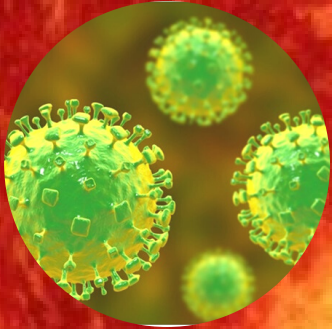


PRAYAS4IAS

AN INITIATIVE BY THE PRAYAS INDIA

SEPTEMBER WEEK 2



September (Week 2)

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Prelims

NATIONAL

What Chandrayaan-2 has sent?

(Source: [Indian express](#))

Context: The failure of Chandrayaan-2, India's second mission to the Moon, to make a soft-landing on the lunar surface had led to much disappointment. The lander and rover malfunctioned in the final moments and crash-landed, getting destroyed in the process. But that did not mean the entire mission had been wasted. The Orbiter part of the mission has been functioning normally, and in the two years since that setback, the various instruments on board have gathered a wealth of new information that has added to our knowledge about the Moon and its environment. Earlier this week, the Indian Space Research Organisation (ISRO) released the information gathered by the scientific payloads till now, some of which were still to be analysed and assessed.

What is the information gathered?

- The Orbiter is carrying eight instruments.
- Through different methods, these instruments are meant to carry out a few broad tasks — study in more detail the elemental composition of the lunar surface and environment, assess the presence of different minerals, and do a more detailed mapping of the lunar terrain.
- ISRO has said each of these instruments has produced handsome amount of data that sheds new light on the moon, and offers insights that could be used in further exploration.



Some of the most significant results so far:

- **WATER MOLECULE:**
 - The presence of water on the Moon had already been confirmed by Chandrayaan-1, India's first mission to the Moon that flew in 2008.
 - Before that, NASA missions Clementine and Lunar Prospector too had picked up signals of water presence.



- But the instrument used on Chandrayaan-1 was not sensitive enough to detect whether the signals came from the hydroxyl radical (OH) or the water molecule (H₂O, which too has OH).
- Using far more sensitive instruments, the Imaging Infra-Red Spectrometer (IIRS) on board Chandrayaan-2 has been able to distinguish between hydroxyl and water molecules, and found unique signatures of both.
- This is the most precise information about the presence of H₂O molecules on the Moon till date.
- Previously, water was known to be present mainly in the polar regions of the Moon.
- Chandrayaan-2 has now found signatures of water at all latitudes, although its abundance varies from place to place.
- The IIRS characterised hydration features in the north polar region on the far side of the Moon and has also quantified the hydration within a crater.
- Besides, the Dual Frequency Synthetic Aperture Radar, a microwave imaging instrument, has reported unambiguous detection of potential water ice at the poles as it has been able to distinguish properties of surface roughness from that of water ice, which is a first.
- **MINOR ELEMENTS:**
 - The Large Area Soft X-Ray Spectrometer (CLASS) measures the Moon's X-ray spectrum to examine the presence of major elements such as magnesium, aluminium, silicon, calcium, titanium, iron, etc.
 - This instrument has detected the minor elements chromium and manganese for the first time through remote sensing, thanks to a better detector.
 - The finding can lay the path for understanding magmatic evolution on the Moon and deeper insights into the nebular conditions as well as planetary differentiation.
 - CLASS has mapped nearly 95% of the lunar surface in X-rays for the first time.
 - Sodium, also a minor element on the Moon surface, was detected without any ambiguity for the first time.
 - Scientists at ISRO believe that based on the CLASS findings with respect to sodium, "a direct link of exospheric sodium to the surface can be established (with global data)", a correlation that remains elusive till date.
 - The finding also opens up the avenue to explore processes causing the sodium to be present on the surface as well as the exosphere.
- **STUDYING THE SUN:**
 - One of the payloads, called Solar X-ray Monitor (XSM), besides studying the Moon through the radiation coming in from the Sun, has collected information about solar flares.
 - XSM has observed a large number of microflares outside the active region for the first time, and according to ISRO, this "has great implications on the understanding of the mechanism behind heating of the solar corona", which has been an open problem for many decades.

How does all this help?

- While the Orbiter payloads build upon existing knowledge of the Moon in terms of its surface, sub-surface and exosphere, it also paves the path for future Moon missions.
- Four aspects — mineralogical and volatile mapping of the lunar surface, surface and subsurface properties and processes involved, quantifying water in its various forms across the Moon surface, and maps of elements present on the moon — will be key for future scope of work.
- A key outcome from Chandrayaan-2 has been the exploration of the permanently shadowed regions as well as craters and boulders underneath the regolith, the loose deposit comprising the top surface extending up to 3-4m in depth.
- This is expected to help scientists to zero in on future landing and drilling sites, including for human missions.
- Some key future Moon missions that hope to make use of such data include the Japan Aerospace Exploration Agency (JAXA)-ISRO collaboration Lunar Polar Exploration (LUPLEX) mission scheduled



for launch in 2023/2024. Its aim is to obtain knowledge of lunar water resources and to explore the suitability of the lunar polar region for setting up a lunar base.

- NASA's Artemis missions plan to enable human landing on the Moon beginning 2024 and target sustainable lunar exploration by 2028.
- The Chinese Lunar Exploration Programme too plans to establish a prototype of the International Lunar Research Station (ILRS) at the lunar south pole and build a platform supporting large-scale scientific exploration.

What was missed because of the crash-landing?

- The most obvious miss has been the opportunity to demonstrate the technology to make a soft-landing in outer space.
- ISRO scientists maintain that the accident was caused by a relatively small error that has been identified and corrected.
- But, to demonstrate this technology all over again, ISRO would have to send a fresh mission, Chandrayaan-3, planned for next year. It is expected to have only a lander and rover, and no Orbiter.
- The lander Vikram and rover Pragyaan were carrying instruments to carry out observations on the surface.
- These were supposed to pick up additional information about the terrain, and composition and mineralogy.
- While the instruments on board the Orbiter are making "global" observations, those on the lander and rover would have provided much more local information.
- The two diverse sets of data could have helped prepare a more composite picture of the Moon.

Right to sit

(Source: [The Hindu](#))

Context: *It might not have all the connotations of a Rosa Parks' protest, but the Bill that the Tamil Nadu government introduced in the Assembly recently is revolutionary enough by recognising workers' 'right to sit'.*

Details:

- Kerala is the only other State to have legislated on the 'right to sit', and that, in response to protests conducted by sections of the labour force.
- In Tamil Nadu, the government has taken a proactive step by introducing a legislation that will provide a chair to each worker, and a whole lot of dignity, besides helping the employees avoid the discomfort and health issues arising from remaining on their feet throughout the day.
- The Bill, which will benefit thousands of employees of large and small establishments, especially those working at textile and jewellery showrooms, was introduced in TN Assembly.
- It seeks to amend the Tamil Nadu Shops and Establishments Act, 1947, by adding a sub-section.
- The proposed Section 22-A reads, "The premises of every establishment shall have suitable seating arrangements for all employees so that they may take advantage of any opportunity to sit which may occur in the course of their work and thereby avoid the 'on their toes' situation throughout the working hours."

Nipah virus in the time of Covid-19

(Source: [Indian Express](#))

Context: *The re-emergence of the Nipah virus in Kerala poses a fresh risk in the state that is already struggling with the Covid-19 pandemic, contributing about 60% of all new cases in the country these days. However, this is not the first time that Nipah virus has been detected in Kerala, or elsewhere in India, and previous outbreaks have remained largely localised and have been contained relatively quickly.*

What is the Nipah virus?

- The first outbreaks of the Nipah virus among humans was reported from Malaysia (1998) and Singapore (1999).
- The virus takes its name from the village in Malaysia where the person in whom the virus was first isolated died of the disease.
- Since it was first identified in 1998-99, there have been multiple outbreaks of the Nipah virus, all of them in South and Southeast Asian nations. In Bangladesh, there have been at least 10 outbreaks since 2001.
- In India, West Bengal had seen an outbreak in 2001 and 2007, while Kerala had reported several cases in 2018.

How does Nipah virus spread?

- It is a zoonotic virus, meaning it has been transmitted from animals to human beings.
- The transmission happens mainly through consumption of contaminated food. But human-to-human transmission is also considered possible.
- The animal host reservoir for this virus is known to be the fruit bat, commonly known as flying fox. Fruit bats are known to transmit this virus to other animals like pigs, and also dogs, cats, goats, horses and sheep.
- Humans get infected mainly through direct contact with these animals, or through consumption of food contaminated by saliva or urine of these infected animals.
- Person-to-person transmission is not fully established, but a recent study, published by two Bangladeshi researchers in March this year, said that previous outbreaks in Bangladesh, the Philippines and India suggested “that respiratory droplets of an infected person can transmit the virus”.
- During previous outbreaks, people in close contact with the infected person, mainly hospital staff and caregivers, have contracted the disease.

Does Nipah spread as fast as Covid-19?

- The Nipah virus is known to spread far more slowly than SARS-CoV-2. However, it is its ability to kill that is the biggest concern.
- During the first outbreak in Siliguri, 45 of the 66 people confirmed to have been infected died. That is a mortality rate of 68%. In the next outbreak, in Nadia district of West Bengal, in 2007, all the five infected people died.
- During the most recent outbreak in Kerala in 2018, 17 of the 18 patients confirmed to have been infected died. In 2019, one case of Nipah virus infection was detected in Ernakulam, but prompt response restricted any further spread. The infected person survived.
- In the Malaysian outbreak in 1999, a total of 265 people had been found infected, of whom 105 had died, according to a study, ‘Nipah Virus: Past Outbreaks and Future Containment’, by researchers from Cochin University of Science and Technology published in the April 2020 issue of the journal Viruses.
- In comparison, the mortality rate of Covid-19 epidemic is expected to be around one per cent.

Outpatient Opioid Assisted Treatment

(Source: [Indian Express](#))

Context: *At a high-level meeting of Punjab's anti-drug campaign chaired by Chief Minister Captain Amarinder Singh's Chief Principal Secretary Suresh Kumar on August 27, it was decided to launch a 100-day Big Bang programme to check the problem of drugs. In the meeting, it was also decided to enhance the outreach of Outpatient Opioid Assisted Treatment (OOAT) centres in rural areas by opening extension centres and clinics.*

What are the Outpatient Opioid Assisted Treatment Centres?

- The move to set up OOAT centres in Punjab began in October 2017. The centres administer de-addiction medicine, a combination of buprenorphine and naloxone, to the opioid dependent people registering there.
- Administered in the form of a pill, the treatment is primarily for addicts of opioid drugs, including heroin, poppy husk and opium.
- The centres were set up seven months after Punjab Chief Minister Captain Amarinder Singh formed a Special Task Force (STF) to tackle the drug problem and take on drug mafia in the state.
- There are currently 202 government-run OOAT centres, including 11 in jails, where medicine is given free of cost. In addition, there are 54 government and 224 private de-addiction and rehabilitation centres.
- In all these centres, there are currently over 7 lakh patients registered for treatment.

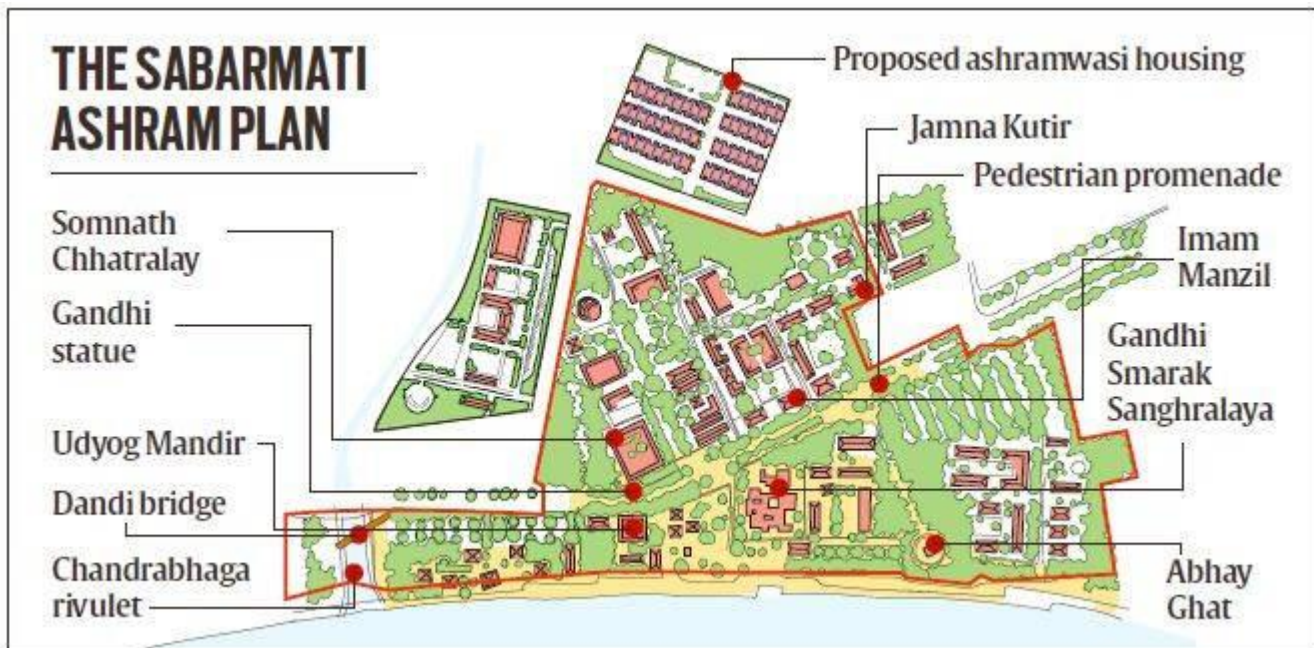
Ashramwasis

(Source: [Indian Express](#))

Context: *In October 2019, Prime Minister Narendra Modi's proposal for a larger Sabarmati Ashram complex had caused much anxiety among its Trustees and residents, with the ashramwasis — third or fourth generation of ashram residents — sitting on protests fearing eviction. Over 250 families residing in the Gandhi Ashram in Ahmedabad will have to be relocated as part of the redevelopment plan of the area.*

Who are the ashramwasis?

- Descendants of the people who were brought into the Harijan Ashram that Mahatma Gandhi established on the bank of the Sabarmati river in 1917, to do various tasks and help run the ashram, and those who continued to stay on the premises, now controlled by one or the other trust, call themselves ashramwasis.
- They comprise all communities as Gandhi believed in 'sarva dharma sambhav', says a resident. Current residents include OBCs, Dalits, a few Muslims and some Brahmins.
- There are some 263 such families on the premises who are tenants of the respective trusts on whose land they reside and will have to be relocated in order to proceed with the Gandhi Ashram redevelopment plan as envisaged by the planners, which include the Government of Gujarat, the Union Culture Ministry under the direct supervision of the Prime Minister's Office.
- The Gujarat government has offered them options of a one-time compensation of Rs 60 lakh, or a tenement just outside the proposed expanded ashram complex or a flat in another area in Ahmedabad.



The original ashram

- On his return from South Africa, Gandhi established the first ashram at Kochrab in 1915 which he shifted after the plague to a piece of open land on the banks of the river Sabarmati in 1917 for experiments in farming, animal husbandry, cow breeding, Khadi and related activities.
- Originally called Harijan Ashram, spread over 120 acres, the ashram was split into six trusts later. Of these the Gandhi Ashram area run by SAPMT has the Gandhi and Kasturba's residence — Hriday Kunj, Vinoba-Mira kutir, a guesthouse- Nandini — where prominent people like Rabindranath Tagore stayed, Magan Nivas where Gandhi's nephew Maganlal Gandhi stayed and managed the ashram, besides Gandhi's writing desk, and spinning wheel among his personal artefacts, and a museum displaying books, manuscripts and photocopies of his correspondence, and photographs.

Centre hikes MSP for rabi crops

(Source: [The Hindu](http://www.thehindu.com))

Context: The government increased the minimum support price (MSP) for wheat for the upcoming rabi season to ₹2,015 per quintal, a 2% hike from the ₹1,975 per quintal rate of last year.

Details:

- Oilseeds and pulses such as mustard, safflower and masoor dal saw higher MSP hikes of up to 8% in a bid to encourage crop diversification, a statement on the decision of the Cabinet Committee on Economic Affairs said.
- The MSP is the rate at which the government purchases crops from farmers. Currently, rates are fixed for 23 crops, including six crops during the upcoming rabi or winter season for which sowing will begin in October.
- According to the Centre, the cost of production of wheat for the upcoming marketing season of 2022-23 is ₹1,008 per quintal, meaning that the new MSP of ₹2,015 will result in 100% returns.
- Rapeseed and mustard farmers, who saw MSP rise 8.6%, or ₹400 per quintal, to a rate of ₹5,050 per quintal can also expect 100% returns.



- Masoor dal also saw a ₹400 per quintal hike, which means MSP for the lentil will be 7.8% higher than last year, with 79% returns over the cost of production. Chana or gram saw a 2.5% hike in MSP, resulting in 74% returns.

Minimum Support Price

- The MSP is the rate at which the government purchases crops from farmers, and is based on a calculation of at least one-and-a-half times the cost of production incurred by the farmers.
- MSP is a “minimum price” for any crop that the government considers as remunerative for farmers and hence deserving of “support”.

Crops under MSP:

- The Commission for Agricultural Costs & Prices (CACP) recommends MSPs for 22 mandated crops and fair and remunerative price (FRP) for sugarcane.
 - CACP is an attached office of the Ministry of Agriculture and Farmers Welfare.
- The mandated crops include 14 crops of the kharif season, 6 rabi crops and 2 other commercial crops.
- In addition, the MSPs of toria and de-husked coconut are fixed on the basis of the MSPs of rapeseed/mustard and copra, respectively.

Factors for Recommending the MSP:

- The CACP considers various factors while recommending the MSP for a commodity, including cost of cultivation.
- It takes into account the supply and demand situation for the commodity, market price trends (domestic and global) and parity vis-à-vis other crops, and implications for consumers (inflation), environment (soil and water use) and terms of trade between agriculture and non-agriculture sectors.

NCLAT term the Devas-Antrix agreement as fraud

(Source: [Indian Express](#))

Context: *The National Company Law Appellate Tribunal (NCLAT) has upheld an order of the Bengaluru bench of the National Company Law Tribunal (NCLT) to wind up Devas Multimedia Private. The appellate tribunal has also said that it was apparent that a fraud had occurred.*

Why does the NCLAT order say that the Devas-Antrix agreement was a fraud?

- One of the major findings of NCLAT in its order is that every benefit or advantage accrued to Devas under the 2005 agreement was “through fraud, misrepresentation or suppression”.
- The NCLAT has also said that while the key personnel involved in the fraud remained out of limelight all the while, they came to the fore to commit the fraud only after the agreement was signed.
- This, the NCLAT said, was apparent from the fact that the 2005 agreement was signed by an clerk who had “had no background in science and technology”, and was not at all aware of the functions of Devas’ services. The said clerk, the NCLAT said it found strange, was just given a “remuneration for signing the agreement”.
- The NCLAT has also placed the Indian Space Research Organisation (ISRO)’s commercial arm Antrix’s due diligence in the docket and questioned as to how it allowed the said agreement to be signed by a clerk.
- “ANTRIX is undisputedly the commercial arm of the ISRO, and its entire shareholding is with the Government of India. Therefore, when ANTRIX signed such an agreement of vital importance on its

behalf, the signatory to the agreement and their authority to sign it was also important,” the NCLAT has observed.

What was the 2005 deal between Devas Multimedia and Antrix Corporation?

- In 2005, Antrix corporation had signed an agreement to lease two communication satellites to Devas for 12 years for Rs 167 crore.
- Devas, which then was a startup incorporated just for the purpose, was to provide audio-video services to mobile platforms in India using the space or S-band on ISRO’s GSAT 6 and 6A satellites.
- The Devas Multimedia-Antrix Corp agreement was cancelled by the then UPA government in 2011 after allegations of the deal being a quid pro quo “sweetheart deal” were raised.
- In 2014, the Central Bureau of Investigation (CBI) and Enforcement Directorate (ED) were asked to probe the deal.

Cabinet approves incentive scheme for textile sector

(Source: [The Hindu](#))

Context: *The Union Cabinet cleared an outlay of ₹10,683 crore on a production linked incentive scheme aimed at attracting fresh investments in the man-made fibre apparel, fabrics, and technical textiles sectors.*

Details:

- The scheme, which the government expects will help draw new investment of more than ₹19,000 crore, aiding in the creation of 7.5 lakh direct jobs, targets improving India’s ability to compete in the global textiles market.
- The Union Cabinet a ₹10,683 crore Production Linked Incentive (PLI) scheme for the textile sector with a view to “helping India regain its historical dominant status in global textiles trade”.
- The incentives are designed to encourage investment in new capacities in man-made fibre (MMF) apparel, MMF fabrics, and 10 segments or products of technical textiles.
- The government expects the scheme to help attract fresh investment of more than ₹19,000 crore, creating an additional 7.5 lakh direct jobs.
- Two-thirds of India’s textile exports now are cotton based whereas 66-70% of world trade in textiles and apparel is MMF-based and technical textiles. India’s focus on the manufacture of textiles in the MMF sector is expected to help boost its ability to compete globally.

Two categories

- The scheme envisages two levels of investment with different sets of incentives.
- While any person or firm can invest a minimum ₹300 crore in plant, machinery, and civil works to produce the identified products to ensure eligibility for the PLI, in the second category a minimum investment of ₹100 crore would make an individual or firm eligible to apply for the incentives.
- Priority would be given for investment in aspirational districts, tier-three, tier-four towns and rural areas.
- The scheme is expected to benefit States such as Gujarat, U.P., Maharashtra, Tamil Nadu, Punjab, Andhra, Telangana and Odisha.

Production Linked Incentive (PLI) Scheme

- Production Linked Incentive or PLI scheme is a scheme that aims to give companies incentives on incremental sales from products manufactured in domestic units.
- The scheme invites foreign companies to set up units in India, however, it also aims to encourage local companies to set up or expand existing manufacturing units and also to generate more employment and cut down the country’s reliance on imports from other countries.



- It was launched in April 2020, for the Large Scale Electronics Manufacturing sector, but later towards the end of 2020 was introduced for 10 other sectors. This scheme was introduced in line with India's Atmanirbhar Bharat campaign.

PLI Scheme – A Brief Background

- It was introduced as a part of the National Policy on Electronics by the IT Ministry to give incentives of 4-6% to electronic companies, manufacturing electronic components like mobile phones, transistors, diodes, etc.
- The main aim of this scheme was to invite foreign investors to set up their manufacturing units in India and also promote the local manufacturers to expand their units and generate employment
- The first sector which the PLI scheme had targeted was the Large Scale Electronics Manufacturing in April 2020, and by the end of the year (November 2020), 10 more sectors including food processing, telecom, electronics, textiles, speciality steel, automobiles and auto components, solar photovoltaic modules and white goods such as air conditioners and LEDs were also expanded under the PLI scheme
- As far as the eligibility is concerned, all electronic manufacturing companies which are either Indian or have a registered unit in India will be eligible to apply for the scheme
- In the Union Budget 2021, Finance Minister Nirmala Sitharaman mentioned the inclusion of thirteen more sectors under the PLI Scheme for a period of five years and Rs. 1.97 lakh crores have been allocated for this scheme from Financial Year 2022

Doppler Weather Radar (DWR)

(Source: [PIB](#))

Context: *Doppler Weather Radar (DWR) & Indigenous GPS based Pilot Sonde at IMD, Jammu inaugurated by the Union Minister for S&T.*

Details:

- This is the latest upgraded state-of-the-art Doppler Weather Radar (DWR) & Indigenous GPS based Pilot Sonde at Indian Meteorological Office in Jammu.
- The X-Band Doppler Weather Radar installed will help in providing real-time monitoring and reporting of weather events affecting the Jammu region and will be helpful in providing weather forecasts in different sectors including agriculture and tourism forecasts.
- Besides providing real-time monitoring, the X-Band Doppler Weather Radar stationed at Jammu will provide improved weather services to the people of J&K and input to numerical weather prediction models for generating better weather forecasts.

National Institute Ranking Framework

(Source: [Indian Express](#))

Context: The Education Ministry launched the sixth edition of the NIRF in which IIT-Madras, IISc-Bangalore, and IIT-Bombay have emerged as the country's top three higher education institutions in the latest NIRF rankings.

What is NIRF?



- National Institute Ranking Framework or NIRF is the first-ever effort by the government to rank higher education institutions (HEIs) in the country.
- Before NIRF's launch in 2016, HEIs were usually ranked by private entities, especially news magazines. While participation in the NIRF was voluntary in the initial years, it was made compulsory for all government-run educational institutions in 2018.
- This year, roughly 6,000 institutions have participated in NIRF — about twice the number in 2016.
- In order to be ranked, all education institutions are assessed on five parameters: teaching, learning and resources, research and professional practices, graduation outcomes, outreach and inclusivity, and perception.
- NIRF lists out best institutions across 11 categories – overall national ranking, universities, engineering, college, medical, management, pharmacy, law, architecture, dental and research.

Top schools | Only three non-IIT institutes feature among the top-10 higher-education institutes

Rank	Institute	Score
1	IIT, Madras	86.8
2	IISc, Bengaluru	82.8
3	IIT, Bombay	82.5
4	IIT, Delhi	81.8
5	IIT, Kanpur	76.5
6	IIT, Kharagpur	75.6
7	IIT, Roorkee	71.4
8	IIT, Guwahati	69.3
9	JNU, Delhi	66.6
10	BHU, Varanasi	63.1

Why did the Union government decide to rank HEIs?

- The idea of NIRF has its roots in the global rankings. The union government and government-run HEIs were quite upset about their standing in QS World University Rankings and the Times Higher Education World University Ranking.
- During the Winter Session of Parliament in 2015, the then Education Minister Smriti Irani had attributed their poor performance in global league tables to subjective ranking methodology.
- To counter this, India decided to emulate the Chinese example. When China encountered the same problem about two decades ago, they responded with a university ranking system of their own.
- The Shanghai Rankings, done by the Shanghai Jiao Tong University, was born out of this in 2003. Nine Chinese universities and three from India (Indian Institute of Science (IISc), IIT Kharagpur and IIT Delhi) made it to the top 500 in the first edition of the Shanghai Rankings.
- India too decided to start its own rankings, with parameters that would be more suitable to the Indian context.
- There was one big difference, though. While the Shanghai Rankings were international in character from the first year itself, the NIRF only ranked Indian HEIs.
- The long-term plan was to make it an international league table.

AUSINDEX

(Source: [PIB](#))

Context: *Indian and Australian navies commenced the bilateral exercise AUSINDEX.*

About AUSINDEX:

- AUSINDEX is a bilateral maritime exercise between India and Australia that commenced in 2015.
- AUSINDEX 21 provides both Navies with an opportunity to strengthen joint defence capabilities in support of a stable and secure Indo-Pacific region.
- It will further strengthen bilateral partnership and interoperability with the Royal Australian Navy in the Indo-Pacific region.
- AUSINDEX has increased in complexity each year the drills have been organized.
- The 2019 event in India saw the first anti-submarine warfare exercises and also the first coordinated P-8 maritime patrol aircraft missions take place over the Bay of Bengal.

C-295MW for Indian Air Force

(Source: [PIB](#))

Context: *The Cabinet Committee on Security approved the procurement of 56 C-295MW transport aircraft from a Spanish company for the Indian Air Force.*

About C-295MW:

- C-295MW aircraft is a transport aircraft of 5-10 Tonne capacity with contemporary technology.
- The aircraft has a rear ramp door for quick reaction and para dropping of troops and cargo.
- This will replace the ageing Avro aircraft of IAF.
- Sixteen aircraft will be delivered in flyaway condition from Spain within 48 months of signing of the contract and forty aircraft will be manufactured in India by TATA Consortium within ten years of signing of the contract.
- ***This is the first project of its kind in which a military aircraft will be manufactured in India by a private company.***
- All the 56 aircraft will be installed with indigenous Electronic Warfare Suite.

INTERNATIONAL

France's biggest criminal trial over 2015 attacks

(Source: [Indian Express](#))

Context: *Recently, France's biggest criminal trial began in a Paris court. The trial involves 20 members of terrorist group Islamic State who have been accused of being complicit in the November 2015 terrorist attacks in and around Paris that left at least 130 people dead.*

Details:

- A special courtroom has been set up at the Palais de Justice in Paris for this trial as it involves over 1,800 plaintiffs and over 300 lawyers will be representing them along with the defendants.
- The Associated Press reported that the Palais de Justice can only accommodate 12 defendants, 10 cameras and 550 people.

The 2015 attacks

- On November 13, 2015, France saw one of its most serious terrorist attacks in Paris that killed over 130 and injured more than 400 people.
- On this day, some French and Belgian nationals launched a series of attacks on the Bataclan concert hall, the Stade de France and some restaurants in Paris.
- While seven of the attackers were killed either during clashes with the police or after detonating their suicide vests, three more were killed after the police stormed a safe house on November 18.
- Earlier, in January 2015, 12 people were killed when terrorist brothers Saïd and Cherif Kouachi stormed the offices of the satirical magazine Charlie Hebdo after it published a controversial cartoon depicting the Prophet.
- Around the same time, a friend of the Charlie Hebdo attackers, Amedy Coulibaly, killed at least four people and a policewoman at a Jewish supermarket in Paris.
- In December 2020, a court in Paris found 14 people guilty of involvement in the Charlie Hebdo attacks. While the attackers themselves were killed, the trial concerned the accomplices who were accused of aiding them.

'Food emergency' in Sri Lanka

(Source: [The Hindu](#))

Context: *Recently Sri Lankan President Gotabaya Rajapaksa, using powers vested in the country's Public Security Ordinance, declared Emergency regulations pertaining to the distribution of essential food items. The regulations sought to empower authorities to provide essential food items at a "concessionary rate" to the public by purchasing stocks of essential food items, including paddy, rice and sugar, at government-guaranteed prices, and prevent market irregularities and hoarding.*

Details:

- The possibility has grabbed international headlines, with the government's drastic measures against hoarding, triggering speculation over food security in Sri Lanka that is home to 21 million people.
- Fuelling the speculation are different factors, including the country's known reliance on imports for essentials — such as petroleum, sugar, dairy products, wheat, medical supplies — its fast-dwindling



foreign reserves, from \$7.5 billion in November 2019 to \$2.8 billion in July 2021, and the daunting foreign debt repayment schedule in the coming years.

- The pandemic's lethal blow since early 2020, to all major sources of foreign exchange earnings — exports, worker remittances and tourism — has further compounded the economic stress.
- Sri Lanka's economy contracted by 3.6 % last year. According to the Central Bank of Sri Lanka, the Sri Lankan rupee depreciated by 10.1% against the dollar this year. It hovered around 200 against a dollar last week.
- The fear of a possible food shortage also stems from the Rajapaksa administration's decision in April to ban import of chemical fertilizers and adopting an "organic only" approach.
- Meanwhile, many, especially daily-wage earners, and low-income families, are complaining about being unable to afford, and in many cases access, essentials such as milk, sugar, and rice during the current lockdown, imposed on August 20 following a rapid surge in daily Covid-19 cases and fatalities, and extended twice since.
- Prices of essential commodities — including rice, dhal, bread, sugar, vegetables, fish — have risen several times during the pandemic, and more rapidly in recent weeks.

Inspiration4 - SpaceX's first all-civilian space mission

(Source: [Indian Express](#))

Context: *Entrepreneur Elon Musk's SpaceX announced that 'Inspiration4', its first all-civilian, non-governmental spaceflight, is on track for launch on September 15. The Crew Dragon spacecraft is set to be launched from NASA's Kennedy Space Centre in Florida in the US. It will take a group of four private citizens into space for three days.*

What is Inspiration4?

- All four seats on the spacecraft have been purchased by US billionaire Jared Isaacman, founder of the fintech company Shift4 Payments.
- This is a part of an effort to raise millions for the Tennessee-based St. Jude Children's Research Hospital, a paediatric treatment and research facility that focuses on children's catastrophic diseases, particularly leukaemia and other cancers.
- The mission involves circling the Earth for three days, and then splashing down into the Atlantic Ocean.
- Inspiration4 will orbit the Earth at 575km, higher than the International Space Station (408km) and the Hubble space telescope (547km).
- This will be the farthest distance travelled by a crewed mission since 2009, when astronauts last went to repair the Hubble.
- The Dragon module that the group will be using has also been modified for the mission. Usually, the SpaceX module is used for travelling to the ISS, where it has to dock or join the floating laboratory.
- Since Inspiration4 is not going to the ISS, the docking port has been removed and has been replaced with a dome window instead, the report said.
- This dome window will offer breath-taking views of the Earth for the four travellers. The window has been inspired by the Cupola, a module on the ISS used to make observations about our planet.

New Island discovered off Greenland

(Source: [Indian Express](#))

Context: A group of researchers who went out to collect samples off the coast of Greenland in July found themselves on a tiny, uninhabited and previously unknown island. Measuring 60×30 metres and with a peak of three metres above sea level, it has now become the new northernmost piece of land on Earth. Before this, Oodaaq was marked as the Earth’s northernmost terrain.

Details:

- Over the decades, a number of expeditions have been searching for the world’s northernmost island. An island was found nearby in 2007 by Arctic veteran Dennis Schmitt.
- The new island is made up of seabed mud and moraine, i.e. soil, rock and other material left behind by moving glaciers, and has no vegetation. It meets the criteria of an island

Land rights

- The group has suggested the discovery be named ‘Qeqertaq Avannarleq’, which is Greenlandic for “the northernmost island”.
- The discovery comes as a battle is looming among Arctic nations, the US, Russia, Canada, Denmark and Norway for the control of the North Pole and of the surrounding seabed, fishing rights and shipping routes exposed by melting ice due to climate change.
- According to Forsberg, an advisor to the Danish government, the new island would not change Denmark’s territorial claim north of Greenland.

Climate Change in Greenland

- Global warming has had a severe effect on the ice sheet of Greenland.
- The new island, which was exposed by shifting pack ice, is, however, not a direct consequence of climate change.

The crisis in Lebanon

Context: Lebanon’s financial meltdown has swiftly worsened in the last month, with much of the country crippled by fuel shortages that have ignited country-wide security incidents.

The economic meltdown

- Over two years, around 78 per cent of the Lebanese population has fallen into poverty. The World Bank says it is one of the sharpest depressions of modern times.
- Early in the crisis, Lebanon defaulted on its massive pile of public debt, including \$31 billion of Eurobonds that remain outstanding to creditors. The currency has fallen by more than 90 per cent, demolishing purchasing power in a country dependent on imports.
- The banking system is paralysed. With depositors locked out of foreign currency savings or forced to withdraw cash in the collapsing local currency, this currently equates to a de facto slump in the value of deposits of 80 per cent.
- Food prices have jumped by 557 per cent since Oct. 2019 according to the World Food Programme, and the economy has contracted by 30 per cent since 2017.
- Fuel shortages have crippled normal life, affecting essential services including hospitals and bakeries. Vital medicines have also run out.
- Many of Lebanon’s most qualified have left the country in a steady brain drain.

Security



- The fuel shortages have led to confrontations at petrol stations, where motorists have to wait for hours and weapons have been drawn in melees over fuel. Fuel tankers have been hijacked.
- One dispute over gasoline in southern Lebanon spiralled into a sectarian standoff between neighbouring Shi'ite Muslim and Christian villages.
- In parts of Lebanon, the state's diminished standing is encouraging lawlessness. Heavy machine guns and rocket-propelled grenades were used in a recent battle between rival Sunni Muslim clans in northern Lebanon. This all adds to the strain on state security forces.
- Security chiefs have warned of the impact the crisis is having on state institutions including the army, with the value of soldiers' wages crashing along with the pound.
- Major General Abbas Ibrahim, a senior security chief, has urged his officers to stand firm in the face of the crisis, warning of the chaos that would ensue if the state collapsed.

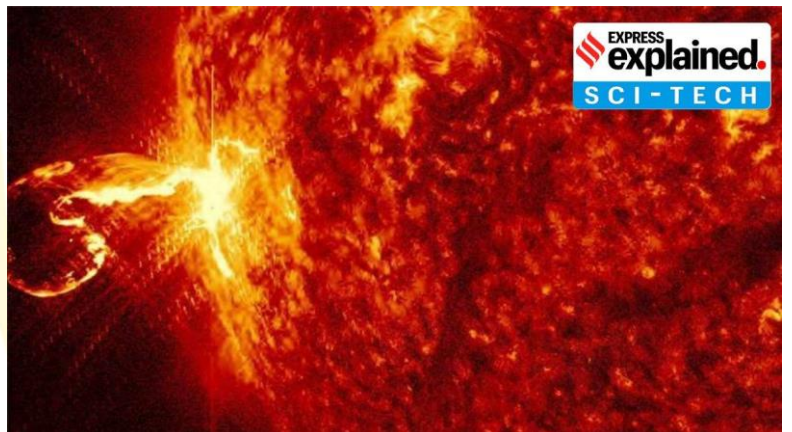
Solar storm

(Source: [Indian Express](#))

Context: A paper presented at the ACM SIGCOMM 2021 Conference last month noted that a powerful solar storm can cause a disruption of the internet, damage submarine cables and communication satellites. Previous studies have shown that there is a 1.6 to 2 per cent chance of an extreme space weather event happening within the next decade.

What is a solar storm?

- A solar storm or a Coronal Mass Ejection as astronomers call it, is an ejection of highly magnetised particles from the sun.
- These particles can travel several million km per hour and can take about 13 hours to five days to reach Earth.
- Earth's atmosphere protects us humans from these particles. But the particles can interact with our Earth's magnetic field, induce strong electric currents on the surface and affect man-made structures.
- The first recorded solar storm occurred in 1859 and it reached Earth in about 17 hours. It affected the telegraph network and many operators experienced electric shocks.
- A solar storm that occurred in 1921 impacted New York telegraph and railroad systems and another small-scale storm collapsed the power grid in Quebec, Canada in 1989.
- A 2013 report noted that if a solar storm similar to the 1859 one hit the US today, about 20-40 million people could be without power for 1-2 years, and the total economic cost will be \$0.6-2.6 trillion.



Solar activity

- The rapid development of technology took place in the last three decades when the Sun was in its period of low activity and there are very limited studies on whether our current infrastructure can withstand a powerful solar storm.

- The Sun goes through an 11-year cycle – cycles of high and low activity. It also has a longer 100-year cycle. During the last three decades, when the internet infrastructure was booming, it was a low period.
- And very soon, either in this cycle or the next cycle, we are going towards the peaks of the 100-year cycle.
- So it is highly likely that we might see one powerful solar storm during our lifetime.



Mains

GS II

A Taliban-led Afghanistan and the Chinese conundrum

(Source: [The Hindu](#))

Context: *Recent weeks have been unsettling for the people in Afghanistan. A devastating bomb blast, on August 26, outside Kabul airport, killed many people, soldiers and civilians. Not the first of its kind, the region has seen umpteen number of bomb blasts, including the one at the Gwadar, just a few days earlier, targeting Chinese nationals. For an economy driven by the opium trade and ruled by tribal leaders, the new normal is bound to be governed by instability, fighting groups, and thereafter, boom, gloom, and doom.*

After the long war, the spoils

- In fact, the United States did the smart thing by leaving Afghanistan. The Afghan occupation was costing it more than what it was getting in return.
- An estimate by Brown University, U.S., suggests that since 2001, the U.S. has spent \$2.26 trillion, out of which \$1.53 trillion was spent on defence.
- The Afghan economy did not flourish, with 90% of its population still living below poverty line, with less than \$2 a day.
- The only thing that the economy can still brag about is its ability to produce opium and mercenaries.
- But then Afghanistan has a few other things that are valuable — rare-earth metals and huge deposits of copper. The Chinese in particular will be happy about it as they have the technology to excavate them.
- In fact, the return of the Taliban is seen as a victory of Chinese diplomacy and a debacle for the United States; comparable to the U.S.'s symbolic evacuation of Saigon, in 1975, at the end of the Vietnam war.
- Indeed, China (also, Russia) have kept their embassies running in Kabul while the western embassies have disappeared. Moreover, China is engaging with the Taliban, with an eye to complete the new Belt and Road Initiative (BRI) investment.
- And a Chinese presence in Afghanistan with an all-weather ally Pakistan may sound ominous for India.

Crucial link in the BRI

- Afghanistan is indeed vital for the BRI. Without counting on Afghanistan, the bulk of Chinese investment in the China-Pakistan corridor will be at risk.
- Considering the heavy infrastructure investment sunk in the BRI, only many years of successful operation could repay it. In such a project, spending is easy, but getting back the money is extremely hard.
- The amount of trade that should flow through the new Silk Road should be massive and long term. Otherwise, it will cost money and effort.
- In fact, the Chinese successfully implemented this investment strategy, and it worked well in the context of Southeast Asia and Africa.
 - First, the cost of production being lower in Southeast Asia meant Chinese firms could gain by shifting their production bases outside China.
 - Second, investing in these regions meant access to bigger markets for Chinese firms and more uniform regional development. For instance, the relatively underdeveloped Kunming region in Yunnan province became a commercial hub.



- Third, Chinese firms could evade protectionist measures targeted at their exports when they began exporting from Southeast Asian countries instead.
- Fourth, investing in Africa and Asia has also reduced some of China's energy requirements, enabling Beijing to access cheaper foreign energy (oil and power) and minerals.
 - Chinese firms have also constructed hydropower plants and a thermal power station in Myanmar.
 - China has also invested in power transmission and copper processing activities in Vietnam.
 - The Chinese want to mimic the same strategies in the case of Afghanistan and Pakistan.
- Success in these two countries would imply that China will be able to bring together a large part of the Indian Ocean littoral and Eurasia through high speed rail lines, pipelines, and maritime linkages.
- The idea of connecting to the rest of the world stems from China's aspiration to get out of manufacturing, go up the global value chains, and start focusing on product designing and innovation.
- According to the government of China, the development of the BRI would impact 4.4 billion people and generate trade worth \$2.5 trillion within a decade.

The shadow of terror

- But here is the flip side. Afghanistan and Pakistan are not comparable to the Association of Southeast Asian Nations (ASEAN).
- The recent suicide attacks in Kabul and Gwadar are a pointer and may even indicate the resurgence of terrorist groups such as al Qaeda, Daesh, and the Islamic State.
- No businesses can flourish in the presence of terrorism, especially when the Taliban are known to have a soft corner for the East Turkestan Islamic Movement — a militant group active in the Uighur province of China.
- No matter how much the Chinese leadership has a desire for inclusive and peaceful development in Afghanistan, in reality, things stand out in stark contrast.
- Even considering Pakistan, a country relatively better off than Afghanistan, the Chinese are facing problems. Pakistan is unable to repay a China-funded energy project, built under the BRI.
- The economy of Pakistan faltered because of dynastic politics and corruption. To top it off, there is an excessive dependence of the political class on the military. Business decisions are not economically driven but are motivated by vested interests with the army calling the shots.
- There are good reasons to believe that the return of the Taliban in Kabul will spell gloom and doom for the Chinese.
- The Taliban ruling groups are far from united, making it impossible to make any reliable domestic and international policy predictions. The dependence on opium export makes Afghanistan vulnerable to world mafias and corruption.
- All this implies that its undemocratic rulers are not comparable to China-like autocracies, with an inherent stable character.
- Embargoes, rebellions, factional wars, will be the likely events in Taliban-controlled Afghanistan. These issues will spread to Kazakhstan, Turkmenistan, Turkey, and other essential rings in the BRI chain.

Sanctions as disruptor

- Additionally, the Taliban are among the world's least acceptable ruling elite for the western countries. The enormous markets controlled by the western powers are the most lucrative for China.
- Hence, the next decade will likely show a sequence of BRI trade flow stop-and-go following likely European and American decisions to block or sanction trade from Afghanistan.
- Given the unfriendly relations between the U.S. and China, any excuse will basically be picked up and used by the White House to stop trade along the BRI.
- Hence, the cash flow into the BRI will constantly face a risk of interruption. The financial market will incorporate this expectation and make the funding of the remaining parts of the BRI more expensive and restricted.
- In a game of chess, the U.S. move of vacating Afghanistan may in fact prove costly for China.

The key to revitalising India's reservation system

(Source: [The Hindu](#))

Context: Hoardings and posters lauding the Narendra Modi government for introducing reservations for Other Backward Classes (OBCs) in the National Eligibility cum Entrance Test (NEET) examinations and a renewed debate on caste census have once again brought the debate on affirmative action in the limelight. The affirmative action programme that was envisaged during the founding moments of the republic is indeed one of the remarkable provisions to have been worked out by our Constitution makers. It has been historically significant in enunciating the principle of justice in a deeply unequal and oppressive social order such as ours.

Still no equity

- While it is undeniable that these provisions have been one of the protagonists of Indian democracy's success stories, these have also accumulated a fair share of problems and call for immediate policy attention and debate.
- Through reservation of seats in political and public institutions of the state, it was thought that the hitherto marginalised groups — which have suffered generations of oppression and humiliation — would, finally, be able to find place in the power sharing and decision-making processes.
- However, this strategy of removal of disabilities has not translated into an equalisation of life chances for many groups in our heterogeneous society.

Problems with current policy

- There is now a strong demand from those who have not been able to accrue the benefits of reservations from within the marginalised sections, to devise some policy option which may be able to supplement the existing system of reservation.
- The fact that the current system suffers from the “problem of reification” is not just wishful thinking, but a hard fact.
- The data released by the Justice G. Rohini Commission's report on the sub-categorisation of OBCs gives a good synoptic view to understand this. Based on the last five years' data on appointments in central government jobs and OBC admissions to central higher education institutions, the commission concluded that 97% of central OBC quota benefits go to just under 25% of its castes.
- As many as 983 OBC communities — 37% of the total — have zero representation in both central government jobs and admissions to central universities. Also, the report states that just 10% of the OBC communities have accrued 24.95% of jobs and admissions.
- Clearly, the assumption that the disadvantages of every sub-group within each category are the same is severely misplaced.
- It is important to note that the Rohini Commission's data are based just on the institutions that come under the purview of the central government. We hardly have any legible data on the socio-economic conditions of varied social groups at more local levels of State and society.
- Consequently, asymmetrical distribution of reservation has severely deterred political projects of unified subaltern solidarity. Parties that were once able to build large Bahujan solidarities are now finding it difficult to garner such support. This should give us hints about the extent of the problem rather than ruling them out as mere conspiracies of breaking lower caste unity.

Insufficiency of data



- **As underlined above, there is a dire need of accurate data pertaining to the socio-economic condition of different social groups.**
- **Though caste-based reservations have been pivotal in animating upward social mobility and led to the emergence of a handful of politically mature and visible Dalit-Bahujan castes, we hardly have sufficient data about the actual reach and access of this policy measure.**
- We do not know what liberalisation has done to castes which remained tied to more traditional sources of income and were incapable of realising the new opportunities provided by the opening of the economy.
- We do not know how these groups have navigated and transitioned to a more accentuated regime of capital amidst nearly no social security net on the ground. The marginal majority within still dwells in the waiting room of history, waiting to see the light of the policy grid of the state.

Affirmative action

- What is urgently required is a mechanism that can address this lacuna and make the system more accountable and sensitive to intra-group demands. Since every further categorisation will only lead to reification and fragmentation in the long run, two things are required.
 - One, we urgently need to develop a wide variety of context-sensitive, evidence-based policy options that can be tailored to meet specific requirements of specific groups.
 - Two, we need an institution alike the Equal Opportunities Commission of the United States or the United Kingdom which can undertake two important but interrelated things: make a deprivation index correlating data from the socio-economic-based census of different communities including caste, gender, religion, and other group inequalities and rank them to make tailor made policies.
- And, undertake an audit on performance of employers and educational institutions on non-discrimination and equal opportunity and issue codes of good practice in different sectors. This will make the formulation of policy and its monitoring simpler at an institutional level.
- As evident, a socio-economic caste-based census becomes a necessary precondition to initiate any meaningful reform in the affirmative action regime in India.
- It is worth noting that similar suggestions were made a decade ago in the recommendations that the expert committee for an Equal Opportunities Commission (2008) made in its comprehensive report that it submitted to the Ministry of Minority Affairs.
- However, little policy progress has been made in this regard. Successive governments have been reluctant to engage with such radical policy options, almost always caving in to immediate and myopic political gains.

The judicial role in improving lawmaking

(Source: [The Hindu](#))

Context: *The deterioration in the quality of deliberation in Parliament over time has prompted calls for reform from different stakeholders. On Independence Day, Chief Justice of India (CJI) N.V. Ramana also highlighted this problem, noting that the ambiguities and gaps in laws passed without meaningful deliberation trigger avoidable litigation. While the CJI suggested that lawyers and intellectuals enter public life to improve deliberation, the judiciary can also play a crucial role in improving the lawmaking process.*

Details:

- Many rely on the volume of Bills passed by Parliament in a session as a measure of its efficiency.
- However, this measure is flawed as it does not account for what is lost when efficiency is achieved by passing laws without adequate notice and deliberation.



- Most, if not all, of these laws create burdensome obligations on persons and often affect their fundamental rights. Legislators, as representatives of the people, are expected to exercise a duty of care before casting their vote.
- This entails due deliberation about the implications of the law, posing amendments and questions to the concerned Minister, and requiring expert evidence through standing committees.
- Moreover, it is in the legislative organ that diverse interest groups find representation. Deliberation in such a forum ensures that the views of persons who are adversely affected by a law are heard and actively engaged with.
- Rushed lawmaking, rendering Parliament a rubber stamp, sacrifices two core ideals of a constitutional democracy, namely, equal participation and respect for fundamental rights.

Evaluating legislative process

- The judiciary can play an important role in improving the lawmaking process and securing these ideals. A straightforward way of doing this is by enforcing the text and spirit of the constitutional provisions governing legislative procedures.
- The Constitution contains certain detailed provisions laying out how laws are to be passed by Parliament and the State Legislative Assemblies. Unfortunately, these are often undermined. For example, even when the result through voice votes are unclear, the exact number of “ayes” and “nays” are not always counted, suggesting that Bills may be passed without securing the majority vote required under Article 100.
- This issue arose most recently when the controversial farm laws were reportedly rushed and passed by voice vote in the Rajya Sabha despite objections by Opposition members.
- Similarly, Bills are certified as Money Bills to bypass the Rajya Sabha even where they do not meet the specific description of Money Bills provided under Article 110. This Article identifies seven areas that can be governed through the enactment of Money Bills, including the imposition of tax, the regulation of borrowing and appropriation of money out of the Consolidated Fund of India.
- In the Aadhaar case, the Supreme Court, to an extent, recognised its power to check whether such procedural provisions had been complied with.
- However, these provisions will only be taken seriously if the judiciary addresses their violations in a timely manner. The longer a challenge is pending, the more ground the State has to argue that rights and obligations created under the law should not be disturbed for a “mere” procedural violation.
- Another important method is for the judiciary to make deliberation a factor in evaluating the constitutional validity of laws. In exercising judicial review, the court’s role is to call on the State to provide justifications explaining why the law is reasonable and, therefore, valid.
- While doing so, the court can also examine whether and to what extent the legislature deliberated the reasonableness of a measure. The legislative inquiry would usually include evaluating the factual basis justifying the law, the suitability of the law to achieve its aim, and the necessity and proportionality of the law relative to its adverse impact on fundamental rights.
- The Supreme Court, in fact, adopted this approach in the Indian Hotel and Restaurants Association (2013) case. The court invalidated a law prohibiting dance performances only in hotels with less than three stars as rooted in class prejudice and, therefore, violative of equality.
- While the State justified the classification on the ground that only such hotels were sites of trafficking, the court rejected this claim by examining the lawmaking process and found that the State did not have empirical data to support this claim.
- The judiciary can also make deliberation a factor in choosing whether to employ the doctrine of “presumption of constitutionality”. This doctrine requires the court to exercise restraint and defer to legislative judgments on the reasonableness of a law.
- It is rooted in the fiction that the legislature is a widely representative, deliberative organ, and thus “understands and correctly appreciates the needs of its own people”.



- When laws are passed without deliberation and without examination of the empirical basis on which they are premised, the State usually finds it more difficult to explain why such laws constitute a reasonable restriction on rights and, therefore, heavily relies on the doctrine of presumption of constitutionality to resist close judicial scrutiny.
- By extending this doctrine to such laws, the judiciary undermines the guarantee of judicial review provided to protect fundamental rights. Instead, if the judiciary confines the doctrine only to cases where the State shows that laws and their consequences were carefully deliberated in Parliament, the judiciary can encourage legislative bodies to ensure a deliberative lawmaking process.

Remedying dysfunction

- The CJI's suggestion that the legislature be reformed from within is admittedly the ideal solution to remedying legislative dysfunction without raising concerns of separation of powers.
- However, legislative majorities have little incentive to cooperate for such reform, and significant public mobilisation on the issue would be necessary to change this.
- Against this backdrop, the judiciary can and should employ the tools available to it to nudge legislative bodies to improve their lawmaking processes. In fact, striking down laws on procedural grounds also mitigates concerns of separation of powers in certain respects.
- Unlike review on purely substantive grounds, it does not foreclose legislative bodies from re-legislating the issue and ensuring that the procedural defects in the law are rectified and the law is properly deliberated in Parliament.
- The Indian judiciary has often demonstrated that it is possible to enrich democracy by addressing dysfunctions in other institutions.
- By adopting a swift and systematic approach to reviewing the legislative process, the judiciary can help restore faith in the 'temples of democracy' and push us toward the culture of justification the Constitution sought to create.

Refining the reservation policy

(Source: [The Hindu](#))

Context: *In February, just before the Election Commission announced the schedule of the State election, the Tamil Nadu Assembly adopted a Bill to provide 10.5% reservation for the Vanniyakula Kshatriyas within the quota of Most Backward Classes (MBCs) and Denotified Communities (DNCs). In May, relying on the 102nd Constitution Amendment, the Supreme Court reiterated the constitutional position that States did not have the power to identify "socially and educationally backward" classes (SEBCs). This evoked a strong reaction from political parties, forcing the Centre to pass in August the 105th Amendment which again empowers States or Union Territories to prepare their own lists of SEBCs. From this year onwards, 27% of the all-India quota for admissions for medical and dental courses will be reserved for Other Backward Classes (OBCs) and 10% for economically weaker sections (EWS). This was an outcome of the judicial intervention and legal battles of parties such as the AIADMK and the DMK.*

Breaching the cap

- All these developments have given a fillip to the demand for a caste-based census and removal of the 50% cap on reservation.
- Those advocating for this argue that only a caste-based census can bring to the fore the composition and numerical strength of various castes.
- Using this as the basis, the 50% cap on reservation can be breached.



- There have been a few attempts in the last 10 years at caste enumeration, but they did not yield the desired results. The 2011 Socio-Economic and Caste Census's report was made public five years ago but without the data on caste. In Karnataka, a similar exercise was launched in 2015.
- The report is still not out. In Tamil Nadu, a one-man commission was constituted in December 2020 to collect data on castes. But six months later, the commission was wound up.
- It is natural that political parties will not agree with the findings of a caste-based census — however well it may have been conducted — if they think that their perceptions of the strength of certain castes do not tally with the findings of the census.
- Besides, any such data alone, particularly those concerning OBCs, cannot be used as the basis for breaching the 50% cap on reservation. This is because there is no provision in the Constitution to link the quantum of reservation to the population of the OBCs.
- A reading of clauses (4) and (5) of Article 15 and clause (4) of Article 16 of the Constitution reveals that the scheme of reservation for the SEBCs is permissible but meant only for those OBCs which are “not adequately represented” in the services in the State.
- As laid down in the Indra Sawhney case (1992), there must be extraordinary circumstances to justify the quantum to exceed the cap. Tamil Nadu is a classic case where the 50% ceiling was breached early.
- The State provides 69% quota for Backward Classes, MBCs, Scheduled Castes (SC) and Scheduled Tribes (ST).
- But the scheme of quota even in Tamil Nadu was not framed keeping in mind the population of the reserved communities. According to the Second Backward Classes Commission, the population of the Backward Classes, MBCs and the DNCs in the State was about 67%, a figure that the State government still uses.
- In addition, SCs and STs account for 21.11%, as per the 2011 Census. Several other States have breached the cap. They have adopted the 10% quota for EWS too. However, while highlighting the cause of the Backward Classes, political parties should keep in mind the rationale behind the cap.
- The Supreme Court, in the Maratha case of May 2021, said: “The 50 per cent ceiling limit for reservation laid down by [the] Indra Sawhney case is on the basis of principle of equality as enshrined in Article 16 of the Constitution.”

Need for sub-classification

- At the same time, it is well known that the scheme of reservation suffers from anomalies. It needs to be refined. Primarily, if the benefits of reservation are equitably distributed among the OBCs, sub-categorisation is a prerequisite.
- While suggesting the creation of three sub-categories — extremely backward classes, more backward classes and backward classes — the National Commission for Backward Classes emphasised in 2015 more on the need for “classification of OBCs” than on streamlining the provisions on creamy layer to ensure fair implementation of the reservation policy.
- It is hoped that the Rohini Commission, constituted by the Centre in October 2017 for the purpose of sub-categorisation of communities in the Central list of OBCs, completes its work in three or four months. Some States and Puducherry have already completed the task of sub-categorisation.
- The parties should also take a dispassionate look at the concept of creamy layer. Fifty years ago, Tamil Nadu's First Backward Classes Commission recommended that the “affluent sections” in the backward classes should be “precluded from reservation” for the reason of equity.
- The annual income limit is one of the parameters that determine the creamy layer. Since September 1993, this was revised only five times against the norm of revision every three years.
- In addition to frequently revising the income limit, the Central government should consider, while revising the limit, many factors such as the trend of rise in GDP, inflation, per capita income and rise in the cost of living.



- Even as there is a strong case for increasing the present limit of ₹8 lakh per annum for determining the creamy layer, the definition of income needs to change. At present, income from salary and agriculture are not considered but “income from other sources” is taken into account.
- This stipulation on the nature of source of income not only complicates the situation but is also unfair to candidates of those whose parents may earn marginally higher income “through other sources” than the ceiling.
- This has been amply illustrated in a communication sent in July by the Tamil Nadu government’s BC, MBC and Minorities Welfare Department’s Secretary to the Commissioner of Revenue Administration.
- According to the communication, for the purpose of issuing OBC certificates, District Collectors should take into account how the parents of candidates earn their annual income, apart from considering other parameters.
- If the parental income is ₹25 lakh through salary or ₹50 lakh through agriculture, such candidates will be given OBC certificates. But if the parents earn ₹8.1 lakh through “other sources,” their son or daughter will not get the certificate.
- Besides, the vacancies in the posts of OBCs have to be filled expeditiously. The parliamentary committee had said that as on January 1, 2016, OBC employees in 78 ministries and departments of the Central government constituted only 21.57% against the quota of 27%.
- In respect of Groups A and B services, the share of OBCs was much lower. This only underscores the need for the Centre to conduct special drives frequently to fill the vacancies. Such an approach will take care of concerns in certain sections that the enforcement of “stringent norms” of the creamy layer might not serve the objective of the 27% quota scheme.
- Instead of fighting over abstract issues, political parties should channel their energies to make substantive and qualitative changes in the way the reservation is implemented, if they are really concerned about social justice, inclusion of all and the plight of the underprivileged among the OBCs.

Needed: A tribunal for CAPF

(Source: [The Hindu](#))

Context: *Over the years, there have been numerous cases of Central Reserve Police Force (CRPF) officers overstaying leave. This prompted the Ministry of Home Affairs (MHA) to issue orders to the CRPF headquarters on August 23, 2021, to “include the provisions of Security Force Court (SFC) as available in the Acts and Rules of other CAPFs (Central Armed Police Forces), for initiating disciplinary action against the delinquent officers, so that such cases are finalised within minimum time.”*

Delays in enquiries

- CRPF rules lay down the procedure for the conduct of departmental enquiries against non-gazetted ranks, and the officers are generally well versed with the procedure. As a result, most of the cases that are challenged in the High Courts are upheld.
- In normal circumstances, the departmental enquiries are completed within three to six months. But when gazetted officers are charge-sheeted, the time taken to order the enquiries is longer as other institutions like the Union Public Service Commission, the Central Vigilance Commission, the Department of Personnel and Training, and the MHA are also roped in for their views and legal opinion.
- When personnel overstay their leave for long durations, the delinquent officers must be directed to appear before the inquiring authority along with the presenting officer and the defence assistant of the charged official. Even if one of them fails to appear for the hearing, the conduct of enquiry must be postponed.



- Often, the enquiry is conducted ex parte (without the presence of the charged official). In such cases, the recorded statements and other documents must be sent to the charged official. Postal delays further aggravate the matter. Since most officers are busy in operational matters, which gain priority over everything else, the enquiries take a backseat.
- It is not just the inquiring authority who has to take time off his busy schedule to conduct the enquiry, but also the charged official and the presenting officer and defence assistant, if any. Quite often, delays occur in providing certain prosecution documents to the charged official who may demand them for preparing his own defence.
- There can be no gainsaying that such delays occur in all ministries and departments. While in the case of non-gazetted ranks, the enquiries are completed within a matter of few months, there can be no reason for undue delay in the case of officers.
- The monitoring system must be very stringent. Since most serving officers who are appointed as inquiring authorities are tasked to conduct enquiries in addition to their usual responsibilities, the enquiries are not given due priority.

The solution

- The solution lies in appointing retired officers as inquiring authorities, who can afford to devote their time to the conduct of enquiries as is being done in most departments of the government.
- The difference between the SFC and the departmental enquiry is that while the former is a purely judicial process where the guilt must be proved beyond reasonable doubt and the charged official is at liberty to engage a legal practitioner to defend him, the latter is a quasi-judicial proceeding where the mere element of preponderance of probability is enough to determine guilt.
- Though the Central Reserve Police Force Act of 1949 provides for conducting judicial trial by a Commandant in his capacity as a Magistrate, seldom is it exercised as it gets into the realm of judicial process. Hence, the conduct of a departmental enquiry is the better option.
- With increasing cases being filed in the High Courts across the country in service matters, it is high time the government considered the setting up of tribunals for the CAPFs on the lines of the Armed Forces Tribunal for defence services.
- Retired officers of the rank of Inspectors General and Additional Directors General from the CAPFs could be part of these tribunals along with retired judges of High Courts. This would ensure speedy delivery of justice.

GS III

What are the new I-T rules on PF savings?

(Source: [The Hindu](#))

Context: *The Finance Ministry on Tuesday notified new Income Tax rules to impose a fresh tax on Provident Fund (PF) savings. In her 2021-22 Budget speech, Finance Minister Nirmala Sitharaman proposed taxing the income on PF contributions of over ₹2.5 lakh a year. This limit was later enhanced to ₹5 lakh for PF accounts wherein employers make no contributions. However, there was a lack of clarity on how this tax was to be levied and the new rules seek to address it.*

What is the government's rationale behind the move?

- Till this year's Budget, all income on provident fund savings was exempt from tax. The provision aimed at ensuring people retire with an adequate nest egg was being misused, according to the Finance Ministry.
- Ms. Sitharaman asserted at her press conference after her Budget speech that "some people go to the extent of contributing ₹1 crore each month [into their PF accounts]".
- For such people to get tax concessions as well as an assured income is not comparable with an employee who earns ₹2 lakh and gets 8% return on PF savings, she said. "This exemption without any threshold benefits only those who can contribute a large amount to these funds as their share," the Budget documents explained.
- After facing criticism over the proposal, the Revenue Department later highlighted that more than 1.23 lakh high net worth individuals (HNIs) had deposited over ₹62,500 crore in their employees' provident fund (EPF) accounts in 2018-19.
- The largest EPF account has a staggering ₹103 crore balance, they pointed out, while the top 20 HNIs have a cumulative balance of ₹825 crore. Of an estimated 4.5 crore EPF accounts, the source said about 0.27% members had an average corpus of ₹5.92 crore and so were earning over ₹50 lakh a year as 'tax-free assured interest'.
- This is the second time the NDA government has sought to tax EPF savings — in 2016, a Budget announcement to tax 60% of EPF account balances at the time of withdrawal was rolled back.
- In the previous year's Budget, contribution by employers into employee welfare schemes like the EPF or the National Pension System (NPS) or a superannuation plan was capped at ₹7.5 lakh a year.

Which PF accounts will be affected?

- EPF accounts managed by the Employees' Provident Fund Organisation (EPFO) and the General Provident Fund (GPF), where government employees save for retirement, will be impacted.
- There are also a few thousand large companies that manage the retirement savings of their workforce in-house through 'exempt' EPF trusts, in order to ensure their employees don't have to run from pillar to post to access these savings when in need or at the time of retirement.
- Public Provident Fund (PPF) accounts are not affected by the new tax, nor are retirement savings accumulated under the NPS. EPF accounts are mandatory for employees earning up to ₹15,000 a month in firms employing over 20 workers, with 12% of the basic pay and dearness allowance deducted as employees' contribution and another 12% remitted by the employer.
- However, government as well as private sector employees are allowed to make voluntary contributions over and above the statutory deductions into the GPF or the EPF respectively.
- The ₹2.5 lakh annual contribution limit shall apply to EPF members, while in the GPF or other PFs wherein there is no contribution from the employer, the threshold has been set at ₹5 lakh.

Why were new rules needed to implement this tax?

- A similar tax provision was introduced in the Budget for income from annual premium payments of over ₹2.5 lakh into unit-linked insurance products, but that clearly stated that maturity benefits will be subjected to capital gains tax.
- In the case of PFs, though the intent of the tax levy was elaborated on, there was no clarity on how it was to be operationalised.
- For instance, practitioners were not clear if the tax had to be imposed at the time of retirement or withdrawal from the PF account, or each year at the time of annual income accrual. If it had to be done annually, should the PF trustees deduct the tax at source on such income, or should a tax assessee include it in her or his income tax return and pay taxes.
- There were also concerns that this tax could be levied on future income on past PF contributions over the new tax-free limits.
- The Chairperson of the Central Board of Direct Taxes at the time, P.C. Mody, had told The Hindu that taxpayers should factor in the interest income earned on contributions beyond ₹2.5 lakh or ₹5 lakh, as the case might be, at the time of filing their tax returns.
- As interest credits from the EPFO are seldom effected in the same year, due to delays in the declaration of the annual EPF rate and actual credits to the members' accounts, this formulation posed another problem in implementation.

What do the new I-T rules say about levying the PF tax?

- For calculation of taxable interest relating to contribution in a provident fund or recognised provident fund, exceeding the specified limit, a new Rule 9D has been added.
- The rule requires all PF accounts to be split into separate accounts — one with the taxable contribution and interest earned on that component, and the other with the non-taxable contribution that shall include the closing balance of the PF account as on March 31, 2021, and all fresh non-taxable contributions and interest thereon.
- While the government has said this will help arrive at the taxable PF income for a year, it is still not clear if the tax has to be deducted from the EPF account concerned or the taxable part added to one's total income at the time of filing returns.
- As things stand, the proposed solution to create two accounts seems to suggest that the EPFO and PF trusts may have to deduct tax on the income earned on the 'taxable contribution' of the EPF account and remit it to the exchequer each year.
- Maintaining two separate accounts is an onerous requirement for the EPFO and the trustees of the other PFs to comply with.
- To put the administrative overhaul required for such accounting in perspective, consider that the EPFO has 24.77 crore members with EPF accounts, of whom 14.36 crore members had been allotted Unique Account Numbers (UANs) by the end of 2019-20. About 5 crore of these members were active contributors to their EPF accounts during 2019-20.
- Even if a technological solution is devised to rejig the existing systems and provide for two EPF accounts for each member, there are other concerns. Deducting tax at source would require the EPFO or the trustees of individual PFs to issue tax deduction certificates or IT Form 26 AS for all such members.
- Whether the EPFO, India's largest retirement fund manager with around ₹15 lakh crore of assets, was consulted over the rules or is prepared for the transition to the proposed system, is not known at this point.

Soil microbes can make for a greener revolution

(Source: [The Hindu](#))

Context: *Plants appear to be simple enough in their organisation. Whether small shrubs or tall trees, all they seem to be made up of is leaves, flowers, fruits, stems and roots. But simple they are not. Being rooted to one spot has required very special personality traits. The ability to make food from sunlight and the carbon dioxide in air has given them a central position in life forms on earth. They cannot run, but ably defend themselves. A fascinating aspect of their abilities lies out of sight, in the soil from which they sprout, and from which they derive water, micronutrients, and a host of other benefits.*

Ancient association

- The association between plants and fungi is ancient. Fossils of plants from about 400 million years ago show the first evidence of roots, and these roots are fungus associations – rhizoids – suggesting that roots co-evolved with fungi.
- One good example is species of *Penicillium*, the fungus from which Alexander Fleming isolated the antibiotic penicillin.
- Fungus–root associations, called mycorrhizae, appear at first glance to be simple mutualisms that are beneficial to both. The root-invading fungus gains nutrients made by the plant, and the plants get difficult-to-find minerals like phosphorus from the microbe. But the association is deeper.

The Wood Wide Web

- Suzanne Simard of the University of British Columbia, working in the dense forests of the Pacific Northwest, made an interesting finding.
- In carefully controlled experiments with saplings of birch and fir trees enclosed in clear plastic bags that contained some radioactive carbon dioxide gas, she showed that the birch converted this labelled gas to radioactive sugars by photosynthesis, and within two hours, traces of this radioactive sugar appeared in the leaves of the fir saplings growing nearby.
- The exchange is mainly through the mycelia of fungi, and may extend through the whole forest, with young trees that are struggling on a dry patch being helped out by carbon transfer from their luckier counterparts. A reviewer writing in the journal *Nature* called such systems as the Wood Wide Web.
- Bacteria that associate with roots are called rhizobacteria, and a very wide range of these species are plant growth promoters.
- Like the fungi, mutualism operates in these relationships too. In exchange for sugars, these bacteria offer plants a wide range of benefits. They may help plants ward off pathogens that cause diseases of the root. They may even trigger systemic resistance to a pathogen throughout the plant.

Hybrid vigour

- The green revolution brought a sea change in the growing of agricultural produce in our country. The key to this was the establishing of hybrid varieties of crop plants.
- Today, a vast majority of commercially grown crops are hybrids, where two inbred lines are crossed, with their first-generation hybrid offspring exhibiting a vigour that is lacking in either of its parents.
- The property of hybrid vigour, called heterosis, has been known for centuries, but remains only partly understood.

Root cause

- A new and fascinating aspect to hybrid vigour has been found in the rhizomicrobiome – the rich collection of microbes that surround the roots of every plant. Maggie Wagner of the University of Kansas (at the heart of one of the great corn-producing areas of the world) addressed heterosis from the viewpoint of plant–root microbe interactions.



- Using maize as the model crop, her group has recently shown that the rich biomass of roots in hybrid maize, as well as other positive traits, is reliant on appropriate soil microbes (PNAS, Volume 118(30), July 27, 2021).
- In laboratory-sterilised soils that are totally devoid of microbes, both the inbred parents and hybrid offspring grow equally well, there being no sign of vigour in the latter. Then they started to 'rebuild' the soil environment, one bacterium at a time.
- They could attain the normal parent–offspring difference in vigour by introducing just seven species of bacteria into the sterile soil. The experiment could be extrapolated to the fields too: Fumigating, or steaming the soil in one experimental plot led to decreased heterosis, because this soil was depleted of microbes.
- Agronomists estimate that depending on the fertility of the soil, hybrid maize requires 180–225 kg of artificial fertilizer for a yield of nine tons of grain per hectare. Producing this fertilizer is an energy intensive task.
- As our nation strives towards lofty goals for sustainable agriculture, using simple microbial ways of improving crop quality (and quantity) would be a small step in that direction.

The economic reforms — looking back to look ahead

(Source: [The Hindu](#))

Context: *The crisis caused by the novel coronavirus pandemic in the country and at global level has led to a debate about fresh thinking and new approaches to manage the economy and the future of humanity. Globally, it has underscored the need for policies to enable resilience in the economy and ensure a robust health system, together with research and development. In India, various efforts are under way to enhance economic growth.*

A critical reading of reforms

- History matters in the complex economic system. So, it is important to briefly look at the economic reforms of the last 30 years. Evidence shows that the economic reforms which were launched in a major way in 1991 — and from time to time, subsequent interjections for liberalisation of economy and trade — have enabled some credible gains for the country.
- Over a period of 30 years, burgeoning foreign exchange reserves, sustained manufacturing contribution in GDP, increased share in global exports (from a mere 0.6% in the early 1990s to 1.8%), robust information and communication technology software exports, and sustained economic growth in the range of 6%-8% are clear hallmarks of success.
- The economic reforms, so far, have been more focussed on the technical nature of the economy than the system, process and people.
- As a result, quite a few primary drivers of the economy — human capital, technology readiness, labour productivity, disposable income, capital expenditure, process innovation in setting up businesses, and institutional capacity — have not got enough recognition. In the context of a global competitive environment, some basic issues deserve close examination.
- The human resource capital (HRC) formation, a good determinant of labour productivity, has been found wanting over the entire period of reforms. The lack of quality education, low skilled manpower and inadequacies in basic health care have resulted in low HRC. The HRC rank for India stands at 103; Sri Lanka is at 70, China at 34, and South Korea at 27, as brought out by the Global Human Capital Report, 2017.
- As indicated in the World Bank database on GDP for 2019, the low per capita GDP in India, at \$2,104 (at \$6,997 in PPP terms, ranked 125th globally) against the world average of \$11,429 (at \$17,678 in PPP terms) has direct links to low per capita family income.



- Closely linked, the report by Deloitte (Global Manufacturing Competitiveness Index in 2016) reflects that the hourly wages in India have been \$1.7; they are \$38, \$24, \$20.7 and \$3.3 for the United States, Japan, South Korea, and China, respectively. Low wages have a direct bearing on the disposable income of families and leave little room for the majority of households to have enough disposable income to purchase consumer durables or industrial products, affecting demand.
- Low research and development expenditure at 0.8% of GDP, vis-à-vis higher value for other fast emerging economies such as South Korea (4.5%), China (2.1%) and Taiwan (3.3%), is resulting in lower capacity for innovation in technologies and reduced 'technology readiness', especially for manufacturing.

Labour productivity

- The lack of HRC and low technology readiness have impacted labour productivity adversely.
- In India, labour productivity in manufacturing is less than 10% of the advanced economies including Germany and South Korea, and is about 40% of China, as reflected in a World Bank publication of 2018, The Future of Manufacturing-Led Development. Low productivity has unfavourable consequences for competitiveness, manufacturing growth, exports and economic growth.
- In addition, due to a lack of capital expenditure and institutional capacity, and inefficiency in business service processes, there are difficulties in acquiring land for businesses, in efficient utilisation of economic infrastructure, and in providing business services, leading to a long time and more cost in setting up enterprises, resulting in a loss of creative energy of entrepreneurs.
- The fundamental deficiencies, as highlighted above, are at the heart of the problem. For years, the economy has been hit internally due to low consumer demand as a result of low household incomes as well as externally on account of lesser competitiveness and inadequacies in integration with global supply chains for trade. A Business as Usual (BAU) approach is resulting in diminishing returns.

Paradigm shift

- In order to drive the economy, there needs to be fresh thinking to address the underlying issues comprehensively in an integrated manner.
- The new reforms will require a distinct departure. The approach should be systemic and address structural issues — HRC, skills, research and development (R&D), land management and institutional capacity.
- The focus should be on quality of business services, technology readiness, labour productivity and per capita income.
- First, to attract large investment in manufacturing and advanced services, at a basic level, investment in human capital and technology is a prerequisite.
- Raising HRC by way of enhanced public sector outlay to 8% of GDP, from current about 5%, for education, skill development (including for advanced technologies) and public health, is another first step.
- The reports (by McKinsey and the World Economic Forum) on advanced manufacturing suggest that Industry 4.0 will be defined by new technologies such as robotics, 3-D printing, artificial intelligence (AI), the Internet of things (IoT), etc., which could usher in rapid changes of a higher order up to 10X or more in speed, scale and scope; technology obsolescence will be much faster than ever before.
- Consequently, efforts for technology readiness are very essential to stay competitive. It demands enhancing public research and development expenditure to 2% of GDP over the next three years.
- There is a need to work on strategies to enhance per capita income by more wages for workers through higher skills and enhancing minimum wages, besides improving the social security net. This calls for a concerted calibrated approach through collaborative efforts of government, industry and workers' unions.
- On the issue of increased cost of labour, it can be compensated by higher productivity, some tax-benefits in the initial period of wage reforms especially for Micro, Small and Medium Enterprises, besides reducing transaction costs in business and improving infrastructure utilisation efficiency.

Systemic approach

- Using insights from the work of Nobel laureate (1993) Douglass C. North on the role of institutions in advancing the economy in a country, it is necessary to build the capacity of public institutions to create a good environment for business and industry.
- The process of reforms is as important as the content. Policy reforms should lay an emphasis on process innovation and promote a business-centric approach to implementing pre-determined service quality levels (SQLs), to create a friendly ecosystem by having a state-of-the-art plug-and-play model for new enterprises, and for efficient internal supply chain management to integrate with the global supply chain.
- Finally, largely absent in the 1990s, apart from rapid globalisation and rising aspirations, the future of the economy should be particularly viewed in the backdrop of a significant and irreversible shift in terms of a reliance on the global supply chain as a result of the knowledge-intensive nature of businesses and exponential effects caused by advanced technologies under Industry 4.0, since the 2010s.
- Therefore, the strategies adopted since the 1990s till now may not ensure adequate returns, and call for innovative approaches in public policymaking.
- In sum, it necessitates a systemic approach — encompassing inter-connected basic factors of the economic system — for policy reforms for setting the economic fundamentals right, in order to unlock creativity and innovation in the economic system, raise the total factor productivity (TFP), or a measure of productive efficiency, and to achieve higher growth.

Green hydrogen, a new ally for a zero carbon future

(Source: [The Hindu](#))

Context: *In order to achieve the goal of an alternative source of energy, governments are placing large bets in the hope of adopting a multi-faceted practical approach to utilise 'Green hydrogen' as a driving source to power our industries and light our homes with the 'zero emission' of carbon dioxide.*

Energy-rich source

- Hydrogen is the most abundant element on the planet, but rarely in its pure form which is how we need it.
- It has an energy density almost three times that of diesel. This phenomenon makes it a rich source of energy, but the challenge is to compress or liquify the LH2 (liquid hydrogen); it needs to be kept at a stable minus 253° C (far below the temperature of minus 163° C at which Liquefied Natural Gas (LNG) is stored; entailing its 'prior to use exorbitant cost'.
- The production techniques of this 'Energy-Carrier' vary depending upon its applications — designated with different colours such as black hydrogen, brown hydrogen, blue hydrogen, green hydrogen, etc.
- Black hydrogen is produced by use of fossil fuel, whereas pink hydrogen is produced through electrolysis, but using energy from nuclear power sources.
- 'Green hydrogen', the emerging novel concept, is a zero-carbon fuel made by electrolysis using renewable power from wind and solar to split water into hydrogen and oxygen.
- This 'Green hydrogen' can be utilised for the generation of power from natural sources — wind or solar systems — and will be a major step forward in achieving the target of 'net zero' emission. Presently, less than 0.1% or say ~75 million tons/year of hydrogen capable of generating ~284GW of power, is produced.

The obstacle of cost

- The 'production cost' of 'Green hydrogen' has been considered to be a prime obstacle. According to studies by the International Renewable Energy Agency (IREA), the production cost of this 'green source



of energy' is expected to be around \$1.5 per kilogram (for nations having perpetual sunshine and vast unused land), by the year 2030; by adopting various conservative measures.

- The global population is growing at a rate of 1.1%, adding about 83 million human heads every year on the planet.
- As a result, the International Energy Agency (IEA) forecasts the additional power demand to be to the tune of 25%-30% by the year 2040.
- Thus, power generation by 'net-zero' emission will be the best solution to achieve the target of expert guidelines on global warming to remain under 1.5° C.
- This will also be a leap forward in minimising our dependence on conventional fossil fuel; in 2018, 8.7 million people died prematurely as result of air pollution from fossil fuels

A power hungry India

- India is the world's fourth largest energy consuming country (behind China, the United States and the European Union), according to the IEA's forecast, and will overtake the European Union to become the world's third energy consumer by the year 2030. Realising the impending threats to economies, the Summit will see several innovative proposals from all over the world in order to reduce dependence on use of fossil fuels.
- The scale of interest for 'plucking the low hanging fruit' can be gauged by the fact that even oil-producing nations such as Saudi Arabia where the day temperature soars to over 50° C in summer, is prioritising plans to manufacture this source of energy by utilising 'idle-land-banks' for solar and wind energy generation.
- It is working to establish a mega \$5 billion 'Green hydrogen' manufacturing unit covering a land-size as large as that of Belgium, in the northern-western part of the country.
- India is also gradually unveiling its plans. The Indian Railways have announced the country's first experiment of a hydrogen-fuel cell technology-based train by retrofitting an existing diesel engine; this will run under Northern Railway on the 89 km stretch between Sonapat and Jind.
- The project will not only ensure diesel savings to the tune of several lakhs annually but will also prevent the emission of 0.72 kilo tons of particulate matter and 11.12 kilo tons of carbon per annum.
- It is high time to catch up with the rest of the world by going in for clean energy, decarbonising the economy and adopting 'Green hydrogen' as an environment-friendly and safe fuel for the next generations.

The national security discourse is changing

(Source: [The Hindu](#))

Context: *The global security landscape is undergoing a churn, creating complexities and new realities unlike any time in the recent past. From a rising China to the pressures of climate change; from the challenges of counter terrorism to a seemingly never-ending COVID-19 pandemic (the four Cs), the old order is collapsing much faster than the ability of nations to create the foundations of a new one. National security debates and discourse are, quietly but surely, undergoing an almost revolutionary transformation. While the academic world has long talked about the need for a 'holistic' conception of national security, much of that debate was considered far too esoteric by practitioners. Today, it is the policymakers and practitioners themselves that are leading the emerging consensus on the need to fundamentally reassess our assumptions about national security thinking.*

Change in the U.S.



- The U.S. policymakers have started changing their cognitive lens when it comes to national security policy making.
- A process that was started by former U.S. President Donald Trump has been taken forward with gusto by the Biden Administration.
- Asserting that “foreign policy is domestic policy and domestic policy is foreign policy,” U.S. President Joe Biden’s National Security Adviser Jake Sullivan has suggested that his team’s task is to re-imagine American “national security for the unprecedented combination of crises we face at home and abroad: the pandemic, the economic crisis, the climate crisis, technological disruption, threats to democracy, racial injustice, and inequality in all forms”.
- He has gone on to argue that “the alliances we rebuild, the institutions we lead, the agreements we sign, all of them should be judged by a basic question. Will this make life better, easier, safer, for working families across this country?”
- The U.S. Secretary of State, Antony Blinken, too has reiterated this message in his comments that “more than at any other time in my career — maybe in my lifetime — distinctions between domestic and foreign policy have simply fallen away” and that “our domestic renewal and our strength in the world are completely entwined, and how we work will reflect that reality”.
- Both Mr. Sullivan and Mr. Blinken have taken their cue from their boss, President Biden, who had campaigned on a “foreign policy for the middle-class” and has been unabashed about the need for the U.S. “to invest in our people, sharpen our innovative edge, and unite the economic might of democracies around the world to grow the middle-class and reduce inequality and do things like counter the predatory trade practices of our competitors and adversaries”.
- There is a growing bipartisan acknowledgement in the U.S. today that if the requirements of American national security during the Cold War could be largely met by its fleets of bombers, nuclear missiles, aircraft carriers and overseas bases, today’s strategic environment requires a different response: one that shores up domestic industrial base, helps in maintaining pre-eminence in critical technologies, makes supply chains for critical goods more resilient, protects critical infrastructure from cyberattacks, and responds with a sense of urgency to climate change.

Not a novel idea

- The idea that foreign and domestic policies are tightly intertwined is not a novel one. All serious grand strategic thinking in democracies, at the end of the day looks for sustenance in popular public support.
- Mr. Trump’s rise and his ideas challenged both the liberals and the conservatives in the U.S. foreign policy establishment as they underscored the widening gulf between the policy community and the American hinterland.
- Mr. Biden and his team have learned their lessons. Mr. Sullivan is working towards integrating the National Security Council with the other components of the White House such as the National Economic Council, with the Domestic Policy Council, with the Office of Science and Technology Policy. This will inevitably present its own sets of challenges but there is no shying away from this new reality.

The Indian situation

- In India too, we have seen a greater recognition of the challenges emanating on national security from domestic vulnerabilities.
- One of the most significant consequences of the COVID-19 pandemic, underscored by Prime Minister Narendra Modi himself, has been to reveal how deeply India has been dependent on Chinese manufacturing for critical supplies.
- At a time when Indian armed forces were facing the People’s Liberation Army across the Line of Actual Control, this exposed India to a new realisation that dependence on overseas supply chains is a national security challenge of the highest order, one that cannot be overlooked any more.
- India has since moved towards shoring up domestic capacities in critical areas and also started looking at free trade agreements through a new lens.



- The Indian Army chief, General M.M. Naravane, in his remarks, has also made it apparent that views of the military leadership in this country are also evolving.
- He has argued that “national security comprises not only warfare and defence but also financial security, health security, food security, energy security and environment security apart from information security” and suggested that instead of viewing national security “primarily from the perspective of an armed conflict, there is a need to take a whole-of-government approach towards security”.

Highlight the synergies

- In the post-pandemic world with a serious strain on national resources, it will be important for policymakers to underline the synergies between the civilian and the military spheres.
- The Army chief has rightfully pointed out a range of tangible and intangible ways in which investment in the armed forces contributes to the national economy such as indigenisation of defence procurement, providing an impetus to indigenous industries, aid to civil authorities or Humanitarian Assistance and Disaster Relief (HADR) operations protecting infrastructure, demand for hi-tech military products by the armed forces spurring entire industries, and transportation and logistics capacities of the armed forces acting as force enablers for the Government in times of emergencies.
- The Army leadership has done well to highlight the role of armed forces in sustaining a broader conception of national security than primarily focusing on war fighting.
- As nations across the world reconceptualise their strategic priorities to bring their ends, ways and means into greater balance, questions of resource allocation will become even more contentious and policymakers will need to think more creatively about the roles of various instruments of statecraft.
- National security thinking is undergoing a shift. India cannot be left behind.

How Assam’s Deepor Beel is perishing from concretisation, waste dumping

(Source: [Down to Earth](#))

Context: *Deepor Beel, a perennial freshwater lake and the only Ramsar site in Assam, has shrunk around 35 per cent in size since 1991. It is now spread across 4,014 hectares. The waterbody once attracted exotic birds and tourists and offered livelihood to the fisherfolk. But heavy encroachment for railway line construction and other development projects as well as proximity to a waste dumping yard have robbed it of its ecological health. Situated on the outskirts of Guwahati, the state capital, the wetland shelters over 200 species of birds, of which 70 are migratory.*

Threatened habitats, littered lake

- A 24-hectare garbage dumping yard lies to the east of the lake in Boragaon. Birds and animals feed on rotten flesh and waste from the site, littering the waterbody and threatening their lives.
- The lake was listed as a biologically and environmentally threatened habitat in November 2002 and declared a Ramsar site. Three years later, the dumping yard came up in its vicinity.
- Huge mountains of solid waste are turning the picturesque lake into a stinking drain. The biodiversity has been impacted but the authorities have made no efforts for its revival, he added. The wetland is dying and nobody is bothered.
- Guwahati generates around 550 tonnes of waste every day and inadequate measures of its disposal have been taking a toll on the health of the beel.
- Endangered species such as greater adjutant stork in Assam have been forced to feed on toxic waste and dead carcasses instead of fish, rats and snakes, its usual prey. This further threatens the existence of these species.



- In 2017, 26 greater adjutant storks were found dead in the garbage dump raising an alarm. Following this, the National Green Tribunal had issued a notice to the Assam government seeking an explanation.
- Concrete factories, houses and warehouses built illegally on the wetland damage the ecology. The laxity of the administration in taking action against culprits sustains the menace, experts pointed out.
- In 2014, the then Assam Chief Minister Tarun Gogoi inspected the lake and ordered immediate measures to remove encroachments from the notified site. But not much has been done to conserve the waterbody and land sharks continue to make inroads.

Rail track impacts wildlife

- A railway line passing through the bird sanctuary has also been posing a danger to the wildlife in and around the lake.
- The Rani Reserve forest and Garbhanga hills to the south of the lake, are the habitat of the Asiatic elephants. But the broad-gauge single railway line has served as a death bed for several elephants over the years.
- At least 14 jumbos were killed crossing the railway track till 2014 between Rani Reserve Forest and Deepor Beel.
- Four corridors are used by the elephants to cross the track for bathing and feeding on the aquatic plants in the wetland.
- In 2019, the railways had decided to construct a double railway through the lake. The project was stalled after stiff resistance from environmentalists and locals who stressed that the move would increase the mortality rate of wildlife.
- The construction could have increased the death toll of elephants and other wildlife species, besides increasing the human-animal conflict, according to Narayan Sharma, assistant professor, Department of Environmental Biology, Cotton University. He did an extensive study on the lake in 2018.
- The wetland is already on a ventilator and any further disturbance would push it to extinction.
- In June this year, the state government proposed the realignment of the single railway line.

Lost livelihoods

- The deterioration of the lake harmed the livelihoods of several hundred fishers who have depended on it for generations. The government has banned fishing in the core area of the lake.
- Many from the finishing community have been forced to migrate, said a local fisher. The government has turned a blind eye to the encroachments and pollution in the lake while solely blaming the fishers for its destruction.
- The locals use traditional methods of farming, which are not dangerous for the wetland, said Sharma, adding that their surveys have shown the extent of impact on fisherfolk.
- Discharge from a local oil refinery has been further polluting the water and inducing kerosene-like smell in the fish, he added.
- The local population have complained to the administration about the stench from the polluted lake but to no avail.
- Government officials, however, claimed they were taking stern action against encroachers. “The state government is serious about saving Deepor Beel and have already urged the railways for the realignment of the railway line to save wildlife.
- The authorities are also planning to segregate waste at the source to ensure it doesn't pollute the lake, he added.

Current Affairs Quiz

- 1) Which of the following is not correct with respect the Karbi-Anglong Peace Agreement?
- It will transfer as much autonomy as possible in exercising their rights to the Karbi Anglong Autonomous Council.
 - A special development package of Rs. 1000 crore will be allocated by the Assam Government for the development of Karbi areas over five years.
 - This agreement will ensure the protection of the culture, identity, language of the Karbi people and all-round development of the region.
 - The Consolidated Fund of the State of Assam will be amended to meet the resources of the Karbi Anglong Autonomous Council.

Answer : b

- 2) Which one of the following correctly describes Breakthrough Infection?
- It occurs when a “variant of interest” becomes a “variant of concern” in a very short period of time.
 - It is a condition in which a person gets infected with SARS-CoV-2 virus after 14 days of the second shot of vaccine.
 - It is an important discovery and recognition of a rapidly spreading unidentified variant of SARS-CoV-2 by WHO.
 - It is a condition where preventive steps taken to control a new variant have reduced the effectiveness related to previously circulating variants.

Answer : b

- 3) Consider the following statements:
- Solar Storm is a directional ejection of a large mass of highly magnetised particles from the sun
 - Undersea cables have a higher risk of failure from solar storms compared to land cables.

Which of the statements given below is/are correct?

- 1 only
- 2 only
- Both 1 and 2
- Neither 1 nor 2

Answer : c

- 4) Consider the following statements with respect Nipah Virus:
- It has an incubation period of 5-14 days.
 - It was first identified in Malaysia and first reported in West Bengal in India.
 - It can be transmitted through contaminated food.

Select the CORRECT answer code:

- 1 only
- 2 only
- 1 and 2 only
- 1, 2 and 3

Answer : d

- 5) Consider the following statements about Residents of UT of Ladakh and J&K:
- The resident certificate issued for the purpose of appointment to all the non-gazetted posts in the UT.
 - In Ladakh, it is restricted to only the Permanent Resident Certificate holders of the region whereas in J&K it is open to outsiders also.

Select the CORRECT answer code:

- 1 only



- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Answer : c

6) NAMASYA App is related to-

- a. AYUSH
- b. Railways
- c. Panchayati Raj
- d. Micro and Small enterprise

Answer : d

7) Consider the following statements with respect to Inspiration4:

- 1. It is the World's first all-civilian, non-governmental spaceflight to orbit around the Earth.
- 2. The Inspiration4 will orbit the Earth at 575km higher than the International Space Station and the Hubble space telescope.

Select the CORRECT answer code:

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Answer : c

8) Consider the following statements about The Tribunals Reforms Bill, 2021:

- 1. A Chairperson/member of a tribunal should have a minimum age of 50 years.
- 2. It provides for a 4-year term of office subject to the upper age limit of 70 years for the Chairperson and members.

Select the CORRECT answer code:

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Answer : a

It provides for a four-year term of office subject to the upper age limit of 70 years for the Chairperson, and 67 years for members.

9) Which among the following is directly responsible for the monitoring of Asset Monetisation programme?

- a. Department of Economic Affairs, Ministry of Finance
- b. Department of Investment and Public Asset Management, Ministry of Finance
- c. Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry
- d. Prime Minister's Office

Answer : d

10) Consider the following statements:

- 1. Deep Sea Mining is the process of retrieving mineral deposits from the area of the ocean below 2000 m.
- 2. International Tribunal for the Law of the Sea regulates all mineral-related activities in the international seabed area beyond the limits of national jurisdiction.

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 : d

It is the process of retrieving mineral deposits from the deep sea – the area of the ocean below 200 m. International Sea Bed Authority is an intergovernmental body established by the Law of the Sea Convention to organize, regulate and control all mineral-related activities in the international seabed area beyond the limits of national jurisdiction.

11) Consider the following statements with respect to 13th BRICS Summit:

1. The event will be held under the Chairmanship of Russia.
2. The theme for the event is “BRICS@15: Intra-BRICS cooperation for continuity, consolidation and consensus”.
3. India hosted the BRICS Summit in 2012 and 2016.

Select the CORRECT answer code:

- a. 1 and 2 only
- b. 1 and 3 only
- c. 2 and 3 only
- d. 1, 2 and 3

Answer : c

The theme for the event will be ‘BRICS @ 15: Intra-BRICS cooperation for continuity, consolidation and consensus’.

12) Consider the following statements:

1. Dengue is a mosquito borne viral infection in which the vector species is same as chikungunya, yellow fever and Zika viruses.
2. There is an evidence of the possibility of maternal transmission.
3. It has become a leading cause for the death of children and adults in Asian and Latin American regions.

Select the CORRECT answer code:

- a. 1 and 2 only
- b. 2 and 3 only
- c. 1 and 3 only
- d. 1, 2 and 3

Answer : d

13) Consider the following statements:

1. Electrolyzers are the machines that split water into hydrogen and oxygen.
2. They are used to produce green hydrogen using electricity produced from renewable energy sources.
3. At present, there are no electrolyzer manufacturers in India.

Which of the statements given above is/are correct?

- a. 1 and 2 only
- b. 2 and 3 only
- c. 1 and 3 only
- d. 1, 2 and 3

Answer : d

14) Consider the following crops:

1. Barley
2. Mustard
3. Soyabean
4. Safflower
5. Sesamum



Which of the above crops are considered for the rabi marketing season under the Minimum Support Price (MSP)?

- 1,2 and 3 only
- 1,2 and 4 only
- 1, 3,4 and 5
- 1,2,3, 4 and 5

Answer : b

Rabi Crops covered under the MSP – Wheat, Barley, Gram, Masur (Lentil), Rapeseed & Mustard, Safflower, Toria

15) Consider the following statements:

1. Cost of Hydrogen produced from coal can be cheaper and less sensitive to imports compared to hydrogen produced through electrolysis and Natural Gas respectively.
2. Almost 100% of Hydrogen produced in India is through Natural Gas.

Which of the statements given above is/are correct?

- 1 only
- 2 only
- Both 1 and 2
- Neither 1 nor 2

Answer : c

16) Consider the following statements with respect to Pollen:

1. Pollen are considered major outdoor airborne allergens responsible for allergic rhinitis and asthma in humans.
2. Pollen distribution greatly depends on meteorological conditions, micro and macro topography of a particular area.
3. Scientists have developed a pollen calendar for Chandigarh, a first of its kind for an Indian city.

Which of the statements given above is/are correct?

- 1 and 2 only
- 1 and 3 only
- 2 and 3 only
- 1, 2 and 3

Answer : d

17) Consider the following regions:

1. Mekong River
2. Chambal River
3. Mahakam River
4. Chilika Lake
5. Loktak Lake

Irrawaddy Dolphin can be found in which of the above regions?

- 1 and 3 only
- 1, 2 and 3 only
- 1, 3 and 4 only
- 1,2,3,4 and 5

Answer : c

18) Consider the following statements:

1. PRANA is a portal for monitoring the implementation of National Clean Air Programme (NCAP).
2. It will support tracking of both physical as well as financial status of city air action plan implementation and disseminate information on air quality to public.

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

19) Gita Govind, a lyrical poem was composed by-

- a. Harihara
- b. Jayadeva
- c. Bhavabhuti
- d. Amarasimha

Answer : b

20) Blood Honey refers to which of the following?

- a. Honey collected by traditional honey gatherers of Sunderbans
- b. Artificial production of Indian Royal Jelly outside its natural habitat
- c. A unique variety of honey in Thailand obtained from the blood of bees instead of its salivas
- d. Highly profitable honey obtained through exploitation of traditional honey gathering tribes in Africa

Answer : a