

# NEXT IAS

## DAILY CURRENT AFFAIRS (DCA)

Time: 45 Min

Date: 15-05-2024

### Table of Content

- Juvenile Justice Act
- Hydro Capacity to Meet Rising Peak Demand
- Regulatory Sandboxes in Artificial Intelligence
- NISAR Satellite will Monitor Tectonic Movements
- India-Middle East EU Economic Corridor (IMEC) Project
- Lack of Public Expenditure in Healthcare Sector

### NEWS IN SHORTS

- Baobab Forests of Madagascar
- Coronal Mass Ejections (CMEs)
- La Nina
- Xenotransplantation
- Semal Trees
- India VIX

## JUVENILE JUSTICE ACT

### Context

- The Supreme Court has attempted to plug significant gaps in the **Juvenile Justice (Care and Protection of Children) Act (JJA), 2015**.

### Background

- The SC was dealing with an appeal in a criminal case involving charges of rape and wrongful confinement under the **Indian Penal Code (IPC)** and the **Protection of Children from Sexual Offences Act (POCSO)**.
- The case in question revolved around an appeal against the Children's Court's decision to treat the appellant as an adult rather than a "child in conflict with law" — a term used when a minor is accused of an offense.
  - ♦ **A Session Court** deals with ordinary criminal offenses, while a **Children's Court** is a specialized court that deals with heinous offenses involving minors.

### Juvenile Justice Act, 2015

- It was introduced and passed in Parliament in 2015 to replace the **Juvenile Delinquency Law and the Juvenile Justice (Care and Protection of Children Act) 2000**.
- The Act seeks to achieve the objectives of the United Nations Convention on the Rights of Children as ratified by India on December 11, 1992.
- It allows the trial of juveniles in conflict with the law in the age group of **16-18 years** as adults, in cases where the crimes were to be determined.

### Procedures for handling legal violations by minors

- The JJA outlines procedures for handling legal violations by minors, managed by the **Juvenile Justice Board (JJB)**, which also fulfills various socio-legal roles.
- According to the JJA, a minor who encounters the criminal justice system due to an alleged offense is identified as a "child in conflict with law".
  - ♦ In such cases, the case is presented before the JJB.
- The JJB is endowed with the authority** to adjudicate matters concerning minors, ensure they have access to legal representation, and oversee the conditions of juvenile residential establishments.

- Should the board conclude that the minor should face trial as an adult, it will issue an order to that effect, which is subsequently forwarded to the **Children's Court** for a final decision.

### Supreme Court Judgement

- The supreme court ruled that an **appeal against the JJB order should be filed within 30 days** and also made it mandatory for the board to mention details, such as reasons for adjourning the hearing in a case in its orders.
- The court also **addressed the interchangeable use of "Children's Court" and "Court of Sessions"** within the Act, noting the frequent absence of a clear appellate process.
  - ♦ If Children's Court is available, even if the appeal is said to be maintainable before the Sessions Court, it has to be considered by the Children's Court.
  - ♦ Whereas, where no Children's Court is available, the power is to be exercised by the Sessions Court.
  - ♦ This ensures that minors have the opportunity to appeal decisions in situations where the alternate court was not previously specified.

Source: [The Print](#)

## HYDRO CAPACITY TO MEET RISING PEAK DEMAND

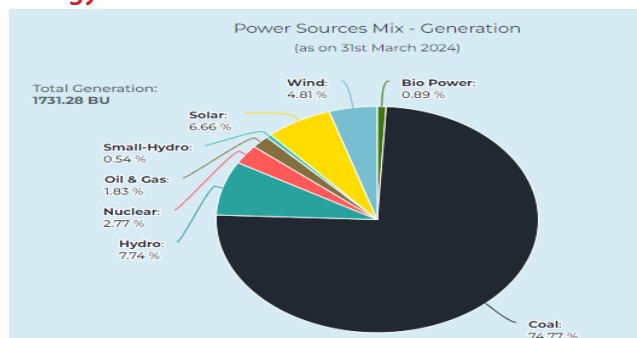
### Context

- The Ministry of Power has optimized hydropower generation to avoid supply shortfall as peak power demand is set to touch 240 GW during the summer months.

### Renewable energy generation in India

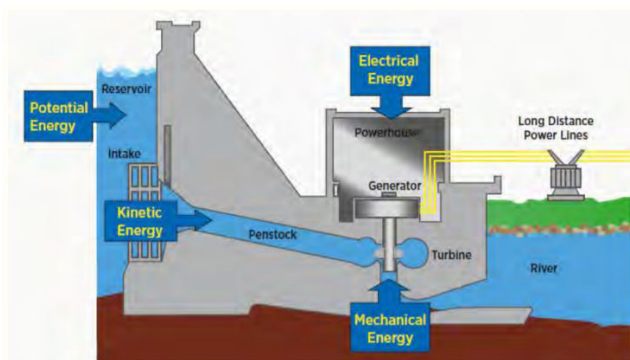
- India is the **world's third largest producer of renewable energy** and around **40 percent** of installed electricity capacity comes from non-fossil fuel sources.
  - ♦ India has added a renewable capacity of over **18 GW in FY24**.
- This green push has resulted in a sharp **24 percent** reduction in emission intensity of GDP between 2005 and 2016, but it has also thrown up challenges in meeting peak demand with a grid being increasingly powered by renewables.
- However the reliance on coal and gas along with hydro power is preferred more to meet peak demand.

## Energy Generation in India



### What is Hydropower?

- Hydropower, or hydroelectric power, is one of the oldest and largest sources of renewable energy, which uses the **natural flow of moving water to generate electricity**.



- Hydropower currently generates more electricity than all other renewable technologies combined and is expected to remain the **world's largest source of renewable electricity generation into the 2030s**.
- Classification of Hydro Projects based on Installed Capacity:**
  - Micro:** up to 100 KW
  - Mini:** 101KW to 2 MW
  - Small:** 2 MW to 25 MW
  - Mega:** Hydro projects with installed capacity  $\geq 500$  MW
- India:** In 2022-23, hydropower accounted for **12.5 percent** of power generation in India. India had about 4745.6 MW pumped storage capacity in operation in 2023.
  - The **hilly States of India** mainly Arunachal Pradesh, Himachal Pradesh, Jammu & Kashmir and Uttarakhand constitute around half of this potential.
  - Other potential States are **Maharashtra, Chhattisgarh, Karnataka and Kerala**.

### Potentials of Hydro Electric power in meeting Energy demand

- Abundant water resources:** India is endowed with several major rivers and their tributaries, which offer immense potential for hydroelectric power generation.
- Potential for small-scale projects:** In addition to large-scale projects, India also has potential for small-scale hydroelectric projects, especially in hilly regions and remote areas where grid connectivity is limited.
- Storage capacity:** Hydroelectric power plants with reservoirs offer the advantage of energy storage, which can be crucial for managing peak demand and providing stable electricity supply.
- Long Lifespan:** Hydropower infrastructure, such as dams and turbines, can have long lifespans, often exceeding 50 years with proper maintenance. This longevity ensures a stable and enduring source of energy for a longer period of time.
- Reliable and Predictable:** Unlike solar and wind energy, which are intermittent and dependent on weather conditions, hydropower provides a consistent and reliable source of electricity.
- Clean Energy:** Hydropower produces minimal greenhouse gas emissions compared to fossil fuels, making it an environmentally friendly option for generating electricity.

### Challenges associated with Hydro Power generation

- Environmental Impact:** Large-scale hydropower projects often require damming rivers, which alter ecosystems, disrupt fish habitats, and impact local biodiversity.
  - It also leads to issues like sediment buildup and water temperature changes downstream, affecting aquatic life.
- Social Impacts:** Building dams and reservoirs displace communities and disrupt livelihoods, especially those relying on the affected rivers for fishing or agriculture.
- High Initial Costs:** Constructing hydropower facilities involves significant upfront investment costs.
- Climate Change Vulnerability:** Hydropower generation relies on consistent water flow, which can be affected by climate change-induced variations in **precipitation patterns and glacial melt**.



- A UK based thinktank found that the drought — likely exacerbated by climate change — **drove an 8.5% drop in hydroelectricity** around the world over the last two decades.
- **Sedimentation:** Dams trap sediment flowing downstream, leading to reservoirs gradually filling up with sediment over time.
  - This reduces the reservoir's capacity and impacts the efficiency and lifespan of the hydropower facility.
- **Maintenance Challenges:** Hydropower infrastructure requires regular maintenance to ensure safe and efficient operation.
- It promotes **transparency and accountability** by requiring participants to disclose information about their AI models, addressing concerns about opacity and enabling tailored regulations.
- by mandating risk assessments and safeguards, the sandbox encourages **responsible innovation, mitigating potential societal impacts** of AI applications and nurturing a culture of ethical development within the industry.

### Way Ahead

- The solution to address the rising peak demand is to **diversify the power sources** by incorporating other renewable technologies into the energy mix.
- **Innovations around placing floating solar panels** on the water's surface in hydropower plants — as countries such **China and Brazil** are exploring — have significant potential.
- **To compensate for the intermittency**, pumped-storage hydroelectric plants – where it stores energy in the form of the gravitational potential energy of water with the help of renewable power is being seen as the most viable alternative

Source: IE

## REGULATORY SANDBOXES IN ARTIFICIAL INTELLIGENCE

### News

- Many governments and regulatory bodies have turned to innovative approaches such as “**AI regulatory sandboxes**” to strike a balance between fostering AI innovation and ensuring responsible development.

### About Regulatory Sandbox

- A regulatory sandbox is a tool allowing businesses to explore and experiment with new and innovative products, services or businesses under a regulator's supervision.

### Applications in AI

- Sandbox provides a **controlled environment for experimentation**, offering invaluable insights into AI technologies capabilities and limitations while fostering collaboration between innovators and regulators.

### Relevance

- It has become a significant instrument in various countries, used to **evaluate innovations** within a **defined and monitored time frame** while being subject to regulatory oversight and controlled constraints.
- It **empowers policymakers** to **adopt a well-informed stance** in crafting legal and policy responses that foster beneficial innovation.
- It enhances **access to funding** by mitigating information imbalances and reducing regulatory costs.
- It is a catalyst for supporting economic growth, and ensuring responsible governance in a rapidly evolving landscape of emerging technologies.

### Progress across the globe

- The inception of the **first formal regulatory sandbox** is often attributed to the **Financial Conduct Authority in the U.K.**
- Numerous other nations have subsequently introduced or announced similar initiatives to assess innovations spanning various industries.
  - According to data from the World Bank, as of November 2020, there were approximately 73 regulatory sandboxes, both announced and operational, within the financial sector across 57 jurisdictions.
- **Article 53 of the European Union's AI Act**, has the provision of a regulatory sandbox to test technology before making it mainstream.
- **Spain became the first European country** to have established the statute of the Spanish Agency for the Supervision of Artificial Intelligence (AESIA), ahead of the European regulation on artificial intelligence.

### Status in India

- In India, all financial sector regulators, including the Reserve Bank of India, Securities and Exchange Board of India, Insurance Regulatory and Development Authority of India, Pension Fund Regulatory and Development Authority, and International Financial Services Centre Authority, have launched their respective regulatory sandboxes.
- The recently passed Telecommunications Act 2023 proposed a regulatory sandbox where the central Government has the authority to establish one or more regulatory sandboxes, as prescribed, to promote and facilitate innovation and technological development in the field of telecommunications, specifying the manner and duration for their implementation.

### Conclusion and Way Forward

- India's interest in regulating AI is grounded in a multifaceted approach encompassing economic ambitions, ethical considerations, job creation, industrial transformation, and overall societal welfare.
- As a global technology hub, the chair of the Global Partnership on Artificial Intelligence and the Delhi Declaration, India aspires to foster innovation in alignment with its cultural and ethical values.
- A comprehensive regulatory sandbox can be envisioned to guide businesses, researchers, and policymakers, steering AI development towards sustainable growth.
- A regulatory sandbox should not be viewed as an approach to directly govern AI, but rather as a progressive step preceding formal legislation.
- It serves as a preparatory measure tailored to India's specific circumstances, paving the way for future regulatory actions aligned with the country's needs and developments in the AI landscape.

#### Additional Information

- In India, NITI Aayog released a discussion paper outlining a national strategy for AI, which led to the establishment of the national AI Portal.
- The Ministry of Electronics and Information Technology (MeitY), released a report on **AI Innovation 2023** highlighting India's AI vision through seven working groups.
- The latest proposal of the Digital India Act, 2023 also talks about **regulating AI by creating a separate set of laws and regulations.**

Source:TH

## NISAR SATELLITE WILL MONITOR TECTONIC MOVEMENTS

### Context

- Recently the ISRO Chairman S. Somanath said that the NISAR satellite will be able to monitor tectonic movements accurately and can fully map the earth twice a month.

### NISAR Satellite

- NISAR is an Earth-observation satellite that stands for **(NASA-ISRO Synthetic Aperture Radar)**.
- It is Jointly developed by the **National Aeronautics and Space Administration (NASA)** and the **Indian Space Research Organisation** under a partnership agreement signed in **2014**.
- It will be launched into a **polar Sun-synchronous dawn-dusk orbit**.
- NISAR is the first satellite mission to collect radar data in two microwave bandwidth regions, called the **L-band and the S-band**.
  - ◆ **The S-band** payload has been made by the ISRO and the **L-band** payload by the U.S.

### Monitoring of Earth Surface

- The NISAR system comprises a **dual frequency, fully polarimetric radar**, with an imaging swath greater than **150 miles (240 km)**.
- This design permits complete global coverage every **12-days**, allowing researchers to create **time-series interferometric imagery** and systematically map the changing surface of Earth.
  - ◆ It can monitor various aspects in very high resolution.
- After a 90-day commissioning period, the mission will conduct a minimum of **three full years** of science operations with the L-band radar to satisfy NASA's requirements,
  - ◆ ISRO requires **five years** of operations with the S-band radar.

### Objectives of the Mission

- NISAR can **measure tectonic plate movements** accurately. So a lot of geological, agricultural and water-related observations can be obtained from this satellite.
- It can study the **water-stressing, climate change-related issues, agricultural changes through patterns, yield, desertification and continental movements** precisely with respect to annual water cycle movements.

- NISAR's data can help people worldwide **better manage natural resources and hazards**, as well as providing information for scientists to better understand the effects and pace of climate change.

Source: TH

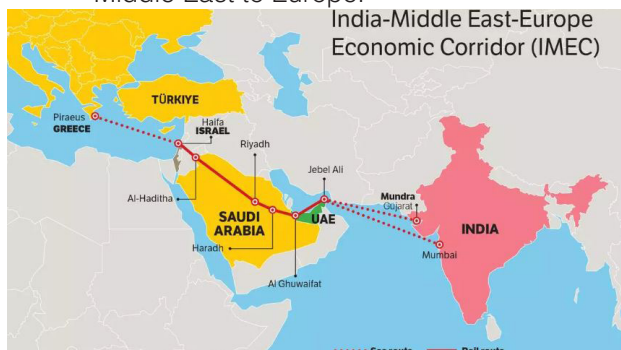
## INDIA-MIDDLE EAST EU ECONOMIC CORRIDOR (IMEC) PROJECT

### Context

- With uncertainty gripping the ambitious India-Middle East EU Economic Corridor (IMEC) project due to the deepening of the West Asia crisis, **India is examining the possibility of beginning work on the eastern leg of the corridor.**

### India-Middle East EU Economic Corridor (IMEC)

- **Background:** The IMEC, a proposed 4,800 km long route was announced in 2023 on the sidelines of the G20 Summit.
  - ♦ This followed a meeting between the leaders of India, the US, the United Arab Emirates, Saudi Arabia, Italy, France, Germany, and the European Commission.
- **Members: India, European Union, France, Germany, Italy, Saudi Arabia, UAE and US** announced the India-Middle East-Europe Economic Corridor (IMEC).
- **Aim:** Integration of Asia, Europe and the Middle East.
- **The IMEC will comprise of two separate corridors:**
  - ♦ The east corridor connecting India to the West Asia/Middle East and
  - ♦ The northern corridor connecting West Asia/Middle East to Europe.



### Ports Which are Part of IMEC

- **India:** Ports in Mundra (Gujarat), Kandla (Gujarat), and Jawaharlal Nehru Port Trust (Navi Mumbai).

- **Europe:** Piraeus in Greece, Messina in Southern Italy, and Marseille in France.
- **Middle East:** Ports include Fujairah, Jebel Ali, and Abu Dhabi in the UAE, as well as Dammam and Ras Al Khair ports in Saudi Arabia.
- **Israel:** Haifa port.
- **Railway Line:** The railway line will link Fujairah port in the UAE to Haifa port in Israel, passing through Saudi Arabia (Ghuwaifat and Haradh) and Jordan.

### Significance

- **Economic Development:** By linking Asia, West Asia, the Middle East and Europe through enhanced connectivity and economic integration, the corridor aims to give a boost to economic development in the regions.
- **Connectivity:** The corridor will include a rail line, which, upon completion, will provide a reliable and cost-effective cross-border ship-to-rail transit network.
  - ♦ The rail line will supplement the existing multi-modal transport routes enhancing trans-shipment of goods and services from South East Asia through India to West Asia/Middle East and Europe.
- **Eco-friendly Infrastructure:** It places emphasis on developing environmentally friendly infrastructure.
- **Transformative Integration:** It intends to increase efficiency, reduce costs, secure regional supply chains, increase trade accessibility, enhance economic cooperation, generate jobs and lower greenhouse gas emission, resulting in a transformative integration of Asia, Europe and the Middle East (West Asia).

### Concerns

- **Gaza War:** Long-term trend towards greater trade and strategic links between Israel and Arab nations that was championed by the **Abraham Accords** will suffer a blow due to the **Gaza war**.
  - ♦ Connecting Al Haditha in Saudi to Haifa in Israel is at the core of IMEC but it is going to be challenging now.
- **The security challenges** in the region have made other partners reluctant to invest in the project.
  - ♦ The instability in the Middle East has given a fatal blow to the project which aimed to radically quicken trade, reduce port costs and aid India's National Logistics Policy.

- The delay in the project could negatively impact the aspirations of India to deepen ties with Arabian Peninsula and Europe.

### Way Forward

- The geopolitical concerns need to be managed by striking a delicate balance in accommodating the geopolitical interests of the participating nations and addressing potential political sensitivities.
- There is also a need to maintain the required security apparatus as the project passes through certain unstable regions of the world.

Source: BL

## LACK OF PUBLIC EXPENDITURE IN HEALTHCARE SECTOR

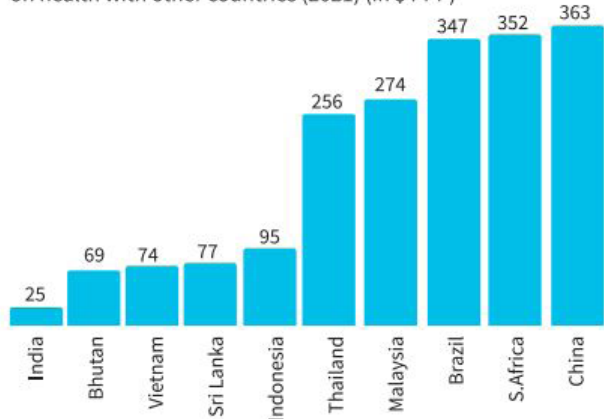
### Context

- **The Union Government's spending on health has decreased post-pandemic** while States have continued to spend more.

### About

- **Per capita public spending on health in India** compared to other countries in 2021.
  - Bhutan's spending on health was 2.5 times more than India's while Sri Lanka's was three times more.
  - Many BRICS nations spent 14-15 times more than India.

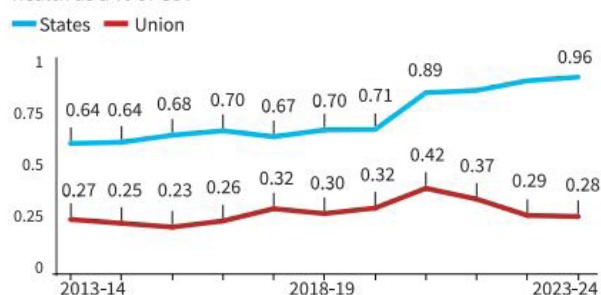
**Chart 1:** The chart compares India's per capita public spending on health with other countries (2021) (in \$ PPP)



- **Decline in Share of Union:** In FY14, three-fourth (75.9%) of the Union spending on health was transferred to the States.
  - By 2017, the share came down to little more than half (53.4%) and declined consistently to reach a new low of 43% in FY24 (Budget Estimates).

- The trend reflects increased centralisation of financial resources on health, a subject which largely falls within the domain of States.

**Chart 2:** The Union Government's and States' spending on health as a % of GDP



Note: Union government spending includes spending by the Ministry of Health and Family Welfare and the Ministry of AYUSH

- **Expenditure Under National Health Mission:** Launched in 2005, the NHM was a crucial intervention by the Union government.
  - But expenditure on the scheme has mostly remained stagnant or has come down in the last seven years.

### Healthcare Sector of India

- **Healthcare Sector:** It comprises hospitals, medical devices, clinical trials, outsourcing, telemedicine, medical tourism, health insurance and medical equipment.
  - India's healthcare delivery system is categorised into **two major components - public and private.**
- **Public Sector:** It comprises limited secondary and tertiary care institutions in key cities and focuses on providing basic healthcare facilities in the form of **Primary Healthcare Centers (PHCs) in rural areas.**
- **Private Sector:** The private sector provides the majority of secondary, tertiary, and quaternary care institutions with a major concentration in metros, tier-I, and tier-II cities.

### Structure of Financing of Public Healthcare Sector in India

- In India, **states bear the responsibility for public health and sanitation**, including hospitals and clinics.
- **The Ministry of Health and Family Welfare** broadly takes responsibility for **formulating policy for public health.**
  - It provides **administrative and financial support to states** to operate public health facilities and infrastructure, and to **deal with specific health issues, such as maternal health and nutrition.**



- ♦ It also **establishes and runs medical Institutes of National Importance** such as AIIMS as well as establishments in union territories including Delhi.
- **The Ministry comprises:** the Department of Health and Family Welfare, which is responsible for implementing public health schemes and regulating medical education, and
  - ♦ the Department of Health Research which is responsible for conducting medical research.

### Concerns with low Public Expenditure on Healthcare

- This has resulted in **inadequate health infrastructure** including human resources, and slow improvement in key health indicators.
- **Limited Access to Healthcare Services:** Low public spending hampers accessibility to healthcare services, particularly in rural and remote areas where infrastructure is already lacking.
  - ♦ This exacerbates health disparities between urban and rural populations and leads to many people being unable to afford or access essential medical services.
- **Neglected Preventive and Primary Care:** A large portion of healthcare spending in India is directed towards tertiary care, neglecting preventive and primary healthcare services.
  - ♦ This results in missed opportunities for early detection and management of diseases, leading to higher treatment costs and poorer health outcomes in the long run.
- **Higher Disease Burden:** Low public spending on healthcare contributes to a higher burden of preventable diseases such as communicable diseases, malnutrition, and maternal and child health issues.
- **Increased Out-of-Pocket Expenditure:** The lack of public healthcare infrastructure has led people to **use private health services more**, and that has **increased the financial burden on citizens**.

### Recent steps Taken by the Government for the Growth of Healthcare Sector

- **National Digital Health Mission (NDHM):** Launched in 2020, NDHM aims to create a digital health ecosystem, including health IDs for citizens and the establishment of a national digital health infrastructure.

- **Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY):** AB-PMJAY, launched in 2018, is a national health protection scheme that provides financial protection to over 100 million families for secondary and tertiary care hospitalization.
- **National Health Policy 2017:** The National Health Policy outlines the government's vision to achieve the highest possible level of health and well-being for all and emphasizes preventive and promotive healthcare.
- **Health and Wellness Centers (HWCs):** The government is working towards transforming primary health centers into HWCs to provide comprehensive primary healthcare services, including preventive and promotive care.
- **Pradhan Mantri Swasthya Suraksha Yojana (PMSSY):** PMSSY aims to enhance tertiary care capacities and strengthen medical education in the country by setting up new AIIMS (All India Institutes of Medical Sciences) institutions and upgrading existing government medical colleges.
- **Research and Development Initiatives:** The government has been encouraging research and development in healthcare, including support for the development of vaccines, drugs, and medical technologies.
- **National Medical Commission (NMC) Act:** The NMC Act, passed in 2019, aims to bring reforms in medical education and practice by replacing the Medical Council of India (MCI) and promoting transparency and accountability.
- **Jan Aushadhi Scheme:** The Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP) aims to provide quality generic medicines at affordable prices through Jan Aushadhi Kendras.

### Way Ahead

- The COVID-19 pandemic had shown the cracks in India's health system and highlighted the **need for increased public investment in healthcare**.
- Effective primary health care can prevent or pre-empt the occurrence of more serious health issues, meaning that overall health outcomes can be improved significantly through investing in primary healthcare.

**Source: TH**



## NEWS IN SHORT

### BAOBAB FORESTS OF MADAGASCAR

#### Context

- Recently, there was news that Madagascar's baobab forests are being restored with the help of Artificial Intelligence (AI) using satellite footage, algorithms and remote sensings.

#### About the Madagascar Baobab (*Adansonia Madagascariensis*)

- Madagascar Baobab is a small to large tree species (six of the world's eight baobab species are indigenous to Madagascar) known for their **giant trunks and long lifespan**.



- It occurs in **Mahajanga and Antsiranana provinces of Madagascar**, an island nation off the southeast coast of Africa.
- It grows in **dense dry deciduous forests** on limestone, sandstone and gneiss and in sub or coastal moist forests on sandy or chalky soil.
- It **can live for over a thousand years**, and has historically grown in vast forests across the island.
- IUCN Red List of Threatened Species: *Least Concern***

#### Threats

- Every year, 4,000 hectares of baobab forest in Madagascar are destroyed due to **slash-and-burn agriculture**.
  - Slash and burn practice involves clearing land with fire to plant crops, driven by the extreme poverty of some communities.
- Baobab Forests** are also facing the **loss of large-bodied animals** such as **giant lemurs** or

giant tortoises, which became extinct about 500 years ago, that played a crucial role in **spreading the seeds** of baobab trees in their dung.

- Climate change** has exacerbated the situation by increasing dryness and irregular weather patterns negatively affecting the growth and survival of baobab trees.

Source: TH

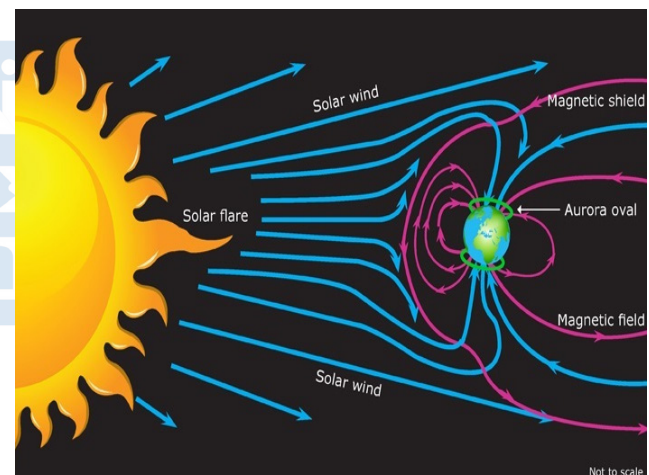
### CORONAL MASS EJECTIONS (CMEs)

#### Context

- Recently, a powerful solar storm impacted the earth triggered by the series of X-class flares and coronal mass ejections (CMEs).

#### About the Coronal Mass Ejections (CMEs)

- The outer solar atmosphere, known as the corona, is **structured by strong magnetic fields**.



- They are large expulsions of **plasma and magnetic fields (frozen in flux)** from the Sun's corona.
  - These are **stronger than the background solar wind** interplanetary magnetic field strength.
- The ejected material can travel at a speed of a million miles per hour or more.
- They can travel in **any random direction** and cut through solar winds, and they are **sometimes associated with flares** but **can occur independently**.
- CMEs are capable of driving the **Space Weather in near-Earth space**.
  - If CMEs are Earth-directed, they can cause severe implications.

**Do You Know?**

- There are **two main types** of explosions that occur on the sun:
  - ◆ Solar Flares
  - ◆ Coronal Mass Ejections (CMEs)
- Unlike the **energy and X-rays produced in a solar flare**, which can reach Earth at the speed of light in eight minutes, **CMEs are giant clouds of solar material that take one to three days to reach Earth.**
- Fast CMEs occur more often near the peak of the 11-year solar cycle, and can trigger major disturbances in Earth's magnetosphere.
- Once at Earth, these ejections can impact satellites in space or interfere with radio communications.

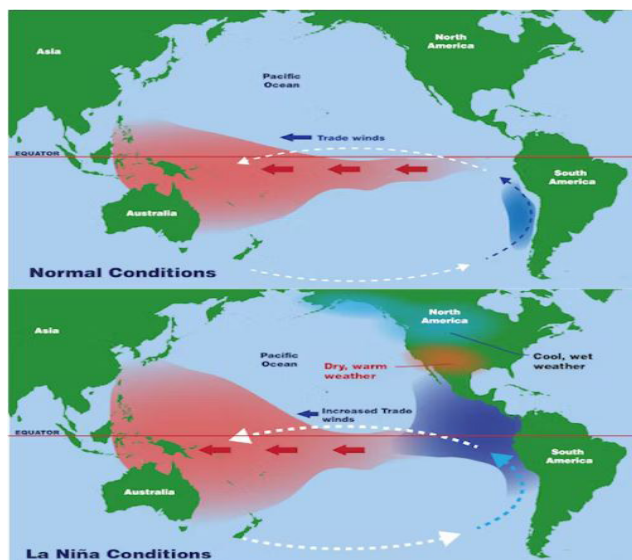
Source: TH

**LA NINA****Context**

- As per the Australia's weather bureau there are **early signs that a La Nina weather event may form in the Pacific Ocean later this year.**

**About**

- La Nina means **Little Girl in Spanish.** La Niña is also sometimes called El Viejo, anti-El Niño, or simply "a cold event."
- La Niña is a weather phenomenon that occurs in the **Pacific Ocean.** It is the counterpart of El Niño, and both are part of the **larger El Niño-Southern Oscillation (ENSO) cycle.**
- The **trade winds become stronger than usual**, pushing more **warmer waters towards the Indonesian coast**, and making the **eastern Pacific Ocean colder than normal.**

**Impacts**

- **Increased rainfall:** Regions such as Southeast Asia, northern Australia, and parts of South America often experience above-average rainfall during La Niña events.
- **Drier conditions in some areas:** Conversely, regions like the southwestern United States and parts of Africa experience below-average rainfall, leading to drought conditions.
- **Stronger Atlantic hurricanes:** La Niña tends to reduce wind shear in the Atlantic, creating conditions that are more conducive to the development of hurricanes.
- **Cooler temperatures:** Some areas experience cooler temperatures than normal, particularly in the Pacific Northwest of the United States and parts of South America.

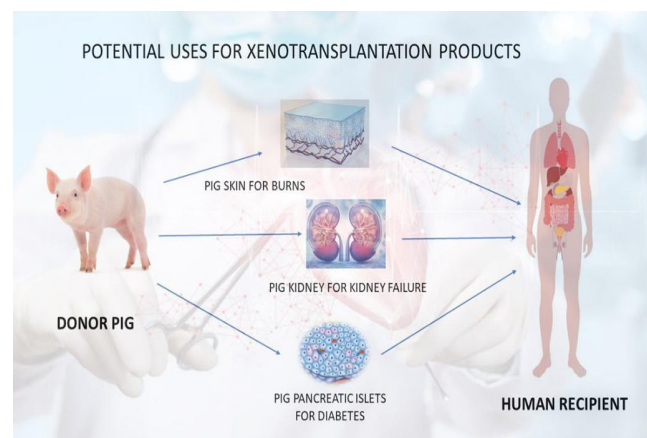
Source: TH

**XENOTRANSPLANTATION****In News**

- The first recipient of a modified pig kidney transplant passed away.

**About Xenotransplantation**

- Xenotransplantation is defined as any procedure that involves the transplantation, implantation, or infusion into a human recipient of live cells, tissues, or organs from a nonhuman animal source.
- The development of xenotransplantation is driven by the fact that the demand for human organs for clinical transplantation far exceeds the supply.



- Xenotransplantation involving the heart was first tried in humans in the 1980s.
  - ◆ In January 2022, the first xenotransplantation of a genetically-modified pig heart was done.

- **Benefits** : Transplantation of cells and tissues may be therapeutic for certain diseases such as neurodegenerative disorders and diabetes, where human materials are not usually available.
- **Concerns** : The use of xenotransplantation raises concerns regarding the potential infection of recipients .

### Why are pigs often used for xenotransplantation?

- Pig heart valves have been used for replacing damaged valves in humans for over 50 years now.
- The pig's anatomical and physiological parameters are similar to that of humans, and the breeding of pigs in farms is widespread and cost-effective.
- Also, many varieties of pig breeds are farmed, which provides an opportunity for the size of the harvested organs to be matched with the specific needs of the human recipient.

Source:IE

## SEMAL TREES

### In News

- Semal trees are disappearing from south Rajasthan.

### About Semal Trees (*Bombax ceiba* L.)

- It is a **silk cotton tree** which is known locally as **semal**.
- It flowers spectacularly in spring.
- It is characterised by its spiked trunk and fluffy seed pods, and is native to India.
- Its roots, fruits, seeds, stem, stem bark, and gum are all medicinally valuable.
- Traditionally, the debarked stem or branch of a semal tree is used as the bonfire's in Udaipur's Holika Dahan.
- **Utility** : It has multiple purposes and is useful to wild animals, insects, and even to tribal communities

- Various parts of semal trees are used to treat gastrointestinal, skin, gynaecological and urogenital diseases.

Source: TH

## INDIA VIX

### Context

- India VIX, which is an indicator of the market's expectation of volatility over the near term, surged past the 21 mark.

### What is the Volatility Index?

- **The Volatility Index**, VIX or the Fear Index, is a measure of the market's expectation of volatility over the near term.
  - Volatility is described as the 'rate and magnitude of changes in prices' and in finance often referred to as risk.
- During periods of market volatility, the market moves steeply up or down and the volatility index tends to rise. As volatility subsides, the Volatility Index declines.
- **The Chicago Board of Options Exchange (CBOE)** was the first to introduce the volatility index for the US markets in **1993** based on S&P 100 Index option prices.
  - In **2003**, the methodology was revised and the new volatility index was based on S&P **500** Index options.

### What is India VIX?

- India VIX is a volatility index computed by the NSE based on the order book of NIFTY Options.
- India VIX indicates the investor's perception of the market's volatility in the near term i.e. it depicts the expected market volatility over the next 30 calendar days.
  - The higher the India VIX values, the higher the expected volatility and vice versa, as per NSE.

Source: IE

