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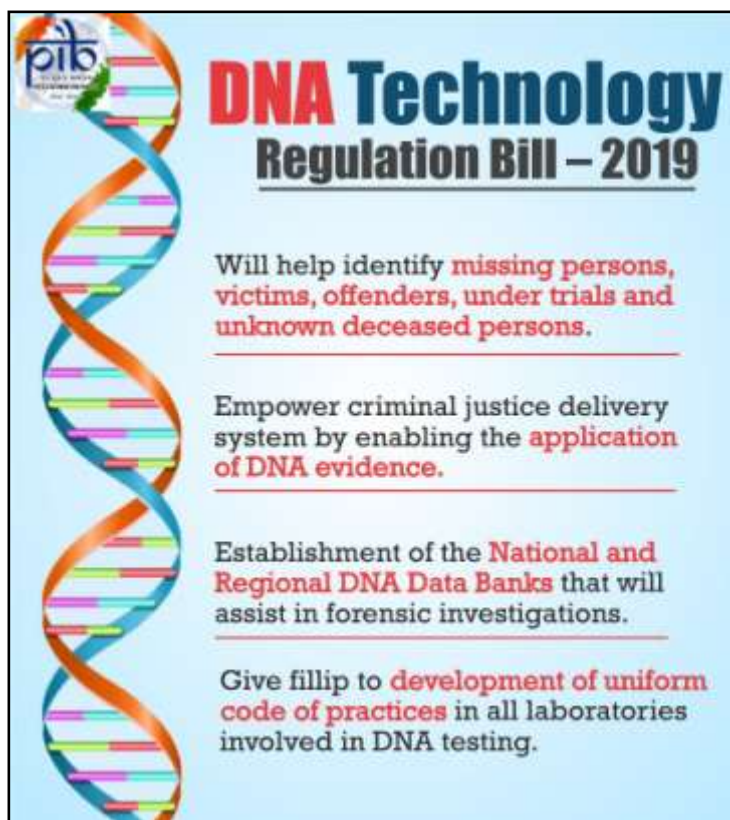
NATIONAL

HOUSE PANEL FLAGS FEARS ON DATABANK

The **Parliamentary Standing Committee on Science and Technology, Environment, Forests and Climate Change** has recommended that the government assuage concerns raised over the **DNA Technology (Use and Application) Regulation Bill, 2019**, including over creation of a **national databank of crime scene DNA profiles** and fears of communities being targeted.

What

1. Recognising the **importance of DNA technology in criminal investigation**, the committee, in its report tabled in Parliament on 3 February 2022, says, “The risk with a **national databank of crime scene DNA profiles** is that it will likely include virtually everyone since DNA is left at the ‘**crime scene**’ before and after the crime by several persons who may have nothing to do with the crime being investigated.”
2. The Committee is of the strong opinion that an enabling ecosystem must be created soon to ensure that DNA profiling is done in a manner that is fully consistent with the letter and spirit of various **Supreme Court judgments** and with the Constitution.
3. **First proposed in 2003**, the Bill has gone through several revisions, by both the **Department of Biotechnology and Law Ministry**.
4. It was referred to the **Parliamentary Standing Committee in October 2019**, soon after it was passed.
5. About a **national databank**, the committee points out that a **crime scene could also hold DNA of someone** who was nowhere near it at the time.
6. The committee adds, “It does not, however, negate the need for such as legislation, especially when DNA technology is already in use.
7. In fact, its use in recent months has **exposed a false encounter in which innocents were killed**, contradicting initial claims made that they were militants.



J&K REORGANISATION AMENDMENT BILL APPROVED

The **Lok Sabha** on 13 February 2021 **passed the Jammu and Kashmir Reorganisation (Amendment) Bill, 2021**, by a voice vote. It was passed by the Rajya Sabha on February 8, 2021. The **Bill amends the J&K Reorganisation Act, 2019** that **bifurcated the former State into Union Territories of J&K and Ladakh**. It seeks to **merge the existing cadre for India Services Officers of J&K** with those of **Arunachal Pradesh, Goa, Mizoram, and Union Territory (AGMUT) cadre**.

Salient Features

1. This shall enable the Government to depute IAS, IPS officers etc. from other Union Territories to the UT of J&K. **It is already in force as an Ordinance.**
2. The Bill seeks to **amend Section 88 of the J&K Reorganisation Act, 2019.**
3. This provision prescribed that members of the cadres of IAS, IPS and IFS for the existing State of J&K shall **continue to function on the existing cadres** in the newly formed UTs.
4. This shall enable the Government to depute IAS, IPS officers etc. from other Union Territories to the UT of J&K. **It is already in force as an Ordinance.**
5. The Bill seeks to amend this provision and **make the existing a cadre a part of the Arunachal Pradesh, Goa, Mizoram and Union territories cadre.**
6. Consequently, all future allocations of All India Services Officers for the UT of J&K and UT of Ladakh shall be made to Arunachal Pradesh, Goa, Mizoram and Union territories cadre.

INDIA'S FIRST GEOTHERMAL FIELD PROJECT

A **historic tripartite agreement** for establishing **India's first-ever geothermal field development project** in Leh has been signed, with Ladakh Lieutenant Governor R K Mathur terming it a step towards achieving the **goal of carbon-neutral Ladakh**. The pact was signed between **Union Territory Administration Ladakh, Ladakh Autonomous Hill Development Council (LAHDC)-Leh** and **Oil and Natural Gas Corporation (ONGC) Energy Centre** on 6 February 2021.

What

1. In Phase-1 of this pilot project, **1 megawatt (MW) power generation capacity** shall be generated and **100 per cent free power shall be supplied to the general public**, **ONGC Energy Centre is the implementing agency** for this pilot project.
2. The **Phase-2 shall involve deeper and lateral exploration of geothermal reservoir** by drilling optimal number of wells and setting up of a higher capacity demo plant in Ladakh, while **Phase-3 shall be a commercial project** as per discovered capacity.
3. The signing of the MoU with ONGC for the **first geothermal project in India** is a promising initiative towards innovative and sustainable development of Ladakh and also a step towards achieving the goal of **carbon-neutral Ladakh**.
4. The energy from this project will give **round-the-clock power supplies**, and the **hot water from the spring could be used for space-heating** and establishing hot swimming pools to attract tourists.
5. With this project **Ladakh enter a new era of development** and emphasised on advocating the '**Vocal for Local**' concept for making **Ladakh a self-sustainable region**.

INDIA ENERGY OUTLOOK 2021

India will overtake the European Union as the world's third-largest energy consumer by 2030, the **International Energy Agency (IEA)** said on 9 February 2021 as it forecast **India accounting for the biggest share of energy demand growth** over the next two decades. In its **India Energy Outlook 2021**, IEA saw primary energy consumption almost doubling to 1,123 million tonnes of oil equivalent as the Gross Domestic Product (GDP) expands to USD 8.6 trillion by 2040.

What the report said

1. **India at present is the fourth-largest global energy consumer** behind **China**, the **United States** and the **European Union**.
2. Underpinned by "**a rate of GDP growth** that adds the equivalent of another Japan to the world economy by 2040", **India will overtake the European Union by 2030** to move up to the **third position**, it said in the report.
3. India accounts for **nearly one-quarter of global energy demand growth from 2019-40** -- the largest for any country. Its share in the growth in renewable energy is the second-largest in the world, after China.
4. By 2040, **India's power system is bigger than that of the European Union**, and is the **world's third-largest in terms of electricity generation**; it also has **30 per cent more installed renewables capacity than the United States**.
5. A **five-fold increase in per capita car ownership** will result in **India leading the oil demand growth in the world**. Also, it will become the **fastest-growing market for natural gas**, with demand more than tripling by 2040.
6. **India's continued industrialisation becomes a major driving force** for the global energy economy. Over the last three decades, **India accounted for about 10 per cent of world growth in industrial value-added (in PPP terms)**.
7. By 2040, **India is set to account for almost 20 per cent of global growth in industrial value-added**, and to lead global growth in industrial final energy consumption, especially in steelmaking. The nation accounts for nearly **one-third of global industrial energy demand growth to 2040**.
8. **India's oil demand is seen rising by rise by 74 per cent** to 8.7 million barrels per day by 2040 under the existing policies scenario.

Natural Gas

1. The **natural gas requirement is projected to more than triple to 201 billion cubic meters** and **coal demand is seen rising to 772 million tonnes in 2040** from the current 590.
2. To meet its energy needs, **India will be more reliant on fossil fuel imports** as its domestic oil and gas production stagnates.
3. **Natural gas import dependency increased from 20 per cent in 2010** to almost 50 per cent in 2019 and is set to grow further to more than 60 per cent in 2040.

FOSSILS OF 'DICKINSONIA' FOUND

Researchers have discovered **three fossils of the earliest known living animal** — the **550-million-year-old 'Dickinsonia'** — on the **roof of the Bhimbetka Rock Shelters**,

about 40 km from Bhopal. One can identify the fossils from the white leaf-like patches with a **central vertebra (central midrib)** and connecting veins. While one fossil is 17 inches long, the other two are much smaller.

What

1. The new discoveries can be seen right at the beginning of the '**Auditorium Cave**', the first of such **caves at Bhimbetka**, a **UNESCO heritage site**, located about 3.5 metres above the ground.
2. **Geological Survey of India's Bhopal in-charge Tapan Pal**, who had come to visit the site that they were the **only such fossils available in the country**, and was similar to those seen in South Australia.
3. This is further proof of the similar **paleoenvironments** and confirms assembly of **Gondwanaland by the 550 Ma (mega annum)**, but not reconstructions adjusted for true polar wander.

NEW MODEL DEVELOPED FOR INDIAN MONSOON

Scientists, including those of **Indian-origin**, have **developed a new system** which they say **can provide farmers in India early forecasts** of expected **variations in the monsoon season**, an advance which may help **reduce crop losses**. The researchers, including those from the **European Centre for Medium-range Weather Forecasts (ECMWF)** in the UK, used their **long-term global weather forecasting system** to predict when the summer monsoon will start, and how much rainfall it will bring.

What

1. In the study, published in the **journal Climate Dynamics**, they noted that the model provided **accurate forecasts a month in advance** for the timing of the monsoon in **India's major agricultural regions**.
2. The scientists believe providing this information to farmers **could help them prepare earlier for unexpected heavy rainfall** or extended dry periods, both of which regularly destroy crops in India.
3. According to the researchers, the **Indian monsoon brings around 80 per cent of India's annual rainfall** with even small variations in the timing of its arrival potentially having a huge impact on agriculture.

Flashback

1. In the study, the **scientists analysed 36 years' worth of monsoon data** to evaluate for the **first time the effectiveness of the ECMWF's latest seasonal forecasting system -- SEAS5 --** in predicting how the Indian monsoon would differ from the long-term average.
2. They **compared forecasts from 1 May each year from 1981-2016** with actual observations of the monsoons that followed.
3. The team found that the forecasts were accurate for the large-scale processes, like **temperature and winds that drive the monsoon rainfall across India**.
4. According to the scientists, **SEAS5 was good at predicting early or late monsoon arrival over the important agricultural regions** along the river Ganges plains and the eastern and western coasts of India.
5. The study could also **identify deficiencies in the system**, which the researchers believe could pave the way for model improvements, potentially providing more detailed and accurate seasonal long-term monsoon forecasts.

4. Accurately predicting these **year-to-year variations** is challenging, but could be the difference between **prosperity or poverty** for many families, said study co-author Amulya Chevuturi from the University of Reading in the UK.
5. The **forecasting accuracy identified in India's main agricultural regions** provides a clear opportunity for this system to make a positive difference to people's lives.
6. **The monsoon season in India begins around 1 June every year** starting in **south west India** before spreading across the whole subcontinent.

MAJOR PORTS AUTHORITY BILL 2020 PASSED

Parliament on 10 February 2021 **passed a bill that seeks to provide greater autonomy in decision-making to 12 major ports** in the country and **professionalise their governance** by setting up boards. The **Major Ports Authority Bill, 2020** was passed through ballot votes in the Rajya Sabha. The **Lok Sabha had on 23 September 2020 passed the bill.**

What

1. Government has said **it was not intended towards privatisation of major ports** and rather aimed at **boosting their decision-making powers** in order to **compete with private ports.**
2. The bill **aims to provide for regulation, operation and planning of major ports in India** and to vest the administration, control and management of such ports upon the boards of major port authorities and for matters connected therewith or incidental thereto, be taken into consideration.
3. In terms of volume, **70 per cent of cargo movement is through ports** while 90 per cent in value terms.
4. India has **12 major ports -- Deendayal (erstwhile Kandla), Mumbai, JNPT, Marmugao, New Mangalore, Cochin, Chennai, Kamarajar (earlier Ennore), V O Chidambarnar, Visakhapatnam, Paradip and Kolkata (including Haldia).**
5. These together had handled **705 million tonnes (MT) of cargo in 2019-20.**

INTERNATIONAL

INDIA SIGN MOU TO BUILD SHAHTOOT DAM

India and Afghanistan on 9 February 2021 **signed an agreement to build the Shahtoot Dam in Kabul** to provide drinking water facility in the Afghan capital. In a virtual summit, both countries signed the MoU in the presence of Prime Minister Narendra Modi and Afghanistan President Ashraf Ghani.

What

1. The **Shahtoot dam is to be constructed on the Kabul river basin**, one of the five river basins of Afghanistan.
2. Along with the Shahtoot dam, **India has pledged to commit \$80 million for various projects** in the country. Around 150 projects have already been announced by India in the conflict-ridden country.

3. **Shahtoot dam will provide clean drinking water** to two million citizens of Kabul and will also be used for irrigation.
4. It is providing an **alternate route by Chabahar port in Iran** and has also opened a dedicated air freight corridor to Afghanistan.
5. The **Shahtoot dam is the second major dam** being built by India in Afghanistan, after the **India- Afghanistan Friendship Dam [Salma Dam]**, which was inaugurated by the Prime Minister and the President in **June 2016**.
6. The project is a part of the **New Development Partnership** between India and Afghanistan.
7. The signing of the Shahtoot Dam agreement is a reflection of India's strong and long-term commitment towards the **socio-economic development of Afghanistan**.

CHINA, RUSSIA PULL OUT FROM UNHRC RESOLUTION

China and Russia on 12 February 2021 **pulled out from a United Nations Human Rights Council (UNHRC) resolution** on the **situation in Myanmar** following the military coup on 1 February 2021. The resolution calls for the release of detained persons including **State Counsellor Aung San Suu Kyi** and **President Win Myint**. It was approved by consensus during a **special session in Geneva** on 12 February 2021.

What

1. China, Russia and others pulled out and their envoys said they are "**disassociating**" from the resolution.
2. Earlier, UN Special Rapporteur Thomas Andrews had condemned the **arbitrary detention of government officials** and human rights leaders in Myanmar.
3. He also cited "**growing reports and photographic evidence**" that security forces have used live ammunition against protesters.
4. The **UNHRC resolution stressed the need to refrain from violence** and fully respect human rights, fundamental freedoms and the rule of law.
5. On 1 February 2021, Myanmar's military staged a coup and overthrew the democratically elected government of the **National League for Democracy (NLD)**, alleging voter fraud in November 2020 elections that saw the NLD securing a resounding victory.
6. Meanwhile, **Nepal, Hong Kong and other countries have protested against China** for bringing civil unrest to Myanmar.

WORLD'S FIRST BITCOIN EXCHANGE

Canada's main securities regulator has cleared the launch of the **world's first bitcoin exchange** traded fund, an investment manager said on 12 February 2021, **providing investors greater access to the cryptocurrency** that has sparked an explosion in trading interest. The **Ontario Securities Commission** has approved the launch of **Purpose Bitcoin ETF**, Toronto-based asset Management Company Purpose Investments Inc. said in a statement.

What

1. The **ETF will be the first in the world to invest directly in physically settled Bitcoin**, not derivatives, allowing investors easy and efficient access to the **emerging asset class of cryptocurrency**.
2. Investors have been able to trade bitcoin using futures contracts on the CME derivatives exchange. They can also buy closed-end investment funds, such as the **Bitcoin Fund** on the Toronto Stock Exchange.
3. An ETF could offer some advantages to investors, such as buying at net asset value rather than at a premium.
4. **Bitcoin gained about 63% so far this year** and soared roughly 1,130% since mid-March 2020.
5. **In the United States, eight firms have tried without success since 2013** to create a bitcoin ETF.

MYANMAR MILITARY SEIZES POWER

Myanmar's military has seized power on 1 February 2021 in a coup **against the democratically elected government** of Nobel laureate **Aung San Suu Kyi** who was detained along with other leaders of her **National League for Democracy (NLD)** party in early morning raids. The army said it had carried out the detentions in response to "**election fraud**", handing power to military chief Min Aung Hlaing and **imposing a state of emergency for one year**, according to a statement on a **military-owned television station**.

What

1. The detentions came after days of **escalating tension between the civilian government and the military** that stirred fears of a coup in the aftermath of the election.
2. **Nobel Peace Prize winner Suu Kyi, 75, came to power after a 2015 election win** that followed decades of house arrest in a struggle for democracy with **Myanmar's junta** that turned her into an international icon.
3. Her international standing was damaged after hundreds of thousands of **Rohingya fled army operations into refuge from Myanmar's western Rakhine state in 2017**, but she remains hugely popular at home.
4. The **constitution published in 2008 after decades of military rule** reserves 25% of seats in parliament for the military and control of three key ministries in Suu Kyi's administration.

ECONOMY

UNION BUDGET 2021-22

Presenting the **Union Budget for 2021-22**, Finance Minister Nirmala Sitharaman said that the Budget proposals for this financial year rest on **six pillars — health and well-being, physical and financial capital and infrastructure, inclusive development for aspirational India, reinvigorating human capital, innovation and R&D, and 'Minimum Government, Maximum Governance'**. Significant announcements included a **slew of hikes in customs duty to benefit Make in India**, proposal to disinvest two more PSBs and

a **general insurance company**, and numerous infrastructure pledges to States. **Fiscal deficit stands at 9.5% of the GDP**, and is **estimated to be 6.8% in 2021-22**. **Personal income tax slabs remain as is.**

Highlights of this year's budget

Health and Sanitation

1. A new scheme, titled **PM Atma Nirbhar Swasthya Bharat Yojana**, to be launched to develop **primary, secondary and tertiary healthcare**
2. **Mission POSHAN 2.0** to improve nutritional outcomes across **112 aspirational districts**
3. **Operationalisation of 17 new public health units** at points of entry
4. **Modernising of existing health units** at 32 airports, 15 seaports and land ports
5. **Jal Jeevan Mission Urban** aimed at better water supply nationwide
6. **Strengthening of Urban Swachh Bharat Mission**

Education

1. **100 new Sainik Schools** to be set up
2. **750 Eklavya schools** to be set up in tribal areas
3. **A Central University to come up in Ladakh**

Infrastructure

1. All vehicles to undergo fitness test in **automated fitness centres every 20 years** (personal vehicles), **every 15 years (commercial vehicles)**
2. Highway and road works announced in **Kerala, Tamil Nadu, West Bengal and Assam**
3. **National Asset Monetising Pipeline** launched to monitor asset monetisation process
4. **National Rail Plan** created to bring a future ready Railway system by 2030
5. **100% electrification of Railways** to be completed by 2023
6. **National Hydrogen Mission** to be launched to generate hydrogen from green power sources
7. **Recycling capacity of ports** to be doubled by 2024
8. **Gas pipeline project** to be set up in Jammu and Kashmir
9. **Pradhan Mantri Ujjwala Yojana (LPG scheme)** to be extended to cover 1 crore more beneficiaries

Tax

1. **No IT filing for people above 75 years** who get pension and earn interest from deposits
2. **Reopening window for IT assessment cases** reduced from 6 to 3 years. However, in case of serious tax evasion cases (Rs. 50 lakh or more), it can go up to 10 years
3. Affordable housing projects to get a tax holiday for one year

4. **Compliance burden of small trusts** whose annual receipts does not exceed Rs. 5 crore to be eased
5. **Duty on solar inverters raised from 5% to 20%**, and on **solar lanterns from 5% to 15%**
6. All nylon products charged with 5% customs duty
7. Tunnel boring machines to attract customs duty of 7%
8. Customs duty on cotton raised from 0 to 10%

Economy and Finance

1. **Fiscal deficit stands at 9.5% of the GDP**; estimated to be 6.8% in 2021-22
2. Proposal to allow States to raise borrowings up to 4% of GSDP this year
3. A **Unified Securities Market Code to be created**, consolidating provisions of the Sebi Act, Depositories Act, and two other laws
4. **Proposal to increase FDI limit from 49% to 74%**
5. An asset reconstruction company will be set up to take over stressed loans
6. **Deposit insurance increased from Rs 1 lakh to Rs 5 lakh** for bank depositors
7. Proposal to **decriminalise Limited Liability Partnership Act of 2008**
8. Two PSU bank and one general insurance firm to be disinvested this year
9. An IPO of LIC to debut this fiscal
10. Strategic sale of BPCL, IDBI Bank, Air India to be completed

Agriculture

1. **Agriculture infrastructure fund** to be made available for APMCs for augmenting their infrastructure
2. 1,000 more Mandis to be integrated into the **E-NAM market place**
3. Five major fishing hubs, including Chennai, Kochi and Paradip, to be developed
4. A multipurpose seaweed park to be established in Tamil Nadu

Employment

1. A portal to be launched to maintain information on gig workers and construction workers
2. **Social security to be extended** to gig and platform workers
3. **Margin capital required for loans via Stand-up India scheme reduced** from 25% to 15% for SCs, STs and women

RBI MONETARY POLICY MEETING

The **Reserve Bank of India's Monetary Policy Committee** its policy meet on 5 February 2021 decided to **keep repo rate unchanged at 4%**. **Inflation has eased below the tolerance level of 6%**. Outlook on growth has improved significantly, says RBI

Governor Shaktikanta Das. He also said that **signs of recovery have strengthened further** and the list of normalising sectors is expanding.

Key takeaways

1. Policy **repo rate unchanged at 4%**
2. Reverse repo rate unchanged at 3.35%
3. GDP growth projected at 10.5% for FY22
4. **CPI inflation target cut to 5.2%** from 5.8%
5. **Inflation eased below tolerance level of 6%**; Govt to review inflation target for RBI by March 2021
6. **Stance of liquidity management** continues to remain accommodative in line with monetary policy
7. **MSF and bank rate unchanged at 4.25%**
8. RBI to form an **expert panel to strengthen primary urban co-operative banks**
9. **Cash reserve ratio to be gradually restored to 4%** by 27 May 2021
10. RBI to **allow retail investors to directly access G-sec market**

CONTINUUM GREEN BOND

The Union Budget proposed a **huge infrastructure push**, overseas investors swarmed around a relatively **small green bond** offering to be part of the action. **Continuum Wind Energy's six-year bond** offering of **\$560 million** received more than \$3 billion pre-order bids from investors as soon as the issue opened in the US. While the **initial price guidance was 4.875 per cent**, the issue rate could be as low as 4.5 per cent given the investor interest.

What

1. To meet the infrastructure needs of the country, foreign investors have to be tapped.
2. Investors in developed countries are willing to give the requisite money if the **theme of Environmental, Social, and Corporate Governance (ESG)** is followed. The mode of financing is **green bond**.
3. **ReNew Power is also in the market to raise \$460 million in green bonds** via a foreign portfolio investor.
4. Bankers say the pipeline for **green bonds** this year is robust as there is huge amount of global liquidity chasing too few investable options.
5. **Green bonds from India** can easily tap into the demand at a very cheap rate.

What Is a Green Bond?

1. A **green bond is a type of fixed-income instrument** that is specifically earmarked to **raise money for climate and environmental projects**.
2. These **bonds are typically asset-linked** and backed by the issuing entity's balance sheet, so they usually carry the same credit rating as their issuers' other debt obligations.
3. **Dating back to the first decade of the 21st century**, green bonds are also referred to as climate bonds.

DEFINITION OF SMALL COMPANIES AMENDED

The **ministry of corporate affairs (MCA)** amended the **Companies Rules** to revise the **definition of a small company** and to **allow non-resident Indians (NRIs) to incorporate one person companies (OPCs)** in India. The changes, announced by finance minister Nirmala Sitharaman during her budget speech, will **come into effect from 1 April**.

What

- Paid up capital and turnover** of the small company shall **not exceed rupees two crores and rupees twenty crores** respectively, the notification said.
- The **previous definition was based on thresholds defined by the Companies Act** which mentioned a **maximum paid up capital of Rs 50 lakh and turnover of Rs 2 crore** for the immediately preceding fiscal.
- Amendments to the Act in 2018**, contained provisions for increasing the **paid up capital and turnover thresholds for small companies** up to Rs 10 crore and Rs 100 crore respectively.
- The move is expected to lighten the compliance burden of about **200,000 companies**.

With regard to OPCs

- With regard to OPCs, the amendment has **substituted the words "whether resident in India or otherwise"** to the clause that earlier stipulated that **only an Indian resident could incorporate an OPC**.
- The notification also **reduced the number of days** a person has to stay in India to qualify as a resident as per these rules to **120 days of the previous year, from 182 earlier**.
- Further, the MCA allowed **voluntary conversion of OPCs to a private or public company**, subject to the minimum requirements of board members and paid up capital as prescribed by the Companies Act.
- The finance minister had said the **move would benefit startups**.

PANEL FOR URBAN CO-OPERATIVE BANKS

The **Reserve Bank** on 15 February 2021 **set up a committee to draw a vision document for strengthening urban co-operative banks (UCBs)** and exploring the potential of consolidation in the sector. The committee, **to be headed by former RBI Deputy Governor N S Vishwanathan**, will suggest **effective measures for faster rehabilitation and resolution of Urban Cooperative Banks (UCBs)** and also assess their potential for consolidation in the sector."

What

- The panel will **"draw up a vision document for a vibrant and resilient urban co-operative banking sector** having regards to the Principles of Cooperation as well as depositors' interest and systemic issues," said the terms of reference of the committee which will be required to **submit its report to the RBI in three months**.
- The **eight-member panel**, including former chairman of **Nabard Harsh Kumar Bhanwala**, will also review the current regulatory and supervisory approach and recommend suitable measures to strengthen the sector, taking into account recent **amendments to the Banking Regulation Act, 1949**.

3. As per the terms of reference of the committee, it will "**take stock of the regulatory measures** taken by the Reserve Bank and other authorities **in respect of UCBs** and assess their impact over the last five years to **identify key constraints and enablers**, if any, in fulfilment of their socio-economic objective."
4. Among other things, the committee **will consider the need for differential regulations** and **examine prospects to allow more leeway in permissible activities** for UCBs with a view to enhancing their resilience.
5. As part of the Statement on **Developmental and Regulatory Policies** released along with the Monetary Policy Statement on 5 February 2021, the Reserve Bank has announced setting up of an Expert Committee on UCBs to examine the issues and to provide a road map for strengthening the sector, leveraging on the **recent amendments to Banking Regulation Act, 1949**.
6. Following the amendment all urban cooperative banks and multi-state cooperative banks have come under the supervision of the Reserve Bank of India.
7. There are **1,482 urban cooperative banks** and **58 multi-state cooperative banks** having about 8.6 crore depositors with total savings deposit of about Rs 4.85 lakh crore.

SCIENCE AND TECHNOLOGY

FIRST ROCKET TO RUN ON BIOFUEL

On 31 January 2021, **Stardust 1.0** was launched from **Loring Commerce Centre in Maine, US**, a former military base, becoming the **first commercial space launch powered by biofuel**, which is **non-toxic for the environment** as opposed to traditionally used rocket fuels. This launch marks another historic first for Maine since Stardust 1.0 has become the first commercial rocket launch for the state located in northeastern US.

What is Stardust 1.0?

1. **Stardust 1.0 is a launch vehicle** suited for student and budget payloads. The **rocket is 20 feet tall** and has a **mass of roughly 250 kg**.
2. The rocket can **carry a maximum payload mass of 8 kg** and during its first launch carried three payloads.
3. The **rocket is manufactured by bluShift**, an aerospace company based in Maine that is developing rockets that are powered by **bio-derived fuels**.
4. **Stardust 1.0** is being developed by the company since 2014 when the company was founded by its CEO Sascha Deri.
5. These rockets will help to launch small satellites called **cubesats** into space in a way that is relatively cheaper than **using traditional rocket fuel** and is less toxic for the environment.
6. Other rockets being developed by the company include **Stardust Gen. 2, Starless Rouge and Red Dwarf**, which is a **low-Earth orbit (LEO) vehicle** and is designed to fly a maximum payload of 30 kg.

WORLD'S LARGEST RADIO TELESCOPE

On 4 February 2021, the **Square Kilometre Array Observatory (SKAO) Council** held its **maiden meeting** and approved the establishment of the **world's largest radio telescope**. **SKAO is a new intergovernmental organisation** dedicated to **radio astronomy** and is **headquartered in the UK**. At the moment, **organisations from ten countries are a part of the SKAO**. These include Australia, Canada, China, **India**, Italy, New Zealand, South Africa, Sweden, the Netherlands and the UK.

What are radio telescopes?

1. Unlike optical telescopes, **radio telescopes can detect invisible gas** and, therefore, they can **reveal areas of space that may be obscured by cosmic dust**.
2. Significantly, since the **first radio signals were detected by physicist Karl Jansky** in the 1930s, astronomers have used radio telescopes to detect radio waves emitted by different objects in the universe and explore it.
3. According to NASA, the **field of radio astronomy evolved after World War II** and became one of the most important tools for making astronomical observations since.
4. The **Arecibo telescope in Puerto Rico**, which was the **second-largest single-dish radio telescope in the world**, collapsed in **December 2020**.
5. The telescope was built in 1963 and because of its powerful radar; scientists employed it to **observe planets, asteroids and the ionosphere**, making several discoveries over the decades, including **finding prebiotic molecules in distant galaxies**, the **first exoplanets**, and the **first-millisecond pulsar**.

WORLD'S FIRST 'CARBON-NEUTRAL' OIL

Billionaire Mukesh Ambani's Reliance Industries Ltd has sourced the world's first consignment of '**carbon-neutral oil**' from the US as it looks to become a **net zero-carbon company by 2035**. Reliance, which operates the **world's largest single location oil refining complex at Jamnagar in Gujarat** with capacity of 68.2 million tonnes a year, got 2 million barrels of consignment Permian basin, the US supplier said.

What

1. **Oxy Low Carbon Ventures (OLCV)**, a division of US oil Major Occidental, delivered carbon-neutral oil to Reliance.
2. **Oxy Low Carbon Ventures** and Macquarie will offset carbon dioxide equivalent to that associated with the production, delivery and refining of the crude oil and the use of the resulting product through the retirement of **carbon offset credits**. This will make the oil '**carbon-neutral**'.
3. The **Very Large Crude Carrier (VLCC) Sea Pearl** containing the carbon-neutral oil unloaded the cargo at Jamnagar on 28 January 2021.
4. This transaction is a first step in the creation of a new market for **climate-differentiated crude oil**.
5. It is also a bridge to the development of a further differentiated petroleum product, **net-zero oil**, which Occidental intends to eventually produce through the capture and sequestration of atmospheric CO₂ via industrial-scale **direct air capture (DAC)** facilities and geological sequestration.

- The offsets were sourced from a variety of projects verified under the **Verra Verified Carbon Standard** meeting eligibility criteria for the UN's International Civil Aviation Organization's **Carbon Offsetting and Reduction Scheme for International Aviation (CORSA)**.
- The first **US-based international energy company** to announce an ambition to achieve **net-zero GHG emissions** associated with the use of its products by 2050, has been using carbon-dioxide in its enhanced oil recovery operations in the **Permian for over 40 years**.

SPACEX SELECTED FOR SPHEREX MISSION

NASA has selected tech billionaire Elon Musk's private aerospace company SpaceX to provide launch services for an **astrophysics mission** to survey the sky in the **near-infrared light**. The planned two-year mission is called **SPHEREx**, short for **Spectro-Photometer for the History of the Universe, Epoch of Reionization, and Ices Explorer**.

What

- The **near-infrared light**, which, though not visible to the human eye, serves as a **powerful tool for answering cosmic questions** involving the birth of the universe, and the subsequent development of galaxies.
- SPHEREx will also will search for water and organic molecules** -- essentials for life as we know it -- in regions where stars are born from gas and dust, known as **stellar nurseries**, as well as disks around stars where new planets could be forming.
- The mission currently is targeted to launch as early as June 2024 on a Falcon 9 rocket from Space Launch Complex-4E at Vandenberg Air Force Base in California.
- Astronomers will **use the mission to gather data on more than 300 million galaxies**, as well as more than 100 million stars in our own **Milky Way galaxy**.

THE MYSTERIOUS ELEMENT

A team of scientists at the Berkeley Lab has reported **some of the properties of element 99** in the periodic table called "**Einsteinium**", **named after Albert Einstein**. It was discovered in 1952 in the **debris of the first hydrogen bomb** (the detonation of a thermonuclear device called "**Ivy Mike**" in the Pacific Ocean). Since its discovery, scientists have not been able to perform a lot of experiments with it because it is difficult to create and is **highly radioactive**. Therefore, **very little is known about this element**.

The discovery of the element

- When **Ivy Mike was detonated on 1 November 1952**, as part of a test at a remote island location called **Elugelab on the Eniwetok Atoll in the South Pacific**, it produced an explosion that was **about 500 times more destructive** than the explosion that occurred at Nagasaki.
- The **scientists worked with less than 250 nanograms of the artificial element**, which was manufactured at the Oak Ridge National Laboratory's High Flux Isotope Reactor, which is one of the few places in the world capable of making einsteinium.

- Specifically, the team worked with **einsteinium-254**, one of the more stable isotopes of the element that has a **half-life of 276 days**. The most common isotope of the element, **einsteinium 253 has a half-life of 20 days**.
- Therefore, so far, the **element has been produced in very small quantities** and its usage is limited except for the purposes of scientific research. The element is also not visible to the naked eye and after it was discovered, it took over nine years to manufacture enough of it so that it could be seen with the naked eye.

SATELLITE CENTRE TO PRIVATE FIRMS

For the first time in over five decades of India's space programme, Isro opened up its facilities to the private sector with two satellites from companies and one from academia being tested in the **UR Rao Satellite Centre (URSC)** in Bengaluru. Over the next few months, **two private firms will test their engines at Sriharikota spaceport** and Thiruvananthapuram rocket centre. Isro will soon give its satellite images to a private firm that offers mapping services. URSC said **satellites from Tamil Nadu-based Space Kidz India and Bengaluru-based Syzygy Space Technologies** have undergone testing.

26 proposals under review

- UNITYsat is a combination of three satellites** designed and built by **Jeppiaar Institute of Technology**, Sriperumbudur, GH Raison College of Engineering, Nagpur and Sri Shakthi Institute of Engineering and Technology, Coimbatore.
- Chennai-based Agnikul Cosmos** will be allowed to test its engine at Thiruvananthapuram while **Hyderabad-based Skyroot Aerospace's engine** will be tested at Sriharikota.
- MapmyIndia**, which builds digital maps and offers **GIS services**, has approached Isro for high-resolution images. These developments are in line with **opening up the space sector to private firms**.
- At least 26 proposals**, including those from **US-based Amazon Web Services** and Bharti Group backed UKbased OneWeb, are being reviewed by **Indian National Space Promotion and Authorisation Centre**.

ARJUN MAIN BATTLE TANK MK-1A

Prime Minister on 14 February 2021 handed over the **indigenously developed Arjun Main Battle Tank (MK-1A) to the Indian Army** at a ceremony in Chennai. The army will get **118 units of the Main Battle Tank**, indigenously designed, developed and manufactured by CVRDE and DRDO along with 15 academic institutions, eight labs and several MSMEs.

What is the Arjun Main Battle Tank?

- The **Arjun Main Battle Tank project was initiated by DRDO in 1972** with the **Combat Vehicles Research and Development Establishment (CVRDE)** as its lead laboratory.
- The objective was to create a **"state-of-the-art tank with superior fire power, high mobility, and excellent protection"**.

3. During the development, the CVRDE achieved breakthroughs in the engine, transmission, **hydropneumatic suspension**, hull and turret as well as the gun control system.
4. **Mass production began in 1996** at the **Indian Ordnance Factory's production facility in Avadi**, Tamil Nadu.

What are the features of the Arjun tank?

1. The Arjun tanks stand out for their '**Fin Stabilised Armour Piercing Discarding Sabot (FSAPDS)**' ammunition and 120-mm calibre rifled gun.
2. It also has a **computer-controlled integrated fire control system** with stabilised sighting that works in all lighting conditions.
3. The secondary weapons include a **co-axial 7.62-mm machine gun** for anti-personnel and a 12.7-mm machine gun for anti-aircraft and ground targets.

GENOME MAP OF MALARIA VECTOR

Scientists have unveiled the **detailed genome of the malaria mosquito vector**, revealing **thousands of new genes** vital for the development of genetic control strategies of disease transmission. The researchers included those from **Tata Institute for Genetics and Society (TIGS)**, and **Institute of Bioinformatics and Applied Biotechnology**, both in Bengaluru.

What

1. In order to engineer advanced forms of **defence against malaria transmission**, including **targeted CRISPR** and **gene drive-based strategies**, scientists require intricate knowledge of the genomes of vector mosquitoes.
2. **CRISPR technology is a gene-editing tool** which **allows researchers to easily alter DNA sequences** and **modify gene function**.
3. Mahul Chakraborty, a project scientist at the University of California, Irvine (UCI) in the U.S. and colleagues produced a **new reference genome for the Asian malaria vector** mosquito **Anopheles stephensi**.
4. With the **newly upgraded Anopheles stephensi genome**, the team unearthed more than 3,000 genes that previously evaded scrutiny and which offer fresh gene-drive targets, play key roles in blood feeding and the metabolism of ingested blood meal, reproduction and **immunity against microbial parasites**.
5. This reference genome and its excellent quality should help malaria biologists in India and the rest of the world, particularly in view of the **national goal of malaria elimination in India by 2030**, TIGS said.
6. The discoveries include **29 formerly undetected genes** that play crucial roles in resistance to chemical insecticides, a development that can help address the growing Asian and African **An. stephensi populations** with insecticide-resistant mutations, the researchers said.

TESS DISCOVERS THREE HOT PLANETS

Using **NASA's Transiting Exoplanet Survey Satellite (TESS)**, astronomers have **discovered a young star called TOI 451** with three planets revolving around it. The recently **discovered mini solar system is located in the Eridanus constellation**, which is a part of the **Pisces-Eridanus stream**. The star of this system is **400 light-years away from us** and is **just 120 million years old**, which makes it a lot younger when compared to our Sun.

What

1. The three hot planets orbiting it were discovered while studying images taken by TESS between October and December 2018.
2. The reason why astronomers are interested in exploring these planets is because **their size can help them understand how planetary atmosphere evolves**, given the system is not that far off from Earth.
3. This system **checks a lot of boxes for astronomers**. It's only 120 million years old and just **400 light-years away**, allowing detailed observations of this young planetary system.
4. And because **there are three planets between two and four times Earth's size**, they make especially promising targets for testing theories about how planetary atmospheres evolve, Elisabeth Newton, Assistant professor of physics and astronomy at Dartmouth College in Hanover, New Hampshire, who led the research said in a press statement.
5. According to NASA, **the nearest planet to the star, named TOI 451 b** is just 0.03 astronomical unit (AU) away and completes its orbit around in just 1.9 days. **The planet is 1.9 times Earth's size.**
6. The **second planet called TOI 451 c** is three times Earth's size and completes its orbit in 9.2 days, while the **third planet TOI 451 d is four times Earth's size** and has a **16-day orbit.**
7. The temperatures on these planets range from **1,200 degree celsius to 450 degree celsius** making them inhospitable. The reason is that even **TOI 451's most distant planet orbits three times closer than Mercury** ever approaches to the Sun, which results in the higher temperatures.
8. However, **the sun of this solar system has 95 per cent of our Sun's mass** and is 12 per cent smaller in size. It also emits **35 per cent less energy** and is considerably faster than our Sun completing a rotation in just 5.1 days.

MISCELLANEOUS

CENTENARY CELEBRATIONS OF CHAURI CHAURA INCIDENT

Prime Minister Narendra Modi on 4 February 2021 inaugurated the **centenary celebrations of the Chauri Chaura incident** in Gorakhpur, Uttar Pradesh. Recalling the incident, the prime minister said, the **incident of Chauri Chaura was not limited to a police station being set on fire**. The message of the incident was huge. Due to various reasons, it was treated as a minor incident, but we should see it in context. The fire was not just in the station but in the hearts of people.

What

1. The prime minister also released a **postal stamp** dedicated to the **Chauri Chaura centenary**.
2. The centenary celebrations and various events planned by the state government will begin in **all 75 districts of the state on 4 February** and **will continue till 4 February 2022**.
3. A group of freedom fighters participating in the **non-cooperation movement** launched by **Mahatma Gandhi in 1922** were fired upon by police, leading to the death of many of them.
4. In retaliation, protestors attacked and **set fire to the Chauri Chaura police station**, killing many of its occupants.
5. The colonial administration tried a large number of people, with many of them executed and many more condemned to life in prison for the incident.

UTTARAKHAND GLACIER BURST

The **glacier burst at Uttarakhand** is an **outcome of climate change** in the Himalayan region which is **warming up faster than the other mountain regions**, say experts. **Incremental use of reinforced concrete cement structures replacing the traditional wood** and stone masonry is accelerating a heat-island impact in the mountain region. **There are more than 8000 glacial lakes in the Himalayas** of which **200 are classified as dangerous**.

What

1. The **glacier collapse at Joshimath** on 7 February 2021 led to a **massive flood in the Dhaulti Ganga river** and caused large-scale devastation in the upper reaches of the ecologically fragile Himalayas.
2. **Glacier retreat and permafrost thaw** are projected to decrease the stability of mountain slopes and increase the number and area of glacier lakes.
3. There is **high confidence that current global glacier shrinkage** caused new lakes to form and existing lakes to grow in most regions, for instance in South America, **High Mountain Asia and Europe**, the report says.
4. The IPCC reports that **climate change has altered the frequency and magnitude of the natural hazards**.
5. The scientist reported with medium confidence that in some regions snow avalanches involving wet snow have increased while the **rain on snow floods has also increased** at lower elevations in springs.
6. The recent assessment report called the **HI-MAP report facilitated by ICIMOD** has also pointed these out. The report shows that **temperatures are rising in the Hindu-Kush Himalayan region** and the **rise in global temperature will have more impact in the Himalayan region** due to elevation-dependent warming.
7. If the world can keep the temperature rise to **below 1.5 degrees Celsius**, in the HKH region it would translate to at **least a rise of 1.8 C**, and in some places, above 2.2 C, said Prakash who was Coordinating Lead Author of the special report on Oceans and Cryosphere, 2018 and Lead Author of the **ongoing 6th Assessment report of IPCC**.

'YUDH ABHYAS' BEGINS

The **16th edition** of the **Indo-US joint military training exercise 'Yudh Abhyas'** commenced at the **Mahajan Field Firing Ranges** in the western sector of **Rajasthan** on 8 February 2021. Indian Army welcomed the US contingent at the firing range and impressed upon both the armies to achieve **optimum cohesion and interoperability** during the exercise.

What

1. The exercise near the **India-Pakistan border** aims at enhancing **cooperation and interoperability between the two armies** and will focus on counter-terrorism operations under the **United Nations mandate**.
2. The drill comes days after the **air forces of India and France held a five-day joint exercise** in Rajasthan in January.
3. The **11th Battalion of Jammu and Kashmir Rifles**, part of the South Western Command **will represent Indian Army in the exercise**.
4. The joint military exercise will enhance the **level of defence cooperation** between both armies which will also foster the bilateral relations between both nations and reiterate **India's key role as a key partner in the Indo-Pacific region**.
5. The exercise is being held in India also assumes **significance in the backdrop of recent developments on northern borders**, and conveys the strategic posture of the two nations as well as enhanced upward trajectory in **Indo-U.S. relations**.
6. The exercise is being conducted despite the COVID-19 pandemic which indicates the strength of bilateral relations and **conveys a geo-strategic message to the environment**.

Flashback

1. **Started in 2004**, Exercise Yudh Abhyas-20 is the **sixteenth edition in the series of bilateral exercises** under this banner.
2. The last edition of the joint exercise was held in **Seattle, USA**.
3. Exercise Yudh Abhyas is **one of the largest running military training and defence cooperation** endeavours between India and US.
4. The joint bilateral exercise is indicative that both the countries understand the common threat of terrorism and stand shoulder to shoulder in countering the same.
5. The Exercise **will go on till 21 February 2021**.

BCCI ALLOWED USING DRONES TO FILM MATCHES

The **Civil Aviation ministry** and the **Directorate General of Civil Aviation (DGCA)** on 8 February 2021 said that they have granted **conditional exemption** to the Board of Control for Cricket in India (BCCI) for the **deployment of drones for live aerial cinematography** of the India Cricket Season in 2021.

What

1. **This would not be the first time permissions** are being granted to **use drones for live aerial cinematography of matches**. DGCA has in the past allowed drones to be used for **IPL matches too**.

2. The drone ecosystem is evolving rapidly in our country. **Its utilization is expanding** from **agriculture, mining, healthcare** and **disaster management** to sports and entertainment.
3. The granting of this permission is in line with the objectives of the Government of India to promote the **commercial use of drones in the country**.
4. The **Drone Rules 2021** are in the final stages of discussion with the law ministry. We are hoping to **receive the approvals by March 2021**, Aviation ministry said.
5. The **conditional exemption is valid till 31st December 2021** from the date of issue of the letter or until the full operationalization of **Digital Sky Platform** (Phase-1), whichever is earlier, the statement read.
6. This exemption shall be valid only if all conditions and limitations as stated below are strictly adhered to.
7. In case of violation of any condition, this exemption shall become null and void.

SOLAR-POWERED PEST CONTROL SYSTEM

Researchers at **Indian Institute of Technology (IIT) Kharagpur** have developed **energy-efficient pest controlling devices** for smaller agricultural tracts owned by marginal farmers. The research team has developed a **self-propelled boom-type sprayer** that can be operated **using solar energy** while safely guided through the crops in smaller tracts of land, the leading engineering institute said.

What

1. The device is aimed to **increase field capacity and uniformity in liquid spraying** and also to **reduce drudgery to the operator and dependency on fossil fuel** for carrying out spraying in cropped areas.
2. This is an open call to the **technical institutions in India** to deliver in the **field of precision agricultural technologies**.
3. In the IIT system, IIT Kharagpur has the sole distinction of having an **Agricultural & Food Engineering Department**.
4. A **set of solar-powered batteries** act as the power source of the DC motor to propel the spraying unit as well as for running the pump.

AI STUDY FOR GROUNDWATER

Almost 20 per cent of India's total land area has **toxic levels of arsenic in its groundwater**, exposing more than 250 million people across the country to the poisonous element, says a new **IIT Kharagpur study** which used **artificial intelligence (AI)-based prediction modelling**. According to the researchers, the findings suggest a **much greater extent of the high arsenic zones** and total population exposed than already known from **arsenic sampling exercises** and reports by various governmental and non-governmental organisations.

What

1. **Arsenic is highly toxic in its inorganic form**, with long-term exposure to the element from drinking-water and food potentially causing cancer and skin lesions, among other disorders, according to the World Health Organisation (WHO).

2. The current study noted that these high arsenic areas are **mostly located along the Indus-Ganga-Brahmaputra river basin** and in **pockets in Peninsular India**.
3. It said the states of **Punjab (92 per cent), Bihar (70 per cent)**, West Bengal (69 per cent), Assam (48 per cent), Haryana (43 per cent), Uttar Pradesh (28 per cent), and Gujarat (24 per cent) show the highest areal extent of **elevated groundwater arsenic zones**.

Flashback

 1. The study is the **first integrated report on the field-sampled arsenic distribution patterns** along with an **arsenic prediction model** using advanced AI across India.
 2. **AI is being increasingly used in various domains of research** for its exceptional computing power and ability to handle complex data, over traditional statistical models.
 3. For this study, the researchers used an advanced AI model, **namely Random Forest**, which has been proven to be the most efficient in predicting groundwater arsenic in one of our previous studies.
 4. At present, **over 80 per cent of the drinking water in India is sourced to groundwater** and previous studies estimated about 90 million groundwater-dependent population in India is at risk of arsenic poisoning through direct and indirect consumption of arsenic-contaminated shallow tubewell waters.
4. These are followed by sporadic occurrences in the states of **Madhya Pradesh (9 per cent), Karnataka (8 per cent)**, Odisha (4 per cent), Maharashtra (1 per cent), and **south-eastern part of Jammu & Kashmir (1 per cent)**.
5. Apart from these, all other states are found to have negligible or **mostly no arsenic hazard**.
6. In the study, the scientists **used advanced AI to model** the occurrence of arsenic above its **national permissible limit of 10 microgrammes per litre (µg/L)** in the groundwater across India based on the various **geologic, hydrogeologic and anthropogenic factors** that have been known to control the groundwater arsenic distribution in the aquifers.

SCALE COMMITTEE FOR LOCALISATION

Commerce and industry minister Piyush Goyal on 11 February 2021 said the **SCALE committee (Steering Committee for Advancing Local Value-Add and Exports)** a **joint government-industry panel** has been setup and is **looking at ways to increase localisation**, component manufacturing and employment in the **country's toy industry**. The panel is tasked with fast-tracking growth of the Indian manufacturing sector.

What

1. It is a **public-private partnership committee**, Goyal said while inaugurating a website for **India Toy Fair 2021**.
2. The **first India Toy Fair-2021** is being organized on a virtual platform from 27 February – 2 March 2021 that offers the opportunity to explore and buy toys from over a thousand exhibitors across the country.

3. The committee is working on **24 champion sectors** including toys and furniture and **sector-specific subgroups** have been formed to come out with actionable points aimed to promote growth of these sectors.
4. The **import duty on toys rose to 60% from 20% last year** and a Quality Control Order requires all toys and material for children below 14 years to be certified by the BIS which is India's national standards body.
5. The **measures were crucial as of India's \$1.75 billion toy market** more than 85% comprises imports, which amounted to around \$1.5 billion in FY20. **China and Taiwan account for around 90% of India's toy imports.**
6. The **domestic toy industry comprises around 4,000 MSMEs** and is primarily in the unorganised sector.
7. The government will explore roping in industry to setup toy libraries at railway stations to boost locally made indigenous toys.