



# INSIGHTSIAS

SIMPLIFYING IAS EXAM PREPARATION

## **SECURE SYNOPSIS**

## **MAINS 2020**

**GS-III**

## **OCTOBER 2019**



**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.

**Insights IAS Felicitation Function**

**CELEBRATING  
OUR STUDENTS' ACHIEVEMENTS & SUCCESS!**

**70 toppers out of 130  
from Insights were felicitated**



Apply Now at  
[www.insightsactivelearn.com](http://www.insightsactivelearn.com) | [www.insightsonindia.com](http://www.insightsonindia.com)



## Table of Contents

Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment.....	8
<b>If the government is serious about Make in India for APIs and boosting R&amp;D spending by pharmaceutical companies, it must shun price controls as a policy measure. Discuss measures required to be taken by the government in augmenting the Pharma sector.(250 words) .....</b>	8
<b>Is it imperative to focus on agricultural production in devising a long-term solution to the problem of unemployment and the present slowdown in economy? Critically Analyse. (250 words).....</b>	10
<b>With India facing an economic slowdown, it is a superlative time to instrument agricultural reforms for the restoration of the economy. Analyse. (250 words) .....</b>	12
<b>What are Green Skills? Discuss the Importance of Green Skill Development Programme that was launched recently. (250 words).....</b>	14
<b>What is a randomised controlled trial in the context of research that won the Nobel Prize in Economics 2019? Why is it so popular? Explain. Also discuss few criticisms of randomised controlled trials. (250 words) .....</b>	16
<b>Putting more money in the hands of the poor, who have a high propensity to consume, should be the aim of our fiscal policy to revive India's ailing economy and ensure inclusive growth. Comment.(250 words) .....</b>	18
<b>To be a \$5-trillion economy by 2025, India needs to build a cohesive national strategy around artificial intelligence (AI), do you agree? Justify your opinion with suitable illustrations. (250 words).....</b>	20
<b>Small businesses hold the greatest potential for job creation, thus a policy agenda to meet India's steep employment challenges must enable them on priority. Elucidate. (250 words) ....</b>	22
<b>As one of the fastest growing online retail markets among the economies of the world, the e-commerce sector must be assured of a fair policy framework to support India's emergence as a \$5 trillion economy by fiscal year 2024-25. Comment.( 250 words).....</b>	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.....	28
<b>Discuss the need of a strong agriculture/veterinary patent regime to augment India's agricultural research and development sector, also, analyse how it can prove to be a road map for agricultural technology transfer and commercialization? (250 words) .....</b>	28
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.....	31
<b>A sustainable solution for price stabilisation is the need of the hour than merely relying on ad-hoc measures. Discuss in the context of Operation Green-TOP.(250 words) .....</b>	31
Food processing and related industries in India- scope and significance, location, upstream and downstream requirements, supply chain management. .....	33
<b>The recently released 20th Livestock Census report census shows that the Centre's drive to increase indigenous breeds of cattle seems to have had little impact among cattle kept for dairy</b>	



<b>purposes, in the backdrop of it analyse the success of such missions and suggest ways for improvement.( 250 words) .....</b>	<b>33</b>
<b>Food Corporation of India's rising debt stock is an alarming concern; discuss in detail the causative factors of the same while suggesting suitable measures to address the issues.( 250 words).....</b>	<b>36</b>
<b>Infrastructure: Energy, Ports, Roads, Airports, Railways etc. ....</b>	<b>39</b>
<b>"Prevention is better than cure". Appreciate the statement in the context of fighting disasters. Also, discuss the role that the Coalition for Disaster Resilient Infrastructure can play in addressing this aspect.(250 words) .....</b>	<b>39</b>
<b>Discuss the Renewable energy generation capacity of India.What would be a cost-effective way to enhance the renewable energy generation capacity of India? Elaborate. ( 250 words) .....</b>	<b>41</b>
<b>Energy efficiency is the foundation of a strong, self-sufficient, and sustainable economy. Comment.( 250 words) .....</b>	<b>44</b>
<b>Science and Technology- developments and their applications and effects in everyday life; Achievements of Indians in science &amp; technology; indigenization of technology and developing new technology. ....</b>	<b>46</b>
<b>India is preparing for a massive digital and technological transformation; in such a phase discuss India's preparedness with respect to embracing Industrial Revolution 4.0.(250 words) .....</b>	<b>46</b>
<b>Lithium-ion batteries are the edifice of the wireless technology revolution. In this context discuss their significance and challenges facing these rechargeable Lithium Batteries.(250 words) .....</b>	<b>48</b>
<b>Technological solutions to combat environment challenges might not be the best mode of action. Do you agree? Discuss with suitable illustrations.(250 words) .....</b>	<b>50</b>
<b>What is ancient DNA (aDNA) and what has it been used to study? Analyse and discuss the utility of it.(250 words) .....</b>	<b>52</b>
<b>What are Organoids? Discuss the role played by them in helping to understand diseases better. Also explain ethical challenges associated with them.( 250 words) .....</b>	<b>53</b>
<b>What are Nano pharmaceuticals? Discuss their key features and elucidate on the role played by them in extending the economic life of proprietary drugs. (250 words) .....</b>	<b>55</b>
<b>When used sensibly, Big data can save lives and help build better future citizens. Explain with suitable illustrations.(250 words) .....</b>	<b>57</b>
<b>Awareness in the fields of IT, Space, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights. ....</b>	<b>62</b>
<b>Artificial Intelligence, is it an end to human miseries or an end to humanity itself? Critically analyse.(250 words) .....</b>	<b>62</b>
<b>Do you think it is imperative that India's legal prowess be applied to the situational complexities of space exploration? Discuss in the backdrop of world's first space crime. ( 250 words) .....</b>	<b>64</b>
<b>Espionage activities through the use of digital tools are increasing in the recent past, in this context discuss the need for India to invest and recruit heavily in counter-measures against social media espionage. ( 250 words) .....</b>	<b>66</b>



<b>Edge computing is the new future face of cloud computing. Elucidate while explaining the relevance of edge computing in the coming times. (250 words) .....</b>	67
Conservation, environmental pollution and degradation, environmental impact assessment .....	70
<b>What is Single Use Plastic? Discuss the challenges posed by them and explain in what way one can deal with the plastic menace steadily and replace it? Also suggest way forward. (250 words)</b> .....	70
<b>The government of India's bid to build a Green wall will be a breakthrough development if fulfilled successfully. Comment.(250 words).....</b>	73
<b>Explain the significance of C40 Clean Air Cities Declaration. Why do you think cooperation at global level is necessary? Discuss the challenges and ways to address air pollution across the global cities.( 250 words) .....</b>	75
<b>Climate change mitigation should be integral to the urban planning, in this regard, discuss the strategies to be developed to have a sustainable urbanisation and discuss any measures taken by the government to that effect. (250 words) .....</b>	78
<b>"The first step towards tackling climate change is to accept the science and create conditions for innovative solutions". Comment. ( 250 words).....</b>	80
<b>What are green crackers? Are green crackers less polluting and to what extent there is awareness among people about it? Explain.( 250 words) .....</b>	83
<b>What do you understand by 'carbon mineralisation'? How does it help in the fight against climate change? Which are other significant carbon capture and storage methods? Discuss the prospects of CCS.( 250 words) .....</b>	85
<b>India intends to move away entirely from single-use plastics by 2022,yet the fact is India hasn't had much success with plastic waste regulation despite ambitious policy moves. Discuss in detail the underlying causes of such a situation and suggest solutions. ( 250 words) .....</b>	88
Disaster and disaster management.....	91
<b>Extreme weather like long dry spells, accompanied with more intense rainfall concentrated over fewer days, are becoming the norm. In this context critically evaluate how Climate change and poor urban planning are jeopardizing lives of people. (250 words) .....</b>	91
<b>States of Bihar and Uttar Pradesh face floods frequently because of various natural and manmade reasons. Analyse floods with Patna as a case study in mind.(250 words) .....</b>	94
<b>Mangroves can act as first line of defence against coastal flooding. Elucidate. ( 250 words).....</b>	96
Linkages between development and spread of extremism.....	98
<b>Discuss the significance of community-based natural resource management. Also, analyse to what extent it can aid in better provisioning of ecological services of a region.( 250 words) .....</b>	98
Role of external state and non-state actors in creating challenges to internal security.....	100
<b>What should be the extents of focus if India desires to accomplish the goal of making a place for itself amongst the top 50, in the Ease of Doing Business Index by 2020? Discuss the possible challenges it can face. Suggest solutions to the same. ( 250 words) .....</b>	100



## INTEGRATED CLASSROOM COACHING(OGP) FOR FRESHERS

**NEW BATCH Starts from 4<sup>th</sup> November 2019 at BENGALURU**

### Features

- ◆ Nearly 500 Hours of classroom teaching for freshers
- ◆ Special CSAT classes every week.
- ◆ Special Current Affairs classes every week
- ◆ Special Sessions on Essay and Mains answer writing
- ◆ 58 Full Length Prelims Mocks as part of OGP-2020 aligned with CLASSROOM TEACHING
- ◆ 12 Full Length Mains Tests
- ◆ Mentorship Program
- ◆ Individual attention – Guaranteed!
- ◆ Separate Mains test series after Prelims
- ◆ Interview guidance Program
- ◆ Unparalleled Guidance throughout your preparation
- ◆ Full time Psychotherapist will be at institute to ease students during Stressful Preparation
- ◆ IGNITE@INSIGHTS, a platform where eminent personalities with enormous knowledge from diverse fields interact with our students and motivate them. Recent Sessions were by Mr. OP Choudhary – former IAS officer, Mr. Anil Swarup- former Coal Secretary, Mr. Deepak Gupta- former UPSC Chairman

### Optional Subjects Available

- ◆ Public Administration classes and Test Series
- ◆ Anthropology Classes and Test Series
- ◆ Kannada Literature Classes & Test Series

### UPSC TOPPERS

**2014**



Nitish K  
AIR 8, CSE 2014



Neha Kumari  
AIR 26, CSE 2014

**2015**



Artika Shukla  
AIR 4, CSE 2015



Kirti Chekuri  
AIR 14, CSE 2015

**2016**



Nandini K R  
AIR 1, CSE 2016



Dhyanchandra H M  
AIR 47, CSE 2016

**2017**



Anudeep  
AIR 1, CSE 2017



Anu Kumari  
AIR 2, CSE 2017

**2018**



Shrushti Deshmukh  
AIR 5, CSE 2018



Rahul Sharangappa Sankarur  
AIR 17, CSE 2018

### BANGALORE

📍 INSIGHTSIAS, NANDA ASHIRWAD COMPLEX,  
3rd floor, Above Village Hyper Market,  
Chandralayout Main Road, Attiguppe,  
Bangalore - 560072  
📞 Ph. No: 7483163074

### DELHI

📍 INSIGHTSIAS, 57/12, 3rd floor,  
Above kumar Book Centre,  
Old rajinder Nagar,  
New Delhi - 60  
📞 Ph No: 7303318519

### HYDERABAD

📍 INSIGHTSIAS (Initiative of INSIGHTSONINDIA)  
#1-1-379/212 , Indira park Main Road,  
Beside Balaji Darshan. Opposite to victoria cafe.  
near Ashoka Nagar Signal. Ashok Nagar.  
Hyderabad, Telangana-500020  
📞 8688512637



# NOW IN DELHI

**India's premier institute is Proud to have bagged  
120+ ranks in UPSC CSE 2018**

**NEW BATCH FOR INTEGRATED CLASSROOM COACHING &  
FREE Interview Guidance STARTING SOON**

**Hit rate of 80% Questions from INSIGHTSIAS PRELIMS Test Series in CSP-2019**

**Hit rate of 70% MAINS QUESTIONS from INSIGHTSIAS MAINS**

**TEST SERIES & SECURE INITIATIVE in CSM-2019**

### **INTEGRATED PRELIMS CUM MAINS TEST SERIES 2020**

- A disruptive methodology in preparation to UPSC CSE Examination 2020 with Single Timetable for both Prelims and Mains Preparation
- Conquer the uncertainty of selection in prelims with 51 high quality Prelims Tests (General Studies 41, CSAT – 10) and a sure shot in MAINS 2020 with 46 Mains Tests (Sectional 20, Full Length 16 and Essay 10)

### **INSIGHTSIAS AUTUMN MAINS (IAM) TEST SERIES (3.5 Months Mains test series)**

- Comprehensive coverage of SYLLABUS with 20 High quality MAINS Tests (Essay, GS I, II, III, IV).
  - 20 MAINS TESTS consist of 16 GS Tests + 4 Essay Tests.
- \*\* Flexible test timings, personalised mentorship Video discussion, Value Additional material, detailed synopsis of tests

**STARTING FROM 14th OCTOBER**

**PRELIMS TEST SERIES :** Designed for both freshers and veterans  
Strictly based on UPSC pattern

**\*ALL TEST SERIES ARE AVAILABLE IN ONLINE AS WELL AS OFFLINE MODE AT  
DELHI, HYDERABAD AND BANGALORE CENTRES**

**BANGALORE  
ADDRESS**

**INSIGHTSIAS**

NANDA ASHIRWAD COMPLEX,  
3rd floor, Above Village Hyper Market,  
Chandralayout Main Road, Attiguppe, Bangalore – 72

**Ph. No: 7483163074**

**DELHI  
ADDRESS**

**INSIGHTSIAS**

57/12, 3rd floor, Above Kumar Book Centre,  
Old Rajinder Nagar, New Delhi - 60.

**Ph No: 7303318519**



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

If the government is serious about Make in India for APIs and boosting R&D spending by pharmaceutical companies, it must shun price controls as a policy measure. Discuss measures required to be taken by the government in augmenting the Pharma sector.(250 words)

[Financialexpress](#)

**Why this question:**

*The article captures that the government is mulling over excluding medicines made from locally manufactured active pharmaceutical ingredient (API)—the key raw material for the production of a drug—from price control. The move, according to a Mint report, is aimed at pushing manufacture of APIs in India to reduce import dependence.*

**Key demand of the question:**

*One has to discuss in depth the need to do away the price controlling policies by the government with respect to APIs in the pharma industry so as to boost the Make in India drive for the sector.*

**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 define what APIs are.*

**Body:**

*Discuss the context of the question as to what steps the government is trying to take.*

*Explain in what way the price control was affecting domestic manufacture of pharma products.*

*Discuss the nuances of Draft Pharmaceuticals Policy 2017,*

*Justify that if the government is serious about Make in India for APIs and boosting R&D spending by pharmaceutical companies, it must shun price controls as a policy measure. To keep medicines affordable for the masses, it must subsidize through bulk purchases for its Jan Aushadhi and other outlets.*

**Conclusion:**

*Conclude with way forward.*

**Introduction:**

The government is mulling over excluding medicines made from locally manufactured active pharmaceutical ingredient (API)—the key raw material for the production of a drug—from price control. The move is aimed at pushing manufacture of APIs in India to reduce import dependence. The move if implemented and to the desired effect, would be a boost for Indian pharma.

**Body:**

**Issues facing the Pharma industry:**

- **Overdependence:** Indian pharma industries import about **80% of Active Pharmaceutical Ingredients(API) from China**. The API forms the base of drugs. With trade-wars at global levels and wavering bilateral relations, there is a looming threat which can stall the Indian pharma industries. In FY19, Indian pharma companies **imported bulk drugs and intermediates** worth \$2.4 million from China.



- **Compliance issues and good manufacturing practices:** Diversifying the global market has been a problem with countries China and USA imposing Sanitary and Phyto-Sanitary(SPS) barriers of WTO against generic drugs. The selective targeting by US Food and Drug Administration and Chinese Drug regulators are a problem still.
- **Drug Price Control Order:** The companies sight that the reforms of the Government for the essential medicines has caused them to lower the price of drugs. This has been done by the Government for the betterment of the public.
- **Stronger IP regulations:** IP regulation has always been a thorn in the skin for the companies, especially the foreign companies. The companies strongly feel that the rules have to be amended and the so-called victim of the lax regulations have been the foreign entrants.
- Because of fewer costs associated with generic medicines, multiple applications for generic drugs are often approved to market a single product; this creates competition in the marketplace globally, typically resulting in lower prices. Pharma sector in India is also facing steep headwinds on account of this.
- There is a **lack of proper assessment of the performance** of the pharmaceutical industry and its efficiency and productivity and due to this many plants have not survived.
- **Unregulated online pharmacies or e-pharmacies** emerging in India have been a major concern for authorized setups.
- There has been a significant drop in the flow of prescriptions as the Indian pharmaceutical industry has been witnessing a decline in the overall quality of its medical representatives (MRs).This is mainly on account of lack of training and support by the industry.
- In countries such as Russia, one requires to be a medical graduate to be a pharma sales representative. In the European Union, one needs to pass stringent examinations to become an MR. Once they qualify, they need to renew their certification every three years. But in India, even non-graduates are performing as MRs without proper guidance.

#### **Measures needed:**

- India's strong innovation capabilities aided partnerships would help in overcoming these problems.
- Developing our R&D sector to reduce dependency on foreign countries for raw materials
- The introduction of pharmaceutical product patents and the mandatory implementation of good manufacturing practices is the need of the hour.
- It is necessary for the Indian pharmaceutical industry to become globally competitive through world-class manufacturing capabilities, with improved quality and a higher efficiency of production, and there is a need to stress on the up-gradation of R&D capabilities.
- Training and development of human resources for the pharmaceutical industry and drug research and development should be done accordingly;
- There is also a need to promote **public-private partnership** for the development of the pharmaceuticals industry; promote environmentally sustainable development of the pharmaceutical industry; and enable the availability, accessibility, and affordability of drugs.



- Improvement in industrial practices to provide better training and support services for employees to perform their job functions.
- Using multilateral organisation like WTO against the illegal trade practices.
- Funding for the pharma companies might be a way to move forward.
- IPR Think Tank formed by the Government to draft stronger national IP policies.

**Conclusion:**

The affordability of healthcare is an issue of concern even in India, and people here would welcome some clarity on the principles of fair pricing vis-à-vis medical products. It is important that the accused companies are given a good hearing. The Government of India has taken up a number of initiatives to create an ecosystem that fosters manufacturing in pharma industries.

**Is it imperative to focus on agricultural production in devising a long-term solution to the problem of unemployment and the present slowdown in economy? Critically Analyse. (250 words)**

**The hindu**

**Why this question:**

*The article discusses the importance of agricultural production in devising a long-term solution to the problem of unemployment and the present slowdown in economy.*

**Key demand of the question:**

*One must establish the significance of agricultural production in devising a long-term solution to address the issues of unemployment and economic slowdown currently being witnessed by the country.*

**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:**

In brief narrate the agrarian situation in the country.

**Body:**

In brief, write a note on the role and significance of agriculture in Indian economy. Analyze the performance of agriculture in the last few years. Then critically look into, how emphasis on agricultural production will address the present issues in economy- unemployment and the slowdown.

**Conclusion:**

Conclude with way forward.

**Introduction:**

Growth has slowed for the past few quarters, the past two-and-a-half years, if we go by annual growth rates. Globally, industrial growth driven by mindless consumption is the cause of climate change, now unmistakably upon us. According to NITI Aayog, the current economic slowdown is the worst economic slowdown that India has faced since independence. Moreover, the slowdown has been witnessed in consumption in the Indian economy. From many decades, consumption has been the major driver of growth in the Indian economy. Income stagnation has been the cause of consumption slowdown.

**Body:**

**Yes, it is imperative to focus on agricultural production due to :**

- Rural unemployment is on all-time high.
- Unstable agricultural production first lowers the demand for agricultural labour and, subsequently, its supply, showing up in greater unemployment.
- This affects the investment rate as when non-agricultural firms observe slow agricultural growth, they are likely to hold their investment plans.
- Also, low agricultural export growth, the dismal banking credit, suggest that poor agricultural performance is a significant explanation of slack domestic demand.
- Figures reported in the report of the last Periodic Labour Force Survey point to a dramatic rise in the unemployment rate since 2011-12, when the previous survey on unemployment was undertaken.
- Apart from the category of 'Urban Females', the most recent estimate of unemployment shows that it is the highest in the 45 years since 1972-73. But even for 'Urban Females', it is double what it was in 2011-12.
- For the largest cohort, namely 'Rural Males', in 2017-18, it is four times the average for the 40 years up to 2011-12.
- These figures should convince us of the existence of a grave situation, if not crisis, with respect to employment in the country.

**Need for a long term solution:**

- Any long-term solution to the problem of unemployment to which the slowing growth of the economy is related must start with agricultural production.
- It has long been recognised that there is a crop-yield cycle related to annual variations in rainfall but we are now witnessing a stagnation.
- We may be experiencing an ecological undertow, and it could defeat our best-laid plans for progress.
- Now, unlike in the case of a cycle, recovery cannot simply be assumed.
- We would need the expertise of agricultural scientists to confirm what exactly is responsible for this state but it would not be out of place to ask if there is not a role for ecological factors in causing agricultural stagnation.
- These factors encompass land degradation involving loss of soil moisture and nutrients, and the drop in the water table, leading to scarcity which raises the cost of cultivation.
- Almost all of this is directly man-made, related as it is to over-exploitation or abuse, as in the case of excessive fertilizer use, of the earth's resources.
- Then there the increasingly erratic rainfall, actually due to climate change entirely induced by human action.



- A deeper adaptation is required to deal with these factors. Intelligent governance, resource deployment and change in farmer behaviour would all need to combine for this.
- It is significant that the reality of an unstable agricultural sector rendering economy-wide growth fragile has not elicited an adequate economic policy response.
- Policy focus is disproportionately on the tax rate, the ease of doing business in the non-agricultural sector and a fussy adherence to a dubious fiscal-balance target.
- It is now time to draw in the public agricultural institutes and farmer bodies for their views on how to resuscitate the sector.

### **Conclusion:**

To tackle the unemployment crisis, action will be needed on multiple fronts including investments in human capital, the revival of the productive sectors, and programmes to stimulate small entrepreneurship. The rural picture matters not only because the largest numbers are located there but also because of their low incomes. This means that the future growth of demand for much of industrial production is likely to come from there. The high unemployment rate for 'Rural Males' does suggest that we have zoomed in up to a reasonable degree of precision on the site of low demand. India does need some growth as income levels here are still very low. The problem of low incomes can, however, be tackled even with less growth so long as it is of the appropriate type.

**With India facing an economic slowdown, it is a superlative time to instrument agricultural reforms for the restoration of the economy. Analyse. (250 words)**

#### **The hindu**

#### **Why this question:**

*One of the world's fastest-growing economies, India, is now facing sluggish growth, with the Reserve Bank of India sharply cutting GDP growth forecast to 6.1% for 2019-20, which is lowest in the last six years.*

#### **Key demand of the question:**

*One has to elaborate that the time is right to execute a slew of doable agricultural reforms as the role of agriculture in reversing the slowdown is immense in the light of its nearly 20% contribution to a \$5-trillion economy.*

#### **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:**

*In brief explain why there is slowdown in the economy.*

##### **Body:**

*Explain the significance of agriculture to the economy in general.*

*Whatever the reason for the slowdown, the opportunity to speed up must accommodate a diverse body of opinion and options for sustainable and inclusive growth.*

*The conventional approach of fiscal and monetary stimulus options to address the relics of a slow pace would only give immediate relief and not an enduring solution.*

*Hence key policy measures as they exist now must reach out to emancipate that which is dragging growth while stimulating key sectors.*

*The occasional dip in growth due to various reasons will slow the pace to achieving a \$5-trillion economy by 2024.*

*This is the right time to execute a slew of doable agricultural reforms as the role of agriculture in reversing the slowdown is immense in the light of its nearly 20% contribution to a \$5-trillion economy.*



*Therefore, a blend of efforts from a range of sectors, agriculture and allied sectors is warranted to enable overall growth.*

**Conclusion:**

*Conclude with way forward.*

**Introduction:**

India which was hailed as the '**fastest growing economy**' is now facing sluggish growth, with the Reserve Bank of India sharply cutting GDP growth forecast to 6.1% for 2019-20, which is lowest in last six years; there has been a sharp decline in the performance of key sectors. The conventional approach of fiscal and monetary stimulus options to address the relics of a slow pace would only give immediate relief and not an enduring solution. Hence key policy measures as they exist now must reach out to emancipate that which is dragging growth while stimulating key sectors.

**Body:**

**Current situation of Agricultural sector:**

- Real agricultural and allied gross value added (GVA) grew by 2.9% during 2011-12 to 2017-18, while in the National Agricultural Policy (2000), it should have been around 4%, to attain an overall economic growth of 8%.
- A **highly skewed and unprecedented monsoon, erratic rainfall, and extreme natural events** are creating havoc as far as farms and farmers are concerned which in turn are likely to disrupt supply chains, fuel inflation and have a negative impact on consumption, all of which can further dampen the prospects of revival of the economy.
- The current growth rate in the farm sector is less than adequate to take on developmental challenges originating from the Sustainable Development Goals, mainly zero hunger, no poverty, life on land, and gender equality.

**Potential of Agriculture sector to revive economy:**

- The sector is a potential enabler and employer for more than 50% of the population.
- It also has the potential to revive “animal spirits” by ensuring farm viability: increasing the ratio of farm to non-farm income to 70:30 by 2022-23 from the present 60:40.
- According to the agriculture census 2015-16, the **real income of farmers doubled** in almost 20 years from 1993-94 to 2015-16.

**Measures needed:**

- The **Agricultural Developmental Council (ADC)** in line with the GST Council is a dire need to make agricultural reforms more expressive and representative.
- For better income distribution, there is also a need to **revisit regional crop planning and the agro-climatic zone model** at the highest possible level
- Promote occupations which are less influenced by the slowdown such as farming, handloom, handicrafts and others.
- There is urgent need to **increase the job-to-investment ratio** which is currently very low.



- Giving a policy nudge to **in-situ employment creation** is a must for a stable income and spending.
- There is a need to reconsider the few distorting reforms that are often stated to revive the short-term chaos in the long run.
- Encouraging public and private investments to develop infrastructure like cold chains;
- Special attention for north-eastern, eastern and rain-fed states for augmenting scope of access to institutional credit;
- Rationalisation and targeting of input subsidies towards small and marginal farmers.
- Reform in land leasing laws to promote land consolidation and contract farming.
- Accelerating the pace of public investment in agriculture and ensure greater efficiency in capital use.
- Loans available through KCC are very low, so the government and RBI should work together to increase the loan amount.
- PPPs could help spur the development of the food processing industry, one of the newest sectors in Indian agriculture.
- present agriculture growth is in declining phase, to revive the agriculture growth need patient capital (as financial returns to investment are unlikely to materialize in the initial years.) like rural infrastructure development fund (RIDF)

#### **Conclusion:**

Agriculture and its allied sectors are believed to be one of the most fertile grounds to help achieve the ambitious Sustainable Development Goals (SDGs). However, with the current pace of agriculture growth, India requires ‘patient capital’, as financial returns to investment are unlikely to materialise in the initial years. This is the right time to execute a slew of doable agricultural reforms as the role of agriculture in reversing the slowdown is immense in the light of its nearly 20% contribution to a \$5-trillion economy. Therefore, a blend of efforts from a range of sectors, agriculture and allied sectors is warranted to enable overall growth.

**What are Green Skills? Discuss the Importance of Green Skill Development Programme that was launched recently. (250 words)**

Vikaspedia

#### **Why this question:**

*India would need around 10.4 crores of new workforces by the year 2022, in various sectors and hence skill development is essential to meet the demand. Thus with this aspect the question aims to examine the significance of Green Skill Development Programme.*

#### **Key demand of the question:**

*Explain what are green skills and their importance in today’s times. Also throw light on the Importance of Green Skill Development Programme that was launched recently.*

#### **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 define what green skills are.*

**Body:**

*Recently Decision has been taken by the Government of India, to expand the Green Skill Development Programme (GSDP) to an all-India level.*

*Discuss –*

*What are Green Skills? – Green skills are those skills needed to adapt processes, services and products to climate change and the environmental regulations and requirements related to it. They include the knowledge, abilities, values and attitudes needed to live in, develop and support a sustainable and resource-efficient society. These skills are required in areas such as such as Renewable energy, Wastewater treatment, Climate resilient cities, Green construction, Solid waste management etc.*

*Explain its significance.*

*List down the importance of Green Skill Development Programme along with recent developments.*

**Conclusion:**

*Conclude with way forward.*

**Introduction:**

Green skills are those which contribute to preserving or restoring environmental quality for sustainable future and include jobs that protect ecosystems and biodiversity, reduce energy and minimize waste and pollution. Realizing the demand for green skilled youth, the Green Skill Development Programme (GSDP) has been conceptualised.

**Body:**

The Green Skill Development Programme (GSDP) of the Ministry of Environment, Forest and Climate Change (MoEF&CC) is an initiative for skill development in the environment and forest sector to enable India's youth to get gainful employment and/or self-employment.

**Importance of Green skill Development programme:**

- India being the second most populous country in the world is bestowed with a large working population. India has advantage of reaping this demographic dividend.
- Green skilling is crucial for making a **transition from energy and emissions – intensive economy to cleaner and greener production and service patterns.**
- A Huge gap exists between the need (demand) and availability (supply) of skill sets, both cognitive and practical, at various levels in the Environment, and Forest sectors in India. However, most of the vocational training programmes focus on mechanical/technical skills rather than 'soft' skills or 'green' skills.
- The Green Skill Development Programme (GSDP) aims to fill this gap. It enhances the employability of people in jobs that contribute to preserving or restoring the quality of the environment, while improving human well-being and social equity.
- GSDP will include **process-based green skills such as, monitoring and managing activities such as waste, energy efficiency, impact minimization and assessment, etc.**
- The programme endeavours to develop green skilled workers having technical knowledge and commitment to sustainable development.



- It will help in the attainment of the Nationally Determined Contributions (NDCs), Sustainable Development Goals (SDGs), National Biodiversity Targets (NBTs), as well as Waste Management Rules (2016).
- The number of people to be covered under GSDP will be 80,000 during 2018-19, 2.25 lakh during 2019-20 and about 5 lakh people by the year 2021.
- The skilling programmes cover diverse fields such as pollution monitoring (air/water/soil), Sewage Treatment Plant, Effluent Treatment Plants and Common Effluent Treating Plants (STP/ETP/CETP) operation, waste management, forest management, water budgeting, auditing, conservation of river dolphins, wildlife management, para taxonomy, including Peoples' Biodiversity Register (PBRs), mangroves conservation, bamboo management and livelihood generation.

#### **Conclusion:**

With the success of the pilot programme, the next step is to take the skilling programme to an all India level and for all the courses to commence in February 2018. For this, the following steps are required to be undertaken: Identification of New courses based on the demand, Identification of New Institutes with the necessary expertise, and Identification of Employment opportunities.

**What is a randomised controlled trial in the context of research that won the Nobel Prize in Economics 2019? Why is it so popular? Explain. Also discuss few criticisms of randomised controlled trials. (250 words)**

The hindu

**Why this question:**

*The article provides an in-depth analysis of randomised controlled trials – the method that was used in the research of recently won Noble prize for economics 2019.*

**Key demand of the question:**

*One has to explain in detail the concept of randomised controlled trial, reasons for its popularity and criticism if any.*

**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.

**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 discuss the origin of randomised controlled trial.*

**Body:**

*Explain that the use of randomized controlled trials as a research tool was largely limited to fields such as biomedical sciences where the effectiveness of various drugs was gauged using this technique. Mr. Banerjee, Ms. Duflo and Mr. Kremer, however, applied RCT to the field of economics beginning in the 1990s. Mr. Kremer first used the technique to study the impact that free meals and books had on learning in Kenyan schools. Mr. Banerjee and Ms. Duflo later conducted similar experiments in India and further popularized RCTs through their book Poor Economics, published in 2011.*

*Discuss the concept in detail, its popularity.*

*List down criticisms; take hints from the article.*



**Conclusion:**

*Conclude with way forward.*

Introduction:

The new Economics Nobel laureates – Abhijit Banerjee, Esther Duflo and Michael Kremer – are considered to be instrumental in using **randomised controlled trials** to test the effectiveness of various policy interventions to alleviate poverty. **Randomised controlled trial** is an experiment that is designed to isolate the influence that a certain intervention or variable has on an outcome or event.

Body:

The Randomised Control Trial (RCT) which was inspired by the use of RCTs in medical science was used by the Nobel laureates to test the effect of small interventions on the individual behaviour. The **experiment-based approach** of the laureates involved **dividing an issue into smaller and more manageable questions**. They have shown that **smaller and more precise questions are often best answered through carefully designed experiments among the people** who are the most affected. In the mid-1990s, **Dr Kremer and his colleagues** demonstrated how powerful this approach can be when they used field experiments to test a range of interventions that could improve school results in Western Kenya.

**RCTs have become popular due to:**

- At any point in time, there are multiple factors that work in tandem to influence various social events.
- RCTs allow economists and other social science researchers to isolate the individual impact that a certain factor alone has on the overall event.
- For instance, to measure the impact that hiring more teachers can have on children's learning, researchers must control for the effect that other factors such as intelligence, nutrition, climate, economic and social status etc., which may also influence learning outcomes to various degrees, have on the final event.
- Randomised controlled trials promise to overcome this problem through the use of randomly picked samples.
- **Many development economists** believe that RCTs can help governments to find, in a thoroughly scientific way, the most potent policy measures that could help end poverty rapidly.

**Criticisms of randomised controlled trials:**

- As per economist Angus Deaton, who won the economics Nobel Prize in 2015, "Understanding and misunderstanding randomised control trials" that simply choosing samples for an RCT experiment in a random manner does not really make these samples identical in their many characteristics.
- While two randomly chosen samples might turn out to be similar in some cases, he argued, there are greater chances that most samples are not really similar to each other.
- Other economists argue that social science research, including research in the field of development economics, may be inherently unsuited for such controlled research since it may be humanly impossible to control for multiple factors that may influence social events.

**Conclusion:**

Governments across the world spend big money on social schemes without the vaguest of ideas on whether their objectives have been met. India has been among the biggest laboratories of these experiments with several experiments on diverse themes such as literacy, nutrition, health, micro-finance and so on. The **field-work based approach** that these economists have perfected has revolutionised the field of development economics and made it more relevant in policy making. The government would do well to borrow from the research of these laureates to understand the impact of its several schemes, and where necessary, tweak them to derive maximum benefit for the thousands of crores of rupees that it spends.

*Case study: For example, to study whether providing a mobile vaccination van and/or a sack of grains would incentivise villagers to vaccinate their kids under an RCT, village households would be divided into four groups.*

- *Group A would be provided with a mobile vaccination van facility.*
- *Group B would be given a sack of foodgrains.*
- *Group C would get both*
- *Group D would get neither*

*Group D is called the “control” group while others are called “treatment” groups. Households would be chosen on a random basis to ensure there was no bias, and that any difference in vaccination levels was essentially because of the “intervention”.*

*Such an experiment would not only demonstrate whether a policy initiative works but would also provide a measure of the difference it brings about. The approach would also show what happens when more than one initiatives are combined. This would help policymakers to have the evidence before they choose a policy.*

**Putting more money in the hands of the poor, who have a high propensity to consume, should be the aim of our fiscal policy to revive India's ailing economy and ensure inclusive growth. Comment.(250 words)**

**Livemint**

**Introduction:**

India which was hailed as the '**fastest growing economy**' is now facing sluggish growth, with the Reserve Bank of India sharply cutting GDP growth forecast to 6.1% for 2019-20, which is lowest in last six years; there has been a sharp decline in the performance of key sectors. The various inequalities that include, social exclusion, discrimination, restrictions on migration, constraints on human development, lack of access to finance and insurance, corruption – are sources of inequality and limit the prospect for economic advancement among certain segments of the population, thereby perpetuating poverty.

**Body:****Reasons for decline in Economic growth in India:**



- From a peak of 8.1% in the fourth quarter of 2017-18, growth in gross domestic product (GDP) has now decelerated to a six-year low of 5% in the fiscal first quarter, with a slowdown visible across all sectors.
- Particularly important in this context is the compression of government expenditure. Central government revenue grew only 6% last year, more than 11% short of the budget estimate.
- Accordingly, expenditure growth was compressed to 6.9% last year, down from more than 11% the year before.
- Weak revenue growth meant devolution to states also fell short, forcing them to cut expenditure.
- This compression of government spending at a time when all major components of aggregate demand were already slowing has been an important driver of the sharp decline in economic growth.

#### **Government's approach to tackle and the shortcomings:**

- Given the grim global economic environment, reliance will have to be placed on internal sources to generate demand.
- The measures the government has announced are largely in response to demands of specific interest groups such as foreign portfolio investors, real estate companies, automobile companies, etc.
- These have mostly been piecemeal supply-side interventions, which may help these specific interest groups but won't reverse the collapse in aggregate demand.
- The Reserve Bank of India (RBI) has repeatedly cut the repo rate to revive demand and has also taken other measures to ease the availability of credit. With limited traction for monetary policy, the burden of growth stimulation must fall mostly on fiscal policy.
- the unrealistic assumptions of the 2019-20 budget are quite worrying. It has been assumed that tax revenue and total revenue will grow by 25.3% and 25.6%, respectively, though they both grew by only 8.9% in 2018-19. The expenditure targets are equally unrealistic. Hence, there will be another large revenue shortfall and corresponding expenditure shock this year, further reducing growth.

#### **Measures needed:**

- The impact of an increase in government spending would be direct and fast, especially if it puts more money in the hands of poor consumers who have a high propensity to consume.
- That would have a **strong multiplier effect**, and this should be the guiding principle for an inclusive fiscal strategy to revive growth.
- According to the Periodic Labour Force Survey 2017-18, 45% of regular workers are paid less than the minimum wage. The Minimum wages code would **benefit about 50 crore workers**
- Fixing the GSTN on a war footing, paring down tax exemptions and rationalizing subsidies can free up fiscal space to the tune of 6-7% of GDP.



- Building on the **PM-Kisan programme**, by extending the ₹6,000 income support per farmer to all citizens, which would cost 1% of GDP. This income support could be increased to ₹12,000 per citizen per year, doubling the cost to 2% of GDP. This support could grow with the economy.
- Education, health and infrastructure are all underfunded. Additional funding of 1% of GDP could be provided to each of these.
- Lastly, the remaining fiscal space could be used to cut the fiscal deficit.

**Conclusion:**

India's socialistic measures to help the poor by spending on their socio-economic challenges like Education, health, livelihood can spur the spending capacities leading to revival of economic growth. This has been substantiated by recent Economic Nobel laureates' approach of work on combating poverty through Randomised Controlled Trials.

**To be a \$5-trillion economy by 2025, India needs to build a cohesive national strategy around artificial intelligence (AI), do you agree? Justify your opinion with suitable illustrations. (250 words)**

[Indianexpress](#)

**Why this question:**

*The article explains that while it is clear that India is heading in a direction where both the private and public sectors are unified in their commitment to promote and upscale AI, most of the commitments have been made on paper, in budget speeches, proposals and heavily researched reports.*

**Key demand of the question:**

*One has to explain in what way to be a \$5-trillion economy by 2025, India needs to build a cohesive national strategy around artificial intelligence (AI).*

**Directive:**

*Justify – When you are asked to justify, you have to pass a sound judgement about the truth of the given statement in the question or the topic based on evidences. You have to appraise the worth of the statement in question using suitable case studies or/ and examples.*

**Structure of the answer:**

**Introduction:**

*Explain that while the government has been vocal about its intention to mainstream AI applications for social good, and ensure that AI research in India keeps pace with global developments, there is little evidence to show that even the basic building blocks to achieve this have been put in place.*

**Body:**

*Discuss first in detail that multiple calls taken by various governmental agencies have led to seemingly independent and often confusing strategies, resulting in conflict and a very real danger of ineffective execution.*

*Bring out and highlight various stands taken by different institutions around this idea.*

*Explain what can be done.*

**Conclusion:**

*Conclude that India's AI strategy narrative needs to change from being a reactionary step to "counter the charge" of countries like China, to a proactive one where policies and infrastructure made in the country serve as "a beacon of inspiration" to other countries that are further behind.*

**Introduction:**

The National Strategy for Artificial Intelligence published by NITI Aayog narrates the different pain points and key challenges involved in implementing Artificial Intelligence in India. It has also tried to touch upon many sectors where AI can play a significant role in bringing India to the



forefront of AI revolution. To be a \$5-trillion economy by 2025, India needs to build a cohesive national strategy around artificial intelligence (AI).

**Body:****A cohesive national strategy around AI will help boost economy:**

- India's digital consumer base is the world's second-largest, as well as the second-fastest growing among 17 major economies, as per findings of the latest India Economic Survey.
- And this base is core to the creation of future economic value and societal empowerment as digital solutions backed by new-gen technologies such as artificial intelligence (AI), internet of things (IoT) and automation become ubiquitous.
- The nation's naturally tech-savvy demography – 1.2 billion mobile phone connections, 560 million internet subscriptions, and over 350 million smartphones – will serve as the fulcrum of an inclusive digital transformation.
- We're already seeing more and more deployment of digital tools in the priority sectors of healthcare, education, financial services, agriculture, and transportation.
- From emboldening India's IT-BPM industry to doubling farmers' income, a strong digital economy holds the key to delivering sustainable growth, propelled by transformational innovations.
- A robust digital economy will also help India be better prepared to tackle some of the opaque complexities of the global marketplace.

**However, there are conflicting views on the proposal:**

- The Niti Aayog's "National Strategy for AI" report allocates a budget of Rs 7,500 crore and recommends setting up **Centers for Research Excellence (COREs)** in conjunction with academic institutions.
- It also recommends setting up **International Centers for Transformational AI (ICTAIs)** in association with leading industry players. It falls short, however, of clearly recommending the governance framework under which this should happen.
- The DIPP is next, with a budget of Rs 1,200 crore towards setting up the **National AI Mission (N-AIM)**. The N-AIM is supposed to be the nodal agency for all "AI related activities" in India which will also set up their own "centers of excellence" to promote interdisciplinary research, and assess the performance of various AI-based products in India.
- The MEITY plans to allocate a Rs 400-crore budget for new technology initiatives as part of the Digital India Programme, including working with the Digital India Corporation to set up yet another apex body for AI called the National Center for Artificial Intelligence (NCAI).
- While details on this are sparse, it has recently emerged that the ministry is at loggerheads with the Niti Aayog in terms of who ought to ultimately spearhead this movement.
- While the Union finance ministry appears to have weighed in to resolve the tussle, the final policy call on who gets to lead the charge is shrouded in controversy and uncertainty.

**Measures needed:**



- The government must put in place proper checks and balances against AI's misuse through legally enforceable and long-term policy guidelines, and a regulatory framework.
- By making national data centres for sensitive human data with a robust policy on data collection, use, inference, privacy, release and security, AI-based tools can enhance the growth and access to technology related to patient data and prevent misuse of personal data by private individuals, government and corporations.
- The strategy should strive to leverage AI for economic growth, social development and inclusive
- To truly harness AI's transformative potential, India must address its lack of expertise in AI research and application.
- The government must address privacy and data security concerns on a war-footing.
- India must foster AI innovations and set up AI-friendly infrastructure to prepare India's job and skill markets for AI-based future.
- Banks may look at using AI for enhancing customer experience, security, and risk management.

**Way forward:**

- It is important that policy-makers and agencies converge their ideas around the groundwork that has been laid to streamline the effective creation and implementation of the country's national AI strategy.
- There is also a need for greater transparency in the timelines and roadmaps associated with these announcements, so that startups, non-governmental organisations and researchers can not only provide their input, but also understand when they can use some of this promised infrastructure if they are to compete at the international level.

**Conclusion:**

India's AI strategy narrative needs to change from being a reactionary step to "counter the charge" of countries like China, to a proactive one where policies and infrastructure made in the country serve as "a beacon of inspiration" to other countries that are further behind. As the DIPP policy recognises, "people, process and technology" are non-negotiable for AI to proliferate in India, but in the absence of the first two, much will still left to be achieved in the third.

**Small businesses hold the greatest potential for job creation, thus a policy agenda to meet India's steep employment challenges must enable them on priority. Elucidate. (250 words)**

*Livemint*

**Why this question:**

*The article highlights as to how we must enable small businesses to grow since these hold the greatest potential for job creation.*

**Key demand of the question:**

*Explain the background of the current economic situation in the country and bring out the role played by small businesses; discuss the positives and negatives associated.*

**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:**

In short set the context of the question.

**Body:**

Explain the following aspects in the answer body:

First discuss that India's economy has an excessive proportion of less productive, informal micro businesses.

Relate it to the employment factor in the country.

Then discuss the need for the government to recognise the impetus that small industries have to contribute to the overall growth.

**Conclusion:**

Conclude that there is an urgent need to recognise the significance of small businesses to the overall economic growth of the country.

**Introduction:**

India currently battles an economic slowdown and myriad other associated problems. The attention is thus bound to be deflected from the ever-present priority of job creation for the country's youth bulge. However, the recently released Annual Survey of Industries for 2017-18 revealed that Job creation in the factories sector has been steady, if not spectacular. The number of workers employed grew **4.8% in 2017-18**.

**Body:**

**Potential of job creation:**

- Micro, Small & Medium enterprises (MSME) termed as "**engine of growth**" for India, has played a prominent role in the development of the country in terms of creating employment opportunities.
- As per the survey, Total people engaged (including managers) rose 4.7%, the highest in four years.
- It currently employs 60 million people, creates 1.3 million jobs every year and produces more than 8000 quality products for the Indian and international markets.
- a growing body of research has upended this conventional wisdom and shown that the predominant source of job creation is firms that start small and formal, and eventually grow into medium-scale enterprises. They reveal an alternative path to generating productive jobs in India.
- Startups and young firms create more jobs regardless of their size, and educated entrepreneurs have a far higher probability of success.

**The challenges and concerns associated with the growth of MSME sector:**

- **Size of Sector:**
  - Micro businesses dominate most countries' economies, India's economy has an excessive proportion of less productive, informal micro businesses.



- employment in India is concentrated in these micro businesses, whereas in developed countries, it is concentrated in formal small and medium-sized firms.
- new and young firms create more jobs than older, established firms.
- with age, Indian firms typically stagnate or decline in employment.
- productive jobs are created by firms that start out as formal.
- **Access to Credit:**
  - According to Economic Survey (2017-18), MSME sector faces a major problem in terms of getting adequate credit for expansion of business activities.
  - The Survey had pointed out that the MSME received only 17.4 per cent of the total credit outstanding.
  - Most banks are reluctant to lend to MSMEs because from the perspective of bankers, inexperience of these enterprises, poor financials, lack of collaterals and infrastructure.
- **Poor Infrastructure:**
  - With poor infrastructure, MSMEs' production capacity is very low while production cost is very high.
- **Access to modern Technology:**
  - The lack of technological know-how and financial constraints limits the access to modern technology and consequently the technological adoption remains low.
- **Access to markets:**
  - MSMEs have poor access to markets. Their advertisement and sales promotion are comparatively weaker than that of the multinational companies and other big companies.
  - The ineffective advertisement and poor marketing channels makes it difficult for them to compete with large companies.
- **Legal hurdles:**
  - Getting statutory clearances related to power, environment, labour are major hurdles.
  - Laws related to the all aspects of manufacturing and service concern are very complex and compliance with these laws are difficult.
- **Lack of skilled manpower:**
  - The training and development programs in respect of MSME'S development has been. Thus, there has been a constant crunch of skilled manpower in MSMEs
  - India has a deficit of productive, job-creating entrepreneurs, and an excess of informal entrepreneurs focused on survival.
  - growing and efficient firms are founded and run by educated entrepreneurs

**Other issues:**

- Low ICT usage.
- Low market penetration.
- Quality assurance/certification.
- IPR related issues.
- Quality assurance/certification.
- Standardization of products and proper marketing channels to penetrate new markets.

**Measures needed:**

- The Government policies on micro, small and medium enterprises (MSMEs) must become more nuanced.
- Informal micro enterprises and single-person enterprises run by those lacking formal education should be termed “subsistence enterprises”.
- Educating the next generation is critical to breaking the iron grip of poverty and pulling single-person enterprises out of survival mode.
- Support to these subsistence enterprises should be provided under anti-poverty measures and not under an economic development programme
- To enhance the productivity of businesses and promote growth, the government should subsidise the provision of management support services—as industrial public goods—to young businesses.
- A nascent initiative in South Tamil Nadu shows that huge productivity gains are waiting to be unlocked in small businesses if entrepreneurs are made to understand the importance of some critical principles and concepts related to finance and human resources.
- Education plays a big role in the growth of startups and their contribution to employment generation, institutions of higher learning should prepare students to be entrepreneurs in the same way that they equip them with functional, marketable skills.
- The government should also periodically update the definitions of MSMEs to bring them closer to international standards. This will help ensure that businesses are not prematurely labelled as large and are not denied government support while still in need of it.

**Conclusion:**

Therefore, public policy to support entrepreneurship and MSMEs should target these entrepreneurs. However, any government support should be made contingent on the enterprise's progress in creating jobs and productive growth, thereby encouraging truly dynamic entrepreneurship.

**As one of the fastest growing online retail markets among the economies of the world, the e-commerce sector must be assured of a fair policy framework to support India's emergence as a \$5 trillion economy by fiscal year 2024-25. Comment.( 250 words)**

Livemint

**Why this question:**

The article brings out the significant contributions that e-commerce in India is making and the steady trajectory of growth it has been achieving amidst economic slowdown facing the country.

**Key demand of the question:**

One has to elaborate on the fact that the potential of job creation in e-commerce is evident from the extent to which it has penetrated India's retail and consumption ecosystem. Explain in depth in what way e-commerce can be potentially used to create more jobs and augment the dream of \$5 trillion economy.

**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:**

In brief highlight statistics related to e-commerce in India.

**Body:**

Explain that the e-commerce sector's resilience indicates an increasingly sharper understanding of what both India and Bharat want.

It also must be noted that amid a perceived nationwide slowdown in consumption, India's e-commerce sector has recorded its highest sales ever.

Discuss the benefits of e-commerce.

What are the possible challenges? And how they can be addressed.

**Conclusion:**

Conclude by reasserting the fact that the potential of e-commerce sector must be utilized to the fullest.

**Introduction:**

E-commerce or Electronic commerce is a type of business model, or segment of a larger business model, that enables a firm or individual to conduct business over an electronic network, typically the internet. It operates in all four of the major market segments in India – business to business, business to consumer, consumer to consumer and consumer to business. Keeping a tab on the growing e-Commerce in India, Ministry of Consumer Affairs has released the draft guidelines on e-commerce for consumer protection. It will act as the guiding principles for e-commerce business for preventing fraud, unfair trade practices and protecting the legitimate rights and interests of consumers.

**Body:****Status of e-Commerce in India:**

- India's e-commerce sector has grown quickly despite an uncertain policy environment.
- The e-commerce sector in India is estimated to reach USD 230 billion by 2028 (accounting for 10% of India's retail).
- The e-commerce sector in India has been witnessing an explosive growth fuelled by the increase in the number of online users, growing penetration of smartphones and the rising popularity of social media platforms.
- The Indian e-commerce industry is expected to surpass the US to become the second largest e-commerce market in the world by 2034.
- Online shoppers in India are expected to reach 120 million in 2018 and eventually 220 million by 2025.



- Even in non-traditional items such as furniture and high-end fashion labels, growth has been phenomenal.

**E-Commerce and its push for \$5 trillion economy:**

- e-commerce is generating sufficient value for all buyer classes, enabling it to boost consumption in a way that is both exponential and inclusive.
- The potential of job creation in e-commerce is evident from the extent to which it has penetrated India's retail and consumption ecosystem.
- e-commerce is giving equal shelf space to domestic artisans and small- and medium-sized manufacturers, granting them access to local, national and even global markets.
- As the e-commerce sector grows and deepens, its engagement with both the "classes" and the "masses" of India, so to speak, its status as a multiplier of prosperity, can only grow.
- Today, placed at the intersection of economic growth, job creation and unprecedented market access for enterprises of all sizes, the e-commerce growth story epitomizes the inclusiveness of the Indian economy set in motion by government policies.
- As it sustains its growth trajectory, e-commerce can emerge as a leading generator of jobs in areas ranging from delivery, logistics and data-analytics to product and brand experience, design and inventory management, as well as support functions such as finance, payments, legal and human resources.
- Newer and more specialised competencies, including payment gateways, big data and mobile technology are being harnessed to give consumers a hassle-free purchase experience.

**Current Policy Environment:**

- It is still a work in progress when it comes to safeguarding customer interest.
- Consumers are still compelled to take wild chances in online transactions.
- There is little they can do if their calls go wrong, as returns and reimbursements are risky and cumbersome.
- There are no authentic ways to figure out if product reviews, ratings or even discounts are genuine.

**Measures needed to strengthen e-Commerce:**

- The sector comprises a growing number of players of various sizes.
- To remain competitive, they will all have to make regular investments that would place our workforce on a par with its global counterparts, while also serving to acquire and sustain a business advantage that enables the sector to surge ahead.
- The sector's multifaceted positives and its evolving nature have led the government to adopt a consultative approach. Such consultations must continue.
- While strategically designed and implemented regulations have a place in our economy, being overly critical of a marketplace that currently serves as a beacon of commercial



success may inadvertently stifle its growth and bring back the worst of the Licence Raj regime.

**Conclusion:**

**Given all these, the Centre should take a call soon on the e-commerce policy, balancing the priorities of the stakeholders.** The draft guidelines thus propose a series of consumer safeguards in India that forbid e-commerce companies from influencing pricing, adopting unfair promotion methods or misrepresenting the quality of goods and services.

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

Discuss the need of a strong agriculture/veterinary patent regime to augment India's agricultural research and development sector, also, analyse how it can prove to be a road map for agricultural technology transfer and commercialization? (250 words)

**Epw****Why this question:**

*The article highlights the aspects of a clear road map for agricultural technology transfer and commercialization.*

**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 narrate India's agricultural research and development sector scenario.*

**Body:**

*Explain that the management and transfer of agricultural technologies for commercialization purposes is considered to be a new concept in India. However, there is an upward surge in the technology protection, incubation and other commercialization activities in recent times. This can be attributed to the recent transformation of the agribusiness ecosystem in the country due to policy initiatives and more focused research in applied and frontier areas.*

*Discuss the various aspects, ways to augment agricultural systems, role of patents etc.*

**Conclusion:**

*Conclude that Appropriate policies should combine the concern with international norms with the specifics of India's economic and social needs to ensure the success of agricultural systems through the aid of technological advancements.*

**Introduction:**

Technologies developed in research or academic institutions are typically transferred through an agreement in which the university or the research institution grants to a third party a licence to use its intellectual property in the defined technology, sometimes for a particular field of use and/or region of the world.

There is an upward surge in the technology protection, incubation and other commercialisation activities in recent times. This can be attributed to the recent transformation of the agribusiness ecosystem in the country due to policy initiatives and more focused research in applied and frontier areas.

**Body:****Need for a strong agriculture/veterinary patent regime:**

- The management and transfer of agricultural technologies for commercialisation purposes is considered to be a new concept in India.
- The technology transfer process promotes commercialisation, reach of better products to the market and job generation.
- The expenses incurred towards intellectual property protection and its maintenance can be justified in view of introduction of better products, increased completion in the market, enhanced customer satisfaction, and more revenue and tax generation.
- A stronger intellectual property enforcement and providing more timely resolution of infringement complaints can help combat intellectual property theft, which is not uncommon in India.
- They can forge strategic alliances with global business houses and their counterparts in foreign universities.
- In spite of the many agencies, schemes and government departments in the country that act as support mechanisms for intellectual property protection and subsequent commercialisation, the benefits have not been reaching to needy entrepreneurs, especially in the case of micro, small and medium scale agribusinesses.

**Strong patent system can be a roadmap**

- **Promotes Agricultural extension system:**
  - Public extension played a major role in ushering in the green revolution in Indian agriculture.
  - Though agriculture development in India is basically a state subject and the agricultural sector plays a crucial role from the perspective of ensuring food and livelihood security of its large population.
  - The central government plays a major role in formulating policies that has direct bearing on the growth of the agricultural sector.
- **Encourage public-public and public-private partnerships for intellectual property management:**
  - To increase industrial competitiveness in India, possibilities of new partnerships should be explored among the research producers, technology providers, users (including start-ups), and funders.
- **Concerted approach for promoting business incubation and start-ups:**
  - By default, agricultural technologies are low-cost technologies, and entrepreneurs consider them less enterprising because of the lower purchasing power of the target market.



- Therefore, ICAR and SAUs should initiate facilities for incubation of new business ideas based on innovative agricultural technologies by providing cheap space, facilities and required information and research inputs.
- **Bringing an act in Parliament like Bayh-Dole Act in the US:**
  - The US Bayh-Dole Act of 1980 allows universities and other non-profit institutions to have ownership rights to discoveries resulting from federally-funded research, provided certain obligations are met.
  - Crafting Indian legislation analogous to the Bayh-Dole Act in the US will ensure more legal clarity and support, lower transaction costs, and facilitate more efficient channels for technology transfer.
- **Changes in existing research ecosystem:**
  - ICAR's and SAUs's policies have to be modified in such a way that will encourage public institutions to share patent revenues with individual inventors or researchers.
  - It should also encourage universities and research institutes to patent all patentable discoveries and make it mandatory for all public research institutions to set aside a portion of royalty revenues to maintain internal systems for updating innovation, filing new patent applications, litigating, licensing, and building intellectual property awareness and competence.
- **Catalyse change in legal system and industrial culture:**
  - Apart from strengthening the institutional innovations and delivery mechanism, the NARS can also play a vital role in strengthening intellectual property laws and regulations in India with respect to agriculture, plant variety, geographical indicators, biodiversity and traditional knowledge.
  - It can also moot new guidelines for IPR policies within and outside NARS for issues related to agriculture, food and water.

**Way forward:**

- More concerted approaches of state and private players through effective PPPs are required to revitalise the Indian agricultural scenario to a more profit-oriented, technology savvy and productive one.
- Innovative institutional mechanisms should be designed for promoting intellectual property protection and technology commercialisation among researchers and academia.
- Legal and other supportive framework should also be strengthened to support the ever-changing intellectual property regime.
- The role of a strong intellectual property education among agricultural, business and law schools is also important in the present-day scenario.
- More open and pragmatic approaches would aid in developing a strong intellectual property platform for Indian agricultural research system.



- Forming protocols and guidelines for operating patents derived through public research funds coupled with appropriate innovations in institutional governance will enhance the prospects for technology transfer from laboratories to commercial markets.
- Appropriate policies should combine the concern with international norms with the specifics of India's economic and social needs.

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.

A sustainable solution for price stabilisation is the need of the hour than merely relying on ad-hoc measures. Discuss in the context of Operation Green-TOP.(250 words)

Indianexpress

**Why this question:**

*Tomatoes-onions-potatoes (TOP) are the three basic vegetables that face extreme price volatility and the government often finds itself on the edge in fulfilling its dual objectives of ensuring remunerative prices for farmers and affordable prices for consumers. Thus necessitating us to examine the relevance of a sustainable price stabilization scheme.*

**Key demand of the question:**

*One has to explain the challenges the operation Green has come across in dealing with the issue of price stability. Explain the challenges and suggest solutions.*

**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 short explain the TOP Scheme.*

**Body:**

*First discuss the key features of the current program of the government of India that seeks to address price volatility issue in agriculture system of the country.*

*Explain what are the possible long term solutions that can be taken forward.*

*Suggest sustainable solution for price stabilisation.*

**Conclusion:**

*Conclude with way ahead.*

**Introduction:**

**Operation Greens** seeks to stabilize the supply of Tomato, Onion and Potato (TOP) crops and to ensure availability of TOP crops throughout the country round the year without price volatility. In the budget speech of 2018-19, a new Scheme “Operation Greens” was announced on the line of “Operation Flood”, with an outlay of Rs.500 crore to promote Farmer Producers Organizations, agri-logistics, processing facilities and professional management.

**Body:**

**Operation Green objectives:**

- Price stabilisation for producers and consumers by proper production planning in TOP clusters.



- Reduction in post-harvest losses by creation of farm gate infrastructure, development of suitable agro-logistics, and creation of appropriate storage capacity linking consumption centres.
- Enhance value realisation of TOP farmers by targeted interventions to strengthen TOP production clusters and their FPOs.
- Increase in food processing capacities and value addition in TOP value chain.
- Set up of market intelligence network to collect and collate real time data on demand and supply and price of TOP crops.

**Need for price stabilization of TOP crops:**

- The scheme is launched on the lines of Operation Flood and seeks to replicate the success of milk in fruits and vegetables.
- Idea behind Operation Greens is to double the income of farmers by the end of 2022.
- The problem with vegetable commodities is that when their production increases sharply, their prices collapse because there is not enough modern storage capacity.
- The links between processing and organized retailing are very weak and small in India which often result in farmer receiving less than 1/4th of what consumers pay for their produce in major cities.
- Operation Greens will focus on these problems for basic ingredients and not on additional commodities in agriculture.

**Challenges in implementation of Operation Green:**

- There are so many varieties of TOP vegetables, grown in different climatic conditions and in different seasons, making marketing intervention (processing and storage) all the more complex, unlike in milk that is a relatively homogenous product produced round the year.
- Viable technology options for long-term storage, transport, and processing are still being developed.
- Energy intensity of available technologies, especially with rising fuel prices, poses additional challenge.
- Organized market at present is very small in relation to total production. The market has to be developed through a viable business model which is both time and cost consuming.
- The scheme has no provision for institutional setup in implementing the scheme like the National Dairy Development Board (NDDB) in Operation Flood.

**Measures needed:**

- There is a need to link major consumption centre to major production centre with a minimal number of intermediaries.
- Increase processing capacities for TOP. Linking the processing industry with organized retailing. On an average, about one-fourth of the produce must be processed. Budget announcement of increasing the allocation for the food processing industry by 100% is a welcome step in this regard.



- By developing forward and backward linkages, the government can ease large price fluctuations, raise farmers' share in the price paid by the consumer and at the same time, ensure lower prices for the consumers — a win-win situation for all.

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

The recently released 20th Livestock Census report census shows that the Centre's drive to increase indigenous breeds of cattle seems to have had little impact among cattle kept for dairy purposes, in the backdrop of it analyse the success of such missions and suggest ways for improvement.( 250 words)

#### *The hindubusinessline*

##### **Why this question:**

*Department of Animal Husbandry & Dairying, Ministry of Fisheries, Animal Husbandry and Dairying have released the 20th Livestock Census report. The release contains some key results reflecting the aggregate counts of various species as well as its comparison with previous census.*

##### **Key demand of the question:**

*Explain in detail the findings of the report and evaluate the efforts of centre in this direction, present your opinion as to how far the government has been successful in achieving its defined targets.*

##### **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:**

*In short highlight the importance of such a census.*

###### **Body:**

*The Livestock Census has been conducted in the country periodically since 1919-20.*

*Then discuss the findings of the report. Thereafter explain the efforts of Centre to increase indigenous breeds of cattle that seem to have had little impact among cows kept for dairy purposes. There are 4.85 crore desi (native) milch cows in the country, less than 1% increase than in the last census in 2012.*

*Discuss Rashtriya Gokul Mission; its objectives.*

###### **Conclusion:**

*Conclude with what needs to be done.*

###### **Introduction:**

India's livestock sector is one of the largest in the world. About 20.5 million people depend upon livestock for their livelihood. Livestock contributed 16% to the income of small farm households as against an average of 14% for all rural households. Livestock provides livelihood to two-third of rural community. It also provides employment to about 8.8 % of the population in India. India has vast livestock resources. Livestock sector contributes 4.11% GDP and 25.6% of total Agriculture GDP.

###### **Body:**



## Livestock Survey, 2019 (In millions)

Animals	2019 Survey	2012 Survey	% difference
Cattle	192.49	190.90	0.83
Buffaloes	109.85	108.70	1.00
Goats	148.88	135.17	10.10
Sheep	74.26	65.06	14.10
Pigs	9.06	10.29	-12.03
Poultry	851.81	729.2	16.80
<b>Total</b>	<b>535.78</b>	<b>512.06</b>	<b>4.60</b>



Trends in livestock population: (Source: 20th Livestock Census)

- Total Livestock population is 535.78 million- an increase of 4.6% over Livestock Census-2012.
- Total Bovine population (Cattle, Buffalo, Mithun and Yak)-79 Million in 2019- an increase of about 1% over the previous census.
- A **decline of 6 % in the total Indigenous/ Non-descript cattle** population over the previous census.
- The population of cows in the country has risen by 18 per cent in the last seven years, while that of oxen dipped by 30 per cent, according to the latest census of livestock.
- there was a spectacular 16.8 per cent increase in the poultry population in the country to 851.81 million, mainly on account of a 46 per cent rise in backyard poultry birds, whose numbers have gone up to 317 million.
- The number of female cattle is 145.12 million, which is 18 per cent over the 122.98 million in 2012. The number of male cattle, on the other hand, dropped to 47.4 million as against 67.92 million in 2012.
- While cattle accounted for 35.94 per cent of total livestock in the country, goats accounted for 27.80 per cent, buffaloes: 20.45 per cent, sheep: 13.87 per cent and pigs: 1.69 per cent.

### Challenges faced by Livestock sector in India:

- Livestock sector did not receive the policy and financial attention it deserved. The sector received only about 12% of the total public expenditure on agriculture and allied sectors, which is disproportionately lesser than its contribution to agricultural GDP.
- The sector has been neglected by the financial institutions.
  - The share of livestock in the total agricultural credit has hardly ever exceeded 4% in the total (short-term, medium-term and long-term). The institutional mechanisms to protect animals against risk are not strong enough.



- **Insurance:**
  - Currently, only 6% of the animal heads (excluding poultry) are provided insurance cover. Livestock extension has remained grossly neglected in the past.
  - Only about 5% of the farm households in India access information on livestock technology. These indicate an apathetic outreach of the financial and information delivery systems.
- **Lack of access to markets** may act as a disincentive to farmers to adopt improved technologies and quality inputs.
- **Productivity:**
  - Improving productivity of farm animals is one of the major challenges. The average annual milk yield of Indian cattle is 1172 kg which is only about 50% of the global average.
- **Diseases:**
  - The Frequent outbreaks of diseases like Food and Mouth Diseases, Black Quarter infection, Influenza etc. continue to affect Livestock health and lower the productivity.
- **Environment:**
  - India's huge population of ruminants contributes to greenhouse gases emission adding to global warming. Reducing greenhouse gases through mitigation and adaptation strategies will be a major challenge.
- **Crossbreeding of indigenous species** with exotic stocks to enhance genetic potential of different species has been successful only to a limited extent.
- **Limited Artificial Insemination services** owing to a deficiency in quality germplasm, infrastructure and technical manpower coupled with poor conception rate following artificial insemination have been the major impediments.
- Livestock derives a major part of their energy requirement from agricultural by-products and residues. Hardly 5% of the cropped area is utilized to grow fodder. India is deficit in dry fodder by 11%, green fodder by 35% and concentrates feed by 28%. The common grazing lands too have been deteriorating quantitatively and qualitatively.
- Except for poultry products and to some extent for milk, markets for livestock and livestock products are underdeveloped, irregular, uncertain and lack transparency. Further, these are often dominated by informal market intermediaries who exploit the producers.
- Likewise, **slaughtering facilities are too inadequate**. About half of the total meat production comes from un-registered, make-shift slaughterhouses. Marketing and transaction costs of livestock products are high taking 15-20% of the sale price.

#### **Measures needed:**

- A national breeding policy is needed to upgrade the best performing indigenous breeds.



- Buffalo breeding ought to be given more attention, while poultry breeding should be focused on conservation.
- State governments should be encouraged to participate in national breeding policy implementation. Geographical information system-based analysis must be utilised to map production systems.
- Animal health care should become a priority, with greater investment in preventive health care.
- Private investment must also be encouraged. The government needs to create better incentive structures for investment in livestock.
- State governments should sponsor research and assessment of the market, along with highlighting investment potential.

**Conclusion:**

With increasing population, persistent rise in food inflation, unfortunate rise in farmer's suicide and majority of the Indian population having agriculture as the primary occupation, the practice of animal husbandry is no more a choice, but a need in contemporary scenario. Its successful, sustainable and skilful implementation will go a long way in ameliorating the socio-economic condition of lower strata of our society. Linking the animal husbandry with food processing industry, agriculture, researches & patents has all the possible potential to make India a nutritional power house of the world. Animal husbandry is the imperative hope, definite desire and urgent panacea for India as well as the world.

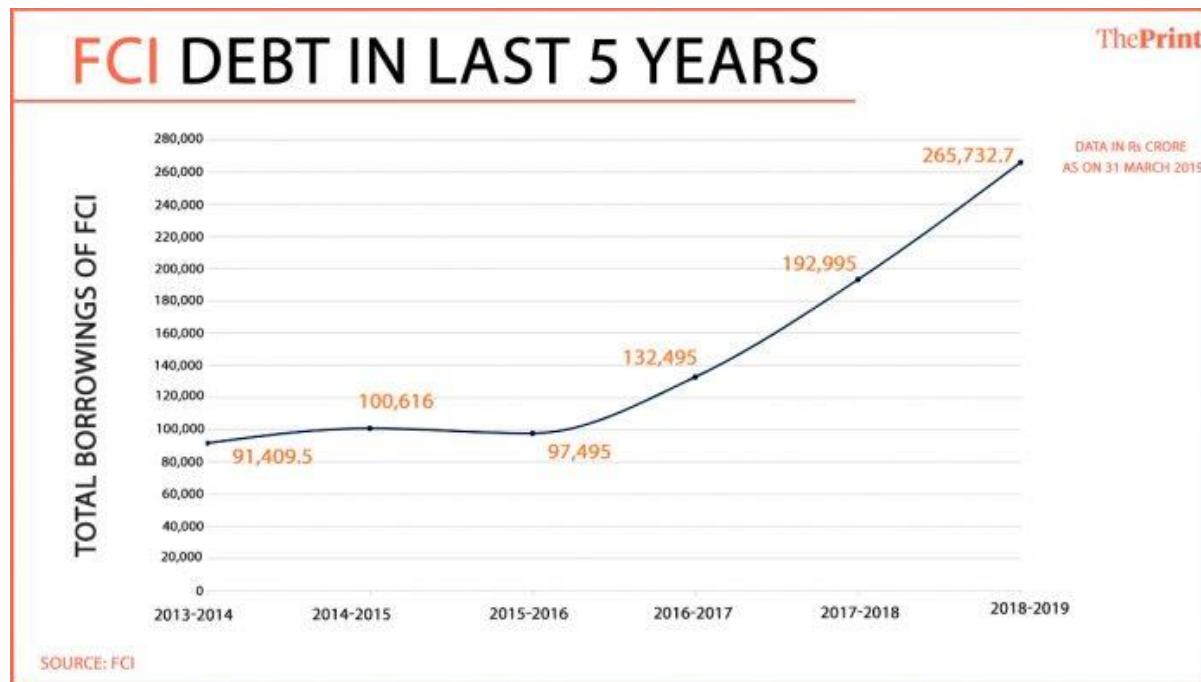
**Food Corporation of India's rising debt stock is an alarming concern; discuss in detail the causative factors of the same while suggesting suitable measures to address the issues. ( 250 words)**

**Reference****Introduction:**

Food Corporation of India (FCI) was formed in 1960's and was part of larger plan directed toward food security and self-sufficiency. Other major institution was CACP. These two institutions along with MSP regime and Public distribution system were expected to work in tandem. FCI's responsibility was to procure, Store and discharge grains as per policy of the government. Over the time, as in other cases these institutions too failed to adapt to changing circumstances such as changing demands of economy. As a result, FCI now reels under chronic inefficiency through huge wastages, and storage cost of grains keeps on cumulating.

**Body:**

In the last five years, Food Corporation of India has seen its debt level magnifying from ₹91,409 crores to ₹2.65 lakh crore in March 2019 — an increase of over 190 per cent.



### Causative factors for the same:

- FCI, responsible for overseeing the National Food Security Act, does not have any stream of income of its own.
- The debt levels went starkly up in 2016-17, because the government decided to start giving credit to the FCI from the National Small Savings Fund (NSF) to fuse the gap between what the government should have provided for in the fiscal budget and what it could actually dispense due to its budgetary constraints.
- FCI is completely dependent for revenue on the Centre. The Centre is responsible to fix the minimum support price for buying the foodgrains from the farmers, as well as the issue price which is the price at which they are supplied to the states.
- This difference, along with the cost of distribution, are paid by the government to FCI in the form of food subsidy.
- The last few years have seen the government increasingly budget a reduced amount than what is required as food subsidy. To recompense for the shortfall, the FCI has been borrowing from the NSF every year.
- The passing of the National Food Security Act, 2013, augmented the number of beneficiaries while dipping the sale price of rice and wheat.
- At the same time, procurement prices have been rising heavily with higher minimum support prices and rising procurement by the FCI.
- The FCI buys high and sells low, managing on subsidies paid by the government. India's food subsidy bill has risen rapidly, doubling in six years (Rs 1.7 lakh crore in financial year 2018-19, or 0.9 per cent of GDP).



The government had set up a **six-member committee under Shanta Kumar** to suggest restructuring or unbundling of FCI to improve its financial management and operational efficiency in procurement, storage and distribution of food grains.

**Important recommendations made:**

- Reduce the number of beneficiaries under the Food Security Act—from the current 67 per cent to 40 per cent.
- Allow private players to procure and store food grains.
- Stop bonuses on minimum support price (MSP) paid by states to farmers, and adopt cash transfer system so that MSP and food subsidy amounts can be directly transferred to the accounts of farmers and food security beneficiaries.
- FCI should involve itself in full-fledged grains procurement only in those states which are poor in procurement. In the case of those states which are performing well, like Haryana, Punjab, Andhra Pradesh, Chhattisgarh, Madhya Pradesh and Odisha, the states should do the procurement.
- Abolishing levy rice: Under levy rice policy, government buys certain percentage of rice (varies from 25 to 75 per cent in states) from the mills compulsorily, which is called levy rice. Mills are allowed to sell only the remainder in the open market.
- Deregulate fertiliser sector and provide cash fertiliser subsidy of Rs 7,000 per hectare to farmers.
- Outsource of stocking of grains: The committee calls for setting up of negotiable warehouse receipt (NWR) system. In the new system, farmers can deposit their produce in these registered warehouses and get 80 per cent of the advance from bank against their produce on the basis of MSP.
- Clear and transparent liquidation policy for buffer stock: FCI should be given greater flexibility in doing business; it should offload surplus stock in open market or export, as per need.

**Government has taken up few of the reforms as follows:**

- **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.
- **Direct Benefit Transfer:** 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 crores every year.
- **Use of GPS technology:** Use of Global Positioning System (GPS) technology to track the movement of trucks carrying food grains 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 centres to register complaints or suggestions.

Government has come up with a **roadmap** with the following highlights:

- Primacy will be given to ensuring that the functioning of FCI is streamlined and fast paced as per recommendations of the **Shanta Kumar Committee**.
- 100 lakh ton silo storage capacity will 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.
- 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) will be implemented, the work for which will begin in August, 2019 and will be completed by August 2020. This move will benefit 22,000 employees in 196 offices of FCI.

Conclusion:

The Committee recommendations however was criticized due to suggestions like limiting NFSAs, cash subsidy, privatization of FCI despite suggesting useful reforms to reform FCI, PDS. A closer scrutiny in the recommendation is needed today in times of agricultural distress & drought prone years.

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

“Prevention is better than cure”. Appreciate the statement in the context of fighting disasters. Also, discuss the role that the Coalition for Disaster Resilient Infrastructure can play in addressing this aspect.(250 words)

Indianexpress

**Introduction:**

The **Coalition for Disaster Resilient Infrastructure (CDRI)**, as proposed by Indian Prime Minister, will act as a convening body that will pool best practices and resources from around the world for reshaping construction, transportation, energy, telecommunication and water, so that building in these core infrastructure sectors factors in natural catastrophes.

**Body:**

**Need for CDRI:**

- According to Sendai framework, every \$1 spent in disaster risk reduction leads to gain of \$7. But developing countries face the dilemma of balancing economic investment for development vs disaster resilient infrastructure.



- CDRI could fill this gap of funds and technology and help developing countries to build disaster-resilient Infrastructure.
- Suppose a disaster strikes a country, the affected nation could approach CDRI for technical and financial help, thus shielding it from excessive damage and devastation.
- **Post-calamity resuscitation and reconstruction** to strengthen local infrastructure and soften the blow of the next disaster, is a farsighted approach.
- It can only work if there is domestic political will, which is reinforced at the multilateral level through CDRI.
- CDRI is an attempt to bring countries together to share and learn from the experiences of one another to protect their key infrastructure — highways, railways, power stations, communication lines, water channels, even housing — against disasters.

**Role of CDRI:**

- To make entire networks of modern infrastructure resilient is the main thought behind the Indian initiative of CDRI.
- The platform is not meant to plan or execute infrastructure projects. Nor is it an agency that will finance infrastructure projects in member countries. Instead, CDRI will seek to identify and promote best practices, provide access to capacity building, and work towards standardisation of designs, processes and regulations relating to infrastructure creation and management.
- It would also attempt to identify and estimate the risks to, and from, large infrastructure in the event of different kinds of disasters in member countries.
- CDRI hopes to have as its members not just countries, but organisations like UN bodies, financial institutions, and other groups working on disaster management.
- It seeks to help member countries integrate disaster management policies in all their activities, set up institutions and regulatory provisions to ensure creation of resilient infrastructure, and identify and use affordable finance and technology.

**Significance of CDRI:**

- CDRI will benefit all sections of society.
- Economically weaker sections of society, women and children, are the most vulnerable to the impacts of disasters and hence, will be benefitted from the improvement of knowledge and practice in creating disaster resilient infrastructure.
- It will also benefit all areas with high disaster risk.
- In India, the north-eastern and Himalayan regions are prone to earthquakes, coastal areas to cyclones and tsunamis and central peninsular region to droughts.
- The CDRI secretariat too would be based in New Delhi. While it is not envisioned to take the shape of a treaty-based organisation, CDRI can be seen as complementing International Solar Alliance's efforts.



- ISA is about climate change mitigation — deployment of more solar energy would bring down the reliance on fossil fuels, thereby reducing greenhouse gas emissions. CDRI, on the other hand, is about adapting to climate change, a need that is inevitable.

**Case Studies:**

- Japan is prone to recurrent killer earthquakes, tsunamis and typhoons, but it has overcome these liabilities through improved building rules, stricter zoning laws and regulations since the 1980s, making it the world's safest and most disaster-resilient country.
- In Latin America, Chile has similarly learnt lessons from past catastrophes and drastically cut down casualties and losses from disasters through well-regulated building standards.

**Conclusion:**

Each time a natural disaster occurs anywhere in the world, countries try to provide immediate relief, but there is no focus on building disaster-resilient Infrastructure. CDRI would help fill this gap and India can play a crucial role in setting a global example. With ISA and CDRI, India is seeking to obtain a leadership role, globally, in matters related to climate change.

**Discuss the Renewable energy generation capacity of India.What would be a cost-effective way to enhance the renewable energy generation capacity of India? Elaborate. ( 250 words)**

**The hindu****Why this question:**

*The article throws light upon the methods of enhancing cost effective renewable energy generation to augment the capacity of Indian renewable energy sector.*

**Key demand of the question:**

*One has to briefly present the Indian renewable energy scenario and explain some of the key cost-effective ways to enhance the renewable energy generation capacity of 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 stating facts – India aims to have a renewables capacity of 175 GW by 2022 and 500 GW by 2030. The editorial analyses how India can achieve these targets in a cost-effective manner.*

**Body:**

*First explain Renewable energy generation capacity of India with relevant facts and details such as – currently installed capacity of 358 GW is about four times of what it was in 1997-98, which shows a doubling of capacity in each of the past two decades — or about 75 MW per day. By India's historical standards, these are astonishing numbers.*

*Then move onto discuss what the concerns are therein.*

*Explain What would be a cost-effective way to enhance the renewable energy generation capacity of India?*

**Conclusion:**

*Conclude with way ahead.*

**Introduction:**

India has been aggressively expanding its power generation capacity. **Today's installed capacity of 358 GW** is about four times of what it was in 1997-98, which shows a **doubling of capacity in each of**



the past two decades — or about 75 MW per day. The **private sector accounts for almost half the installed generation capacity**. For the last three years, growth in generation from renewables has been close to 25%. India aims to have a renewables capacity of 175 GW by 2022 and 500 GW by 2030. **Solar and wind power plants** would account for much of the targeted capacity from renewables.

#### Body:

Powering India							
		Table 2: Comparison of public and private capacity costs (1997 – 2017)					
Plant Type	Average capacity (MW)	Average Cost / MW (₹ crore)	Average cost (₹ crore/ MW)		Average Capacity (MW)		
			Public	Private	Public	Private	
Thermal	741	7.50	7.9	6.8	721	748	
Solar	39	9.38	8.1	11.4	82	37	
Wind	44	7.06	7.7	6.8	36	46	
Hydel	112	12.01	12.2	8.0	223	29	

Table 3: Reducing costs of power capacity (1997 – 2017)						
Plant Type	Average cost / MW (₹ crore)		Average plant capacity		Percentage fall in costs	Percentage change in capacity
	Before 2013	After 2013	Before 2013	After 2013		
Thermal	8.3	6.6	561.0	676.0	-21%	20%
Solar	11.3	8.4	30.0	51.0	-25%	70%
Wind	7.4	6.6	42.0	44.0	-11%	5%
Hydel	14.5	7.7	141.0	279.0	-47%	98%

(Note: All costs are calculated for 2017 values)

#### Cost-effective way to enhance the renewable energy capacity:

- **Increasing accessibility to clean energy:**
  - India has already committed to bring electricity to every household by 2022. An even more ambitious goal would be to provide electricity to all households on 24x7 basis.
  - To bring clean fuel in rural areas the Pradhan Mantri Ujjawala Yojana, should be complemented by: Setting up of biomass pelletising units; and distribution of 'efficient biomass chullahs'.
  - On the agricultural front, solar irrigation pump distribution target must be stepped up and financed through credit support from NABARD and government subsidy.
  - The potential non-conventional energy sources must be explored and researched to make them technologically economical and accessible, like geothermal energy, tidal energy etc.
- **Enhancing efficiency:**
  - The National Mission for Enhanced Energy Efficiency (NMEEE) should conduct a thorough cost-benefit analysis of the available energy-efficient technologies and products across all sectors, especially agriculture, housing and transportation.



- At the institutional level, the national and state designated agencies working in the area of energy efficiency should be strengthened.
- To enhance vehicle fuel efficiency gains, the auto fuel quality should be upgraded to BS VI norms for nation-wide launch in 2020.
- **Policy changes:**
  - Around three-quarters of our power comes from coal powered plants. It is important that India increases its domestic coal to reduce its dependence on imports.
  - There is need to fast track the regulatory clearances, improve labour productivity, increase coal production and enhance efficiency of distribution.
  - **Hydrocarbon Exploration and Licensing Policy (HELP)** intends to minimize government's discretion in decision making, reduce disputes, reduce administrative delays and introduce concept of revenue sharing, freedom of marketing to stimulate growth in the oil and gas sector in India.
  - **The tax structure** should be rationalized in import and sale of energy on thermal value basis with a view to enhance the competitiveness of the economy.
  - **The India energy security scenarios, 2047(IESS)** has been developed as an energy scenario building tool. The guiding ambition of this is to develop energy pathways leading up to the year 2047, comprising of likely energy demand and supply scenarios.
  - NITI Aayog launched the India Energy Security Scenarios 2047 calculator (IESS 2047), as an open source web based tool.
  - The tool aims to explore a range of potential future energy scenarios for India, for diverse energy demand and supply sectors leading up to 2047.
- **Infrastructure:**
  - Refining and distribution of oil and gas needs augmentation. Thus, India should sustain its export capacity of refined products by setting up new refineries.
  - At present, 31 companies are developing City Gas Distribution (CGD) networks in 21 states for transportation or distribution of natural gas to consumers in domestic, commercial or industrial and transport sectors through a network of pipelines.
  - For the hydro projects, the government will need to make efforts to expedite progress on capacity under construction through satisfactory Rehabilitation & Resettlement implementation.
  - India has also built its **strategic petroleum reserves** in order to meet any supply shocks due to any external exigencies like wars, natural disasters etc. Indian Strategic Petroleum Reserves Ltd, a special purpose vehicle under the Oil and Gas Ministry, has constructed three strategic petroleum reserves in huge underground rock caverns at Visakhapatnam on the East Coast, and at Mangaluru and Padur on the West Coast.
  - These facilities, with total capacity of 5.33 million tonnes, can meet about 10 days of India's crude oil requirements. India now plans to build another 6.5 million tonnes of storage at Padur and Chandikhole in Odisha which will augment its supply to 22 days.



- **India's Energy diplomacy:**

- India is setting up a web of energy relationships in the extended neighborhood covering Myanmar, Vietnam in the east, with Central Asian countries like Kazakhstan and Gulf countries in the west.
- Indo-US Nuclear deal opened new vistas for India in field of Nuclear energy facilitating cutting edge technology and nuclear fuel. India has started to engage with China, Kazakhstan and Australia for nuclear fuel.
- India's SCO membership could now play a bigger role in ensuring greater energy cooperation between energy producers and consumers by linking Central Asia and South Asia.

- **Promotion of Renewable Energy:**

- A renewable energy capacity of 100 GW should be achieved by 2019-20 so as to contribute to achievement of 175 GW target by 2022.
- Solar Energy Corporation of India Limited (SECI) should develop storage solutions within next three years to help bring down prices through demand aggregation of both household and grid scale batteries.
- A large programme should be launched to tap at least 50% of the bio-gas potential in the country by supporting technology and credit support through NABARD by 2020.

### **Conclusion**

Major transformations are underway in global energy sector, from growing electrification to the expansion of renewable energy, upheavals in oil production and globalization of natural gas markets. India needs to build its capacity in research and skills building to deal with these transformations in energy sector. India needs to ensure long term planning to ensure universal energy access and meeting its commitment under Paris Agreement to ensure sustainable and inclusive growth.

**Energy efficiency is the foundation of a strong, self-sufficient, and sustainable economy.**

**Comment.( 250 words)**

**Hindustantimes**

**Why this question:**

*The article highlights the achievements of SLNP program and its contributions to energy saving efforts of the GOI.*

**Key demand of the question:**

*One has to discuss the significance of energy efficiency, in what way it can be achieved.*

**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:**

*In brief explain what energy efficiency is.*

**Body:**

*First highlight that through nationwide initiatives promoting the affordability of energy efficiency solutions, the government has showcased its strong commitment to the fundamentals of sustainability. Then explain what measures are yet to be taken.*

*Discuss various methods to bring in and achieve the vision of energy efficiency.*

**Conclusion:**

Conclude with way forward.

**Introduction:**

Energy efficiency simply means using less energy to perform the same task – that is, eliminating energy waste. Energy efficiency brings a variety of benefits: reducing greenhouse gas emissions, reducing demand for energy imports, and lowering our costs on a household and economy-wide level. For example, a compact fluorescent bulb is more efficient than a traditional incandescent bulb as it uses much less electrical energy to produce the same amount of light. Similarly, an efficient boiler takes less fuel to heat a home to a given temperature than a less efficient model.

**Body:****Street Lighting National Programme (SLNP): a good example of energy efficient practice**

- The installation and retrofitting of energy-efficient LED streetlights under SLNP has crossed one crore.
- The initiative has enabled annual energy savings of 6.71 billion kwh reducing 4.63 million tonnes of CO<sub>2</sub> emissions.
- The resultant energy savings have enabled the country to free up 1,119.40 MW of capacity during peak hours.
- Moreover, these energy-efficient street lights have illuminated 270,000 km of roads in India and generated 13,000 employment opportunities.
- Further, from various surveys carried out to find the satisfaction level of citizens, it is found that about 99% of the respondents feel more comfortable with the new LED installation.
- They also feel that there has been significant improvement regarding safety and business activities.
- Owing to the energy-efficient LED lights, the visibility on roads has improved significantly instilling a sense of safety among citizens.
- These smart LEDs installed under SLNP can be monitored and operated remotely through a central control and monitoring system.
- The government recognises the importance of energy efficiency and milestones like these reinforce my confidence that we will achieve our climate commitments before the targeted deadline.

**India's energy efficiency initiatives:**

- **Intended Nationally Determined Contribution (INDC):**
  - India has expressed a strong resolve to work towards low carbon emissions, while simultaneously achieving all developmental targets. We aim to reduce the emission intensity of GDP by 33 to 35% by 2030.
  - To protect the poor and vulnerable from the adverse impacts of climate change, it is an imperative that the world adopts a sustainable lifestyle.



- India's INDC proposal also highlights the need for a sustainable lifestyle as one of the integral solutions to climate change.
- The **National Mission for Enhanced Energy Efficiency (NMEEE)** seeks to achieve a total avoided capacity addition of 19,598 MW, annual fuel savings of around 23 million tonne and reduction in greenhouse gas emissions by 98.55 million tonne per year at its full implementation.

#### **Way forward:**

- The standards and labelling programme provide the consumer an informed choice about energy saving and thereby the cost saving potential of the products.
- We are also building capacity of discoms to help them reduce peak electricity demand.
- To incentivise efficiency in energy-intensive industries, we have launched a market-based mechanism called Perform Achieve and Trade scheme which allows trading of energy-saving certificates.
- Electric vehicles and chargers have penetrated almost every state, and smart metres are rapidly making headway into homes.

#### **Conclusion:**

Through nationwide initiatives promoting the affordability of energy efficiency solutions, the government has showcased its strong commitment to the fundamentals of sustainability. Our ultimate purpose is to promote energy efficiency as a way of life for every Indian. This vision is aligned with our commitments made under the Paris Agreement.

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

**India is preparing for a massive digital and technological transformation; in such a phase discuss India's preparedness with respect to embracing Industrial Revolution 4.0.(250 words)**

#### Timesofindia

#### **Why this question:**

*Recently, A pilot project for ushering in Industry 4.0 in the country has been launched at the Modern Coach Factory in Uttar Pradesh's Raebareli.*

#### **Key demand of the question:**

*The question seeks to discuss the relevance and progress of Industrial revolution 4.0 for Indian economy.*

#### **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 define Industrial revolution 4.0. – The fourth Industrial Revolution describes the present technological age ongoing in 21st century that has come up since the first such revolution took place in the 18th century.*

**Body:**

*Explain the context of India and its progress on IR 4.0.*

*India has become the fourth country in the world where World Economic Forum has opened its centre for Fourth Industrial Revolution.*

*Hence, India is preparing for a massive digital and technological transformation.*

*The centre for Fourth Industrial Revolution works as a network that includes USA, China and Japan.*

*The centre would be based in Maharashtra and it has selected drones, artificial intelligence and block chain as the first three project areas.*

*NITI Aayog will coordinate the partnership on behalf of the government and the work of the centre among multiple ministries.*

**Conclusion:**

*Conclude with way forward.*

**Introduction:**

The **fourth Industrial Revolution** describes the present technological age ongoing in 21st century that has come up since the first such revolution took place in 18th century. Industry 4.0 is a **complex cyber-physical system** which synergies production with **digital technologies, Artificial Intelligence, Big Data, Analytics, Machine Learning and Cloud computing**. A pilot project for ushering in Industry 4.0 in the country has been launched at the Modern Coach Factory in Uttar Pradesh's Rae Barelli district.

**Body:**

Industrial Revolution 4.0 can help in transforming India by:

- Alleviating poverty
- Better and low-cost healthcare
- Enhancing farmer's income
- Providing new technology and equipment to farmers
- Strengthening infrastructure, improving connectivity
- Improve ease of living and ease of doing business

**India's preparedness to embrace IR 4.0:**

- India has become the fourth country in the world where **World Economic Forum** has opened its centre for Fourth Industrial Revolution. Hence, India is preparing for a massive digital and technological transformation.
- The centre for Fourth Industrial Revolution works as a network that includes USA, China and Japan.
- The centre would be based in Maharashtra and it has selected drones, artificial intelligence and block chain as the first three project areas.
- NITI Aayog will coordinate the partnership on behalf of the government and the work of the centre among multiple ministries.
- The Department of Science and Technology has recently launched a **programme 'Intermediary Cyber Physical Systems' (ICPS)** to foster and promote R&D in AI.



- Google at the fifth edition of its annual Google for India event announced that it is setting up a research lab focused on artificial intelligence (AI) and its applications in India. The company's AI lab — **Google Research India** — is based in Bengaluru
- The NITI Aayog has drawn up a plan for creating an institutional framework for artificial intelligence (AI) in the country. It has circulated a cabinet note to provide Rs 7,500 crore in funding for creation of cloud computing platform called AIRAWAT and research institutes.
- A national artificial intelligence (AI) programme, will see the formation of a task force under Principal Scientific Advisor K Vijay Raghavan to identify projects and initiatives in which to implement the AI technology.
- The policy will also include a national artificial intelligence centre on which will be the department that will anchor the project.
- The proposed policy and the centre could finally see the light of day as the finance ministry has cleared the NITI Aayog's Rs 7,500-crore plan.

#### **Conclusion:**

Schemes like Skill India, Startup India, Atal Innovation Mission and Digital India are developing youths to use new technologies. India's diversity, demographic potential, fast growing market size and digital infrastructure have the potential to make India a global hub for Research and Development.

Lithium-ion batteries are the edifice of the wireless technology revolution. In this context discuss their significance and challenges facing these rechargeable Lithium Batteries.(250 words)

#### **The hindu**

#### **Why this question:**

*The article discusses in detail the coming of Li-ion batteries and in what way they have set off a technology revolution. The 2019 Nobel Prize for Chemistry was awarded to John B. Goodenough, M. Stanley Whittingham and Akira Yoshino for working towards the development of practical lithium-ion batteries, thus making it important from exam point of view.*

#### **Key demand of the question:**

*One has to explain in detail the technological revolution that Li-Ion batteries have brought in and the importance of the same with challenges.*

#### **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 coming of Li-ion batteries.*

##### **Body:**

*Explain first why Li-ion batteries are important?*

*Discuss the genesis of the same.*

*Explain that For many years, nickel-cadmium had been the only suitable battery for portable equipment from wireless communications to mobile computing. Nickel-metal-hydride and lithium-ion emerged In the early 1990s, fighting nose-to-nose to gain customer's acceptance. Today, lithium-ion is the fastest growing and most promising battery chemistry.*

*List down the advantages and limitations of the same.*

#### **Conclusion:**



*Conclude with way forward.*

#### Introduction:

Lithium-ion batteries are the edifice of the wireless technology revolution that made possible portable compact disc players, digital wrist watches, laptops and the mobile phones of today. It is also seen as important to a fossil-free future of electric cars that governments envisage to address climate change. The **2019 Nobel Prize for Chemistry** was awarded to **John B. Goodenough, M. Stanley Whittingham and Akira Yoshino** for working towards the development of practical lithium-ion batteries.

#### Body:

##### Lithium Ion Battery:

- It is type of **rechargeable battery** that contains several cells.
- Each cell consists of cathode, anode and electrolyte, separator between electrodes and current collectors. Li-ion battery use **intercalated lithium compound** as one electrode material.
- When the battery is **charging up**, the **lithium-cobalt oxide**, positive electrode gives up some of its lithium ions, which move through the electrolyte to the negative, graphite electrode and remain there.
- When the battery is **discharging**, the lithium ions move back across the electrolyte to the positive electrode, producing the energy that powers the battery.

#### Advantages:

- Li-ion batteries are rechargeable (lifecycle of 5000 recharges), highly space efficient, light-weight and low-maintenance vis-à-vis lead acid batteries.
- **High energy density:** The much higher power density offered by lithium ion batteries is a distinct advantage.
- Rate of self-discharge is much lower than that of other rechargeable cells such as Ni-Cad and NiMH forms.
- It can provide instant torque to the electric motor and maintain constant voltage throughout entire discharge cycle.
- Clean and safe technology vis-à-vis fossil fuels.

#### Challenges:

- Raw materials are concentrated only in few places on earth. **Example:** Afghanistan, China etc.
- They are not as robust as some other rechargeable technologies and require long durations for charging.
- They require **protection circuitry** incorporated to ensure they are kept within their safe operating limits.
- Typically they are around 40% more costly to manufacture than Nickel cadmium cells.



### Conclusion:

India is **one of the largest importers** and in 2017, it imported nearly 150 Million US Dollar worth Li-Ion batteries. Indian manufacturers source Lithium Ion Battery from China, Japan and South Korea among some other countries. The Lithium Ion batteries currently score over the Hydrogen Fuel cells due the former's wide applications from mobile phones to wearable devices to e-Vehicles. The **FAME India** is a part of the **National Electric Mobility Mission Plan** whose main thrust is to **encourage electric vehicles by providing subsidies**. India must however make a concerted attempt to incentivize both EVs and FCEVs.

**Technological solutions to combat environment challenges might not be the best mode of action. Do you agree? Discuss with suitable illustrations.(250 words)**

The hindu

### Introduction:

The climate change and environmental degradation has posed some grave threats to the environment. According to **UN Water**, some 1.1 billion people worldwide lack access to water, and a total of 2.7 billion find water scarce for at least one month of the year. The recent **IPCC's "Special Report on Global Warming of 1.5°C"** revealed that the impacts and costs of 1.5 degrees Celsius of global warming will be far greater than expected. The Intergovernmental Panel on Climate Change says a **1.5°C average rise may put 20-30% of species at risk of extinction**. If the **planet warms by more than 2°C, most ecosystems will struggle**. Coral reefs are projected to **decline by a further 70-90% at 1.5°C**.

### Body:

A number of technological solutions are at place to mitigate the effects of climate change. These technologies have helped humankind to find solutions to the problems posed by the climate change. However, in a world where climate change, air and water pollution, biodiversity loss, water scarcity, ozone depletion, and other environmental problems overlap, a fix in one arena can cause trouble or pose challenges in another.

- **Transport technologies:** Like Metro, pods, high speed rail which help in mass movement of the people from point to point.
- **Challenges posed:** In Mumbai, despite a sustained and widespread citizens' campaign, the Aarey forest has been chopped down. Despite a number of alternative available sites for the Metro car depot, the agency has remained stubborn on the forest land. The push for the capital-intensive Metro has come at a time when the city's bus service is in tatters. Building a Metro will prevent an increase in emissions.
- **Desalination technology:** Desalination has become a solution for many cities located in coastal areas. The saline water from the sea is treated and the water is made potable. More than 16,000 desalination plants are scattered across the globe producing fresh water, according to a **first global assessment of the sector's industrial waste**.
- **Challenges posed:** The plants produce more briny toxic sludge than fresh water. For every litre of fresh water extracted, a litre-and-a-half of salty, chemical-laden sludge called brine is dumped—in most cases—into the ocean. That's enough to cover the state of Florida in a 30-centimetre (one-foot) layer of slime.



- **Hydro Fluoro Carbons to protect ozone depletion:** The 1987 Montreal Protocol banned industrial chemicals (CFCs) dissolving stratospheric ozone, which protects us from the Sun's dangerous ultraviolet rays. To replace the forbidden molecules, used in aerosols and refrigerants, scientists invented a new category known as HFCs.
- **Challenges posed:** But there was a small problem that didn't emerge until much later: the substitutes—while harmless to the ozone layer—were **dangerous greenhouse gases**, thousands of times more potent than carbon dioxide or methane. That meant a new, protracted round of negotiations over an amendment calling for the phase of HFCs, which was finally adopted in 2016.
- **Bio-fuels:** The rise in oil prices in the 1970s, and later the looming threat of climate change, boosted the production of bio-fuels made from corn, sugarcane and palm oil. It seemed like a great idea: planet-warming CO<sub>2</sub> released into the atmosphere when the bio-fuels were burned would be partially offset by the CO<sub>2</sub> absorbed while the plants were growing.
- **Challenges posed:** The energy needed to transform and transport plant-based fuels undercuts their original purpose. To make matters worse, the newly emerging market created a perverse incentive to cut down tropical forests—far more efficient at soaking up CO<sub>2</sub>—to make way for sugarcane and palm oil trees. When it comes to climate change, projections for how humanity can cap global warming under two degrees Celsius (3.6 degrees Fahrenheit) assume a major role for bio-fuels. But recently scientists have calculated that an area up to twice the size of India would be needed to cultivate them, which may not leave enough land to grow food.
- **Wind farms:** There are some 350,000 wind turbines scattered across the globe producing more than 500 gigawatts of clean, green energy and supplying four percent of global electricity demand.
- **Challenges posed:** But wind farms are also bird killers: up to 328,000 birds—especially those that fly at night—are felled every year by fast-spinning blades in the United States alone, where there are some 50,000 turbines. They also **disrupt ecosystems**.
- **Case Study:** A scientific study of **wind farms in the Western Ghats**, a UNESCO-listed range of mountains and forest spanning India's west coast, found that predatory raptor birds were four times rarer than in adjacent areas. Their absence cascaded down the food chain and radically altered the density and behaviour of the birds' prey. There was, in particular, an explosion in the raptors' favourite meal: fan-throated lizards.
- **Solar energy:** Photovoltaic solar panels absorb sunlight to generate electricity. This has powered many homes in developing and under-developed countries. It has shown the potential to reduce the consumption of coal for electricity generation.
- **Challenges posed:** However, the solar panels pose a challenge. A study by French investigative journalist Guillaume Pitron reveals this. The fastest growing renewable energy source includes critical metals and minerals that require a lot of energy to extract and often leave a trail of environmental devastation in their wake. Wandering the world to research his book "The Rare Metals War", Pitron said he saw mountains in southern China "cut in half vertically," and "toxic lakes" in Inner Mongolia.

#### **Conclusion:**



The need of the hour is to create solutions that are sustainable. The solutions themselves shouldn't pose further challenges, easily scalable and cost saving. Better Research and Development techniques with right validation is the way ahead before deployment on large scale.

**What is ancient DNA (aDNA) and what has it been used to study? Analyse and discuss the utility of it.(250 words)**

The hindu

#### **Introduction:**

**Ancient DNA (aDNA)** is DNA isolated from ancient specimens. Due to degradation processes (including cross-linking, deamination and fragmentation) ancient DNA is of more degraded in comparison with contemporary genetic material. Even under the best preservation conditions, there is an upper boundary of 0.4–1.5 million years for a sample to contain sufficient DNA for sequencing technologies. Genetic material has been recovered from paleo/archaeological and historical skeletal material, mummified tissues, archival collections of non-frozen medical specimens, preserved plant remains, ice and from permafrost cores, marine and lake sediments and excavation dirt.

#### **Body:**

##### **aDNA is used to study:**

- Ancient DNA can be carefully extracted from archaeologically recovered bones, teeth or fossil plant remains.
- Small fragments are processed to sequence the genome of those ancient organisms.
- aDNA becomes degraded, on account of its age and the climatic and soil conditions it was buried in.
- Techniques developed over the past three decades have led to a revolution in how we understand the evolution and genetic history of a range of animals and plants, including species that are extinct today.
- Palaeogeneticists have been able to establish how genetic variation might relate to the independent evolution of species on different continents that were previously thought to be related, or how different subspecies of horses emerged after their domestication, or how populations that today appear distinct and in different geographical areas were once related and likely existed together in one region.

##### **Utility of aDNA from human samples:**

- To understand the genetic predisposition towards certain diseases and responses to medicines in different social groups in South Asia.
- The comparison of aDNA samples with other aDNA and modern DNA databases can reveal otherwise unsuspected genetic histories.
- Researchers can trace the deep ancestry of ancient individuals and assess how their genetic makeup is distinct on account of specific variant genes (alleles), mutations and other markers and see how this compares with that of modern groups.
- Thus, the most common way of understanding the relatedness of DNA between groups and individuals is by their admixture percentages.



**Case study: Ancient DNA samples of Rakhigarhi:**

The journal *Cell* published a paper, *An Ancient Harappan Genome Lacks Ancestry from Steppe Pastoralists and Iranian Farmers*, which claimed that the inhabitants of the Indus Valley Civilisation lacked the steppe-pastoralist ancestry which had brought Indo-European languages into South Asia.

Another paper, published in the journal *Science* by the same authors and others, established baselines for the DNA of South and Central Asian populations over the last 10,000 years.

**Key facts:**

- The paper concludes Indians came from a genetic pool predominantly belonging to an indigenous ancient civilisation.
- The findings are based on the study of the ancient genome in the skeletons excavated from a burial site at Rakhigarhi, which is among the biggest Indus Valley locations, spread across 300 hectares near Hisar.
- It belongs to the mature phase of the Harappan period, dating back to about 2800-2300 BC.
- The paper claims Iranian genetic traits in the Indus Valley period and in present day South Asians come from ancient Iranian and South East Asian hunter-gatherers, much before the advent of large-scale farming.
- According to paper, The Iranian related ancestry in IVC derives from a lineage leading to early Iranian farmers, herders and hunter-gatherers before their ancestors separated, contradicting the hypothesis that the shared ancestry between early Iranians and South Asians reflects a large-scale spread of western Iranian farmers' east.
- Instead, sampled ancient genomes from the Iranian plateau and IVC descend from different groups of hunter gatherers who began farming without being connected by substantial movement of people.
- The paper claims: "Multiple lines of evidence suggest the genetic similarity of I6113 (the Rakhigarhi burial DNA) to the Indus Periphery Cline individuals is due to gene flow from South Asia rather than in the reverse direction."

What are Organoids? Discuss the role played by them in helping to understand diseases better. Also explain ethical challenges associated with them. ( 250 words)

**The hindu**

**Why this question:**

Recently, at Neuroscience 2019, the Society for Neuroscience's 49th annual meeting, held in Chicago, U.S., two neuroscientists warned the gathering that fellow scientists are "perilously close" to crossing the ethical red line of growing mini-brains or Organoids in the laboratory that can perceive or feel things.

**Key demand of the question:**

One has to discuss the concept of Organoids in detail, its advantages and disadvantages along with the critical analysis of the ethical concerns involved.

**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 what Organoids are.*

**Body:**

*Explain that Organoids are a group of cells grown in laboratories into three-dimensional, miniature structures that mimic the cell arrangement of a fully-grown organ. They are tiny (typically the size of a pea) organ-like structures that do not achieve all the functional maturity of human organs but often resemble the early stages of a developing tissue.*

*Discuss their salient features.*

*Explain how Organoids are grown in the laboratory?*

*Discuss the ethical concerns involved.*

**Conclusion:**

*Conclude with way forward.*

**Introduction:**

**Organoids** are a **group of cells grown in laboratories into three-dimensional, miniature structures that mimic the cell arrangement of a fully-grown organ**. They are tiny (typically the size of a pea) organ-like structures that do not achieve all the functional maturity of human organs but often resemble the early stages of a developing tissue. Most organoids contain only a subset of all the cells seen in a real organ, but lack blood vessels to make them fully functional. In the case of brain organoids, scientists have been able to develop neurons and even make specific brain regions such as the cerebral cortex that closely resemble the human brain. The largest brain organoids that have been grown in the laboratory are about 4 mm in diameter.

**Body:**

**Role of Organoids in understanding diseases:**

- Organoids offer new opportunities to studying proteins and genes that are critical for the development of an organ.
- This helps in knowing how a mutation in a specific gene causes a disease or disorder.
- In a study in Europe using intestinal organoids from six patients with an intestine disorder, it became possible to identify the mutation in a gene that prevented the formation of a healthy intestine.
- Researchers have used brain organoids to study how the Zika virus affects brain development in the embryo.
- Scientists are already using stem cells taken from tumours to grow organoids that are poised to develop cancer.
- The ability to grow organoids using cancer stem cells allows researchers to study the genes, proteins and signalling pathways that cancer cells use to develop and grow.
- They are also using healthy organoids to identify and verify the gene mutations that cause cancer.

**Other benefits:**

- Organoids can be used to study the safety and efficacy of new drugs and also test the response of tissues to existing medicines.



- Organoids will bring precision medicine closer to reality by developing patient-specific treatment strategies by studying which drugs the patient is most sensitive to.
- Since the use of animals during drug development studies is becoming increasingly difficult, the focus has been on refining, reducing and replacing them.
- While scientists have been increasingly using human cell lines and other methods, such alternatives have some inherent limitations — they cannot mimic the whole organ system.
- Organoids are a far superior alternative to cell lines.

#### **Ethical concerns posed:**

- In some cases, scientists have already transplanted such lab-grown brain organoid to adult animals.
- These are seen as a step towards **potential “humanisation” of host animals**.
- Scientists argue that organoids **do not have sensory inputs and sensory connections** from the brain are limited.
- Isolated regions of the brain cannot communicate with other brain regions or generate motor signals.
- Thus, the possibility of consciousness or other higher-order perceptive properties, such as the ability to feel distress, emerging seems extremely remote.

#### **Conclusion:**

Despite organoids providing bright prospects which can change the future of medicine and technology in medicine, the associated concerns must be tackled at the earliest.

**What are Nano pharmaceuticals? Discuss their key features and elucidate on the role played by them in extending the economic life of proprietary drugs. (250 words)**

#### Livemint

#### **Why this question:**

Recently, Guidelines were released for Evaluation of Nano pharmaceuticals in India.

#### **Key demand of the question:**

Explain what are Nano pharmaceuticals, their utility, advantages and possible concerns.

#### **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 Nano pharmaceuticals are.

#### **Body:**

Nano pharmaceuticals represent an emerging field where the sizes of the drug particle or a therapeutic delivery system work at the Nano scale.

Describe briefly the recently launched guidelines.

Explain the significance of such guidelines.

Bring out the applications of Nano pharmaceuticals.

#### **Conclusion:**

Conclude with advantages; suggest that Nano pharmaceuticals have the ability to extend the economic life of proprietary drugs, thereby creating additional revenue streams.

**Introduction:**

Nano pharmaceuticals are a relatively new class of therapeutic-containing nanomaterials that often have unique “nanoproperties” (physiochemical properties) due to their small size (compared with their bulk-phase counterparts) a high surface-to-volume ratio and the possibility of modulating their properties. Recently, the Government of India released “Guidelines for Evaluation of Nano-pharmaceuticals in India”.

**Body:****Nano-pharmaceuticals key features:**

- A Nano-material can be defined as material having a particle size in the range of 1 to 100 nm in at least one dimension.
- Nano-formulations are not entirely new drugs but medicines that have better quality because of the technology-led delivery mechanisms that are used to make its administration in the body more effective.
- Nanopharmaceuticals are rapidly emerging sub-branch that deals with the drug-loaded nanocarriers or nanomaterials that have unique physicochemical properties and minute size range for penetrating the Central Nervous system
- Nano-pharmaceuticals can be tailored with functional modalities to achieve active targeting to the brain tissues.
- The magic behind their therapeutic success is the reduced amount of dose and lesser toxicity, whereby localizing the therapeutic agent to the specific site.

**Role played by them in extending the economic life of proprietary drugs:**

- They present novel reformulation opportunities for active agents (e.g., single molecule drugs, proteins, nucleic acids, etc.) that were previously insoluble or could not be targeted to a specific site of the body where they were needed.
- Nano-pharmaceuticals can also increase drug half-life by reducing immunogenicity and diminishing drug metabolism.
- They are expected to bring about a revolution in treatment strategies as they would enable targeting specific delivery of drugs and therapeutic molecules.
- They offer higher efficacy and lower toxicity in many disease conditions.
- They are expected to be of great use particularly in cancer treatment.
- With these advantages, nano-pharmaceuticals have the ability to extend the economic life of proprietary drugs, thereby creating additional revenue streams.

**Conclusion:**

Nanopharmaceuticals have enormous potential in addressing this failure of traditional therapeutics which offers site-specific targeting of active agents. Such precision targeting via nanopharmaceuticals reduces toxic systemic side effects, resulting in better patient compliance.



When used sensibly, Big data can save lives and help build better future citizens. Explain with suitable illustrations.(250 words)

**Reference**

**Why this question:**

The article highlights the importance of Big data as a technology for building better future for citizens.

**Key demand of the question:**

Bring out the significance of Big Data as a technology. Its applications in detail.

**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:**

In brief define what Big Data is and explain its evolution.

**Body:**

Explain first the relevance of Big Data and its emergence as a powerful tool.

Mention the significance of Big Data in India.

Then move on to discuss how big data can help vulnerable people manage their health and lives.

List down the applications of Big Data ranging from governance, economy, disaster management etc.

**Conclusion:**

Conclude with way forward.

**Introduction:**

Big data is a term for data sets that are so large or complex that traditional data processing application software is inadequate to deal with them. Almost 90% of the world's data today was generated during the past two years. "Big data" refers to the use of predictive analytics, user behavior analytics, or certain other advanced data analytics methods that extract value from data. Big data can be understood as the consolidation and centralization of public data inputs from various spheres of activities like commercial, consumer based, census, or even Aadhar controlled personal information.

**Body:**



# The six Vs of big data

Big data is a collection of data from various sources, often characterized by what's become known as the 3Vs: *volume, variety and velocity*. Over time, other Vs have been added to descriptions of big data:

VOLUME	VARIETY	VELOCITY	VERACITY	VALUE	VARIABILITY
The amount of data from myriad sources.  	The types of data: structured, semi-structured, unstructured.  	The speed at which big data is generated.  	The degree to which big data can be trusted.  	The business value of the data collected.  	The ways in which the big data can be used and formatted.  

Big data can be used in a variety of applications which can help build better future for citizens.

## Good Governance:

- Big data with the government is a huge boon for governance.
- Consumer habits can be studied and policies can be framed which would then be in line with the need of the hour.
- Patterns of investment, savings and expenditure can be revisited with changing time and government can instil such changes in its policies.
- Security of the state can be further enhanced by access to larger data.
- Transforming government programmes and empowering citizens to improving transparency and enabling the participation of all stakeholders.
- Geo-tagging in MGNREGA can help analyse the effectiveness of the policy geographically and bring in required changes.
- The Digital India and Smart Cities initiatives of the government also include efforts to utilise data to design, plan, implement, manage, and govern programmes.

## Economy:

- Big data can provide huge benefits to various sectors of the economy like,
- In Insurance Sector to improve customer experience & ensure their right to claim
- In Banking Sector to manage financial data
- To capture the production, price statistics, & calculate the resultant GDP
- Evade risks & minimize losses for financial firms
- Tax officials catching hold the tax evaders using Project Insight



**Health Care:** Big Data in health care caters the following benefits:

- Predicting diseases,
- Prescribing medicines,
- Optimizing treatment,
- Using clinical data to improve patient care,
- In critical Diagnostic tests,
- Finding new cures (R&D)

**Agriculture and Food:**

- Seed Selection
- Geo-Tagging to keep the track record of agricultural assets in the country
- Weather Forecasting
- Irrigation & effective water management
- Food Processing
- Identification of Crop Diseases

**Digital Space:**

- In the telecom sector- connecting the hinterland areas and bringing them to the mainstream,
- On Social Media for targeting platform users,
- Artificial Intelligence – Controlling home appliances,
- Analysing & Improving individual performance (at work, sports, or home) using wearable devices.

**Way forward:**

- Ethical issues related to data privacy need to get addressed.
- Data protection law must incorporate some of the best practices followed in the World.
- It must strengthen cybersecurity in order to safely utilize the large pool of virtually available data.
- Economically, the alliance of big data with blockchain technology will potentially change the way we see big data for now.
- To effectively analyse the large chunks of available data, well-equipped data centres are needed. It is essential to segregate the relevant data from the irrelevant data pool.
- In a world where most of the governments & businesses rely more on new-age data sources such as satellite imagery, parking images, and night lights, Big Data governance could be a game-changer for India, where policies have for long been under-implemented.

**Conclusion:**

The big data revolution is in its early days and most of the potential for value creation is still unclaimed. But it has set the industry on a path of rapid change and new discoveries. Stakeholders committed to innovation will likely be the first to reap rewards. If the farmers would have been concerned about the infirmities in terms of data-based farming, production could be increased.

INSIGHTSIAS



INSIGHTSIAS

SIMPLIFYING IAS EXAM PREPARATION

## INTEGRATED CLASSROOM COACHING(OGP) FOR FRESHERS

**NEW BATCH Starts from 4<sup>th</sup> November 2019 at BENGALURU**

### Features

- ◆ Nearly 500 Hours of classroom teaching for freshers
- ◆ Special CSAT classes every week.
- ◆ Special Current Affairs classes every week
- ◆ Special Sessions on Essay and Mains answer writing
- ◆ 58 Full Length Prelims Mocks as part of OGP-2020 aligned with CLASSROOM TEACHING
- ◆ 12 Full Length Mains Tests
- ◆ Mentorship Program
- ◆ Individual attention – Guaranteed!
- ◆ Separate Mains test series after Prelims
- ◆ Interview guidance Program
- ◆ Unparalleled Guidance throughout your preparation
- ◆ Full time Psychotherapist will be at institute to ease students during Stressful Preparation
- ◆ IGNITE@INSIGHTS, a platform where eminent personalities with enormous knowledge from diverse fields interact with our students and motivate them. Recent Sessions were by Mr. OP Choudhary – former IAS officer, Mr. Anil Swarup- former Coal Secretary, Mr. Deepak Gupta- former UPSC Chairman

### Optional Subjects Available

- ◆ Public Administration classes and Test Series
- ◆ Anthropology Classes and Test Series
- ◆ Kannada Literature Classes & Test Series

### UPSC TOPPERS

**2014**Nitish K  
AIR 8, CSE 2014Neha Kumari  
AIR 26, CSE 2014**2015**Artika Shukla  
AIR 4, CSE 2015Kirti Chekuri  
AIR 14, CSE 2015**2016**Nandini K R  
AIR 1, CSE 2016Dhyanchandra H M  
AIR 47, CSE 2016**2017**Anudeep  
AIR 1, CSE 2017Anu Kumari  
AIR 2, CSE 2017**2018**Shruti Deshmukh  
AIR 5, CSE 2018  
Rahul Sharangappa Sankur  
AIR 17, CSE 2018Balaji D K  
AIR 36, CSE 2014Satish Reddy Pingile  
AIR 97, CSE 2014Chandra Mohan Gang  
AIR 25, CSE 2015Kumar Ashirvad  
AIR 35, CSE 2015Shivam Pratap Singh  
AIR 52, CSE 2016Santosh B M  
AIR 307, CSE 2016Sachin Gupta  
AIR 3, CSE 2017Saumya Sharma  
AIR 9, CSE 2017Sreelakshmi R  
AIR 29, CSE 2018Lakshmi N  
AIR 45, CSE 2018

#### BANGALORE

📍 INSIGHTSIAS, NANDA ASHIRWAD COMPLEX,  
3rd floor, Above Village Hyper Market,  
Chandralayout Main Road, Attiguppe,  
Bangalore - 560072  
📞 Ph. No: 7483163074

#### DELHI

📍 INSIGHTSIAS, 57/12, 3rd floor,  
Above kumar Book Centre,  
Old rajinder Nagar,  
New Delhi - 60  
📞 Ph No: 7303318519

#### HYDERABAD

📍 INSIGHTSIAS (Initiative of INSIGHTSONINDIA)  
#1-1-379/212 , Indira park Main Road,  
Beside Balaji Darshan. Opposite to victoria cafe.  
near Ashoka Nagar Signal. Ashok Nagar.  
Hyderabad, Telangana-500020  
📞 8688512637



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

**Artificial Intelligence, is it an end to human miseries or an end to humanity itself?**

**Critically analyse.(250 words)**

### The hindubusinessline

#### **Introduction:**

Artificial Intelligence (AI) brings in a host of real-world applications which had earlier merely been a subject of science fiction novels or movies. The breakthroughs such as the Weather Company's to be launched, **the GRAF model** capable of predicting a thunderstorm virtually anywhere on the planet every hour and other such applications are useful. AI has made inroads to automation and decision support systems to complement or augment human abilities.

#### **Body:**

AI is being widely used today as shown below

- AI enhances the ability of computer systems to learn from their experiences over time, makes them capable of reasoning, perceiving relationships and analogies, helps solve problems, as well as respond in natural languages and adapt to new conditions.
- AI allows machines to sense and comprehend their surroundings and act according to their own intelligence or learning.
- **Governance:**
  - As India is poised for reforms in governance, AI can actually help with process optimization and cost savings for the government, in addition to solving some strategic problems or assisting in decision making.
- **Economy:**
  - Economic growth is vital for development, and the next generation of economic growth is anticipated to be fuelled by technologies relating to big data, block chain, quantum computing and AI. These game changing technologies will spur innovation, create value for the investors, generate specialized job domains and as a result, propel economic growth.
  - Issues such as tax evasion, money laundering etc can be easily addressed using AI.
  - 68% of Indian business decision-makers believe AI will help their business in various ways such as boosting productivity, generating growth and addressing societal issues
  - India has one of the world's largest automotive industries, with a significant production and consumption base. AI applications have vast scope in the automotive sector, ranging from enhancing fuel efficiency to passenger safety to the concept of self-driving vehicles.
- **Healthcare:**
  - Healthcare sector in India is burgeoning with innovation and demand, having business models unique to the Indian requirements and spending power.



- AI can augment the potential of government and private sector to deliver healthcare services and products with improved drug safety, better diagnosis and analysis of clinical reports for preventive and accurate treatment.
- **Defence:**
  - More advanced applications of AI extend to the domains of foreign, defence and security policies. Deep learning in AI can unravel futuristic functions by augmenting decision making ability of the humans with access to the information derived from large data sets.
- **Security:**
  - AI has many peace time applications as well. It can be used to train soldiers and pilots, simulate war-game, synthesize information from surveillance systems and address critical problems in optimizing logistics, fleet management and maintenance
  - Vision and Voice systems to interpret and comprehend visual inputs such as images, clinical diagnosis and facial recognition or voice inputs to recognize the source of the sound.
  - Law enforcement or internal security requirements for detecting and recognizing individuals or criminals, with multitudes of data streaming from police databases or the network of surveillance cameras.
  - Banking and financial services for fraud detection using advanced algorithms to identify patterns in transactions and consumer behaviours which are risk prone.
  - AI is also helping insurance providers arrive at better risk assessment.
- Countries such as India can benefit a lot from the use of AI by focusing on sectors such as agriculture, manufacturing, infrastructure etc.

#### **Concerns and Risks:**

- The armed forces of US and China have already invested billions of dollars to develop LAWS, intending to gain strategic and tactical advantage over each other. This runs the risks of an arms race.
- There is no clearly stated policy document or vision statement for AI development.
- AI has to meet the first and foremost challenge of acceptability with the users from the government, public sector and the armed forces, or even the private sector.
- As users of AI, their interest in the technology augmenting their own ability, and not posing a threat, is quite pertinent.
- Technical competence in this fast-paced sector, primarily in the case of government, could be a road block.
- AI can better adapt to the goals and expectations of the Indian decision makers, if the technology development is indigenous. Foreign dependence in this case would be detrimental and unproductive.
- AI has set off an **economic and technological competition**, which will further intensify.



- **LAWs** operate without human intervention, and there is formidable challenge in distinguishing between combatants and non-combatants, which is a subject of human judgment.
- **AI powered bots** have also been used to influence humans perceptions, views and opinions. Such activities are rampantly being promoted through social media platforms for various ulterior purposes using fake news, unethical advertisements, etc which then have huge negative consequences.
- **AI based weapons** are fast gaining currency. Since humans can be replaced by such machines, declaring war would become more convenient. These machines can wreck havoc if uncontrolled endangering the human race itself.
- AI is being used for **extensive surveillance** as in China which violates right to privacy. Such intelligence can be even used to selectively target and eliminate opponents which instil deep fear among people who would like to raise voice against injustice.
- Humans can pass on their limitations to robots. E.g.: biases, prejudices, discrimination, etc. A recent report in USA revealed that robot can be racist.

#### **Conclusion:**

“The greatest enemy of knowledge is not ignorance, it is the illusion of knowledge” was what **Stephen Hawking** said. The transformative capability of AI in India is huge, and must be rooted in an egalitarian ethical basis. Any institutional framework for AI should have a multidisciplinary and multi-stakeholder approach, and have an explicit focus on the ethical basis.

Do you think it is imperative that India’s legal prowess be applied to the situational complexities of space exploration? Discuss in the backdrop of world’s first space crime. (250 words)

#### The hindu

##### **Why this question:**

*The article discusses in detail the need for legal system in addressing any crimes arising out of space.*

##### **Key demand of the question:**

*One must bring out and reason with substance the need to have a legal system to address situational complexities of space exploration.*

##### **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:**

*One can start by highlighting the space race that the world countries are into.*

###### **Body:**

*First discuss how far world countries have come in terms of space explorations and what has made space exploration systems complex to address.*

*Explain that it is time to answer the questions like – What will happen when legal issues that are beyond the foresight of existing agreements arise? What will happen when crimes take place on commercial space vehicles sent by private corporations, third-party nations, and jurisdictions not already covered?*

###### **Conclusion:**

*Conclude with way forward.*

**Introduction:**

It was recently reported that the “world’s first space crime” may have been committed by a NASA astronaut, Anne McClain. She is suspected of signing into the personal bank account of her estranged spouse from a computer aboard the International Space Station (ISS). In this context, it is necessary to understand the ambit of space laws, issues in this relation and way forward.

**Body:****The case of Anne McClain:**

- Currently, there is no detailed framework for international space law nor is there any way to handle criminal disputes that arise on commercial space vessels.
- It gets even less defined when it comes to disputes between individuals from separate countries.
- Our only outer space presence comes from the International Space Station, which is currently governed under an international treaty called the **Intergovernmental Agreement (IGA) on Space Station Cooperation**.
- Article 22 of the Agreement concerns itself with criminal jurisdiction and states that countries which are mentioned in the agreement may exercise criminal jurisdiction over personnel in flights who are their respective nationals.
- Hence, the laws of the U.S. will be applicable in this situation concerning the first space crime.
- There are legal documents that govern space, such as the Outer Space Treaty, the Moon Agreement, the Registration Convention, the Rescue Agreement, and the Liability Convention, none of them comprehends a detailed framework to cater to criminal disputes that might arise on commercial space vessels, which will have personnel and space tourists from different jurisdictions.

**Issues persist:**

- NASA has recently announced the opening of the ISS for commercial uses like filming etc. which can naturally give rise to crimes committed in outer space.
- India is presently not a party of IGA but will have to become considering its ambitious projects like the Gaganyaan etc.
- If so, India will have to include provisions relating to offences in space in the Indian Penal Code, as that could be material in situations involving outer space, Indian citizens, and space equipment.

**Way forward:**

- Thus it is opined that India’s legislature should proactively legislate on this front and remain apace in space exploration missions.
- India might also need to formulate new international agreements on space, or sign MOUs to that effect.



- It is imperative, therefore, that India's legal prowess is therefore applied urgently and rigorously to the situational complexities of space exploration.
- Only by keeping pace with the explosive growth in space technology can India hope to remain at the forefront of scientific development in this exciting field.
- More comprehensive international codes and legislation will need to be drafted and thought up as space becomes increasingly more populated.

Espionage activities through the use of digital tools are increasing in the recent past, in this context discuss the need for India to invest and recruit heavily in counter-measures against social media espionage. ( 250 words)

### The hindu

#### **Why this question:**

*Espionage activities through the use of digital tools are increasing in the recent past. The article presents a detailed discussion on the same.*

*It was recently found out that a spy from Pakistan had managed to get access to secret and crucial information pertaining to Indian security through the means of honey-trap by using social media.*

#### **Key demand of the question:**

*Discuss the emergence of espionage and other methods of cyber terrorism with the coming of newer digital tools and the urgency to curb them.*

#### **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 narrate what are Espionage activities.*

##### **Body:**

*Discuss the emergence of espionage activities with increasingly coming of digital tools – for example explain what Honey trap is? – It is an investigative practice involving the use of romantic or sexual relationships for interpersonal, political, or monetary purpose.*

*Discuss what are the challenges involved.*

*Explain what measures need to be taken.*

*Role of government agencies and other stakeholders.*

##### **Conclusion:**

*Conclude with way forward.*

#### **Introduction:**

Cyber espionage, is “the act or practice of obtaining secret information without the permission of the holder of

the information (personal, sensitive, proprietary or of classified nature), from individuals, competitors, rivals, groups, governments and enemies for personal, economic, political or military advantage using methods on the

Internet, networks or individual computers through the use of cracking techniques and malicious software including Trojan horses and spyware.” Simply said, Cyber espionage is “The use of computer networks to gain illicit access to confidential information, typically that held by a government or other organization.”

#### **Body:**



honey-trap cases are a weapon of hybrid warfare being waged by the enemy across the borders.

**Instances of Cyber Espionage:**

- Using social media profile, by infecting their lives and devices. The second is to find someone on adult sites and inject malware into their phones and computers. According to reports, three of the world's 20 most visited websites are pornographic-related sites.
- It is important to note that 25% of all Android malware is porn-related. A 2017 study found that a hacker collective known as KovCoreG had been targeting millions of users of the site Pornhub, tricking them into installing viruses on their computers.
- Indian Army reported two cases of honey-trapping in 2015 and another two in 2017.
- The Indian Air Force reported one case in 2015, while the Navy did not report any.

**Counter-Measures needed:**

- An information warfare team is being set up at the Army headquarters.
- Suspected Twitter handles and Facebook accounts have also been identified.
- Investing in the latest technologies for early and better detection of viruses.
- Conducting frequent workshops to sensitise defence personnel against cyber risks.
- Conducting timely reviews and audits of all devices; developing better protocols in the event of contamination.
- Developing a methodology to embed dormant malware in all sensitive data and devices which will be able to track the bad actors and destroy the documents with a programmed kill switch.
- Developing a doctrine to hit back. The Defence Cyber Agency should be leveraged towards this end.
- Best cyber practices must be built amongst fresh recruits.
- Reforms in Indian intelligence need to cover a lot of ground, especially in providing a firm legal basis to the agencies involved in the trade. But they must begin with a complete overhaul of the recruitment process.

**Conclusion:**

In this information age, the enemy will be relentless and continue to invest and recruit heavily in these methods. India needs to act fast to deter such threats.

Edge computing is the new future face of cloud computing. Elucidate while explaining the relevance of edge computing in the coming times. (250 words)

*Indianexpress*

**Why this question:**

*The article suggests that By 2025, according to the global research and advisory firm Gartner, companies will generate and process more than 75% of their data outside of traditional centralized data centres — that is, at the “edge” of the cloud.*

**Key demand of the question:**



*The question expects us to elaborate on the new technology of edge computing and in what way it will be the new face of cloud.*

**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:**

Define what is edge computing? – Edge computing enables data to be analyzed, processed, and transferred at the edge of a network.

**Body:**

Explain the application of cloud computing first, and then discuss in what way edge computing is different from it.

Cloud computing — by which remote servers hosted on the Internet store and process data, rather than local servers or personal computers — is ready to move to the next level.

Amazon, Microsoft, and Alphabet, the parent company of Google — the technology giants that provide cloud computing infrastructure to major corporates and governments — want to leverage 5G wireless technology and artificial intelligence to enable faster response times, lower latency (ability to process very high volumes of data with minimal delay), and simplified maintenance in computing. This is where Edge Computing comes in — which many see as an extension to the cloud, but which is, in fact, different in several basic ways.

Quote relevant examples highlighting the uses of such applications.

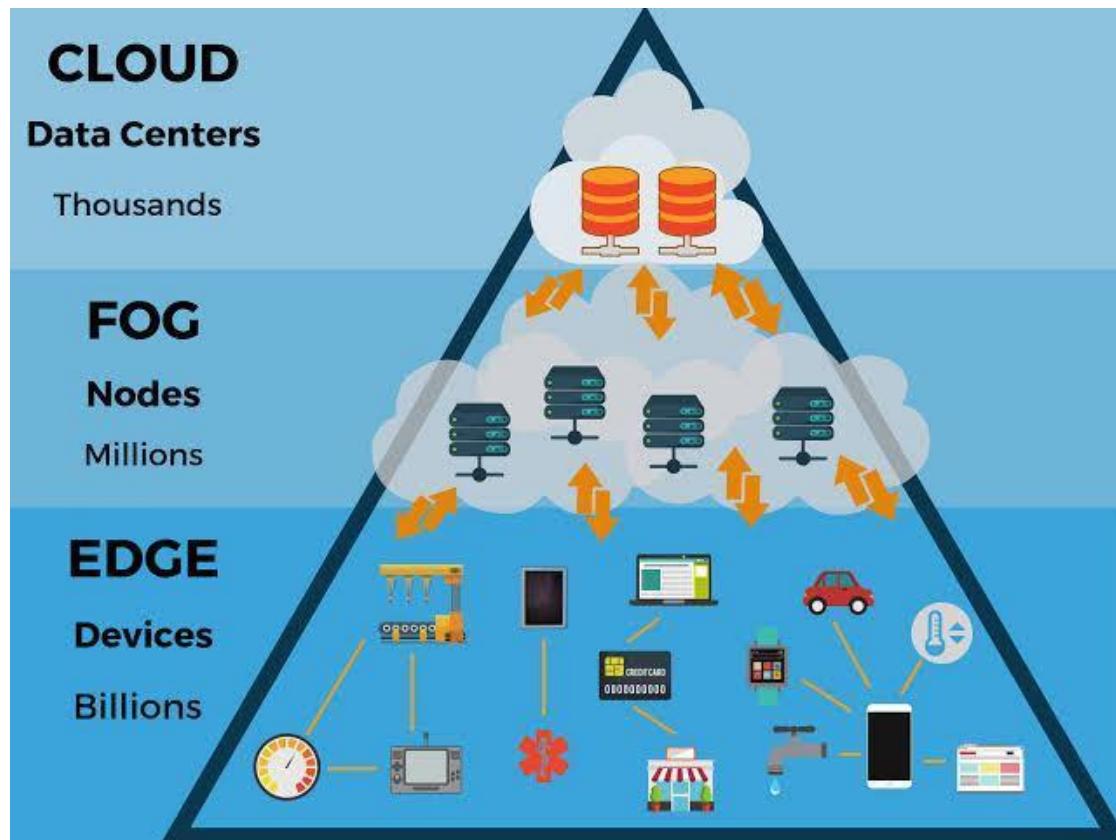
**Conclusion:**

Conclude with way forward.

**Introduction:**

**Edge computing** enables data to be analysed, processed, and transferred at the edge of a network. The idea is to analyse data locally, closer to where it is stored, in real-time without latency, rather than send it far away to a centralised data centre. So whether you are streaming a video on Netflix or accessing a library of video games in the cloud, edge computing allows for quicker data processing and content delivery.

**Body:**



#### Edge computing vis-à-vis Cloud computing:

- Edge Computing can be seen as an extension to the cloud, but which is, in fact, different in several basic ways.
- By 2025, says the global research and advisory firm Gartner, companies will generate and process more than 75% of their data outside of traditional centralised data centres — that is, at the “edge” of the cloud.
- At the moment, the existing Internet of Things (IoT) systems perform all of their computations in the cloud using data centres.
- **Edge computing**, on the other hand, essentially manages the massive amounts of data generated by IoT devices by storing and processing data locally.
- That data doesn't need to be sent over a network as soon as it processed; only important data is sent — therefore, an edge computing network reduces the amount of data that travels over the network.
- Technologies such as 5G wireless technology and artificial intelligence enable faster response times, lower latency (delay), and simplified maintenance in computing.
- It is preferred over cloud computing in remote locations, where there is limited or no connectivity to a centralized location. These locations require local storage, similar to a mini data centre, with edge computing providing the perfect solution for it.

#### Relevance of Edge computing in coming days:



- Edge application services reduce the volumes of data that must be moved, the consequent traffic, and the distance that data must travel.
- That provides lower latency and reduces transmission costs. Computation offloading for real-time applications, such as facial recognition algorithms, showed considerable improvements in response times as demonstrated in early research.
- Further research showed that using resource rich machines near mobile users, called cloudlets, offering services typically found in the cloud, provided improvements in execution time when some of the tasks are offloaded to the edge node.
- For instance: Nvidia, one of the biggest players in the design and manufacture of graphics and AI acceleration hardware, has just announced its EGX edge computing platform to help telecom operators adopt 5G networks capable of supporting edge workloads.
- The new Nvidia Aerial software developer kit will help telecom companies build virtualised radio access networks that will let them support smart factories, AR/VR and cloud gaming.
- Other notable applications include connected, autonomous cars, smart cities, and home automation systems.

**Conclusion:**

Experts believe the true potential of edge computing will become apparent when 5G networks go mainstream in a year from now. Users will be able to enjoy consistent connectivity without even realising it.

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

**What is Single Use Plastic? Discuss the challenges posed by them and explain in what way one can deal with the plastic menace steadily and replace it? Also suggest way forward. (250 words)**

[youtube](#)

**Why this question:**

*The TV debate captures the issues associated with single use plastic and the challenges associated with it.*

**Key demand of the question:**

*One must explain in detail the issues associated with single use plastic and the challenges in overcoming the threats posed by it and in managing and eradicating the menace totally.*

**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.**

**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:**

*In brief narrate the recent ban placed on single use plastic in the country.*

**Body:**



*Explain the following dimensions:*

*Provide some statistics/data on single use plastic usage to set the background.*

*Explain what is single use plastic? – Single-use plastics, also referred as disposable plastics, are commonly used for plastic packaging and intended to be used only once before they are thrown away or recycled. These include grocery (polythene) bags, food packaging, bottles, straws, containers, cups, cutlery etc.*

*Discuss the challenges involved in detail.*

*Why we need to ban single-use plastic? Its impact and Government's Initiatives against plastic menace.*

**Conclusion:**

*Conclude with way forward.*

### **Introduction:**

Single Use plastic is a form of plastic that is disposable, which is only used once and then has to be thrown away or recycled. The single-use plastic items include plastic bags, water bottles, soda bottles, straws, plastic plates, cups, most food packaging and coffee stirrers. The single-use plastic products also prevent the spread of infection. Instruments such as syringes, applicators, drug tests, bandages and wraps are often made to be disposable. Also, single-use plastic products have been enlisted in the fight against food waste, keeping food and water fresher for longer and reducing the potential for contamination

### **Body:**

Govt. of India has laid great emphasis on eradicating single use plastic which has become one of the biggest sources of pollution. During his Independence Day Speech this year Prime Minister had urged the people to take a pledge on Mahatma Gandhi's 150th Anniversary on 2nd October to make the country free of single use plastic

### **Challenges posed:**

- Petroleum-based plastic is not biodegradable and usually goes into a landfill where it is buried or it gets into the water and finds its way into the ocean.
- Plastic in oceans and forests are choking flora and fauna. In fact, plastic trash is expected to exceed the fish population in 2050.
- Microplastics have ability to enter food chain with the highest concentration of the pollutants.
- **The PWM Rules Amendment, 2018**, omitted explicit pricing of plastic bags that had been a feature of the 2016 Rules.
- Waste plastic from packaging of everything from food, cosmetics and groceries to goods delivered by online platforms remains unaddressed.
- The fast moving consumer goods sector that uses large volumes of packaging, posing a higher order challenge.
- Lack of adequate infrastructure for segregation and collection is the key reason for inefficient plastic waste disposal.
- Small producers of plastics are facing the ban, while more organised entities covered by the Extended Producer Responsibility clause continue with business as usual.



- Lack of consultation with stakeholders such as manufacturers of plastics, eateries and citizen groups: This leads to implementation issues and inconvenience to the consumers.
- Exemptions for certain products such as milk pouches and plastic packaging for food items severely weaken the impact of the ban.
- No investment in finding out alternative materials to plug the plastic vacuum: Until people are able to shift to a material which is as light-weight and cheap as plastic, banning plastic will remain a mere customary practice.
- Lack of widespread awareness among citizens about the magnitude of harm caused by single-use plastic: Without citizens ‘buying in’ to a cause, bans only result in creating unregulated underground markets.
- No strategy to offset the massive economic impact: Sweeping bans like the one in Maharashtra are likely to cause massive loss of jobs and disruption of a large part of the economy dependent on the production and use of plastic.

**Measures needed:**

- Target the most problematic single-use plastics by conducting a baseline assessment to identify the most problematic single use plastics, as well as the current causes, extent and impacts of their mismanagement.
- Consider the best actions to tackle the problem (e.g. through regulatory, economic, awareness, voluntary actions), given the country’s socio-economic standing and considering their appropriateness in addressing the specific problems identified.
- Assess the potential social, economic and environmental impacts (positive and negative) of the preferred short-listed instruments/actions. How will the poor be affected? What impact will the preferred course of action have on different sectors and industries?
- Identify and engage key stakeholder groups – retailers, consumers, industry representatives, local government, manufacturers, civil society, environmental groups, tourism associations – to ensure broad buy-in. Evidence-based studies are also necessary to defeat opposition from the plastics industry.
- Raise public awareness about the harm caused by single-used plastics. Clearly explain the decision and any punitive measures that will follow.

**Way forward:**

- Promote alternatives like cotton, khadi bags and bio-degradable plastics.
- Provide economic incentives to encourage the uptake of eco-friendly and fit-for-purpose alternatives that do not cause more harm. Support can include tax rebates, research and development funds, technology incubation, public-private partnerships, and support to projects that recycle single-use items and turn waste into a resource that can be used again.
- Reduce or abolish taxes on the import of materials used to make alternatives.
- Provide incentives to industry by introducing tax rebates or other conditions to support its transition. Governments will face resistance from the plastics industry, including importers and distributors of plastic packaging. Give them time to adapt.



- Use revenues collected from taxes or levies on single-use plastics to maximize the public good. Support environmental projects or boost local recycling with the funds. Create jobs in the plastic recycling sector with seed funding.
- Enforce the measure chosen effectively, by making sure that there is clear allocation of roles and responsibilities.
- Monitor and adjust the chosen measure if necessary and update the public on progress.
- **International examples:**
  - The success of imposing a plastic bag fee has also been established in cities like Chicago and Washington, showing that such interventions could be effective in shaping behaviour change.
  - The European Union is mulling new laws to ban some everyday single-use plastic products including straws, cutlery and plates citing plastic litter in oceans as the concern prompting the action.
  - Countries such as the U.S., Canada and the Netherlands have already put in place regulations to stop the use of microbeads in personal-care products. The sooner India adopts such regulations, the better
- **Encouraging plogging:** Picking up litter while jogging or strolling was kick-started on a small scale in a small part of Stockholm about a year ago, it has spread across the globe and India can adopt this as well.

**The government of India's bid to build a Green wall will be a breakthrough development if fulfilled successfully. Comment.(250 words)**

#### Livemint

##### **Why this question:**

The article provides for the detailed presentation of the scheme for Green wall proposed by the government of India on the lines of the Green wall of Sahara in Africa.

##### **Key demand of the question:**

One has to explain the relevance of such move to the environmental efforts of the government.

##### **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:**

In brief explain how the idea is a true inspiration.

###### **Body:**

Discuss the grand significance of such a pilot project that is a great step forward in terms of reducing carbon foot print on Earth.

India is reportedly planning to undertake a vast reforestation exercise along the Aravalli hill range that stretches from the Ridge of Delhi to Banaskantha in Gujarat.

Provide for a brief discussion on the African green belt too.

Discuss the aim behind the project and assert upon its significance.

###### **Conclusion:**

Conclude that it is a positive step forward to deal with the issue of climate change and global warming.

###### **Introduction:**



**'Green wall of India'** is the proposal of a 1,400km-long and 5km-wide green corridor all the way from Panipat in Haryana to Porbandar in Gujarat. India is reportedly planning to undertake a vast reforestation exercise along the Aravalli hill range that stretches from the Ridge of Delhi to Banaskantha in Gujarat. It should reassure us that ecological concerns haven't fallen off the map. The Green wall of India would be modelled on the so-called Great Green Wall of Africa that was envisioned to run from Djibouti in the continent's east to Senegal in its west.

#### Body:

##### Need for the initiative:

- Felling of trees is turning greenery scarce, but other forms of depredation too is also hurting.
- Unauthorized mining for minerals and building materials, for instance, has gone on unchecked for much too long.
- Around 96.4 million hectares, or nearly 30% of India's total land, is estimated to have been degraded already.
- The desertification and land degradation atlas of India, brought out by the ISRO in 2016, revealed that Gujarat, Rajasthan and Delhi were among states/UT where more than 50% of the total area was degraded land and those under the threat of desertification.
- Two-thirds of all Indian households still live off the land and land degradation puts their livelihoods at direct threat.
- Global warming has begun to distort rainfall and other climatic patterns that have sustained our ecological systems for millennia.

## SHIELD AGAINST DESERT



Rough contours of proposed 1,400km 'green wall'

- ▶ Forest belt likely to run roughly **from Porbandar to Panipat**, covering entire Aravali range and beyond
- ▶ 'Green wall' will act as barrier for dust from west and check eastward march of Thar desert
- ▶ It will check desertification by **restoring degraded land through massive afforestation**
- ▶ Project yet to get formal nod, details to be worked out

##### Green wall – a breakthrough initiative:

- It would act as a **defensive flank against climate change, desertification and other forms of land degradation**.



- The Delhi metropolitan region's expansion has resulted in widespread deforestation around the capital.
- The Aravalli range, which separates western India's Thar desert from the relatively green plains to its east, has lost so much green cover that it is losing its ability to act as a natural barrier against the heat and dust that blows in from the west.
- The greener the green wall remains, say ecologists, the less likely that the desert will expand into the rest of the Indian landmass.
- Without top-level intervention in favour of vegetation, environmentalists warn, the Thar desert's expansion could even threaten the "granary of India"—the fertile belts of Punjab, Haryana, western Uttar Pradesh and the Malwa region.
- If this is so, then the proposed project could insure the country against a potential crisis of food insufficiency in the decades ahead.
- The very idea behind it could inspire tree plantation drives elsewhere around the country.

**Conclusion:**

The green belt may not be contiguous, but would roughly cover the entire degraded Aravali range through a massive afforestation exercise. A legacy programme like converting such a huge tract of land as a green belt in high-intensive land-degraded states will be great boost towards meeting India's target.

**Explain the significance of C40 Clean Air Cities Declaration. Why do you think cooperation at global level is necessary? Discuss the challenges and ways to address air pollution across the global cities.( 250 words)**

**Hindustantimes****Why this question:**

'Clean Air Cities Declaration' was unveiled at the C40 World Mayors Summit in Copenhagen, an event that occurs once every three years and is designed to implement "substantive clean air policies by 2025".

**Key demand of the question:**

One must explain the significance of C40 Clean Air Cities Declaration and the increasing need to address the issue of air pollution across the world cities.

**Directive:****Comment****Structure of the answer:****Introduction:**

One can start by quoting relevant statistics/data highlighting the air pollution issue.

**Body:**

Explain first the key features of the C40 Clean Air Cities Declaration.

Through this Declaration, mayors commit to using their power and influence to reduce air pollution and work towards meeting the World Health Organization's Air Quality Guidelines.

This means cities will continually reduce their local emissions, and advocate for reductions in regional emissions, resulting in continuous declines in air pollution levels that move towards the WHO guidelines.

Discuss why we need a global action to tackle the menace of air pollution?

Suggest solutions.

**Conclusion:**

Conclude with way forward.

**Introduction:**



C40 is a network of the world's megacities taking action to address climate change. It is a group of 94 cities around the world that represents one-twelfth of the world's population and one-quarter of the global economy. The summit was launched in London in 2005 when the then London Mayor convened representatives from 18 megacities.

**Body:****Significance of C40 Clean Air cities declaration:**

- The aim of the summit is also to show how cities are delivering their strong commitments for healthier, sustainable, resilient and inclusive future.
- C40 supports cities to collaborate effectively, share knowledge and drive meaningful, measurable and sustainable action on climate change.
- It has been created and led by cities and is focused on tackling climate change and driving urban action that reduces greenhouse gas emissions and climate risks while increasing the health, wellbeing and economic opportunities of urban citizens.
- Signatories set ambitious pollution reduction targets within two years that meet or exceed national commitments, putting them on a path towards meeting World Health Organization guidelines;
- Implement substantive clean air policies by 2025 that address the unique causes of pollution in their cities
- They publicly report progress on achieving these goals.

**Need for global level cooperation:**

- It helps to take bold action to address the issues of climate change and air pollution.
- Nowadays, air pollution is an international problem with several impacts on living organisms

**Challenges posed by air pollution:**

- The role of air pollution in climate change dynamics is a question that must be urgently addressed.
- For example, the importance of air pollution and greenhouse warming vs. aerosol cooling needs to be discussed with air pollution cooling, dominated by aerosol content
- Many open questions still remain, such as the measurement and monitoring of air pollution, including the exploration of new technologies and methods like remote sensing and in-situ observations.
- Air pollution also impacts historic and modern buildings and materials, affecting sites of cultural heritage by damaging structural materials of monuments, statues, and even paintings.
- Air pollution has become a year-round phenomenon particularly in north India which causes health impacts far beyond the seasonal rise of respiratory illnesses.
- It is now the leading risk factor for chronic obstructive lung disease in India, and a major contributor to pneumonia and lung cancer.



- In 2017, air pollution accounted for 12.4 lakh deaths in India, which included 6.7 lakh deaths due to outdoor particulate matter air pollution and 4.8 lakh deaths due to household air pollution.
- According to a report by the **United Nations Environment Programme (UNEP)**, India had the highest share of welfare costs (or a loss of income from labour), of about \$220 billion (about ₹1.4 trillion), in South and South-East Asia of a combined total of \$380 billion from mortality due to air pollution.
- In addition to human lives lost, there's an estimated global cost of \$225 billion in lost labour, and trillions in medical costs, Greenpeace report says.
- Government is keen to ascend the World Bank's "ease of doing business" chart, but images of people walking around Delhi in safety masks do little to attract investment.

#### **Measures needed:**

- Short term measures should be accompanied by measures that **increase the forest cover** of the land and provide farmers with an alternative to burning the remains of their crops.
- An innovative approach could be to **use climate change funds to turn farm residues into a resource**, using technological options such as converting them into **biofuels** and **biofertilizers**.
- **Proactive engagements are necessary to persuade and reassure farmers.**
- It is important to find other uses for stubble such as biomass, which may encourage farmers to look for **alternative sources of income**.
- India should at least now give high importance to the **WHO warning about air pollution being the new tobacco**. Sharply escalated, deterrent parking fees can be implemented.
- From an urban development perspective, large cities should reorient their investments to **prioritise public transport, favouring electric mobility**.
- **Incentives** for adoption of **alternate mobility technologies** should be promoted.
- The **World Bank** has said it is keen to enhance its lending portfolio to tackle air pollution, opening a new avenue for this.
- Governments should make the **use of personal vehicles in cities less attractive** through **strict road pricing mechanisms** like **Congestion tax, Green-house Gas tax**
- Need to speed up the journey towards **LPG and solar-powered stoves**.
- **Addressing vehicular emissions** is within India's grasp but requires a multi-pronged approach. It needs to combine the already-proposed tighter emission norms (in form of BS VI), with a push for shared mobility and public transport and adoption of alternate mobility technologies.
- NCAP should take precedence from emerging practices in the country—**pollution cess in Delhi on truck entry, big diesel cars, and diesel fuel sales and the coal cess**—to generate dedicated funds to finance clean air action plan.



- Tackle road dust by mechanised sweeping and water-sprinkling but what would be more beneficial is if the sides of the roads could be paved or covered with grass that holds the soil together and stops the production of the dust in the first place.
- Attention to non-technological aspects such as urban planning, to reduce driving, and to increase cycling, walking, and use of public transport are needed.

Climate change mitigation should be integral to the urban planning, in this regard, discuss the strategies to be developed to have a sustainable urbanisation and discuss any measures taken by the government to that effect. (250 words)

### The hindu

#### **Why this question:**

*The article highlights the significance of keeping urban planning centric to the climate change.*

#### **Key demand of the question:**

*Explain the significance of considering the climate change factor integral to the urban planning aspect.*

#### **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 discuss the centrality of climate change aspect to urban planning.*

##### **Body:**

*Explain, in brief, cities contribution to the emissions and need for integrating the climate change in planning of cities.*

*Suggest on various strategies to have sustainable urbanization transportation, land resource management, green vehicles, green buildings etc.*

*Elaborate on the measures taken by the government to ensure sustainable cities.*

##### **Conclusion:**

*Conclude with way forward.*

#### **Introduction:**

Climate change impacts such as increased rainfall intensity, storm surges, and flooding and urban heat island effects are likely to affect many urban systems worldwide. These will impact severely on urban systems and the populations and services they support. For the second time this year, Bihar is submerged. In July, 13 districts in north Bihar were inundated, and now, it's the turn of four other districts, including the capital, Patna.

#### **Body:**

Climate change presents a significant challenge for urban systems worldwide. Its effects will likely intensify over the coming decades. Whilst humanity may be able to take collective action to limit the intensity of these effects, scientific evidence indicates that some are already happening and will continue to occur, irrespective of any ongoing mitigation.

#### **Some global good practices:**

- In Copenhagen, mayors from Toronto and Berlin spoke about expensive plans to retrofit buildings for energy efficiency and shift their transport infrastructure to greener options.



- Montreal is shifting city logistics to electric vehicles, keeping large trucks confined to centralised terminals.
- The city of Rome has an aggressive plan to ban diesel emissions, encourage sustainable shared mobility including biking and walking, and pursue a green new deal.
- China's Hangzhou already has the largest public bicycle-sharing system and is moving to a smart bus service.
- Hong Kong is ready to harvest super typhoons in new drainage tunnels that will reuse rainwater and grow biodiversity.
- Singapore will put a price on carbon.
- Novo Nordisk, a healthcare company, wants to partner with mayors on its Cities Changing Diabetes programme to "bend the curve" on the public health challenge through better facilities for biking, walking and urban mobility.

**Measures taken by the government:**

- **National Action Plan on Climate Change (NAPCC).**
- **National Adaptation Fund on Climate Change (NAFCC).**
- **Climate Change Action Programme (CCAP)**
- **International Solar Alliances (ISA)**
- The ambitious goal of generating 175 GW of renewable energy by 2022.
- Atal Mission for Rejuvenation & Urban Transformation (AMRUT), Smart cities.
- FAME Scheme – for E-mobility
- Energy efficiency initiatives
- Leapfrogging from Bharat Stage -IV to Bharat Stage-VI emission norms by April 2020
- India's forest and tree cover has increased by 1 percent as compared to assessment of 2015.
- Schemes like **UJALA** for LED distribution has crossed the number of 320 million while **UJJWALA** for distributing clean cooking stoves to women below poverty line has covered more than 63 million households.
- **State Action Plan on Climate Change (SAPCC)**
- At the C40 summit, Kolkata bagged an award for green mobility.
- Delhi's Chief Minister informed the delegates that the national capital was cutting emissions by inducting 1,000 electric buses, planting trees on a massive scale, and eliminating the use of dangerous industrial chemicals.
- Delhi is also setting up a task force for clean air. These must be the priorities for all cities.

**Way Forward**

- Investment in R&D is needed to spur innovations in sustainable climate-friendly and climate-proof productivity, and the private sector can help on this.



- Creation of urban policies which focus on both green cover as well as development of urban areas.
- Micro-forests, urban forests, vertical gardens, roof-top gardens and preservation of green spaces in the urban spaces must be taken up at rapid pace.
- All Indian states must conduct a detailed survey of their water bodies, which can serve as an insurance against floods.
- Strict laws against encroachment of the wetlands in the urban areas must be implemented.
- Involvement of the people in decision making on important issues like infrastructure development leads to unbiased and sustainable decision making.
- A high-density, poly-nodal, public-transport oriented urban pattern that would reduce travel distances and encourage non-motorised travel must find favour with India's city planners.
- Specific environmental targets must be built into the urban planning process.
- the new Energy Conservation Building Code should be made mandatory.
- Promoting a green growth model and pushing for radical reforms in urban planning should be the norm.

**Conclusion:**

It is vital that urban and climate change policies synergise at the local body level and a sustainable growth pattern is adopted on priority. Simultaneously, the resilience of cities, particularly of their poor areas, has to be vastly improved so that they can better manage the impact of climate change.

**"The first step towards tackling climate change is to accept the science and create conditions for innovative solutions". Comment. ( 250 words)**

**Livemint**

**Why this question:**

*The article explains in what way the projections of future climate are based on scenarios of socio-economic changes.*

**Key demand of the question:**

*One has to elucidate upon the fact that the first step towards tackling climate change is to accept the science and create conditions for innovative solutions.*

**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:**

*In brief highlight the alarming concerns posed by climate change.*

**Body:**

*First discuss the significance of science to handle the ill effects of climate change.*

*Take hints from the article and explain in what way tackling climate change is to accept the science and create conditions for innovative solutions to be found.*

*Explain what effect the climate change is having upon the children of future generations who are unknowingly compelled to involve in tackling and dealing with climate change.*

**Conclusion:**

*Conclude with way forward.*

**Introduction:**

Climate change is a complex problem. It is inextricably linked with society, economics, politics, and people's way of life. More than 190 countries signed the Paris Agreement in 2016, committing to change how they create and use energy in order to lower impacts of carbon and other greenhouse gases on the planet. All over the world, people and organizations are taking action to both lower carbon footprints and find innovative ways to adapt to the effects of climate change.

**Body:****Climate change is an immediate issue to be tackled:**

- Global warming above pre-industrial levels has touched about 1 degree Celsius.
- The IPCC 1.5 report basically says, at the current rates at which we are producing greenhouse gases, we are looking at a couple of decades really before what we have available is exhausted.
- At one level, for many people climate change has become an existential problem, a problem that risks undermining the conditions for productive life and therefore a problem that does not override but certainly permeates all kinds of other issues.
- For many others, climate change is a distant problem that is overwhelmed by more immediate issues.
- The rapid change of climate change is likely to exceed the ability of many species to migrate or adjust. Experts predict that one-fourth of Earth's species will be headed for extinction by 2050 if the warming trend continues at its current rate.
- Sea levels have risen between four and eight inches in the past 100 years. Current projections suggest that sea levels could continue to rise between 4 inches and 36 inches over the next 100 years.
- As temperatures rise globally, droughts will become more frequent and more severe, with potentially devastating consequences for agriculture, water supply and human health. This phenomenon has already been observed in some parts of Asia and Africa, where droughts have become longer and more intense.
- Hot temperatures and dry conditions also increase the likelihood of forest fires.

**Challenges in addressing climate change:**

- **Regional Inequality:**
  - The principle of Common but differentiated responsibilities was proposed to tackle climate change by addressing the regional inequality.
  - However, the indifferent behaviour by the developed countries has led to partial success of many global initiatives. E.g. Kyoto Protocol.
- **Developed Countries not taking responsibility:**
  - Historical emissions and pollution caused due to industrial revolution is not accepted by the industrialized nations.



- Developed nations are unwilling to accept the responsibility and are moving away from global agreements. E.g. USA rejecting the Paris deal.
- **Finance:**
  - Huge amount of funds is required for adaptation and mitigation measures to be adopted.
  - For e.g.: electric mobility, certainly is a green measure, but is actually expensive, in immediate terms, in terms of cost per vehicle kilometre.
  - The cost of shifting into renewable energy is also a fiscal challenge to most countries.
- **Technology:**
  - Many adaptation and mitigation measures need sophisticated technologies and Research and Development which is an impediment to many developing and small island nations.
  - Commercialization of technology in form of Patents, evergreening has made it unaffordable.
- **Increasing use of fossil fuels.**
- **Complex linkages among emissions, concentrations, climate changes, and impacts.**
- **Lack of certainty about the details of future climate change.**
- **Significant time lags in human response systems.**
- **Risks, judgments about risk, and adaptation needs are highly variable across different contexts.**

### Way Forward

- The first step in tackling climate change is to accept the science and create conditions for innovative solutions to be found.
- Investment in R&D is needed to spur innovations in sustainable climate-friendly and climate-proof productivity, and the private sector can help on this.
- There should instead be major changes in technological innovation, behaviour, values and governance. This is an unprecedented challenge for humanity.
- Incremental changes along with increasing contributions from renewables and improvements in energy efficiencies would not be sufficient.
- This is the time for the world's leaders to demonstrate that they are ready to go beyond expediency and take the actions needed to avert long-term catastrophe.
- Wealthy nations like the U.S., and those of the EU argued that emissions from developing countries are consistently rising and they need to commit to more serious emission cuts. A consensus needs to be developed at the earliest.
- The immediate up scaling of ambition in the second Commitment period of Kyoto Protocol and its early ratification by all Kyoto Protocol parties would be a step in the right direction.



- Concerning mitigation, distinction enshrined in the Convention between Annex I (Developed) and non-Annex I (developing) Parties must be maintained in accordance with the principles of Equity, CBDR and other provisions of the UN Conventions.
- The ‘developing versus developed country’ schism needs to be diluted at the earliest and Developed Countries should avoid watering down the CBDR principle envisaged in earlier agreements.

**What are green crackers? Are green crackers less polluting and to what extent there is awareness among people about it? Explain.( 250 words)**

#### The hindu

#### **Why this question:**

*Last October, in a landmark judgment, the Supreme Court of India mandated the use of green crackers for Deepavali, prescribing specific norms for the manufacture. This year, for the first time, ‘green crackers’ have been made available in markets, though the reach has been limited. These are milder avatars of traditional firecrackers in terms of the sound and smoke generated when burnt. Thus making it important for us to have an understanding of what are Green Crackers.*

#### **Key demand of the question:**

*Explain in detail what Green Crackers are and explain their significant contributions to environment in controlling pollution.*

#### **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:**

*In brief define green crackers and highlight the SC judgments in this regard.*

##### **Body:**

*In brief, show the impact of burning crackers on the environment.*

*Define green crackers and discuss various aspects of green crackers.*

*Add a note, in brief, on their supplies as of now.*

*Comment in detail whether green crackers are less polluting or not?*

*Assess the extent to which there is awareness about the green crackers.*

##### **Conclusion:**

*Conclude with way forward.*

#### **Introduction:**

Green crackers are low-polluting firecracker within the permitted decibel and emission norms is a green cracker. They are the crackers with reduced emission and decibel level. They are known as ‘green’ firecrackers because they have a chemical formulation that produces water molecules, which substantially reduces emission levels and absorbs dust. In 2018, while restricting the use of fireworks during all events to an 8-10 pm window, the Supreme Court ordered that only crackers with reduced emission and “green crackers” can be manufactured and sold.

#### **Body:**

In its report the CPCB said that due to fireworks on Diwali day, particulate matter 2.5 (tiny particles or droplets in the air that are two and one half microns or less in width, and hinder visibility and adversely affect health) levels go up. It stated when there was less fireworks in 2017, the level had reduced compared to previous years.



The crackers have been named as **Safe Water Releaser (SWAS)**, **Safe Thermite Cracker (STAR)** and **Safe Minimal Aluminium (SAFAL)**. These crackers are available as sparklers, flowerpots, maroons and atom bombs and have been developed by the **National Environmental and Engineering Research Institute (NEERI)**, a **Council of Scientific and Industrial Research (CSIR)** lab.

#### Pollution levels of Green Crackers:

- **SWAS (Safe Water Releaser)**
  - SWAS crackers eliminates usage of (KNO<sub>3</sub>) Potassium nitrate and Sulphur with consequent reduction in particulate matter (30-35%) SO<sub>2</sub> and NO<sub>x</sub>.
  - It has matching sound intensity with commercial crackers in the range of 105-110 dB
  - STAR eliminates usage of KNO<sub>3</sub> and S with consequent reduction in particulate matter (35-40%), SO<sub>2</sub> and NO<sub>x</sub>. It has matching sound intensity with commercial crackers in the range of 105-110 dB
  - SWAS has been tested for shelf life upto 3 weeks with consistent performance.
- **SAFAL (Safe Minimal Aluminium)**
  - SAFAL has minimal usage of aluminium (only in flash powder for initiation) with consequent significant reduction in particulate matter (35-40 %) compared to commercial crackers.
  - It has matching sound intensity with commercial crackers in the range of 110-115 dB
  - PESO has been approached to analyse and test SWAS/STAR/SAFAL from point of view of safety, stability and other related issues.
  - Also functional prototypes of flower pots for substitution of BaNO<sub>3</sub> (Barium nitrate) by low cost eco-friendly materials have been developed with significant reduction in particulate matter (30-35%).
- **STAR (Safe Thermite Cracker)**
  - STAR has the capability to eliminate the usage of KNO<sub>3</sub> and S with a consequent reduction in particulate matter (35-40 per cent), SO<sub>2</sub> and NO<sub>x</sub>.
  - Components in firecrackers are replaced with others that are **less dangerous and less harmful to the atmosphere**.
  - Broadly, it avoids the use of ash or filler materials and use charcoal as per specifications by **Petroleum and Explosives Safety Organisation (PESO)**.
  - The green crackers will be 25-30 per cent cheaper to manufacture and manufacturers would not have to make any changes in their facilities.
  - In green crackers the commonly used polluting chemicals like aluminium, barium, potassium nitrate and carbon have either been removed or sharply reduced to slow down the emissions by 15 to 30%.



# WHAT ARE 'GREEN CRACKERS'?

**Firecrackers that have "less dangerous" and "less harmful" chemicals than conventional ones**

**Being Developed by** CSIR's National Environmental Engineering Research Institute

Production after they are approved by Petroleum and Explosives Safety Organisation (PESO)

**Green Because**

- ▶ They have a chemical formulation that produces water molecules
- ▶ This substantially reduces emission level and absorbs dust
- ▶ Is basically a light and sound show that produces lower emissions
- ▶ Promise **30-35% reduction** in particulate matter, nitrous oxide and sulphur oxide

**Expected to hit the market in 4-5 years\***

**Also In The Works**

E-CRACKERS BEING DEVELOPED BY CSIR'S CENTRAL ELECTRONICS ENGINEERING RESEARCH INSTITUTE

**OTHER INITIATIVES**

Crackers with lower aluminium to reduce emissions substantially	'Anar' or flower pot made using eco-friendly material that can reduce particulate matter by 40%	Bijli crackers that eliminate use of ash as desiccants	Firecrackers without antimony, lithium, mercury, arsenic and lead as directed by PESO last year
---	---	--	---

Council of Scientific and Industrial Research

### Conclusion:

CSIR-CEERI, being an electronics laboratory, is developing safe and pollution free technology of electronic crackers (E-crackers) to meet latent social aspiration of enjoying fireworks.

What do you understand by 'carbon mineralisation'? How does it help in the fight against climate change? Which are other significant carbon capture and storage methods? Discuss the prospects of CCS. ( 250 words)

#### The hindubusinessline

#### Why this question:

The question is amidst the recent coming of newer methods of carbon capture and storage.

#### Key demand of the question:

One has to elaborate what is carbon mineralisation, Elaborate how it helps in the fight against the climate change. Write other significant carbon capture and storage methods available.

#### 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:**

Write in brief about the 'Carbon mineralization'.

**Body:**

'Mineralisation' is the decomposition of the chemical compounds in organic matter, by which the nutrients in those compounds are released in soluble inorganic forms that may be available to plants. Carbon sequestration is the process of capture and long-term storage of atmospheric carbon dioxide to mitigate global warming and to avoid dangerous impacts of climate change. The Carbon Capture And Storage (CCS) chain consists of three parts; capturing the carbon dioxide, transporting the carbon dioxide, and securely storing the carbon dioxide emissions, underground in depleted oil and gas fields or deep saline aquifer formations.

Explain significant carbon capture and storage methods.

**Conclusion:**

Conclude with way ahead.

**Introduction:**

Carbon mineralization is the process of conversion of carbonaceous material to carbon dioxide. It is the most general function of soil microbial communities that can be affected by exposure to pollutants. The mineralisation of carbon compounds is the fundamental energy-producing process for heterotrophic organisms. The process may result in production of CO<sub>2</sub> or CH<sub>4</sub> (depending on oxygen availability) in secondary production, which is subsequently mineralised, and in residual compounds, which tend to be increasingly resistant to decomposition.

**Body:**

It is a kind of Carbon capture and storage (CCS) technology which removes carbon dioxide from flue gases for storage in geologic formations or the ocean.

This iterative cascade provides some opportunities for directly manipulating the rate of carbon mineralisation by (i) maintenance of the food web; (ii) selective control of specific functional groups; and (iii) relocation of the organic resources.

**Carbon mineralization and fight against climate change:**

- Increasing soil carbon offers a range of co-benefits and this would buy us time before other technologies can help us transition to a zero-carbon lifestyle.
- Significant carbon pools on earth are found in the earth's crust, oceans, atmosphere and land-based ecosystems. Soils contain roughly 2,344 Gt (1 gigatonne = 1 billion tonnes) of organic carbon, making this the largest terrestrial pool.
- Increasing Soil Organic Carbon (SOC) through various methods can improve soil health, agricultural yield, food security, water quality, and reduce the need for chemicals.
- Changing agricultural practices to make them more sustainable would not just address carbon mitigation but also improve other planetary boundaries in peril such as fresh water, biodiversity, land use and nitrogen use.

**Other CCS methods:**

- Researchers have developed a new technology to capture carbon dioxide from a stream of air — virtually at any concentration level — an advance that may pave the way for new strategies to reduce atmospheric greenhouse gas levels.



- **Pre-combustion:** This method is normally applied to coal-gasification combined-cycle power plants. The coal is gasified to produce a synthetic gas made from carbon monoxide and hydrogen. The former is reacted with water to produce CO<sub>2</sub>, which is captured, and more hydrogen. The hydrogen can be diverted to a turbine where it can be burned to produce electricity. Alternatively, some of this gas can be bled off to feed hydrogen fuel cells for cars.
- **Post-combustion:** In this method, CO<sub>2</sub> is separated from the flue gas of the power station by bubbling the gas through an absorber column packed with liquid solvents (such as ammonia). In the most widely used system, once the chemicals in the absorber column become saturated, a stream of superheated steam at around 120C is passed through it. This releases the trapped CO<sub>2</sub>, which can then be transported for storage elsewhere.
- **Oxyfuel:** When coal, oil or natural gas is burned in normal air, CO<sub>2</sub> makes up around 3-15% of the waste gas – and separating it out is difficult and energy-intensive. An alternative method is to burn the fuel in pure oxygen. In this environment, virtually all the waste gas will be composed of CO<sub>2</sub> and water vapour. The latter can be condensed out while the former can be piped or transported directly to a storage facility.
- **Green Cover:** Afforestation / Reforestation / Plantation / Agro forestry: Trees are natural sequesters of carbon, they take carbon from atmosphere, utilize it in the process of photosynthesis as well as they store it in the form of biomass or wood.
- **Wetland restoration:** Wetland soil is an important natural carbon pool or sink. Wetlands conserve 14.5 % of the soil carbon found in world. But only 6 % of the world's land is composed of wetland
- **Oceans:** Oceans absorb CO<sub>2</sub> from the atmosphere because the concentration of CO<sub>2</sub> in the atmosphere is greater than that in the oceans. This difference in partial pressure of CO<sub>2</sub> results in the gas being absorbed into the world's oceans.
- **Subterranean injection or Geological sequestration:** Carbon dioxide can be injected into depleted oil and gas reservoirs and other geological features, or can be injected into the deep ocean, this is known as subterranean injection.

#### Prospects for CCS:

- Momentum for climate action has surged since the Paris Agreement in December, with increased investment in clean, renewable energy and new energy technologies.
- CCS technologies aims to keep climate-warming carbon dioxide out of the atmosphere, acting as a bridge to a lower-carbon future.
- To reach that future, national commitments to reduce emissions and increase public and private funding for research and development could help move CCS forward.
- Along with global deployment of renewable energy, CCS has the potential to cut emissions from fossil-fuelled power sources and energy-intensive industry.
- In addition, the Paris conference saw the launch of a CCS development and deployment roadmap for China, a paper outlining the role of CCS in the climate change mitigation portfolio of a coalition of environmental organizations, and a report that highlights CCS in its call for increased climate action over the next five years.



- Increasing support for carbon pricing from private companies, national governments and international organizations could also support the fledgling CCS industry by using funds collected from putting a price on emissions to help pay for carbon capture and storage, and ultimately making carbon expensive enough to incentivize wider CCS use.
- Another encouraging sign for CCS is the commitment by 20 countries, known as **Mission Innovation**, to double public funding for clean energy research and development over the next five years.

India intends to move away entirely from single-use plastics by 2022, yet the fact is India hasn't had much success with plastic waste regulation despite ambitious policy moves. Discuss in detail the underlying causes of such a situation and suggest solutions. ( 250 words)

### Financialexpress

#### **Why this question:**

*The article captures a detailed discussion on What does India's plastic regulation provide for, and where does it fall short.*

#### **Key demand of the question:**

*One must debate upon the plastic regulation scenario of 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:**

*In brief state some key facts to set the context of the question.*

##### **Body:**

*The answer must detail upon what ails India when it comes to meaningful action on reducing plastic waste.*

*Explain what does India's plastic regulation provide for, and where does it fall short?*

*Discuss that India has tried to regulate plastic pollution for at least two decades now. And yet nearly every stakeholder seems ill-prepared. Is regulation the problem, or is it industry and consumers who have simply failed to respond?*

*Suggest solutions specific to the problems.*

##### **Conclusion:**

*Conclude with way forward.*

#### **Introduction:**

Govt. of India has laid great emphasis on eradicating single use plastic which has become one of the biggest sources of pollution. During his Independence Day Speech this year Prime Minister Narendra Modi had urged the people to take a pledge on Mahatma Gandhi's 150th Anniversary on 2nd October to make the country free of single use plastic.

#### **Body:**

**Single Use plastic** is a form of plastic that is disposable, which is only used once and then has to be thrown away or recycled. The single-use plastic items include plastic bags, water bottles, soda bottles, straws, plastic plates, cups, most food packaging and coffee stirrers. The single-use plastic products also prevent the spread of infection. Instruments such as syringes, applicators, drug tests, bandages and wraps are often made to be disposable. Also, single-use plastic products have been enlisted in the fight against food waste, keeping food and water fresher for longer and reducing the potential for contamination

**India's policies to curb single-use plastic:**

- The Plastic Waste Management (PWM) Rules, 2016, with specific obligations for every stakeholder in the plastic supply-chain, including the extended producer responsibility (EPR) for producers, importers, brand owners.
- The Solid Waste Management Rules (SWM Rules), 2016, also have provisions for plastic waste, including EPR.
- The Biomedical Waste Management Rules, 2016, mandated phase-out of chlorinated plastic bags, gloves and blood bags within two years.
- Then there are state regulations banning single-use plastics (SUP).
- **Odisha** has defined SUP as polythene carry-bags, bottled water of less than 200ml, disposable cutlery made of thermocol and plastics and decorative materials (flower and the likes) made of thermocol.
- **UP** has excluded 200ml plastic water bottles and decorative materials, and included disposable tumblers, in the definition of SUP.
- **Tamil Nadu** has defined SUP as “use and throw plastics,” which include plastic carry-bags, flags, plastic sheets used for food wrapping and spreading on the dining table, plastic plates, plastic-coated cups, tumblers, water pouches and packets.

**Shortcomings in the above regulations:**

- The problem is with regulations, and with consumer awareness and industry's status-quo approach.
- There is a difference in EPR provisions under SWM Rules and PWM Rules.
- SWM Rules say that manufacturers/brand-owners shall provide financial assistance to local authorities for establishing waste management systems to fulfil their EPR.
- PWM Rules, however, don't mention the financial contribution to local authorities.
- Instead, these direct manufacturers/brand-owners to collect waste through their distribution channel or the local body concerned.
- **Implementation** of the Biomedical Waste Management Rules is still lax.
- States have **different definitions** of what constitutes SUP.
- **Consumer apathy** is at the core of the problem. We all talk about plastic pollution, but end up using polythene bags. We crib about dumpsites, but litter ourselves, and waste segregation is still to take off meaningfully.
- **No company in India** has shown leadership in dealing with plastic pollution.
- our approach to rule-making is command-and-control or ruling with a stick, to be precise. The experience of the past 20 years should have made it clear that regulations and penalties are not sufficient to eliminate the use of SUP.

**Solutions needed:**



- Proper plastic waste management will only happen if there is good municipal waste management. EPR provisions will have to be designed for this reality.
- we must be more focused on **recycling** than bans, given almost 40% of the plastic waste generated in the country remains uncollected
- To increase recycling, we must **improve segregation of waste at source and improve the collection and transportation of segregated wastes.**
- Multi-Layered Plastics contain several polymers, they can't be recycled. At best, they can be incinerated in cement plants, used as a refuse-derived fuel (RFD), used in road construction or for making down-cycled products.
- plastic waste management can't be treated as separate from solid waste management.
- Along with banning thin plastic carry-bags, the government should also promote options like textile or paper bags.
- A combination of economic and regulatory tools is required to incentivise quick entry of alternatives in a viable manner.

**Global practices to tackle single-use plastic:**

- Globally, plastic waste regulation is about **better segregation, collection, and then disposal.**
- The focus is not so much on the end-of-the-life reuse/recycling. This is the reason why, globally, **more than 90% of the plastics are not recycled.**
- Sweden, which is considered to have one of the best plastic waste management systems. Its plastic recycling rate is meagre, as it burns most of its plastic waste to generate electricity.
- Other developed countries, like the US, have outsourced plastic pollution. They consume a lot and then ship the waste to developing countries like China, India and now Africa.

**Way forward:**

- Design for recycling. Instead of using multiple polymers in packaging like multilayered plastics, they should be shifting to single polymers that will aide recycling. This can be done quickly.
- Reduce the weight of packaging and the need for packaging. There is a vast scope to reduce plastic consumption here. This is again a short- to medium-term goal.
- Start developing, substituting plastic with alternatives. This is something that they need to start working immediately, but this is a medium- to long-term goal.
- Start working closely with the local authorities to ensure littering is minimised and the collection of segregated plastics is maximised. This will reduce visible pollution, enhance recycling and end-of-life use.
- The plastic life cycle eventually is “from oil to oil” or “from oil to ash (incineration).” So, we will have to develop state-of-the-art facilities for energy recovery and conversion.



## Disaster and disaster management.

Extreme weather like long dry spells, accompanied with more intense rainfall concentrated over fewer days, are becoming the norm. In this context critically evaluate how Climate change and poor urban planning are jeopardizing lives of people. (250 words)

*Hindustantimes*

### Why this question:

The article discusses how extreme rainfall events are on the rise in the country. Long dry spells, accompanied with more intense rainfall concentrated over fewer days, are becoming the norm.

### Key demand of the question:

One has to explain the causative factors and the relationship between Climate change and poor urban planning and how it can be addressed.

### Directive:

**Critically evaluate** – When asked to evaluate, 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:

In brief discuss the recent extreme weather events in short.

#### Body:

Explain in detail the causative factors of these extreme weather events.

Discuss with suitable case studies – floods, dry spells etc.

Explain that the floods, especially in urban India, are taking place not just due to climate change, but also inadequate urban planning, which has not paid attention to natural water bodies and has forgotten the “art of drainage”.

Expand on the linkages between urban planning and its correlation with extreme events of weather.

#### Conclusion:

Conclude with way forward.

### Introduction:

Climate change impacts such as increased rainfall intensity, storm surges, and flooding and urban heat island effects are likely to affect many urban systems worldwide. These will impact severely on urban systems and the populations and services they support. For the second time this year, Bihar is submerged. In July, 13 districts in north Bihar were inundated, and now, it's the turn of four other districts, including the capital, Patna.

### Body:

Climate change presents a significant challenge for urban systems worldwide. Its effects will likely intensify over the coming decades. Whilst humanity may be able to take collective action to limit the intensity of these effects, scientific evidence indicates that some are already happening and will continue to occur, irrespective of any ongoing mitigation.

### Climate change and poor urban planning effects:

- Urban sprawl, combined with unsustainable transportation planning and energy guzzling building practices, has been the main source for the GHG emission.
- This has aggravated climate effects like **urban floods, urban heat islands, reduced ground water table levels etc.**



- The floods, especially in urban India, are taking place not just due to climate change, but also inadequate urban planning, which has not paid attention to natural water bodies and has forgotten the “art of drainage”.
- Urban water bodies, such as wetlands, provide crucial services like groundwater recharge (which is helpful during water-scarce summers, the other face of climate change) and flood management.
- Unfortunately, in India, water bodies are rarely recorded under municipal laws.
- Planners see only land, not water, and the builder lobby just encroaches on them.
- A study by the non-profit, Centre for Science and Environment, shows that Chennai, which faced devastating floods in 2015, had 600 water bodies in the 1980s; a master plan published in 2008 said only a fraction of the lakes in the city were in healthy condition.
- The rapid unplanned urbanization has led to chopping down of urban forest areas inducing climate imbalance and effects of local climate regulation.
- Concretized buildings and pavements, high usage of glass in the buildings has led to compounding of heat leading to urban heat islands.
- Poor urban plans result in rising slums in the cities where basic amenities are lacking and are the first to be affected in case of urban floods and famine.
- All these have lead to loss of lives in the urban cities in large scale, economic losses as well.

#### **Challenges in addressing climate change:**

- **Regional Inequality:**
  - The principle of Common but differentiated responsibilities was proposed to tackle climate change by addressing the regional inequality.
  - However, the indifferent behaviour by the developed countries has led to partial success of many global initiatives. Eg. Kyoto Protocol.
- **Developed Countries not taking responsibility:**
  - Historical emissions and pollution caused due to industrial revolution is not accepted by the industrialized nations.
  - Developed nations are unwilling to accept the responsibility and are moving away from global agreements. Eg. USA rejecting the Paris deal.
- **Finance:**
  - Huge amount of funds are required for adaptation and mitigation measures to be adopted.
  - For eg: electric mobility, certainly is a green measure, but is actually expensive, in immediate terms, in terms of cost per vehicle kilometre.
  - The cost of shifting into renewable energy is also a fiscal challenge to most countries.
- **Technology:**



- Many adaptation and mitigation measures need sophisticated technologies and Research and Development which is an impediment to many developing and small island nations.
- Commercialization of technology in form of Patents, evergreening has made it unaffordable.
- **Increasing use of fossil fuels.**
- **Complex linkages among emissions, concentrations, climate changes, and impacts.**
- **Lack of certainty about the details of future climate change.**
- **Significant time lags in human response systems.**
- **Risks, judgments about risk, and adaptation needs are highly variable across different contexts.**

### Way Forward

- Investment in R&D is needed to spur innovations in sustainable climate-friendly and climate-proof productivity, and the private sector can help on this.
- Creation of urban policies which focus on both green cover as well as development of urban areas.
- Micro-forests, urban forests, vertical gardens, roof-top gardens and preservation of green spaces in the urban spaces must be taken up at rapid pace.
- All Indian states must conduct a detailed survey of their water bodies, which can serve as an insurance against floods.
- Strict laws against encroachment of the wetlands in the urban areas must be implemented.
- Involvement of the people in decision making on important issues like infrastructure development leads to unbiased and sustainable decision making.
- A high-density, poly-nodal, public-transport oriented urban pattern that would reduce travel distances and encourage non-motorised travel must find favour with India's city planners.
- Specific environmental targets must be built into the urban planning process.
- the new Energy Conservation Building Code should be made mandatory.
- Promoting a green growth model and pushing for radical reforms in urban planning should be the norm.

### Conclusion:

It is vital that urban and climate change policies synergise at the local body level and a sustainable growth pattern is adopted on priority. Simultaneously, the resilience of cities, particularly of their poor areas, has to be vastly improved so that they can better manage the impact of climate change.



States of Bihar and Uttar Pradesh face floods frequently because of various natural and manmade reasons. Analyse floods with Patna as a case study in mind.(250 words)

### The hindu

#### **Why this question:**

Nearly 110 people died in rain-related incidents across the country in the past four days, with Uttar Pradesh reporting the maximum deaths, while

Incessant rainfall in Bihar has badly hit normal life, with almost all areas of capital city Patna under knee-deep waters and people struggling to meet their daily needs.

#### **demand of the question:**

One has to explain the causative factors of the flood situation in the states of Bihar and UP.

#### **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:**

Narrate the ongoing situation in these states.

##### **Body:**

In brief discuss the flood situation in Bihar and UP.

Explain the causative factors of the floods – discuss both manmade and natural causes of it.

Discuss using the case study of Patna; describe specific issues that have left the situation grim.

##### **Conclusion:**

Conclude with solutions to address the situation both short term and long term.

#### **Introduction:**

Several parts of Bihar and Uttar Pradesh were reeling from floods on Monday following continuing showers over the past few days. Incessant precipitation has deluged many districts, causing havoc, snapping communication lines and claiming several lives.

#### **Body:**

The water footprint is a measure of humanity's appropriation of fresh water in volumes of water consumed and/or polluted. It helps us understand for what purposes our limited freshwater resources are being consumed and polluted.

#### **Factors causing floods:**

##### **Natural factors:**

- **More than average rainfall:**
  - India's northern states have received above-average rainfall on account of sustained low-pressure conditions.

##### **Anthropogenic factors:**

- **Uncontrolled urbanization:**
  - Unregulated construction in Patna has been blamed for the situation the city has found itself in over the last few days.
  - The linear development which has been along major road networks, has completely ignored the varying and ecologically sensitive landscape.



- Substantial portions of revenue lands in the State are wetlands and forests, which has resulted in a shortage of buildable land parcels.
- This in turn is creating huge pressure on these ecologically fragile areas for conversion to government-supported infrastructure projects as well as private profit-making enterprises.
- **Poor planning:**
  - The State Action Plans on Climate Change elucidate measures for disaster-risk reduction in the wake of an increasing frequency of heavy rainfall in turn leading to more flooding and landslides.
  - Though plans and laws such as Integrated Water Resources Management or Coastal Regulation Zone Notification hold key solutions to natural disasters that are linked to water management, most of them are not implemented or followed to the letter.
  - A lack of holistic and coordinated measures within planning departments has resulted in further problems
  - **Roads, railway lines and housing colonies** being laid and built without regard for natural water ways, but with formal planning permission.
- **Dilution of laws:**
  - The need of the hour is for a review and revision of building bye-laws for urban and rural areas in accordance with bettering environmental sustainability.
- **Land use:**
  - Injudicious use of land is responsible for making states more prone to floods and landslides.
  - However, other factors such as a change in land use patterns and climate change could have contributed to the situation on the ground.
- **Deforestation:**
  - Unfettered development activity had increased the chances of landslides, a major cause of casualties during the floods.
- **Extra: Mismanagement of dams:**
  - *For dams to truly tame floods, experts say dam reservoirs need to be relatively empty before the onset of rain. This was not the case in many states.*
  - *Local officials have been blamed for exacerbating the situation by failing to gradually open the dams dotting the state's complex river network, waiting instead until they were already full before unleashing the excess water.*
  - *More flooding was caused by emergency releases from dams that were full. Despite forecasts of more rain, there were no controlled releases.*
  - *World Bank analysis while preparing the National Hydrology Project (NHP) in 2015 showed that although weather forecasts are more accurate now, dam managers (especially bureaucrats) are reluctant to authorise advance controlled releases.*



### Measures needed for flood management:

- The dire need is for **watershed-based master planning and development legislated guidelines** for each major river basin, especially those that impact densely populated settlements.
- There must be a demarcation of ecologically sensitive zones using existing village survey maps and public participation.
- There must be clear land use plan for these zones specifying flood plains, protected forest areas, agricultural and plantation zones, with details of the types of crops, building usages permitted and the density of buildings permitted.
- To compensate owners in non-buildable areas, there must be strategies such as Transfer of Development Rights to buildable zones in cities.
- The master plan should focus on permitting only ecologically sensitive building strategies for these areas by proposing new construction techniques.
- Controlled development can be proposed using building height rules, floor area ratio control, and restrictions on cutting and filling natural land.
- Strategies to make sure that all infrastructure projects are carried out in a scientific manner with strict scrutiny must be specified.
- This should include roads built on difficult terrain and all public infrastructure projects in wetlands and the High Ranges.
- Copenhagen in Denmark, which faces a similar problem of repeated flooding, has come up with active cloudburst responsive planning as a process to develop the city in line with climate change needs.

### Conclusion:

A complete overhaul of processes to hire technical expertise which allows access to necessary skills, and with a long-term vision of capacity building of local agencies, is the way forward.

**Mangroves can act as first line of defence against coastal flooding. Elucidate. ( 250 words)**

#### The hindu

#### **Why this question:**

*The article discusses a case study dealing with significant contributions of mangroves to coastal flooding.*

#### **Key demand of the question:**

*One has to explain the importance of Mangroves as a strong mechanism to prevent and manage the issue of coastal flooding.*

#### **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:**

*In brief state the recent coastal flooding witnessed by the Indian states like Kerala and Karnataka.*

**Body:**

First explain the causative factors of coastal flooding.

Discuss the need to manage these floods; their impact.

Explain the role played by Mangroves – what are mangroves? Advantages and in what way they act as natural seawall.

Illustrate with suitable examples to justify better.

**Conclusion:**

Conclude with way forward.

**Introduction:**

Mangroves are salt tolerant trees, also called **halophytes**, which survive high salinity, tidal regimes, strong wind velocity, high temperature and muddy anaerobic soil – a combination of conditions hostile for other plants. The mangrove ecosystems constitute a symbiotic link or bridge between terrestrial and marine ecosystems. They are found in the inter-tidal zones of sheltered shore, estuaries, creeks, backwaters, lagoons, marshes and mud-flats.

**Body:**

Mangroves act as first line of defence against coastal flooding:

- Mangroves are to a coastal area what rain forests are to the Western Ghats.
- They are extremely important in maintaining a peaceful coastal ecosystem, as they form a **natural seawall**.
- Mangrove plants have (additional) special roots such as prop roots, pneumatophores which help to impede water flow and thereby enhance the deposition of sediment in areas (where it is already occurring), stabilize the coastal shores, provide breeding ground for fishes.
- It prevents soil erosion, protects the coastline and has its own ecological natural habitat. The floods of these two years made us think of what we could do to check flood waters and strengthen our coastline.
- Mangroves moderate monsoonal tidal floods and reduce inundation of coastal lowlands.
- They protect coastal lands from tsunami, hurricanes and floods.

**Other significance:**

- Mangroves are a rich zone of biodiversity, as they are the main breeding grounds of brackish water fish species.
- The trees offer sanctuary to a number of bird species.
- They play an active role in carbon sequestration
- Mangroves enhance natural recycling of nutrients.
- Mangrove supports numerous flora, avifauna and wild life.
- Provide a safe and favourable environment for breeding, spawning, rearing of several fishes.
- They supply timber, fire wood, medicinal plants and edible plants to local people.
- They provide numerous employment opportunities to local communities and augment their livelihood.



### **Scientific management measures for conservation of Mangroves:**

- The mangrove species under grave threat must be included in **the Red List of the International Union for Conservation of Nature (IUCN)**.
- Suitable sites are to be identified for planting mangrove species. **Mangrove nursery banks** should be developed for propagation purposes.
- **Environmental monitoring in the existing mangrove areas** should be taken up systematically and periodically.
- Various threats to the mangrove resources and their root causes should be identified, and earnest measures should be taken to eliminate those causes.
- The **participation of the local community** should be made compulsory for conservation and management.
- **Floristic survey of mangroves** along the coast is to be taken up to prepare biodiversity atlas for mangroves.
- Potential areas are to be identified for implementing the management action plan for mangroves, especially in cyclone prone areas.
- Coastal industries and private owners need to be persuaded to actively participate in protecting and developing mangrove biodiversity.
- The forest department officials should be trained on taxonomy, biology and ecology of mangrove species.

### **Way forward:**

- The impact of environmental and human interference on marine flora and fauna needs to be assessed.
- The traditional rights of coastal communities to use the natural resources in their surrounding natural habitats for their livelihood should also be recognised on priority basis.

### **Linkages between development and spread of extremism.**

Discuss the significance of community-based natural resource management. Also, analyse to what extent it can aid in better provisioning of ecological services of a region. ( 250 words)

#### Downtoearth

#### **Introduction:**

**Community-based natural resource management (CBNRM)** is a **people-centered approach to the integration of conservation of the natural resource base (water, soil, trees and local biodiversity) and development to overcome poverty, hunger and disease**. CBNRM was affirmed by the 1980 World Conservation Strategy of the International Union for Conservation of Nature (IUCN), and the Earth Summit's 1992 Statement of Forest Principles and the Convention on Biological Diversity.

#### **Body:**

**Significance of CBNRM:**

- **Multi-stakeholder collaboration** that involves all participants, from communities, to government, to NGOs, and promotes coordination among them.
- **Conflict management mechanisms** support processes to manage natural resource conflicts among stakeholders.
- **Participatory action research** collaborative fact-finding and analysis generates a mutually agreed upon perspective for action.
- Strong local organizations, such as forest-farmer groups and inter-village networks are built from the bottom-up.
- **Livelihood improvement and environmental services** work to sustain environmental conservation by linking it to farm and community enterprises.
- **Provide opportunities for reinvestment** by linking upland environmental services to lowland and urban communities.
- Policy support and law enforcement are essential to curbing illegal encroachment leading to ecosystem degradation.
- Collaborative management plans – build shared responsibilities and decision-making among all stakeholders through joint management plans of natural resources. This leads to healthy communities and ecosystems.
- **Participatory monitoring and evaluation** – promote learning, trust and accountability through monitoring of the natural resource base and application of the management plan.
- Gender and social justice in access to, and control of, natural resources is the ultimate measure of the sustainability of community-based natural resource management efforts.

**CBNRM and provisioning of ecological services of a region:**

- Most community-based natural resource management programmes may have only limited success at achieving both conservation and human development goals.
- But the concept appears to be the best opportunity for countries like India to achieve these two outcomes of conservation and human development goals.
- The most important part of the approach is that user rights are transferred from central government to local communities.
- The model is being increasingly promoted as a conservation tool and has become the dominant approach in natural resource conservation worldwide.
- It can help the country retain its place as one of the most famous and profitable wildlife tourism destinations in the world. And it can also contribute to other economic sectors and alleviate rural poverty.

**Way forward:**

- Awareness on environmental degradation, effects of climate change and possible peoples' collective actions to address these imminent challenges will be crucial, especially for the young generation in schools and colleges.



- Valuing local people's indigenous knowledge systems and practices will be the first step to prepare local hill communities for collective actions to restore and manage the already degraded and fragile hill ecosystems.
- Massive plantation drives ensuring new plantations of grass, shrubs and trees species suitable to the local agro-ecology and funded by the forest department, power companies and other development actors like NGOs/donor agencies.
- Revival and strengthening of village institutions like Van Panchayats, Youth clubs, Women's Groups/Collectives, Farmers' Collectives etc, will be important to ensure the decentralised conservation and management of common property resources and forest.
- Conscious and sustainable use and management of land, water and forest resources by local hill communities, ensuring natural regeneration processes, participatory planning, management and maintenance of natural resources will be crucial. Community level rules/bye-laws and enforcement mechanisms for sustainable management of natural resources will be useful in the long run.
- More collaborations and partnerships will be required among local communities, local self-governance bodies, government, academicians, universities, non-profits, Corporate Social responsibility Foundations, Himalayan Mountain Forum, social movements and networks and the larger civil society are needed to ensure community-based natural resource management and better provisioning of ecological services for the hill communities.

**Conclusion:**

Conservation of local areas by promoting the community has been highlighted by various instances such as **IUCN's Policy Statement on Sustainable Use of Wild Living Resources in 2000**, and **the Convention on Biological Diversity's 2004 Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity**. Involving communities living in and around natural resource-rich areas in the management and use of these resources is an effective tool of conservation that has been recognised across the world.

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

What should be the extents of focus if India desires to accomplish the goal of making a place for itself amongst the top 50, in the Ease of Doing Business Index by 2020?

Discuss the possible challenges it can face. Suggest solutions to the same. ( 250 words)

Indianexpress

**Introduction:**

India has secured 63rd position out of 190 countries in World Bank's Ease of Doing Business Report 2019 which is 14 places up since the last report. The ranking comes when the leading financing institutions including RBI, World Bank and IMF are slashing country's growth forecasts. In 2014, India was ranked 142 among 190 countries. As compared to 2018, India moved up 14 places in the ranking mainly due to several reforms in the trade and commerce sector.

**Body:**



India has also been placed on the list of economies with the most notable improvements on this index for the third year in a row. Further, this jump in the ranking, while it comes at a time when economic activity has slowed down sharply, moves India closer towards the target of being in the top 50 economies on this index.

**Reasons for improved ranking:**

- India's performance over the past year can be traced to significant gains made on four parameters, namely, resolving insolvency, dealing with construction permits, trading across borders, and registering property.
- On resolving insolvency, where India has seen the biggest gain this year, its performance has improved on both the time taken for the insolvency process to culminate, which has fallen from 4.3 years to 1.6 years, and on the recovery rate, which has risen from 26.5 to 71.6 cents on the dollar.
- Introduction of GST has made registration process faster; World Bank in its report had specifically mentioned Mumbai and Delhi.
- Implementation of the single-window clearance system in Delhi and the online building permit approval system in Mumbai. India has also streamlined and centralized its construction permitting process.
- India has also decreased border and documentary compliance time for both exports and imports.
- Sustained business reforms over the past several years.
- India conducted four reforms in the 12-month period to May 1. Among other improvements, India made the process of obtaining a building permit more efficient.
- Importing and exporting also became easier for companies with the creation of a single electronic platform for trade stakeholders, upgrades to port infrastructure and improvements to electronic submission of documents.

**Challenges faced:**

- India still lags in areas such as enforcing contracts (163rd) and registering property (154th).
- It takes 58 days and costs on average 7.8% of a property's value to register it, longer and at greater cost than among OECD high-income economies.
- It takes 1,445 days for a company to resolve a commercial dispute through a local first-instance court, almost three times the average time in OECD high-income economies.
- It takes approximately a month to start a business in India while the OECD average is 12 days. Though some states like Telangana have eased up the procedures for starting a business, this is yet to be achieved on a pan India basis.
- The procedures to secure permits are rather cumbersome and involve permissions to be sought from various departments.
- The implementation efficiency of Insolvency and Bankruptcy code is yet to be proven.



- Though India has been a modest improvement in enforcing contracts, it now takes longer time than it did 15 years ago. The absence of effective means for enforcing contracts impedes growth and development and is a disincentive for the private sector.
- When the domestic market is sluggish, it is important that foreign trade is boosted.
- India's largest urban agglomerations, Mumbai and Delhi cannot host the kind of large factories to generate adequate employment. The procedural reforms have not yet reached the hinterland.
- Legislative roadblocks still exist for Land Acquisition.
- A plan for the industrial park in Gujarat with Singapore has been abandoned due to issues of land acquisition.
- Difficulty in cutting the red tape erodes the trust of investors and impedes the prospects of small businesses.
- Lack of coordination among different government ministries and departments, Central and State governments.

#### **Measures needed to break into the top-50 rankings:**

- India has significant room for improvisation in almost all the sub-indices.
- India fares among the best in access to credit in the South Asian region. Access to credit should be assured for small businesses and rural entrepreneurs through penetration of formal banking channels into rural areas.
- Effective implementation of reforms like **GST, Insolvency and Bankruptcy code** is needed. The limit of 180 days prescribed in Insolvency and Bankruptcy code should be pertained to.
- Governments should be proactive in obtaining regular feedback about the implementation and initiating the changes accordingly.
- States can work towards providing a **robust online system for registering property**.
- **Digitising land records, improving titling and streamlining procedures for transfer of property** should be taken up.
- Foreign trade needs to be boosted by cutting red tape and reducing transaction costs.
- A fair judicial and executive system need to be in place to achieve the confidence of domestic and foreign investors.
- Fast track commercial courts, paper-less courts need to be set up to speed up the judicial processes.
- Reforms should not be restricted to Mumbai and Delhi but should be implemented in the hinterland as well.
- Create awareness about the reforms and procedures of institutional arbitration.
- Labour compliances need to be eased.
- Bureaucracy needs to be well trained and should try to come out of its popular mindset of being lax and indifferent.



- In the spirit of cooperative and competitive federalism, all the states should initiate the best and proven practices for ease of doing business.
- The government's assessment of states for implementation of Business Reforms Action Plan is a step in the right direction and helps to reinforce the idea of competitive federalism.

**Conclusion:**

In 2015, the government's goal was to join the 50 top economies on the ease of doing business ranking by 2020. While the competition to move up the ladder would increase and become much tougher, India is on track to be within top 50 of the Ease of Doing business in the next year or two. And to come under 25 or below 50, the government needs to announce and start implementing next set of ambitious reforms now, as these reforms takes a few years to be realized on the ground.



INSIGHTSIAS

SIMPLIFYING IAS EXAM PREPARATION

## INTEGRATED CLASSROOM COACHING(OGP) FOR FRESHERS

**NEW BATCH Starts from 4<sup>th</sup> November 2019 at BENGALURU**

### Features

- ◆ Nearly 500 Hours of classroom teaching for freshers
- ◆ Special CSAT classes every week.
- ◆ Special Current Affairs classes every week
- ◆ Special Sessions on Essay and Mains answer writing
- ◆ 58 Full Length Prelims Mocks as part of OGP-2020 aligned with CLASSROOM TEACHING
- ◆ 12 Full Length Mains Tests
- ◆ Mentorship Program
- ◆ Individual attention – Guaranteed!
- ◆ Separate Mains test series after Prelims
- ◆ Interview guidance Program
- ◆ Unparalleled Guidance throughout your preparation
- ◆ Full time Psychotherapist will be at institute to ease students during Stressful Preparation
- ◆ IGNITE@INSIGHTS, a platform where eminent personalities with enormous knowledge from diverse fields interact with our students and motivate them. Recent Sessions were by Mr. OP Choudhary – former IAS officer, Mr. Anil Swarup- former Coal Secretary, Mr. Deepak Gupta- former UPSC Chairman

### Optional Subjects Available

- ◆ Public Administration classes and Test Series
- ◆ Anthropology Classes and Test Series
- ◆ Kannada Literature Classes & Test Series

### UPSC TOPPERS

**2014**Nitish K  
AIR 8, CSE 2014Neha Kumari  
AIR 26, CSE 2014**2015**Artika Shukla  
AIR 4, CSE 2015Kirti Chekuri  
AIR 14, CSE 2015**2016**Nandini K R  
AIR 1, CSE 2016Dhyanchandra H M  
AIR 47, CSE 2016**2017**Anudeep  
AIR 1, CSE 2017Anu Kumari  
AIR 2, CSE 2017**2018**Shrushti Deshmukh  
AIR 5, CSE 2018  
Rahul Sharangappa Sankur AIR 17, CSE 2018

### BANGALORE

📍 INSIGHTSIAS, NANDA ASHIRWAD COMPLEX,  
3rd floor, Above Village Hyper Market,  
Chandralayout Main Road, Attiguppe,  
Bangalore - 560072  
📞 Ph. No: 7483163074

### DELHI

📍 INSIGHTSIAS, 57/12, 3rd floor,  
Above kumar Book Centre,  
Old rajinder Nagar,  
New Delhi - 60  
📞 Ph No: 7303318519

### HYDERABAD

📍 INSIGHTSIAS (Initiative of INSIGHTSONINDIA)  
#1-1-379/212 , Indira park Main Road,  
Beside Balaji Darshan. Opposite to victoria cafe.  
near Ashoka Nagar Signal. Ashok Nagar.  
Hyderabad, Telangana-500020  
📞 8688512637