

DAILY CURRENT AFFAIRS (DCA)

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Table of Content

MHA Proposes New Chapter 'K' Under Article 371 For Ladakh

Onus on Legislature to Make Marital Rape Punishable: SC

Digital India Land Records Modernisation Programme (DILRMP) 3.0

Defence Minister Visit to Srilanka

Winter Waste Burning Worsens Urban Air Pollution

News In Short

Tokenisation of Assets as the Next Frontier for India's Digital Ecosystem

Central Consumer Protection Authority (CCPA)

Sagar Manthan Vessel

Dark Matter could Form Tiny Black Holes inside Stars: Study

Lakes Alter the Global Carbon Cycle

Osteoarthritis

MHA PROPOSES NEW CHAPTER 'K' UNDER ARTICLE 371 FOR LADAKH

Context

- Recently, the Ministry of Home Affairs (MHA) discussed a proposed **Article 371(K)** to provide **Ladakh with constitutional safeguards** and a directly elected governing body.

Why is Article 371 relevant to Ladakh?

- The proposed **Article 371(K)** would be significant because the existing **Article 371** framework primarily provides special arrangements for **States**, whereas Ladakh is a **Union Territory without a legislature**.
- Thus, a **new 371(K)** could represent a **sui generis constitutional model** for Ladakh, potentially giving an elected UT-level body legislative powers over **land, culture and language, forests, environment and natural resources**.

Background: Why Does Ladakh Seek Safeguards?

- Ladakh was separated from Jammu and Kashmir and made a **Union Territory (UT) without a legislature in August 2019**.
- The absence of an elected Assembly led to growing political alienation while this initially generated enthusiasm in Leh.
- Ladakh had earlier been represented by **four MLAs in the J&K Assembly**, but its post-2019 administration has largely been bureaucratic.
- Concerns were further intensified by changes in **domicile rules in Jammu and Kashmir**, raising apprehensions regarding **land, employment, demography and cultural identity**.
- The UT has two Hill Councils i.e. the **Leh Autonomous Hill Development Council** and **Kargil Autonomous Hill Development Council** but they are not covered by the Sixth Schedule and have limited powers.
- The **Leh Apex Body (LAB)** and **Kargil Democratic Alliance (KDA)** have therefore demanded **statehood, tribal status/Sixth Schedule protection and greater democratic control** over land and infrastructure decisions.

Articles 371, & 371-A to 371-J

Part XXI of the Constitution of India: 'Temporary, Transitional and Special Provisions'.

Articles	State	Broad Focus
371	Maharashtra and Gujarat	Separate development boards for regions like Vidarbha and Marathwada
371-A	Nagaland	Naga customary law, religion, land/resources
371-B	Assam	Committee for tribal areas
371-C	Manipur	Hill Areas Committee
371-D/E	Andhra Pradesh & Telangana	Local opportunities/education; Central University
371-F	Sikkim	Special constitutional arrangements
371-G	Mizoram	Customary law, religion, land
371-H	Arunachal Pradesh	Governor's special responsibility for law and order
371-I	Goa	Special provision concerning Assembly
371-J	Karnataka	Special provisions for Hyderabad-Karnataka/Kalyana Karnataka region

What Has the Centre Proposed?

- The MHA has proposed a **sui generis governance model under Article 371, through a new Chapter K**. The proposed body would:
 - be **directly elected**;
 - possess legislative powers over **land, culture and language, forests, environment and natural resources**; and
 - potentially legislate on other matters reserved for the UT under **Article 240**.
- The proposal follows an **'in-principle understanding'** reached during discussions in May and July 2026.
- However, the **MHA has not yet provided a detailed draft**. Representatives have consequently described the proposal as incomplete.

Key Unresolved Issues

- The major questions concern:
 - Executive powers** of the elected body;
 - control over **finances, budgets and planning**;
 - control over the **bureaucracy**;
 - authority over **police and law and order**; and
 - the extent of the **Lieutenant Governor's powers**.
- Ladakh representatives have demanded that the L-G should not take major administrative, bureaucratic or land-related decisions until the new arrangement is finalised.

Sixth Schedule vs Article 371(K)

- The **Sixth Schedule under Article 244** provides constitutionally protected **Autonomous District Councils (ADCs)** with legislative, judicial and administrative powers over subjects including land, forests, water, agriculture, village councils, health, sanitation, inheritance, social customs and mining.
- It currently applies to tribal areas of **Assam, Meghalaya, Mizoram and Tripura**.
- The **National Commission for Scheduled Tribes (NCST)** recommended in **September 2019** that Ladakh be brought under it, citing its overwhelmingly tribal population and distinct cultural heritage.
 - However, no area outside the Northeast has so far been included in the Sixth Schedule.
- Article 371 and **Articles 371-A to 371-J** provide special arrangements for specific States.
 - For instance, **Article 371-A** protects Naga customary practices, religious and social matters, and ownership/transfer of land and resources; similar protections exist for Mizoram under **Article 371-G**.
- The **proposed Article 371(K)** would create a **tailor-made UT-level constitutional arrangement**, rather than simply extending the Sixth Schedule to Ladakh.

Additional Information**Insertion of a New Article in the Constitution of India**

- A **new Article** can be inserted into the Constitution only through a **Constitutional Amendment**, provided under **Article 368**.
- A **Constitution Amendment Bill** may be introduced in **either House of Parliament**.

- It generally requires a **special majority**:
 - majority of the **total membership** of each House, and
 - two-thirds of the members present and vote**.
- Ratification by **at least half of the State Legislatures** is required for certain matters affecting the **federal structure**.
- The Bill is presented to the **President**, who gives assent after Parliament completes the required procedure.
- The new provision then becomes part of the Constitution and is assigned an **Article number**.
- Parliament's amending power is **subject to the Basic Structure doctrine** laid down by the Supreme Court.

Source: TH

ONUS ON LEGISLATURE TO MAKE MARITAL RAPE PUNISHABLE: SC**Context**

- The Supreme Court guaranteed safety and security to sexually abused married women, but questioned whether **courts can direct rape prosecutions against husbands** when the **penal law exempts marital rape** from criminal liability.

SC Observations

- It recognised the **individual autonomy of married women** but the exception to Section 375 of the Indian Penal Code (IPC) states that sexual intercourse or sexual acts **by a man with his wife, provided she is not under 18, do not constitute rape under the law**.
 - Section 63 of the Bharatiya Nyaya Sanhita, which replaced the IPC in 2023, has **carried forward the exemption**.
- Keeping the Centre's reservations in mind, the **Bench said it will primarily examine two questions**:
 - Whether a man **can be prosecuted even if the marital rape remains an exception**.
 - Whether the **exception itself is constitutionally valid**.
- Marital rape **has never been criminalised in India** in view of the social matrix despite intense pressure from women's groups. It is the only exception that blocks legal action in cases of rape.

Arguments For Criminalising Marital Rape

- **Article 21 of Indian Constitution:** A woman is entitled to refuse sexual relations with her husband as the right to bodily integrity and privacy is an intrinsic part of Article 21 of the Constitution.
 - ♦ **In the State of Karnataka v. Krishnappa,** the Supreme Court held that sexual violence apart from being a dehumanizing act is an unlawful intrusion of the right to privacy and sanctity of a female.
- **Article 14 of Indian Constitution:** Indian women deserve to be treated equally under article 14 and an individual's human rights do not deserve to be ignored.
- **Human Rights Perspective:** International human rights treaties like **CEDAW (Convention on the Elimination of All Forms of Discrimination Against Women)**, to which India is a signatory, advocate for the criminalization of all forms of sexual violence, including within marriage.
- **Global Precedent:** Till date, more than 130 countries have criminalised marital rape, agreeing that marriage cannot mean freedom to commit sexual violence.
 - ♦ India, being a progressive democracy, should align with global standards on protecting women's rights.

Stance of J.S. Verma Committee on marital rape 2013

- The Verma Committee recommended that the **exception to marital rape be removed**, pointing out that "a marital or other relationship between the perpetrator or victim is not a valid defence against the crimes of rape or sexual violation."
- Concurring with the judgment of the European Commission of Human Rights, the Committee endorsed the conclusion that a **rapist remains a rapist regardless of his relationship with the victim.**

Arguments Against Criminalising Marital Rape

- **Destabilize marriage as an institution:** It may create absolutely anarchy in families and destabilize the institution of marriage.
- **Misuse of law:** The law can be misused and may become an easy tool for harassing the husband.
- **Difficulty of establishing consent:** Opponents argue that determining whether consent was absent in a particular instance may be evidentially difficult, especially when the allegation is made after a prolonged period.

- **The Ministry of Home Affairs** argued that being married does not take away a woman's right to give or refuse consent. There are other laws in place to protect a woman's consent within marriage under **Indian Penal Code (IPC)**.

- ♦ **Section 354:** Punishes assault or force used to outrage a woman's modesty.
- ♦ **Section 354A:** Deals with sexual harassment.
- ♦ **Section 354B:** Punishes assault or force used with the intent to disrobe a woman.
- ♦ **Section 498A:** Addresses cruelty by a husband or his relatives.

Way Ahead

- While protecting the institution of marriage is important, laws must also ensure that **women's autonomy and consent are upheld**.
 - ♦ However merely criminalizing marital rape may not stop it as "**moral and social awareness**" plays a vital role in stopping such an act.
- India could look to global examples where marital rape has been criminalized, and learn from their approaches to implementing the law while minimizing misuse and ensuring justice.

Source: TH

DIGITAL INDIA LAND RECORDS MODERNISATION PROGRAMME (DILRMP) 3.0

Context

- The Department of Land Resources, Ministry of Rural Development, is set to officially launch the Operational Guidelines for the **Digital India Land Records Modernisation Programme (DILRMP) 3.0 (2026–2031)**.

About

- The **core vision of DILRMP 3.0** shifts the focus from simple digital record-keeping to establishing a comprehensive, GIS-enabled "**Land Stack**".
- **Key Interventions to be Unveiled:**
 - ♦ **Universal Bhu-Aadhaar (ULPIN):** A framework to assign a **14-digit unique identification number** to every land parcel in the country, ensuring secure and unmistakable identity for all properties.
 - ♦ **Digitisation of Maps and Georeferencing:** Complete digitization of cadastral maps embedded with exact geographical coordinates.

- ♦ **Paperless Property Registration:** The introduction of end-to-end online, paperless registration and a new Registration Repository. The Ministry also plans to upgrade 75 Sub-Registrar Offices (SROs) into modern 'Registration Seva Kendras' with an outlay of Rs. 37.5 Crore.
- ♦ **Integrated Revenue Courts:** A modern, paperless case management system (RCCMS) integrated directly with land records to track disputes and cut down the time and cost of legal battles.
- ♦ **NAKSHA Pilot for Urban Areas:** Completion of NAKSHA Pilot.

Digital India Land Records Modernization Programme (DILRMP)

- Digital India Land Records Modernization Programme (erstwhile National Land Record Modernization Programme) was **revamped and converted as a Central Sector Scheme** in 2016 with **100%** funding by the Centre.
- **The objective of DILRMP** is to develop a comprehensive and transparent land record management system with the aim to develop an **Integrated Land Information Management System** which will inter alia:
 - ♦ Improve real-time information on land;
 - ♦ Optimize use of land resources;
 - ♦ Benefit both landowners & prospectors;
 - ♦ Assist in policy & planning;
 - ♦ Check fraudulent/benami transactions etc.

Need for Digitization of Land Records

- It will **transform land management** by addressing **traditional challenges** like disputes, fraud, and inefficient manual processes.
- **Ownership information** will be **easily accessible** online, enhancing transparency and reducing illegal encroachments.
- It **simplifies dispute resolution**, easing court burdens, and empowering marginalized communities by improving access to land rights.
- Integration with geospatial mapping **enhances land management**, enabling accurate surveys and planning.
- **During land acquisitions or disasters**, digital records ensure fair and timely **compensation**.

Challenges with Digitalisation of Land Records

- **Legacy and inaccurate records:** Historical records may contain errors in ownership,

boundaries, names and survey numbers, while old paper maps may not accurately correspond with present ground realities.

- **Fragmented databases:** Land records, registration records, cadastral maps and revenue databases are maintained by different authorities and often follow different formats, making seamless integration difficult.
- **Inter-State and inter-departmental coordination:** Land is primarily a **State subject**, while several components of modern land administration involve **Central institutions**, requiring **effective coordination between Union, State and local authorities**.
- **Cybersecurity and data privacy risks:** Digitised land databases contain sensitive information about ownership and property assets, making them vulnerable to unauthorised access, manipulation and cyberattacks.

Way Ahead

- Digitisation should be accompanied by progressive movement from presumptive titles towards **conclusive, guaranteed land titles, supported by reliable surveys** and appropriate title insurance or state guarantees.
- Modern technologies such as **GIS, satellite imagery, drones and CORS-enabled surveying** can improve the accuracy of cadastral boundaries and facilitate periodic updating.

Source: PIB

DEFENCE MINISTER VISIT TO SRILANKA

Context

- India and Sri Lanka have **inked three Memoranda of Understanding (MoU) on defence equipment and training**.

About

- The Defence Minister visit to Sri Lanka is the **first by an Indian Defence Minister to Sri Lanka in nearly 40 years**.
- **The MoUs signed are pertaining to** the upgradation of **L70 Guns for the Sri Lankan Air Force**, and cooperation between the **National Cadet Corps and the National Defence Colleges of the two countries**.

India and Sri Lanka Relations

- **Diplomatic Ties:** Diplomatic relations were established in **1948** after Sri Lanka's independence.

- **Trade Relations:** India-Sri Lanka Free Trade Agreement (ISFTA) in 2000 contributed significantly towards the expansion of trade between the two countries.
 - ♦ India has traditionally been among **Sri Lanka's largest trade partners** and Sri Lanka remains among the largest trade partners of India in the SAARC.
 - ♦ India is also one of the **largest contributors to Foreign Direct Investment** in Sri Lanka.
 - ♦ **The merchandise trade** amounted to USD 7.18 billion in FY 2025-26, with India's exports at USD 5.52 billion and Sri Lanka's exports at USD 1.66 billion.
 - ♦ **The negotiations for finalization of the Economic and Technology Cooperation Agreement (ETCA)** covering both goods and services was resumed after 5 years in 2023.
 - **Cultural relations:** The Cultural Cooperation Agreement signed in 1977 forms the basis for periodic Cultural Exchange Programmes between the two countries.
 - **Tourism:** India has traditionally been Sri Lanka's **top inbound tourism market**, followed by China.
 - ♦ In 2025 India accounted for around 5.31 lakh arrivals (22.5% of Sri Lanka's tourist traffic).
 - **Maritime Security and Defence Cooperation:** In 2011, a decision was taken to establish the **Colombo Security Conclave which aims to further promote maritime security in the Indian Ocean Region**.
 - ♦ India and Sri Lanka conduct a joint Military exercise named '**Mitra Shakti**', Trilateral Maritime Exercise "**Dosti**", and a Naval exercise named **SLINEX**.
 - **Connectivity Projects:** Recently, the two sides adopted a **vision document to enhance maritime, energy and people to people connectivity**.
 - ♦ There are plans to develop a **land bridge between the two countries** to provide India with land access to the ports of Trincomalee and Colombo to boost economic growth.
 - ♦ **Important projects under this mechanism include** commencement of ferry services between Nagapattinam, Tamil Nadu and Kankesanthurai, Sri Lanka.
 - ♦ **In order to develop Kankesanthurai port**, Gol has extended a grant of USD 65 million to GoSL.
 - **Multilateral Forum Collaboration:** India and Sri Lanka are member nations of several regional and multilateral organizations such as the **South Asian Association for Regional Cooperation (SAARC)**, South Asia Co-operative Environment Programme, South Asian Economic Union and BIMSTEC, working to enhance cultural and commercial ties.
- Areas of Concern**
- **The Fishermen Issue:** Sri Lanka's proximity to Indian territorial waters has often blurred the line for fishermen on both sides in pursuit of fish stock.
 - ♦ Since 2016, a **Joint Working Group on Fisheries (JWG) mechanism** has been in place to address the immediate concerns of fishermen of both sides and to find a permanent solution to the issue.
 - **Rise of China:** China's increasing strategic investments in vital maritime ports in the IOR has been an area of concern.
 - ♦ There is a lack of transparency in implementation of projects and possible military use of ports by China.
 - **Maritime Security Concerns:** Piracy, illegal fishing, and smuggling in the Palk Strait and surrounding waters.
 - ♦ Need for constant coordination on maritime borders to prevent incidents.
 - **Domestic Instability in Sri Lanka:** Political unrest or changes in government affect continuity of agreements and development projects.
 - ♦ Delays in infrastructure or economic projects due to internal instability.
- Way Ahead**
- India and Sri Lanka share **deep historical, cultural, and strategic ties**, reinforced by trade, defence, and development cooperation.
 - While challenges such as Chinese influence, and economic instability persist.
 - Enhanced economic and maritime collaboration, and strong people-to-people ties can ensure a **resilient, mutually beneficial, and strategically vital partnership** in the Indian Ocean.
- Source: TH**

WINTER WASTE BURNING WORSENS URBAN AIR POLLUTION

Context

- A report has found that open waste burning increases sharply during winter, and the quantity of waste burnt and associated emissions are up to three times higher than in summer.
 - ♦ **Paper and plastics** constituted major components of the waste being openly burnt.

Reasons for Open Waste Burning

- **Irregular door-to-door collection** and weak municipal services encourage residents to burn accumulated waste.
- **Limited Processing Capacity:** Insufficient recycling, composting and waste-processing facilities lead to waste accumulation.
- **Cost and Convenience:** Burning is often perceived as a quick and low-cost method of disposing of household and commercial waste.
- **Winter Heating:** Waste burning increases during winter as some people use waste as a readily available source of warmth.
- **Weak Enforcement of Rules:** Inadequate monitoring and penalties allow repeated burning at dumping sites and public spaces.

Impacts of Waste Burning

- **Environmental Impacts:**
 - ♦ **Air Pollution:** Releases particulate matter and toxic pollutants.
 - ♦ **Soil and Water Contamination:** Ash and residues contaminate soil and groundwater.
 - ♦ **Food-Chain Contamination:** Toxins accumulate in plants, animals and aquatic organisms.
 - ♦ **Ecosystem Damage:** Plastic residues harm wildlife and aquatic ecosystems.
 - ♦ **Climate Impact:** Releases greenhouse gases and black carbon.
- **Health Impacts:**
 - ♦ **Respiratory Problems:** Causes coughing, breathing difficulties and irritation.
 - ♦ **Cardiovascular Effects:** Increases risks of heart and circulatory problems.
 - ♦ **Toxic Exposure:** Dioxins, heavy metals and PAHs cause long-term health risks.
 - ♦ **Cancer Risk:** Certain combustion products, including PAHs, are carcinogenic.

Government Initiatives

- **CAQM Measures:** The **Commission for Air Quality Management (CAQM)** has identified recurring waste-dumping and burning locations as “waste-sensitive” sites and adopted a zero-tolerance approach under Operation Clean Air.
- **Waste-to-Energy:** The MNRE provides Central Financial Assistance for Waste-to-Energy projects that convert urban, industrial, agricultural and municipal waste into biogas, Bio-CNG, electricity and producer/syngas.
- **Pradhan Mantri JI-VAN Yojana:** Ministry of Petroleum and Natural Gas has launched ‘**Pradhan Mantri JI-VAN (Jaiv Indhan- Vatavaran Anukool fasal awashesh Nivaran) Yojana**’ to provide financial support for integrated bio-ethanol projects.
- **Legal Measures:** The government has notified dedicated rules for solid waste, plastic waste, hazardous waste, e-waste, battery waste and biomedical waste to ensure scientific collection, processing and disposal.
 - ♦ **Market-Based Extended Producer Responsibility (EPR)** mandates producers to manage post-consumer waste for plastic packaging, e-waste, batteries, tyres, and used oil. It promotes recycling, reduces landfill pressure, and curbs emissions from informal waste handling.
 - ♦ **Ban on 12 Single-Use Plastics (SUP) items** with low utility and high littering potential, like plastic cutlery, straws, and thermocol decorations.

Way Ahead

- Cities need to move from **reactive enforcement to source-level prevention** through universal door-to-door collection, decentralised processing and systematic monitoring of waste-sensitive locations.
- Municipalities should integrate **winter-specific waste-management plans** with air-pollution action plans, particularly in economically vulnerable neighbourhoods.
- Providing **safe heating alternatives** to sanitation and waste-management workers, along with stronger segregation and recycling systems, can address both the causes and consequences of winter waste burning.

Source: TH

NEWS IN SHORT

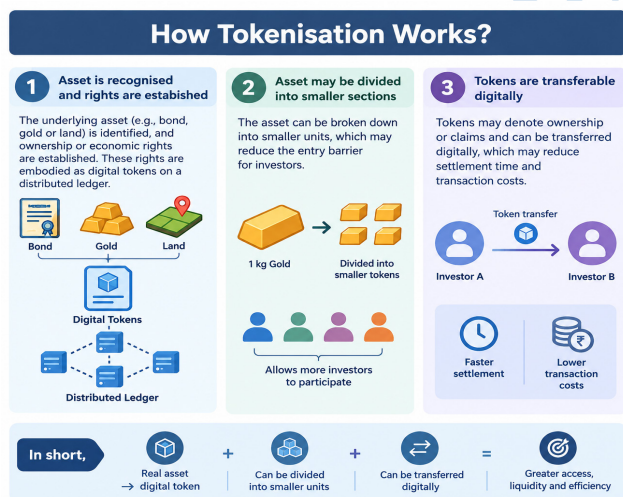
TOKENISATION OF ASSETS AS THE NEXT FRONTIER FOR INDIA'S DIGITAL ECOSYSTEM

Context

- Maharashtra has enacted the **Maharashtra Digitisation and Exchange of Land Token Asset (DELTA) Act** to build a blockchain-based system for the tokenisation of land and other immovable assets.

What is Asset Tokenisation?

- Asset tokenisation is the **process of transforming ownership or economic rights** in a real-world or financial asset into digital tokens that are recorded on a **blockchain or distributed ledger system**.
- Tokenisation can allow a **high-value asset to be divided into smaller units**, enabling investors to obtain fractional exposure to assets that would otherwise require substantial capital.
- For instance, a **₹10 lakh bond** can theoretically be broken up into smaller digital units, so that the investor can buy exposure to a smaller part of the asset.



India's Emerging Tokenisation Framework

- The RBI launched the Unified Markets Interface (UMI) as a digital infrastructure project to democratise ownership and transactions in financial assets.
- SEBI is also working on a pilot project for corporate bond tokenisation.

Source: IE

CENTRAL CONSUMER PROTECTION AUTHORITY (CCPA)

Context

- The Central Consumer Protection Authority (CCPA) has taken action against food companies using “100%” claims, holding that such claims can create a misleading impression of absolute purity or complete composition.

About Central Consumer Protection Authority

- Section 10** of the Consumer Protection Act, 2019 establishes the **Central Consumer Protection Authority** which seeks to promote, protect and enforce the rights of consumers as a class.
- Powers & Functions of CCPA:** It is empowered to:
 - conduct investigations into violation of consumer rights and institute complaints / prosecution
 - order recall of unsafe goods and services
 - order discontinuation of unfair trade practices and misleading advertisements
 - Impose penalties on manufacturers/endorsers/publishers of misleading advertisements.

Consumer Protection Act, 2019

- This Act replaced **The Consumer Protection Act, 1986**, and seeks to widen its scope in addressing consumer concerns.
- The new **Act recognises offenses such as providing false information** regarding the quality or quantity of a good or service, and misleading advertisements.
 - Under Section 21** of the Act, the CCPA can order a false or misleading advertisement to be discontinued or modified.
- The **Act came into force in July 2020** and empowers consumers and helps them in protecting their rights through its various notified rules and provisions.

Source: TH

SAGAR MANTHAN VESSEL

In News

- Kolkata-based Garden Reach Shipbuilders and Engineers (GRSE) Ltd launched the ‘**Sagar Manthan**’ vessel.

'Sagar Manthan' vessel

- It is an **indigenous ocean research vessel (ORV)** being built for the National Centre for Polar and Ocean Research (NCPOR).
- It is expected to be commissioned by **2028 after extensive sea trials**.
- It is an all-weather, multi-disciplinary platform developed under Vertical-4 (Deep Ocean Survey and Exploration) of **India's flagship Deep Ocean Mission (DOM)** at a cost of about Rs. 840 Crore.
- It will have a speed of **14 knots at 90 per cent** of its maximum continuous rating, with an estimated lifespan of 30 years.
- This vessel would strengthen India's efforts to explore marine mineral resources, including manganese nodules and polymetallic sulphides in the Indian Ocean region.

Deep Ocean Mission

- Deep Ocean Mission was **launched in 2021** & focusses on sustainably harnessing ocean wealth and strengthening the Blue Economy.
- India's first manned submersible vehicle '**MATSYA 6000**' is being developed as part of the **Samudrayaan Project under Deep Ocean Mission**.

Source: TH

DARK MATTER COULD FORM TINY BLACK HOLES INSIDE STARS: STUDY**Context**

- A new study suggests that **heavy dark matter particles** trapped inside a **dense star** could accumulate at its core, collapse into a tiny black hole and gradually transform the entire star into a black hole.

About

- Their study focuses on two extremely dense types of stellar objects - **millisecond pulsars and white dwarfs**.
 - ♦ **An extremely dense star** is essentially a dead star that has run out of nuclear fuel.
 - ♦ **A millisecond pulsar** is a rapidly rotating neutron star that emits regular beams of electromagnetic radiation at intervals of less than 10 milliseconds, while a **white dwarf is a hot, dense stellar remnant**.
- The study suggests that **ancient, extremely dense stars can act as natural laboratories** for detecting or constraining ultra-heavy dark matter.

Dark Matter

- Unlike normal matter, dark matter **does not interact with the electromagnetic force**. This means it does not absorb, reflect or emit light, making it extremely hard to spot.
 - ♦ Dark matter works like an **attractive force**, a kind of cosmic cement that **holds the universe together**. This is because dark matter **does interact with gravity**.
 - ♦ Since dark matter doesn't emit, absorb or reflect light, astronomers can **only study its gravitational effect on visible matter**, such as stars and galaxies.
 - ♦ Roughly **68% of the universe is dark energy**, **dark matter** makes up about **27%** and the rest everything observed adds up to **less than 5% of the universe**.

What is a Black Hole?

- A black hole is an **extremely dense object** whose gravity is so strong that nothing, not even light, can escape it.
- It does not have a surface, like a planet or star. Instead, it is a region of space where **matter has collapsed in on itself**.
 - ♦ This catastrophic collapse results in a **huge amount of mass being concentrated in an incredibly small area**.
- **Formation:** A black hole is formed when a **really massive star runs out of fuel** to fuse, blows up, leaving its core to implode under its weight to form a black hole.
 - ♦ The centre of a black hole is a **gravitational singularity**, a point where the general theory of relativity breaks down, i.e. where its predictions don't apply.
 - ♦ A black hole's great gravitational pull emerges as if from the **singularity**.

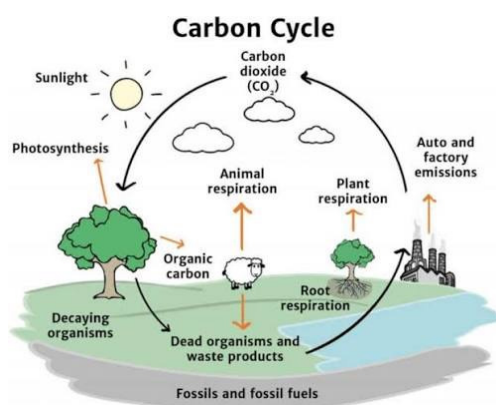
Source: TH

LAKES ALTER THE GLOBAL CARBON CYCLE**In News**

- New Swedish research shows that lake-rich Arctic stream networks significantly reshape the **global carbon cycle** by releasing more carbon to the atmosphere instead of **transporting it downstream**.

Carbon cycle

- The carbon cycle is the ongoing exchange of carbon between the atmosphere, oceans, rocks, sediments, and living creatures.
- Carbon is a key ingredient of life, found in molecules like DNA and proteins, and atmospheric CO₂ helps regulate the temperature of the Earth.
- The most carbon is stored in rocks and sediments. Oceans, ecosystems, and the atmosphere are all substantial carbon reservoirs.
- Carbon is released back into the atmosphere when organisms die, volcanoes erupt, fires blaze, fossil fuels are burned, and through a variety of other mechanisms.
- The oceans also exchange and sequester carbon over extended time periods.
- The significant rise in **atmospheric CO₂ levels is disturbing** this natural cycle due to human activities such as the combustion of fossil fuels and changes in land use.



Source : DTE

OSTEOARTHRITIS

In News

- Scientists are developing a **cell-free regenerative therapy** for **osteoarthritis** using extracellular vesicles derived from mesenchymal stromal cells found in menstrual blood.

Osteoarthritis

- It is a degenerative joint condition. It causes pain, swelling and stiffness, affecting a person's ability to move freely.
- It is most common in the knees, hips, spine and hands. Major causing factors are injury, older age and overweight. It affects women more than men.

Source : TH

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