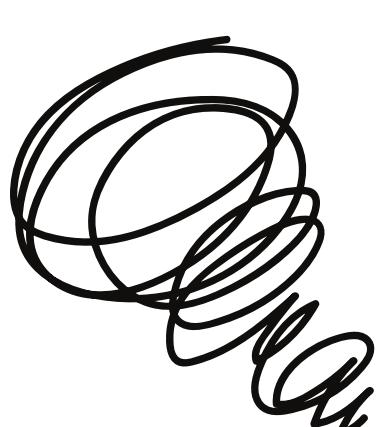


OFFICERS' PULSE

Issue no. 27 | 28th November to 4th December, 2021



AT A GLANCE
& IN DEPTH.

COVERAGE.

The Hindu
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Polity and Social Issues
Economy
International Relations
Environment
Science and Tech
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CURRENT AFFAIRS **WEEKLY**

THE **PULSE** OF UPSC AT YOUR FINGER TIPS



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News @ a glance

POLITY

1. NFHS-5

About NFHS

- The National Family Health Survey (NFHS) is a large-scale, multi-round survey conducted in a representative sample of households throughout India.
- The Ministry of Health and Family Welfare designated the **International Institute for Population Sciences** (IIPS) as the nodal agency, responsible for providing coordination and technical guidance for the NFHS.
- NFHS was funded by the United States Agency for International Development (USAID) with supplementary support from the United Nations Children's Fund (UNICEF).
- Four rounds of NFHS (1992–93, 1998–99, 2005–06 and 2015–16) have been successfully completed in India.
- The main objective of successive rounds of the NFHS is to **provide reliable and comparable datasets on health, family welfare and other emerging issues**.
- Only the decadal census is considered the official marker of population trends in India and has a wider surveillance programme. The NFHS surveys are smaller but are conducted at the district level and are a **pointer to the future**.

Why in News?

- The Union Ministry of Health and Family Welfare has released the findings of NFHS-5 for 14 states and Union territories, pertaining to surveys held in 2019-21. These states include key ones such as Uttar Pradesh, Punjab, Odisha, Madhya Pradesh and Rajasthan.
- The data for 22 states had already been released last year. The new findings complete the all-India picture on issues such as population, health, and nutrition.

About NFHS-5

- The findings of NFHS-5 from 22 States & UTs covered in Phase-I were released in

December, 2020 and the remaining comprising Arunachal Pradesh, Chandigarh, Chhattisgarh, Haryana, Jharkhand, Madhya Pradesh, NCT of Delhi, Odisha, Puducherry, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and Uttarakhand were made public recently.

- The NFHS-5 survey work has been conducted in around 6.1 lakh sample households from 707 districts of the country; covering 7,24,115 women and 1,01,839 men to provide disaggregated estimates up to district level.
- NFHS-5 includes some **new focal areas**, such as death registration, pre-school education, expanded domains of child immunisation, components of micro-nutrients to children, menstrual hygiene, frequency of alcohol and tobacco use, additional components of non-communicable diseases (NCDs), expanded age ranges for measuring hypertension and diabetes among all aged 15 years and above, which will give requisite input for strengthening existing programmes and evolving new strategies for policy intervention.

Growth under check

- India has officially hit a **total fertility rate (TFR) of 2.0** that indicates a decrease from the 2.2 in the NFHS-4. According to the United Nations Population Division, a TFR of about 2.1 children per woman is called **replacement-level fertility**. If replacement level fertility is sustained over a sufficiently long period, each generation will exactly replace itself.
- The urban-rural gap has also narrowed. The **TFR was 1.6 for urban areas and 2.1 for rural areas** in the latest survey. Just five states had a TFR exceeding the replacement level: Bihar (3.0), Meghalaya (2.9), Uttar Pradesh (2.4), Jharkhand (2.3) and Manipur (2.2).
- Experts say that this is a significant feat for the country's family-planning programme,

which does not include coercive policies. These findings bust the population-explosion myth and show that India must steer away from coercive measures of population control.

Use of Contraceptives

- An overall survey of the major differences between the NFHS-5 and NFHS-4 suggests that the **use of contraceptives** has improved from 53.5% to **66.7%** in the latest NFHS-5 and **institutional births** increased from 78.9% to **88.6%**.
- While there is an increase in the use of modern contraceptive methods, an increase in female sterilisation coupled with continued stagnation in male sterilisation uptake shows that the **onus of family planning still lies with women**.
- The **proportion of children (12-23 months) who were fully vaccinated improved** from 62% to **76%** and **children under 6 months who were exclusively breastfed** also showed a sharp improvement from 54.9 to **63.7%**.

Child marriage

- Child marriage is a key determinant of high fertility, poor maternal and child health, and lower social status of women. The **share of women aged 20-24 who married before turning 18 has declined from 27% to 23%** in the last five years.
- Although the reduction was spread across rural and urban areas, **wide disparities persist**. While 15% of women aged 20-24 got married before turning 18 in urban areas, the share was 27% in rural areas.
- **West Bengal and Bihar**, with around 41% such women each, had the highest prevalence of girl child marriage, and this has remained unchanged since the last survey held in 2015-16.

Rampant anaemia

- The **prevalence of anaemia has risen across age groups**. As many as **57% women aged 15-49** were anaemic in 2019-21, compared to 53% in 2015-16, while the same for **men** rose from 22.7% to **25%**. The most formidable increase—8.5 percentage points—was observed for **children aged 6-59 months (67.1%)**.
- Those **overweight** (or had a higher body mass index (BMI) than ideal) **increased by around 4 percentage points**. Abnormal

BMI^s are linked to an increase in obesity and other non-communicable diseases (NCD).

- An expert said that a **nutritionally deficient diet** likely explained the rise in obesity.

High malnutrition

- The **share of under-five children who were stunted (too short for age), wasted (low weight for height), or underweight has declined**. However, every third child still suffers from chronic undernourishment, and every fifth child is acutely malnourished.
- Meghalaya (46%) had the highest stunting prevalence, followed by Bihar, Uttar Pradesh and Jharkhand, all over 39%.
- Acute malnutrition among under-five children increased significantly in Telangana, Bihar and northeastern states, whereas states such as Haryana, Jharkhand, Madhya Pradesh, Karnataka, Rajasthan, and Chhattisgarh saw noteworthy improvement.

Improving amenities

- **Access to household amenities has improved**. All states, except Manipur, Meghalaya, Assam and Jharkhand, had over **90% population with access to improved drinking water sources**.
- Only Uttar Pradesh, Meghalaya, Assam, Jharkhand and Arunachal Pradesh had less than 95% population living in households with **access to electricity**.
- Despite remarkable growth, **only 70% of the population had access to improved sanitation facilities**. Bihar, Jharkhand, Odisha, Madhya Pradesh, Uttar Pradesh and Chhattisgarh almost doubled the access since 2015-16, but most fell below the 75% mark.
- **Access to clean cooking fuel** has improved from 45% to **60%**.
- The NFHS findings are a reminder of the urgent need to close gaps in girls' education and address the pathetic nutritional status of women and children.

Demographic Shift

- The fifth edition of NFHS confirmed **signs of a demographic shift in India**. For the first time since the NFHS began in 1992, the **proportion of women exceeded men**: there were **1,020 women for 1,000 men**. In the last edition of the survey in 2015-16, there were 991 women for every 1,000 men.

- However, **sex ratio at birth for children** born in the last five years only improved from 919 per 1,000 males in 2015-16 to **929 per 1,000**, underscoring that boys, on average, continued to have better odds of survival than girls.

2) Dam Safety Bill

What's in the news?

- The Parliament has passed the Dam Safety Bill.
- While it was passed by the Lok Sabha in August 2019, it was cleared by Rajya Sabha recently.

What is the Dam Safety Bill?

Main Objective

- The Bill proposes to help all states and Union Territories **adopt uniform dam safety procedures**. It provides for the surveillance, inspection, operation, and maintenance of **all specified dams** across the country. These are dams with **height more than 15 metres, or height between 10 metres to 15 metres** with certain design and structural conditions.
- As of 2019, India has 5,745 large dams. Of these, 5,675 large dams are operated by states, 40 by central public sector undertakings, and five by private agencies. Over 75% of these dams are more than 20 years old and about 220 dams are more than 100 years old.
- Due to the lack of legal and institutional architecture for dam safety in India, dam safety is an issue of concern. Unsafe dams are a hazard and dam break may cause disasters, leading to huge loss of life and property. Therefore, monitoring dam safety is essential.

National Committees

- The Bill constitutes two national bodies: the **National Committee on Dam Safety**, whose functions include evolving policies and recommending regulations regarding dam safety standards; and the **National Dam Safety Authority**, whose functions include implementing policies of the National Committee, providing technical assistance to State Dam Safety Organisations (SDSOs), and resolving matters between SDSOs of states or between a SDSO and any dam owner in that state.

State Bodies

- It also constitutes two state bodies: **State Committee on Dam Safety**, and **State Dam Safety Organisation**. These bodies will be responsible for the surveillance, inspection, and monitoring the operation and maintenance of dams within their jurisdiction.
- The state dam safety organisation must also report events such as dam failures to the National Dam Safety Authority and also maintain records of major dam incidents of each specified dam.
- Functions of the national bodies and the State Committees on Dam Safety have been provided in **Schedules to the Bill**. These Schedules can be amended by a government notification.
- **Penalties**
- An offence under the Bill can lead to **imprisonment of up to two years, or a fine, or both**.

3) Farm Laws Repeal Bill, 2021

Background

- In 2020, the Union government took up on itself the task of legislating on agricultural marketing and passed the farm laws namely:
 - **The Farmers Produce Trade and Commerce (Promotion and Facilitation) Act, 2020**
 - **The Farmers (Empowerment and Protection) Agreement of Price Assurance and Farm Services Act, 2020**
 - **Essential Commodities (Amendment) Act, 2020.**

The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Act, 2020

- This legislation seeks to give **freedom to farmers to sell their produce outside the notified Agricultural Produce Market Committee (APMC) mandis**.
- This is aimed at facilitating remunerative prices through competitive alternative trading channels.
- State governments are prohibited from levying any market fee, cess or levy outside APMC areas.

The Farmers (Empowerment and Protection) Agreement of Price Assurance and Farm Services Act, 2020

- This legislation seeks to give farmers the right to enter into a contract with agribusiness firms, processors, wholesalers, exporters, or large retailers for the sale of future farming produce at a pre-agreed price.

The Essential Commodities (Amendment) Act, 2020

- It deregulated the sale of six types of agricultural produce, including cereals, edible oils, oilseeds, pulses, onions and potatoes, by amending the Essential Commodities Act, 1955.
- Stock limits on these commodities may be regulated only under extraordinary circumstances which may include (i) war, (ii) famine, (iii) extraordinary price rise and (iv) natural calamity of grave nature.

Why had the need been felt?

- There has been a long-pending demand for reforms in agricultural marketing, a subject that comes under the purview of state governments. The Centre took the issue up in the early 2000s by pushing for reforms in the Agricultural Produce Market Committee (APMC) Acts of the states.
- The Union Agriculture Ministry designed a model APMC Act in 2003 and circulated it among the states. The subsequent governments, too, pushed for these reforms. But given that it is a state subject, the Centre has had little success in getting the states to adopt the model APMC Act.
- It was in this backdrop that the present government went for reforms in the sector by passing these laws.

Protests

- After the legislation of the three controversial farm bills, the farmers' protests began from States such as Punjab and Haryana where the mandis were deeply rooted institutions in the local economy and society.
- However, as days passed, the agitation spread to western Uttar Pradesh and from there to many other States.
- Farmers feared that the existing APMC mandis, where they sell their produce, mostly wheat and paddy, would be shut down once private players started trading in agri-produce outside the mandi premises, and that once the APMC mandi system became redundant, procurement based on

minimum support prices (MSP) too would come to an end.

Why in News?

- The Parliament has passed the Farm Laws Repeal Bill, 2021 to repeal the three farm laws – Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Act, 2020, the Farmers' Produce Trade and Commerce (Promotion and Facilitation) Act, 2020, the Essential Commodities (Amendment) Act, 2020.
- The Bill was necessitated after Prime Minister Narendra Modi announced the government's intention to repeal the three laws in view of ongoing farmers' protests against these laws.

4) International Day of Persons with Disabilities

Initiatives for welfare of Disabled Persons

- As per the Census 2011, there are 2.68 crore persons with disabilities (Divyangjans) in the country. The Government of India has started various initiatives to empower India's divyang population in many ways.

Rights of Persons with Disabilities Act, 2016

- The Act fulfills the obligations to the United National Convention on the Rights of Persons with Disabilities (UNCRPD), to which India is a signatory and subsequently ratified the same on 1st October, 2007.

Disabilities covered

- Disability has been defined based on an evolving and dynamic concept.
- The types of disabilities have been increased from existing 7 to 21 and the Central Government will have the power to add more types of disabilities.

Rights and entitlements

- All Government institutions of higher education and those getting aid from the Government are required to reserve at least 5% of seats for persons with benchmark disabilities.
- 4% reservation for persons with benchmark disabilities is to be provided in posts of all Government establishments with differential quotas for different forms of disabilities.
- Incentives to employers in the private sector are to be given who provide 5%

reservation for persons with benchmark disability. **Special employment exchanges** for the PWD are to be set up.

Establishment of Authorities

- Broad based **Central & State Advisory Boards on Disability** are to be set up to serve as apex policy making bodies at the Central and State level.
- The Chief Commissioner for Persons with Disabilities and the State Commissioners will act as regulatory bodies and Grievance Redressal agencies and also monitor implementation of the Act.

Accessible India Campaign (Sugamya Bharat Abhiyan)

- It was launched in 2015 by the Department of Empowerment of Persons with Disabilities (DEPwD) as a nation-wide Campaign for **achieving universal accessibility** for Persons with Disabilities (PwDs). It aims at providing equal opportunity to PwDs to participate in all the aspects of life and live independently.
- The Accessible India Campaign comprises of the following three components:
 - **Built Environment Accessibility:** It aims to provide an accessible physical environment for everyone. To achieve this, measures need to be undertaken to eliminate obstacles and barriers to indoor and outdoor facilities including schools, medical facilities, and workplaces.
 - **Transportation System Accessibility:** It focuses on providing persons with disabilities an equal right to travel and use public and private transportation infrastructure with dignity and independence.
 - **Information and Communication Eco-System Accessibility:** Access to information refers to all information.

This can range from actions such as being able to read price tags, to physically enter a hall, to participate in an event, to read a pamphlet with healthcare information, to understand a train timetable, or to view webpages.

Other important initiatives

- The Ministry of Social Justice and Empowerment launched the **National Job Portal for Persons with Disabilities** (www.disabilityjobs.gov.in) in 2015. Divyangjans can apply through the portal for jobs, skill training, scholarships, education loans and self-employment loans.
- The **Swavlamban Health Insurance Scheme** for PwDs was launched with the objective of providing affordable health insurance to Persons with Disabilities.
- Another scheme of the DEPwD is the **Unique Disability Identification Project** started in 2016-17. The UDID card will be the single document of identification, verification of the Divyangjans for availing various benefits in future.
- Under the **Assistance to Disabled persons for purchasing/fitting of aids/appliances (ADIP) scheme**, funds are released to various implementing agencies to assist the needy persons with disabilities in procuring modern, standard aids and appliances.
- The **Deen Dayal Disabled Rehabilitation Scheme (DDRS)**, executed by DePWD provides grant-in-aid to NGOs/voluntary organisations for projects aimed at rehabilitation of Divyangjans.

Why in News?

- International Day of Persons with Disabilities was observed on December 3.

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ENVIRONMENT

1) Omicron Variant of Coronavirus

What's the news?

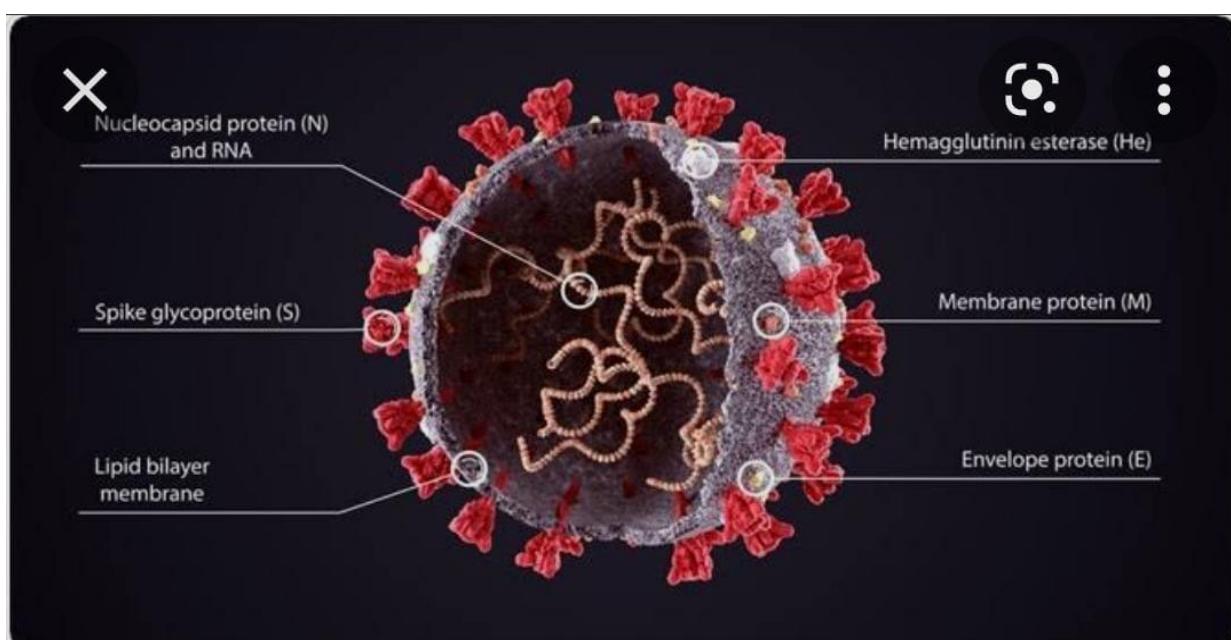
- A new lineage of SARS-CoV-2 has been identified in samples sequenced and deposited in public domain from Botswana, South Africa and Hong Kong and was assigned as **B.1.1.529**.
- The variant has been designated as a **Variant of Concern (VoC)** by the World Health Organisation (WHO) and has been named **Omicron**.

About Omicron Variant

- The Omicron variant has a **large number of mutations** compared to other prevalent variants circulating across the world.
- This includes **32 mutations** in the spike protein.
- The WHO has now designated this variant as '**Omicron**' following the convention of naming variants for Greek alphabets such as Delta, Gamma and Alpha which is based on the **extent of its spread, its severity and how quickly it can transmit**.

About Spike Protein

- The spike protein is the part of the virus that **latches on to the surface of the human cell** and is the most conspicuous part of the virus.
- Many of the mutations in the spike protein have been previously suggested to cause **resistance to antibodies as well as increased transmission**.
- Many of these mutations lie in the **receptor-binding domain of the spike protein**, a key part of the protein required for binding to the human receptor proteins for entry into the cell, and thus may play an important role in recognition by antibodies generated due to a previous infection or by vaccines.
- From a diagnostic point of view, some of the mutations in the spike protein cause primers used in some of the RT-PCR kits to not function as expected. This is otherwise known as a **spike gene dropout or spike gene target failure (SGTF)**.



Does the variant result in vaccine breakthrough infections?

- Some of the initial individuals identified to be infected with the variant have been vaccinated for COVID-19 and therefore the

variant can indeed cause **vaccine breakthrough infections**.

What needs to be done ahead for being prepared for the variant?

- Enhanced **surveillance and genome sequencing** efforts are essential to

detect and track the prevalence of the Omicron variant.

- **Rapid sharing of genome sequences** of the virus and the epidemiological data linked with publicly available databases will help in developing a better understanding of the variant.
- Existing **public health and social measures** need to be strengthened to control and prevent transmission.
- **Enhancing vaccination coverage** across different regions along with

access to testing, therapeutics and support will be essential for combating the new variant.

- **Equitable access to vaccines** would be key to controlling the Omicron variant, and slowing down the emergence of any future variants.

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ECONOMY

1) What will a legal guarantee of MSP involve?

Context

- After a year-long agitation on the borders of Delhi, protesting farm unions under the banner of the Samyukt Kisan Morcha (SKM) have achieved their headline demand, namely the repeal of three contentious laws seeking to reform the storage and marketing of agricultural produce.
- However, farmers say this is only a half-victory and are pushing for their other major demand for providing a **legal guarantee that all farmers will receive remunerative prices for all their crops.**

How many crops does the minimum support price cover?

- The Central Government sets a **minimum support price (MSP) for 23 crops every year**, based on a formula of **one-and-a-half times production costs**. This takes into account **both paid-out costs (A2)** such as seeds, fertilizers, pesticides, fuel, irrigation, hired workers and leased-in land, as well as the **imputed value of unpaid family labour (FL)**.
- Farm unions are demanding the government to adopt **C2 cost method** which is a comprehensive cost calculation since it also includes capital assets and the rentals and interest forgone on owned land.
- The **National Commission on Farmers (NCF)** headed by **MS Swaminathan** also recommended the C2 method to calculate MSP. However, at present, MSP is calculated based on the A2+FL method.
- There is currently **no statutory backing** for these prices, **nor any law mandating their enforcement**. The government **only procures about a third of wheat and rice crops at MSP rates** (of which half is bought in Punjab and Haryana alone), and **10%-20% of select pulses and oilseeds**.
- According to the **Shanta Kumar Committee's 2015 report**, only **6% of the farm households sell wheat and rice to**

the government at MSP rates. However, such procurement has been growing in the last few years.

Why do farmers want a law on MSP?

- In a letter to Prime Minister Narendra Modi, farmers unions said **MSP based on a C2+50% formula** should be made a **legal entitlement for all agricultural produce**, so that every farmer of the country can be guaranteed at least the MSP announced by the government for their entire crop.

What is the Government's position?

- Both the Prime Minister and the Agriculture Minister have previously **assured Parliament that the MSP regime is here to stay, even while dismissing any need for statutory backing**.
- A **policy paper** by NITI Aayog's agricultural economist Ramesh Chand argues, "Economic theory as well as experience indicates that the price level that is not supported by demand and supply **cannot be sustained through legal means.**" It suggests that the States are free to guarantee MSP rates if they wish, but also offers **two failed examples of such a policy**.
 - One is in the **sugar sector**, where private mills are mandated to buy cane from farmers at prices set by the Government. Faced with low sugar prices, high surplus stock and low liquidity, mills failed to make full payments to farmers, resulting in an accumulation of thousands of crores worth of dues pending for years.
 - The other example is a **2018 amendment to the Maharashtra law** penalising traders with hefty fines and jail terms if they bought crops at rates lower than MSP. The paper noted that as open market prices were lower than the legalised MSP levels declared by the State, the buyers withdrew from the market and farmers had to suffer and the move was soon abandoned.

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INTERNATIONAL RELATIONS

1) India joins G20 Troika

About G20

- Founded in 1999, the Group of Twenty (G20) is the premier forum for its members' international economic cooperation and decision-making.

- The G20 comprises Argentina, Australia, Brazil, Canada, China, European Union, France, Germany, **India**, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, UK and USA.

G20 members



Note: The European Union is also a member

BBC

- The G-20's member-countries represent around 85% of the world's economic output, three-quarters of international trade and two thirds of the world's population.
- The objectives of the G20 are:
 - Policy coordination between its members in order to achieve global economic stability, sustainable growth;
 - To promote financial regulations that reduce risks and prevent future financial crises; and
 - To create a new international financial architecture.

- Italy hosted the G20 summit during October 30-31 that was attended by Prime Minister Narendra Modi where India had raised the issue of Afghanistan's future following the takeover by the Taliban.
- Indonesia took over the G20 presidency recently. In the coming months, Indonesia will hold rounds of discussion at various levels among the members of the G20 before convening the G20 Leaders' Summit scheduled for October 30-31, 2022. Next year's summit will be organised along the overall theme of "**Recover Together, Recover Stronger**".
- India will assume the G20 Presidency on December 1, 2022, from Indonesia, and will convene the G20 Leaders' Summit for the first time in India in 2023.
- As a founding member of the G20, India has used the platform to raise issues of vital importance and those that impact on the most vulnerable around the world.

Why in News?

- India formally joined the G20 Troika which consists of **Indonesia, Italy and India** -- the current, previous and incoming G20 Presidencies, respectively.
- With this move, India has started the procedure for taking over the G20 presidency next year. Troika refers to the **top grouping within the G20 that consists of the current, previous and the incoming presidencies**.

2) EU plans €300 billion infrastructure fund to counter China's BRI

What's in the news?

- The European Commission announced a plan to mobilise €300 billion (\$340 billion) in public and private infrastructure investment around the world, a move seen as a **response to China's Belt and Road strategy**.
- The project, known as **Global Gateway**, will aim at mobilising investments of up to 300 billion euros between 2021 and 2027 bringing together resources of the European Union, member states, European financial institutions and national development finance institutions.

Global Gateway

- Officially, the Global Gateway plan aims to **develop land and sea infrastructure** to better connect China to Asia, Europe and Africa for trade and development, and it has found many partners around the world.
- The West, however, sees it as a **tool for China to influence poorer countries**. They criticise Beijing for inciting emerging economies to take on too much debt, and allege the secretive tender process is prone to corruption.

- China argues that it respects its partners' sovereignty while providing loans that benefit joint projects, while critics say Beijing's contractual terms ignore abuses of human, labour and environmental rights.

Belt and Road Initiative

- China's Belt and Road Initiative (BRI) aims to strengthen Beijing's economic leadership through a vast program of infrastructure building throughout China's neighbouring regions.
- Launched in 2013 by President Xi Jinping, the vast collection of development and investment initiatives would stretch from **East Asia to Europe**, significantly expanding China's economic and political influence.
- The plan was two-pronged: the **overland Silk Road Economic Belt** and the **Maritime Silk Road**. The two were collectively referred to first as the **One Belt, One Road initiative** but eventually became the Belt and Road Initiative.
- China's vision included creating a vast network of railways, energy pipelines, highways, and streamlined border crossings, both westward—through the mountainous former Soviet republics—and southward, to Pakistan, India, and the rest of Southeast Asia.

Land and Sea Corridors of the Belt and Road Initiative



- To date, **more than sixty countries**—accounting for two-thirds of the world's population—have signed on to projects or indicated an interest in doing so.

- Beijing has said it had invested \$139.8 billion by 2020, including \$22.5 billion last year alone.

What are the potential roadblocks?

- The Belt and Road Initiative has also stoked opposition. BRI projects are built using **low-interest loans** as opposed to aid grants. Some BRI investments have involved **opaque bidding processes** and **required the use of Chinese firms**. As a result, contractors have inflated costs, leading to canceled projects and political backlash.
- Critics worry China could use “**debt-trap diplomacy**” to extract strategic concessions – such as over territorial disputes in the South China Sea or silence on human rights violations.

India's position

- India has tried to convince countries that the BRI is a plan to dominate Asia, warning of what some analysts have called a “**String of Pearls**” geoeconomic strategy whereby China creates unsustainable debt burdens for its Indian Ocean neighbors in order to seize control of regional choke points.
- Meanwhile, India has provided its own development assistance to neighbors, most notably Afghanistan, where it has spent \$3 billion on infrastructure projects.

What is the CPEC project?

- China-Pakistan Economic Corridor (CPEC) refers to a clutch of major infrastructure works currently under way in Pakistan, intended to **link Kashgar in China's Xinjiang province to Gwadar deep sea port** close to Pakistan's border with Iran.
- Several other road, rail and power projects are associated with the corridor, and the project seeks to expand and upgrade infrastructure across the length and breadth of Pakistan, and to widen and deepen economic ties with China.
- CPEC is part of the larger Belt and Road Initiative.**
- CPEC was launched in 2015 when Chinese President Xi Jinping visited Pakistan and it now envisages investment of over USD 60 billion in different projects of development in Pakistan.



Significance

- The goal of CPEC is both to transform Pakistan's economy—by modernizing its road, rail, air, and energy transportation systems—and to connect the deep-sea Pakistani ports of Gwadar and Karachi to China's Xinjiang province and beyond by overland routes.
- This would reduce the time and cost of transporting goods and energy such as natural gas to China by circumventing the Straits of Malacca and the South China Sea.
- The CPEC project is also strategically important for China. Currently, eighty percent of China's oil has to pass through the **Strait of Malacca**, a narrow stretch of water between the Indonesian island of Sumatra and the Malay Peninsula. In the event of a conflict, the Malacca Strait could easily be blocked by a rival nation, cutting off China from crucial energy resources. CPEC allows China to circumvent the Strait of Malacca and reduce its dependency on the strait.

India's position on CPEC

- India has been opposing the project as it **passes through Gilgit-Baltistan in Pakistan-occupied Kashmir (PoK)**, which New Delhi considers its own territory.
- India claims that the CPEC project encroaches on sovereignty and territorial integrity of the country.

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SCIENCE AND TECHNOLOGY

1) Quantum computing

About

- Quantum computing harnesses the **phenomena of quantum mechanics** to deliver a huge leap forward in computation to solve certain problems.
- One of the basic elements that make up this quantum computer is that where the classical one uses bits to compute this one uses "**qubits**".
- **Classical bits can take the value 0 or 1**, allowing for a **binary system** to be set up and the lowest level of computer language is done manipulating these bits. A **qubit** on the other hand can exist as a **superposition of two states 0 and 1**. So if you have an n-qubit number, it can exist as a superposition of **2^n states**. This also allows for an **immense amount of parallel processing**.
- **Quantum computers can create vast multidimensional spaces** in which to represent these very large problems. Classical supercomputers cannot do this.
- **Algorithms** that employ quantum **wave interference** are then used to **find solutions** in this space, and translate them back into forms we can use and understand.
- In this scheme of things, **processors can be both a 1 and a 0, a state known as quantum superposition**.
- Because of quantum superposition, a quantum computer can simulate multiple classical computers functioning in parallel if everything goes as planned.

Uses of Quantum Computing

- **Artificial Intelligence & Machine Learning:** As the number of applications increases, it becomes a challenging task for traditional computers, to match up the accuracy and speed. And, that's where quantum computing can help in processing through complex problems in very less time.
- **Computational Chemistry:** The ability for quantum computers to focus on the existence of both 1 and 0 simultaneously could provide immense power to the machine to successfully map the molecules which, in turn, potentially opens opportunities for pharmaceutical research.
- **Cybersecurity & Cryptography:** Quantum computing with the help of machine learning

can help in developing various techniques to combat these cybersecurity threats. Additionally, quantum computing can help in creating encryption methods, also known as quantum cryptography.

- To read more about quantum cryptography : <https://officerspulse.com/quantum-cryptography/>
- **Financial Modelling:** By applying quantum technology to perform these massive and complex calculations, companies can not only improve the quality of the solutions but also reduce the time to develop them.
- **Weather Forecasting:** Weather forecasting includes several variables to consider, such as air pressure, temperature and air density, which makes it difficult for it to be predicted accurately. Application of quantum machine learning can help in improving pattern recognition, which, in turn, will make it easier for scientists to predict extreme weather events and potentially save thousands of lives a year. With quantum computers, meteorologists will also be able to generate and analyse more detailed climate models, which will provide greater insight into climate change and ways to mitigate it.

Why in News?

- According to research firm IDC, spending on **quantum computing is expected to grow to \$8.6 billion in 2027**, from \$412 million in 2020, growing at an annual growth rate of 50.9% over the period.

Related technical terms

- **Quantum Entanglement:** The existence of two members of a pair (Qubits) in a single quantum state is referred to as entanglement. Changing the state of one of the qubits will instantly and predictably impact the state of the other. This occurs even when they are separated by great distances
- **Quantum Superposition** refers to a quantum system's ability to be in several states at the same time. Mathematically, it refers to a property of solutions to the Schrödinger equation
- **Quantum Interference:** Quantum interference asserts that elementary particles (Qubits) can not only be in more

than one place at the same time (by superposition), but that an individual particle, such as a photon (light particle), can

cross its own trajectory and interfere with its own path's direction.

Government efforts

Budget 2020 announced Rs 8,000 crore over the next 5-yrs in the National Mission on Quantum technology and its applications

The areas of focus for the NM-QTA Mission will be in fundamental science, translation, technology development and towards addressing issues concerning national priorities

The mission can help prepare next generation skilled manpower, boost translational research and also encourage entrepreneurship and start-up ecosystem development.

Quantum principles will be used for engineering solutions to extremely complex problems in computing, communications, sensing, chemistry, cryptography, imaging and mechanics

Their applications which will be boosted include those in aero-space engineering, numerical weather predictions, simulations, securing the communications & financial transactions, cyber security, advanced manufacturing, health, agriculture, education

It can bring India in the list of few countries with an edge in this emerging field will have a greater advantage in garnering multifold economic growth and dominant leadership role

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- The National Mission on Quantum Technologies & Applications (NM-QTA) will be able **address** the ever **increasing technological requirements** of the society, and take into account the international technology trends and road maps of leading countries for development of next generation technologies.
- Implementation of the mission would help **develop and bring quantum computers, secured communications through fibre and free space, quantum encryption and crypt-analysis and associated technologies** within reach in the country and help address India specific national and regional issues.
- The mission will help prepare **next generation skilled manpower**, boost **translational research and also encourage entrepreneurship and start-up ecosystem development**. By promoting advanced research in quantum science and

technology, technology development and higher education in science, technology and engineering disciplines India can be brought at par with other advanced countries and can derive several direct and indirect benefits.

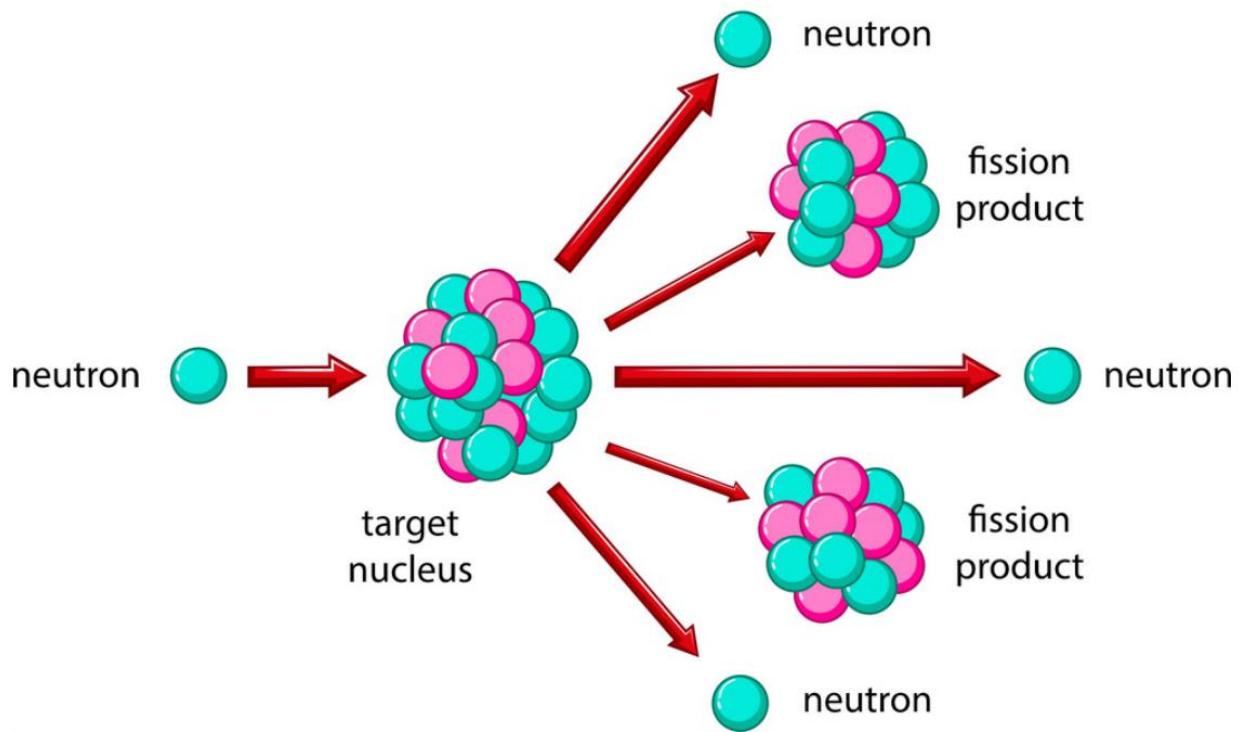
2) Nuclear fission

Why in the News?

- The **Jaitapur Nuclear Power Project** has been planned for a 9900 Megawatt project of the Nuclear Power Corporation of India (NPCIL) in the **Ratnagiri region of Maharashtra**. When finished, Jaitapur will be "**the world's largest nuclear power station**."
- With India's yearly energy consumption predicted to reach 800 GW by 2032, it is critical to incorporate all energy sources in the optimal energy mix.

About nuclear fission

- Atomic energy can be **released in two ways** – either by **breaking up heavy nuclei**, like uranium, into smaller fragments, releasing a lot of energy in the process or by **fusing together light nuclei like hydrogen** to form heavier stable nuclei and high-energy neutrons which carry a lot of energy that can be harnessed.
- The **former process is nuclear fission**, and it is what happens in established nuclear reactors around the world.
- The **second route is nuclear fusion**, and this is the way stars generate energy. In the Sun, for example, hydrogen is being converted into helium, releasing huge amounts of energy.
- When a **nucleus fissions, it splits into several smaller fragments**. These fragments, or fission products, are about equal to half the original mass. **Two or three neutrons are also emitted**.



- A **chain reaction** refers to a process in which **neutrons released in fission produce an additional fission** in at least one further nucleus. This nucleus in **turn produces neutrons**, and the **process repeats**. The process may be controlled (nuclear power) or uncontrolled (nuclear weapons).
- Although two to three neutrons are produced for every fission, **not all of these neutrons are available for continuing the fission reaction**. If the conditions are such that the neutrons are lost at a faster

- rate than they are formed by fission, the chain reaction will not be self-sustaining.
- At the point where the chain reaction can become self-sustaining, this is referred to as **critical mass**.
 - A neutron absorbing element must be present to control the amount of free neutrons in the reaction space. Most reactors are controlled by means of **control rods** that are made of a strongly neutron-absorbent material such as **boron or cadmium**.

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DEFENCE

1) Carrier Battle Group

What is a Carrier Battle Group?

- A **carrier battle group (CVBG)** is a **naval fleet** that consists of an **aircraft carrier** capital ship and a **significant number of escorts**.
- Carrier Battle groups are **usually established for a given objective**.
- The carrier is normally **part of a larger formation** that includes **destroyers, frigates, submarines, and logistical support ships**.
- The carrier supplies the **primary offensive air power**, but the other boats provide **broader defence and support** and can

potentially assist offensively, such as with **missile system** launches.

To read about **India's indigenous Aircraft Carriers**-

<https://officerspulse.com/indigenous-aircraft-carrier-iac/>

Why in News?

- The Vice-Admiral of the Navy said that the Eastern Fleet will have a Carrier Battle Group of its own, once the **indigenously built aircraft carrier INS Vikrant** is commissioned into the Indian Navy.

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ART AND CULTURE

1) Horses in India

Why in News?

- A recent study has been able to collect bones and teeth samples of over 2,000 ancient specimens from regions from where domestic horses could have originated.
- A genetic analysis has found that **horses with the modern domestic DNA profile** lived in the **Western Eurasian Steppes, particularly the Volga-Don River region.**

Were horses native to India?

- The answer seems to be no.
- The “**World Atlas**” says that the only **animals native to India are the Asian elephant, snow leopard, rhinoceros, Bengal tiger, Sloth bear, Himalayan wolf, Gaur bison, red panda, crocodile, and the birds peacock and flamingo.**
- **Horses must have come into India through inter-regional trading** between countries. Indians might have traded their elephants, tigers, monkeys, birds to their neighbours and imported horses for our use.
- **Horse-related remains and artefacts** have been found in **Late Harappan sites (1900-1300 BCE)**, and that horses did not seem to have played an essential role in the Harappan civilisation.
- The Sanskrit word for horse is **Ashwa**, which is mentioned in the Vedas and Hindu Scriptures.

2) Vedas

About vedas

- **Rigveda, Samaveda, Yajurveda, and Atharvaveda** are the four Vedas.

- The **Rigveda** is the **earliest Veda**. It contains **1028 hymns known as 'Suktas,'** as well as a collection of ten books known as **'Mandalas.'**
- **Samaveda**, often known as the **Veda of melodies and chants**, dates around **1200-800 BCE**. This Veda is about **public worship**. Samaveda has two Upanishads: **Chandogya Upanishad and Kena Upanishad.**
- **Yajurveda**, which means '**Worship Knowledge**', goes back to **1100-800 BCE** and corresponds with Samaveda. It compiles **mantras/chants for ritual offerings**. The priest gave these **chants alongside a person** who used to perform a ceremony (in most cases yajna fire.)
- **Atharvaveda**-It dates back to **1000-800 BCE** and is a tatpurusha composite of Atharvan, an old sage, and knowledge (atharvan+knowledge). It is said to be a **Veda of magical formulas** because it **contains three fundamental Upanishads: Mundaka Upanishad, Mandukya Upanishad, and Prashna Upanishad.**

Why in the News?

- The Parliamentary Panel on Education opined that school textbooks should incorporate the ancient wisdom, knowledge and teachings about life and society from the Vedas and other great Indian texts.
- The panel said that history textbooks should also give greater importance to unknown freedom fighters, women heroes, the empires of the Deccan and the history of the Northeast, and the Sikh and Maratha communities.

PIB ANALYSIS

1) Zero Defect and Zero Effect Scheme

About the Scheme

- Zero Defect and Zero Effect (ZED) is a certification scheme. Under the scheme, **MSMEs are assessed for their process in achieving Zero defects in their products and processes.** Similarly the process which they adopt for production **should not affect the environment.**
- There are **three stages of assessment** based on which the MSMEs will be graded for certification under **five categories** as **Bronze, Silver, Gold, Diamond and Platinum.**
- The cost of certification in grading shall be **subsidized by Government of India up to 80% of the expenditure and financial assistance** is provided for interested MSMEs for Gap analysis, Handholding and consultancy for improving their rating and adopting measures for moving towards zero effect.

Objectives

- Scheme Endeavours to Attain the Following Key Goals
 - To promote and encompass ZED manufacturing processes in the MSMEs;
 - Encourage to attain a continuous momentum in improving the sector that contributes to the success of Make in India initiative;
 - Reassure to adapt Quality tools and systems, thus promote energy-efficient manufacturing;
 - Make sure that the MSMEs are constantly upgrading their tools and processes to obtain better products;
 - Most importantly, the acclimatization to ZED protocol to have a minimalist impact on the environment.

Why in News?

- The Ministry of Micro, Small and Medium Enterprises has announced that more than 20,000 MSMEs had registered with intent to adopt the principle of the Zero Defect Zero Effect Scheme.

2) Samagra Shiksha

About the Scheme

- Samagra Shiksha is an overarching programme for the school education sector extending from **pre-school to class 12**. The **centrally sponsored scheme** has been prepared with the broader goal of improving school effectiveness measured in terms of equal opportunities for schooling and equitable learning outcomes.
- It subsumes the three Schemes of **Sarva Shiksha Abhiyan (SSA)**, **Rashtriya Madhyamik Shiksha Abhiyan (RMSA)** and **Teacher Education (TE)**.
- The Integrated Scheme **envisages the 'school' as a continuum** from pre-school, primary, upper primary, secondary to senior secondary levels.
- It was introduced in the Union Budget, 2018-19.

Objectives

- The major objectives of the Scheme are
 - Provision of quality education and enhancing learning outcomes of students;
 - Bridging Social and Gender Gaps in School Education;
 - Ensuring equity and inclusion at all levels of school education;
 - Ensuring minimum standards in schooling provisions;
 - Promoting Vocationalisation of education and
 - Support States in implementation of Right of Children to Free and Compulsory Education (RTE) Act, 2009;

Measures taken

- **Bridging gender and social category gaps at all levels of school education** is one of the major objectives of the scheme. The scheme reaches out to **girls and children** belonging to SCs, STs, minority communities and transgender. The scheme also gives **attention to urban deprived children, children affected by periodic migration and children living in remote and scattered habitations.**
- Acknowledging that issues such as lack of toilets in schools and unavailability of schools within a short distance play a big

role in school dropouts, especially among girls, the scheme supports states for **strengthening of school infrastructure including in rural areas**.

- Under Samagra Shiksha, various interventions have been targeted to promote education, which include opening of schools in the neighbourhood, provision of free text-books up to Class VIII, uniforms to all girls and SC, ST, BPL boys up to class VIII, provision of gender segregated toilets in all schools, teachers' sensitisation programmes to promote girls' participation, construction of residential quarters for teachers in remote/hilly areas/in areas with difficult terrain.
- In addition, there is a provision for **twinning of schools** under which well-functioning private or government schools in urban or semi-urban areas are linked with schools located in rural areas for interaction and exchange of experience.
- The Department of School Education and Literacy is also implementing the **component of vocational skills training** under the umbrella of Samagra Shiksha.

Extension of Samagra Shiksha

- Recently, the Union Cabinet approved the **extension of the centrally sponsored Samagra Shiksha scheme from April 1, 2021 to March 31, 2026** with an estimated outlay of around ₹3 lakh crore.
- The scheme is in accordance with **Sustainable Development Goal for Education (SDG-4)** and has now been aligned with the **National Education Policy (NEP) 2020** to ensure inclusive and equitable, quality and holistic school education.
- The scheme covers 11.6 lakh schools, over 15.6 crore students and 57 lakh teachers of government and aided schools (from pre-primary to senior secondary level).

New Interventions

- Keeping with the NEP's recommendations on encouraging Indian languages, the revamped scheme has a **new component for appointment of language teachers**, which includes salaries, and training costs as well as bilingual books and teaching learning material.
- In accordance with NEP's recommendation on pre-primary education, Samagra Shiksha will now include **funding to support pre-**

primary sections at government schools, both in terms of teacher training as well as ₹500 per child per year for teaching and learning materials, indigenous toys and games and play-based activities. **Master trainers** for pre-primary teachers and anganwadi workers will be supported under the scheme and in-service teacher **training for Early Childhood Care and Education (ECCE)**.

- Another new component is the **NIPUN Bharat initiative for foundational literacy and numeracy**, which will get an annual provision of ₹500 per child for learning materials, ₹150 per teacher for manuals and resources and ₹10-20 lakh per district for assessment.
- As part of digital initiatives, there is a provision for **Information and Communication Technology (ICT) labs and smart classrooms**, including support for digital boards, virtual classrooms and DTH channels which have become more important in the wake of the COVID-19 pandemic.
- The pandemic is likely to cause more school dropouts as well, so it is important that Samagra Shiksha now includes a provision to **support out of school children from age 16 to 19 with funding of ₹2000 per grade to complete their education via open schooling**.
- The Centre also plans to pay students their **Right to Education entitlements such as textbooks, uniforms and transport allowance in the form of direct benefit transfer (DBT)**.
- There will also be a **greater focus on skills and vocational education**, both for students in school and dropouts.
- Other features of the revamped scheme includes:
 - **Incinerator and sanitary pad vending machines** in all girls' hostels;
 - training for 3 months for inculcating self-defence skills under '**Rani Laxmibai Atma Raksha Prashikshan'**;
 - **additional Sports grant of up to Rs. 25,000 to schools** in case at least 2 students of that school win a medal in Khelo India school games at the National level.

Why in News?

- The Ministry of Education has given information about financial assistance provided to States/ UTs for various ICT and Digital initiatives for setting up ICT labs, smart classrooms, etc. under Samagra Shiksha.

3) PAHCHAN Scheme

About the Scheme

- 'Pehchan' cards scheme is a part of the initiative of the **Union Textile Ministry to register and provide identity cards to handicraft artisans and link them to a national database.**
- Launched in 2016, it is a new upgraded ID card for artisans that is linked with their Aadhaar numbers and bank accounts so that they can receive direct cash transfer benefits.
- The scheme was planned to facilitate the benefits of various schemes of the Union Government to flow directly into their accounts.
- Besides, the ID card enables the artisans to **avail easy loans at lower interest rates.**

Why in News?

- 27.80 lakhs handicrafts artisans across the country have been registered under the PAHCHAN scheme this year.

4) Krishi UDAN Scheme

About the Scheme

- Krishi UDAN Scheme was launched to **assist farmers in transporting agricultural products so that it improves their value realisation.**
- The scheme aims to ensure seamless, cost-effective, time-bound air transportation and associated logistics for all Agri-produce originating especially from Northeast, hilly and tribal regions of the country.
- The objectives are to **increase the share of air in the modal mix for transportation of Agri-produce**, which includes horticulture, fishery, livestock & processed products.

Why in News?

- The Ministry Of Civil Aviation has conducted an awareness programme about the Krishi UDAN scheme.

5) Pradhan Mantri Shram Yogi Maan-dhan

About Pradhan Mantri Shram Yogi Maan-dhan

- It is a **Central Sector pension scheme** to ensure old age protection for **Unorganised Workers**. It was launched in 2019.
- It is administered by the **Ministry of Labour and Employment** and implemented through **Life Insurance Corporation of India (LIC)** and **Common Service Centres (CSCs)**.
- LIC will be the Pension Fund Manager and responsible for Pension pay out.

Eligibility

- The **Unorganised workers whose monthly income is Rs 15,000/ per month or less** and belong to the entry **age group of 18-40 years** are eligible for the scheme.
- They should not be covered under New Pension Scheme (NPS), Employees' State Insurance Corporation (ESIC) scheme or Employees' Provident Fund Organisation (EPFO).
- He/she **should not be an income tax payer.**

Salient Feature of PM-SYM

- Matching contribution by the Central Government:** PM-SYM is a voluntary and contributory pension scheme on a **50:50 basis** where prescribed age-specific contribution shall be made by the beneficiary and the matching contribution by the Central Government.
- Minimum Assured Pension:** Each subscriber under the PM-SYM, shall receive a minimum assured pension of **Rs 3000/- per month after attaining the age of 60 years.**
- Family Pension:** During the receipt of pension, if the subscriber dies, the spouse of the beneficiary shall be entitled to receive 50% of the pension received by the beneficiary as family pension. Family pension is applicable only to the spouse.

Why in News?

- The Ministry of Labour and Employment has announced that more than 45 lakh unorganized workers have been registered under the Pradhan Mantri Shram Yogi Maan-dhan pension scheme.

6) Swadhar Greh Scheme

About the scheme

- The **Ministry of Women and Child Development** is implementing the Swadhar Greh Scheme which targets the **women victims of difficult circumstances** who are in need of institutional support for rehabilitation so that they could lead their life with dignity.
- Swadhar Greh targets the following categories of women in difficult circumstances without economic and social support:
 - Deserted women;
 - Women rendered homeless due to natural calamities;
 - Women ex-prisoners;
 - Trafficked women/girls rescued or runaway from brothels;
 - HIV/AIDS affected women;
 - Women victims of domestic violence, family tension or discord driven out from their homes and facing marital litigations;
 - Women victims of terrorist violence

Objectives

- Under the Scheme, Swadhar Greh will be set up in **every district**. Swadhar Greh provides **temporary residential accommodation** with the following objectives:
 - To cater to the **primary need** of shelter, food, clothing, medical treatment and care of the women in distress and who are without any social and economic support.
 - To enable them to regain their **emotional strength** that gets hampered due to their encounter with unfortunate circumstances.
 - To provide them with **legal aid and guidance** to enable them to take steps for their readjustment in family/society.
 - To **rehabilitate** them economically and emotionally.
 - To act as a **support system** that understands and meets various requirements of women in distress.
 - To enable them to start their life afresh with dignity and conviction.
- For big cities and other districts having **more than 40 lakh population** or those districts where there is a need for additional support to the women, **more than one Swadhar Greh could be established**.

- The Swadhar Greh Scheme initially introduced as a central sector scheme has been revised in 2016 as a sub-scheme of the **Centrally Sponsored Umbrella Scheme "Protection and Empowerment of Women"**.
 - Funds are released through the States, with a cost sharing ratio of **60:40** between the Centre and the States excepting for the North Eastern and Himalayan States where it shall be **90:10** and for UTs it is **100%**.
- Why in the news?**
- Union Minister of Women and Child Development Smriti Irani provided details about the Swadhar Greh Scheme in the Lok Sabha.

7) Pradhan Mantri Matru Vandana Yojana

About PMMVY

- Pradhan Mantri Matru Vandana Yojana (PMMVY) is a **Maternity Benefit Programme** that is implemented in all the districts of the country.
- The scheme is implemented by the **Ministry of Women and Child Development**.
- It is a centrally sponsored scheme launched in 2016.
- It is a **direct benefit transfer (DBT) scheme** under which cash benefits are provided to pregnant women in their bank account directly to meet enhanced nutritional needs and partially compensate for wage loss.
- Under the scheme, Pregnant Women and Lactating Mothers (PW&LM) receive a cash benefit of **Rs. 5,000 in three installments** on fulfilling the respective conditionality, viz. early registration of pregnancy, antenatal check-up and registration of the birth of the child and completion of the first cycle of vaccination for the first living child of the family.
- The scheme covers pregnant and lactating mothers for the **birth of the first child**.
- All Pregnant Women and Lactating Mother **except** those who are in regular employment with the Central Government or State Government or Public Sector Undertaking or those who are in receipt of similar benefits are eligible to claim benefits under PMMVY.

Why in News?

- As on 22.11.2021, maternity benefits of ₹ 9420.58 crores have been disbursed amongst more than 2.17 crores eligible beneficiaries under PMMVY since inception of the scheme.

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News in Depth

AIR NEWS

1) India achieves non-fossil fuel sources target

What's in the news?

- India has achieved the ambitious target of **40 per cent of installed electricity capacity from non-fossil fuel sources**.
- The Ministry of New and Renewable Energy has said that total installed non-fossil fuel-based capacity stands at **156.83 Giga Watts** which is 40.1 percent of the total installed electricity capacity of **over 390 Giga Watts**.
- The country achieved this target in November 2021, way ahead of the target year set at Conference of the Parties-21 held in France, as a part of its **Nationally Determined Contributions (NDC)** to the Paris Agreement.
- Under the Agreement, India pledged to achieve about 40 per cent cumulative electric power installed capacity from non-fossil fuel-based energy resources by **2030**.
- The government is committed to achieve 500 Giga Watts of installed electricity capacity from non-fossil fuel sources by the year 2030 in line with the Prime Minister Narendra Modi announcement at the recently concluded CoP-26.

2) Project RE-HAB

About Project RE-HAB

- Last year, the **Khadi Village Industries Commission (KVIC)** launched the project Reducing Elephant Human Attacks using Bees (RE-HAB) in Karnataka **to reduce the elephant-human conflict**.
- Under Project RE-HAB, "Bee-fences" are created by setting up bee boxes in the passageways of elephants to block their entrance to human territories. The boxes are connected with a string so that when elephants attempt to pass through, a tug or pull causes the bees to swarm the elephant herds and dissuade them from progressing further.

What are the benefits?

- Project RE-HAB is an effective way of restricting elephants from entering the villages because **elephants are naturally afraid of bees** as they might sting the elephants in their eyes and inner trunk. Furthermore, the buzzing of the bees in certain frequencies also make the elephants irritable and subsequently drive them away.
- It is a unique way of preventing elephant-human conflicts without causing any harm to the animals and the humans.
- It is extremely **cost-effective** as compared to various other measures such as digging trenches or erecting fences.



- The night vision cameras installed at these locations show evidence of the success of the project. The bee boxes not only reduced the movement of elephants at the respective points but also recorded footage of a number of elephants backing off from the points where the bee boxes have been installed.
- Since 2015, approximately 2,400 people have been killed in elephant attacks, and huge damage to property and crops have been recorded. Various state governments had taken several preventive measures like digging up trenches, electric fencing, spiked pillars etc., but nothing came off as effective and harmless as project RE-HAB.

Why in News?

- Following the success of its innovative Project RE-HAB in Karnataka, KVIC has now replicated the project in Assam.

- The project has been implemented in Assam with the support of the local forest department.

About KVIC

- Khadi and Village Industries Commission (KVIC) is a **statutory body** under the **Ministry of Micro, Small and Medium Enterprises**.
- Established in 1956, KVIC aims to plan, promote, facilitate, organize, and assist in

the establishment and development of Khadi and Village industries in the rural areas.

- Over the years, the main thrust of KVIC activities has been to provide a larger share of employment to scheduled caste and scheduled tribes and women.

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THE HINDU EDITORIALS

1) A close reading of the NFHS-5, the health of India

CONTEXT

- The **national health and demographic report card** is finally completely out.
- The results from the **first phase (conducted between June 2019 and January 2020) of the fifth round of the National Family Health Survey (NFHS-5)** were released in 2020.
- Recently the key results from the second phase (conducted between January 2020 and April 2021) are out.

NATIONAL FAMILY HEALTH SURVEY

- NFHS is a **large-scale, multi-round survey conducted in a representative sample of households throughout India**.
- All NFHSs have been **conducted under the supervision of the Ministry of Health and Family Welfare**, Government of India, with the **International Institute for Population Sciences (IIPS) Mumbai**, serving as the **nodal agency**.
- Every National Family Health Survey (NFHS) has **two specific goals to fulfill**. These goals are:
 - To **provide essential data** needed by the Ministry of Health and Family Welfare and other agencies for informed decision making and policy and programme intervention purposes.
 - To provide **insight regarding important emerging health and family welfare issues**.

GOOD PERFORMANCE

India's performance is a mixed verdict, containing both cheer and alarm in abundant measure.

Population has stabilised

- A **comparison of NFHS-5 with NFHS-4 (2015-16)** reveals improvement in several dimensions such as **educational attainment, institutional deliveries, vaccinations, infant mortality** and much more.
- The biggest news from NFHS-5 is that the **total fertility rate (TFR), which is the average number of children born to a woman during her lifetime, has been falling over time and is now just below the replacement rate of 2.1**.

- This is true across all States of India.
- Thus indicating that the total population has stabilised.

- This will allow politicians to **devote their energies to urgent health matters, instead of raising the bogey of population explosion** to justify coercive population policies.
- There is absolutely no evidence to justify tying welfare support measures or holding elected office to the number of children.

Data on sex ratio

- This survey reveals that nationally, **there are 1,020 adult women per 1,000 men for the first time**.

Malnutrition

- Usually, malnutrition is associated with **poverty, poor maternal health and nutrition, frequent illness and/or inappropriate feeding and care in early life**.
- It prevents children from reaching their physical and cognitive potential.
- There are **three indicators of malnutrition**:
 - stunting (low height-for-age),
 - wasting (low weight-for-height)
 - underweight (low weight-for-age)
- All these three indicators have shown an **overall improvement**.

CONCERNS ATTACHED

Unclear reason behind improved Sex Ratio

- Improved sex ratio of the country raises the question — if this **signal the beginning of the end of another deep-rooted problem of son preference which leads to illegal but pervasive sex-selective abortions** as parents repeatedly try for at least one son?
 - To gauge this, the **key metric to examine would be the sex ratio at birth (SRB)**.
 - If there are **pervasive sex selective abortions, leading to a masculine SRB, a part of this imbalance would carry forward into adulthood**.
 - But **adult sex ratio is shaped by many factors** other than sex selective abortions, as it can be affected by sampling errors, arising, for instance, from undercounting migrant males.

- Although nationally, the SRB has improved from 919 in 2015-16 to 929 in 2019-21, but it is still short of the natural SRB.
 - The natural SRB translates to 952 girls per 1,000 boys.
 - Major States with low SRBs are spread all over the country: Uttar Pradesh, Haryana, Punjab, Rajasthan, Bihar, Delhi, Jharkhand, Andhra Pradesh, Tamil Nadu, Odisha, Maharashtra.
 - Therefore, there is a need to recognise that the move to a small family size combined with persistent son preference is likely to impede the improvements in SRB.
- Increase in case of Anaemia**
- A key health indicator that has worsened is the incidence of anaemia in under-5 children (from 58.6 to 67%), women (53.1 to 57%) and men (22.7 to 25%) in all States of India.
 - Anaemia has weakening effects on overall health, which is why the World Health Organization characterises it as a serious public health concern.
 - Indian States show variation: from 39.4% in Kerala to 79.7% in Gujarat: but barring Kerala, all States are in the “severe” category.
 - Further this situation may worsen as the COVID-19 effect.

Anomaly in Malnutrition estimates

- The overall reduction in national estimates of these three measures masks an anomaly.
 - In Phase 1, several States revealed a worsening in one or more of these, whereas in Phase 2, none of the States showed a worsening.
- Hence, there is a need to understand if the novel coronavirus pandemic affected the survey in Phase 2, leading to undercounting of incidence, or whether by pure chance, all States in Phase 2 happen to be better performers on the malnutrition count.
- Also, along with an improvement in these three indicators, there is an increase in the proportion of overweight children, women and men.
 - Being overweight also reflects malnutrition, with serious health consequences in the form of non-communicable diseases.

Data on Micronutrients

- Despite micronutrient deficiencies having a significant role in measuring lack of adequate nutrition, NFHS does not have data on it.
 - Micronutrient deficiencies include lack of vitamins and minerals that are essential for body functions such as producing enzymes, hormones and other substances needed for growth and development.

Policing of Diet

- Indian diets display a rich diversity. Many traditional diets reflect both local climatic conditions as well as a multiplicity of sources of essential nutrients, such as proteins.
 - But policing of diets, by imposing an unnatural uniformity, and preventing access to animal protein for large sections of Indians that are not traditionally vegetarian is likely to reduce micronutrient diversity and contribute to poor health outcomes.
- Unethical actions of private health practitioners**
- The survey shines a spotlight on women's reproductive health, and reveals, for instance, that cesarean births have increased dramatically.
 - In private health facilities, 47.5% births are by C-section and 14.3% in public health facilities.
 - These findings are exceedingly unusual and bring into question the unethical actions of private health practitioners that put financial gain before women's health.

ISSUES WITH THE NFHS-5

- Some analyses have suggested that the rate of progress has slowed down, based on comparisons between NFHS-4 and NFHS-5 to the improvements between the two previous rounds.
- Some have argued that COVID-19 is to blame for the bad health consequences.
- The data for the second phase of NFHS-5 have been, to a large extent, collected during the highly unusual conditions of the COVID-19 pandemic.

CONCLUSION

- The overall evidence from the NFHS-5 is compelling and clear that health ought to be a matter of concern for all political

parties and all governments, both at national and State level.

- The survey highlights **deep inequalities in health outcomes**.
 - Hence, an action plan to improve India's health needs to be **inclusive, firm in its commitment, and backed by solid resources**.

2) A launch window for India as a space start-up hub

CONTEXT

- The **great space race of the 20th century was kicked off by the Soviet Union's launch of Sputnik in 1957**.
 - It was a **competition between the world's great powers**, a test of their ideologies, which proved to be a synecdoche of the entire Cold War between the capitalist United States and the socialist Soviet Union.
- The **space race is on again, but this time, private players are on the power field** to take the next leap for mankind and **democratise space usage to build commercial value**.
- This has **huge implications for original equipment manufacturers (OEMs)** in the space sector in India and is a promising venture for global investors.

INDIA'S SPACE SECTOR

- India currently stands **on the cusp of building a space ecosystem** and with ISRO being the guiding body, India can now evolve as a space start-up hub for the world.
- The **sector is in the embryonic stage** where the possibilities are limitless with a scope to build a feasible business model.
- Already **350 plus start-ups** such as AgniKula Cosmos, Skyroot Technologies, Dhruva Space and Pixxel **have established firm grounds for home-grown technologies** with a practical unit of economics.

CHALLENGES TO TACKLE

A very marginal player

- Today, the **space economy is a \$440 billion global sector**, with India having **less than 2% share** in the sector.
 - This is **despite the fact that India is a leading space-faring country** with end-to-end capabilities to make satellites, develop augmented launch

vehicles and deploy inter-planetary missions.

Low investment in space sector

- While total early-stage investments in space technologies in FY21 were \$68 billion, **India was in fourth place with investments in about 110 firms, totalling not more than \$2 billion**.

Extensive brain drain

- There has been an incidence of **extensive brain drain in India**, which has **increased by 85% since 2005**.

Bottlenecks in Policies:

- The extensive brain drain from India can be **linked to the bottlenecks in policies which create hindrances for private space ventures** and founders to attract investors, **making it virtually non-feasible to operate in India**.

- Currently, a report on a leading news portal says: the reason for the lack of independent private participation in space includes the **absence of a framework to provide transparency and clarity in laws**.

Issue of Liability

- Another crucial aspect of space law is **insurance and indemnification clarity**, particularly about who or which entity undertakes the liability in case of a mishap.

- In several western countries with an evolved private space industry, there is a cap on liability and the financial damages that need to be paid.
- In fact, space operators are required to hold insurance of up to AUD\$100 million under Australian space law.

Competitive ecosystem due to domestic support

- Currently, many of the private entities are involved in equipment and frame manufacturing, with either outsourced specifications or leased licences.
- These companies have revolutionised the space sector by reducing costs and turnaround time with innovation and advanced technology.
- For such purposes, **NASA and the CNSA award a part of their annual budget to private players**.
 - Until 2018, SpaceX was a part of 30 missions of NASA, getting over \$12 billion under contract.

INDIA'S INITIATIVES TO CATCH UP THE RACE

- Last year, the Government of India created a new organisation known as IN-SPACe (Indian National Space Promotion and Authorisation Centre) which is a “single window nodal agency” established to boost the commercialisation of Indian space activities.
- It will act as a supplement to the Indian Space Research Organisation (ISRO), the agency promoting the entry of the Non-Government Private Entities (NGPEs) in the Indian space sector.
- It will also facilitate a swift on-boarding of private players in the sector through encouraging policies in a friendly regulatory environment and by creating synergies through already existing necessary facilities.

WAY FORWARD

- To boost India's space sector, investor confidence needs to be pumped up and for the same, clear laws need to be defined.
- The laws need to be broken down into multiple sections, each to address specific parts of the value chain and in accordance with the Outer Space Treaty (or the United Nations resolution, the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies).
- There is a need to provide a solid foundation to products and services developed by the non-governmental and private sectors within the value chain.
- Also, to create value, Indian space private companies need to generate their intellectual property for an independent product or service (e.g. satellite-based broadband).
- There needs to be a cap on liability and the financial damages that need to be paid. In several western countries with an evolved private space industry, such steps have already been taken.

3) Boosting green hydrogen

CONTEXT

- Recently, the Indian Prime Minister has announced that India would aim for net-zero carbon emissions by 2070.
- The announcement was given credence by the country's solar achievements since 2015.
- Further, India is the only major economy whose policies and actions are on track to limit global average temperature rise below 2°C above pre-industrial levels, as envisioned in the Paris Agreement.

HYDROGEN AND ITS TYPES

- Hydrogen is one of the most abundant elements on earth for a cleaner alternative fuel option.
- The hydrogen produced is coded with a colour, depending on the method of its production:
 - Green hydrogen is produced by electrolysis of water using renewable energy (like Solar, Wind) and has a lower carbon footprint.
 - Brown hydrogen is produced using coal where the emissions are released to the air.
 - Grey hydrogen is produced from natural gas where the associated emissions are released to the air.
 - Blue hydrogen is produced from natural gas, where the emissions are captured using carbon capture and storage.

SIGNIFICANCE OF HYDROGEN

- As of now, 75% of India's energy demand is met by coal and oil, including imports and this is expected to increase.
 - Therefore, the synergy between renewable energy and green hydrogen must be tapped to tackle the dependence on fossil fuel and take greater advantage of India's solar capacity.
- Hydrogen — green hydrogen, in particular, is a crucial weapon in India's arsenal to fight climate change as it improves the long-term energy storage capabilities of renewable energy.
- The simplest element in the periodic table is also the most promising solution to decarbonise sectors like cement, steel, and refineries.
- As per a recent statement from the Hydrogen Council, “Hydrogen can provide the lowest-cost decarbonization solution

for over a fifth of final energy demand by mid-century — contributing a cumulative reduction of 80Gt of CO₂ — and is thus an essential solution to reach the 1.5°C climate scenario.”

- Thus due to the above significance, several major economies which are adopting legislation to reduce carbon emissions are also catalysing global efforts towards transitions to green hydrogen.

INDIA'S OPPORTUNITY

- India's solar capacity has increased nearly 3,000 times in less than a decade, the **cost of solar energy has reached a low of ₹2 per kWh**. This gives India a unique head start in scaling up the use of green hydrogen.
 - Nearly 70% of the investments required to produce green hydrogen through electrolysis goes into generating renewable energy.
- Therefore, **India can reduce its carbon emissions and make a dent in its annual import bills** by developing a value chain for hydrogen from its production to its diverse applications, including **production technologies, storage, transport and distribution, infrastructure (ports, refuelling stations), vehicular applications, and electricity/gas grid**.

WAY FORWARD

- **Government funding and long-term policies** that attract private investments within the standards and a progressive compliance framework are essential to boost green hydrogen.
- **Hydrogen's cross-sectoral capabilities** should be exploited according to each sector's cost and ease of adoption.
- A few **key sectors with low transition costs**, such as refineries, fertilizers and natural gas, **should be mandated to use hydrogen** to bring down costs as part of near-term goals.
 - New demand from steel, cement and road mobility should be mandated as part of medium-term goals.
 - Heavy-duty vehicles should receive **State and Central incentives**.
 - Shipping, aviation, energy storage and solutions towards power intermittency should be mandated to use green hydrogen in the long run.

- India should **replace its grey hydrogen with green hydrogen and reduce dependence on imported ammonia**.

- India's current grey hydrogen production is six million tonnes per annum, which is around 8.5% of global annual production.

CONCLUSION

- At present, more than 30 countries have hydrogen road maps and over 200 large-scale hydrogen projects across the value chain. If all the projects come to fruition, total investments will reach \$300 billion in spending by 2030.
- **Governments worldwide have committed to more than \$70 billion in public funding**, according to the Hydrogen Council, to develop a hydrogen economy.
- **With its abundant and cheap solar energy, India has the upper hand** to tap into these investments and lead global efforts in transitioning to green hydrogen.

4) Reforming the fertilizer sector

CONTEXT

- Since 1991, when economic reforms began in India, several attempts have been made to reform the fertilizer sector to keep a check on the rising fertilizer subsidy bill, promote the efficient use of fertilizers, achieve balanced use of N, P and K (nitrogen, phosphorus and potassium), and reduce water and air pollution caused by fertilizers like urea.

BACKGROUND

- The Economic Survey of 1991-92 noted that fertilizer prices remained almost unchanged from July 1981 to July 1991.
- Then the Union Budget of 1991 raised the issue prices of fertilizers by 40% on average.
- But from August that year, this was reduced to 30%, and small and marginal farmers were exempted from the price increase.
- The Economic Survey further noted that even with this 30% increase, fertilizer subsidy remained substantial and needed to be reduced further.
- Due to opposition to increased fertilizer prices, the increase in the price of urea was rolled back to 17% a year later over the pre-reform price.

IMPACT OF STAGNANT UREA PRICES

- The change which almost stabilised disturbed the relative prices of various fertilizers and resulted in a big shift in the composition of fertilizers used in the country in favour of urea and thus N.
- The ratio of use of N:P:K increased from 5.9:2.4:1 in 1991-92 to 9.7:2.9:1 in 1993-94.
- Farmers tended to move towards balanced use, but policy and price changes reversed the favourable trend a couple of times in the last three decades.
- Also, there has been an uncontrolled increase in subsidies on urea, due both to almost freezing the MRP of urea in different time periods and its rising sale leading to an increase in indiscriminate and imbalanced use of fertilizers.

CHALLENGES

Increase in fertilizer subsidy

- Fertilizer subsidy has doubled in a short period of three years.
 - For 2021-22, the Union Budget has estimated fertilizer subsidy at ₹79,530 crore (from ₹66,468 crore in 2017-18).
 - But it is likely to reach a much higher level due to the recent upsurge in the prices of energy, the international prices of urea and other fertilizers, and India's dependence on imports.

Volatile prices of fertilizers

- The international prices of fertilizers are volatile and almost directly proportional to energy prices.
- Besides, cartels of major global producers have a strong influence on prices.

Inter-State Disparities

- Due to high variations in subsidy content, there is a growing case of inter-State disparities in fertilizer subsidy, which is highly biased towards urea and thus nitrogen.
- As a result, the magnitude of fertilizer subsidy among the major States ranges in the ratio of 8:1.

Improper Use

- In 2019-20, fertilizer use per hectare of cultivated area varied from 70 kg of NPK in Rajasthan to 250 kg in Telangana. This gap was much wider at the district level.
- Further, composition of total plant nutrients in terms of the N,P,K ratio deviated considerably from the recommended or optimal NPK mix.

- It was 33.7:8.0:1 in Punjab and 1.3:0.7:1 in Kerala.

Fiscal Concerns

- The total demand for urea in the country is about 34-35 million tonnes (mln t) whereas the domestic production is about 25 mln t, thus leaving India at the mercy of imports.

Environment Impact

- Concerned with the adverse environmental impact of certain chemical fertilizers, some sections of society suggest the use of organic fertilizers and biofertilizers instead.

Non-inclusive government policies

- The government introduced the Nutrient Based Subsidy (NBS) in 2010 to address the growing imbalance in fertilizer use in many States, which is skewed towards urea (N).
 - However, only non-nitrogenous fertilizers (P and K) moved to NBS; urea was left out.

WAY FORWARD

- In order to address the multiple goals of fertilizer policy, we need to simultaneously work on four key policy areas:
- There is a need to be self-reliant and not depend on import of fertilizers. This way, we can escape the vagaries of high volatility in international prices.
 - In this direction, five urea plants at Gorakhpur, Sindri, Barauni, Talcher and Ramagundam are being revived in the public sector.
- There is a need to extend the NBS model to urea and allow for price rationalisation of urea compared to non-nitrogenous fertilizers and prices of crops.
 - The present system of keeping the price of urea fixed and absorbing all the price increases in subsidy needs to be replaced by distribution of price change over both price as well as subsidy based on some rational formula.
- There is a need to develop alternative sources of nutrition for plants.
 - Discussions with farmers and consumers reveal a strong desire to shift towards the use of non-chemical fertilizers as well as a demand for bringing parity in prices and subsidy given to chemical fertilizers with organic and biofertilizers.

- This also provides the scope to **use a large biomass of crop that goes waste and enhance the value of livestock byproducts.**
- There is a need to **scale up and improve innovations to develop alternative fertilizers.**
 - Though compost contains low amounts of nitrogen, technologies are now available to enrich this.
- Finally, India should **pay attention to improving fertilizer efficiency through need-based use** rather than broadcasting fertilizer in the field.
 - The recently developed **Nano urea by IFFCO** shows promising results in reducing the usage of urea.
 - Such products need to be promoted expeditiously after testing.

CONCLUSION

- Change in the required policies will go a long way in **enhancing the productivity of agriculture, mitigating climate change, providing an alternative to chemical fertilizers and balancing the fiscal impact of fertilizer subsidy on the Union Budgets in the years to come.**

5) Small grant but a big opportunity for local bodies

Context

- The Fifteenth Finance Commission has recommended health grants of ₹70,051 crore which are to be released over five years, from FY2021-22 to FY2025-26.
- It is an **unprecedented opportunity to fulfil the mandate provided under the two Constitutional Amendments, in 1992.**

Mandate under constitution

- The 73rd and 74th Constitutional Amendments of 1992 mandated the local bodies (LBs) in the rural (Panchayati raj institutions) and urban (corporations and councils) areas to take the **responsibility to deliver primary care and public health services.**
- **Expected outcome:** Greater attention to and the allocation of funds for health services in the geographical jurisdiction of the local bodies.

Why does the 15th Finance commission grant sound important?

- The allocation in FY 2021-22 would be **2.3% of the total health expenditure** (both public and private spending together), 5.7% of the annual government health expenditure (Union and State combined), 18.5% of the budget allocation of the Union Department of Health and Family Welfare for FY 2021-22 and around 55% of the second COVID-19 emergency response package announced in July 2021.
- Yet, it is arguably the **single most significant health allocation** in this financial year with the potential to have a far greater impact on health services in India in the years ahead.
- Because in 2017-18 the ULBs and RLBs in India were contributing **1.3% and 1% of the annual total health expenditure** in India. Both urban and rural India need more health services; however, the challenge in rural areas is the poor functioning of available primary health-care facilities while in urban areas, it is the shortage of primary health-care infrastructure and services both.

Problem with Local bodies dealing with health

Poor infrastructure

- Urban India has just a sixth of primary health centres in comparison to rural areas even though it has just half of the rural population.

Insufficient funding

- Insufficient funding for health is further compounded by the lack of coordination between a multitude of agencies which are responsible for different types of health services.

- For example, a few reports of three municipal corporations in Delhi refused to allocate land for the construction of mohalla clinics (an initiative of the State Health Department) and even the demolition of some of the under-construction clinics.

Unwilling to increase health spending

- The government funding for urban primary health services was not channelled through the State Health Department and the ULBs (which fall under different departments/systems in various States) **did not make a commensurate increase**

in allocation for health. The reasons included

- Resource crunch
- Lack of clarity on responsibilities related to health services
- Completely different spending priorities.

Essential steps

Sensitise key stakeholders

- The grant should be used as an opportunity to sensitise key stakeholders in local bodies, including the elected representatives (councillors and Panchayati raj institution representatives) and the administrators, on the role and responsibilities in the delivery of primary care and public health services.

Enable accountability

- Awareness of citizens about the responsibilities of local bodies in health-care services should be raised.

Raise awareness

- Civil society organisations need to play a greater role in raising awareness about the role of Local Bodies in health, and possibly in developing local dashboards to track the progress made in health initiatives.

Increase health spending

- The Fifteenth Finance Commission health grants should not be treated as a 'replacement' for health spending by the local bodies, which should alongside increase their own health spending regularly to make a meaningful impact.

Better coordination

- Mechanisms for better coordination among multiple agencies working in rural and urban areas should be institutionalised.
- Time-bound and coordinated action plans with measurable indicators and road maps need to be developed.

Develop innovative health models

- The young administrators in charge of such RLBs and ULBs and the motivated councillors and Panchayati raj institution members need to grab this opportunity to develop innovative health models.

Need of the hour

- India's health system needs more government funding for health. However, when it comes to local bodies, this has to be a blend of
 - Incremental financial allocations supplemented by elected

representatives showing health leadership

- Multiple agencies coordinating with each other,
- Increased citizen engagement in health,
- The setting up of accountability mechanisms and guiding the process under a multidisciplinary group of technical and health experts.

Conclusion

- The Fifteenth Finance Commission health grant has the potential to create a health ecosystem which can serve as a springboard to mainstream health in the work of rural and urban local bodies and the Indian health-care system should make use of this in the right direction.

6) Assisted Reproductive Technology (Regulation) Bill, 2020

Context

- The Assisted Reproductive Technology (Regulation) Bill, 2020 which seeks to provide for the regulation of Assisted Reproductive Technology services in the country was passed by the Lok Sabha recently.

Need for the bill

- The growth of Assisted Reproductive Technology (ART) clinics which offer gamete donation, intrauterine insemination, in-vitro- fertilisation, intracytoplasmic sperm injection, and pre-implantation genetic diagnostic in India is among the highest in the world, and these are a key part of medical tourism.
- India does not have standard protocols of ART clinics yet.

Assisted Reproductive Technology:

- The Bill defines ART to include all techniques that seek to obtain a pregnancy by handling the sperm or the oocyte (immature egg cell) outside the human body and transferring the gamete or the embryo into the reproductive system of a woman.
- Examples of ART services include
 - Gamete (sperm or oocyte) donation,
 - In-vitro-fertilisation (fertilising an egg in the lab), and

- Gestational surrogacy (the child is not biologically related to surrogate mother).
- **ART services** will be provided through:
 - (i) ART clinics, which offer ART related treatments and procedures, and
 - (ii) ART banks, which store and supply gametes.
- Regulation of ART clinics and banks:**
- The Bill provides that **every ART clinic and bank must be registered** under the National Registry of Banks and Clinics of India.
- The **National Registry** will be established under the Bill and will act as a central database with details of all ART clinics and banks in the country.
- State governments will appoint **registration authorities** for facilitating the registration process.
- Clinics and banks will be registered only if they adhere to certain standards (specialised manpower, physical infrastructure, and diagnostic facilities).
- The registration will be valid for **five years** and can be renewed for a further five years.
- Registration may be cancelled or suspended if the entity contravenes the provisions of the Bill.
- Conditions for gamete donation and supply:**
- Screening of gamete donors, collection and storage of semen, and provision of oocyte donors can only be done by a registered ART bank.
- A bank can obtain semen from males between **21 and 55 years of age**, and oocytes from females between **23 and 35 years of age**.
- An oocyte donor should be an ever-married woman having at least one alive child of her own (minimum three years of age).
- The woman can donate oocytes only once in her life and not more than seven oocytes can be retrieved from her.
- A bank cannot supply gamut of a single donor to more than one commissioning couple (couple seeking services).
- Conditions for offering ART services:**
- ART procedures can only be carried out with the **written informed consent** of both the party seeking ART services as well as the donor.

- The party seeking ART services will be required to provide insurance coverage in the favour of the oocyte donor (for any loss, damage, or death of the donor).
- A clinic is prohibited from offering to provide a child of pre-determined sex.
- The Bill also requires **checking for genetic diseases** before the embryo implantation.
- Rights of a child born through ART:**
- A child born through ART will be deemed to be a biological child of the commissioning couple and will be entitled to the rights and privileges available to a natural child of the commissioning couple.
- A donor will not have any parental rights over the child.
- National and State Boards:**
- The Bill provides that the **National and State Boards for Surrogacy** constituted under the Surrogacy (Regulation) Bill, 2019 will act as the **National and State Board respectively for the regulation of ART services**.
- Key powers and functions of the National Board include:
 - (i) advising the central government on ART related policy matters,
 - (ii) reviewing and monitoring the implementation of the Bill,
 - (iii) formulating code of conduct and standards for ART clinics and banks, and
 - (iv) overseeing various bodies to be constituted under the Bill.
- The State Boards will coordinate enforcement of the policies and guidelines for ART as per the recommendations, policies, and regulations of the National Board.
- Offences and penalties:**
- Offences under the Bill include:
 - (i) abandoning, or exploiting children born through ART,
 - (ii) selling, purchasing, trading, or importing human embryos or gametes,
 - (iii) using intermediates to obtain donors,
 - (iv) exploiting commissioning couple, woman, or the gamete donor in any form, and
 - (v) transferring the human embryo into a male or an animal.
- These offences will be **punishable with a fine** between five and ten lakh rupees for the first contravention.

- For subsequent contraventions, these offences will be punishable with imprisonment for a term between eight and 12 years, and a fine between 10 and 20 lakh rupees.
- Any clinic or bank advertising or offering **sex-selective ART will be punishable with imprisonment** between five and ten years, or fine between Rs 10 lakh and Rs 25 lakh, or both.
- No court will take cognisance of offences under the Bill, except on a complaint made by the National or State Board or any officer authorised by the Boards.

Significance of the bill

- The bill seeks to **fill a vacuum** by bringing in government intervention to regulate the field of fertility treatments and by seeking to establish a national registry and registration authority for all clinics and medical professionals in the segment.
- The Bill has provisions to protect the rights of the donors, the commissioning couple and the children born out of ART, to grant and withdraw licences for clinics and banks depending on performance factors.
- It makes it impossible for people who operate against the law for a profit by exploiting patients.
- It also plans to **put an end to illegal trafficking** in embryos, and mistreatment of the poor coerced by their circumstances into donating eggs or sperm.

Conclusion

- The piece of legislation caters to a longstanding need of regulatory deficit in the field of Assisted Reproductive Technology.

7) Man- Elephant Conflict

Context

- The death of five elephants caused by trains colliding with them in a week has highlighted the **gaps in efforts to reduce man-animal conflicts** in the country.

Human-Wildlife conflict

- Human-wildlife conflict (HWC) refers to the **negative interactions between human and wild animals**, with undesirable consequences both for people and their resources, on the one hand, and wildlife and their habitats on the other. (IUCN 2020).

Instances of Man-Elephant conflict

- On November 26, the first accident occurred near Madukkarai in Coimbatore district, Tamil Nadu that has seen many elephant deaths on a rail track stretch that extends up to Kanjikode, Kerala.
- The second accident was near Jagiroad in Assam's Morigaon district, four days later.
- A reply by the Project Elephant division of the Union Ministry of Environment, Forest and Climate Change in May to a set of RTI questions highlighted reasons other than natural causes as having led to the killing of 1,160 elephants over 11 years ending December 2020
 - 741 deaths were due to **Electrocution**
 - Railway accidents** accounted for 186 cases
 - Poaching** 169 and
 - Poisoning** 64.

Effective solutions

- Installing **hanging solar-powered fences**, as has been planned in Tamil Nadu and Kerala and ensuring that there are no illegal electric fences or barbed wire fences.
- Planting citronella and lemongrass**, as done in Golaghat district, Assam, to deter elephants.
- The **participation of local communities** is crucial and hence highlighting the critical role elephants play in biodiversity conservation especially to those living in areas close to elephant corridors is must.
- The proposals for **elevated wildlife crossings or eco-bridges and underpasses** for the safe passage of animals should also be expedited by the Environment Ministry and Ministry of Railways.
 - Finding of the C&AG was that after the construction of underpasses and overpasses in the areas under the jurisdiction of East Central and Northeast Frontier Railways, there was **no death** reported.
 - The authorities should also expedite other recommendations made by the C&AG such as a
 - Periodic review of **identification of elephant passages**
 - More **sensitisation programmes** for railway staff

- Standardisation of track signage
- Installation of an **animal detection system** (transmitter collars) and
- '**Honey bee' sound-emitting devices** near all identified elephant passages.

Conclusion

- Finding long lasting solutions to the problem of man-animal conflicts is the sole responsibility of concerned state governments and the centre.

8) NCR's Pollution Control strategy

Context

- The UN Environment Programme's review of Beijing's control of air pollution provides useful lessons for policymakers of India.

Why is Beijing compared to Delhi?

- The population size of both cities, Beijing and Delhi, is comparable.
- Delhi also shares with Beijing, the three stages in dealing with urban air pollution as a long-term task which starts with
 - **End-of-pipe air pollution control**
 - Integrated measures **targeting primary pollutants** (SO₂, NO₂, PM₁₀, and CO), with the Government playing the main role.
 - **Regional coordination mechanism targeting secondary pollutants**, or particulate matter leading to smog, primarily PM_{2.5}.
- The review by the UN points to a management system characterised by
 - Systematic planning
 - Strong monitoring capacity
 - Local standards
 - Specific enforcement mechanism and
 - Public awareness.

Lessons to be learnt from Beijing

Provide early warning

- A new model of network operation and quality control to **provide early warning** to effectively reduce the level of pollution under adverse weather conditions should be adopted from Beijing. This includes
 - Daily air quality reports and forecasts
 - Warnings issued at least **24 hours in advance** through the media in case of forecasted heavy pollution

- Technical system combining high-resolution satellite remote sensing and laser radar.
- An integrated network combining 'air-land' data for quality monitoring with greater analytical capacity and
- Over 1,000 PM_{2.5} sensors throughout the city to accurately identify high-emission areas and periods.

Approach to urbanisation

- Rather than shutting down polluting units, restricting car ownership and travel, and improving fuel standards, the **different approach to urbanisation** can effectively help in controlling air pollution which is evident in 'Smart cities' such as New York, London and Beijing.
 - They provide **more space for public transport and mixed land use spatial planning** thereby minimising travel.
 - In China, 72% of travel is completed by public transport compared with 37% in Japan, 17% in Europe and 10% in the U.S.

Vehicle policy- Source appointment

- Likehow Beijing found that the largest source of PM_{2.5} is on road diesel vehicles through source appointment studies, India should also **find the largest source of PM_{2.5} emission and take appropriate actions to cut down it** as it is more difficult to control, causing smog and health issues.
- **Phasing out older vehicles** and the push for the **use of electric vehicles** should be our priority.

Innovative implementation steps

- Innovative implementation steps as instituted in Beijing can be adopted.
 - **Transforming and upgrading the industrial structure** production processes and equipment such that both the concentration and total emission can be controlled.
 - **Economic incentives** can be tailored to the specific problem, with attractive levels of subsidies to high-polluting enterprises to close their production and differentiated fees charged according to the concentration of waste gas emissions for those who chose to remain in production.
 - **Enforcement at the municipal and State levels** can be coordinated, with

- each level having different responsibilities and a mechanism for cooperation.
- Municipal environmental enforcement teams can do specific inspections and hotspot grid supervision based on a detailed emission inventory for each source, passing on serious cases to the State level.
 - **Independent evaluations** review the air quality management system, conduct quantitative assessments of the pollution reduction effects in selected areas, analyse new challenges, and provide recommendations for enabling further improvement in air quality and building public support.

9) Focus of COP27 must be on Food systems

Context

- The United Nations Climate Change Conference (COP 27) to be held in Egypt should focus on food systems as the climate crisis and hunger are linked such that they are impossible to disentangle.

Climate crisis and global food systems

- The climate crisis impacts all parts of the global food system — from production to consumption.
- It destroys land and crops, kills livestock, depletes fisheries, and cuts off transport to markets.
- Crop failures, water scarcity, and declining nutrition threaten millions who rely on agriculture, fishing, and livestock.
- This impacts food production, availability, diversity, access, and safety.
- At the same time, **food systems impact the environment** and are a driver of climate change.
- Analysis by the **United Nations World Food Programme (WFP)** shows that a 2°C rise in average global temperature from pre-industrial levels will see a staggering 189 million additional people in the grip of hunger.
- Across the world, up to **811 million people do not have enough food** and as per the recent WFP estimates, 41 million people in 43 countries are at risk of sliding into famine.

- The poor and the vulnerable continue to be hardest hit even though they contribute least to greenhouse gas emissions.
- The top 10 most food-insecure countries contribute 0.08% of global carbon emissions.

Adaptation is urgent

- **Adaptation and resilience-building** for poor and vulnerable communities are critical for food security.
- The focus though has been on reducing emissions and targets related as these are essential to protect livelihoods and the food security of millions.
- Recent pledges made by the developed countries in COP26 on **enhancing climate finance to support adaptation** in developing countries to adjust to worsening climate crisis impacts is a step in the right direction.
- The **World Food Programme** is working with communities to adapt to the changing climate that threatens their ability to grow food, secure incomes, and withstand shocks. It has supported 39 governments, helping them realise their national climate ambitions.
- In India, the WFP and the Ministry of Environment, Climate Change, and Forestry are planning to develop a best practice model on adaptation and mitigation with potential support from the Adaptation Fund.

Measures to focus on

- Creating **resilient livelihoods and food security solutions** by protecting and improving the livelihood of vulnerable communities.
- The **adaptation of climate-resilient food crops**, such as millets, for nutritional security.
- Enabling women's control and ownership of production processes and assets and increased value addition and local solutions.
- **Promoting a resilient agriculture sector** by creating sustainable opportunities, access to finance, and innovation for small-holder farmers, with climate information and preparedness.
- **Building capacity and knowledge** of civil society and governments for vulnerability analysis to increase food security by

- addressing the link between food security and climate risk.
- Parties to UNFCCC should be encouraged to continue to **explore innovative approaches** and instruments for mobilizing finance for adaptation from private sources.

Conclusion

- As we are on the cusp of transformation to make the **world free of hunger by 2030** and deliver **promises for Sustainable Development Goals (SDGs)**, we should work towards achieving the following.
 - Strong cooperation** and partnership between governments, citizens, civil society organisations, and the private sector.
 - Reimagining the food system** towards balancing growth and sustainability

- Mitigating climate change**
- Ensuring healthy, safe, quality, and affordable food, with investment from governments and the private sector in supporting farmers
- Maintaining biodiversity, improving resilience**, and offering attractive income and work environment to smallholders and youth.
- Reimagining food systems requires us to look at food systems through the prism of climate change adaptation and mitigation, making them resilient to climate change and pandemics while making them green and sustainable.

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INDIAN EXPRESS EXPLAINED

1) Paika Rebellion

Why in the news?

- Recently, the Centre through a written reply in the Rajya Sabha said the **Paika rebellion cannot be called the first War of Independence.**
- Since 2017, **Odisha has demanded** that the rebellion of Odisha be declared as the first war of Independence.
- At present, the **Indian Mutiny or Sepoy Mutiny of 1857** is called the first war of Independence against British Rule.

What is the Paika Rebellion?

- The Paika Bidroha (Paika Rebellion) of 1817 took place nearly 40 years before the first sepoy mutiny.
- The **Paikas ("foot soldiers")** were a class of **military retainers recruited** from a **variety of socioeconomic groups** by **Odisha's Gajapati rulers** from the 16th century to **offer martial services** in exchange for **hereditary rent-free land (nish-kar jagirs) and titles.**
- The British established themselves in Odisha when the East India company dethroned the King of Khurda, Raja Mukunda Deva in 1803.

- The Paikas lost their estates when the new colonial establishments and land revenue settlements of the British came into force.
- The continuous interference in the economy and revenue systems led to exploitation and oppression of the peasants and farmers eventually triggering a rebellion against the British.
- A large number of Paikas were mobilised under the leadership of **Bakshi Jagabandhu Bidyadhar**, who then confronted the British on April 2, 1817.
- A 400-strong party of Kandhas crossed over into Khurda from Ghumsur and declared rebellion.
- The uprising spread like a wildfire across the state resulting in several confrontations and encounters between the British and the Paika forces.
- Government buildings in Banapur were set on fire, policemen killed and the British treasury looted.
- Over the next few months, **the revolt continued but was eventually overpowered by the British army.** Bidyadhar was imprisoned in 1825 and died while still in jail four years later.

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INFOGRAPHIC OF THE WEEK

1) National Recruitment Agency

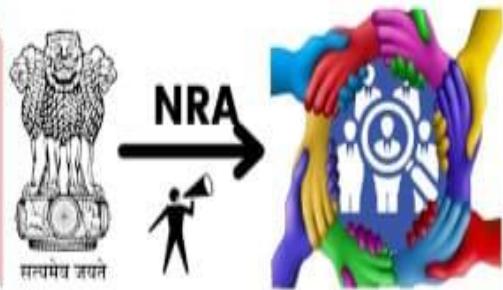


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About NRA

Last year, the central government announced it has decided to set up a **common recruitment body called National Recruitment Agency (NRA)**.

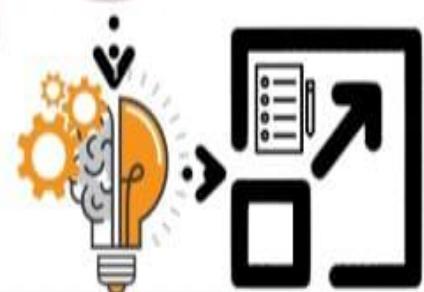


The Agency aims to conduct a single online '**Common Eligibility Test**' or CET, the scores of which will be used for various central government recruitment



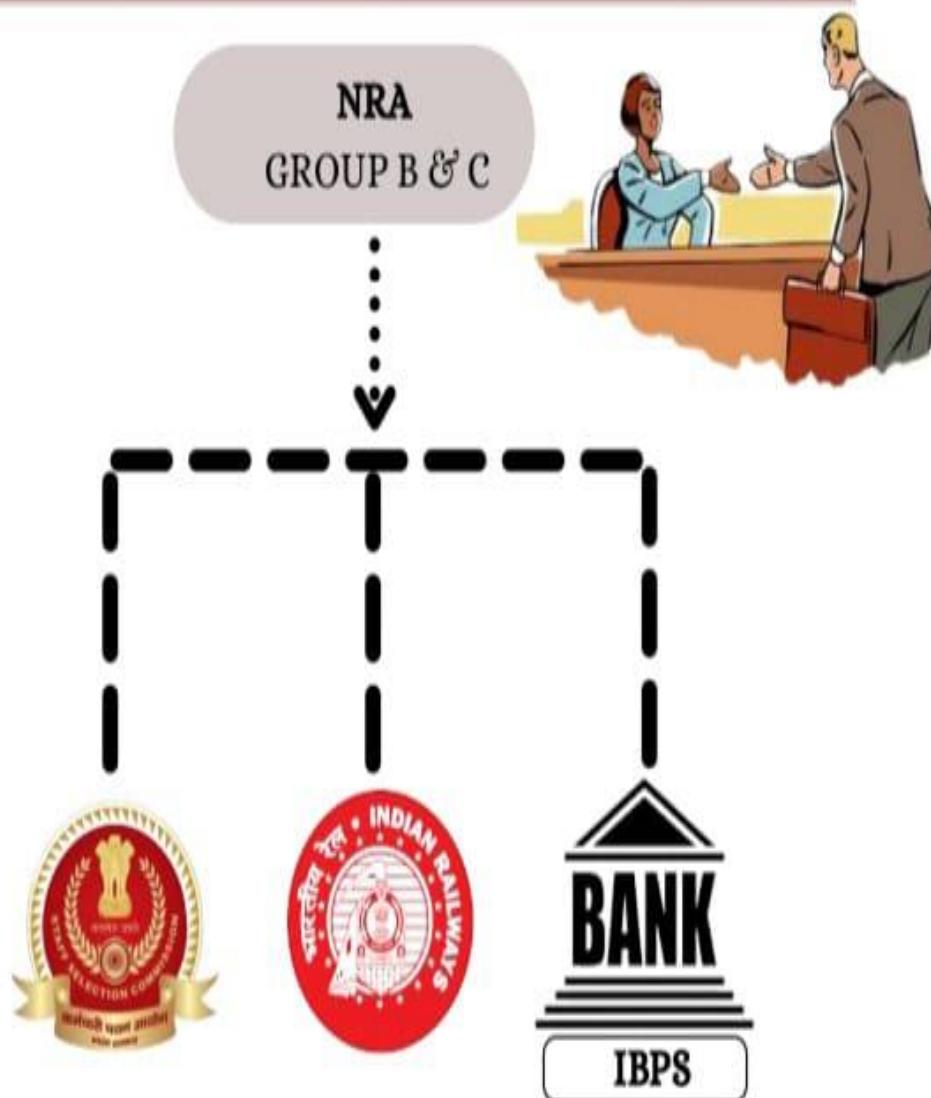
Initially, the Agency will conduct exams for **Group B and C (non-technical) posts**. There is a proposal to expand the purview of the exams.

Group B and C



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Currently, the Group B and C recruitment is done by Staff Selection Commission (SSC), Railway Recruitment Board (RRB), and Institute of Banking Personnel Selection (IBPS)



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News in Detail



NRA will conduct a **common preliminary exam** and based on the scores received by the candidates, IBPS, SSC and RRB will conduct the Tier II and Tier III examinations. This means that these agencies **will remain in place**; however, the preliminary exams will be conducted by the NRA.



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NRA aims to conduct separate exams for graduate candidates, 12th pass candidates, and 10th pass candidates. The scores received in these exams will be **valid for 3 years** which can be used to apply for Tier II recruitment.



There is **no restriction on the number attempts** a candidate can make but there will be an **upper age limit for candidates**. The best valid score will be considered as the current score.



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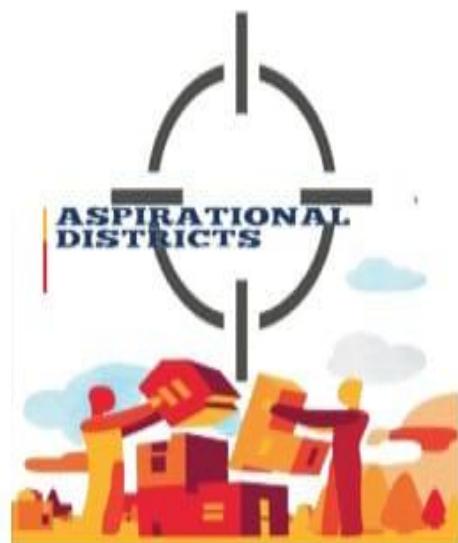
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Initially candidates will have an option to appear for the exams in **12 languages**. There are plans to expand the number of languages in which the exam will be conducted in the future.



The examination will be conducted based on a **common curriculum**.

Special focus would be given on creating examination infrastructure in the **Aspirational Districts**.



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Why is the NRA needed?

As of now, aspirants have to take different exams that are conducted by various agencies for central government jobs. Currently, around 2.5 crore candidates appear for these exams for around 1.25 lakh vacancies.

1.25 lakh vacancies



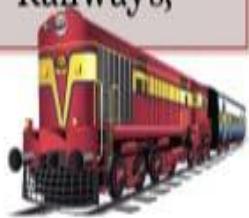
The Agency aims to streamline the process of recruitment for various central government positions.

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NRA will have representatives from the

Ministry of
Railways,



Ministry of
Finance/
Department of
Financial Services

SSC, RRB & IBPS.



Advantages

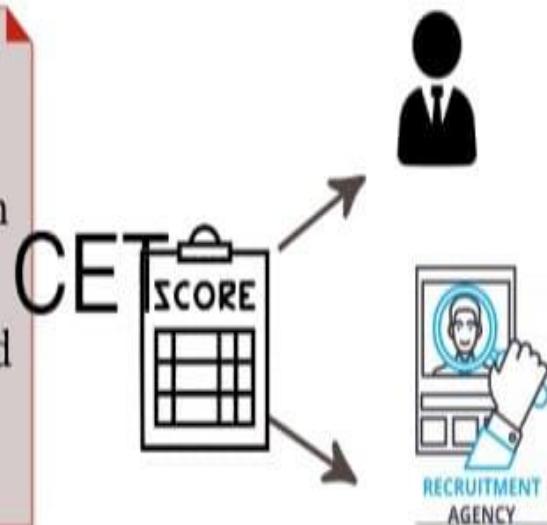
For Students



Candidates applying for these recruitments will **no longer have to pay repetitive fees** to multiple agencies.

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The CET score would be generated immediately and shall be made available for both the candidate and the recruitment agency. This would help in ensuring better transparency.



Every district across states will have at least one CET exam centre to help disadvantaged sections, rural candidates and women.

The exam will be conducted twice a year, for different educational levels and in multiple Indian languages.



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For Government



**Reduction in cost of conducting
the examination.**

Better Transparency- Currently, the recruitment cycle takes at least 18 months and is often marred by clashing dates, leaked papers and examination scams.



Standardized exam pattern

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The infographic features a light brown background with a white header section. In the top right corner, the text "OFFICERS IAS ACADEMY™" is written in red, with "IAS ACADEMY BY IAS OFFICERS" in smaller black text below it. To the left, a blue rounded rectangle contains the text "Faster recruitment cycle". To the right is a white outline of a head containing a blue circle with a white person icon and a checkmark. Below this is a dark brown rounded rectangle with the text "Why in News?". The main content area has a light brown background and contains the following text:

The Government has announced that the National Recruitment Agency will be established in the country by March 2022 which will conduct Common Eligibility Test for recruitment.

MARCH 2022

The illustration includes the Indian National Emblem (Lion Capital of Ashoka) on the left, with the motto "सत्यमेव जयते" written below it. To its right is a black silhouette of a person holding a megaphone. To the right of the person is a blue graphic of a pen writing a checkmark inside a square box on a white document. The text "MARCH 2022" is written in large red capital letters above the pen.

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<https://newsonair.gov.in/News?title=National-Recruitment-Agency-will-be-established-by-March-2022-which-will-conduct-Common-Eligibility-Test-for-recruitment%3a-Jitendra-Singh&id=429501>

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