implementation plan, road map, and institutional framework for its One Sun One World One Grid (OSOWOG) program. The question is straightforward and there isn’t much to deliberate, it aims to analyse in detail the “One Sun One World One Grid project of India”.

Key Demand of the question:
In detail provide for an analysis of One Sun One World One Grid project of India.

Directive:
Analyze – 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:
Explain what “One Sun One World One Grid project” is.

Body:
Explain in detail the vision of the project – With India at the center, the solar spectrum is divided into two broad zones, namely, Far East, which would include countries like Myanmar, Vietnam, Thailand and Cambodia. The far west would cover the West Asia and the African region. Through this initiative, India plans to build a global ecosystem of interconnected renewable energy resources that can be seamlessly shared for mutual benefits and global sustainability. Discuss the positives and negatives associated with the project. Highlight the possible challenges associated.

Conclusion:
Conclude with importance.

Introduction:
India has come up with a ‘One Sun One World One Grid’ (OSOWOG) initiative to set up a framework for facilitating global cooperation in this regard aiming at building a global ecosystem of interconnected renewable energy resources that can be seamlessly shared. Indian Prime Minister in October 2019, had floated the idea of cross-border solar connectivity. Recently, the Government of India has called for bids to roll-out the ‘One Sun One World One Grid’ (OSOWOG) plan.

Body:
‘One Sun One World One Grid’ (OSOWOG) plan:

- **Objective:** The Union Ministry of New and Renewable energy (MNRE), through this initiative, plans to build global consensus about sharing solar resources among more than 140 countries of West Asia and South East Asia.
- The vision behind the OSOWOG is ‘The Sun Never Sets’ and is a constant at some geographical location, globally, at any given point of time.
- At a later stage, the project envisages getting this grid interconnected with the African power pools.
- The idea is to utilize solar power when the sun is not shining in other parts of the world by building a common transmission system.
- It has been taken up under the technical assistance program of the World Bank.
- OSOWOG plan may also leverage the International Solar Alliance (ISA), co-founded by India

Potential:

- India would generate 40% of power from non-fossil fuels by 2030 and has called for connecting solar energy supply across borders giving the mantra of ‘One World One Sun One Grid’.
- The proposed integration would lead to reduced project costs, higher efficiencies and increased asset utilization for all the participating entities.
- This plan will require only incremental investment because it will not require a parallel grid infrastructure due to working with existing grids.
- It will help all the participating entities in attracting investments in renewable energy sources as well as utilizing skills, technology and finances.
- Resulting economic benefits would positively impact poverty alleviation and support in mitigating water, sanitation, food and other socio-economic challenges.
- It will allow national renewable energy management centers in India to grow as regional and global management centers.
- This move, during the time of the Covid-19 pandemic, gives India the opportunity to be seen as taking a lead in evolving global strategies.

Importance and Need for a OSOWOG plan for Globe:
The challenges of global warming and climate change is becoming serious and efforts need to be done by moving more towards cleaner fuels to resolve it.

Limiting the rise in global average temperature by 2°C as per the Paris Agreement and even further to 1.5°C require that the world should move towards fossil-fuel free economy by about 2040. This is a huge challenge and requires to act rigorously to achieve it.

India, Europe, United States etc are more or less covered with an integrated grid for power supply.

Integration of nations over the world with a common grid can be very helpful. This can help in generating, for example, solar energy in regions where it is largely available (like deserts of the world) to places where it is less available. For example, solar energy generated in Sahara Desert can be taken to Europe and reduce Europe’s dependence on gas.

Pitching International Solar Alliance to becoming a global body like United Nations is going to be a very important foreign policy tool for India (as its Headquarter is in Gurugram, India) apart from being helpful from environment, economy and energy points of views.

India has an installed capacity of 345GW in electricity sector with one National Grid. Solar energy is a fast developing industry in India and its capacity has reached 23 GW till June 2018. India has an ambitious target of achieving 100GW of solar capacity by

India has developed solar energy in large solar parks. But, the solar energy needs to be made available in lakhs of villages as well. This will be helpful for farmers to a large extent in increasing his productivity.

Government of India has worked on programmes like increasing use of LED bulbs in rural and urban areas both. Such initiatives need to be taken further to save both energy and climate.

A major challenge towards achieving solar energy all over India is storage technology (like using batteries). This will help in getting solar power in different areas and in non-peak times of solar energy. India needs to develop and get such technologies at present.

OSOWOG plan and South Asia:

India is already planning to connect more neighbouring countries through a regional power grid which can be used to supply electricity to surrounding nations without adequate number of power plants.

Apart from Bhutan, Nepal, Myanmar and Bangladesh, which already take power from India, there are plans to connect Sri Lanka with power transmission lines as well.

Draft procedural guidelines have been framed for firms to participate in cross-border electricity trade.

In November 2014, India, along with the other countries of the South Asian Association for Regional Cooperation, had signed an agreement to enable cross-border electricity trade among the member states on a voluntary basis.

Later in August 2018, the country also signed a memorandum of understanding for establishing grid interconnection between the members of the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (Bimstec).

OSOWOG and the world:

India is already expediting ISA’s plan to set up the World Solar Bank (WSB) with a capital of USD 10 billion.

WSB aims to compete with other newly created funding institutions like the Asian Infrastructure Investment Bank (AIIB) and the New Development Bank (NDB).
• OSOWOG will help to mitigate the ill effects on climate by providing clean and renewable energy sources, enabling member countries to fulfill their Nationally Determined Contributions (NDCs) towards reducing global warming.

• OSOWOG will provide a strategic rebalance in favour of India and will control the increasing Chinese dominance in Asian subcontinent, providing a better alternative to developing countries.

**Way forward:**

• The first and foremost action would be to develop storage technology. In this regard, both the government and the private sector need to make a substantial investment.

• Continents like Africa can be explored for ensuring the constant supply of rare earth minerals that are important for making batteries for energy storage.

• An alternative to storage like solar thermal can be explored.

• However, the most important work has to be done at the front of ISA. The team of 121 countries should come together and work as a facilitator instead of a cartel (OPEC).

• The move is the key to future renewable-based energy systems globally because regional and international interconnected green grids can enable sharing and balancing of renewable energy across international borders.

• It allows grabbing opportunities to learn quickly from global developments and share renewable energy resources to reduce the global carbon footprint and insulate the societies from pandemics.

Public disclosure of energy performance is not only needed to aid energy efficiency and climate target accounting but also to build public confidence in energy efficient technologies and strategies. Discuss. (250 words)

*Reference:*  downtoearth.org.in

**Why this question:**

Prime Minister after his recent review of the Indian power sector, advised the Union Ministry of Power to ensure that the Discoms (distribution companies) publish their performance parameters periodically so that the people know how their provider fares in comparison to the peers. It is anticipated that these performance disclosure requirements may be included in the proposed Electricity (Amendment) Bill 2020. This is a move in the right direction and can become more effective if extended to end-users of electricity as well.

**Key demand of the question:**

One must discuss in detail how India loses a considerable portion of the electricity it generates at the supply end much of the power ends up in the kitty of a privileged section of society that has been documented to waste it as well.

**Directive:**

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:**

In brief explain the scenario of lack of transparency in the power consumption in India. Further elaborate how power wastage leading to multiple issues like Discom losses, inequal access to power to various sections of society etc.

**Body:**

Explain in detail how Indian consumers are unaware of the energy consumption and this is leading to power inefficiency. Discuss the initiatives taken in India like BEE, EC Act etc and why it has failed in its
Introduction:

Many different governments have begun to require disclosure of building energy performance, in order to allow owners and prospective buyers to incorporate this information into their investment decisions. These policies, known as disclosure or information policies.

Prime Minister after his recent review of the Indian power sector, advised the Union Ministry of Power to ensure that the Discoms (distribution companies) publish their performance parameters periodically so that the people know how their provider fares in comparison to the peers.

Body:

Prospects of disclosure of energy performance:

- The first step to achieving a zero-carbon building goal is to measure the current energy efficiency for core segments of the city’s building stock, and understand the scope for improvement.
- Reporting and disclosure policies are vital to enable this, delivering valuable data to the city, and to building owners and managers.
- This allows cities to design better programmes to achieve zero-carbon buildings, and track progress.
- Over time, benchmarking builds and refines the city’s datasets on building energy efficiency, enabling more tailored policies to support a zero-carbon building goal.
- Benchmarking data also helps to promote market adoption of new building energy efficiency technologies, by providing evidence of the energy and cost savings they deliver.
- Challenges faced due to lack of disclosure of energy performance:
  - India loses a considerable portion of the electricity it generates at the supply end.
  - Transparency will help understand in nuanced detail and aid development of effective remedies and solutions.
  - But given the asymmetrical distribution, much of the power ends up in the kitty of a privileged section of society that has been documented to waste it as well.
  - A separate legislation was enacted in 2001 to address this wastage on the consumer end.
  - The Energy Conservation (EC) Act 2001 established the Bureau of Energy Efficiency (BEE) with the mandate of setting and enforcing energy consumption standards with periodic energy audits for major energy consumers (referred to as designated consumers in the EC Act).
  - Discoms and commercial establishments, along with various industries, are designated consumers.
  - a quick assessment of the implementation of the EC Act and Rules in the commercial building or establishments (only designated consumers whose performance by individual entities is in the public domain) paints a rather dull image.
  - BEE issues Energy Saving Certificates to most designated consumer entities to track and ensure compliance with the EC Act. +But for existing commercial buildings or establishments, BEE developed a star rating programme, in the same spirit as the star labeling for appliances.
  - It was launched in 2009 and was limited to daytime office typology and was to eventually extend to cover all commercial building typologies.

Measures needed:
Globally, legislations like the EC Act, that aim to track and improve energy performance of various consumers, have incorporated disclosure of energy performance as an integral part of their mandate.

These policies not only seek energy consumption information but an assortment of details regarding physical infrastructure, operation and management to establish peers, fair comparisons and realistic reduction targets.

Understanding the importance of energy performance data and behavioral gains to be made via peer-to-peer comparison, India Cool Air Action Plan prepared by the environment ministry has recommended disclosure of energy performance of commercial buildings.

And rating is an effective tool to make use of the standardized data collected through disclosure policies to understand the baseline performance of different consumers and setting up of energy performance targets.

BEE needs to revisit, revive, and expand its star rating system for all designated consumers, especially buildings. It can’t be kept voluntary and confidential.

Way forward:

- It is anticipated that these performance disclosure requirements may be included in the proposed Electricity (Amendment) Bill 2020.
- This is a move in the right direction and can become more effective if extended to end-users of electricity as well.
- Cities should consider partnering with utility providers for benchmarking. They can help to gather energy use data for specific segments of the city’s building stock.
- Cities can lead by example through the public disclosure of energy performance of all government-owned and managed buildings.
- For example, the Tokyo Metropolitan Government publicly discloses emissions from several thousand public buildings online.

Discuss the impacts of the COVID-19 crisis on global energy demand. (250 words)

Reference: Down to Earth

Why the question:
The question is straightforward and aims to discuss the impact of COVID-19 crisis on global energy demand.

Key Demand of the question:
Explain the impact of COVID-19 crisis on global energy demand in detail.

Directive:
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:
The article talks about the current global energy scenario – The US — one of the largest consumers of global energy from the 1950s till 2018 — is now emerging as a major energy supplier to the global energy market.

Body:
First, explain that the global economic slump that largely occurred in the past few months due to the novel coronavirus disease (COVID-19) pandemic is also putting a severe stress on the global energy structure. Explain the reasons for such an effect; Lockdown measures are driving a major shift towards low carbon sources of electricity including wind, solar photovoltaic, hydropower and
nuclear. However also explain the fact that lowdown in the conventional energy sector also provides an opportunity for growth of the renewable energy sector.

Conclusion:
Conclude with what should be the way ahead.

Introduction:

The International Energy Agency (IEA) has released a report detailing the impact of Covid-19 — which it has called a “once-in-a-century crisis” — on global energy demands and CO2 emissions. With lockdowns imposed in last few months in several countries, transportation such as road and air travel has been largely restricted, due to which global energy demands have plummeted. Further, since millions of people were confined to their homes, domestic electricity demand has elevated as commercial demand has fallen.

India has seen a reduction in its energy demands by over 30 per cent as a result of the nation-wide lockdown.

Body:

Findings of the report:

- Coal Demand:
  - It has been declined by 8% compared with the first quarter of 2019.
  - The reasons for such decline include, China – a coal-based economy – was the country hardest hit by Covid 19 in the first quarter and cheap gas and continued growth in renewables elsewhere challenged coal.
  - In advanced economies, coal demand will fall by 25 per cent in the US, 20 per cent in the European Union (EU) and 5-10 per cent in Korea and Japan.
  - In the coming months, the demand for coal will be impacted based on how its biggest consumers, such as China, recover from the crisis.

- Oil Demand:
  - It has declined by 5% in the first quarter, majorly due to curtailment in mobility and aviation, which account for nearly 60% of global oil demand.
  - The report also estimates that the global demand for oil could further drop by 9% on average in 2020, which will return oil consumption to 2012 levels.
  - Every month of a full lockdown impacts electricity demand by 20 per cent on average or 1.5 per cent on an annual basis.

- Gas Demand:
  - The impact of the pandemic on gas demand has been moderate, at around 2%, as gas-based economies were not strongly affected in the first quarter of 2020.

- Renewables Energy Resources Demand:
  - It is the only source that has registered a growth in demand, driven by larger installed capacity.
Further, the demand for renewables is expected to rise by 1% by 2020 because of low operating costs and preferential access for many power systems.

Electricity Demand:
- It has been declined by 20% during periods of full lockdown in several countries.
- However, the residential demand is outweighed by reductions in commercial and industrial operations.

Impacts:
Positive impacts:
- CO2 emissions:
  - Overall, the emissions decline in 2020 could be 8% lower than in 2019, which would be the lowest level of emissions since 2010.
  - It is also the largest level of emission reduction — six times larger than witnessed during the 2009 financial crisis, and twice as large as the combined total of all reductions witnessed since World War II.
  - In the first quarter of 2020, the decline in CO2 emissions is more than the fall in global energy demand.

Negative impacts:
- New energy facilities delayed or stopped:
  - Many companies across different sectors globally have ceased or decreased capital expenditures where possible, and the energy sector is no exception.
  - For example, Distribution System Operators (DSOs) are delaying most initiated projects, resulting in a substantial decrease in the procurement of goods and services. Non-critical investments have been suspended.
- Renewables Sector hit:
  - Covid-19 is having an especially negative impact on the renewables sector. One of the main problems relates to the delivery of equipment to power plants.
  - Since coronavirus has delayed deliveries from China, renewable energy companies are not able to comply with deadlines for equipment installation.
  - For instance, in India alone 3,000 MW of solar and wind energy projects face delays, due to the coronavirus lockdown.
- Default of payment:
  - In many countries (including all but two Contracting Parties of the Energy Community), customers have been advised by energy regulators and governments to delay the payment of utility bills.
  - Defaults on payments cause cascade effect and impact the whole sector.
- Discoms hit:
The waiving of interest and bans on disconnection will most likely increase costs for Distribution System Operators (DSOs) or Discoms.

Consequently, their revenues will be decreased and, if the crisis continues, their financial status will deteriorate.

It is inevitable that all this would negatively impact the cash flow and short-term liquidity of DSOs.

A lack of working capital to finance short-term liabilities for regular operation is expected within two to three months if the situation persists.

Affects clean energy transition:

As was rightly pointed by the International Energy Agency, the sharp decline of the oil market may put clean energy transitions at risk by reducing the impetus for energy efficiency policies.

Without measures by governments, cheaper energy always leads consumers to use it less efficiently.

It reduces the appeal of buying more efficient cars or retrofitting buildings to save energy.

Way forward:

- policymakers should keep the “green” agenda in mind.
- The long-standing goals of promoting solar and wind energy, shifting more baseload power to natural gas, and shutting the most-polluting coal-fired power plants should now be pushed.

Conclusion:

Covid-19 has drastically impacted the energy sector across the globe. The whole range of consequences for the energy sector is yet to be revealed and is difficult to predict, however it is already clear that demand for energy resources has dropped, prices have plummeted and non-payment of utility bills by end-consumers will have a detrimental effect along the supply chain (DSOs, TSOs, suppliers and producers). Notwithstanding, the “green” agenda should not slip away from the list of national policymakers’ and regulators’ priorities.

Discuss the effects of COVID-19 lockdown on the urban mobility. (250 words)

Reference: [Indian Express](https://indianexpress.com)

Why the question:

Even as policymakers and experts have come up with standard operating procedures for public transportation while combating COVID-19, it is not going to be an easy ride for passengers who grapple with social distancing and going contactless in a mode that is used to being crowded and infrequent. Thus the question.

Key Demand of the question:

One has to bring out the relevance and importance of public transit system and the challenges it is facing across the world amidst the Covid-19 lockdown.

Directive:

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:
In a few introductory lines explain what urban mobility is and why is it very important.

**Body:**
Public transport is the backbone of cities, providing an essential service to keep cities moving, particularly in times of pandemics. The key objective for public transport operators therefore has to be maintaining a minimum service. Discuss why urban mobility becomes challenging with the lockdown, explain the critical concerns involved. Present the case of India – Central to India’s lockdown to control the spread of COVID-19 was a complete shutdown of the transport system. Now, as the country emerges from the lockdown, a proper ramping up of the transport system is needed. This should not be done in haste, however. Account for suggestions that can be taken forward to ensure urban mobility in such tough times.

**Conclusion:**
Conclude that there is need to address the challenges in urban mobility and that can be achieved only through a well-researched, scientifically designed public transport policy.

**Introduction**
COVID-19 has had a disruptive impact on the way we live and move around, on cities and society as a whole. Cities need to steer ‘Mobility as a Service’ that can be accessed by commuters. Pedestrians, bicyclists, e-bikers, all must be accommodated alongside public transit.

Commute is a huge part of urban sustenance and living without which India cannot hope for revival of economic growth back to the same trajectory.

**Body**
Covid-19 disease’ primary mechanism of contagion is contact and proximity. The very key factor that led to the success of cities — people congregating in close proximity to one another for social and economic benefits — is now emerging as an unexpected source of serious health risk.

**Effects of covid-19 lockdown on urban mobility**
The urban transportation landscape is likely to undergo significant changes due to the ongoing COVID-19 crisis. Increased risks associated with crowded places combined with social distancing measures in public and shared transport are likely to affect modal choices of commuters.

- Fearing crowd infections, commuters prefer travelling in private modes like two-wheelers.
  - **Cities like Delhi,** that resumed services nearly four weeks ago, **observed less ridership** than the allowed **20 passengers per bus,** despite the limited frequencies on many routes.
  - Although bus crowding is seen in some cities such as Mumbai, it is temporary and due to a lack of alternatives.
- **Congestion due to Increasing use of personal vehicles:** Already, **in parts of China,** car-use in the still recovering economy has surpassed pre-Covid levels as commuters **shun public transit to maintain social-distancing.**
  - They appear willing to accept traffic congestion and longer travel times in the process.
  - **The collapse of oil prices has only served to increase the appeal of personal car-use.**
  - If this reverse migration away from public transit to personal cars continues, cities will become unliveable due to congestion and unhealthy air.
• **Automobile sector:** The most immediate and visible effect of COVID-19 in the traditional automotive sector is the **standstill of many OEM and supplier factories**, which will likely produce 7.5 million fewer vehicles in 2020.

• **Public Operators cash strapped:** Public-transit ridership has fallen 70 to 90 percent in major cities across the world, and the operators are burdened with uncertainty and the potential need to implement and control strict hygiene protocols—such as compulsory face masks and health checks for passengers, or restricting the number of riders in trains and stations to comply with space requirements.

• **Local taxis and car-pooling:** Ride hailers have also experienced declines of up to 60 to 70 percent, and many micro mobility and carpooling players have suspended their services.
  - **Eg:** Ola, Uber had to stop pool rides after lockdown resumption. Many migrant drivers had not returned back to cities while also suffering loss of income.

**Steps to be taken to ensure safe mobility**

• **Safety Protocols:** Social Distancing, wearing mask and thermal screening must become compulsory in all public transport systems.
  - The Delhi Metro Rail Corporation has released guidelines to tackle several social distancing and sanitisation concerns, and to address the possibility of viral **transmission through tokens, push buttons on lifts, and handrails at the station elevators.**
  - Other metro rail systems are also expected to follow similar guidelines.

• **Non-motorised transport should be encouraged and touchless and cashless technologies should be adopted to curb COVID-19 transmission on public transit networks,** according to a Ministry of Housing and Urban Affairs (MoHUA) advisory on public transport for States, cities and Metro rail companies.
  - **Eg:** To reduce human interface, cashless systems like BHIM, PhonePe should be used as well as the **National Common Mobility Card** should be quickly rolled out.
  - **Fastag** will prove to be visionary in this regard.
  - Promotion of non-motorised transport is essential to prevent an increase in the use of private vehicles.
  - **Improved cycling and walking infrastructure** combined with increased public awareness are required to achieve sustainable urban mobility.

• **Infrastructure:** Investments in public transport and non-motorised transport will have to be prioritized over infrastructure for private vehicles. **Eg:** Dedicated bi-cycle lanes around the city

• Focus on demand moderation efforts like work from home and staggered working hours should be adopted.

• The first is to employ staff to **wipe the handgrips at frequent intervals,** constantly moving from end to end in the train.
  - Any handgrips in buses also need to be cleaned often.
- Another is to give wet sanitising wipes to every traveller entering a metro rail coach with a suggestion to have it in their palms before touching or gripping anything.

- Wipe disposal bins will be needed in the coaches.

- **Maintaining hygiene**: Offering contact-less wash basins with soap dispensers at the platform level could be effective. Signs on hand hygiene vis-a-vis touching surfaces are needed.

**Conclusion**

As in the rest of the world, the post-recovery period in India too is likely to see a rise in home-based work and schooling, walking, cycling and the use of public transport. More so because of India’s high-density urban agglomerations and its vast numbers of low- and middle-income urban families for whom public transport often provides a lifeline. This is a good time to build upon the lessons of this crisis and rethink the new normal.

“Establishing a global solar grid is a novel idea, especially in context of climate change. However, underlying issues in its implementation needs to be addressed first”. Give your opinion in this context. (250 words)

Reference: *Financial Express*

**Why the question:**

In recent years, India has leveraged forums like the G20 and the UNFCCC to collaborate with major powers in new areas of growth and in bringing about global reforms. One such initiative is One Sun One World One Grid’ (OSOWOG). Thus the context of the question

**Key Demand of the question:**

One has to discuss the idea of global solar grid and in what way it is a novel idea. Also discuss the associated issues and need to recognize and resolve them.

**Directive:**

Give your opinion – Weigh up to what extent something is true. Persuade the reader of your argument by citing relevant research but also remember to point out any flaws and counter-arguments as well. Conclude by stating clearly how far you are in agreement with the original proposition.

**Structure of the answer:**

**Introduction:**

One can start by explaining the OSOWOG vision, where in India seeks to replicate its global solar leadership (International Solar Alliance) by encouraging the phased development of a single globally connected solar electricity grid to leverage the multiple benefits (Low cost, Zero pollution) of solar energy.

**Body:**

Firstly, explain why it seems to be a brilliant idea in pursuit of sustainable development. However, it faces certain challenges in its implementation.

Discuss the novelty of the idea to Indian economy and other aspects; parity with other countries, self-reliance in energy sector, Climate Mitigation etc.

Discuss what the hurdles are or challenges are – Problem with Interconnectedness, Dependency on China and so on.

**Conclusion:**

Conclude that establishing a global solar grid is a novel idea, especially in context of climate change. However, underlying issues in its implementation needs to be addressed first. Apart from it, India can explore the possibility of establishing a federation of regional grids like SAARC grid.

Introduction:
India has come up with a ‘One Sun One World One Grid’ (OSOWOG) initiative to set up a framework for facilitating global cooperation in this regard aiming at building a global ecosystem of interconnected renewable energy resources that can be seamlessly shared. Indian Prime Minister in October 2019, had floated the idea of cross-border solar connectivity. Recently, the Government of India has called for bids to roll-out the ‘One Sun One World One Grid’ (OSOWOG) plan.

Body:

‘One Sun One World One Grid’ (OSOWOG) plan:

- **Objective:** The Union Ministry of New and Renewable energy (MNRE), through this initiative, plans to build global consensus about sharing solar resources among more than 140 countries of West Asia and South East Asia.
- The vision behind the OSOWOG is *The Sun Never Sets* and is a constant at some geographical location, globally, at any given point of time.
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Potential:

- India would generate 40% of power from non-fossil fuels by 2030 and has called for connecting solar energy supply across borders giving the mantra of ‘One World One Sun One Grid’.
- The proposed integration would lead to reduced project costs, higher efficiencies and increased asset utilization for all the participating entities.
- This plan will require only incremental investment because it will not require a parallel grid infrastructure due to working with existing grids.
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Importance and Need for a OSOWOG plan for Globe:

- The challenges of global warming and climate change is becoming serious and efforts need to be done by moving more towards cleaner fuels to resolve it.
• Limiting the rise in global average temperature by 2OC as per the Paris Agreement and even further to 1.5OC require that the world should move towards fossil-fuel free economy by about 2040. This is a huge challenge and requires to act rigorously to achieve it.

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• Integration of nations over the world with a common grid can be very helpful. This can help in generating, for example, solar energy in regions where it is largely available (like deserts of the world) to places where it is less available. For example, solar energy generated in Sahara Desert can be taken to Europe and reduce Europe’s dependence on gas.

• Pitching International Solar Alliance to becoming a global body like United Nations is going to be a very important foreign policy tool for India (as its Headquarter is in Gurugram, India) apart from being helpful from environment, economy and energy points of views.

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• WSB aims to compete with other newly created funding institutions like the Asian Infrastructure Investment Bank (AIIB) and the New Development Bank (NDB).

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• OSOWOG will provide a strategic rebalance in favour of India and will control the increasing Chinese dominance in Asian subcontinent, providing a better alternative to developing countries.

Way forward:

• The first and foremost action would be to develop storage technology. In this regard, both the government and the private sector need to make a substantial investment.

• Continents like Africa can be explored for ensuring the constant supply of rare earth minerals that are important for making batteries for energy storage.

• An alternative to storage like solar thermal can be explored.

• However, the most important work has to be done at the front of ISA. The team of 121 countries should come together and work as a facilitator instead of a cartel (OPEC).

• The move is the key to future renewable-based energy systems globally because regional and international interconnected green grids can enable sharing and balancing of renewable energy across international borders.

• It allows grabbing opportunities to learn quickly from global developments and share renewable energy resources to reduce the global carbon footprint and insulate the societies from pandemics.

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.

“SpaceX Crew Dragon capsule successfully docking into the International Space Station marks a new era in the space exploration”, comment and explain what does it signal for the future of space exploration? (250 words)

Reference: Indian Express

Why this question:
SpaceX’s Crew Dragon has landed two NASA astronauts at the International Space Station, marking the first human spaceflight with private collaboration. Thus the question.

Key demand of the question:
One has to elaborate in what way the SpaceX Crew Dragon capsule experiment has marked a new era in the space exploration and also explain what it signals for the future of space exploration.

Directive:
Comment— here we have to express our knowledge and understanding of the issue and form an overall opinion thereupon.

Structure of the answer:

Introduction:
Discuss the context; highlight the achievement made by SpaceX Crew Dragon capsule.

Body:

Explain in what way SpaceX flight is a culmination of more than decade-long efforts to free to enable private players build and operate what essentially is a commercial taxi-service to space, and allow NASA to concentrate on deep space exploration, and work more vigorously towards taking humans to moon, and Mars, and, possibly, on some asteroid, in between. Discuss the significance of private players in the space exploration and in what way it has led to new era of space exploration.

Conclusion:
Conclude with its significance.

Introduction:

SpaceX’s Crew Dragon has landed two NASA astronauts at the International Space Station, marking the first human spaceflight with private collaboration. SpaceX became the first private company to launch human spaceflight into orbit, a feat achieved by the US, Russia & China.

Body:

Importance of the mission:

- It was the first time that astronauts used a spaceship built and launched by a private company, and the event is being widely seen as the beginning of a new era in space exploration.
- Two NASA astronauts flew onboard a spaceship named Crew Dragon built by SpaceX.
- The rocket, named Falcon 9, which carried the spaceship into the orbit, was also built by SpaceX.
- The Florida launch facility used for the flight shall belonged to NASA, however, and had previously been used to launch American spaceships including the Apollo missions that took human beings to moon.
- The mission was called Demo-2, in keeping with the fact that it was shall only a ‘test flight’, which if successful, would lead to more missions in the coming months.
Implications of private participation in the Space industry:

For USA:

- **End of Russian Monopoly**: Over the last nine years, there have been some 40 successful launches of Russian Soyuz spacecraft with US astronauts on board. But, now the Moscow’s monopoly on crew transport has ended.

- **Boost to USA**: President Donald Trump has pledged that US astronauts will return to the moon in 2024 to stay, and make a launch base for Mars.

- **Speeds up Mars Mission**: The US has also stated that it would put the first woman on the moon, and the first astronauts on Mars. It will also allow NASA to concentrate on deep space exploration.

- **Possible Space Race**: Trump’s competitive America-first rhetoric is of Cold War vintage, when winning the space race was a matter of superpower prestige

- **Era of PPP**: An era of public-private partnerships in space is beginning, where the sector will also be driven by profits rather than mere National prestige.

- **National Cooperation**: The biggest achievement of the ISS program could be lost: the “invaluable experience of cooperation.” A return to nations going it alone in outer space would be a step backward for international collaboration

- **Cost reduction**: The entry of private sector has begun to drive down the cost-per-launch through innovations such as reusable rockets. For a trip to the ISS and back Roscosmos had increased its fees from $21 million to nearly $90 million in 2020

For India:
- While there are many private companies operating in the space sector in the United States, their contribution is not much significant in India.
- Most of them collaborate with the **Indian Space Research Organisation (ISRO)**, in building and fabricating the components that go into making rockets and satellites.
- However, launch services, including the building of rockets or launch vehicles are still a monopoly of government space agency, i.e. ISRO.

**In General:**
- **Space tourism** is one among several opportunities that Indian businesses may be keen to explore. A policy framework to enable private participation in this sector, of course, would have to be formulated by the government.
- **Small satellite revolution** is underway, globally, 17,000 small satellites are expected to be launched between 2020 and 2030. A strong private sector in space will help India to tap into this lucrative commercial space launch market.
- **Competitive Space Market:** Rapid mass commercial aviation at the edge of space would probably be the most lucrative segment in the future. Singapore, China, New Zealand, India are also encouraging the private partnership in Space industry.

**Way forward:**
- The landing by the SpaceX flight underlines the fact that space research and exploration is now a much more collaborative enterprise than earlier.
- There is also a growing realization that space agencies need to direct their energies and resources more towards scientific research and deep space exploration.
- It’s been fifty years since the landing on the moon and efforts to take human beings to Mars and other celestial bodies, needs to be expedited.
- Getting back to the Moon would also require huge amounts of financial resources that most of the space agencies and private players are expected to infuse fresh investments and also technological innovation that will benefit everyone.

**Critically analyse the reasons for dismal performance of science personnel in the country despite having scientific institutions in all fields of science. (250 words)**

**Reference:** [dst.gov.in](https://dst.gov.in)

**Introduction:**
Science, technology and innovation have instrumental and intrinsic value for society. They are key drivers of economic performance and social well-being. India has a very deep scientific knowledge base and infrastructure across the country in various institutions and R&D labs. We are number three in the world in number of scientific and engineering publications, and also at number three in many cutting edge fields like nanosciences and materials science. We shouldn’t underestimate the brilliance of our scientific human resources, who are among the best in the world.

**Body:**
In the past few decades India has taken major strides in science and technology since its independence and is today recognized for its achievements in many fields ranging from agriculture, textiles, health-care, and pharmaceuticals to info-tech, space technology, defence technologies and nuclear technology. However, when one compares India’s techno-economic performance with some
of the advanced countries or even other fast progressing developing countries, one finds that there is much to be desired.

**Reasons for dismal performance of science personnel in India:**

- **Administrative challenges:**
  - The system is also largely run by scientists-turned-bureaucrats and “nepotism, patronage culture” are prevalent.
  - Notably, Indian scientists perceive success as ‘becoming an administrative head in research institutions’, rather than advancing research.
  - Also, the prevalent incompetence across the spectrum has taken a toll on ‘peer reviewing’ where incompetent scientists get to reinforce their mediocrity.

- **Financial challenges:**
  - Research expenditure has remained at 0.6–0.7% of GDP over the past two decades. This is well below other countries such as US (2.8), China (2.1), Israel (4.3) and Korea (4.2). Yet it has tripled in nominal terms and doubled in real terms since 2004-05 to 2016-17.
  - Central government undertakes almost entire R&D expenditure with limited State government spending
  - There is a disconnect between the teaching and research enterprise with research being concentrated in specialized research institutes under different government departments limiting universities to largely play a teaching role
  - Currently, it has been observed that, small elite research institutions get most of the grants, while universities get very less research funds.
  - Consequently, universities focus mainly on teaching, which has resulted in a clear segregation of education & research – thereby affecting both.
  - Due to funding constraints, almost all the significant work from India is in the theoretical domain, as these are less burdened by money requirements.
  - Poor performance in experimental sciences is attributed mainly to the lack of significant collaborative efforts and sustained long-term funding.

- **Hierarchy:**
  - There is a culture of elitism in our labs, were the manual work is done by lab assistants and scientists mostly just command orders.
  - Also, rather than contributing to social debates, Indian scientists shun public commentary, unless it is to serve as government spokespersons.

- **Lack of private participation:**
  - At present, a large section of the country’s public research is concentrated in national research centres such as the S. N. Bose Center, the Raman Research Institute and organizations such as the Indian Association for the Cultivation of Science.
• India still only contributes less than three per cent of the global research output and half of its peer-reviewed publications come from just 40 Indian institutions.

• In comparison, research at universities has been neglected.

• **Publications:**
  • India’s share in global publications increased from 3.1% (2009) to 4.5% (2014).
  • Though the quality of publications (as measured by highly cited articles) has increased over the years but it still lags behind China and US

• **Patents:**
  • According to WIPO, India is the seventh largest patent filing office in the world. However, India produces fewer patents per capita.
  • India’s patent applications and grants have grown rapidly abroad, however the same is not true at home.
  • Since joining the international patent regime in 2005, while residential applications have increased substantially; the number of patents granted fell sharply post 2008 and has remained low

• **Gender disparity:**
  • According to the 2018 UNESCO Institute for Statistics’ report on women in science, 44% of bachelor students and 41% of doctoral students in India are female.
  • Women face “double burden syndrome” -a culture where both men and women feel the family and household duties are primarily the woman’s responsibility.
  • According to a recent survey on Women in STEM, 81 per cent women in India perceive gender bias in performance evaluations.
  • While more women are enrolling in university, relatively few pursue careers in research.

• **Poor industry-academia collaboration:**
  • The point we often miss is that there are two distinct systems that need to seamlessly collaborate to make this possible – systems that generate knowledge (academia, R&D labs) and systems that consume knowledge (industry, startups).
  • The knowledge generated needs a push, which combined with an equally effective pull of the knowledge consuming system, allows societal and commercial translation of knowledge.

**Way forward:**

• **Invest in Excellence:**
  • In order to emerge as a global superpower, India needs to focus on a few key elements, the first among them being ‘right’ investment in research. It is often argued that low public and private investment in research is a major impediment. However, this is only partially true. We need to invest in ‘excellence’.
Rather than having too many researchers, we need to spend to possess a larger number of high productivity researchers. Our proportion of high productivity researchers is currently at 14%

We need to have high ‘quality’ of researchers – high quantity of high-quality researchers. This is the first and the most immediate need.

**Liberalise processes with speed and merit:**

- It’s time we liberalise our science ecosystem as well. We can do so by providing greater autonomy to our institutions and making the processes for funding and equipment-purchase more efficient.

- For instance, experimentalists in fields like neuroscience need equipment such as a MRI machine, components to build a prosthetic arm and various electronic components. In the US, a doctoral student can order $5000 worth of material with just a simple email approval from her adviser, for shipment overnight.

- We need to similarly simplify processes in India while having audit mechanisms for financial control and propriety.

**Enabling our researchers:**

- Our researchers cannot give their full attention to research. We need sufficient technical and administrative staff to assist them.

- Our faculty should spend their time on thinking about original research questions and their breakthrough solutions, rather than just maintaining equipment, calibrating them and doing paperwork.

- Institutions like MIT, Stanford and UC, Berkeley, provide tremendous support to their faculty in this regard.

**Increased emphasis on Industry-academia interaction:**

- As in many knowledge based economies, industries should create a strong pull factor for knowledge, for example, by attracting the bright young minds and creating knowledge based culture which can interface strongly with academia, labs and startups to translate research into scalable technological solutions.

- Government through its policies and direct support, creates an enabling environment for R&D, innovation and its connections to industry.

- Our education and academic research should also bring the elements of innovation, relevance and critical independent thinking to produce the best of scientists.

- The private sector should be incentivised to undertake and support R&D through CSR (Corporate Social Responsibility) funds.

**Leveraging the potential:**

- 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.
- Having a young population and a strong Diaspora that is more affluent than any other country, India has the potential pioneering high-tech innovation.

**Conclusion:**

India has the resources, talent and opportunity. All it needs to do is nurture them all. We need a movement, a science satyagraha, to make India a formidable knowledge creator again. The government, the policymakers and our public institutions need to work in tandem toward making India a scientific superpower.

**What is meant by Industry 4.0? What will be the impact of it post Covid – 19? Elucidate.**

**Reference:** Yojana June 2020 edition

**Why the question:**

Industry 4.0 is signaling a change in the traditional manufacturing landscape. Thus the question.

**Key Demand of the question:**

Explain the concept of Industry 4.0 and discuss its impact post COVID-19.

**Directive:**

Elucidate – 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 with relevant associated facts.

**Structure of the answer:**

**Introduction:**

Industry 4.0 encompasses three technological trends driving this transformation connectivity, intelligence and flexible automation.

**Body:**

Industry 4.0 describes the growing trend towards automation and data exchange in technology and processes within the manufacturing industry, including: The Internet of Things (IoT), The Industrial Internet of Things (IIoT), Cyber-physical Systems (CPS), Smart Manufacturing, Smart Factories, Cloud Computing, Additive Manufacturing, Big Data, Robotics, Cognitive Computing, Artificial Intelligence & Blockchain etc.

Discuss then briefly the evolution of Industrial evolution.

Then move onto explain what will be the possible impact of Industry 4.0 post Covid – 19? Present both positives and negatives.

**Conclusion:**

Conclude that Many manufacturers are increasing efforts to equip their human workers with digital connected-worker tools that incorporate safety checks into workflows, ensure collaboration with colleagues when physical contact is off the cards, and other such processes that ultimately balance business continuity and employee health, Manufacturers who understand and act on this new normal will have ample opportunities for growth in this era of Industry 4.0.

**Introduction:**

The **Fourth Industrial Revolution (IR 4.0)** is a term that describes present technological age. It is the fourth industrial era since the inception of the initial Industrial Revolution of the 18th century. The key elements of the fourth revolution are the fusion of technologies ranging from the physical, digital to biological spheres. Prime Minister gave an institutional shape to the expression by launching the **Centre for Fourth Industrial Revolution in India.**

**Body:**
As described by the founder and executive chairman of World Economic Forum, Klaus Schwab, “the fourth industrial revolution is a technological revolution that will fundamentally alter the way we live, work and relate to one another”.

**Characteristics of IR 4.0:**

- It is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres.
- It brings together digital technology and the physical world to create a new range of products and services.
- The possibilities of billions of people connected by mobile devices, with unprecedented processing power, storage capacity, and access to knowledge, are unlimited.
- And these possibilities will be multiplied by emerging technology breakthroughs in fields such as artificial intelligence, robotics, the Internet of Things, autonomous vehicles, 3-D printing, nanotechnology, biotechnology, materials science, energy storage, and quantum computing.
- The revolution is evolving at an exponential rather than a linear pace and it is disrupting almost every industry in every country.

**Impact of IR4.0 in the post Covid situation:**

- Industry 4.0 is not only as relevant as it was before the global COVID19 emergency; it is actually far more relevant moving forward.
- The impact of the COVID-19 pandemic has demonstrated the value of IT and digital transformation across industries and businesses and they must utilize this time to speed up the transition.
- COVID-19 is causing radical shifts in workflow across the globe as millions practice social distancing and comply with self-quarantine recommendations.
- The pandemic’s dramatic appearance has accelerated numerous trends while slowing others. Although businesses have had reason to embrace digital workflows in the past, COVID-19 has provided another strong incentive to move towards a smart factory, complete with smart manufacturing or smart printing processes.
- While conventional wisdom says that a dedicated office space is required to maximise productivity but this theory is being put to the ultimate test during COVID-19.
The integration of digital infrastructure to streamline public health to respond to the COVID-19 pandemic is very crucial in the context of epidemic forecasting and decision-making, one such example in India is the Aarogya Setu app by Government of India.

The fastest scalable solution to India’s COVID-19 challenge was to employ digital technology for diagnosis and for contact tracing. For instance, the Aarogya Setu app can also be tapped for providing telemedicine, especially in remote parts, during this moment of crisis.

This digital infrastructure implementation increasingly fuels the digital transformation initiatives within an organisation as well.

In the present situation, we are seeing major occurrences worldwide, including soaring adoption of online services, an enormous requirement for internet services, and enhanced connectivity among industries, regardless of their sizes.

It has been demonstrated in the enhanced corporate ability of long-distance collaborative work, wide recognition of the value of digital transformation and information technology among all employees, and the ability to market online and business development.

Manufacturers who understand and act on this new normal will have ample opportunities for growth in this era of Industry 4.0.

Many manufacturers are increasing efforts to equip their human workers with digital connected-worker tools that incorporate safety checks into workflows, ensure collaboration with colleagues when physical contact is off the cards, and other such processes that ultimately balance business continuity and employee health.

**Way forward:**

- Governments, businesses and civil society organisations should put together an ecosystem for massive upskilling of the workforce.
- India needs to prepare itself for a period of information and digital abundance, adapt itself to the scorching pace of innovation and learn to collaborate on scale, quickly transform the idea into a breakthrough innovation, shift from a system of time-bound education to a mode of continuous learning and create more employment opportunities than what new and disruptive technologies take away.
- There is a need for good quality education to make India’s youth a productive asset.
- Access to finance commensurate with maturity of the business model and beginning stage of the start-up lifecycle is extremely important to scale innovations.
- Corporates will have a key role in championing this on-going movement, leveraging the ART Model – Alliances, Relationships enabled through Technology.

**Conclusion:**

Going forward, many organisations may adopt remote working agreements as strategies to reduce costs, improve productivity, and increase worker satisfaction.
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Awareness in the fields of IT, Space, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights.

“New Space” is a rapidly growing market that will be worth hundreds of billions of dollars in the next decade. Discuss the prospects that it holds for India? (250 words)

Reference: Indian Express

Why the question:
The article is premised on the recent achievements made by the SpaceX mission and how it has opened “New space” to the world.

Key Demand of the question:
One has to bring out the possible prospects of “New Space” to India and how this market can bring in lot of growth and development prospects to the country.

Directive:
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:
Explain the concept of “New space” first.

Body:
Start by explaining the ground-breaking initiative of opening up space and atomic energy to private players, referring to them as “fellow travellers” in India recently. The welcome reforms announced recently by India include the leveling of the playing field for private companies in satellites, launches and space-based services by introducing a predictable policy and regulatory environment to private players and providing access to geospatial data and facilities of the Indian Space Research Organisation (ISRO). Discuss the potential it holds for India, possible challenges etc.

Conclusion:
Conclude with way forward.

Introduction:
“New space” refers to the recent commercialization of the space sector. While the state used to have a monopoly over the sector, private actors now play an increasingly important role, most notably companies like SpaceX and the so-called “GAFAs” (Google, Apple, Facebook and Amazon). On May 30, 2020, history was created by SpaceX when NASA astronauts were launched into orbit by the first-ever commercially-built rocket and spacecraft.

Body:

Some recent development in ‘New Space’ industry in India:

- On May 16, 2020, Finance Minister announced a ground-breaking initiative by opening up space and atomic energy to private players, referring to them as “fellow travelers”.
- Prixxels, founded by two BITS Pilani graduates, is building a constellation of nano-satellites to provide global, real-time and affordable satellite imagery services.
- Bengaluru-based startup, Bellatrix Aerospace offers novel “electric propulsion” systems, which have applications in the field of nano and micro-satellite propulsion.
- Mumbai-based startup Manastu Space has developed a “green propulsion” system using hydrogen peroxide as fuel.

Significance of Space startups in Indian scenario:
There are over a thousand space startups all around the world. India’s share of these startups remains less than 1%.

Indian Space Research Organization (ISRO) is increasingly looking for collaboration with the private sector to increase the number of satellites, explore more research-related opportunity areas and to overcome manpower and budgetary constraints.

ISRO plans to double the number of satellites launched in the next two years and this would necessitate active involvement and participation of the private sector.

The current manpower of ISRO is less to meet the increasing demands of satellite launches and the heightened expectations that will arise, and hence the involvement of the emerging private sector becomes crucial.

In the past two decades, through a combination of technology, policy, and will, governments of more than a dozen countries have successfully transferred many space operations to the private sector and it has yielded good results.

Collaboration with private players is vital for capacity building, cost reduction and getting an extra mile cutting-edge advantage.

Since ISRO is making a lot of satellites, and a large chunk of its manpower is involved in manufacturing and launch vehicles, so active involvement of the private sector would also mean that ISRO can devote more time to core research.

With the introduction of the new Space Activities Bill, the Indian government has also opened up opportunities for the private sector and made it much easier for them to sustain and thrive.

The principal propellant of growth in the private space sector would be the medium and small industries because the big industries focus mainly on system integration.

With initiatives such as Make in India, Digital India, and Startup India, the government has been able to push the startup sector. What is now needed is to frame a program exclusively for space startups that will benefit the space entrepreneurs and help them make an impact in the space industry.
Potential advantages of rising Space industry:

- Adding an edge to India’s foreign policy as our space capabilities can be a part of our initiatives to foster new relationships,
- Avoiding the outflow of tax-payer’s money to foreign hands from where we procure turnkey products and services,
- Creating more opportunities for foreign direct investments (FDI), as well as new jobs for highly-skilled labour market,
- Empowering India’s defence system by equipping it with space technology, and allowing armed forces to procure defence products and services indigenously, and
- Reversing the brain-drain from India.
- The New Space industry to now has attracted several billion USD worth of investment, with this amount expected to rise in the coming years with more support from government entities and the private sector.
- The plethora of technological changes that have occurred on earth over the past decades—miniaturization of components, cheaper processing power, etc.—will increasingly make their way into space, enabling new applications and new business models to emerge.

Challenges:

- **Monopoly:** In India ‘Space’ means Indian Space Research Organisation. Globally the technology is highly protected because of its dual use capability. Even if it was not, it would be prohibitively expensive.
- **Funding:** A major challenge in setting up a space business in India is funding. Space industry is capital intensive and upstream activities come with a long gestation period.
- **Investor’s Dilemma:** The lack of clarity among the investors and lack of the ecosystem required for significant contribution is a challenge for the investors.
- **Lack of Regulation:** India is a party to the Outer Space Treaty, where one of the fundamental requirements laid upon states is the supervision of space activities within its borders, the country did not have any formally legislated laws. This is a potential roadblock for commercialization.
- **Growth Challenges:** Scaling up, international marketing and funding are challenges.
- **Lack of Support:** The Indian ecosystem has neither incubation support nor pointers to seek support of leaders such as ISRO for space start-ups.
- **Political and bureaucratic hurdles** limit private space operations in India.
- Low in-house capacity of ISRO restricts them to very few launches in a year. Privatization can offload 30-40% of the work and help them work more efficiently.

Way forward:

- India should have **national space activities legislation** which takes on board all stakeholders.
- A **public-private partnership (PPP) model** can be looked into to realise ISRO’s workhorse Polar Satellite Launch Vehicle (PSLV), with a joint venture between ISRO and the private sector.
In the UK, space ventures are treated as a complement to big organizations and not a competitor. This should be encouraged in India too.

A supportive international partner and likeminded local partners helps to set up a space business.

The idea should be to let the private industry build their own facilities after gaining enough expertise.

ISRO has built a space technology park spread over 25 acres in Bengaluru where the entire range of facilities have been set up for use by the industry.

Conclusion:
To thrive in this throttling competition and be head-and-shoulders above others in the same segment, innovative research has to be fostered and dynamic players have to be brought onboard. This is not possible without engagement, collaboration, partnership and devolving some of the roles to the private industry.

Define the key objectives of IN-SPACe; in what way would it increase the role of private sector in Space industry? Elucidate. (250 words)

Reference: Indian Express

Why the question:
The government on Wednesday approved the creation of a new organisation to ensure greater private participation in India’s space activities, a decision which it described as “historic”, and which Indian Space Research Organisation (ISRO) chairman K Sivan said was part of an important set of reforms to open up the space sector and make space-based applications and services more widely accessible to everyone.

Key Demand of the question:
The question is straightforward and one must discuss the key objectives of IN-SPACe and explain in what way it would increase the role of private sector in Space industry.

Directive:
Elucidate – 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 with relevant associated facts.

Structure of the answer:
Introduction:
The new Indian National Space Promotion and Authorization Centre (IN-SPACe), which is expected to be functional within six months, will assess the needs and demands of private players, including educational and research institutions, and, explore ways to accommodate these requirements in consultation with ISRO.

Body:
State the key objectives of the IN-SPACe.
Discuss why private participation is important in space.
IN-SPACe is supposed to be a facilitator, and also a regulator. It will act as an interface between ISRO and private parties, and assess how best to utilize India’s space resources and increase space-based activities.

Conclusion:
Conclude with its importance for Indian space industry.

Introduction:
The government has decided to set up an Indian National Space Promotion and Authorization Centre (IN-SPACe) to act as a bridge for private sector players. It will be an autonomous nodal agency functioning as a facilitator and a regulator under the Department of
Space. It will act as an interface between ISRO and private parties, and assess how best to utilize India’s space resources and increase space-based activities.

**IN-SPACE** is the second space organization created by the government in the last two years. In the 2019 Budget, the government had announced the setting up of a New Space India Limited (NSIL), a public sector company that would serve as a marketing arm of ISRO.

**Body:**

**Key objectives:**

- IN-SPACE will act as a single-point interface between Indian Space Research Organization (ISRO), and everyone who wants to participate in space-related activities, or use India’s space resources.
- The newly created IN-SPACE will provide a level playing field for private companies to use Indian space infrastructure.
- It will also hand-hold, promote and guide the private industries in space activities through encouraging policies and a friendly regulatory environment.

**IN-SPACE benefits:**

- Space sector can play a major catalytic role in the technological advancement and expansion of our Industrial base.
- The proposed reforms will enhance the socio-economic use of space assets and activities, including through improved access to space assets, data and facilities.
- This will not only result in an accelerated growth of this sector but will enable Indian Industry to be an important player in global space economy.
- With this, there is an opportunity for large-scale employment in the technology sector and India becoming a Global technology powerhouse.

**IN-SPACE and the role of private sector in Space industry:**

- The new organization would be aiming to ensure greater private participation in India’s space activities.
- It would provide a level-playing field for private sector participants to use Indian space infrastructure; this would allow ISRO to focus more on R&D activities.
- Through IN-SPACE, the existing ISRO infrastructure, both ground- and space-based, scientific and technical resources, and even data are planned to be made accessible to interested parties to enable them to carry out their space-related activities.
- Allowing industries and others like students, researchers or academic bodies greater access to space assets would lead to a much better utilization of India space resources.
- These reforms will allow ISRO to focus more on research and development activities, new technologies, exploration missions and human spaceflight programme.
- Some of the planetary exploration missions will also be opened up to private sector through an ‘announcement of opportunity’ mechanism.
- A few private companies that were in the process of developing their own launch vehicles, the rockets like ISRO’s PSLV that carry the satellites and other payloads into space would be helped.
- The private industry’s participation will also free up ISRO to concentrate on science, research and development, interplanetary exploration and strategic launches. Right now, too much of ISRO’s resources is consumed by routine activities that delay its more strategic objectives.

**Way forward:**
India should have **national space activities legislation** which takes on board all stakeholders.

A **public-private partnership (PPP) model** can be looked into to realise ISRO’s workhorse Polar Satellite Launch Vehicle (PSLV), with a joint venture between ISRO and the private sector.

In the UK, space ventures are treated as a complement to big organizations and not a competitor. This should be encouraged in India too.

A **supportive international partner and likeminded local partners** helps to set up a space business.

The idea should be to let the private industry build their own facilities after gaining enough expertise.

ISRO has built a space technology park spread over 25 acres in Bengaluru where the entire range of facilities have been set up for use by the industry.

**Conclusion:**

India is among a handful of countries with advanced capabilities in the space sector. With these reforms, the sector will receive new energy and dynamism, to help the country leapfrog to the next stages of space activities. To thrive in this throttling competition and be head-and-shoulders above others in the same segment, innovative research has to be fostered and dynamic players have to be brought onboard. This is not possible without engagement, collaboration, partnership and devolving some of the roles to the private industry.

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

Account for the possibility of use of technology as a water conservation tool to achieve sustainability in near future in the country. (250 words)

**Reference:** *Financial Express*

**Why the question:**

On the eve of the World Environment day, the article highlights how emphasis should be on the use of technology as a water conservation tool to achieve sustainability.

**Key Demand of the question:**

Explain the importance and need of using technology as a tool for water conservation to achieve sustainable use of water as a crucial resource.

**Directive:**

 Account – Weigh up to what extent something is true. Persuade the reader of your argument by citing relevant research but also remember to point out any flaws and counter-arguments as well. Conclude by stating clearly how far you are in agreement with the original proposition.

**Structure of the answer:**

**Introduction:**

Briefly account for water as a crucial resource in the current times, one should quote some data to substantiate the same.

**Body:**

Rising population and climate change have led to water becoming a scarce resource across the globe. Rightly so, the theme of World Water Day 2020 was centred on climate change to create a much-needed awareness about water and how the two are inextricably linked. Discuss the challenges specific to water in the country -millions suffer due to issues related to inadequate water, sanitation and hygiene. The country’s water sources are getting drained, and those that are not, are getting polluted etc.
Explain how technology can play a key role – water management responsibility; Optimization of water usage for industrial purposes, deletion of obsolete process technology and deployment of the right recycling practices must all be part of their plan. Give examples of use of technology in conservation of water resources.

**Conclusion:**
Conclude with need and importance of the use of technology in making water conservation sustainable.

**Introduction:**

The NITI Aayog report on Composite Water Management Index (CWMI) said that India is facing its ‘worst’ water crisis in history. Taps in Shimla went dry in summer of 2018, posing an unprecedented water crisis in the hill town. According to a forecast by the Asian Development Bank, India will have a water deficit of 50% by 2030. Recent studies also ranked Chennai and Delhi at the top of the 27 most vulnerable Asian cities in terms of low per-day water availability Mumbai and Kolkata follow close.

**Body:**

India’s water crisis is more serious that its energy crisis:

- The water crisis in India is more dire than imagined.
- The annual per capita availability of water continues to decline sharply from about 5,177 cubic metres in 1951 to about 1,720 cubic metres in 2019.
- The NITI Aayog in its report on Composite Water Management Index (2018) has underlined that currently 600 million people face high to extreme water stress.
- Twenty-one cities, including Delhi, Bengaluru, Chennai and Hyderabad will run out of groundwater by 2020, affecting 100 million people.
- Apart from mega cities, many fast-growing small and medium cities such as Jamshedpur, Kanpur, Dhanbad, Meerut, Faridabad, Visakhapatnam, Madurai and Hyderabad also figure in this list.
- The demand-supply gap in most of these cities ranges from 30 per cent to as much as 70 per cent.
- About two lakh die every year due to inadequate access to safe water, about three-fourths of the household do not get drinking water at their premise and about 70 per cent of water is contaminated.
- The rate of groundwater extraction is so severe that NASA’s findings suggest that India’s water table is declining alarmingly at a rate of about 0.3 metres per year.
- At this rate of depletion, India will have only 22 per cent of the present daily per capita water available in 2050, possibly forcing the country to import water.
- About 81 per cent of India’s ultimate irrigation potential, estimated at 140 million hectares, has already been created and thus the scope for further expansion of irrigation infrastructure on a large scale is limited.
- Climate experts have predicted that there will be fewer rainy days in the future but in those days it would rain more.

**Causative factors for water crisis:**

- A combination of population explosion, unplanned growth of the city and its expansion to some traditional catchment areas (a region from which rainfall flows into a river, lake, or reservoir) have led to a reduction in the natural flow of water, and large-scale deforestation.
- Climate change, leading to much lower precipitation during the winter months. As a result, the natural flow and recharge of water in the region has fallen sharply.
• Failure of State governments to check unplanned development and exploitation of water resources. There is no attempt at the central or state levels to manage water quantity and quality
• The vegetation pattern has changed, tree cover is shrinking and unscientific dumping of debris in water streams is rampant.
• The debris blocks the natural course of water bodies.
• Increasing number of tube wells resulting in depletion of groundwater.
• Changes in farming patterns lead to consumption of more water for irrigation and also change the soil profile because of the use of fertilizers
• The states ranked lowest like Uttar Pradesh, Haryana and Jharkhand – are home to almost half of India’s population along with the majority of its agricultural produce.
• There is also a lack of interest in maintaining India's traditional water harvesting structures.

Hence, there is a dire need to adopt effective measures to conserve water, including by the cement industry in India. Here, the emphasis should be on the use of technology as a water conservation tool to achieve sustainability.

• Agriculture:
  ▪ WaterSense Labeled Irrigation Controllers: WaterSense labels weather-based irrigation controllers, a type of “smart” irrigation control technology that uses local weather data to determine when and how much to water. WaterSense labeled irrigation controllers can save you water, time, and money when compared to standard models.
  ▪ Soil Moisture Sensors: Soil moisture–based control technologies water plants based on their needs by measuring the amount of moisture in the soil and tailoring the irrigation schedule accordingly. WaterSense has issued a Notice of Intent to label soil moisture–based control technologies.
  ▪ Rainfall Shutoff Devices: Rainfall shutoff devices turn off your system in rainy weather and help compensate for natural rainfall. This inexpensive device can be retrofitted to almost any system.
  ▪ Rain sensors: Rain sensors can help decrease water wasted in the landscape by turning off the irrigation system when it is raining.
  ▪ Micro-Irrigation: Micro–irrigation or drip systems are generally more efficient than conventional sprinklers, because they deliver low volumes of water directly to plants’ roots, minimizing losses to wind, runoff, evaporation, or overspray. Drip irrigation systems use 20 to 50 percent less water than conventional pop-up sprinkler systems and can save up to 30,000 gallons per year.

• Industries:
  ▪ Installation of rooftop rainwater harvesting systems: Interestingly, a meagre 100 cm rainfall annually on a 1000 square feet roof can provide a full year’s supply of water for drinking and cooking purposes for a family of five.
  ▪ Another technological intervention that can be considered by cement is the Modular Curing Solution (MCS) technique that has, over the past eight years, conserved 423 million litres of water across 35,224 construction sites across India, thus promoting sustainable construction. This technique entails the use of specially designed plastic sheets that prevent water loss due
to evaporation and protect the surface against strong winds, low humidity and high temperatures.

- **Households:**
  - **Prepaid water: access, control and transparency:** Prepaid metering further gives consumers financial control and enabling municipalities to measure, manage, and bill, accurately and in real time. With prepaid meters, users don’t have to wait until month-end to see that it wasn’t the best idea to water the garden every day, or to find out that they have a leak.
  - **Leak Detectors:** Leaks are one the worst offenders when it comes to wasted water. Smart home enabled leak detectors monitor moisture around pipes and other fittings. Once connected to your smartphone, these devices trigger a notification at the first sign of condensation, drips, leaks, or flooding.
  - **Energy Star Appliances:** Older washers and dishwashers waste significant amounts of water. However, Energy Star appliances can save you hundreds of dollars on your utility bills. For example, Energy Star washers use about 13 gallons of water per load, versus the 23 gallons per load used by traditional machines.

**Conclusion:**

Equal importance to water management and resource growth should be a part of sustainability plan. It involves evaluating the total volume of freshwater required for operations and then proactively cutting down that number, either by reducing wastage or by replenishment. Reducing water footprint and usage of freshwater in the production or supply of goods and services must be given top priority.

**Discuss the concept of “Nagar van”, explain how it is integral to forest resource management to provide improved environment in urban systems. (250 words)**

**Reference:** Times of India

**Why the question:**
With biodiversity the theme of World Environment Day (WED) (WED) this year, the ministry of environment, forest and climate change (MoEFCC) will launch ‘Nagar Van’ (city forest) scheme on June 5. Thus the context of the question.

**Key Demand of the question:**
One has to elaborate on the concept of “Nagar – Van” and discuss its utility in forest resource management to provide improved environment in urban systems.

**Directive:**
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:**
Briefly define what “Nagar-Van” is.

**Body:**
A Nagar Van is a forested area lying in vicinity of cities which is accessible to the city dwellers and is suitably managed. These city forests provides wholesome natural environment for recreation, education, biodiversity, water and soil conservation and reduces pollution, heat. Govt. wants to create/ develop at least one CITY FOREST in each city having Municipal Corporation/ Class I Cities. This will provide wholesome healthy living environment and will also contribute to growth of Smart, Clean, Green, Sustainable and Healthy Cities.
Explain how the concept is integral to forest resource management.
Discuss its importance in overall management of bio diversities especially in the urban areas.

**Conclusion:**
Conclude with importance.

**Introduction:**

The Union ministry of environment, forest and climate change (MoEF&CC) has launched ‘Nagar Van’ (city forest) scheme, with ‘Celebrating Biodiversity’ as the theme of World Environment Day (WED). The “Nagar Van” scheme aims to develop the urban forests. **Warje Urban Forest in Pune** will be considered as a role model for the Scheme.

**Body:**

**Urban forestry** is the management of trees for their contribution to the physiological, sociological, and economic well-being of urban society. Urban forestry deals with woodlands, groups of trees, and individual trees, where people live – it is multifaceted, for urban areas include a great variety of habitats (streets, parks, derelict corners, etc) where trees bestow a great variety of benefits and problems

**Nagar Van scheme:**

- The scheme emphasizes on urban forestry.
- The Centre has announced the implementation of a scheme to develop 200 urban forests across the country in the next five years.
- The scheme will also provide an opportunity to the states to manage urban ecosystems.
- The Scheme enforces **people’s participation and collaboration** between the Forest Department, Municipal bodies, NGOs, Corporates and local citizens.
- These urban forests will primarily be on the **existing forest land in the City or any other vacant land** offered by local urban local bodies.
- These will be on public private partnership (PPP) mode where fencing will be done by the government but planting, public convenience infrastructure, walkways can be done by private companies as part of their corporate social responsibility.
- The finances for the scheme will be paid for by the **CAMPA (Compensatory Afforestation Fund (CAF) Act, 2016) funds**.
- Planting of local species will be prioritized.

**Importance in providing improved environment in urban systems:**

- Trees can cool cities by between 2 to 8 degrees Centigrade.
- When planted near buildings, trees can cut air conditioning use by 30%, and, according to the UN Urban Forestry office, reduce heating energy use by a further 20-50%.
- One large tree can absorb 150kg of carbon dioxide a year, as well as filter some of the airborne pollutants, including fine particulates.
- Trees can also help urban communities adapt to threats that are exacerbated by climate change: providing shade and lowering ambient temperatures during heatwaves; reducing flood risk in the case of extreme weather events; and even limiting the development of ground-level ozone, which can lead to toxic air pollution.
- Biodiversity conservation has traditionally been considered confined to remote forest areas but with increasing urbanisation a need has arisen to safeguard and save biodiversity in urban areas also.
- With this activity of creating urban forest we will also create additional carbon sink.
Mature trees clean air, lower stress, boost happiness, reduce flood risk – and even save municipal money.
Urban and peri-urban forests can also provide financial benefits to cities by helping to alleviate social burdens and barriers.
Thus, Urban forest is the best way to bridge this gap.

Conclusion:
Now more than ever, trees and forests are a vital component of healthy, liveable, and sustainable communities around the globe. Urban forests help define a sense of place and well-being where people live, work, play, and learn.

The oil spill in Russia’s Arctic region has become a cause for worry to the environment. Examine. (250 words)
Reference: Indian Express

Introduction
Russia declared a state of emergency, five days after a power plant fuel leak in its Arctic region caused 20,000 tonnes of diesel oil to escape into a local river, turning its surface crimson red. The Ambarnaya river, into which the oil has been discharged, is part of a network that flows into the environmentally sensitive Arctic Ocean.

Body
Reasons for the leak
- The thermoelectric power plant at Norilsk is built on permafrost, which has weakened over the years owing to climate change.
- This caused the pillars that supported the plant’s fuel tank to sink, leading to a loss of containment on May 29, 2020.
- Reports said that around 20,000 tonnes of diesel oil was released into the Ambarnaya river, which has since drifted 12 km on its surface.
- Environmentalists have said the river would be difficult to clean, given its shallow waters and remote location, as well as the magnitude of the spill.

Oil spill: An Environmental Hazard
When an oil spill occurs, many elements of the environment may be affected. Depending on the magnitude of the spill and its location, the effects can vary, ranging from minimal to serious ones.

- **Ecosystem Destruction:** Oil spills can have a major impact on the temporary animal and fish loss of habitat. Heavy oils may affect several organism functions like respiration, feeding, and thermo-regulation.
  - At the same time, the entire ecosystem can change temporarily because of the chemical components and elements of the spilled oil that are toxic to the environment.
  - If an aquatic oil spill is substantial enough (such as in the case of Exxon Valdez 1989 spill or the April 2010 BP spill in the Gulf of Mexico from offshore drilling) then the effects on marine life, birds, and ecosystems (including marshes and wetlands, as well as shorelines or gulf coasts) could be serious.
• There are immediate effects on humans, fish, animals, birds and wildlife in general, mainly due to:
  ▪ direct contact with the spilled oil including breathing of volatilized oil components (hydrocarbons) from the spill;
  ▪ direct contact with the environment polluted with spilled oil components (some of which may persist a long time), such as drinking polluted water or breathing polluted dust particles;
  ▪ consumption of polluted food – at any level within the food chain, with a higher risk for food pollution at the higher levels of the food chain, i.e. humans and animals.
  ▪ If the oil washes into coastal marshes, mangrove forests, or other wetlands, fibrous plants and grasses absorb oil, which can damage plants and make the area unsuitable as wildlife habitat.
    ▪ Eg: Despite massive clean-up efforts following the 1989 Exxon Valdez oil spill, a 2007 study conducted by the National Oceanic and Atmospheric Administration (NOAA) found that 26,000 gallons of oil were still trapped in the sand along the Alaska shoreline.
  ▪ Although some organisms may be seriously injured or killed very soon after contact with the oil in a spill, other effects are more subtle and often longer lasting.
    ▪ For example, freshwater organisms are at risk of being smothered by oil that is carried by the current, or of being slowly poisoned by long-term exposure to oil trapped in shallow water or stream beds.
  ▪ On Marine Organisms: Oil spills frequently kill marine mammals such as whales, dolphins, seals, and sea otters.
    ▪ Oil can clog blowholes of whales and dolphins, making it impossible for them to breathe properly and disrupting their ability to communicate.
    ▪ Oil coats fur of otters and seals, leaving them vulnerable to hypothermia.
    ▪ Marine mammals that eat fish or other food exposed to an oil spill may be poisoned by oil and die or experience other problems.
    ▪ Oil spills often take a deadly toll on fish, shellfish, and other marine life, particularly if many fish eggs or larvae are exposed to oil.
    ▪ Eg: Fisheries impacted by the Exxon Valdez took over three decades to recover.
  ▪ On Birds: Oil spills also damage nesting grounds, potentially causing serious long-term effects on entire species.
    ▪ The 2010 BP Deepwater Horizon offshore oil spill in the Gulf of Mexico, for example, occurred during prime mating and nesting season for many bird and marine species, and long-term environmental consequences of that spill won’t be known for years.
    ▪ Oil spills can disrupt migratory patterns by contaminating areas where migrating birds normally stop.
• By coating feathers, oil not only makes flying impossible but also destroys birds’ natural waterproofing and insulation, leaving them vulnerable to hypothermia or overheating.

• As birds frantically preen their feathers to restore their natural protections, they often swallow oil, which can severely damage their internal organs and lead to death.

• A World Wildlife Fund described this as the second-largest known oil leak in modern Russia’s history in terms of volume.

• The Russian chapter of activist group Greenpeace said damages to the Arctic waterways could be at least 6 billion rubles (over $76 million), and has compared the incident to Alaska’s 1989 Exxon Valdez disaster.

• Its estimate does not include atmospheric damage due to greenhouse gases and soil pollution.

Conclusion

Ultimately, the severity of environmental damage caused by an oil spill depends on many factors, including the amount of oil spilled, type and weight of oil, location of the spill, species of wildlife in the area, timing of breeding cycles and seasonal migrations, and even the weather at sea during and after the oil spill.

The country’s poor performance on the Environmental Performance Index highlights the urgent need to plug the gaps on the fronts of sanitation, drinking water, air quality and others. Critically analyse and suggest measures to address these concerns. (250 words)

Reference: Financial Express

Why the question:
According to the 12th edition of the Environment Performance Index (EPI 2020)—released by Yale University—India has performed poorly. Out of the 180 countries analyzed, India stood at 168. Thus the question.

Key Demand of the question:
The answer should discuss the poor performance of the country and the underlying causes of it, it must emphasize on the urgent need to plug the gaps on the fronts of sanitation, drinking water, air quality and others.

Directive:
Critically analyze – 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. 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:
Discuss the facts brought about by the EPI and India’s status with respect to it.

Body:
India performed the worst regionally on all five key parameters for environmental health—sanitation, drinking water, air quality, heavy metals, and waste management. It seriously needs to focus on fixing air & water quality and biodiversity. Discuss the causes that have led to such poor performance. Also explain what needs to be done, highlight the policy measures that are already in place in this direction.

Conclusion:
Conclude that the government must take a hard look at the problem areas the report highlights, and, with the help of all stakeholders, act on safeguarding the environment and not only protect it from further degradation, but also try and reverse the damage wherever possible.

Introduction:

Environmental Performance Index (EPI) is a biennial index prepared by Yale University and Columbia University in collaboration with the World Economic Forum. It offers a scorecard that highlights leaders and laggards in environmental performance and provides practical guidance for countries that aspire to move toward a sustainable future. This index was first published in 2002 designed to supplement the environmental targets set forth in the United Nations Millennium Development Goals.

India ranked 168th out of 180 countries in 2020 EPI. India as a country faces serious environmental health risks, including poor air quality.

Body:

<table>
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<th>India’s Ranking on different Indicators</th>
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<tr>
<td><strong>Overall EPI 2020</strong></td>
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<td>Sanitary and Drinking Water</td>
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**Source: EPI 2020**

Performance of India and neighbours:

- India secured 168th rank. The country scored 27.6 out of 100 in the 2020 index.
- India’s rank was 177 (with a score of 27.6 out of 100) in 2018.
- India scored below the regional average score on all five key parameters on environmental health, including air quality, sanitation and drinking water, heavy metals and waste management.
It has also scored below the regional average on parameters related to biodiversity and ecosystem services too.

Among South Asian countries, India was at second position (rank 106) after Pakistan on ‘climate change’.

The 11 countries lagging behind India were — Burundi, Haiti, Chad, Soloman Islands, Madagascar, Guinea, Côte d’Ivoir, Sierra Leone, Afghanistan, Myanmar and Liberia.

All South Asian countries, except Afghanistan, were ahead of India in the ranking.

Reasons for poor performance are:

- **Big gap between policy goals and action:**
  - The government has gone back on its promise of implementing strict power plant emission norms by December 2017, and may even dilute the norms.
  - Full conversion to electric vehicles is realistically possible only by 2047.
  - Annual electronic waste collection target of 30% of the products sold in the market has now been relaxed to 10%.
  - CAG report criticized government for not developing an action plan and for its poor utilization of allocated funds in the clean-up of the Ganga.

- India is not on track to decarbonize quickly enough to avoid the worst impacts of climate change.

- Low EPI scores for India suggest a need for national sustainability efforts on a number of fronts, including air and water pollution, biodiversity protection, and the transition to a clean energy future.

- Too much focus on economic imperatives is leading to environment degradation.

- Lack of political will to implement even existing environmental laws and regulations.

- There have been instances of grabbing of forest land by private conglomerates, illegal mining etc.

- Environmental impact assessment is not effectively done.

- The current state of the country’s air quality reveals that only seven cities come under the satisfactory annual average air quality, as per the latest report by the Central Pollution Control Board (CPCB).

- Pollution from solid fuels, coal and crop residue burning, and emissions from motor vehicles continues to degrade the air quality for millions of Indians

**Measures needed:**

- The environmental costs of development should be duly recognised in addressing environmental problems.

- Transition to renewables, especially solar energy, should be accelerated by offering subsidies.

- On the other hand, the more polluting fuels should be priced higher.

- Strict environmental standards for coal plants should be put in place.

- Similarly, the transition to electric vehicle use should be aided by higher pricing of petrol and diesel.
• Existing environmental laws and regulations should be implemented properly with more political will.
• The country’s poor environmental performance calls for taking forward the environmental targets more seriously.

Way forward:
• India can progress towards meeting its climate targets and goals if it follows better governance.
• The most crucial distinction between the worst and the best performers in the EPI has been good governance.
• With public inputs in policymaking and a more targeted regulatory mechanism, India can perhaps better its showing—quite crucial at a time when the time to contain the deadly climate change effects might be running out fast.
• India needs to re-double national sustainability efforts on all fronts.
• The country needs to focus on a wide spectrum of sustainability issues, with a high-priority to critical issues such as air and water quality, biodiversity and climate change.

Conclusion:
The government must take a hard look at the problem areas and, with the help of all stakeholders, act on safeguarding the environment and not only protect it from further degradation, but also try and reverse the damage wherever possible.

Habitat loss and fragmentation have become the primary causes for Man-Animal conflicts, critically examine and suggest measures to reduce the risks of man-animal conflicts. (250 words)

Reference: The Hindu

Introduction:
Man-animal conflict is an existential crisis not only for the animals, but for human beings as well with data showing that about one person has been killed every day for the past three years by roaming tigers or rampaging elephants. India is a unique country with respect to wildlife conservation. Despite a billion people we still have most of our large wildlife species. Compared to relatively lower human density countries in south-east Asia, India today has the largest population of the tiger, Asian elephant, leopard, sloth bear, gaur and many others.

Body:
Major causes of man animal conflict:
• Unsustainable development:
  ▪ Tiger reserves, national parks and sanctuaries exist only as islets in a vast sea of human, cattle and unsustainable land use.
  ▪ People are increasingly encroaching into the country’s traditional wild spaces and animal sanctuaries, where people compete with wildlife for food and other resources.
  ▪ These conflicts have increased as elephants increasingly find their usual corridors blocked by highways, railway tracks and factories.
Urbanisation and growth agendas alter landscape dynamics, which has a cascading effect on the ecological dynamics of wildlife. This results in ecological dislocation of sorts, wherein endangered wild animals like tigers either cause distress or land themselves in trouble.

**Failure of government measures:**
- ‘Human-Wildlife conflict mitigation’ said most of the measures are dysfunctional, haphazardly implemented and therefore not effective.
- Elephants are used to travelling long distances, most of which fall outside the protected areas.
- Wildlife experts claim that territorial animals do not have enough space within reserves and their prey do not have enough fodder to thrive on. This is forcing the wild animals to move out and venture close to human habitation in search of food.
- Primary reason for the increasing human-animal conflicts is the presence of a large number of animals and birds outside the notified protected areas. Wildlife experts estimate that 29 per cent of the tigers in India are outside the protected areas.
- Road kill of wild animals is the new enemy to India’s wildlife.
- There is no proper land use planning and management, cumulative impact assessments or wildlife management.
- There is no buffer zone between wildlife and human settlements.
- Monkeys along with grey langurs have adapted to urban habitats over the years.
- Continued destruction and divergence of forest lands.

**Impacts of Man-animal conflicts:**
- Crop Damage.
- Animal Deaths.
- Loss of Human Life.
- Injuries to People.
- Injuries to Wildlife.
- Livestock Depredation.

**Government Initiatives to reduce the man-animal conflicts are:**
- **Awareness programmes** to sensitize the people about the Do’s and Don’ts to minimize conflicts.
- **Training programmes for forest staff and police** to address the problems of human wildlife conflicts.
- Approach by **wildlife protection act, 1972** is that the model of conservation enshrined in is premised on creating human-free zones for the protection of rare species based on the erroneous notion that local people are the prime drivers of wildlife decline. This approach has been successful in protecting certain species, not all species.
- Providing **technical and financial support** for development of necessary infrastructure and support facilities for immobilization of problematic animals.
• Providing LPG to villagers: LPG should be provided to those villagers who frequently go to the forest areas specially wildlife habitats to fetch fuel wood for their chullahs so that they may stop penetrating into forest and stop inviting Man-Animal Conflicts.

• State governments:
  ▪ Assistance to state government for construction of boundary walls and solar fences around the sensitive areas to prevent the wild animal attacks
  ▪ Supplementing the state government resources for payment of ex gratia to the people for injuries and loss of life in case of wild animal attacks
  ▪ Encouraging state government for creation of a network of protected areas and wildlife corridors for conservation of wildlife.
  ▪ **Eco development activities in villages** around protected areas to elicit cooperation of local community in management of the protected areas.
  ▪ Supporting involvement of the research and academic institutions and leading voluntary organisations having expertise in managing human wildlife conflict situations.
  ▪ To control poaching: Poaching of wild animals should be stopped so that the no of wild animals can stabilize at its carrying capacity which would reach equilibrium in the ecosystem and this equilibrium between the numbers of prey animals and predators in the forest ecosystem would be maintained.

• Technology:
  ▪ Information technology like radio collars, GPS, satellite uplink facilities are used by research institutions to monitor the movement of wild animals
  ▪ Centrally sponsored schemes of project tiger, project elephant and integrated development of wildlife habitats
  ▪ **Solar Fencing around agriculture fields:** Agriculture fields situated near wildlife habitat/forest areas can be protected by stone fencing or solar fencing. Solar fencing has been tried with quite good effect in Wardha District of Maharashtra.

Way Forward:
• **Forest corridors** linking protected areas must be maintained where they exist.
• Existing habitats have to be surveyed and improved to provide food for the elephants
• **Local communities** need to be educated to have reduced stress levels in elephants during conflict mitigation, no fire, no firecracker and no mob crowds.
• There is a need for a **monitoring mechanism** which will record and disperse information on such conflicts
• Experts suggest the other way to reduce the man-animal conflict is to increase the population of wild ungulates, namely hares and the wild boars, both of which are prolific breeders, as a prey for wild carnivores. Separate big enclosures can be made in the jungles to breed them. The excess stock can be released in the jungles at regular intervals for the wild carnivores to prey upon.
The **draft National Forest Policy** will be an overarching policy for forest management. Also there is a proposal for National Community Forest Management (CFM) Mission which will be launched soon.

In order to be truly effective, prevention of human-wildlife conflict has to involve the full scope of society: international organizations, governments, NGOs, communities, consumers and individuals.

Solutions are possible, but often they also need to have financial backing for their support and development.

In what way can humanity’s relentless production and consumption be addressed? Do you think it’s possible to change public attitudes to the leading driver of land degradation? Elucidate. (250 words)

Reference: un.org

**Why the question:**
World Day to Combat Desertification and Drought is being observed on June 17, 2020 with the theme “Food. Feed. Fibre. – the links between consumption and land.” Thus the question.

**Key Demand of the question:**
One must discuss the possible changes that can be made in public attitudes towards land degradation wherein the population is the key driver through its relentless production and consumption.

**Directive:**
*Elucidate* – 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 with relevant associated facts.

**Structure of the answer:**

**Introduction:**
Start by quoting some key facts about land degradation; explain with some key facts in what way the people are the major contributors to it.

**Body:**
Explain what is land degradation, what is its impact on the overall health of the world. Desertification is the degradation of land in arid, semi-arid and dry sub-humid areas. It is caused primarily by human activities and climatic variations. Desertification does not refer to the expansion of existing deserts. It occurs because dryland ecosystems, which cover over one third of the world’s land area, are extremely vulnerable to overexploitation and inappropriate land use. Poverty, political instability, deforestation, overgrazing and bad irrigation practices can all undermine the productivity of the land.

As populations become larger, wealthier and more urban, there is far greater demand for land to provide food, animal feed and fibre for clothing. Meanwhile, the health and productivity of existing arable land is declining, worsened by climate change. Clothing and footwear production causes 8 per cent of global greenhouse gas emissions, a figure predicted to rise almost 50 per cent by 2030.

Suggest measures that can aid in changing the political attitudes of people towards land degradation.

**Conclusion:**
Conclude with way forward.

**Introduction:**

Land degradation is reduction or loss of biological or economic productivity of the land resulting from land uses or from a process or combination of processes, including human activities and climatic variations. Desertification is the degradation of land in arid, semi-arid and dry sub-humid areas. Desertification does not refer to the expansion of existing deserts. It occurs because
Dryland ecosystems, which cover over one-third of the world’s land area, are extremely vulnerable to overexploitation and inappropriate land use. Poverty, political instability, deforestation, overgrazing and bad irrigation practices can all undermine the productivity of the land.

Body:

In India, the main reason for desertification is loss of soil cover, mainly due to rainfall and surface runoff. It is responsible for 10.98 per cent of desertification in the country followed by vegetation degradation (8.91 percent) and wind erosion (5.55 percent).

Land degradation is a global problem largely related to agricultural use. The major causes include:

- Land clearance, such as clearcutting and deforestation
- Agricultural depletion of soil nutrients through poor farming practices
- Livestock including overgrazing and over drafting
- Inappropriate irrigation and over drafting
- Urban sprawl and commercial development
- Vehicle off-road ing
- Quarrying of stone, sand, ore and minerals
- Increase in field size due to economies of scale, reducing shelter for wildlife, as hedgerows and copses disappear
- Exposure of naked soil after harvesting by heavy equipment
- Monoculture, destabilizing the local ecosystem
- Dumping of non-biodegradable trash, such as plastics
- Invasive Species
- Soil degradation which includes Soil contamination, Soil erosion, Soil acidification and Loss of soil carbon

Land restoration includes

- Restoration of vegetation – vegetation cover prevent soil erosion, it increases water run-off time thus giving time for water to percolate into earth=> improves ground water level. Forest is considered as lakhs off check dams.
- Restoration of soil – this in turn enhances the life support capability of the land, hence helps in restoration of vegetation.
- Restoration of water bodies – this includes restoring wetlands, lake, river etc.
- In reality vegetation, soil and water bodies all are inter dependent. Ultimately results in enhancement in water availability.
- Thus in India where 67% of land is dry land and 30% of land is under degradation, reversing the degradation will also have potential to solve problem of water scarcity.
- Mostly in southern states there in acute shortage of water example Chennai in 2019 has declared emptying of ground water. Restoring of ground water table by using traditional and scientific water harvesting technique and conserving wetland like Pallikaraini wetland will certainly bring back life to water bodies.
- Example – Revival of Alwari river in Alwar dist. Of Rajasthan by Rajendra Singh (water man of India). He helped to build around 9000 Johads, Check dams.
- India had joined “Bonn Challenge” a global effort to bring 150 million hectares of the world’s deforested and degraded land into restoration by 2020, and 350 million hectares by 2030.
- India pledged to bring into restoration 13 million hectares of degraded and deforested land by 2020, and an additional 8 million hectares by 2030.
At COP 14 of UNCCD India raised the Target of 21 million hectares to 26 million hectares between now and 2030 to be restored.

**Other steps taken by India:**

- Desert Development Programme.
- Integrated Watershed Management Programme which is now subsumed under Pradhan Mantri Krishi Sinchai Yojana.
- National agriculture policy 2000
- National Mission on Green India which is a part of National Action Plan on Climate Change.
- National Afforestation Programme.
- Soil Conservation in the Catchment of River Valley Projects and Flood Prone Rivers.
- National Watershed Development Project for Rain fed Areas.
- Fodder and Feed Development Scheme – a component of Grassland Development including Grass Reserves
- Command Area Development and Management Programme.
- National water policy 2012
- National forest policy 1988

**Conclusion:**

It is land over which humans are surviving with the help of ecosystem services provided by Flora and Fauna. Degradation of land would mean degradation of human life. Water is becoming scar resource and land degradation is fueling it. Restoration of land provide us the chance to handle water scarcity problem with ease. Hence conservation efforts are necessary along with fast development and urbanisation. It is also enshrined in SDG 15. Development without sustainability is worse than on development at all.

**India is on the brink of a Covid-induced waste crisis, Discuss the concerns associated with biomedical waste crisis facing the country.** (250 words)

**Reference:** Hindustan Times

**Why the question:**
The article presents to us the dismal affair of biomedical waste management in the country. And point out the fact that sanitation workers are contracting Covid-19.

**Key Demand of the question:**
Explain the biomedical waste management system that exists in the country; bring out how the Covid-19 is inducing the crisis further.

**Directive:**
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:**
Introduction of answer can be either definition based or statistics based.

**Body:**
Discuss the reasons for the current biomedical waste management crisis. Present the case of COVID-19 waste mismanagement, lack of realization of rules meant for the waste management. Present an example say any metro city or Delhi. Where sanitation workers are suffering and reporting more positive cases. Explain what needs to be done.

**Conclusion:**
Conclude with way forward.
Introduction:

The Bio-medical Waste (Management and Handling) Rules of India defines Biomedical waste (BMW) as “Any waste which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biologicals”. Recently, the National Green Tribunal (NGT) has directed all States and Union Territories to take adequate steps to mitigate risks in disposal of bio-medical waste in view of the Covid-19 pandemic.

Body:

![Segregation of Solid Bio-Medical Waste](image)

Dangers posed by untreated Biomedical waste:

- The personal protective equipment, the mask, the gloves, the face shield, the shoe cover, and the sanitizer bottle have two things in common: they protect people – and prevent them from transmitting – from the Sars-CoV-2 virus; they are also made up (mostly) of plastic.
- In the past three months, a lot of them have ended up in already overflowing landfills, posing a health risk to waste pickers, sanitation workers and garbage collectors tasked with handling them.
- In Delhi, over 40 sanitation workers have tested positive for the virus, and 15 have lost their lives.
- In Mumbai, 10 workers and two security guards at the city’s two landfills, in Deonar and Kanjurmarg, have been infected with Covid-19, and recovered.

Concerns associated with treatment of Biomedical waste:

- The country has 200 biomedical waste treatment facilities; of these two are in Delhi and one is in Mumbai. And, according to CPCB data, these facilities are already running at 60% capacity – that’s a 15% jump since March.
Before the Covid-19 outbreak, a government or a private hospital would typically produce 500 grams of biomedical waste (like syringes, urine bags, gauze etc) per bed, daily.

Now, that number has gone up to between 2.5kg to 4kg per bed, daily, according to SMS Water Grace BMW Private Limited, one of the two CBWTFs in Delhi, which collects waste from labs, quarantine centres, and hospitals.

A large Covid-19 facility can anywhere between 1800 to 2200 kg of biomedical waste per day.

Delhi generates 27 tonnes of non-Covid biomedical waste and up to 11 tonnes of Covid-19 related waste every day, according to the CPCB; Mumbai has been generating 9 tonnes of Covid-19 waste and 6 tonnes of non-Covid biomedical waste every day, BMC estimates.

Much of this is plastic — N-95 masks are made up of polyisoprene (natural rubber) and polypropylene (thermoplastic); face shields are all plastic.

Part of the problem is that a lot of organic biomedical waste is making its way to incinerators due to the CPCB guidelines, when it should ideally be going to the waste-to-energy plant.

The capacity of incinerators is a problem, especially when the projection says that we will see a spike in the first week of July and the active cases could go up.

But that said, it still doesn’t make sense to invest in these machines because we do not know if this infection is episodic or will it be recurring.

**Measures needed:**

- To ensure safe disposal of biomedical waste generated during treatment, diagnosis and quarantine of patients with the novel Coronavirus disease (COVID-19), the Central Pollution Control Board of India has come out with special guidelines.
- The guidelines provide a series of steps for safe disposal of waste generated in hospital isolation wards for COVID-19 patients, testing centres and laboratories, quarantine facilities and homes of suspected patients.
- The communities need to dispose their used napkins, tissues, empty sanitizer bottles in a separate bag, to ensure the safety of municipal workers and ragpickers.
- It will also ensure that the cycle of garbage collection and plastic recycling don’t get affected. The government should also provide safety kits to municipal workers urgently and educate them on how to handle household waste during the outbreak, to help in halting the chain of transmission.
- In case of home-care for suspected patients, biomedical waste should be collected separately in yellow bags (yellow coloured, non-chlorinated plastic bags) and handed over to authorised waste collectors engaged by local bodies.
- Urban local bodies should engage the common bio-medical waste treatment facilities (CBWTFs) to pick up such waste either directly from such quarantined houses or from identified collection points.

**Way forward:**

- Managing healthcare waste requires effective knowledge not only among those who produce the healthcare waste but also among those who handles it.
- So, to achieve this, HCFs and regulatory authorities have to take stringent measures in order to ensure safe disposal of BMW in the country.
- Training and awareness programme for healthcare personnel needs to be conducted;
- Legal actions against defaulting HCFs and ill-operated CBWTFs is obligatory;
- Self-regulatory mechanism for monitoring and implementation for waste management should be encouraged and
Human-wildlife conflict is increasingly becoming an existential crisis, both for animals and man. Discuss the major reasons for increase in man-animal conflict in India in recent years. What have been major steps undertaken by the government for mitigation of conflict? (250 words)

Reference: The Print

Why the question:
The question is amidst the rising incidents of human-wildlife conflicts being witnessed across the country.

Key Demand of the question:
Explain the major reasons for increase in man-animal conflict in India in recent years. Also discuss the major steps undertaken by the government for mitigation of conflict.

Directive:
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:
Give some statistics about human-wildlife conflict in India.

Body:
Enumerate and explain (in brief because of word limit constraint) reasons for increasing human-wildlife conflict. Then mention the steps taken by the government for conflict mitigation. The question has 2 parts- reasons and solutions. Both of these demand equal weightage in your discussion.

Conclusion:
Conclude with efforts of the government that have been successful.

Introduction:
Man-animal conflict is an existential crisis not only for the animals, but for human beings as well with data showing that about one person has been killed every day for the past three years by roaming tigers or rampaging elephants. India is a unique country with respect to wildlife conservation. Despite a billion people we still have most of our large wildlife species. Compared to relatively lower human density countries in south-east Asia, India today has the largest population of the tiger, Asian elephant, leopard, sloth bear, gaur and many others.

Body:
Major causes of man animal conflict:

- Unsustainable development:
  - Tiger reserves, national parks and sanctuaries exist only as islets in a vast sea of human, cattle and unsustainable land use.
  - People are increasingly encroaching into the country’s traditional wild spaces and animal sanctuaries, where people compete with wildlife for food and other resources.
  - These conflicts have increased as elephants increasingly find their usual corridors blocked by highways, railway tracks and factories.
• Urbanisation and growth agendas alter landscape dynamics, which has a cascading effect on the ecological dynamics of wildlife. This results in ecological dislocation of sorts, wherein endangered wild animals like tigers either cause distress or land themselves in trouble

• **Failure of government measures:**
  - ‘Human-Wildlife conflict mitigation’ said most of the measures are dysfunctional, haphazardly implemented and therefore not effective
  - Elephants are used to travelling long distances, most of which fall outside the protected areas.
  - Wildlife experts claim that territorial animals do not have enough space within reserves and their prey do not have enough fodder to thrive on. This is forcing the wild animals to move out and venture close to human habitation in search of food.
  - Primary reason for the increasing human-animal conflicts is the presence of a large number of animals and birds outside the notified protected areas. Wildlife experts estimate that 29 per cent of the tigers in India are outside the protected areas.
  - Road kill of wild animals is the new enemy to India’s wildlife
  - There is no proper land use planning and management, cumulative impact assessments or wildlife management
  - There is no buffer zone between wildlife and human settlements
  - Monkeys along with grey langurs have adapted to urban habitats over the years.
  - Continued destruction and divergence of forest lands.

**Impacts** of Man-wildlife conflicts:
- Crop Damage.
- Animal Deaths.
- Loss of Human Life.
- Injuries to People.
- Injuries to Wildlife.
- Livestock Depredation.

**Government Initiatives to reduce the man-tiger conflicts are:**
- **Awareness programmes** to sensitize the people about the Do’s and Don’ts to minimize conflicts
- **Training programmes for forest staff** and **police** to address the problems of human wildlife conflicts
- Approach by **wildlife protection act, 1972** is that the model of conservation enshrined in is premised on **creating human-free zones for the protection of rare species based on the erroneous notion that local people are the prime drivers of wildlife decline.** This approach has been successful in protecting certain species, not all species.
- **Providing technical and financial support** for development of necessary infrastructure and support facilities for immobilization of problematic animals.
• Providing LPG to villagers: LPG should be provided to those villagers who frequently go to the forest areas specially wildlife habitats to fetch fuel wood for their chullahs so that they may stop penetrating into forest and stop inviting Man-Animal Conflicts.

• State governments:
  ▪ Assistance to state government for construction of boundary walls and solar fences around the sensitive areas to prevent the wild animal attacks
  ▪ Supplementing the state government resources for payment of ex gratia to the people for injuries and loss of life in case of wild animal attacks
  ▪ Encouraging state government for creation of a network of protected areas and wildlife corridors for conservation of wildlife.
  ▪ **Eco development activities in villages** around protected areas to elicit cooperation of local community in management of the protected areas.
  ▪ Supporting involvement of the research and academic institutions and leading voluntary organisations having expertise in managing human wildlife conflict situations.
  ▪ To control poaching: Poaching of wild animals should be stopped so that the no of wild animals can stabilize at its carrying capacity which would reach equilibrium in the ecosystem and this equilibrium between the numbers of prey animals and predators in the forest ecosystem would be maintained.

• Technology:
  ▪ Information technology like radio collars, GPS, satellite uplink facilities are used by research institutions to monitor the movement of wild animals
  ▪ Centrally sponsored schemes of project tiger, project elephant and integrated development of wildlife habitats
  ▪ **Solar Fencing around agriculture fields**: Agriculture fields situated near wildlife habitat/forest areas can be protected by stone fencing or solar fencing. Solar fencing has been tried with quite good effect in Wardha District of Maharashtra.

**Way Forward:**

• **Forest corridors** linking protected areas must be maintained where they exist.
• Existing habitats have to be surveyed and improved to provide food for the elephants
• **Local communities** need to be educated to have reduced stress levels in elephants during conflict mitigation, no fire, no firecracker and no mob crowds.
• There is a need for a **monitoring mechanism** which will record and disperse information on such conflicts
• Experts suggest the other way to reduce the man-animal conflict is to increase the population of wild ungulates, namely hares and the wild boars, both of which are prolific breeders, as a prey for wild carnivores. Separate big enclosures can be made in the jungles to breed them. The excess stock can be released in the jungles at regular intervals for the wild carnivores to prey upon.
• The **draft National Forest Policy** will be an overarching policy for forest management. Also there is a proposal for National Community Forest Management (CFM) Mission which will be launched soon.

• In order to be truly effective, prevention of human-wildlife conflict has to involve the full scope of society: international organizations, governments, NGOs, communities, consumers and individuals. Solutions are possible, but often they also need to have financial backing for their support and development.

**Elucidate the significance of the Environment Impact Assessment (EIA) process in the Indian context. Also highlight the apprehensions related with it. (250 words)**

*Reference: The Hindu*

**Why the question:**

Student unions from several universities and colleges from across India have petitioned Union Environment Minister Prakash Javadekar to put the draft of the proposed Environment Impact Assessment Notification 2020 on hold.

**Key Demand of the question:**

One has to discuss the significance of the Environment Impact Assessment (EIA) process in the Indian context. Also highlight the concerns associated with it.

**Directive:**

*Elucidate* – 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 with relevant associated facts.

**Structure of the answer:**

**Introduction:**

Environment Impact Assessment in India is statutorily backed by the Environment Protection Act, 1986 which contains various provisions on EIA methodology and process.

**Body:**

Discuss the process of EIA in brief. It is an important process for evaluating the likely environmental impact of a proposed project. It is a process whereby people’s views are taken into consideration for granting final approval to any developmental project or activity. It is basically, a decision-making tool to decide whether the project should be approved or not.

*Explain the challenges and concerns associated.*

**Conclusion:**

*Conclude with its significance.*

**Introduction:**

Environmental Impact Assessment (EIA) is an important management tool for ensuring optimal use of natural resources for sustainable development. It covers developmental sectors such as industries, thermal power projects, mining schemes etc. EIA has now been made mandatory under the Environmental (Protection Act, 1986) for 29 categories of developmental activities involving investments of Rs. 50 crores and above.

**Body:**

**Recent amendments to EIA:**

• The EIA 2020, which is open to public comments until June 30, is a proposed update to the existing EIA 2006 that prescribes the procedure for industries to assess the ecological and environmental impact of their proposed activity and the mechanism whereby these would be assessed by expert committees appointed by the Ministry.
The key points of dispute with the proposed draft are that it shortens the period of public consultation hearings to a maximum of 40 days, and reduces from 30 to 20 days the time provided for the public to submit their responses during a public hearing for any application seeking environmental clearance.

Crucially, the draft also institutionalises “violation” projects. Under a provision issued in 2017, it allows projects that have come up flouting environmental norms to be reviewed by a committee of experts and, if they so decreed, legalise the project after paying a fine.

The proposed norms also allow the declaration of some areas as “economically sensitive areas” without a public hearing or environmental clearance, and several “red” and “orange”-classified toxic industries could now operate as close as 0-5 km from a Protected Area in “callous disregard” for forests.

Finally, the increased validity of the environment clearances for mining projects (50 years versus 30 years currently) and river valley projects (15 years versus 10 years currently) raises the risk of irreversible environmental, social and health consequences on account of the project remaining unnoticed for long.

Objectives of EIA:

- To identify, predict and evaluate the economic, environmental and social impact of development activities.
- To provide information on the environmental consequences for decision making.
- To promote environmentally sound and sustainable development through the identification of appropriate alternatives and mitigation measures.
- To identify and quantify emission sources and determine the significance of impacts on sensitive receivers and potential affected uses.
- To identify and quantify any potential losses or damage to flora, fauna and natural habitats.

Significance of EIA:

- EIA reports are a critical component of India’s environmental decision-making process.
- It acts as a detailed study of the potential impacts of proposed projects.
- It helps in predicting environmental impacts at an early stage in project planning and design.
- Based on these reports, the Environment Ministry or other relevant regulatory bodies may or may not grant approval to a project.
- The EIA reports are also important to define measures that the project could take in order to contain or offset project impacts.
- EIA-based approvals for most projects also involve the process of conducting public hearings, so that who are likely to be affected can be taken on board before approving the project.
- EIA links environment with development. The goal is to ensure environmentally safe and sustainable development.

Apprehensions related to EIA:

- Environmental decision-making processes for development projects are supposed to use the best available scientific knowledge to ensure that development does not lead to negative impacts.
- But there are compromised decision-making on development and infrastructure projects.
- Sometimes the EIA reports lack the expected degrees of honesty, owing to bias, corruption, exaggeration and wrong claims.
There are several projects with significant environmental impacts that are exempted from the notification either because they are not listed in schedule I, or their investments are less than what is provided for in the notification.

Public comments are not considered at an early stage, which often leads to conflict at a later stage of project clearance. Many projects with significant environmental and social impacts are approved without mandatory public consultation.

One of the biggest concerns with the environmental clearance process is related to the quality of EIA report that are being carried out.

There are so many cases of fraudulent EIA studies where erroneous data has been used, same facts used for two totally different places etc.

There are many instances of missing or misleading information which understate the potential impact of the projects.

It has been found that the team formed for conducting EIA studies is lacking the expertise in various fields such as environmentalists, wildlife experts, Anthropologists and Social Scientists.

Lack of awareness among the local people about the process of EIA, its significance for them, their own rights and responsibilities.

Most of the time EIA reports are unavailable in local languages, thus local people are unable to decipher the reports, and are misled by the proponents

**Way Forward:**

- Independent EIA Authority and Sector wide EIAs needed.
- Creation of a centralized baseline data bank.
- Dissemination of all information related to projects from notification to clearance to local communities and general public.
- All those projects where there is likely to be a significant alternation of ecosystems need to go through the process of environmental clearance, without exception.
- No industrial developmental activity should be permitted in ecologically sensitive areas.
- Public hearings should be applicable to all hitherto exempt categories of projects which have environmental impacts.
- The focus of EIA needs to shift from utilization and exploitation of natural resources to conservation of natural resources.
- The present executive committees should be replaced by expert’s people from various stakeholder groups, who are reputed in environmental and other relevant fields.
- The EIA notification needs to build within it an automatic withdrawal of clearance if the conditions of clearance are being violated and introduce more stringent punishment for noncompliance. At present the EIA notification limits itself to the stage when environmental clearance is granted.
- The composition of the NGT needs to be changed to include more judicial authorities from the field of environment.
- Citizen should be able to access the authority for redressal of all violation of the EIA notification as well as issues relating to non-compliance.
- NGOs, civil society groups and local communities need to build their capacities to use the EIA notification towards better decision making on projects.

**Conclusion:**

An EIA should not be used just as a means for obtaining an environmental clearance; rather, project proponents should use it as a management tool to assess the soundness of a project plan. The focus
of EIA needs to shift from utilization and exploitation of natural resources to conservation of natural resources.

**Disaster and disaster management.**

**Micro-level planning and adaptation and resilience plans is the need of the hour to address the climate crisis in the country. Elucidate. (250 words)**

*Reference: Hindustan Times*

*Why the question:*

Start by hinting towards onset of Both Amphan and Nisarga, in what way they are trailers of what the future is going to look like for India’s eastern and western coastlines.

**Key Demand of the question:**

One has to explain and emphasize on the fact that Micro-level planning and an adaptation and resilience plan is the need of the hour to address the climate crisis in the country.

**Directive:**

*Elucidate –* 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 with relevant associated facts.

**Structure of the answer:**

**Introduction:**

Explain what climate crisis is first. Discuss the need for the Cities to prepare better for disasters in the country.

**Body:**

Explain that as the coronavirus disease continues to engulf the world, the other big agenda of our time, the climate crisis has begun to re-emerge from the shadows. Present the case study of recent cyclones – Both Amphan and Nisarga are trailers of what the future is going to look like for India’s eastern and western coastlines, thanks to the climate crisis. The climate crisis is making these cyclones stronger and more destructive by increasing the sea surface temperature and rainfall during the storm; raising sea levels, which increases the distance that a storm surge can reach; and allowing storms to gain strength quickly. Suggest what needs to be done urgently to mitigate all these factors. Emphasize on the importance of micro level planning.

**Conclusion:**

A top-down climate adaptation and resilience policy will not suffice; the climate crisis will need micro-level planning and adaptation and resilience plans.

**Introduction:**

India’s vast coastline of 7500 kms is both a boon and a bane. On the one hand it provides avenues for trade, commerce and livelihood; while on the other, it is prone to natural disasters like cyclones, tsunami. The recent cyclones Amphan and Nisarga battered the east and west coast of India causing huge losses to infrastructure and lives. Human-caused climate change has played a role in shaping the global distribution of tropical cyclones in the past 40 years.

**Body:**

**Climate crisis and recent cyclones in India:**

- The rapid warming of the Indian Ocean due to climate change is leading to more cyclones pummelling South Asia, as storms gather more quickly and become more intense
The climate crisis is making these cyclones stronger and more destructive by increasing the sea surface temperature and rainfall during the storm; raising sea levels, which increases the distance that a storm surge can reach; and allowing storms to gain strength quickly.

In the case of both the recent cyclones, Amphan and Nisarga, the anomalously warm ocean temperatures are giving them a major boost. These recent cyclones are due to **ocean heat waves and warming up of oceans**.

Temperatures in the Bay of Bengal were between 30-33 degrees Celsius when Cyclone Amphan formed in mid-May and surface temperatures over the Arabian Sea were 30-32 degrees before the weather depression that evolved into Cyclone Nisarga.

Such high temperatures aid rapid intensification of cyclonic systems.

Indian cities need to adapt quickly to this new reality. A top-down climate adaptation and resilience policy will not suffice; the climate crisis will **need micro-level planning and adaptation and resilience plans**.

**Importance of micro-level planning and adaptation and resilience plans in tackling climate crisis:**

- The same plan, regardless of the regional characteristics, is implemented or imposed everywhere.
- Local knowledge, experiences, skills, resources and techniques are not given due importance. Rather external resources and techniques are proposed to be utilized.
- Negligence about local cultural instincts and heritage.
- Prioritisation is decided by an outsider and not the stakeholders or the community itself.
- Local community does not have any information about the disaster management plans for their area and the role of different sectors in helping the community during disasters.

**Advantages of micro-level planning:**

- Feelings of coordination and self-belonging to the society are developed.
- Local geo-climatic and socio-cultural characteristics get attention of the people in development and disaster management.
- Local initiatives begin and community provides assistance to the executing agencies involved in disaster management.
- There is exchange of knowledge, information, skills and techniques between the community and the experts involved from outside.
- Community comes forward to put forward its ideas for selection of appropriate programmes suitable to their locality and society.
- Community can monitor the quality of works being done in its locality. It will also generate a sense of responsibility among the community.
- It will lead to capacity building of the community on issues of disaster-safe developmental activities.

**Way forward:**
City governments must be politically and financially empowered; and have adequate personnel who understand the climate crisis.

On their part, government departments must stop working in silos; to develop a long-term resilience strategy, they need to work together because the climate crisis affects all sectors.

For centuries, cities have been centres of commerce, culture and innovation.

They must now develop the ability, the capacity, and the will to take on the climate crisis.

Discuss the role of media in disaster management in India. (250 words)

Reference: The Hindu

Why the question:
The question is based on the role of Media in disaster management of the country.

Key Demand of the question:
Explain the role of media in disaster management in India in detail with relevant examples.

Directive:
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:
Introduce by defining disaster management and its status in India. Define disaster management defined as the organization and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies, in particular preparedness, response and recovery in order to lessen the impact of disasters.

Body:
Highlight the role, which media can play in disaster management in India, explain how Media can prove to be of immense use in different phases including pre-disaster, during disaster And post disaster. Briefly mention some challenges that may arise due to media. Media has the responsibility to make the message more valuable and credible for the General public in the wake of a disaster. It needs to desist from any type of sensitization of news, politicization of crisis situation or any leakage of critical strategy, which may further create panic among people.

Conclusion:
Conclude with significance.

Introduction:

Disaster is a sudden, calamitous event bringing great damage, loss, and destruction and devastation to life and property. The damage caused by disasters is immeasurable and varies with the geographical location, climate and the type of the earth surface/degree of vulnerability. This influences the mental, socio-economic, political and cultural state of the affected area. The media forges a direct link between the public and emergency organizations and plays a very important role in disseminating vital information to the public before, during and after disasters.

Body:

Role of media in disaster management in India:

Pre-disaster:

- The media, by communicating the information to the people and the concerned authorities sufficiently in advance, can enable them to take the necessary steps to prevent and minimize the loss of life and property.
Media can effectively educate public about regional population’s susceptibility to various disasters. For example, educating the fishermen community about cyclones.

Advanced technologies and accurate weather prediction have helped avert major disasters during the Odisha and Andhra Pradesh cyclones.

The media could play an important role in raising public awareness and education for effective response to natural hazards through television and radio programs.

Furthermore, the role of newspapers can be significant in providing detailed information such as evacuation routes or preventive steps to follow in the preparedness process.

During disaster:

- It is during the disaster that media has a greater role to play.
- While the disaster is on, the media can also play the role of relaying the measures that are being taken and monitoring them.
- They can caution the affected or to be affected people about the Dos and Don’ts, of scotching rumours and preventing panic and confusion.
- They can help establish contacts, of identifying the needy spots and focusing attention on them, and generally by assisting the authorities, voluntary organizations and volunteers in reaching, informing and assuring the affected ones of the assistance and the measures taken, for their relief.
- During the onslaught of the disaster, what is of utmost importance is to keep the morale of the people high, to create self-confidence in them, to prevent panic and to maintain order by assuring and making available the necessary help readily and quickly.
- In times of crisis and natural disasters, amateur radio or ham radio is often used as a means of emergency communication when wireline, cell phones and other conventional means of communications fail.
- Media can also help in mobilizing resources, financial aid and volunteers from around the world.
- Lastly by continuous coverage it can also get disaster management on the focus of government.
- The media can help, in many ways in ensuring these conditions.

Post-Disaster:

- The rescue, relief and rehabilitation measures need an integrated and co-coordinated approach and for that purpose all agencies, government and non-government, have to pool their resources together for efficient, expedient and effective work on all fronts.
- It can help in disseminating information about survivors, diseased and effected people to the families elsewhere and world around. especially the social media can help in this with technological inventions like i am safe marker by Facebook and google
- Reporting genuine facts with constructive criticism by media would greatly help in restoring the order.
- Assist the government and the non-governmental organizations providing relief supplies to the people.
- Boosting the morale of the afflicted and those engaged in relief operations during any disaster is of primary importance.
- The collection of material resources and the enlisting of man-power are as much important as their efficient utilization.
- The depiction of devastation and of human misery through the media many times by itself acts as an appeal to the people to come forward to render help in various ways.
• In addition, the specific appeal made for relief through the columns and the time-slots of the media, brings in sizeable aid in the requisite form.
• At the same time, it becomes necessary to keep a watch and report on some anti-social elements who try to take advantage of such situations.

However, the media though has also come in bad light owing to the exaggeration of situation and giving unwanted importance to some issues. In their desire for TRPs and sensationalism, the media has overlooked basic ethics of journalism. During the Nepal earthquake, media was severely criticized as well as during the Uttarakhand floods, the visits of politicians was focused on rather than disaster management.

Areas where media can contribute:

• **Aid prioritization of Disaster Risk Issues:** The media can influence the government to prioritize disaster risk issues, thereby ensuring that “self-serving” political interests are not emphasized at the expense of the wider population.
• **Facilitate creation of Early Warning Systems:** Owing to the extensive outreach the media can help disaster mitigation experts create Early Warning Systems by providing information on risks and existing technologies that can aid the development of useful concepts and systems. Emergency Alert System (EAS), which uses radio, TV and cable services across the country in United States for transmitting early warning, has been very effective.
• **Increase international donations:** The media can trigger donations from the international community subsequent to the occurrence of national disasters, as well as push the government to increase budgetary allocations for disaster response programmes.
• **Improve coordination of risk assessment activities:** The media can improve the coordination of risk-assessment activities between policymakers and donor communities. This integration of effort should result in increased availability of resources and improved work programmes geared towards saving lives of affected populations and vulnerable communities.
• **Media ethics:** It is important that ethics in journalism during disaster reporting are strictly followed. The survivors and the grief stricken people deserve complete privacy and if at all, their consent must be sought and questions must be brief. The media was seen taking up the space on the arrival of the choppers with relief material. During a disaster relief must take precedence which the media failed to comply with.

Conclusion:

“Quick, Reliable and Accurate (QRA)” are three essential keywords for disaster related information. The media play a unique role in disaster mitigation. Although the aims of the media and those of disaster mitigation organizations are not synonymous, without compromising the independence and integrity of either, much can be done to communicate to the public the information that will help many save their own lives.

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.

Many of the ills of social media today can be tackled by inculcating right behavior in the people and by bringing awareness of right attitude. Discuss. (250 words)

*Reference: Live Mint*
Why This Question:
The article very well talks about the current issues being faced and posed by the social media and the role of attitude and behaviour in dealing with the ills of it.

Key Demand of the question:
Explain how ills of social media today can be tackled by inculcating right behaviour in the people and by bringing awareness of right attitude.

Directive:
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:
Information and communication technology has changed rapidly over the past 20 years with a key development being the emergence of social media.

Body
First explain how Social media is being used in ways that shape politics, business, world culture, education, careers, innovation, and more. Discuss the impact of social media in general; explain how attitude and behaviour of people often shape the ideologies through these mediums. Explain that responsible behaviour online could be inculcated by generating awareness across India.

Conclusion
Conclude with need to recognise the importance of generating awareness and inculcating right attitude and behaviour in the people to overcome these ills.

Introduction:
The term “social media” refers to internet-based applications that enable people to communicate and share resources and information. While they have enabled faster communication, there are many challenges, of which information hygiene is the most important.

We live in an age of infodemic, where there is a lot of data to consume; but at the same time the veracity of claims made by the information is not factually true. This leads to fake news and mass hysteria.

Body
Challenges posed by social media and its content:
There are more than 500 million internet users in India and today social media is not only a subset of internet rather the internet itself.

• Weaken the democracy: Fake news poses a serious challenge to this proposition as it misleads the consumers of information, poses a threat to a democratic society as it can give a handle to the state to interfere with the functioning of media.
  ▪ For instance, Facebook took a hammering over Russia’s interference in the 2016 U.S. election.
  ▪ It conceded the following year that up to 10 million Americans had seen advertisements purchased by a Russian agency.

• Affecting choices and behaviours: These platforms are predominant source of news and a critical mass of misinformation leads to mis-directed behaviours filled with fake news and disinformation aimed at influencing choices ranging from day to day life to political choices made during the Indian elections.
• **Creating fear and Panic:** A small indiscretion of forwarding an unverified message can lead to loss of life or cause a serious disturbance of public order.
  
  - With governmental and public resources pushed to limits, it is incumbent upon the general public to perform diligence in their interactions with reference to the Pandemic.
  - On April 16, a group of villagers in Palghar district of Maharashtra dragged out three men out of their car and beat them to death on suspicion that they were thieves. The attack on the three took place amid a nationwide lockdown.

• **Communalizing the issues:** The Tablighi incident during the coronavirus pandemic added fuel to already tense environment in Delhi and elsewhere. News regarding the same circulated widely on social media, unabated, further giving the pandemic a communal color.

• **False remedies** such as distributing unchecked concoctions, medicines and herbs at egregious prices to unsuspecting innocent people online. It may lead to worsening the underlying conditions in people and endanger their lives.

• **Accountability issues:** Challenges with respect to fixing the liability of intermediaries. It is also difficult to trace the origin of fake news circulation.

• **Jurisdictional challenges:** Complications in jurisdiction as Facebook, twitter etc. operate as subsidiaries of foreign internet companies with their servers located outside India.

• **Anonymity:** Police officers have expressed concern over multiplicity of fake profiles. There is no accountability of a crime.

• **Encrypted Message:** Use of WhatsApp to send and receive messages, concerns the government because the communications sent via such devices and applications are encrypted.

• **Spread hatred and mistrust:** False information propagated through fake news have helped people developing racist and xenophobic sentiments against people of Asian origin around the world, as we saw in the case of Corona epidemic. Such messages can often be a means of reinforcing existing prejudices.

**Citizens’ actions to curb the social media ills:**

- **Responsible citizenry:** Consumers who play the central role in the spread of misinformation, are also the most efficient and effective in debunking the various myths and fake news. This skill can be taught via:
  
  - **Creating awareness on television and social media.**
  - Innovative initiatives like ‘Fake News Classes’ introduced in government schools in Kerala, where they teach students how to identify and spot misinformation.
  - By asking questions like “What is the source of that (post/forward)?” before sending it to other people.
  - Use fact-checking services, there are many reputed factchecking sites, which help people to verify claims made on social media or messages which have gone viral.
  - This can be done simply by a quick search on Google, or checking for that information or visiting the official websites to verify the accuracy of the data.
• In case of any claims made in the message one has received, conduct secondary checks on google or other sites before disseminating it.

Promoting the culture of authenticity:
• The people who consume the data on an everyday basis educate themselves and acquire the skills to tackle it.
• There is a need to shift towards a system where self-verification of information is an ‘internet skill’ and an important duty.

Ascertaining the source and origin of the message. If one is not sure of the authenticity and correctness of the message or its content, one may make attempts to be sure of the veracity of the matter before forwarding it to others.
• If the message incites strong emotions, it is likely to be sent for such purposes. Any shocking or outrageous claim made needs to be verified before it is sent to others who may believe it completely.
• In case of the message containing videos or pictures, there is a possibility of them being edited or used out of context to mislead unsuspecting recipients. A simple reverse image search on google can reveal the original source and context of the picture. Any harm resulting from such forwarding can make the person doing so liable to legal consequences.

Governmental measures:
• Strict Law enforcement: Section 505(1) of Indian Penal Code, 1860: The punishment for making, publishing or circulating any statement, rumour or report which may cause fear or alarm to the public, or to any section of the public.
  ▪ Section 66D of Information Technology Act: Whoever, by means for any communication device or computer resource cheats by personating. Punishment includes imprisonment of for a term which may extend to three years and shall also be liable to fine which may extend to one lakh rupees.
  ▪ Section 54 of the Disaster Management Act, 2005: Whoever makes or circulates a false alarm or warning as to disaster or its severity or magnitude, leading to panic. Punishment is Imprisonment which may extend to one year or with fine.
• Proactive web monitoring: The Mumbai Police has launched a project called “Social Media Lab” to check explosive content on various platforms and quell fake news.
  ▪ Initiatives such as ‘WhatsApp’s Checkpoint Tipline’, ‘The Logical Indian’ should create user awareness regarding fake news.
• Crisis Protocols: Creating a crisis protocol for responding to emerging or active events, on an urgent basis, so relevant information can be quickly and efficiently shared, processed, and acted upon by all stakeholders with minimal delay.
• Global cooperation: Christchurch Call of Action outlined voluntary commitments from governments, ISP’s to address issue of violent extremist content online. India is a signatory to this plan.

Conclusion:
The state and its different enforcement apparatus have to remain ever vigilant in the online and virtual worlds to protect individuals and society from the lurking dangers of an Infodemic. This entails timely detection of content before it goes viral and causes widespread damage, taking it down with the help of social media platforms and intermediaries and tracing the sources of such mischief. Media outlets and the press also have an enhanced responsibility to make people aware and increase literacy about the menace of fake news and misinformation.

With trends like ‘George Floyd Challenge’ becoming a rage on social media, there is a need for platforms to monitor such content, In this context discuss measures to be taken to battle infodemic.(250 words)

Reference: thewire.in

Why the question:
The article presents to us the nuances of the social media and in what way it is being used as a weapon of rage under various circumstances.

Key Demand of the question:
The question is about battling the Infodemic facing the entire world and about examining the ways and means with which it can be resolved.

Directive:
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 fact that as the world battles a pandemic, the biggest source of information are digital channels. However, the bigger issue with digital sources is verification.

Body:
Today, social media platforms are a bigger source of information than news websites or journals. Thousands of live streaming videos on Facebook, Tiktok, Instagram, twitter which go viral on these platforms let consumers instant information about what is happening before it is published on news websites. But the authenticity of these videos and stories can be contested. Present the case study of ‘George Floyd Challenge’.

Talk about the challenges – lack of authenticity, verifiability, False claims and fake news have also led to several cases of communal violence, hate speeches and other discriminatory activities, while cyber frauds are also on the rise with fraudster seeking to take advantage of the crisis. With so much of unverified content present in the digital space, the government, media and public must work in coordination to combat fake news.

Conclusion:
Conclude with measures and policies already in place to address such challenges while also suggest more amicable measures to resolve them.
Social Media, with its ability to amplify a message through endorsements and forwards, gives one the tool to reach a potential audience without needing substantial resources or access to expensive media technology.

- Social media provides the tools for an information cascade. It enables individuals to distribute large volumes of disinformation or fake news.

- **George Floyd Challenge:** An insensitive ‘challenge’ on social media that has people imitating a police officer kneeling on George Floyd’s neck has left people fuming online.

- Social media sites have been clamping down on people participating in it. In this context “infodemic” becomes important, especially when the world is also battling a pandemic.

- **Echo Chambers:** Today’s decision-making is not based on individual rationality but from shared group-level narratives.

- Social media helps in making the false and misleading narratives of some social miscreants.

- These issues can be reflected in the Covid-19 pandemic. There are rising dangerous conspiracy theories of Covid-19 of being a Bioweapon.

- A rumour of a lockdown of essential commodities resulted in people hoarding the essential supplies.

- **Non-Utilitarian:** The anonymity that the internet lends was supposed to aid freedom of speech and, thereby, help democracy thrive.

- But, political elites have managed to design a grim nexus between anonymity, capital, and technology to influence public opinion, promote political agendas, and disseminate fake and misleading news and information.

- **Tools for disharmony:** Fake news can divide people based on many fault lines, especially in a diverse country like India. It increases Ghettoization and communalism.

- **Deep Fake**, a new entrant to the arena is even vicious than spreading misinformation. It is used to combine and superimpose existing images and videos onto source images or videos using a machine learning technique known as generative adversarial network.

- **Mob lynching:** Rumors of child lifting in Jharkhand led to mob lynching on innocent victims.

- **Violence:** An atmosphere of violence and chaos is created directly or indirectly. The Christchurch Terror attack on a mosque by an extremist was a result of Islamophobia (a direct result of hate speech).

- **Misinformation and disinformation** due to hate speech and fake news have led to riots as seen in the Delhi Riots case 2020.

Despite the various issues of social media, it is also proven to be highly advantageous due to below reasons.

**Social media advantages**

- Covid-19 has led to social distancing and lockdown all across the nation. In these conditions, social media serves as:

  - A crucial conduit between families, friends, office, and a medium of entertainment.
A reliable way for the victims of this virus to **communicate with the outside world**.

- Social media has also been instrumental in helping improve the situation.
  - In response to Covid-19 pandemic, it gave birth to a fair share of online fundraisers. For example, donations in the **PM-CARES fund** got encouraged by people sharing this on social media.
  - People are also giving money to financially struggling hospitals, as well as individuals at risk of dying from the disease.
- **Scientists** are using social media tools to collaborate.
  - The coronavirus genome was openly published early on during the outbreak, allowing thousands of researchers to brainstorm possible solutions, cures and explanations.
- Social media **displays and strengthens solidarity** against this virus. For example, Indian Prime Minister called for lighting lamps to reinforce the public commitment to fight Covid-19.
- It is being used to **spread preventive steps** that one can take to fight Covid-19. These small changes in behaviours can have enormous consequences.

### Measures taken to battle infodemic

- **Producing and disseminating facts and accurate information**: The world's biggest social media companies, including Facebook, Google, Twitter and ByteDance, are exploring an **industry-wide alliance** to curb fake news on their platforms in India.
  - The proposed alliance — to be named the **Information Trust Alliance (ITA)** — will be a grouping of digital platforms and publishers, fact checkers, civil society and academia that will aim to control the spread of harmful content, including fake news and hate speech.
  - **Facebook** has announced that it currently has over 500 full-time employees and at least 3,500 external contractors who focus on election work, on top of the 30,000 people across the company focused on safety and security issues.
- **Partnering with businesses**: For instance, while partnering with WhatsApp and Facebook, **WHO launched dedicated messaging services in several languages**, including Arabic, English, French, Hindi, Italian, Portuguese and Spanish, to share critical guidance on COVID-19.
  - This easy-to-use messaging service could reach up to 2 billion people and allows WHO to get the facts directly into people’s hands.
  - Eg: Facebook has promised to ban ads that promise “cures” for the Covid-19 virus.
- **Working with media and journalists**: **Press Council of India**, a regulatory body, can warn, admonish or censure the newspaper, the news agency, the editor or the journalist or disapprove the conduct of the editor or the journalist if it finds that a newspaper or a news agency has violated journalistic ethics.
  - A better and more effective approach to limit the influence of hoaxes on WhatsApp and other platforms is to increase **media literacy**.
- **Information hygiene**: This needs to be practiced and can be cultivated through user awareness.
  - Verifying the authentic source of fact.
Double checking with some fact checking website.

Asking some expert opinion on that particular issue.

Applying rational thinking while going through a forwarded news on social media.

Applying these ideas before sharing the same.

- Government of India could partner with local news groups to further educate citizens on how to identify real news from fake news. **Eg: Logical Indian site**
- Imposing hefty fines, like in Germany the Social media companies face fines of up to €50m if they persistently fail to remove illegal content from their sites.

**Conclusion**

Social media is a double-edged sword and infodemic is one such offshoots of a platform that has the ability to disseminate information globally in a second. A tripartite collaboration of governments, industry and citizenry is needed to responsibly use social media platforms for the benefit of humanity, more so in these testing times.

**Account for the need for an updated cyber security strategy for India. (250 words)**

**Reference:** Financial Express

**Why the question:**
The article presents a detailed analysis of why India needs an updated Cyber security strategy.

**Key Demand of the question:**
One must Account for the need for an updated cyber security strategy for India.

**Directive:**
Account – Weigh up to what extent something is true. Persuade the reader of your argument by citing relevant research but also remember to point out any flaws and counter-arguments as well. Conclude by stating clearly how far you are in agreement with the original proposition.

**Structure of the answer:**

**Introduction:**
Although India was one of the few countries to launch a cybersecurity policy in 2013, not much has transpired in terms of a coordinated cyber approach.

**Body:**
Discuss why cyber-attacks are on the rise? Financial services, payments, health services, etc are all connected to digital mediums; and thanks to Corona, this is expected to increase. In India, too, attacks have been happening with increasing frequency.

Discuss examples of recent cyber attacks. Explain the role being played currently by CERT-In. While CERT-IN has responded to cyber threats, it has been late in conducting security checks, and often has released advisories once an attack has taken place. In the case of WhatsApp and Pegasus, CERT-IN only came in after others had warned of the possibility of individuals being compromised.

With countries resorting to digital warfare and hackers targeting business organisations and government processes, India needs comprehensive cybersecurity guidelines and standards for checking cyber vulnerabilities and cyber responses.

**Conclusion:**
Conclude with way forward.

**Introduction:**

Cyber Security refers to protecting cyber space including critical information infrastructure from attack, damage, misuse and economic espionage. Cyber security is a broad spectrum phrase and relates to preventing any form of unauthorized and malafide access to a personal computer, a
laptop, a smartphone or a major network like the national banking system or the railway network or a national information technology asset that also has military implications.

Recently, Australia had to stave off its biggest cyber threat with the attack targeting everything from public utilities to education and health infrastructure. India has also been a victim to many such cyber-attacks in the past like WannaCry, Petya ransomware, Mirai botnet etc.

Body:

Incidences of cyber-attacks in India:

- In India, too, attacks have been happening with increasing frequency.
- More than 4,000 fraudulent portals emerged within two months, and on a typical day in April 2020, Google alone blocked 240 million spam messages and 18 million phishing scams.
- In 2016, banks had reportedly announced a leak of personal information of 3.2 million debit cards.
- In 2018, Pune-based Cosmos Bank lost Rs 94 crore in a malware attack. Last year, the Kudankulam plant was attacked using malware.
- Criminals can defraud unsuspecting users in sharing their bank or credit card account details with the PIN and passwords, intimidate and bully others, indulge in cyberstalking or, for that matter, could be involved in cyberespionage, terror financing or child pornography.
- Operations of critical infrastructure such as power grid or ports can come to a halt with ransomware, and fake news can flare up social tensions.

Need for an updated cyber-security strategy for India:

- With the vision of a trillion-dollar digital component, accounting for one-fifth of the $5-trillion national economy, the importance of cyberspace in India would only keep growing as Indians have taken to mobile broadband like fish to water, driven by affordable tariffs, low-cost smartphones and a spurt in availability of audio-visual content in Indian languages.
- Financial services, payments, health services, etc are all connected to digital mediums; and thanks to Corona, this is expected to increase.
- CERT-IN has recently issued an advisory that there is a threat of a massive phishing attack.
- India was one of the few countries to launch a cybersecurity policy in 2013, not much has transpired in terms of a coordinated cyber approach.
- Unlike the US, Singapore, and the UK where there is a single umbrella organization dealing in cybersecurity, India has 36 different central bodies—most ministries have their own—that deal with cyber issues, and each has a different reporting structure; each state government has its own CERT.
- Add to this the fact that while the National Cyber Security Strategy 2020 was to devise a cyber-readiness roadmap for organisations and the government for cyber-readiness, this is yet to be announced.
- India is not even a signatory to some of the basic international frameworks on Cybersecurity like the Convention of Cybercrime of the Council of Europe which not only European nations but Japan, US, South Africa have become signatories to, except India.
- Indian laws are not in tandem with the ever-changing global cyberspace.
The laws are old and hence need to be more dynamic in nature to deal with issues like cyber-espionage, data theft and so on.

The Information Technology Act, 2000 (IT Act 2000) is the sole law that deals with cyberspace in India and was passed way back in 2000.

Also, the Cyber Law of India has been subject to amendments on various occasions but hasn’t served the changing dynamics and the growing threats and manifestations of cyberwar.

Strategy should include the following:

- Since a global consensus is unlikely any day soon, India should consider joining or leveraging existing frameworks like the Convention on Cybercrime and the Paris Call. After all, cybersecurity has become a geopolitical issue, as reiterated time and again by the Prime Minister.

- **Security by design, budgeting by default:**
  - It is high time that 10% of every IT budget in the government be earmarked for cybersecurity, as recommended by the NASSCOM Cyber Security Task Force, just like 1-3% of every ministry’s budget was set aside for IT in 1998, as recommended by the Prime Minister’s IT Task Force in 1998.
  - The National Cyber Security Strategy (NCSS) 2020 and the data protection framework must be consistent with each other.
  - Exceptions and exemptions must be narrowly crafted, in compliance with the principles of lawfulness, fairness, transparency and proportionality laid down by the Supreme Court in its 2017 privacy judgment.

- **Prevention is better than cure:**
  - Nine out of 10 data breaches can be mitigated if we all take care of basic cybersecurity like using licensed and updated software, using different and difficult passwords for different services and devices, multi-factor authentication and strong encryption.
  - We need innovative solutions to scale up awareness as our user base is expected to reach a billion over the next five years, compared to half a billion currently.

- **Bidirectional partnership:**
  - The government should share its own assessment back with the private sector to create incentive for the latter to proactively share their intelligence on threat vectors without jeopardizing contractual obligations or intellectual property.

- **Pragmatic, predictable, flexible**
  - Underlying principles must go along with the strategic objectives and provide sufficient guidance and flexibility to sector regulators within their respective ecosystem.
  - For example, the cybersecurity guidelines or frameworks issued by RBI, SEBI, IRDAI and PFRDAI can be greatly synergized under the aegis of the Financial Stability and Development Council (FSDC), thereby bringing greater sanity for the regulators as well as the regulated entities.
In addition, every regulation must emerge through public consultation and be backed up with a regulatory impact assessment, whether it is about cross-border data flows or restricting encryption.

Measures needed:

- **A Defence Cyber Agency** could be the first step the government plans to for critical infrastructure and military networks that are increasingly becoming dependent on the Internet, thus increasing vulnerabilities.
- The Defence Cyber Agency will work in coordination with the National Cyber Security Advisor. It will have more than 1,000 experts who will be distributed into a number of formations of the Army, Navy and IAF. According to reports, the new Defence Cyber Agency will have both offensive and defensive capacity.
- Equally important is **cyber propaganda**. During the Doklam conflict, China tried its best to unleash cyber propaganda on India and indulged in complex psy-ops.
- **Critical cyber infrastructure** needs to be defended and the establishment of the National Critical Information Infrastructure Protection Centre (NCIIPC) is a good step in this direction.
- Individual ministries and private companies must also put procedures in place to honestly report breaches. It is only then that the NCIIPC can provide the requisite tools to secure these networks. This partnership must be transparent and not mired in the usual secrecy of intelligence organizations.
- The **upgrading of the Defence Cyber Agency to a Cyber Command** must be implemented at the soonest.
- A robust ecosystem must be built to secure India from acts of state and non-state actors, including protocol for grievance redressal in international forums.
- Better capabilities must be built to detect and deflect attacks.
- The **computer emergency response team (CERT)** must be strengthened and aligned with military and foreign affairs operations.
- Building a joint task force between the government and key technology players will be crucial.
- The government should push for the creation of a **global charter of digital human rights**.
- **A national gold standard** should be created, which ensures that Indian hardware and software companies adhere to the highest safety protocols.
- Impart cybercrime investigation training and technological know-how to the various law enforcement agencies.
- **Cyber awareness** must be spread and there should be multi-stakeholder approach-technological inputs, legal inputs, strengthening law enforcements, systems and then dealing with transborder crime involves lot of international cooperation.

**Conclusion:**

Most of the Indian banking industry and financial institutions have embraced IT to its full optimization. Reports suggest that cyber-attacks are understandably directed toward economic and financial institutions. With innovative, technology led programmes such as AADHAAR, MyGov, GeM, Digital Locker the new India is the land of technological prowess and transformation. Government and the private sector jointly have to give cyber security some priority in their security and risk management plan.
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