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# CURRENT AFFAIRS

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## **GS 2 : Polity, Governance, International Relations**

### **1. Caste census**

Bihar is planning to conduct **State-specific caste-based exercise**. This comes after a delegation of Bihar leaders led by CM had met Prime Minister Narendra Modi and urged him to hold caste census in the country but later, the Central Government had refused to hold the same.

#### **What's the issue?**

The Union government had told the Supreme Court that the **caste-based** data enumerated in **the Socio-Economic Caste Census (SECC) of 2011** was “unusable”, but in 2016, **the Registrar-General and Census Commissioner of India** had informed the Standing Committee on Rural Development that 98.87% of the data on individual caste and religion was “error free”.

#### **Why the data is “unusable” according to the government?**

- The government had said that the total number of castes surveyed in 1931 was 4,147, while the SECC figures show that there are more than 46 lakh different castes. Assuming that some castes may bifurcate into sub-castes, the total number can not be exponentially high to this extent.
- The entire exercise was corrupted because the enumerators had used different spellings for the same castes. In many cases the respondents, the government said, had refused to divulge their castes.

#### **How have caste details been collected so far?**

1. While **SC/ST details are collected as part of the census**, details of other castes are not collected by the enumerators. The main method is by **self-declaration** to the enumerator.
2. So far, **backward classes commissions** in various States have been conducting their own counts to ascertain the population of backward castes.

#### **What kind of caste data is published in the Census?**

Every Census in independent India from 1951 to 2011 has published data on Scheduled Castes and Scheduled Tribes, but not on other castes. Before that, every Census until 1931 had data on caste.

### What is SECC 2011?

The **Socio-Economic Caste Census of 2011** was a major exercise to obtain data about the socio-economic status of various communities.

- **It had two components:** a survey of the rural and urban households and ranking of these households based on pre-set parameters, and a caste census.
- However, only the details of the economic conditions of the people in rural and urban households were released. **The caste data has not been released till now.**

### Difference between Census & SECC:

- The Census provides a portrait of the Indian population, while the SECC is a tool to identify beneficiaries of state support.
- Since **the Census falls under the Census Act of 1948**, all data are considered confidential, whereas all the personal information given in the SECC is open for use by Government departments to grant and/or restrict benefits to households.

### Pros of caste census:

The precise number of the population of each caste would help tailor the reservation policy to ensure equitable representation of all of them.

### Concerns associated:

- There is a possibility that it will lead to heartburn among some sections and spawn demands for larger or separate quotas.
- It has been alleged that the mere act of labelling persons as belonging to a caste tends to perpetuate the system.

## 2. What is the negative imports list for defence?

The Government has brought in few changes in its **negative imports list policy**. This includes:

- The armed forces will now be able to import defence equipment in certain circumstances even if it figures in the negative import list.
- This includes scenarios where there is an “immediate requirement” that domestic industry cannot cater to, or if the safety of soldiers is at stake due to inadequacies in an indigenous product.
- There is also a provision now to review or remove items mentioned in the negative import list, which was first formulated in August 2020.

### What is the negative imports list policy/positive indigenisation list?

Introduced in August 2020, the negative list essentially means that the Armed Forces – Army, Navy and Air Force – will only procure such items from domestic manufacturers.

- The manufacturers could be private sector players or Defence Public Sector Undertakings (DPSUs).

### Why was this policy needed? What will be the impact?

As per **Stockholm International Peace Research Institute**, India has been the second largest importer between 2014 and 2019 with US\$ 16.75 billion worth of imports during this period.

- **The government wants to reduce the dependence on imported items in defence** and give a shot in the arm to the domestic defence manufacturing industry.
- By denying the possibility of importing the items on the negative list, **the domestic industry is given the opportunity to step up and manufacture them for the needs of the forces.**

### 2nd list:

The **Defence Ministry** notified **the second negative import list**, in May 2021, of 108 items that can now be only purchased from indigenous sources. **The new list takes the total number on the list to 209.**

- The list comprises complex systems, sensors, simulator, weapons and ammunitions like helicopters, next generation corvettes, Air Borne Early Warning and Control (AEW&C) systems, tank engines.

### **Significance and implications of this move:**

1. Recognises the potential of local defence industry.
2. Invigorate impetus to domestic Research and Development by attracting fresh investment into technology and manufacturing capabilities.
3. Provides an excellent opportunity for 'start-ups' as also Micro, Small and Medium Enterprises (MSMEs).

### **3. Dam Safety Bill 2019:**

The Rajya Sabha has passed the **Dam Safety Bill, 2019**.

- The Bill was passed in the Lok Sabha on 2 August, 2019.

#### **Concerns raised:**

- The bill is too focused on structural safety and not on operational safety.
- There is inadequate compensation to the people affected by dams.
- There is need for an independent regulator as well as for a precise definition of stakeholders.
- Many states say it encroaches upon the sovereignty of States to manage their dams, and violates the principles of federalism enshrined in the Constitution. They see it as an attempt by the Centre to consolidate power in the guise of safety concerns.

#### **Why Centre is introducing this Bill?**

Though the subject does not fall under the purview of Parliament, the Centre has decided to introduce this bill mainly because dam safety is an issue of concern in the country. And there are no legal and institutional safeguards in this regard.

#### **Highlights of Dam Safety Bill, 2019:**

- The Bill provides for proper surveillance, inspection, operation and maintenance of all specified dams in the country to ensure their safe functioning.
- The Bill provides for constitution of a **National Committee on Dam Safety** which shall evolve dam safety policies and recommend necessary regulations as may be required for the purpose.
- The Bill provides for establishment of **National Dam Safety Authority** as a regulatory body which shall discharge functions to implement the policy, guidelines and standards for dam safety in the country.
- The Bill provides for constitution of a **State Committee on Dam Safety** by State Government.

### Significance:

- The Bill will help all the States and Union Territories of India to adopt uniform dam safety procedures which shall ensure safety of dams and safeguard benefits from such dams. This shall also help in safeguarding human life, livestock and property.
- It addresses all issues concerning dam safety including regular inspection of dams, Emergency Action Plan, comprehensive dam safety review, adequate repair and maintenance funds for dam safety, Instrumentation and Safety Manuals.
- It lays onus of dam safety on the dam owner and provides for penal provisions for commission and omission of certain acts.

### Need for:

- Over the last fifty years, India has invested substantially in dams and related infrastructures, and ranks third after USA and China in the number of large dams. 5254 large dams are in operation in the country currently and another 447 are under construction.
- In addition to this, there are thousands of medium and small dams.
- While dams have played a key role in fostering rapid and sustained agricultural growth and development in India, there has been a long felt need for a uniform law and administrative structure for ensuring dam safety.
- The Central Water Commission, through the National Committee on Dam Safety (NCDS), Central Dam Safety Organization (CDSO) and State Dam Safety Organizations (SDSO) has been making constant endeavours in this

direction, but these organizations do not have any statutory powers and are only advisory in nature.

- This can be a matter of concern, especially since about 75 percent of the large dams in India are more than 25 years old and about 164 dams are more than 100 years old.
- A badly maintained, unsafe dam can be a hazard to human life, flora and fauna, public and private assets and the environment.
- India has had 42 dam failures in the past.

#### 4. Paika Rebellion to be included as 'case study' in history textbook

The 1817 Paika Rebellion of Odisha would be included as a case study in the Class 8 NCERT history textbook, informed the Union Culture Minister.

*Who were the Paiks?*

- The Paiks of Odisha were the traditional landed militia and enjoyed rent free land tenures for their military service and policing functions on a hereditary basis.

*Paika Rebellion*

- When the British started tinkering with the revenue system in 1803, the farming community of Odisha rose in rebellion.
- At that critical juncture, **Bakshi Jagabandhu Bidyadhar** – the military chief of the King of Khurda – led his army of Paikas forcing the British East India Company forces to retreat.
- The rebellion came to be known as Paika Bidroh (Paika rebellion).

*When did it take place?*

- The rebellion, by the landed militia of Khurda called Paiks, predates the first war of independence in 1857 but did not get similar recognition.
- It took place when the British East India Company wrested the rent-free land that had been given to the Paiks for their military service to the Kingdom of Khurda.

#### 5. Indian SARS-CoV-2 Consortium on Genomics (INSACOG)

- The Indian SARS-CoV-2 Genomics Consortium (INSACOG) is jointly initiated by the Union Ministry of Health and Family Welfare, and Department of Biotechnology (DBT) with Council for Scientific & Industrial Research (CSIR) and Indian Council of Medical Research (ICMR).
- It is a consortium of 28 National Laboratories to monitor the genomic variations in the SARS-CoV-2.
- It carries out whole genome sequencing of SARS-CoV-2 virus across the nation, aiding in understanding the spread and evolution of the virus.
- INSACOG also aims to focus on sequencing of clinical samples to understand the disease dynamics and severity.

## 6. Global Wealth Tax on Multimillionaires

Global billionaire wealth in 2021 represents 3.5 per cent of global household wealth.

- Also, the share of the top 0.01 per cent rose from 7 per cent of global wealth in 1995 to 11 per cent in 2021 as per the findings of the latest World Inequality Report 2022 showed.

### The concentration of wealth

- Since the mid-1990s, **the richest 1 per cent captured 38 per cent of wealth growth** at the global level, the report says.
- As per the report, **the richest 10 per cent own around 60-80 per cent of wealth**, and the poorest half systematically own less than 5 per cent of wealth.
- The **bottom 50% of the global population owns just 2% of wealth** and 8 per cent of income, while the top 10 per cent of population owns 76 per cent of total household wealth and captured 52 per cent of total income in 2021, as per the report.
- It said that government intervention is key to tackling inequality **with social and tax policies**.

### The solutions

- Economist Thomas Piketty has suggested developing **new forms of wealth taxation on multimillionaires** including a progressive rate of wealth tax with tax rates according to the value of the total amount of wealth owned.
- What has been happening is a higher concentration of wealth, more wealth inequality and our tax systems so far in most countries in the world have not adapted to this.



- Such new taxes also makes sense especially when the governments are looking for money to repay the **increased debt during Covid times**.

### Why the need for Global Wealth Tax?

- There is a proposal of global wealth tax on multimillionaires, people who own more than a million dollars or euros and this tax in this proposal is progressive, meaning that the rates are going to be according to the value of the total amount of wealth that one owns.
- In countries, where wealth is highly concentrated, more rates on the stock of wealth of very wealthy individuals can **deliver high amounts of revenues**.
- The global bottom 50 per cent income share remains historically low despite growth in the emerging world in the past decades.
- The share of global income going to top 10 per cent highest incomes at the world level has fluctuated around 50-60 per cent between 1820 and 2020 (50 per cent in 1820, 60 per cent in 1910, 56 per cent in 1980, 61 per cent in 2000, 55 per cent in 2020).
- However, the share going to the bottom 50 per cent lowest incomes has generally been around or below 10 per cent (14 per cent in 1820, 7 per cent in 1910, 5 per cent in 1980, 6 per cent in 2000, 7 per cent in 2020).
- The top 0.1 per cent of the global population captures more income than the entire bottom 50 per cent.
- The average annual wealth growth rates among the poorest half of the population were between 3 per cent and 4 per cent per year between 1995 and 2021.
- The poorest half of the world population only captured 2.3 per cent of overall wealth growth since 1995.
- The top 1 per cent benefited from high growth rates (3 per cent to 9 per cent per year). This group captured 38 per cent of total wealth growth between 1995 and 2021.
- The share of wealth detained by the world's billionaires rose from 1 per cent of total household wealth in 1995 to nearly 3.5 per cent today, it said.

### Income inequality in gender terms

- In gender terms, the income inequality is sharp, with **women workers getting just one-third of total labour income**.
- Women today get just one-third of all labour income in the world whereas gender parity would mean they get half of that.
- But currently women earn just one-third of all incomes from work and the situation has increased since the 1990s but at a very slow rate. If we continue at this rate, we need to wait at least a century to reach gender parity.

## GS 3 : Economy, Science and Technology, Environment

### 7. hypersonic weapons

US has said that China's pursuit of hypersonic weapons "increases tensions in the region" and vowed the U.S. would maintain its capability to deter potential threats posed by China.

#### What's the issue?

- China's growing military muscle and its drive to end American predominance in Asia has triggered unease in Washington.
- China's efforts to accelerate its military capabilities were highlighted by its July test of a hypersonic weapon capable of partially orbiting the Earth before reentering the atmosphere and gliding on a maneuverable path to its target.

#### Concern:

Experts say the weapons system is clearly designed with a purpose of evading U.S. missile defences, although China insisted it was testing a reusable space vehicle, not a missile.

#### What are hypersonic speeds?

- **Hypersonic speeds** are 5 or more times the speed of sound.

#### Concerns and implications for India and the world:

- The weapon could, in theory, fly over the South Pole. That would pose a big challenge for the US military because its missile defence systems are focused on the northern polar route.
- India is especially concerned with the latest developments considering relations with China in the recent past. Such capabilities highlight the threat for our space assets along with the surface assets.

### Technology used:

The exact details on technology used by China in this particular test are not known through media sources. But most of the hypersonic vehicles primarily use **the scramjet technology**.

### What is scramjet technology?

Scramjets are a category of **engines designed to handle airflows of speeds in multiples of the speed of sound**.

- In an air-breathing scramjet engine, air from the atmosphere is rammed into the engine's combustion chamber at a supersonic speed of more than Mach two.
- In the chamber, the air mixes with the fuel to ignite a supersonic combustion but the cruiser's flight will be at a hypersonic speed of Mach six to seven. So it is called **supersonic combustion ramjet or Scramjet**.

### 8. Facial recognition technology

After a delay of three years, come March 2022, passengers will be able to use a face scan as their boarding pass at four airports in the country.

- Airports at Varanasi, Pune, Kolkata and Vijaywada will be the first to roll-out the facial recognition technology-based biometric boarding system, and the service will go live from March 2022.
- Thereafter, the technology will be scaled up in a phased manner across various airports in the country.

### Implementation:

- The Airports Authority of India has engaged **NEC Corporation Private Limited** for implementing the technology as part of the DigiYatra policy, which seeks to promote paperless air travel and a seamless journey from entering an airport till boarding a plane.

- The policy was unveiled in October 2018, and as per the original plan, the roll-out of the facial recognition technology was scheduled for April 2019.

### What is facial recognition?

**Facial recognition** is a biometric technology that uses distinctive features on the face to identify and distinguish an individual.

- AFRS works by maintaining a large database with photos and videos of peoples' faces. Then, a new image of an unidentified person – often taken from CCTV footage – is compared to the existing database to find a match and identify the person.
- The artificial intelligence technology used for pattern-finding and matching is called “neural networks”.

### Benefits of facial recognition:

1. Improves outcomes in the area of Criminal identification and verification.
2. Easy identification amongst crowds.
3. Boosts the police department's crime investigation capabilities.
4. Helps civilian verification when needed. No one will be able to get away with a fake ID.

### What are the Concerns?

1. Absence of specific laws or guidelines poses a huge **threat to the fundamental rights to privacy and freedom of speech and expression** because it does not satisfy the threshold the Supreme Court had set in its landmark privacy judgment in the '**Justice K.S. Puttaswamy Vs Union of India**' case.
2. Many institutions have not conducted “**privacy impact assessment**” prior to deployment of the facial recognition system (FRS).
3. **Function creep**: A function creep happens when someone uses information for a purpose that is not the original specified purpose (Police got permission to use the FRS by an order of the Delhi High Court for tracking missing children. Now they are using it for wider security and surveillance and investigation purpose, which is a function creep).

4. This might lead to **an over-policing problem or problems** where certain minorities are targeted without any legal backing or any oversight as to what is happening. Another problem that may arise is of mass surveillance, wherein the police are using the FRT system during protest.
5. **Mass surveillance:** If someone goes to a protest against the government, and the police are able to identify the person, then there might be repercussions.
6. **The basis of the AFRS is a Cabinet note of 2009.** But the Cabinet note is not a legal substance, it's a procedural note at best. So it does not form a valid legal system based on which the AFRS can be built.

### Need of the hour:

The Supreme Court in **the Puttaswamy judgment** ruled that privacy is a fundamental right even in public spaces. And if these rights needs to be infringed, then the government has to show that such action is **sanctioned by law, proportionate to the need for such interference, necessary and in pursuit of a legitimate aim.**

## THE INDIAN EXPRESS

### GS 2 : Polity, Governance, International Relations

#### 1. The politics-policy disconnect in India

Decision-making on virtually all governance issues is disconnected from politics and the mobilisation of public opinion.

#### Disconnect between politics and policy

- The repeal of the farm laws is thus a notable instance of politics and policy coming together, although in conflict.
- The Opposition speaking in one voice in the Parliament helped, but the heavy lifting of organising in the villages and sustaining the protests was done by the farmers' groups.

- This disconnect between politics and policy is not a recent development, though it manifests differently across political divides.
- **Policy-first lens and its implications:** The liberal side has a policy-first lens but is **unable to articulate its ideas in a manner which makes for good politics**, repeatedly couching its ideas in a bureaucratic framework disconnected from political organisation.
- Bureaucracy is downstream from politics and this approach rather than curbing the state may have instead contributed to **undermining the democratic process of political accountability** since the political class is, by design, not central to the policy in the first place.
- **A politics-first approach:** The right, on its side, has a **politics-first lens** but it derives its politics largely from its social agenda instead of issues of governance.
- The policy imperatives, if any, are ad hoc and appear to be driven by the demands of running the political apparatus instead of a clear governance agenda.
- Despite these differences, what is common across parties is the apolitical harnessing of the **state as a disburser of different kinds of economic largesse**, especially just before elections, as political parties cast about for simple ideas for easy mass communication.

### Reasons for the breakdown of the process

- **Weakly institutionalised nature of state and politics:** Indian politics and the state are weakly institutionalised to begin with, which leads to an all-around fuzziness in the relationship between politics and policy.
- However, this is as much an effect as it is cause, with the direction of change towards greater deinstitutionalisation instead of the opposite.
- **Lack of consensus-building:** Another contributing factor is that traditional sites of consensus-building such as media, civil society, and political parties have developed pathologies which have rendered sustained **consensus-building almost impossible**.
- **Centralisation of power:** The excessive centralisation of power in party platforms and the head of the government (state and national).
- This renders the individual elected representative **extraneous to governance** even in their own constituency, where their function is to provide representation and oversight.

### Way forward

- There's too much at stake to allow such a state of affairs to continue.
- It is important to rescue public interest from partisanship and cut through at least some of the bad-faith crosstalk across partisan divides.

- **Cross-cutting collaboration:** There are many issues which lend themselves to cross-cutting collaboration outside of ideological affiliations.
- **Need for reforms:** Institutional reforms are required to create such a space but public-spirited individuals across political divides can lay the foundation for such collaboration through **issue-based discipline, moderation and intellectual independence.**

## Conclusion

We need to address the disconnect between policy and politics to make the functioning of democracy more meaningful for us.

## 2. What the latest NFHS data says about the New Welfarism

The second and final phase of NFHS-5 was released which covered 11 states (including Uttar Pradesh (UP), Tamil Nadu, Punjab, Rajasthan, Madhya Pradesh (MP), Jharkhand, Haryana, and Chhattisgarh) and about 49 per cent of the population.

### Major findings

#### [1] Success of New Welfarism

- Figure one plots household access to improved sanitation, cooking gas and bank accounts used by women.
- The improvements are as striking as they were based on the performance of the phase 1 states.
- In all cases, access has increased significantly, although claims of India being 100 per cent open defecation-free still remain excessive.

#### [2] Child-related outcomes

- India-wide, **stunting has declined** although the pace of improvement has slowed down post-2015 compared with the previous decade.
- For example, stunting improved by **0.7 percentage points per year between 2005 and 2015** compared to 0.3 percentage points between 2015 and 2021.
- On diarrhoea too, adding the new data reverses the earlier finding.
- However, on anaemia and acute respiratory illness, there seems to have been deterioration.
- The new child stunting results are significant but also surprising because of the sharply divergent outcomes between the phase 1 and phase 2 states.

- The interesting pattern is that nearly all the phase 2 states show large improvements, whereas most of the phase 1 states exhibited a deterioration in performance.

### [3] Catch up by the laggard states

- If the new child stunting numbers are right, a different picture of India emerges.
- Apparently, Madhya Pradesh now has fewer stunted children than Gujarat; **Uttar Pradesh and Jharkhand are almost at par with Gujarat**; Chhattisgarh fares better than Gujarat, Karnataka, and Maharashtra; and **Rajasthan and Odisha fare better than Gujarat, Karnataka, Maharashtra, West Bengal, Telangana and Himachal Pradesh!**
- On child stunting, the old BIMARU states (excepting Bihar) are no longer the laggards; **the laggards are Gujarat, Maharashtra, and Karnataka**, and to a lesser extent, West Bengal, Andhra Pradesh and Telangana.
- Indeed, the decline in stunting achieved by the poorer states such as UP, MP, Chhattisgarh and Rajasthan would be all the more remarkable given the overall weakness in the economy between 2015 and 2021.

### Conclusion

When commentators speak of two Indias, it is now important to ask: Which ones and on what metrics.

### 3. Scheme for Protection and Preservation of Endangered Languages of India (SPPEL)

The Government of India has initiated a Scheme known as “Scheme for Protection and Preservation of Endangered Languages of India” (SPPEL) informed the Minister of Culture and Tourism.

#### About SPPEL

- The Scheme was instituted by Ministry of Human Resource Development in 2013.
- The sole objective of the Scheme is to document and archive the country’s languages that have become endangered or likely to be endangered in the near future.
- The scheme is monitored by the Central Institute of Indian Languages (CIIL) located in Mysuru, Karnataka.
- The CIIL has collaborated with various universities and institutes across India for this mission.



- University Grants Commission (UGC) is also providing financial assistance for the creation of centres for endangered languages at Central and State Universities.

### What are Endangered Languages?

- At the moment, the languages which are spoken by less than 10,000 speakers or languages that are not been linguistically studied earlier are considered endangered language.

### Present status of the scheme

- Presently, 117 languages have been listed for the documentation.
- Documentation in the form of grammar, dictionary and ethno-linguistic profiles of about 500 lesser known languages are estimated to be accomplished in the coming years.

### 4. Census 2021 with a Mixed-Mode Approach

Due to outbreak of COVID-19 pandemic, the Census 2021 and related field activities have been postponed.

- Will be the first digital Census
- Mobile App for collection of data and a Census Portal for management and monitoring of various Census related activities have been developed.
- State Governments of Bihar, Maharashtra and Odisha have requested to collect caste details
- The names of the mother tongue and two other languages known in order of proficiency are to be recorded
- There is a provision for self-enumeration. Self-enumeration refers to completion of census survey questionnaires by the respondents themselves.

### What is Census?

- In Census (decennial census), data is collected on demographic and various socio-economic parameters like education, SC/ST, religion, language, marriage, fertility, disability, occupation and migration of the individuals.
- Office of the Registrar General and Census Commissioner, India under Ministry of Home Affairs, Government of India is responsible for carrying out the census.
- It provides information on size, distribution and socio-economic, demographic and other characteristics of the country's population.

- The first synchronous census in India was held in 1881. Since then, censuses have been undertaken uninterruptedly once every ten years.
- As per the official Gazette, the individual data collected in Census under the Census Act, 1948, are not made public as per the provisions contained in the Act.
  - The individual data are not used for the preparation of any other database, including the National Register of Citizens.
- Only the aggregated Census data at various administrative levels are released.
- The Census 2021 will be conducted in 18 languages out of the 22 scheduled languages (under 8th schedule) and English, while Census 2011 was in 16 of the 22 scheduled languages declared at that time.
- The Census data would be available by the year 2024-25 as the entire process would be conducted digitally and data crunching would be quicker.

### **Census Act 1948**

The Census Act 1948, as amended in 1994 defines the act as; In this Act, unless the context otherwise requires –

- (a) “premises” means any land, building or part of a building and includes a hut, shed or other structure or any part thereof;
- (b) “Prescribed” means prescribed by rules made under this Act;
- (c) “Vehicle” means any vehicle used or capable of being used for road transport, whether propelled by mechanical power or otherwise

### **What is the Registrar-General and Census Commissioner of India?**

- Registrar General and Census Commissioner of India, was founded in 1961 by the Government of India, Ministry of Home Affairs.
- **Role:** Arranging, conducting and analysing the results of the demographic surveys of India including Census of India and Linguistic Survey of India.
- The position of Registrar is usually held by a civil servant holding the rank of Joint Secretary.

### **What is the Socio-Economic Caste Census (SECC)?**

- Socio-Economic Caste Census (SECC), which collected the first figures on caste since 1931, is the largest exercise of the enumeration of caste.
- SECC supplies data to differentiate the socio-economic status of households based on housing, educational status, landholding, differently abled, occupation, possession of assets, SC/ST households, incomes etc.

- The Census thus provides a portrait of the Indian population, while the SECC is a tool to identify beneficiaries of state support.

## **GS 3 : Economy, Science and Technology, Environment**

### **5. James Webb Space Telescope**

The James Webb Space Telescope, NASA's largest space science telescope ever constructed, is scheduled to be sent into orbit in December.

#### **James Webb Space Telescope (JWST)**

- It is a space telescope being jointly developed by NASA, the European Space Agency (ESA), and the Canadian Space Agency (CSA).
- It has taken 30 years and \$10bn to develop, and is being described as one of the grand scientific endeavors of the 21st Century.

#### **What is the goal of this telescope?**

- The telescope will be able to see just about anything in the sky.
- However, it has one overriding objective – to see the light coming from the very first stars to shine in the Universe.
- These pioneer stars are thought to have switched on about 100-200 million years after the Big Bang, or a little over 13.5 billion years ago.
- Webb will be picking out groupings of these stars.
- They are so far away their light – even though it moves at 300,000km per second – will have taken billions of years to travel the cosmos.

#### **JWST mirror**

- One of the most important objects it will carry is a large mirror which will help collect light from the objects being observed.
- The primary mirror is made of 18 hexagonal-shaped mirror segments – each 1.32 metre in diameter – stitched together in a honeycomb pattern.
- The primary mirror is a technological marvel.
- The lightweight mirrors, coatings, actuators and mechanisms, electronics, and thermal blankets when fully deployed form a single precise mirror that is truly remarkable.
- Each mirror segment weighs approximately 20 kilograms and is made from beryllium.

### Why beryllium?

- NASA explains that beryllium was used as it is both strong and light.
- Beryllium is very strong for its weight and is good at holding its shape across a range of temperatures. Beryllium is a good conductor of electricity and heat and is not magnetic.
- Because it is light and strong, beryllium is often used to build parts for supersonic airplanes and the Space Shuttle.
- It added that special care was taken when working with beryllium because it is unhealthy to breathe in or swallow beryllium dust.

### So, it does not have gold?

- After the beryllium mirror segments were polished a thin coating of gold was applied to it. Gold helps improve the mirror's reflection of infrared light.
- The gold was coated using a technique called vacuum vapour deposition.
- The mirrors are kept inside a vacuum chamber and a small quantity of gold is vapourised and deposited on the mirror.
- The thickness of the gold is just 100 nanometers. So less than 50 grams of gold was used for the entire mirror.
- A thin layer of glass was also deposited on top of the gold layer to protect it from scratches.

## 6. Perform, Achieve and Trade (PAT) Scheme

A recent report by the Centre for Science and Environment (CSE) has attributed the inefficiency of the PAT scheme to non-transparency, loose targets and overlooked deadlines.

### PAT Scheme

- Perform Achieve and Trade (PAT) scheme is a flagship program of Bureau of Energy Efficiency under the National Mission for Enhanced Energy Efficiency (NMEEE).
- NMEEE is one of the eight national missions under the National Action Plan on Climate Change (NAPCC) launched by the Government of India in the year 2008

## Working of the scheme

- PAT is a market-based compliance mechanism to accelerate improvements in energy efficiency in energy-intensive industries.
- The energy savings achieved by notified industries is converted into tradable instruments called Energy Saving Certificates (ESCerts).
- The ESCerts after issuance by the Bureau of Energy Efficiency are traded at Power Exchanges.

## What is PAT cycle?

- The government shortlists industries and restricts the amount of energy they can consume and defines a time limit of three years by when this restriction should be met as part of PAT.
- These three years of time are called one PAT cycle.
- The industries are chosen after in-depth, sector-wise analysis by the government.
- Industries that participate in this scheme are called designated consumers (DC).
- Those that overachieve their targets are issued energy savings certificates (ESCerts) that can be traded with industries that have not achieved their targets.
- Non-achievers have to buy the ESCerts after the three years for compliance.

## Various PAT cycles

- PAT covered about 13 energy-intensive sectors
- Sectors included are thermal power plants (TPP), cement, aluminium, iron and steel, pulp and paper, fertilizer, chlor-alkali, petroleum refineries, petrochemicals, distribution companies, railways, textile and commercial buildings (hotels and airports)
- Announcements for six cycles since 2012 have been made so far

## 7. Smart Cities Mission (SCM)

The deadline for completing projects under the Smart Cities Mission (SCM) has been extended for all 100 participating cities to June 2023 due to the delays caused by COVID-19 and based on a NITI Aayog recommendation in August.

GoI launched the smart cities mission in 2015.

- The cities were given five years to complete the projects under the mission, with the first set of Smart Cities expected to complete in 2021.
- The objective is to integrate city functions, utilize scarce resources more efficiently, and improve the quality of life of citizens.
- It is an innovative initiative under **the Ministry of Housing and Urban Affairs.**
- It is a **Centrally Sponsored Scheme.**

Smart city is envisaged to have four pillars:

1. Social Infrastructure.
2. Physical Infrastructure.
3. Institutional Infrastructure (including Governance).
4. Economic Infrastructure.

**Progress made under this scheme (as of June 2021):**

- Of the total proposed projects under this mission, 5,924 projects have been tendered, work orders have been issued for 5,236 and 2,665 projects are fully operational.
- 212 PPP projects worth Rs. 24,964 crore have been grounded/completed
- 70 Smart cities have developed. operationalized their Integrated Command and Control Centres (ICCCs) in the country.

**Challenges ahead:**

1. A lot of progress is desired in creating energy-efficient and green buildings.
2. Making Urban Bodies self-reliant.
3. The share of public transport is declining, it needs to be increased to meet the needs of increasing urbanization.
4. Rising air pollution, increase in road congestion due to an increase in urbanization.

## **8. Global Fuel Economy Initiative (GEFI)**

According to GFEI 2021, the global goal to halve the fuel consumption of new light-duty vehicles by 2030 from 2005 levels is stalling.

- The average rated fuel consumption of new light-duty vehicles fell by only 0.9% between 2017 and 2019.
- The 3 major car markets – China, the European Union and the US – accounted for 60% of global sales of light-duty vehicles in 2019, which totalled 90 million, down 7% from 2017
- A number of factors were responsible for the slowing pace of improvement between 2017 and 2019. These included-
  - Stagnating fuel economy standards in the US and the EU up to 2019
  - Market share of SUVs is increased and these cars can use almost one-third more fuel than a medium-sized car
  - Slow adoption of electric cars to compensate for larger vehicles

### About GFEI

- The Global Fuel Economy Initiative (GFEI) is collaboration between the UNEP, IEA, the University of California, International Council on Clean Transportation, International Transport Forum and the FIA Foundation.
- GFEI promotes fuel efficiency in cars and light duty vans, through the adoption of the cost effective fuel efficiency technologies.
- The objective of the GFEI is to help stabilize greenhouse gas emissions from the global light duty vehicle fleet through a **50% improvement of vehicle fuel efficiency worldwide by 2050**.
- GFEI promotes the introduction of cleaner, more energy efficient vehicles in developing and transitional countries.
- It offers support to governments to develop fuel economy policies.

**Prelims Practice Questions**

**1. Consider the following statements:**

1. The Human Immunodeficiency Virus (HIV) attacks the White Blood Cell in the human body.
2. Once HIV enters the body, it can never be removed.

Which of the statements given above is/are correct?

- A 1 only  
B 2 only  
C Both 1 and 2  
D Neither 1 nor 2

Answer :C

Explanation

- **Human Immunodeficiency Virus (HIV)** attacks CD4, a type of **White Blood Cell** (T cells) in the body's immune system. T cells are those cells that move around the body detecting anomalies and infections in cells. **Hence, statement 1 is correct.**
- After entering the body, HIV multiplies itself and destroys CD4 cells, thus severely damaging the human immune system. **Once this virus enters the body, it can never be removed. Hence, statement 2 is correct.**
- The CD4 count of a person infected with HIV reduces significantly. In a healthy body, CD4 count is between 500- 1600, but in an infected body, it can go as low as 200.

**2. With reference to land reforms in independent India, which one of the following statements is correct?**

- a. The ceiling laws were aimed at family holdings and not individual holdings.
- b. The major aim of land reforms was providing agricultural land to all the landless.



- c. It resulted in the cultivation of cash crops as a predominant form of cultivation.
- d. Land reforms permitted no exemptions to the ceiling limits.

**Answer: b**

The major weakness of land ceiling laws was that they were aimed at individual holdings. It allowed many zamindars to transfer land notionally to their relatives and thus escape the ceiling. The reason for land reforms was providing land to all landless people (redistribution) because landlessness was considered as one major reason for poverty and exploitation. Cultivation of cash crops requires much more inputs than the mere availability of holdings.

Cash crops, during British time, were induced by force while in post-independence India, major transformation for cash crops has happened where the capital, market access, technology and irrigation are available. After the Second Plan, a large number of exemptions kicked in for certain categories of land – tea/rubber plantations, orchards, dairying, etc. to promote certain kinds of capitalist expansion in place of absentee landlordism.

**3. Which of the following was/were established upon the recommendations of Santhanam Committee?**

1. Central Vigilance Commission (CVC)
2. Central Bureau of Investigation (CBI)
3. National Crime Records Bureau (NCRB)
4. Lokpal

Select the correct answer using the code given below:

- A 1 and 2 only  
B 2 only  
C 1, 2 and 3  
D 1, 2 and 4

**Answer : A**

**Explanation**

- The **Central Bureau of Investigation (CBI)** was set up in 1963 by a resolution of the Ministry of Home Affairs.

- The establishment of the CBI was recommended by the **Santhanam Committee** on Prevention of Corruption (1962–1964).
- The CBI is the main investigating agency of the Central Government.
- The **Central Vigilance Commission** is conceived to be the apex vigilance institution, free of control from any executive authority, monitoring all vigilance activity under the Central Government.
  - The CVC was set up by the Government in February, 1964 on the recommendations of the **Committee on Prevention of Corruption, headed by K. Santhanam**.
  - It is an independent body which is only responsible to the Parliament. It submits its report to the President of India.
- The **National Crime Records Bureau** was set-up in 1986 under the Ministry of Home Affairs to function as a repository of information on crime and criminals so as to assist the investigators in linking crime to the perpetrators.
  - It was set up based on the **recommendations of the National Police Commission (1977-1981)** and the MHA's Task Force (1985).
- The **Lokpal and Lokayukta Act, 2013** provided for the establishment of **Lokpal at the national level**.
  - They perform the function of an "ombudsman" and inquire into allegations of corruption against certain public functionaries and for related matters.
  - In 1966, the **First Administrative Reforms Commission (ARC)** recommended the setting up of two independent authorities- at the central and state level, to look into complaints against public functionaries, including MPs.
  - In 2002, a **Commission headed by M.N. Venkatachaliah** recommended the appointment of the Lokpal and Lokayuktas.
  - In 2005, the **Second ARC chaired by Veerappa Moily** also recommended the establishment of Lokpal.
- **Hence, option A is correct.**

**4. With reference to the G20, which amongst the following correctly defines 'Troika'?**

- a. Three-member nations with the largest GDP sizes
- b. Three-member nations that will hold the presidency in the next three years
- c. Three-member nations comprising current, previous, and upcoming presidencies of G20
- d. Top three resolutions adopted after the G20 meeting

**Answer: c**

**Explanation:**

India is assuming the G20 presidency for the year 2022-2023. Troika refers to the top grouping in G20 which consists of current, previous, and incoming presidencies. So, India joined Troika this year.

**5. Consider the following:**

1. Jeevamrutha
2. Bijamrita
3. Acchadana
4. Whapasa

Which of the above are the pillars of Zero Budget Natural Farming (ZBNF)?

- A 1, 2, and 3 only  
B 1 and 2 only  
C 2 and 4 only  
D 1, 2, 3 and 4

**Answer : D**

**Explanation**

- **Zero budget natural farming** is a method of chemical-free agriculture drawing from traditional Indian practices.
- It was originally promoted by agriculturist **Subhash Palekar**, who developed it in the mid-1990s as an alternative to the **Green Revolution's methods** that are driven by chemical fertilizers and pesticides and intensive irrigation.
- ZBNF is based on 4 pillars:
  - **Jeevamrutha:** It is a mixture of fresh cow dung and aged cow urine (both from India's indigenous cow breed), jaggery, pulse flour, water and soil; to be applied on farmland.
  - **Bijamrita:** It is a concoction of neem leaves & pulp, tobacco and green chilies prepared for insect and pest management, that can be used to treat seeds.
  - **Acchadana (Mulching):** It protects topsoil during cultivation and does not destroy it by tilling.

- **Whapasa:** It is the condition where there are both air molecules and water molecules present in the soil. Thereby helping in reducing irrigation requirements.
- **Hence, option D is correct.**

**6. Recently seen in the news, 'Southern Birdwing' and 'Grass Jewel' are-**

- a. Largest and smallest butterflies found in India respectively.
- b. Species of butterflies that recently became extinct from India.
- c. Migratory birds that are hunted in Nagaland.
- d. Recently discovered frog species from the Western Ghats.

**Answer: a**

**Explanation:**

- Southern Birdwing is the largest butterfly in India. It is seen up to a height of 3,000 ft in the Western Ghats limits. Karnataka has declared it as the state butterfly.
- The grass jewel is the smallest butterfly found in India. It is found in Africa, Arabia (United Arab Emirates, Oman, Saudi Arabia), southern Europe (Bulgaria and Greece), India.

### **Mains Practice Questions**

**1Q. The suspension of cross-LoC trade in Jammu and Kashmir region, which was started as one of the main steps in confidence building measures, will impact in multiple ways, apart from controlling terror linked and illegal activities along the trade corridor. Discuss (250 words)**

#### **Approach:**

- Briefly describe the recent decision of government of suspension of trade.
- Enlist and describe the impact of this decision.
- Give conclusion.

**2Q. What do you understand by “Wuhan Spirit”? Examine the reset in India-China relations in the context of Wuhan spirit and Chennai Connect. (250 words)**

#### **Approach**

- Explain ‘Wuhan Spirit’ and ‘Chennai Connect’ in the introduction.
- Examine the outcomes, shortcomings and challenges of India China relation in this context
- Conclude by signifying the importance of India China ties and how best India can work towards it,