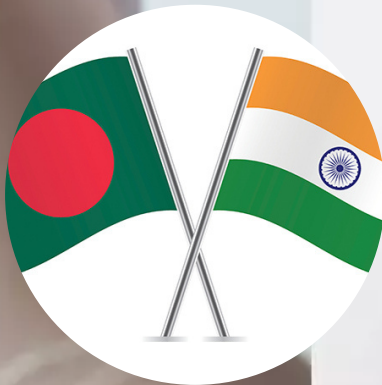


PRAYAS4IAS

AN INITIATIVE BY THE PRAYAS INDIA

APRIL WEEK 5



April (Week 5)

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Prelims

NATIONAL

Maharashtra's two-child norm for government employees

(Source: [Indian Express](#))

Context: A woman officer from the Maharashtra Prison Department was dismissed from service after an inquiry revealed that she violated the Maharashtra Civil Services (Declaration of Small Family) rules because she suppressed the information from the authorities that she has three children.

What is the 'children norm' or Maharashtra Civil Services (Declaration of Small Family) Rules, 2005?

- Maharashtra is one of the few states in the country that have a 'two children' policy for appointment in government jobs or even for the elections of some local government bodies.
- Other states such as Rajasthan, Madhya Pradesh, Andhra Pradesh and Telangana, Gujarat, Odisha, Uttarakhand and Assam being the latest addition to the list in 2019.
- The set of norms came into force in Maharashtra as Maharashtra Civil Services (Declaration of Small Family) Rules on March 28, 2005. The rules mandate filing a small family declaration at the time of applying for a government job.
- The definition of child under these rules does not include adopted children. The rules make the Small Family norm an additional essential requirement for Groups A, B, C, D of Maharashtra government employees.
- A person having more than two children on the date commencement of the rule (March 28, 2005), shall not be disqualified for appointment under these provisions so long as the number of children on the date of such commencement does not increase.
- Also, provided that one or more than one children are born in a single delivery within an year of the commencement, shall not be considered for the disqualification of the rules.
- The rules also empower the state government to give relaxation in 'just and reasonable' manner and mandates recording such reasons.

Ct value in a Covid-19 test

(Source: [Indian Express](#))

Context: Among various scientific terms that the Covid-19 pandemic has made part of the public vocabulary, one is the 'Ct value' in RT-PCR tests for determining whether a patient is positive for Covid-19. This was the subject of a recent request sent by the Maharashtra government to the Indian Council of Medical Research (ICMR). The state sought clarity whether it was advisable to treat a person as Covid-negative if the Ct value is more than 24 and the person is asymptomatic. State officials said various ICMR documents had mentioned different Ct values and there were divergent views even among Niti Aayog and the National Centre for Disease Control.

What is Ct value?

- Short for cycle threshold, Ct is a value that emerges during RT-PCR tests, the gold standard for detection of the SARS-CoV-2 coronavirus.
- In an RT-PCR test, RNA is extracted from the swab collected from the patient. It is then converted into DNA, which is then amplified.
- Amplification refers to the process of creating multiple copies of the genetic material — in this case, DNA.
- This improves the ability of the test to detect the presence of virus. Amplification takes place through a series of cycles — one copy becomes two, two becomes four, and so on — and it is after multiple cycles that a detectable amount of virus is produced.
- According to the ICMR advisory, the Ct value of an RT-PCR reaction is the number of cycles at which fluorescence of the PCR product is detectable over and above the background signal.
- Put simply, the Ct value refers to the number of cycles after which the virus can be detected. If a higher number of cycles is required, it implies that the virus went undetected when the number of cycles was lower.
- The lower the Ct value, the higher the viral load — because the virus has been spotted after fewer cycles.

Why is it important?

- To put that in context, let us look at the ICMR advisory and Maharashtra's letter to ICMR. According to the ICMR, a patient is considered Covid-positive if the Ct value is below 35.
- In other words, if the virus is detectable after 35 cycles or earlier, then the patient is considered positive. If the benchmark were to be lowered to 24 — the value mentioned in Maharashtra's letter — it would mean that Ct values in the range 25-34 would not be considered positive.
- A benchmark of 35, therefore, means that more patients would be considered positive than we would get if the benchmark were 24. The ICMR has said lowering Ct threshold parameter may lead to missing several infectious persons.

What is the significance of the ICMR threshold of 35?

- Globally, the accepted cut-off for Ct value for Covid-19 ranges between 35 and 40, depending on instructions from the respective manufacturers of testing equipment.
- The ICMR has arrived at the Ct value of 35 based on laboratory experiences and inputs taken from several virology labs.
- There was no new advisory, but ICMR informed the Maharashtra government that it was not advisable to use a lower cycle threshold parameter as it would lead to missing several infectious persons and increase disease transmission.

Is there any correlation between a Ct value and severity of disease?

- No. Although Ct value is inversely correlated with viral load, It does not have any bearing on the severity of the disease, experts have said.
- A patient can have a low Ct value, which means her viral load is high enough to be detected rapidly, but she may still be asymptomatic.
- A small study published in the Indian Journal of Medical Microbiology in January this year found that there was no correlation between Ct values and severity of disease or mortality in patients with Covid-19 disease.
- It found that the time since the onset of symptoms has a stronger relationship with Ct values as compared to the severity of the disease.

Project Dantak

(Source: [PIB](#))

Context: *Project DANTAK completes 60 years in Bhutan.*

About Project Dantak:

- Dantak is a BRO project that was initiated in 1961.
- It is headquartered at Simtokha, near Thimphu under a Chief Engineer.
- Project DANTAK has constructed, under GOI funding, over 1500 km of roads through very difficult mountainous terrain in Bhutan.
- Identifying the utmost importance of connectivity in the socio-economic development and growth of Bhutan, DANTAK was mandated with constructing motorable roads in the Himalayan kingdom.
- Project Dantak has built all the major highways such as the East-West highway (548 km) and Thimphu-Phuentsholing highway (181 km), airfields at Paro and Yangphula and airport terminal at Paro, a number of helipads, the Indo- Bhutan microwave link, Bhutan Broadcasting Station, India House Complex, Chhukha Hydroelectric Housing Complex, Power sub-stations, river training works, and several important buildings (including SAARC Convention Centre).
- The medical and educational facilities established by DANTAK in far flung areas were often the first in those locations.

'Large Area Certification' scheme

(Source: [PIB](#))

Context: *Department of Agriculture, Cooperation and Farmers' Welfare (DAC&FW) is working to identify Traditional Organic Areas to transform them into certified organic production hubs.*

What's in the news?

- The Government of India has certified 14,491 ha of such area under Car Nicobar and Nancowry group of islands in the Andaman and Nicobar Islands.
- This area becomes the first large contiguous territory to be conferred with **organic certification under the 'Large Area Certification' (LAC) scheme** of the PGS-India (Participatory Guarantee System) certification programme.
- Under LAC, each village in the area is considered as one cluster/group.
- All farmers with their farmland and livestock need to adhere to the standard requirements and on being verified get certified en mass without the need to go under conversion period.
- Certification is renewed on annual basis through verification by a process of peer appraisals as per the process of PGS-India.
- The LAC is a quick certification programme under the Paramparagat Krishi Vikas Yojana.

Benefits of LAC:

- As per the established norm of organic production systems, the areas having chemical input usage history are required to undergo a transition period of minimum 2-3 years to qualify as organic.
- During this period, farmers need to adopt standard organic agriculture practices and keep their farms under the certification process.



- On successful completion, such farms can be certified as organic after 2-3 years. The certification process also requires elaborate documentation and time to time verification by the certification authorities.
- Whereas under LAC requirements are simple and the area can be certified almost immediately.
- LAC is a quick certification process that is cost-effective and farmers do not have to wait for 2-3 years for marketing PGS organic certified products.

Aditya-L1 Support Cell (AL1SC)

(Source: [PIB](#))

Context: *A community service centre has been set up to bring all data on board India's first dedicated solar space mission to a single web-based interface enabling the users to quickly look at the data and identify the interesting science cases.*

About AL1SC:

- The community service centre is called Aditya-L1 Support Cell (AL1SC).
- It is a joint effort of the Indian Space Research Organisation (ISRO) and the Aryabhata Research Institute of Observational Sciences (ARIES), an autonomous institute of the Department of Science & Technology, Government of India.
- It will be used by the guest observers in analyzing science data and preparing science observing proposals.
- AL1SC set up at the transit campus of ARIES at Haldwani, Uttarakhand, will jointly work with ISRO to maximize utilization of science data from Aditya-L1 and facilitate India's first dedicated solar space mission, Aditya-L1.
- The centre will act as conduit between the users (student and faculty members from research institutes/universities/colleges, etc.) and payload teams of Aditya-L1 and the solar astronomy research community at large.
- It is slated to develop specific tools to assist guest observers/researchers to prepare observing proposals for Aditya-L1 observations and will assist ISRO with the design and development of the required analysis software for handling scientific data.
- The centre will also provide the co-aligned data from other observatories around the world that can complement the data obtained from Aditya-L1 allowing users to accomplish the science goals beyond the capabilities of the Aditya-L1.
- In addition to this, AL1SC will also build capacity by establishing periodic training of the national user community on data analysis and proposal preparation.

Python-5

(Source: [PIB](#))

Context: *DRDO conducts maiden trial of Python-5 Air to Air Missile.*

About Python-5:

- Python is a family of air-to-air missiles (AAMs) built by the Israeli weapons manufacturer Rafael Advanced Defense Systems.



- Now, India's indigenous Light Combat Aircraft Tejas has added the 5th generation Python-5 Air-to-Air Missile in its air-to-air weapons capability.
- Python 5 is the newest member in the range of Python AAMs.
- The successful trials were conducted by the DRDO in Goa.
 - Prior to these trials, extensive missile carriage flight tests were conducted at Bengaluru to assess integration of the missile with aircraft systems on board the [Tejas](#), like avionics, fire-control radar, missile weapon delivery system and the flight control system.
- The missile can engage enemy aircraft from very short ranges and near beyond visual range.
- Python-5 is considered among the most sophisticated guided missiles in the world.

Exercise Varuna 2021

(Source: [PIB](#))

Context: *Exercise Varuna 2021 concluded recently.*

About Exercise Varuna:

- Exercise Varuna is an Indo-French naval exercise that is held annually since .
- 2021 was the 19th edition of the exercise and it was held in the Arabian Sea.
 - From the Indian Navy's side, INS Kolkata guided missile stealth destroyer, INS Tarkash and INS Talwar guided missile frigates, INS Deepak Fleet Support Ship, with Seaking 42B and Chetak helicopters, a Kalvari-class submarine and P8I Maritime Patrol Aircraft participated.
- The "Varuna" joint exercise is part of the Clemenceau 2021 deployment the French Navy is conducting from February to June 2021 in the eastern Mediterranean, the Gulf and the Indian Ocean (Arabian Sea).
 - Its goal is to contribute to the stabilization of strategic zones and strengthening cooperation with the navies of partner countries, in particular India for the Indian Ocean component.
 - As part of this deployment, the carrier strike group is also taking part in anti-ISIS operations.
- The bilateral naval exercise was initiated in 1983 and it was christened 'Varuna' in 2001.

DRDO develops crystal blades for aero engines

(Source: [The Hindu](#))

Context: *In a major technological breakthrough, the Defence Research and Development Organisation (DRDO) said it has developed single crystal blade technology and supplied 60 of such blades to the Hindustan Aeronautics Limited (HAL) as part of their indigenous helicopter development programme for helicopter engine application.*

Details:

- "It is part of a programme taken up by the Defence Metallurgical Research Laboratory (DMRL), a laboratory of the DRDO, to develop five sets, 300 in number, of single crystal high pressure turbine (HPT) blades using a nickel-based super alloy," the DRDO said in a statement.
- The supply of the other four sets would be completed in due course, it said.
- **Very few countries such as the U.S., the U.K., France and Russia have the capability to design and manufacture such single crystal components**, it said. The DRDO has been working for a long time to develop this technology which is a critical component in aero engines.



- Helicopters need compact and powerful aero-engines for operating at extreme conditions and to achieve this, state-of-the-art single crystal blades having complex shape and geometry, manufactured out of nickel-based super alloys capable of withstanding high temperatures of operation are used.

Government of National Capital Territory of Delhi (Amendment) Act, 2021

(Source: [The Hindu](#))

Context: *The Ministry of Home Affairs issued a gazette notification stating that the provisions of the Government of National Capital Territory of Delhi (Amendment) Act, 2021, would be deemed to have come into effect from April 27.*

Details:

- The Act, which gives the Lieutenant-Governor of Delhi more teeth and significantly waters down the powers of both the elected government and the Legislative Assembly, will clarify the expression “Government” and address “ambiguities” in the legislative provisions to promote “harmonious relations between the legislature and the executive”.
- The move comes a day after the Delhi High Court cautioned the Delhi government to put its “house in order” over the issue of inadequate oxygen supply in the city, adding that the Centre would be asked to take over if it could not manage the situation.
- Coming as the development does in the middle of the COVID-19 pandemic, the Act is expected to trigger another round of confrontation between the L-G and the Delhi government under AAP.
- **The Act defines the responsibilities of the elected government and the L-G along with the “constitutional scheme of governance of the NCT” interpreted by the Supreme Court in recent judgments regarding the division of powers between the two entities.**
- It will also seek to ensure that the L-G is “necessarily granted an opportunity” to exercise powers entrusted to him **under proviso to clause (4) of Article 239AA of the Constitution.**
- This particular clause provides for a Council of Ministers headed by a Chief Minister for the NCT to “aid and advise the Lieutenant-Governor” in the exercise of his functions for matters in which the Legislative Assembly has the power to make laws.

‘Covaxin shields from B.1.617’

(Source: [The Hindu](#))

Context: *A study has found that people who have been vaccinated with Covaxin have protection against the double mutant (B.1.617) variant first found in India.*

Details:

- A preprint of the study carried out by the Indian Council of Medical Research (ICMR) and Bharat Biotech researchers has been posted in biorXiv. Preprints are yet to be peer-reviewed and published in medical journals.
- **An earlier study had found that Covaxin neutralises the B.1.1.7 variant first found in the U.K.**
- **The B.1.617 variant has two mutations — E484Q and L425R — of concern.**
- These mutations are found in the receptor-binding domain of the spike protein.

- Though how the two mutations behave individually is well-known, the combined effect of these mutations when present together is not known.

Oxygen Concentrators during COVID-19

(Source: [PIB](#))

Context: *As India battles the 2nd wave of the COVID-19 pandemic, the surge of new infections has resulted in an alarming increase in the number of active cases. The resultant stress on our public health infrastructure has led to a big spike in demand for oxygen concentrators.*

Details:

- To survive, we need a steady supply of oxygen, flowing from our lungs to various cells in the body. COVID-19 is a respiratory disease which affects our lungs and can cause the oxygen level to drop to dangerous levels.
- In such a situation, we would need to undergo what is known as oxygen therapy – using oxygen for medical treatment, to enhance our oxygen levels to clinically acceptable levels.
- Oxygen level is measured by oxygen saturation, known briefly as SpO₂. This is a measure of the amount of oxygen-carrying haemoglobin in the blood. A healthy individual with normal lungs, will have an arterial oxygen saturation of 95% – 100%.
- According to a WHO training manual on pulse oximetry, if the oxygen saturation is 94% or lower, the patient needs to be treated quickly. A saturation of less than 90% is a clinical emergency.
- Now, according to the latest clinical guidance for management of adult COVID-19 patients, issued by the Ministry of Health & Family Welfare, an oxygen concentration less than or equal to 93% on room air requires hospital admission, while that below 90% is classified as a severe disease, requiring admission in ICU.
- However, given the prevalent situation in the wake of the 2nd wave, we must do whatever we best can, in order to try and replenish our oxygen levels, in the event of delay or inability in getting hospital admission as per the clinical management protocol.



Oxygen Concentrator – how does it work ?

- We know that atmospheric air has roughly 78% nitrogen and 21% oxygen. Oxygen concentrators are simple devices which do precisely what its name promises – they take in ambient air and increase the oxygen concentration, by filtering out and throwing away nitrogen.
- These Oxygen concentrators work the same way in supplying oxygen needed by the body such as oxygen tanks or cylinders, with the use of a cannula, oxygen masks or nasal tubes.
- The difference is that, while the cylinders need to be refilled, the Oxygen Concentrators can work 24 x 7.

O2 Concentrators market in India

- India has seen a big spurt in manufacture and sale of Oxygen concentrators. Besides multi-national brands, several Indian start-ups, funded under the CAWACH (Centre for Augmenting War with Covid

19 Health Crisis) programme of Department of Science & Technology, have developed efficient and cost effective Oxygen Concentrators.

- Given their usefulness during the second wave of Covid Pandemic, 1 lakh Oxygen Concentrators are being procured through PM CARES fund.



INTERNATIONAL

The Lag B'Omer festival of Israel

(Source: [Indian Express](#))

Context: *At least 44 people were crushed to death in a stampede as tens of thousands of ultra-Orthodox Jews gathered in northern Israel to celebrate the annual Lag B'Omer festival. Over 150 people have also been injured in the stampede, with several in critical condition. The incident is widely being described as one of the country's deadliest civilian disasters.*

What is the Lag B'Omer festival?

- Lag B'Omer is an annual Jewish festival observed during the Hebrew month of Iyar. It is celebrated on the 33rd day of the Omer, the 49-day period between Passover and Shavuot.
- Lag B'Omer is the only day during the 49-day period when celebration is permitted.
- Hence, it is common for Jews to schedule weddings on this day every year. Young boys, who have reached the age of three, are also traditionally brought here for their first hair cut.
- To mark the occasion, tens of thousands of ultra-Orthodox Jewish pilgrims make their way to the base of Mount Meron every year, to pay their respects to Rabbi Shimon Bar Yochai, a second century sage and mystic, who is believed to have died on this day. The Rabbi's tomb is a much revered holy site in Israel.

Who was Rabbi Shimon?

- Rabbi Shimon was said to have been a gifted Talmudic scholar and a disciple of Rabbi Akiva, one of the greatest Jewish sages of all time.
- According to some accounts, Rabbi Shimon authored the 'Zohar', which is the main work of Kabbalah, or Jewish mysticism.
- Jews believe that on the day of his death, Rabbi Shimon told his disciples the many secrets of the Kabbalah, which some believe is how Lag B'Omer became a day of celebration. Bonfires are often lit on the day to represent the knowledge and wisdom he shared with his followers.
- Others believe that a deadly plague that killed 244,000 of Rabbi Akiva's followers ended on this day. Rabbi Shimon was said to have been among the few people who survived.

Supply Chain Resilience

(Source: [The Hindu](#))

Context: *The Supply Chain Resilience Initiative (SCRI) formally launched by the Trade Ministers of India, Japan and Australia brought a wary response from China, which has described the effort as 'unrealistic'.*

Details:

- The three sides agreed the pandemic "revealed supply chain vulnerabilities globally and in the region" and "noted the importance of risk management and continuity plans in order to avoid supply chain disruptions".
- Some of the joint measures they are considering include supporting the enhanced utilisation of digital technology and trade and investment diversification, which is seen as being aimed at reducing their reliance on China.

- “The SCRI aims to create a virtuous cycle of enhancing supply chain resilience with a view to eventually attaining strong, sustainable, balanced and inclusive growth in the region,” a statement said.

The SIPRI report

(Source: [Indian Express](#))

Context: *In its report on trends in global military expenditure in 2020, the Stockholm International Peace Research Institute (SIPRI) has found that the world’s top military spenders — the US, China and India — saw their military spending go up compared to 2019, even during a pandemic year.*

Details:

- Last year, the US spent a total of \$778 billion, China spent \$252 billion and India’s military expenditure was \$72.9 billion.
- While India’s spending since 2019 grew by 2.1 per cent, the increase for China was more moderate, at 1.9 per cent. The US saw a 4.4 per cent growth over its 2019 expenditure.
- In total, the global military expenditure rose to \$1981 billion last year, an increase of 2.6 per cent in real terms from 2019, the report said.
- It mentioned that the “2.6 per cent increase in world military spending came in a year” when the global GDP shrank by 4.4 per cent (October 2020 projection by the International Monetary Fund), “largely due to the economic impacts of the Covid-19 pandemic”.

What SIPRI does

- The Sweden-based SIPRI is an independent international institute dedicated to research into conflict, armaments, arms control and disarmament.
- It was established on the basis of a decision by the Swedish Parliament and receives a substantial part of its funding in the form of an annual grant from the Swedish Government.
- Established in 1966, SIPRI provides data, analysis and recommendations, based on open sources, to policymakers, researchers, media and the interested public.

What the 2020 report says

- In 2020, the United States’ military spending was 3.7 per cent of its GDP while the corresponding numbers for China and India were 1.7 per cent and 2.9 per cent respectively.
- From 2011 to 2020, American military expenditure dropped by 10 per cent, but China saw a 76 per cent growth while India’s military spending grew by 34 per cent.
- SIPRI said that military spending in Asia and Oceania “was 2.5 per cent higher in 2020 than in 2019 and 47 per cent higher than in 2011, continuing an uninterrupted upward trend since at least 1989” and attributed the rise “primarily to increases in spending by China and India, which together accounted for 62 per cent of total military expenditure in the region in 2020”.
- The other top spenders included Russia with \$61.7 billion, the UK at \$59.2 billion, Saudi Arabia at \$57.5 billion, followed by Germany and France at just under \$53 billion each.
- Releasing the latest data, SIPRI said that the total “global military expenditure rose to \$1981 billion last year, an increase of 2.6 per cent in real terms from 2019” and the “five biggest spenders in 2020, which together accounted for 62 per cent of global military expenditure”.
- As a consequence of the reduction in global GDP last year, it said that “military spending as a share of GDP—the military burden—reached a global average of 2.4 per cent in 2020, up from 2.2 per cent in 2019,” which, it said, “was the biggest year-on-year rise in the military burden since the global financial and economic crisis in 2009”.

- While military spending did rise globally, some countries explicitly reallocated part of their planned military spending to pandemic response, such as Chile and South Korea, and many others, including Brazil and Russia, spent considerably less than their initial military budgets for 2020, the report said.

International Space Station

(Source: [The Hindu](#))

Context: *The International Space Station (ISS) is a landmark of international cooperation. For over 20 years, it has seen intense collaboration between the U.S., Russia, the EU, Japan and Canada, and has played host to people from 19 countries since its launch in 1998. This scenario appears to be coming to an end, as Russian space agency Roscosmos's chief has declared that Russia is ready to build its own space station and launch it by 2030 if President Vladimir Putin would give the go ahead. Further, in an interview to Russian TV, Deputy Prime minister Yuri Borisov said Russia would give notice and leave the ISS by 2025.*

About ISS

- The idea of the ISS was born in 1984 when Ronald Reagan, then the US President, announced it in a State of the Union address.
- Since then, the ISS project saw a collaboration grow between several countries, mainly the following space agencies: NASA (U.S.), Roscosmos (Russia), ESA (Europe), JAXA (Japan) and CSA (Canada). Though the programme began in 1993, the construction of the station started only in 1998.
- The ISS has been assembled section by section over several years. The first segment was launched on November 20, 1998 in a Russian proton rocket named Zarya (which means 'sunrise').
- The first human expedition to the station was launched in a Soyuz TM 31 rocket from Baikonur Cosmodrome in Kazakhstan. This crew became the very first to inhabit the ISS — these were NASA astronaut Bill Shepard and Yuri Gidzenko and Sergei Krikalev from Roscosmos, who reached the station on November 2, 2000 and stayed for several months.
- The assembling of the ISS has been a complex undertaking in itself. It took over 10 years and over 30 missions to bring it to its present form.
- Though the basic unit was launched in 1998, a photograph of the station taken in September 2000 from spaceship Atlantis looked markedly different from a picture taken in October 2018 by Expedition 56 members after undocking in a Soyuz spacecraft. Installation of different parts took place on close to 40 different occasions from 1998 to 2020.

Physics experiments

- Some of the early physical sciences experiments related to crystal growth. The newer ones study the behaviour of free-flying soccer balls in microgravity.
- More exotic sounding subjects include Janus particles, or particles that have two 'faces' with distinct properties — one side is hydrophobic and avoids water, while the other is hydrophilic and loves water.
- Studying these in microgravity reveals the fundamental physics behind microparticle self- assembly and the kinds of colloidal structures that can be fabricated.
- Do these experiments justify the amount of money that is spent on the ISS? There is a debate. It costs NASA about \$3 billion to \$4 billion a year just to maintain the station, and the total spending had gone up to \$100 billion in 2018 itself. Would it be more fruitful to invest in space-based telescopes or missions other than the ISS?
- Under the Donald Trump administration, the U.S. reached out to private firms to participate in the space expeditions. American space research had been a governmental activity until this development. This showed NASA the way to cut the huge payments it had been making to Russia to ferry astronauts back and forth. The commercial equation was disrupted once again.



- For over 20 years, the ISS has remained an ideal of global unity and peace, at least in the realms of space. Will there be another such expensive investment in the areas of science and technology? There is no answer now, but, so far, the ISS is unique in being one such ideal.

Oldest water on Earth

(Source: [Indian Express](#))

Context: While NASA's Perseverance rover has been making news since reaching Mars in February, a 2016 study by Canadian geologists is also eliciting significant interest, for the clues it offers in the search for alien life, especially on the Red Planet. The research, published in Nature Communications, is based on a discovery made by Dr Barbara Sherwood Lollar of the University of Toronto, who in 2009 extracted from a Canadian mine water that is 1.6 billion years old– the oldest to be found on our planet. The discovery of the water 2.4 km below the Earth's surface has since been heralded as one of great importance, given its ramifications on what we know about the origin and evolution of our planet, the nature of water and life, as well as the **possibility of finding life on Mars**.

The 'world's oldest water'

- Since 1992, Sherwood Lollar had been carrying out research at the Kidd Creek mine, located on the 2.7 billion-year-old Canadian Shield, one of the world's largest continental shields – meaning the oldest and least tectonically active parts of the Earth's crust.
- It was on an expedition in 2009 that a musty smell led Sherwood Lollar to make the crucial discovery. "It literally is following your nose right up to the rock, to find the crack or the fractures where the water is discharging," she told the magazine Maclean's. The water was highly saline– ten times saltier than sea water.
- According to the report, the researcher, who at the time was unaware of how old the water exactly was, sent a sample to UK's Oxford University, who informed her that it caused their mass spectrometer to break. Researchers then conducted studies for four years on the sample, finally settling at the 1.6 billion years figure.

What scientists found in the water

- Investigations into the highly saline water led to a pathbreaking discovery: scientists found that chemolithotrophic microbes– bacteria that can thrive in the most extreme surroundings– had been able to survive in the subterranean liquid.
- Researchers found that the microbes had been feeding on nitrogen and sulphate, and that the chemistry that supported them bore resemblance to ocean beds that are known to support similar such extreme life forms.
- As it happens, the Canadian Shield, on which the Kidd mine is located, in the past used to form an ocean floor, as per the report. Over millions of years of flux, however, its horizontal seabed became vertical, now preserved in the mine's rock walls from which the water sample was extracted.

Why this matters in the search for life on Mars

- Being a continental shield, which suffers the least from plate tectonic activity, the Canadian Shield is the closest analogue on Earth to the subsurface of Mars, researchers believe.
- Scientists argue that if life-supporting water can be found 2.4 km below the Earth, it may be possible that the same could be true in the case of the Red Planet. This hypothesis provides an impetus for missions like Perseverance, which are looking for signs of present or past life on Mars.

MOXIE

Context: *NASA has extracted oxygen from the carbon dioxide in the thin Martian atmosphere.*

Details:

- The unprecedented extraction of oxygen on Mars was achieved by a device called MOXIE aboard Perseverance, a six-wheeled science rover .
- It produced about 5 grams of oxygen, equivalent to roughly 10 minutes' worth of breathing for an astronaut.
- This is the first extraction of a natural resource from the environment of another planet.

About MOXIE:

- A technology demonstrator, MOXIE is designed to generate up to 10 grams of oxygen per hour, and is placed inside the Perseverance rover.
- It is the size of a car battery, weighing 37.7 pounds (17.1 kg) on Earth, but just 14.14 pounds (6.41 kg) on Mars.
- Over the next two years, MOXIE is expected to extract oxygen nine more times.

Why is producing oxygen on the Red Planet so important?

- Oxygen supply on Mars is essential for crewed missions to Mars– not just for astronauts to breathe but for rockets to use as fuel while coming back to Earth.
 - As per NASA, for four astronauts to take off from Mars, a future mission would require around 7 metric tons of rocket fuel and 25 metric tons of oxygen– around the weight of an entire space shuttle.
 - In contrast, **astronauts living and working on Mars would require far less oxygen to breathe**, maybe around one metric ton.
 - Thus, it will be an enormous challenge to haul the 25 metric tons of oxygen from Earth to Mars for the return journey, and that their job would become significantly easier if the liquified oxygen can be produced on the Red Planet.

Mains

GS II

Temples are not fiefdoms of the state

(Source: [The Hindu](#))

Context: No doubt the problem of hierarchical division in Hindu society is prevalent. But the issue of government control of temples is distinct from the issue of throwing open Hindu religious institutions to all classes and sections of society. To confuse the two is constitutionally misleading. Separate pieces of legislation exist — the [Madras] Temple Entry Authorisation Act, 1947 — to address these issues.

A myth

- A myth is trotted out to justify sovereign control of temples: that Hindu temples were supervised and managed by kings, who “habitually employed ministries to supervise temples and charitable bodies”. Like many myths the colonials perpetuated, this too must be disabused: there is not a shred of historical source to support this claim.
- On the contrary there are inscriptions, cast in stone, that attest that temples were managed wholly and entirely by local communities.
- Before turning to the solution, it would seem sensible to ask the question.

State in religion

- Why is the community demanding that the government stay away from temples? Unbridled corruption; theft and destruction.
- If the gross mismanagement of financial resources and indisputable corruption by the state along with the loss and destruction of temple antiquities were not sufficient reasons for the government to relinquish its (mis)management, a mere glance at state legislations will reveal a deeper malady.
- The state has assumed the role of religious functionaries to determine who will be heads of Mutts and the authority to conduct poojas.
- For example, The Shri Jagannath Temple Act, 1954 entrusted the committee appointed by the state with the task of ensuring the performance of seva pooja. When the Act was questioned by the Raja of Puri before the Supreme Court, in Raja Birakishore vs The State Of Orissa, the Court made a revelation: the performance of a puja is in fact a secular act and, therefore, the state is justified in its regulation.
- The exercise of state regulation of secular aspects of religion was taken to extreme lengths when the Court ruled that the state, by appointing temple priests, was exercising a secular function (Seshammal & Ors, Etc. Etc vs State Of Tamil Nadu).
- Whatever style of secularism we subscribe to, surely the Indian state is not to tell the believer how he/she is to offer worship to the deity nor is it to tell the custodian of the deity how she will be appointed.

Distinct aspects

- The writer of the article rightly points out that the Constituent Assembly framed the religious liberty clauses keeping in mind the historical prohibition of entry to certain classes and sections of Hindu society.
- Article 25(2) grants power to the State to enact law on two distinct aspects. Article 25(2)(a) empowers the state to regulate “economic, financial, political or other secular activities which may be associated

with religious practice”. Article 25(2)(b) enables the state to enact law to prohibit the exclusion of ‘classes and sections’ of Hindu society to enter into Hindu temples of a public character and also make law for social welfare and reform.

- Thus, the control of secular aspects associated with religion and the power to throw open Hindu temples to all classes and sections of society are distinct. The control of secular aspects is not a measure of any social reform.
- Viewed from this standpoint, the Hindu Religious and Charitable Endowments Department is not a “tribune for social justice” as argued in the article nor has it ever guaranteed equal access to worship.
- Nowhere does the text of the Constitution permit the state to assume ownership of properties belonging to religious institutions and treat them as state largesse to be siphoned off.
- The only vestige of authority under the Constitution empowering the state to take over property of religious institutions is under Article 31A(b). Even then it is doubtful that this article covers property belonging to religious sects.
- The history of legislative practice of endowment laws reveals the state prerogative in ensuring regulation of only secular activities. As a matter of fact, the Shirur Mutt case, while upholding certain provisions of the 1951 Act, struck down a major portion of the Act characterising the provisions as a “disastrous invasion” of religious liberty. In 1959, the Legislature ‘cured’ the defects pointed out by the Supreme Court, by inserting verbatim the very provisions that the Supreme Court had struck down in 1954.

Applicable to charities

- The Waqf Act justification for the legitimacy of control of Hindu religious endowments is misleading. A reading of the Act reveals that it applies to charities and specifically excludes places of worship such as mosques. In fact the scheme of the Waqf Act supports the argument that the government should not regulate places of worship.
- The most fundamental criticism against the release of Hindu temples from government control to the society is two-fold.
 - First, it is asked to whom will the temples be handed over to?
 - Second, once restored to the community, will it not perpetuate class hierarchies?
- What is being asserted by the community is the right of representation in the affairs of the management of temples.
- This right of representation can be effectuated by the creation of boards representative of religious heads, priests and responsible members from the dharmik sampradaya. The logic is simple. Members who profess a particular dharmik sampradaya will have its due interest in mind.

British legacy

- When the British government realised that a secular government should take no part in the management of religious institutions, it enacted the Religious Endowments Act (Act XX of 1863) repealing the pre-existing Bengal and Madras Regulations.
- Interestingly, in handing over the religious institutions to the society, it created committees in every district to exercise control over temples.
- Section 8 of the Act provided that the members of the committee to be appointed from persons professing the religion, for purposes of which the religious establishment was founded or maintained and in accordance with the general wishes of those who are interested in the maintenance of the institution.
- For this purpose the local government caused an election. In the spirit of equality of all religions, this scheme should be applicable to all religious institutions which would guarantee adequate community representation in the management of their places of worship.



Reforms in the National Pension System

(Source: [The Hindu](#))

Context: *Started as the New Pension Scheme for government employees in 2004 under a new regulator called the Pension Fund Regulatory and Development Authority (PFRDA), the National Pension System (NPS) has been open for individuals from all walks of life to participate and build a retirement nest-egg. Given the dominance of informal employment in India, the Employees' Provident Fund Organisation, which is contingent on a formal employer-employee relationship, only covers a fraction of the workforce. The NPS has been gradually growing in size and now manages ₹5.78 lakh crore of savings and 4.24 crore accounts in multiple savings schemes. Of these, over 3.02 crore accounts are part of the Atal Pension Yojana (APY), a government-backed scheme for workers in the unorganised sector that assures a fixed pension payout after retirement. The rest constitute voluntary savings from private sector employees and self-employed individuals, for whom some significant changes are on the anvil.*

What overhaul is the PFRDA planning?

- The law regulating the NPS allows members to withdraw just 60% of their accumulated savings at the time of retirement.
- With the remaining 40%, it is mandatory to buy an annuity product that provides a fixed monthly income to retirees till their demise. Members who accumulate up to ₹2 lakh in their NPS account at the time of retirement are exempted from the mandatory annuitisation, and can withdraw the full amount.
- Last week, PFRDA chairman Supratim Bandyopadhyay said this limit will soon be revised to ₹5 lakh. Separately, the regulator has decided that the annuity purchase stipulation for 40% of members' retirement corpus should be dropped altogether. Legislative amendments to this effect are being worked out for Parliament's approval.

What prompted this rethink?

- Falling interest rates and poor returns offered by annuity products had triggered complaints from some members and experts about the compulsory annuitisation clause.
- With retail inflation running at about 5%-6% over the past year, the returns on annuities are, in fact, negative, even if one does not factor in the tax.
- To avoid forcing people into such an unattractive investment, the regulator has now proposed to give members a choice to retain 40% of their corpus with the NPS fund managers even after retirement.
- This, the PFRDA chief believes, will allow them to get better returns, and these savings can be paid out to members over 15 years through something like the systematic withdrawal plan offered by mutual funds.
- While this change shall need Parliament's nod, the expansion of the annuity-free withdrawal limit from ₹2 lakh to ₹5 lakh is being done immediately.
- "Suppose somebody reached ₹2.1 lakh at retirement, he will get an annuity component of ₹84,000, which, today, will give an income of ₹400 or ₹450 a month — a pittance. So, now, we will allow those with savings up to ₹5 lakh to take the entire corpus out if they choose," the PFRDA chief said.

Are there any other tweaks in the works?

- While different schemes under the NPS have given reasonable returns at a low fund-management cost so far, there has been a clamour for a guaranteed return product for large sections of potential investors with a high aversion to risk. An actuary is being appointed to suggest the design for such a product and the PFRDA hopes to launch its first guaranteed product soon.
- At least three more fund managers are expected to be appointed soon, which will take the total managers to ten. Age restrictions to join the NPS are also being eased to allow people to join the scheme up to the age of 70 years, from 65 years earlier.



- The reason is that over 15,000 recent NPS members joined after the age of 60 since the age limit was raised to 65 years from 60 years in 2017. So, as Indians' overall longevity improves, the population of "retired, but not so tired" will also have access to the NPS.

India-Bangladesh

(Source: [The Hindu](#))

Context: *Bangladesh and India both celebrated the golden jubilee of Bangladesh's Independence recently, alongside the birth centenary of 'Banghabandu' Sheikh Mujibur Rahman. There was a predictable outburst of warm sentiments witnessed in Bangladesh on this occasion, but celebrations in India were on an extremely low key. The creation of Bangladesh — from the ashes of East Pakistan — is presumably India's finest foreign policy triumph till date, and it defies imagination why India has been so reticent in acknowledging this fact.*

The architect, India's stand

- A plausible reason put forward in certain quarters is that it possibly meant acknowledging the role of former Prime Minister Indira Gandhi in this seminal event, as she is widely acknowledged to be the real architect of this triumph, notwithstanding claims put forward by many a swashbuckling General and others in uniform.
- Hopefully this canard is not true, though she is currently being demonised for her so-called sins of commission and omission. It would amount to ignoring historical facts, for without Prime Minister Indira Gandhi, it is difficult to conceive of India pulling off such a triumph.
- This may sound like exaggerated praise, but anyone who had an opportunity to witness Mrs. Indira Gandhi's steely resolve during that period — as for instance when it was communicated to her during a meeting of the War Cabinet, that the U.S. Seventh Fleet (which included the nuclear powered aircraft carrier, Enterprise) was steaming up the Bay of Bengal, will hardly dispute this fact. Displaying no signs of diffidence, she made it clear that it made little difference to the cause that they had embarked upon.
- Few nations across the world can possibly boast of an achievement of this nature. What is even more noteworthy is that while accomplishing this task, India did not claim any 'spoils of victory'. After Pakistan's defeat in East Pakistan, India voluntarily and unconditionally, handed over power to the elected representatives of the newly established nation. Such magnanimity is seldom seen in the annals of world politics.

A year of significance

- Not too many among the current generation would remember that 1971 was a signal year for India. It was in 1971 that India had extended all out support to the Government in Sri Lanka to defeat the group, the Janatha Vimukthi Peramuna in that country.
- And, 1971 was again the year in which India contributed to the establishment of a new nation, Bangladesh, which was carved out of East Pakistan following a pogrom launched by the military rulers in Islamabad, that was unmatched in modern times. Half-a-century later, India would have done well to highlight and remind the world of these two events, to further embellish its democratic credentials.
- While India was busy scripting a new destiny for the people of East Pakistan, millions of refugees from East Pakistan were streaming into India. What was especially striking was that despite such a calamitous situation, and the strain on its resources, the Government of the day acted with extreme circumspection and did not give in to the rising clamour for any kind of premature military intervention in East Pakistan. It was to adhere to this position till Pakistan declared war on India in December 1971.

- Meantime, Sheikh Mujibur Rahman had been arrested and flown to West Pakistan. Tajuddin Ahmad had been secretly sworn in as the Prime Minister of an independent Bangladesh and installed in Mujibnagar, from where the new government-in-exile operated till the liberation of East Pakistan.
- India well recognised that before India could legitimately intervene in East Pakistan, the new government-in-exile had to acquire legitimacy, both within East Pakistan and also internationally. All this demonstrated political finesse of the highest order. It was not easy with over five million refugees coming into the country, conveying gruesome tales of untold atrocities.

Coordination and the goal

- At the diplomatic level, India did not act entirely alone. Prime Minister Indira Gandhi's carefully crafted diplomatic dispatches to world leaders had helped create a groundswell of support for the persecuted Bengalis of East Pakistan.
- The signing of the Indo-Soviet Treaty in August 1971 came as a shot-in-the-arm for India, encouraging it to stay the course. Russia's action was in marked contrast to the stand of western nations such as the United States which displayed hostility to India's efforts, viewing it as an encouragement to the forces seeking to dismember the state of Pakistan.
- Within the country, regular meetings and the constant dialogue with Opposition leaders ensured that India acted in a united manner, notwithstanding the public clamour for immediate action.
- India sought to intervene in East Pakistan, only after Pakistan attacked India on December 3, 1971.
- Three days later on December 6, India made the formal announcement of recognising the new state of Bangladesh, almost nine months after the Peoples' Republic of Bangladesh had been proclaimed by Sheik Mujibur Rahman. Still later in March 1972, India and Bangladesh signed a Treaty of Peace and Friendship.
- The events spread over several months that culminated in the emergence of a new nation, became possible only because of close coordination among the various limbs of the Government, which acted in concert to achieve the cardinal objective, viz., that the struggle of the people of East Pakistan should not go in vain.
- The West, however, erroneously believed the humanitarian disaster notwithstanding, that it could not let down its ally Pakistan, which was a member of several western-led military alliances. Quite a few other nations, while sympathetic to the plight of the beleaguered population of East Pakistan, were unwilling to extend support fearing the wrath of the U.S.

Operating from the shadows

- A great deal has been written about the military exploits in connection with the formation of Bangladesh — of the Indian Army, the Indian Navy and the Indian Air Force. Very little has, however, been mentioned about the role of the intelligence agencies.
- Understandably so, since the intelligence agencies do not publicise their exploits and operate behind an iron curtain.
- Fifty years after Bangladesh gained Independence, it may, however, be time to give a pat on the back of the two principal intelligence agencies at the time — the Intelligence Bureau (IB) and the Research & Analysis Wing (R&AW/RAW).
- A vast network of agents had been created by the IB well before the organisation was bifurcated in 1968 into the IB and the R&AW, and the latter built on these assets. These agents played a critical role behind the scenes, preparing the ground for the eventual collapse of Pakistani Army resistance in East Bengal.
- At the risk of violating a cardinal rule of intelligence, it might also be the opportune moment to pay a silent tribute to one of the most outstanding secret agents of recent times, whose name and pseudonym will, however, have to remain a secret, but whose exploits were no less than that of the most celebrated spy of World War II, Richard Sorge.
- The time has also come to acknowledge the role of the Mukti Bahini — the Army of Bangladeshi irregulars — fashioned by the intelligence agencies which played a key role during the conflict. This seldom happens, but is worth a mention, at least in a newspaper article.

- The ultimate accolade for India's role in creating a new nation is that Bangladesh is today a relatively prosperous country, having made steady progress from the category of a Least Developed Country to a Developing country.
- Bangladesh "will get time up to 2026 to prepare for the transition to the status of a developing country". Few countries across the world expected the new nation to survive, let alone thrive, given that the nascent Bangladesh Government was functioning under an untested leader, Sheikh Mujibur Rahman; the country had been born amidst widespread and unprecedented violence and upheaval, possessed scarce resources, and was riven with internecine differences.

Bangladesh today

- Today, Bangladesh is a shining example of what is possible through human endeavour and a wise leadership. It has not allowed itself to be drawn into the vortex of foreign influences, and maintains an independent foreign policy.
- Relations with India are excellent today, though there have been periods when relations were not all that cordial. Currently, Bangladesh's annual GDP growth exceeds that of its erstwhile parent, Pakistan. Women empowerment has been a major catalyst in Bangladesh's progress, and this is largely responsible for transforming the country.
- India's achievement in enabling the people of East Pakistan to carve out a separate destiny for themselves and achieve full freedom from Islamabad, well mirrors what can be achieved when the political, diplomatic, military, intelligence and civil segments act in a coordinated manner under a firm and far-sighted political leadership. This is the acid test for any future eventuality of this nature.

A case for judicial federalism

(Source: [The Hindu](#))

Context: *In the face of a de facto COVID-19 health emergency, the High Courts of Delhi, Gujarat, Madras and Bombay, among others, have done exactly that. They considered the pleas of various hospitals for oxygen supply. The Gujarat High Court issued a series of directions, including for laboratory testing and procurement of oxygen. The Nagpur Bench of the Bombay High Court was constrained to hold night sittings to consider the issue of oxygen supply. It directed immediate restoration of oxygen supply that had been reduced from the Bhilai steel plant in Chhattisgarh. The Delhi High Court directed the Central government to ensure adequate measures for the supply of oxygen. It cautioned that we might lose thousands of lives due to lack of oxygen.*

Transfer of cases

- On April 22, the Supreme Court took suo motu cognisance of the issue in 'Re: Distribution of Essential Supplies and Services During Pandemic'.
 - It said, "Prima facie, we are inclined to take the view that the distribution of these essential services and supplies must be done in an even-handed manner according to the advice of the health authorities" and asked the Central government to present a national plan. In addition, it issued an order asking the State governments and the Union Territories to "show cause why uniform orders" should not be passed by the Supreme Court. The court thus indicated the possibility of transfer of cases to the Supreme Court, which it has done on various occasions before.
- Under Article 139A of the Constitution, the Supreme Court does have the power to transfer cases from the High Courts to itself if cases involve the same questions of law.



- However, what make the court's usurpation disturbing are two well-founded observations regarding its contemporary conduct.
 - One, the court has been indifferent to the actions and inactions of the executive even in cases where interference was warranted, such as the Internet ban in Kashmir.
 - Two, where effective remedies were sought, when activists and journalists were arrested and detained, the court categorically stayed aloof. It acted as if its hands were tied. Lawyers will find it difficult to recall a significant recent case of civil liberty from the court where tangible relief was granted against the executive, except for rhetorical statements on personal liberty.
- These features, coupled with the unhealthy characteristics of an executive judiciary, makes the court's indication for a takeover disturbing. On April 23, presumably due to widespread criticism of the court's move, especially from a section of the legal fraternity, the court backtracked and simply adjourned the case.
- The matter might be heard by the Supreme Court in the coming days. Significantly, the developments so far offer some crucial lessons for judicial federalism in India.
- The very fact that many from different High Court Bar Associations spoke up against the move to transfer the cases from the High Courts to the Supreme Court is a positive signal that underlines re-emergence of internal democracy within the Bar.
- In the Supreme Court, the judges sit in Benches of two or more. The purpose of this practice is to encourage deliberation on the Bench to have a higher level of deliberative justice. This necessarily presupposes dissent. A characteristic feature of the apex court in the recent years is general lack of dissent in issues that have serious political ramifications. This deficit occurs not only in the formally pronounced judgments and orders; dissenting judges on the Bench are rare, and the hearing on the COVID-19 case was no exception.
- According to the Seventh Schedule of the Constitution, public health and hospitals come under the State List as Item No. 6. There could be related subjects coming under the Union List or Concurrent List.
- Also, there may be areas of inter-State conflicts. But as of now, the respective High Courts have been dealing with specific challenges at the regional level, the resolution of which does not warrant the top court's interference.
- In addition to the geographical reasons, the constitutional scheme of the Indian judiciary is pertinent. In *L. Chandra Kumar v. Union of India* (1997), the Supreme Court itself said that the High Courts are "institutions endowed with glorious judicial traditions" since they "had been in existence since the 19th century and were possessed of a hoary past enabling them to win the confidence of the people".
- Even otherwise, in a way, the power of the High Court under Article 226 is wider than the Supreme Court's under Article 32, for in the former, a writ can be issued not only in cases of violation of fundamental rights but also "for any other purpose". This position was reiterated by the court soon after its inception in *State of Orissa v. Madan Gopal Rungta* (1951).

Autonomy is the rule

- Judicial federalism has intrinsic and instrumental benefits which are essentially political. The United States is an illustrative case. Scholar G. Alan Tarr of Rutgers University hinted, "Despite the existence of some endemic and periodical problems, the American system of judicial federalism has largely succeeded in promoting national uniformity and subnational diversity in the administration of justice".
- Justice Sandra Day O'Connor rightly said in a 1984 paper that the U.S. Supreme Court reviews "only a relative handful of cases from state courts" which ensures "a large measure of autonomy in the application of federal law" for the State courts.
- This basic tenet of judicial democracy is well accepted across the courts in the modern federal systems. The need for a uniform judicial order across India is warranted only when it is unavoidable — for example, in cases of an apparent conflict of laws or judgments on legal interpretation.
- Otherwise, autonomy, not uniformity, is the rule. Decentralisation, not centrism, is the principle. In the COVID-19-related cases, High Courts across the country have acted with an immense sense of judicial

responsibility. This is a legal landscape that deserves to be encouraged. To do this, the Supreme Court must simply stay away.

Undermining ‘vaccination for all’

(Source: [The Hindu](#))

Context: *Just when the spread of COVID-19 has reached catastrophic proportions, with the daily case-load rising faster than that seen anywhere in the world since the beginning of the novel coronavirus pandemic, the Government of India has acted by unveiling a completely revamped vaccine strategy.*

Details:

- Two key elements are the hallmark of this new strategy, which will be implemented from May 1.
 - First, the phased roll-out of the vaccination drive initiated on January 16 under which the vaccine-eligible sections of the population were gradually increased, has now been extended to the entire adult population, namely, to those above 18 years.
 - Second, and more importantly, a significant deregulation of the vaccine market has been effected and vaccine manufacturers have the freedom to sell 50% of their vaccine production to State governments and private hospitals, and at prices that can be substantially higher than that hitherto fixed by the government.
 - A third element of the vaccine strategy, which was not announced formally, is a grant of ₹45 billion to the two vaccine manufacturers, the Serum Institute of India (SII) and Bharat Biotech, to boost their capacities.

Handing over the reins

- The new vaccine strategy raises a number of questions, not the least from the manner in which the central government has given up its control over the market for vaccines, a key feature of the vaccine roll-out plans thus far.
- This issue assumes further significance since the Government of India is well aware, as all public authorities around the world are, about the significance of vaccinating every citizen in the country; “none of us will be safe until everyone is safe”.
- It is, therefore, vitally important that public health authorities in the country take an objective view of the realities of the country before adopting strategies for vaccine availability, for this is absolutely critical for resetting lives and livelihoods disrupted by the pandemic. Several facts suggest that this has not done while rejigging the extant vaccine strategy.

Vaccine exports

- The phased roll-out of the government’s ambitious vaccination drive, beginning with health-care and frontline workers in January, followed by the gradual inclusion of senior citizens and people above 45 years in March and April, respectively, was in sync with the availability of vaccines in the country.
- Although SII, the largest vaccine producer, had initially promised to supply 100 million doses of vaccines a month, in reality it could provide between 50 million to 60 million doses. But, given that India too saw a degree of “vaccine-scepticism”, the Government of India found itself in a situation where it could promise exports of vaccines to 95 countries, mostly in Africa and Asia.
- Until now, nearly 142 million vaccine doses have been administered in the country, the third highest in the world. However, in terms of population share, less than 2% has received both vaccine doses, while less than 9% has received one dose.



- But there is one worrying facet, which is that a demand-supply mismatch has begun to appear as the coverage of the vaccine-eligible population expanded.
- The largest supplier, SII, gave two explanations for its inability to meet its commitments.
 - The first was that the United States Government had used a Cold War piece of legislation, the Defense Production Act, to restrict exports of vaccine culture and other essential materials.
 - Second, the company complained that it lacked the financial capacity to expand its production, requesting a grant of ₹30 billion from the government (<https://bit.ly/2S8z3iB>).

Onus on States

- It is the face of this vaccine supply-crunch that the government has announced the new vaccine strategy, by opening vaccination to all adults in the country, and allowing vaccine producers to sell 50% of their production directly to State governments and private hospitals.
- The new strategy shifts the onus onto the State governments, which have to take decisions regarding free vaccination for people above 18 years, while the central government would continue to support vaccination for people above 45 years, and health-care workers and frontline workers.
- The government has not fixed the vaccine prices and has allowed the producers to pre-declare the prices they would charge from the State governments and private hospitals, a sharp departure from the extant strategy.
- Thus far, government facilities have provided vaccines free of cost, while private facilities are allowed to charge no more than ₹250 per dose. The central government played the role of a sole procurement agency that helped in driving down prices, thus addressing the issue of affordable access to vaccines.
- However, the new strategy abandons this mechanism and fragments the market into three layers namely, central government procurement, State government procurement and the private hospitals. This layering of the market would allow the producers to charge high prices from the State governments and private hospitals.
- In fact, both SII and Bharat Biotech have immediately announced their intentions to raise vaccine prices. SII will sell Covishield to State governments and private hospitals would have at ₹400 and ₹600 per dose, respectively, while the corresponding figures for Bharat Biotech's Covaxin are ₹600 and ₹1,200 per dose.
- The new strategy would shift the burden of vaccination of the young population, namely, those between 18-44 years, entirely on the State governments. This implies that the vaccination of a significant section of the population depends on the financial health of each State government, resulting in inequitable access to vaccines across States.
- Moreover, given their poor state of finances, most State governments may not be able to procure the required number of vaccine doses to meet the demands of the targeted population. In such a situation, a large share of the vaccine quota (50% of domestic production) earmarked for the State governments and the private hospitals could end up with the latter.

In the U.S.

- The decision to substantially deregulate the vaccine market raises serious questions in view of the reported advance of ₹45 billion made by the Government of India to the two vaccine producers in India for expanding their production capacities.
- The Federal government in the United States has done similarly, providing financial support to vaccine producers, who are now set to rake in their billions by charging high prices.
- Several public interest groups in the U.S. have asked questions as to why the tax-paying public should bear the high prices of vaccines when Federal taxes have been used to beef up the vaccine producers.
- This question is more pertinent in India, where access to affordable vaccines is critical for ensuring "vaccination for all".

More open licensing needed



- It is somewhat ironic that the new vaccine strategy, which could undermine “vaccination for all”, comes from a country that has long championed the cause of access to affordable medicines in international forums.
- Rather than hand over the reins of price determination to the duopoly in the vaccine market, the government should have urgently addressed the serious doubts over affordability of vaccines by ensuring a competitive market for vaccines.
- According to recent estimates, existing producers in India will be unable to meet the country’s vaccine requirements by some distance, and therefore, India needs more vaccine manufacturers to ensure uninterrupted supply.
- One positive step that the government has taken in this direction is to increase production of Bharat Biotech’s vaccine through the involvement of three public sector undertakings, including Haffkine Institute.
- We would argue that there is a need for more open licensing of this vaccine to scale up production. This would enhance competition in the market, enabling the vaccines to reach every citizen in the country.

Antimicrobial resistance: the silent threat

(Source: [The Hindu](#))

Context: *Antimicrobial resistance (AMR), the phenomenon by which bacteria and fungi evolve and become resistant to presently available medical treatment, is one of the greatest challenges of the 21st century. World Health Organization Director-General Tedros Adhanom Ghebreyesus said in July 2020, “AMR is a slow tsunami that threatens to undo a century of medical progress”. AMR is already responsible for up to 7,00,000 deaths a year. Unless urgent measures are taken to address this threat, we could soon face an unprecedented health and economic crisis of 10 million annual deaths and costs of up to \$100 trillion by 2050.*

Diverse challenges

- AMR represents an existential threat to modern medicine. Without functional antimicrobials to treat bacterial and fungal infections, even the most common surgical procedures, as well as cancer chemotherapy, will become fraught with risk from untreatable infections.
- Neonatal and maternal mortality will increase. All these effects will be felt globally, but the scenario in the low- and middle-income countries (LMICs) of Asia and Africa is even more serious. LMICs have significantly driven down mortality using cheap and easily available antimicrobials.
- In the absence of new therapies, health systems in these countries are at severe risk of being overrun by untreatable infectious diseases.
- The challenges are complex. Drug resistance in microbes emerges for several reasons. These include the misuse of antimicrobials in medicine, inappropriate use in agriculture, and contamination around pharmaceutical manufacturing sites where untreated waste releases large amounts of active antimicrobials into the environment.
- All of these drive the evolution of resistance in microbes. This is compounded by the serious challenge that no new classes of antibiotics have made it to the market in the last three decades, largely on account of inadequate incentives for their development and production.
- A recent report from the non-profit PEW Trusts found that over 95% of antibiotics in development today are from small companies, 75% of which have no products currently in the market. Major pharmaceutical companies have largely abandoned innovation in this space.



- Tackling these diverse challenges requires action in a range of areas – in addition to developing new antimicrobials, infection-control measures can reduce antibiotic use. A mix of incentives and sanctions would encourage appropriate clinical use.
- At the same time, it is critical to ensure that all those who need an antimicrobial have access to it; 5.7 million people worldwide die annually because they cannot access drugs for infections that are treatable.
- Further, to track the spread of resistance in microbes, surveillance measures to identify these organisms need to expand beyond hospitals and encompass livestock, wastewater and farm run-offs. Finally, since microbes will inevitably continue to evolve and become resistant even to new antimicrobials, we need sustained investments and global coordination to detect and combat new resistant strains on an ongoing basis.

The way forward

- There is room, however, for cautious optimism. A multi-sectoral \$1 billion AMR Action Fund was launched in 2020 to support the development of new antibiotics, and the U.K. is trialling a subscription-based model for paying for new antimicrobials towards ensuring their commercial viability.
- This means that the government will pay upfront for these new antimicrobials, thereby delinking the life-saving value of the drugs from the volume of sales and providing an incentive for their production in market conditions that do not do so.
- Other initiatives focused on the appropriate use of antibiotics include Peru's efforts on patient education to reduce unnecessary antibiotic prescriptions, Australian regulatory reforms to influence prescriber behaviour, and initiatives to increase the use of point-of-care diagnostics, such as the EU-supported VALUE-Dx programme.
- Beyond human use, Denmark's reforms to prevent the use of antibiotics in livestock have not only led to a significant reduction in the prevalence of resistant microbes in animals, but also improved the efficiency of farming.
- Finally, given the critical role of manufacturing and environmental contamination in spreading AMR through pharmaceutical waste, there is a need to look into laws such as those recently proposed by India, one of the largest manufacturers of pharmaceuticals, to curb the amount of active antibiotics released in pharmaceutical waste.
- While the range of initiatives that seek to control the emergence and spread of AMR is welcome, there is a need to recognise the limitations of a siloed approach.
- Current initiatives largely target individual issues related to AMR (such as the absence of new antibiotics, inappropriate prescription and environmental contamination) and consequently, narrowly defined groups of stakeholders (providers, patients and pharmaceutical companies).
- Regulating clinician prescription of antimicrobials alone would do little in settings where patient demand is high and antimicrobials are freely available over-the-counter in practice, as is the case in many LMICs.
- Efforts to control prescription through provider incentives should be accompanied by efforts to educate consumers to reduce inappropriate demand, issue standard treatment guidelines that would empower providers to stand up to such demands, as well as provide point-of-care diagnostics to aid clinical decision-making.
- Policy alignment is also needed much beyond the health system. Solutions in clinical medicine must be integrated with improved surveillance of AMR in agriculture, animal health and the environment. This means that AMR must no longer be the remit solely of the health sector, but needs engagement from a wide range of stakeholders, representing agriculture, trade and the environment with solutions that balance their often-competing interests.
- Finally, successful policies in individual countries are no guarantee of global success. International alignment and coordination are paramount in both policymaking and its implementation. Indeed, recent papers have proposed using the Paris Agreement as a blueprint for developing a similar global approach to tackling AMR.

- With viral diseases such as COVID-19, outbreaks and pandemics may be harder to predict; however, given what we know about the “silent pandemic” that is AMR, there is no excuse for delaying action.

Making social welfare universal

(Source: [The Hindu](#))

Context: *India is one of the largest welfare states in the world and yet, with COVID-19 striking in 2020, the state failed to provide for its most vulnerable citizens. The country witnessed multiple crises: mass inter- and intra-migration, food insecurity, and a crumbling health infrastructure. The extenuating circumstances of the pandemic has pushed an estimated 75 million people into poverty. The second wave has brought even the middle and upper-class citizens to their knees. Economic capital, in the absence of social capital, has proven to be insufficient in accessing healthcare facilities. Illness is universal, but healthcare is not.*

Absorbing shocks

- The country has over 500 direct benefit transfer schemes for which various Central, State, and Line departments are responsible.
- However, these schemes have not reached those in need. The pandemic has revealed that leveraging our existing schemes and providing universal social security is of utmost importance. This will help absorb the impact of external shocks on our vulnerable populations.
- An example of such a social protection scheme is the Poor Law System in Ireland. In the 19th century, Ireland, a country that was staggering under the weight of poverty and famine, introduced the Poor Law System to provide relief that was financed by local property taxes.
- These laws were notable for not only providing timely assistance but maintaining the dignity and respectability of the poor while doing so. They were not designed as hand-outs but as necessary responses to a time of economic crisis.
- Today, the social welfare system in Ireland has evolved into a four-fold apparatus that promises social insurance, social assistance, universal schemes, and extra benefits/supplements.
- A similar kind of social security system is not unimaginable in India. We have seen an example of a universal healthcare programme that India ran successfully — the Pulse Polio Universal Immunisation Programme.
- In 2014, India was declared polio-free. It took a dedicated effort over a number of years. However, it shows us what is possible. With the advancements in knowledge and technology, a universal coverage of social welfare is possible in a shorter time frame.

Ease of application

- Existing schemes cover a wide variety of social protections. However, they are fractionalised across various departments and sub-schemes. This causes problems beginning with data collection to last-mile delivery.
- Having a universal system would improve the ease of application by consolidating the data of all eligible beneficiaries under one database. It can also reduce exclusion errors. The Pradhan Mantri Garib Kalyan Yojana (PMGKY) is one scheme that can be strengthened into universal social security.
- It already consolidates the public distribution system (PDS), the provision of gas cylinders, and wages for the MGNREGS.
- Generally, social assistance schemes are provided on the basis of an assessment of needs. Having a universal scheme would take away this access/exclusion barrier. For example, PDS can be linked to a universal identification card such as the Aadhaar or voter card, in the absence of a ration card.



- This would allow anyone who is in need of foodgrains to access these schemes. It would be especially useful for migrant populations. Making other schemes/welfare provisions like education, maternity benefits, disability benefits etc. also universal would ensure a better standard of living for the people.
- To ensure some of these issues are addressed, we need to map the State and Central schemes in a consolidated manner. This is to avoid duplication, inclusion and exclusion errors in welfare delivery.
- Alongside, a study to understand costs of welfare access for vulnerable groups can be conducted. This will help give a targeted way forward. The implementation of any of these ideas is only possible through a focus on data digitisation, data-driven decision-making and collaboration across government departments.

The rising sun in India-Japan relations

(Source: [The Hindu](#))

Context: *Contrary to the expectations of many, Japanese Prime Minister Yoshihide Suga has turned out to be a true successor of his predecessor, Shinzo Abe, on the foreign policy front. His visit to the United States last month has set the agenda for the wider Indo-Pacific engagement of Tokyo and its evolving priorities.*

Focus on China

- Right at the outset, it was clear that the crux of the discussions during this first in-person meeting between the newly anointed President of the United States, Joe Biden, and Mr. Suga would revolve around China.
- To begin with, Tokyo and Washington drilled down to brass tacks on their joint security partnership given the need to address China's recent belligerence in territorial disputes in the South and East China Seas as well as in the Taiwan Strait. Both sides affirmed the centrality of their treaty alliance, for long a source of stability in East Asia, and pledged to stand up to China in key regional flashpoints such as the disputed Senkaku Islands and Taiwan.
- Reflecting the changed nature of conflict, both sides acknowledged the importance of extended deterrence vis-à-vis China through cooperation on cybersecurity and space technology.
- Discussions also touched upon Chinese ambitions to dominate the development of new age technologies such as 5G and quantum computing.
- Given China's recent pledge to invest a mammoth \$1.4 trillion in emerging technologies, Washington and Tokyo scrambled to close the gap by announcing a Competitiveness and Resilience Partnership, or CoRe.
- The two allies earmarked billions in funding for the deployment of secure 5G networks, committed to building digital infrastructure in developing countries and promised to collaborate on setting global digital standards.
- Both sides have also signalled their intent to continue the Trump-era policy of pressure on China to reform economic practices such as "violations of intellectual property rights, forced technology transfer, excess capacity issues, and the use of trade distorting industrial subsidies".
- Tokyo and Washington also rallied around the standard of shared values. Both powers repeatedly emphasised their vision of a Free and Open Indo-Pacific that respects the rule of law, freedom of navigation, democratic norms and the use of peaceful means to settle disputes.
- In the aftermath of the successful Quad Summit, both parties expressed their continued support for the four-nation grouping of the United States, India, Australia and Japan. China's human rights violations in Xinjiang, its heavy-handed suppression of protests in Hong Kong and military aggression towards Taiwan came in for heavy criticism.
- Given that the Japanese premier plans to visit India as soon as the situation permits following the COVID-19 pandemic, his dealings with the U.S. are a preview of what New Delhi can expect from Tokyo.

A preview

- First, one can expect a continuation of the balancing security policy against China that began with Prime Minister Narendra Modi and Shinzo Abe in 2014. During a phone call with the Indian Prime Minister, Mr. Suga expressed concern over China's "unilateral" actions in the East and South China Seas, Xinjiang and Hong Kong. Crucially, India's clashes with China in Galwan have turned public opinion in favour of a more confrontational China policy.
- In just a decade, New Delhi and Tokyo have expanded high-level ministerial and bureaucratic contacts, conducted joint military exercises and concluded military pacts such as the Acquisition and Cross-Servicing Agreement (ACSA) logistics agreement.
- Further, no meeting would be complete without an affirmation of New Delhi and Tokyo's support for a Free and Open Indo-Pacific and continued willingness to work with the Quad, which is fast emerging as a central pillar of the security strategies of both nations.
- A Modi-Suga meeting, accompanied by the planned 2+2 Ministerial meetings, will likely aim to take stock of the state of play in the security relationship while also pushing the envelope on the still nascent cooperation on defence technology and exports.

Technology partnership

- Second, the two powers will look to expand cooperation in sectors such as cybersecurity and emerging technologies. During the Shinzo Abe years, New Delhi and Tokyo put together a digital research and innovation partnership that ran the gamut of technologies from AI and 5G to the Internet of Things and space research.
 - As with the U.S.-Japan summit, Mr. Suga and Mr. Modi may look to deepen cooperation between research institutes and expand funding in light of China's aforementioned technology investment programme.
 - It is yet unclear whether Mr. Suga will attempt to stir the pot and bring up the disagreements over India's insistence on data localisation and continued reluctance to accede to global cybersecurity agreements such as the Budapest Convention.
- Third, economic ties and infrastructure development are likely to be top drawer items on the agendas of New Delhi and Tokyo. While Japan has poured in around \$34 billion in investments into the Indian economy over the course of the last two decades, Japan is only India's 12th largest trading partner, and trade volumes between the two stand at just a fifth of the value of India-China bilateral trade.
- A Modi-Suga summit will likely reaffirm Japan's support for key manufacturing initiatives such as 'Make in India' and the Japan Industrial Townships.
- Further, India will be keen to secure continued infrastructure investments in the strategically vital connectivity projects currently under way in the Northeast and the Andaman and Nicobar Islands.

Third country outlook

- Finally, a Suga-Modi Summit would undoubtedly devote much attention to evolving a joint strategy towards key third countries and multilateral bodies.
- In years past, New Delhi and Tokyo have collaborated to build infrastructure in Iran and Africa, provide vital aid to Myanmar and Sri Lanka and hammer out a common Association of Southeast Asian Nations outreach policy in an attempt to counter China's growing influence in these corners of the globe.
- However, unlike previous summits, the time has come for India and Japan to take a hard look at reports suggesting that joint infrastructure projects in Africa and Iran have stalled with substantial cost overruns. Tokyo will also likely continue its charm offensive on the Regional Comprehensive Economic Partnership in an attempt to get New Delhi to reverse its decision not to join the massive trade compact.
- Writing in 2006, Shinzo Abe, in his book, Utsukushii Kuni E (Toward a Beautiful Country), expressed his hope that "it would not be a surprise if in another 10 years, Japan-India relations overtake Japan-U.S. and Japan-China relations".

- Thus far, New Delhi has every reason to believe that Japan's Yoshihide Suga is willing to make that dream a reality.

GS III

Nutrition loss and Food security concerns amid COVID-19

(Source: [The Hindu](#))

Context: *The political and social handling of the COVID-19 pandemic have added to the persisting issues of food insecurity faced by millions in India even prior to the novel coronavirus pandemic India consistently has ranked poorly in all international rankings on hunger (ranking 102 among 117 countries in the Global Hunger Index 2019). With the second, more vigorous wave of COVID-19, the inability of those already on the brink of subsistence to absorb a second economic shock cannot be overlooked even as the current health crisis is creating havoc. Rural distress specifically needs closer examination and urgent policy attention.*

Data collection, findings

- The Rapid Rural Community Response, or RCRC to COVID-19, a collective of over 60 non-governmental organisations has collected three rounds of data since the lockdown.
- The data provide crucial evidence of the nature and persistence of food and financial insecurity among the poor residing in rural areas.
- The third round conducted between December 2020-January 2021 has collected data from 11,766 households across 64 districts, in Assam, Bihar, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Telangana and Uttar Pradesh.

Cutting down on food

- The most recent data suggest a persistence of cutting down on food even nine months after the first lockdown, during the seeming "revival" period.
- While 40% of the sample cut down on food during the first lockdown, an alarming 25% reportedly continued to cut down on food during the most recent survey conducted between December and January 2021.
- Households reported cutting down on nutritious food — 80% cut down on milk, vegetables, pulses and oil (around 50% reported cutting down on pulses alone).
- Disaggregating the figure, we find that the poorer, socially marginalised Dalits, and those with lesser access to food security schemes (such as migrants) faced more severe food insecurity.
- Comparing similar households, we find households in Uttar Pradesh and Jharkhand were faring among the worst performing States.
- These reductions will undoubtedly further accelerate the impending effects on children's nutrition, as highlighted in the National Family Health Survey or NFHS-V (2019-20) and the Global Food Policy Report, 2021.
- The loss in nutrition may have come as a consequence of people losing their jobs and/or being pushed into lower income brackets over time due to the nature and handling of the pandemic.

Reduction in incomes



- Pew Research Center has indicated that the middle class in India has shrunk by over 32 million households in the past year.
- We find an indication of a downward shift in incomes even among a much poorer sample of households. Our survey suggests an over 70% reported reduction in incomes post the pandemic, with many falling into significant precarity.
- While 55% of households recalled earning less than ₹5,000 per month prior to the pandemic, around 74% reported doing so in December 2020-January 2021.
- It is thus unsurprising that around 30% households were also seeking loans, and among them, at least half of them reported needing loans for food, all indicative of the debilitating food and financial insecurities that poor households continue to face.

Migrants on the margins

- The second wave of the pandemic comes on the back of an uneven recovery and persistence of crippling food and financial insecurity among the poorest households, especially migrants. Migrants who have travelled to cities only months ago are again travelling back to their villages.
- It was the relatively disadvantaged who had not been able to find their way back to the cities. There was limited support for migrants even in existing social protection schemes such as the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). For example, among the poorest, households with migrants were more likely to seek work than those without (43% versus 32%), but less likely to get work (49% versus 59%) under the scheme.
- It is clear that households have not had a chance to rebuild, and with many completely exhausting their savings and facing massive debt, they are bound to be more severely hit than last year. In the face of such a threat, including high unemployment that is steadily rising again, the state must ensure immediate, sustained action.

Food security is a must

- The Government has promised to restart the Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY) with 5 kg of rice/wheat per person per month for the next two months.
- The government needs to provide similar support for stabler longer periods; expand the current offering to include nutritious foods like pulses; address issues faced in existing schemes such as MGNREGA (like delays in wages and rationing); and new schemes such as a potential urban employment scheme should be explored.
- Food security schemes such as ration provided to children through anganwadis, Public Distribution System and mid-day meal scheme in primary schools need to be ramped up systematically and urgently.
- For migrants stuck in cities without work, community kitchens (such as Amma canteens) are required.
- The most vulnerable will need more predictable and stable support than ever before.

Marking the beginning of a green era

(Source: [The Hindu](#))

Context: *One of the lessons learned from the ongoing COVID-19 pandemic is the need for collective action among members of the international community to effectively address global challenges such as pandemics and climate change. The pandemic has created an unprecedented crisis that demands an exceptional global response. Even as countries rightly continue to focus on tackling the immediate health emergency, the need is to have a long-term vision to build a climate-resilient global economy for the future.*



Progress towards goals

- Ambition alone cannot attain goals. Good results depend on our ability to act. That is precisely what defines the two recent initiatives launched by Crown Prince Mohammed bin Salman bin Abdulaziz, Deputy Prime Minister of the Kingdom of Saudi Arabia, to combat the threat of climate change — the ‘Saudi Green Initiative’ and the ‘Middle East Green Initiative’.
- In fact, one of the main pillars of the Saudi G20 presidency was to “safeguard the planet”. The Saudi leadership of the summit highlighted how climate change had negatively impacted the planet, people’s lives and their well-being.
- The G20 introduced initiatives like establishing a Global Coral Reef Research and Development Accelerator Platform to accelerate scientific knowledge and technology development in support of coral reef survival, conservation, resilience, adaptation and restoration.
- G20 leaders also acknowledged the Circular Carbon Economy (CCE) Platform as a tool towards affordable, reliable, and secure energy and economic growth.
- Saudi Arabia is committed to lead regional efforts to address climate change and has been making steady progress in this direction.
- The Saudi Green Initiative aims to raise the vegetation cover, reduce carbon emissions, combat pollution and land degradation, and preserve marine life. As part of the initiative, 10 billion trees will be planted in the Kingdom.
- It aims to reduce carbon emissions by more than 4% of global contributions, through a renewable energy programme that will generate 50% of Saudi’s energy from renewables by 2030.
- With the understanding that the need of the hour is to do more than enough, Saudi Arabia is working towards raising the percentage of its protected areas to more than 30% of its total land area, representing roughly 6,00,000 sq km, exceeding the global target of 17%.
- As part of the Middle East Green initiative, Saudi Arabia will work with the Gulf Cooperation Council countries and regional partners to plant an additional 40 billion trees in the West Asian region. It represents 5% of the global target of planting one trillion trees and reducing 2.5% of global carbon levels.
- Saudi Arabia has been sharing its expertise and know-how with its neighbouring countries to reduce carbon emissions resulting from hydrocarbon production in the region by 60% and globally by 10%.
- Saudi Arabia currently operates the largest carbon capture and utilisation plant in the world, turning half a million tonnes of CO₂ annually into products such as fertilizers and methanol.
- It also operates one of the region’s most advanced CO₂-enhanced oil recovery plants that captures and stores 8,00,000 tonnes of CO₂ annually. Plans are afoot to deploy additional carbon capture, utilisation and storage infrastructure. Saudi Arabia believes that nature-based solutions will play an important role in removing carbon as part of the CCE.
- We have already joined hands in February 2019 with India when Saudi Arabia joined the International Solar Alliance during the Crown Prince’s state visit to the country, hence promoting cooperation in the renewable energy sector.
- Later that year, when the Indian Prime Minister visited Saudi Arabia, several MoUs and agreements in key sectors including renewable energy were signed.
- To ensure momentum and continuity, Saudi Arabia will convene an annual summit called the Middle East Green Initiative which will host leaders from the government, scientists and environmentalists to discuss the details of implementation.
- The aim is start implementing the plan in the fourth quarter of this year and continue for the next two decades. Saudi Arabia also recognises the scarcity of financial resources to irrigate the terrain. Therefore, in partnership with participating countries, innovative methods will be researched to irrigate from treated water, cloud seeding and other purpose-driven solutions such as planting native trees which requires support for three years to grow and will then be able to survive on their own with natural irrigation.

Working towards Vision 2030

- In 2016, the Crown Prince unveiled Vision 2030, a comprehensive road map to improve the quality of life of the citizens of the country. As part of this, Saudi Arabia carried out a comprehensive restructuring of the environmental sector and established the Environmental Special Forces in 2019.
- With NEOM and The Line, Saudi Arabia has already redefined the idea of sustainable habitats. NEOM's location also gives Saudi Arabia many advantages in the field of hydrogen production. According to the World Bank, for every dollar invested in resilient infrastructure, \$4 in benefits are generated.
- With the Public Investment Fund recently pumping in \$15 billion in the NEOM project and another \$10 billion in renewable and solar energy projects, it is clear that the pandemic has only strengthened Saudi Arabia's resolve to realise the goals of Vision 2030 and become one of the major producers of renewable energy with a capacity to generate 9.5 GW by 2023.
- Our close friend and strategic partner India has also made remarkable commitments to tackle climate change and is on track to achieve its Paris Agreement targets. India's renewable energy capacity is the fourth largest in the world.
- India has an ambitious target of achieving 450 gigawatts of renewable energy capacity by 2030. We admire India's endeavour to build a safe and clean environment for future generations.
- Saudi Arabia hopes that the launch of the Saudi Green Initiative and the Middle East Green Initiative marks the beginning of a green era and that these initiatives provide momentum to other countries to unify their efforts to save our planet.

A patently wrong regime

(Source: [The Hindu](#))

Context: *Even an unprecedented pandemic can do little, it appears, to upset the existing global regime governing monopoly rights over the production and distribution of life-saving drugs. If anything, since the onset of COVID-19, we've only seen a reaffirmation of intellectual property rules that have served as a lethal barrier to the right to access healthcare over the last few decades. The neo-liberal order, under which these laws exist, is so intractable today that a matter as seemingly simple as a request for a waiver on patent protections is seen as a claim unworthy of exception.*

Request for waiver

- On October 2 last year, India and South Africa submitted a joint petition to the World Trade Organization (WTO), requesting a temporary suspension of rules under the 1995 Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS).
- A waiver was sought to the extent that the protections offered by TRIPS impinged on the containment and treatment of COVID-19.
- As we now know, quick and efficient vaccination is the surest route to achieving global herd immunity against the virus. Should the appeal for waiver be allowed, countries will be in a position, among other things, to facilitate a free exchange of know-how and technology surrounding the production of vaccines.
- The request for waiver has, since, found support from more than 100 nations. But a small group of states — the U.S., the European Union, the U.K. and Canada among them — continues to block the move.
- Their reluctance comes despite these countries having already secured the majority of available vaccines, with the stocks that they hold far exceeding the amounts necessary to inoculate the whole of their populations.

- Their decision is all the more galling when one considers the fact that for the rest of the world mass immunisation is a distant dream. Reports suggest that for most poor countries it would take until at least 2024 before widespread vaccination is achieved.
- A patent is a conferral by the state of an exclusive right to make, use and sell an inventive product or process.
- Patent laws are usually justified on three distinct grounds: on the idea that people have something of a natural and moral right to claim control over their inventions; on the utilitarian premise that exclusive licenses promote invention and therefore benefit society as a whole; and on the belief that individuals must be allowed to benefit from the fruits of their labour and merit, that when a person toils to produce an object, the toil and the object become inseparable. Each of these justifications has long been a matter of contest, especially in the application of claims of monopoly over pharmaceutical drugs and technologies.

A new world order

- In India, the question of marrying the idea of promoting invention and offering exclusive rights over medicines on the one hand with the state's obligation of ensuring that every person has equal access to basic healthcare on the other has been a source of constant tension.
- The colonial-era laws that the country inherited expressly allowed for pharmaceutical patents. But in 1959, a committee chaired by Justice N. Rajagopala Ayyangar objected to this on ethical grounds.
- It noted that access to drugs at affordable prices suffered severely on account of the existing regime. The committee found that foreign corporations used patents, and injunctions secured from courts, to suppress competition from Indian entities, and thus, medicines were priced at exorbitant rates.
- To counter this trend, the committee suggested, and Parliament put this into law through the Patents Act, 1970, that monopolies over pharmaceutical drugs be altogether removed, with protections offered only over claims to processes.
- This change in rule allowed generic manufacturers in India to grow. As a result, life-saving drugs were made available to people at more affordable prices. The ink had barely dried on the new law, though, when negotiations had begun to create a WTO that would write into its constitution a binding set of rules governing intellectual property.
- In the proposal's vision, countries which fail to subscribe to the common laws prescribed by the WTO would be barred from entry into the global trading circuit. It was believed that a threat of sanctions, to be enforced through a dispute resolution mechanism, would dissuade states from reneging on their promises. With the advent in 1995 of the TRIPS agreement this belief proved true.
- As the Yale Law School professor Amy Kapczynski has written, compelling signatories to introduce intellectual property laws like those in the global north was nothing short of a scandal. The follies in this new world order became quickly apparent when drugs that reduced AIDS deaths in developed nations were placed out of reach for the rest of the world.
- It was only when Indian companies began to manufacture generic versions of these medicines, which was made possible because obligations under TRIPS hadn't yet kicked in against India, that the prices came down. But lessons from that debacle remain unlearned.

Refuting objections

- Instead, two common arguments are made in response to objections against the prevailing patent regime.
 - One, that unless corporations are rewarded for their inventions, they would be unable to recoup amounts invested by them in research and development.
 - Two, that without the right to monopolise production there will be no incentive to innovate. Both of these claims have been refuted time and again.
- Most recently, it has been reported that the technology involved in producing the Moderna vaccine in the U.S. emanated out of basic research conducted by the National Institutes of Health, a federal government agency, and other publicly funded universities and organisations.



- Similarly, public money accounted for more than 97% of the funding towards the development of the Oxford/AstraZeneca vaccine. Big pharma has never been forthright about the quantum of monies funnelled by it into research and development. It's also been clear for some time now that its research is usually driven towards diseases that afflict people in the developed world.
- Therefore, the claim that a removal of patents would somehow invade on a company's ability to recoup costs is simply untrue.
- The second objection — the idea that patents are the only means available to promote innovation — has become something of a dogma. But other appealing alternatives have been mooted. The economist Joseph Stiglitz is one of many who has proposed a prize fund for medical research in place of patents. Under the current system, "those unfortunate enough to have the disease are forced to pay the price... and that means the very poor in the developing world are condemned to death," he wrote.
- A system that replaces patents with prizes will be "more efficient and more equitable", in that incentives for research will flow from public funds while ensuring that the biases associated with monopolies are removed.
- The unequal vaccine policy put in place by the Indian state is indefensible. But at the same time, we cannot overlook the need for global collective action. If nation states are to act as a force of good, they must each attend to the demands of global justice.
- The pandemic has demonstrated to us just how iniquitous the existing world order is. We cannot continue to persist with rules granting monopolies which place the right to access basic healthcare in a position of constant peril. In its present form, the TRIPS regime, to borrow the law professor Katharina Pistor's words, represents nothing but a new form of "feudal calculus".

Current Affairs Quiz

1. Which of the following statements is/are correct regarding the Ecotype?

1. Ecotype of a species are always inter-fertile.
2. Ecotypes arise due to mutations, hybridization and isolation.
3. Ecotype is genetically distinct and adapted to specific environmental conditions.

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 : d

All statements are correct

2. Which of the following is considered as legislative powers of the President?

- a. The Power of the President to consult Supreme Court on matters of public importance
- b. The Power of the President to promulgate Ordinances during recess of Parliament
- c. The Power of the President to appoint the Chief Election Commissioner
- d. The Power of the President to appoint the chiefs of the Indian Armed Forces

Answer : b

3. Padmaja Naidu Himalayan Zoological Park is located-

- a. Jammu and Kashmir
- b. Uttarakhand
- c. Sikkim
- d. West Bengal

Answer : d

4. Global Energy Transition Index is released by -

- a. International Solar Alliance (ISA)
- b. International Energy Agency (IEA)
- c. World Economic Forum (WEF)
- d. International Renewable Energy Agency (IRENA)

Answer : c

5. Which of the following statements is/are correct with respect to Varuna – 2021?

1. It is a bilateral maritime exercise between Indian and French Navy.
2. The 19th edition of Varuna 2021 will be conducted in the Arabian Sea.

Select the correct answer code:

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

Answer : c

Both statements are correct

6. Which of the following is associated with Project DANTAK?

- a. Border Roads Organisation
- b. Indian Space Research Organization
- c. Defence Research and Development Organization
- d. Council for Scientific and Industrial Research

Answer : a

Border Roads Organization's Project DANTAK is commemorating its Diamond Jubilee in Bhutan.

It was established on April 24, 1961 as a result of the visionary leadership of his Majesty the Third King and then Prime Minister Jawahar Lal Nehru.

7. Which of the statements given below is/are correct?

- 1. India is the second-largest producer of wheat in the world.
- 2. Some of the important winter crops are wheat, barley, mustard and peas.

Select the correct answer code:

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

Answer : c

Both statements are correct

8. Mission Oxygen Express is a mission to render oxygen support to-

- a. Maharashtra
- b. Uttar Pradesh
- c. Lakshadweep
- d. None of the above

Answer : c

As part of the nation's fight against COVID 19, Indian Navy ships under Headquarters, Southern Naval Command at Kochi are progressing with the mission of OXYGEN EXPRESS in order to render support to the local administration of the Union Territory of Lakshadweep (UTL).

9. Which of the following statements is/are incorrect with respect to investments instruments InvITs and REITs?

- 1. In REITs investor own a share of property, and he receives an appropriate share of the income from it, after deducting an appropriate share of expenses.
- 2. InvITs are similar to REIT but invest in infrastructure projects such as roads or highways which take some time to generate steady cash flows.

Select the correct answer code:

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

Answer : d

Both statements are correct

10. NASA's Ingenuity mission is related to

- a) Study Neptune and Uranus during planetary flybys
- b) Deep space exploration systems

- c) Flying Helicopter on Mars
- d) Nuclear-powered drone to search for life on Mars

Ans: c)

NASA's Ingenuity Mars Helicopter became the first aircraft in history to make a powered, controlled flight on another planet.

11. Which of the following countries share border with Indian Ocean?

- 1. Tanzania
- 2. Zimbabwe
- 3. Botswana
- 4. Mozambique

Select the correct answer code:

- a) 1 and 3 only
- b) 1, 2 and 3 only
- c) 1 and 4 only
- d) 1, 2, 3 and 4

Ans. c)

12. Which of the following countries jointly launched Supply Chain Resilience Initiative (SCRI)?

- 1. India
- 2. China
- 3. Australia
- 4. Sri Lanka
- 5. New Zealand

Select the correct answer using the codes given below:

- a. 1 and 3 only
- b. 1, 2 and 4 only
- c. 1, 2 and 4 only
- d. All of the above

Answer : a

It aims to create a virtuous cycle of enhancing supply chain resilience with a view to eventually attaining strong, sustainable, balanced and inclusive growth in the Indo-Pacific region

13. Consider the following statements with respect to organic production in India:

- 1. Organic products are currently exported from India only if they are produced, processed, packed and labelled as per the requirements of Paramparagat Krishi Vikas Yojana.
- 2. The National Programme for Organic Production (NPOP) has been implemented by APEDA since its inception in 2001 as notified under the Foreign Trade (Development and Regulations) Act, 199

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 : b

Organic products are currently exported from India only if they are produced, processed, packed and labelled as per the requirements of the National Programme for Organic Production (NPOP).

14. Which of the following statements is/are correct with respect to Oldest Water on Earth?
1. It has been discovered from Kidd Creek mine, located on the Canadian Shield.
 2. The water is highly saline, ten times saltier than sea water and Chemolithotrophic microbes can survive in this water.

Select the correct answer code:

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

Answer : c

Both statements are correct

15. Which of the following statements is/are correct with respect to Agriculture Infrastructure Fund ?
1. It is a pan India central sector scheme to inject formal credit into farm and farm-processing based activities.
 2. It is a medium-long term debt financing facility for investment in post-harvest management infrastructure through interest subvention and credit guarantee.

Select the correct answer codes:

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

Answer : c

Both statements are correct

16. Consider the following statements with respect to Report on Military Expenditure and Arms Trade:
1. It is prepared and released annually by Amnesty International.
 2. The civil defence and current expenditure on previous military activities, and military involvement in non-military activities are excluded in the report.

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 : b

Stockholm International Peace Research Institute (SIPRI) has released the report on military expenditure and arms trade globally.

17. Which of the following statements is/are correct with respect to 'Large Area Certification' (LAC) Scheme?

1. It is launched by department of Agriculture and Farmers Welfare under its flagship scheme of Paramparagat Krishi Vikas Yojna.
2. Areas in Arunachal Pradesh is first to get certified as organic under this scheme.

Select the correct answer code:

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

Answer : a

Area in Andaman and Nicobar has been certified as organic, the first large contiguous territory to be done under LAC Scheme

18. Which of the following statements is/are correct with respect to investments instruments Ct value in a Covid-19 Test?

1. It refers to the number of cycles after which the virus can be detected.
2. It tells about the viral load in the throat and not in the lungs.

Select the correct answer code:

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

Answer : c

Both statements are correct

19. Which of the following statements is/are correct with respect to GNCT of Delhi (Amendment) Act 2021?

1. It states that the “government” in the National Capital Territory of Delhi meant the elected government in the city.
2. It empowers Lieutenant Governor (L-G) of Delhi, he/she is not obliged to give his opinion to the State government within a time frame.

Select the correct answer code:

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

Answer : b

It states that the “government” in the National Capital Territory of Delhi meant the Lieutenant-Governor of Delhi.

20. Which of the following statements is/are correct with respect to investments instruments Himalayan Front Thrust (HFT)?

1. It is also known as Main Boundary Thrust (MBT), which is found along the boundary of Indian and Australian tectonic plates.
2. It demarcates a sharp physiographic and tectonic boundary between the Himalayan foothills and the Indo-Gangetic Alluvial Plains.

Select the correct answer code:

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

Answer : b

It is also known as the Main Frontal Thrust (MFT), a geological fault along the boundary of the Indian and Eurasian tectonic plates.

The Main Boundary Thrust (MBT) is another major thrust fault in the Himalaya orogenic wedge that was active in the Cenozoic.

- It runs parallel to the MFT with a spacing distance of about 20 km.

