

WEEKLY NEWS

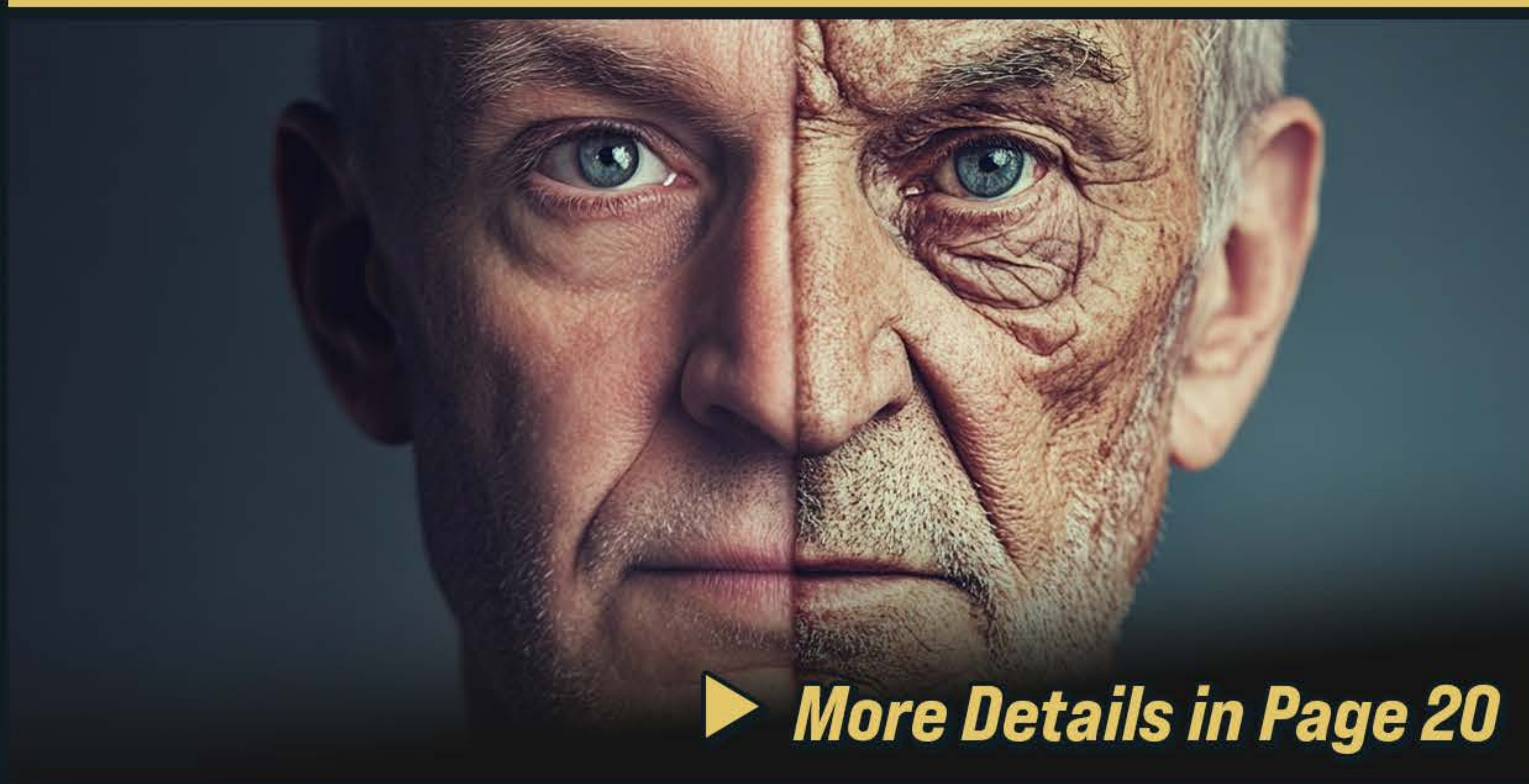
August 18-24, 2024

Liquid Water on Mars



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Hayflick Limit




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HIGHLIGHTS

- VOGSS
- 4D printed blood vessels
- RHUMI-1

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3rd Voice of Global South Summit (VOGSS)

● Why in News?

- ⇒ India hosted the **3rd Voice of Global South Summit (VOGSS)**, aiming to unite countries from the Global South to share their perspectives on various issues. This aligns with the philosophy of '**Vasudhaiva Kutumbakam**' (the world is one family).

● What is Global South

- ⇒ The Global South refers to countries often described as "**developing**," "**less developed**," or "**underdeveloped**." It contrasts with the Global North, which includes richer nations, divided by the **Brandt line**.

● Previous Summits

- ⇒ India also hosted the 1st and 2nd VOGSS in January and November 2023.

● Key Highlights of the 3rd VOGSS

- ⇒ **Theme:** "An Empowered Global South for a Sustainable Future."
- ⇒ **Virtual Participation:** 123 countries joined the summit virtually (China and Pakistan were not invited).
- ⇒ **Global Development Compact (GDC):** India proposed the GDC to address concerns about countries burdened with debt in the name of development finance. The Compact focuses on trade for development, sustainable growth, and technology sharing.
- ⇒ **Financial Commitments:**

India announced a **special fund of \$2.5 million** to boost trade promotion activities. A **Trade Policy Training Fund of \$1 million** will be established for capacity building.



● **Challenges Faced by the Global South**

- ⇒ Obsolete global governance and financial institutions.
- ⇒ Technology divides between the Global North and South.
- ⇒ Persistent threats of terrorism, extremism, and separatism.

● **India's Advocacy for the Global South**

- ⇒ **Social Impact Fund:** India will contribute \$25 million to accelerate Digital Public Infrastructure (DPI) in the Global South.
- ⇒ **Global South Young Diplomat Forum:** Launched to promote education and capacity building among young diplomats.
- ⇒ **Induction of African Union into G20:** India supported the inclusion of the African Union as a permanent member during its G20 Presidency.
- ⇒ **Vision of Aarogya Maitri:** India's mission for health security under the principle of "One World-One Health," including initiatives like Jan Aushadhi Kendras in African and Pacific Island countries.

● **Way Forward**

- ⇒ Strengthening global cooperation to address the challenges faced by the Global South.
- ⇒ Enhancing the role of the Global South in global governance and financial institutions.
- ⇒ Promoting sustainable development and technology sharing for a more equitable world.



Lateral Entry Recruitment in Central Ministries

● Why in News?

- ➡ A Union Minister has urged the Union Public Service Commission (UPSC) to cancel the recent advertisement for lateral entry positions in central ministries.
- ➡ The advertisement sought to fill roles such as **joint secretaries, directors, and deputy secretaries**.
- ➡ So far, 63 appointments have been made through lateral entry, with 35 of these from the private sector.

● About Lateral Entry

- ➡ **Definition:** Lateral entry refers to recruiting individuals from outside the traditional government service to occupy mid and senior-level positions in government departments.
- ➡ **Introduction:** Formally introduced in 2018, based on NITI Aayog's three-year Action Agenda.
- ➡ **Endorsement:** Supported by the Second Administrative Reforms Commission established in 2005.

● Arguments in Favour of Lateral Entry

- ➡ **Domain Expertise:** Brings in specialized knowledge to tackle complex governance and policy challenges.
- ➡ **Addressing Manpower Shortage:** Only 442 IAS officers are currently working at the Centre, against the required strength of 1,469 officers.
- ➡ **Widening the Talent Pool:** Expands the pool of candidates, a practice successfully followed by institutions like the RBI.

● Arguments Against Lateral Entry

- ➡ **Accountability Concerns:** Difficult to ensure accountability due to short tenure.
- ➡ **Lack of Field Experience:** Lateral entrants may lack the on-ground experience of career civil servants.
- ➡ **Deter Existing Talent:** May discourage existing government talent.
- ➡ **Reservation Issues:** Lack of clarity about the application of reservation policies.



● **Other Reforms Needed in Bureaucracy**

- ➔ **Deputation to Private Sector:** Encouraging civil servants to work in the private sector to gain domain expertise and foster competition.
- ➔ **Goal Setting and Tracking:** Institutionalizing goal setting and progress tracking for each department.
- ➔ **Appraisal Mechanisms:** Implementing comprehensive appraisal systems like the "360-degree" performance appraisal.
- ➔ **Public Administration Universities:** Establishing universities dedicated to public administration for both aspiring and serving civil servants.



Broadcasting Services (Regulations) Bill, 2024

● Why in News?

- ➔ The proposed **Broadcasting Services (Regulations) Bill** has raised concerns over its impact on online freedom of expression and the creative independence of digital content creators.

● Objective and Intent Behind the Bill

- ➔ **Significance of Digital Media:** Digital media plays a crucial role in providing a platform for scrutiny, dissent, and counter-narratives, especially during elections.
- ➔ **Objectives of the Bill:** The Bill aims to extend existing regulations from traditional media to digital platforms, consolidating guidelines and increasing broadcaster accountability.
- ➔ **Intent of the Bill:** The Bill may pose a threat to creative independence and restrict online freedom of expression, which are essential for a functioning democracy.

● Key Provisions of the Draft Bill

- ➔ **Broadcaster Redefined:** The definition of "broadcaster" is expanded to include digital news creators on platforms like YouTube, Twitter, blogs, and podcasts covering current affairs.
- ➔ **Regulations for Digital Broadcasters:** Broadcasters with a certain audience size are required to notify the government, follow a Programme Code, establish a grievance redressal mechanism, and adhere to a three-tier regulatory structure. Non-current affairs content needs pre-certification.
- ➔ **Penalties:** The government is empowered to impose penalties, shut down broadcasters, or prohibit transmission for reasons such as security and public order.
- ➔ **Global Scope:** The Bill extends its reach to global content creators and news publishers.
- ➔ **Threat to Safe Harbour:** Social media platforms may face new obligations to comply with government demands for information on broadcasters.



● **Issues with the Draft Bill**

- ➔ **Inappropriate Regulation:** The Bill overlooks the differences between television and internet content delivery, potentially leading to increased costs and censorship.
- ➔ **Implementation Challenges:** The decentralized nature of the internet makes global enforcement of the Bill difficult.
- ➔ **Regulatory Overlap:** The Bill adds complexity by overlapping with existing requirements under the IT Act 2000.

● **Way Forward**

- ➔ **Constitutional Challenges:** The IT Rules 2021 faced legal challenges, and it is suggested that existing laws like the IT Act 2000 should be used to address issues such as fake news.
- ➔ **Need for Deliberation:** The draft Bill requires thorough discussion with a diverse range of stakeholders before being enacted into law.



Melting Permafrost and Toxic Mercury Release in the Arctic

● Why in News?

- ➔ A recent study reveals that melting permafrost is releasing significant amounts of toxic mercury into the Arctic region. Researchers analyzed samples from the top three meters of permafrost in the Yukon River and found that riverbank erosion is a key factor in mercury release.

● About Permafrost

- ➔ **Definition:** Permafrost is ground that remains frozen (0°C or colder) for at least two consecutive years.
- ➔ **Composition:** It consists of soil, rocks, and sand held together by ice.
- ➔ **Location:** Commonly found in high mountain regions and at Earth's higher latitudes, such as the Arctic and Antarctica.
- ➔ **Characteristics:** Permafrost regions may not always be covered in snow, despite the ground being frozen.

● Impact of Melting Permafrost

- ➔ **Greenhouse Gas Emissions:** Thawing permafrost leads to the decomposition of soil organic carbon, releasing greenhouse gases like carbon dioxide and methane into the atmosphere.
- ➔ **Health Risks:** Thawing can release ancient bacteria and viruses, posing health threats to humans and animals.
- ➔ **Toxic Mercury Release:** The release of mercury due to melting permafrost poses a direct threat to over 5 million people living in the Arctic region.
- ➔ **Environmental Threats:** Contributes to sea level rise, increased erosion, and risks of landslides.



● **About Mercury**

➡ **Characteristics:** Mercury is a naturally occurring metal found in air, water, and soil. It is the only metal that is liquid at room temperature.

➡ **Sources:**

Natural: Volcanoes, geothermal springs, geological deposits, and oceans.

Anthropogenic: Burning of coal, hazardous waste, gold mining, and industrial uses.

Health Hazards: Exposure to mercury, even in small amounts, can cause serious health problems, affecting the nervous, digestive, and immune systems. Minamata disease, a neurological disorder, is caused by mercury poisoning.

● **Way Forward**

➡ **Monitoring and Research:** Enhance monitoring of permafrost regions and mercury levels to better understand and mitigate the risks.

➡ **Global Cooperation:** Strengthen international efforts to address climate change and its impact on permafrost regions.

➡ **Public Awareness:** Increase awareness of the health risks associated with mercury exposure, particularly in Arctic communities.



Liquid Water on Mars

● Why in News?

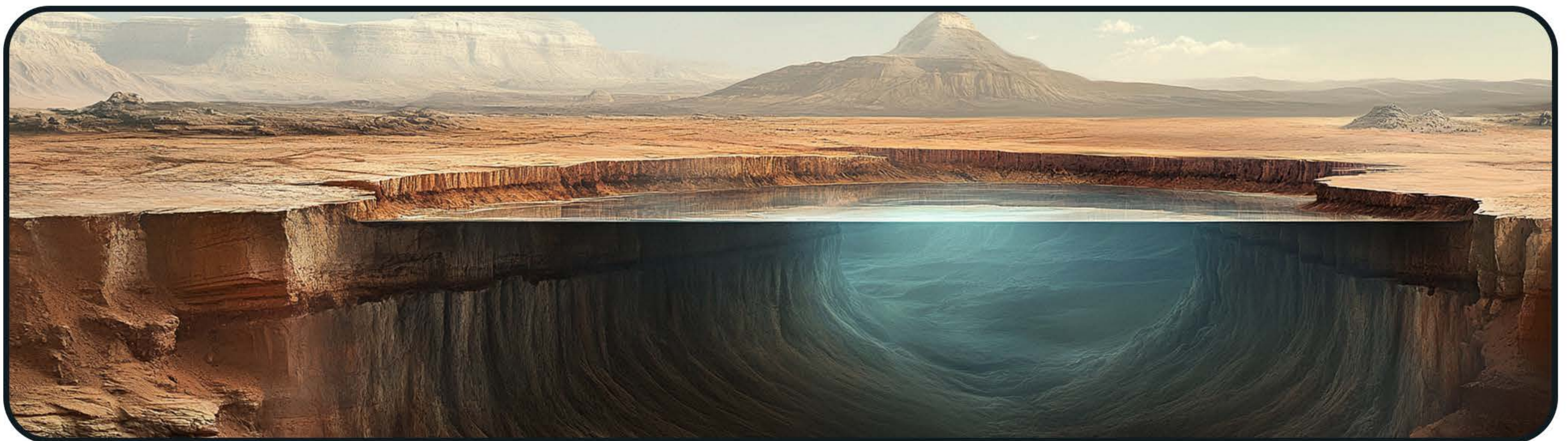
- ➡ A recent study titled "**Liquid Water in the Martian Mid-Crust**" reveals that Mars may have vast amounts of liquid water deep within its rocky outer crust.
- ➡ The liquid water layer is believed to be located at a depth of 10 to 20 km in the Martian crust.
- ➡ The discovery was made using data from **NASA's Mars Insight Lander**.

● Significance of the Discovery

- ➡ **First Evidence of Liquid Water:** This is the first time scientists have identified liquid water on Mars, marking a significant breakthrough in our understanding of the planet.
- ➡ **Understanding Mars' Water Cycle:** The discovery could provide valuable insights into the water cycle on Mars, which is crucial for understanding the planet's climate, surface, and interior evolution.
- ➡ **Implications for Mars Exploration:** The presence of liquid water raises the possibility of past or present life on Mars and could influence future missions to explore the planet's habitability.

● Way Forward

- ➡ **Further Exploration:** Additional missions and research are needed to explore the extent and properties of the liquid water layer in the Martian crust.
- ➡ **Climate and Geological Studies:** The findings could lead to a better understanding of Mars' climate history and geological processes, aiding in the development of models for planetary evolution.
- ➡ **Potential for Human Exploration:** Understanding the availability of water on Mars is crucial for future human missions, as it could support long-term exploration and habitation on the planet.



UN Framework Convention on International Tax Cooperation

● Why in News?

- ➔ The UN's Ad Hoc Committee has adopted the Terms of Reference for drafting a **United Nations Framework Convention on International Tax Cooperation**.
- ➔ The initiative aims to establish a UN Global Tax Treaty to create a legitimate, fair, stable, inclusive, and effective international tax system.
- ➔ Developing countries, including India, largely supported the treaty's terms, while industrialized nations like Australia, Israel, Japan, the UK, and the USA voted against it.

● Objectives of the UN Global Tax Convention

- ➔ **Strengthening International Tax Cooperation:** Enhance collaboration among nations to make tax systems more inclusive and effective globally.
- ➔ **Addressing Global Tax Challenges:** Tackle issues related to digitalization and the global operations of large Multinational Corporations (MNCs).
- ➔ **Mobilizing Domestic Resources:** Utilize tax policies to support sustainable development and boost domestic resource mobilization.
- ➔ **Supporting Global Development Agendas:** Accelerate the implementation of the Addis Ababa Action Agenda on Financing for Development and the 2030 Agenda for Sustainable Development Goals (SDGs).

● Commitments of the UN Global Tax Convention

- ➔ **Fair Allocation of Taxing Rights:** Ensure equitable taxation of MNCs and fair distribution of taxing rights among nations.
- ➔ **Combatting Tax Evasion and Avoidance:** Address illicit financial flows, tax evasion, and avoidance by high-net-worth individuals.
- ➔ **Taxation of Cross-Border Services:** Develop guidelines for the effective taxation of income derived from cross-border services.
- ➔ **Mutual Administrative Assistance:** Facilitate cooperation among nations in tax matters and ensure effective resolution of tax disputes.



● **Other Global Initiatives**

➡ **OECD Global Minimum Tax:** The OECD's Global Anti-Base Erosion Model Rules impose a minimum effective tax rate of 15% on corporate profits in each jurisdiction where MNCs operate, reducing incentives for profit shifting.

● **Way Forward**

➡ **Global Collaboration:** Continued efforts are needed to bring industrialized nations on board to ensure the success of the UN Global Tax Convention.

➡ **Inclusive Dialogue:** Engage in inclusive discussions to address the concerns of both developing and developed nations.

➡ **Monitoring and Implementation:** Establish robust mechanisms for monitoring and implementing the provisions of the Global Tax Convention to ensure fair and effective tax cooperation worldwide.



Revised Model Foster Care Guidelines (MFCG) 2024

● Why in News?

- ➔ The Ministry of Women and Child Development has released the updated Model Foster Care Guidelines (MFCG), 2024.
- ➔ These guidelines succeed the MFCG 2016 and align with the Juvenile Justice (Care and Protection of Children) Act, 2015, JJ Model Rules, 2016, Adoption Regulations, 2022, and the Mission Vatsalya Scheme.

● Overview of Foster Care

- ➔ **Definition:** Foster care involves placing a child in the domestic environment of a family other than the child's biological family.
- ➔ **Selection:** The foster family is selected and approved by the Child Welfare Committee to provide care.

● Key Provisions in Revised Guidelines

➔ Eligibility for Foster Care:

Children above 6 years of age living in childcare institutions or the community.

Includes hard-to-place children, children with special needs, and children with unfit guardians.

➔ Eligibility to Foster:

Any person, regardless of marital status, can foster a child.

Single females can foster and adopt children of any gender, while single males can only foster male children.

Married couples must have a stable marital relationship of at least 2 years.

➔ Foster Adoption:

Foster parents who have been fostering a child for a minimum of 2 years (previously 5 years) are eligible to adopt the same child.

● **Child Adoption Framework in India**

➡ **CARA's Role:**

The Central Adoption Resource Authority (CARA) is the nodal body for the adoption of Indian children, overseeing both in-country and inter-country adoptions.

CARA, a statutory body under the Ministry of Women & Child Development, was established under the JJ Act 2015.

The agency primarily manages the adoption of orphaned, abandoned, and surrendered children through recognized adoption agencies.

● **Way Forward**

➡ **Strengthening Implementation:** Ensuring that the guidelines are effectively implemented at the grassroots level to facilitate smoother foster care and adoption processes.

➡ **Awareness and Training:** Raising awareness and providing training to potential foster parents, especially focusing on the new eligibility criteria.

➡ **Monitoring and Evaluation:** Continuous monitoring and evaluation of the foster care system to ensure the well-being and protection of children.

● **Significance**

➡ **Inclusivity:** The revised guidelines promote inclusivity by allowing more individuals, regardless of marital status, to foster and adopt children.

➡ **Support for Vulnerable Children:** The guidelines focus on providing care for vulnerable children, including those with special needs and those in difficult-to-place situations.



Enhancing Fungal Infection Treatment with Nanoparticles

● Why in News?

- ➡ A team of scientists has recently developed a polymeric nanoparticle method for advanced drug delivery to treat fungal infections.
- ➡ The nanoformulation created was found to be free of cytotoxic and hemolytic effects, marking a significant step forward in medical treatment.

● About the Development

- ➡ **Polymeric Nanoparticles:** The method uses advanced polymeric nanoparticles for the controlled and effective release of drugs, potentially benefiting patients with conditions such as asthma, cystic fibrosis, HIV, and cancer.

● About Nanotechnology

- ➡ **Definition:** Nanotechnology involves the design, production, and use of structures, devices, and systems by manipulating atoms and molecules at the nanoscale (100 nanometers or less).

● Applications of Nanotechnology in Healthcare

- ➡ **Improved Imaging and Diagnostics:** Nanoparticles can serve as contrast agents in medical imaging techniques like MRI and CT scans, providing better visualization.
- ➡ **Targeted Drug Delivery:** Enables precise delivery of drugs to specific body areas, minimizing side effects.
- ➡ **Tissue Engineering and Regenerative Medicine:** Nanostructured materials, such as hydrogels, mimic the extracellular matrix, supporting cell growth and tissue regeneration.
- ➡ **Gene Sequencing Technologies:** Advanced solid-state nanopore materials enable single-molecule detection at a lower cost and higher speed.



● **Applications of Nanotechnology in Other Fields**

- ➡ **Energy Sector:** Nanoparticles enhance the efficiency of chemical processes, including the use of nanotechnology-enabled gas lift valves in offshore operations.
- ➡ **Environmental Remediation:** Nanomaterials improve water purification, desalination, and oil spill cleanup efforts.
- ➡ **Electronics and IT:** Nanoscale transistors and quantum dots enable continued miniaturization and performance improvements in devices.
- ➡ **Agriculture and Food Systems:** Nanoparticles enhance crop yields, improve food safety, and extend shelf life through targeted delivery of nutrients, pesticides, and herbicides.

● **Way Forward**

- ➡ **Research and Development:** Continued investment in nanotechnology research to explore its full potential in various sectors.
- ➡ **Regulatory Framework:** Establishing guidelines for the safe use of nanotechnology in healthcare, environment, and other industries.
- ➡ **Public Awareness:** Educating stakeholders about the benefits and potential risks associated with nanotechnology.

● **Significance**

- ➡ **Medical Advancements:** The use of nanoparticles in drug delivery could revolutionize treatment methods for various diseases.
- ➡ **Sustainability:** Nanotechnology offers innovative solutions for environmental and energy challenges, contributing to sustainable development.



Quantum Nonlocality

● Why in News?

- ➔ **New Research:** Recent studies have broadened the applications of quantum non-local correlations, which are already utilized in secure communication and cryptographic key creation.

● Understanding Quantum Nonlocality

- ➔ **Definition:** Quantum nonlocality refers to the ability of quantum particles to instantly correlate their states, even when separated by vast distances.
- ➔ **Contradiction to Locality Principle:** This phenomenon challenges the "principle of locality," which suggests that distant objects cannot influence each other.
- ➔ **Entanglement:** Nonlocality arises from quantum entanglement, where particles that interact become permanently correlated, affecting each other's states and properties.

● Applications

- ➔ **Secure Communication:** Quantum nonlocality is instrumental in developing highly secure communication channels.
- ➔ **Cryptography:** It is crucial for creating unbreakable cryptographic keys, enhancing data security.

● Way Forward

- ➔ **Further Research:** Ongoing studies aim to explore new practical applications of quantum nonlocality in various technological fields.
- ➔ **Technological Integration:** The challenge lies in integrating these quantum phenomena into existing technologies for broader use.



4D-Printed Artificial Blood Vessels

● Why in News?

- ⇒ Indian researchers have developed 4D-printed artificial blood vessels, marking a significant advancement in medical graft technology.

● About 4D Printing

- ⇒ **Evolution from 3D Printing:** 4D printing builds upon 3D printing by incorporating the dimension of time, allowing objects to change shape or function in response to environmental stimuli such as heat, light, or moisture.
- ⇒ **3D Printing Basics:** Traditional 3D printing, or Additive Manufacturing, creates three-dimensional objects from digital models by adding material layer by layer, unlike subtractive manufacturing, which removes material from a solid block.

● Applications of 4D Printing

- ⇒ **Medical Applications:** Used in drug delivery, tissue fabrication, organ regeneration, and now, artificial blood vessels.
- ⇒ **Soft Robotics:** Offers flexibility and deformability in response to environmental changes, making it suitable for developing soft robots.
- ⇒ **Aerospace:** Enables the creation of low-cost, durable parts that can adapt to extreme conditions, such as those made from Nitinol alloy.
- ⇒ **Other Fields:** Includes applications in sensors and flexible electronics, active origami art, and self-evolving structures.

● Advantages of 4D Printing

- ⇒ **Dynamic Functionality:** Creates adaptive structures that go beyond the capabilities of traditional 3D printing.
- ⇒ **Material Efficiency:** Reduces material waste, making the process more sustainable.
- ⇒ **Complex Design Fabrication:** The stereo-lithography 4D technique allows for the efficient creation of complex designs.

● Challenges in 4D Printing

- ⇒ **Limited Technology Availability:** Currently, 4D printing technology is accessible only in a few research institutes worldwide.
- ⇒ **Material Limitations:** Continuous deformation can lead to degradation issues in certain materials, limiting the long-term viability of 4D-printed objects.



● **Significance**

- ➔ **Medical Breakthroughs:** The development of 4D-printed artificial blood vessels opens new possibilities in medical grafts and other advanced medical applications.
- ➔ **Sustainability and Innovation:** 4D printing represents a significant leap forward in manufacturing, combining sustainability with innovative design and functionality

● **Way Forward**

- ➔ **Technological Advancements:** Continued research and development are needed to make 4D printing more accessible and reliable.
- ➔ **Material Innovation:** Ongoing innovation in materials is crucial for overcoming current limitations and expanding the applications of 4D printing.
- ➔ **Broader Adoption:** Encouraging the adoption of 4D printing across various industries will unlock its full potential.



Regional Rural Banks (RRBs)

● Why in News?

- ➡ The Union Finance Minister recently chaired a review meeting to assess the performance of Regional Rural Banks (RRBs).
- ➡ The focus was on enhancing business performance, upgrading digital technology services, and exploring growth potential in MSME clusters.

● About Regional Rural Banks (RRBs)

- ➡ **Establishment:** RRBs were established under the RRB Act of 1987, based on the recommendations of the Narasimham Working Group (1975).
- ➡ **Aim:** To provide banking and credit facilities for agriculture and other rural sectors.
- ➡ **Ownership:** RRBs are jointly owned by the Government of India, State Governments, and Sponsoring Commercial Banks in a ratio of 50:15:35.
- ➡ **Current Status:** There are 43 RRBs in India.
- ➡ **Regulation and Supervision:** RRBs are Scheduled Commercial Banks regulated by the RBI and supervised by NABARD.
- ➡ **Operational Areas:** Primarily focused on rural areas, but also permitted to set up branches in urban areas.

● Issues with RRBs

- ➡ **Branch Expansion:** Lack of coordination in branch expansion leads to inequitable distribution.
- ➡ **Deposit Mobilization:** Limited ability to mobilize deposits due to the exclusion of the wealthier rural population.
- ➡ **Human Resources:** High attrition rates due to more attractive job opportunities in urban areas.
- ➡ **Competition:** Commercial Banks offer more attractive loans with lower interest rates for weaker sections.

● Way Forward

- ➡ **Structural Consolidation:** Improve efficiency through consolidation.
- ➡ **Recapitalization:** Recapitalize RRBs to augment their capital base.
- ➡ **Human Resource Development:** Periodic review and capacity building of human resources.



Hayflick limit

● Why in News?

- ➔ Leonard Hayflick, the scientist who introduced the concept of the 'Hayflick limit,' recently passed away. His work fundamentally changed the understanding of human aging.

● About the Hayflick Limit

- ➔ **Definition:** The Hayflick limit refers to the number of times a cell population can divide before it enters a state of cell cycle arrest, where no further division occurs.
- ➔ **Telomere Dependency:** The limit is determined by the length of chromosomal telomeres, which are protective regions of repetitive DNA sequences at the ends of chromosomes. These telomeres shorten with each cell division.
- ➔ **Telomere Function:** Telomeres protect the chromosome from deterioration or fusion with neighboring chromosomes.
- ➔ **Human Lifespan:** The Hayflick limit for humans is approximately 125 years. Beyond this limit, no amount of diet, exercise, or genetic intervention can extend the human lifespan.

● Significance

- ➔ **Impact on Aging Research:** The Hayflick limit introduced the concept that cellular aging is a natural process linked to the finite ability of cells to divide. It has become a foundational concept in the study of aging and longevity.
- ➔ **Limits of Human Lifespan:** The concept underscores the biological constraints on human lifespan, highlighting that natural cellular processes ultimately limit how long humans can live.



State Action Plan on Climate Change (SAPCC)

● Why in News?

- ⇒ Delhi's **State Action Plan on Climate Change (SAPCC)**, originally adopted in 2019, needs revision due to intensifying extreme weather events like unprecedented heat waves and record rainfall this year.

● About SAPCC

- ⇒ **Purpose:** Each State/UT prepares its SAPCC to address specific climate-related issues through adaptation and mitigation measures.
- ⇒ **Context-Specific:** SAPCCs are tailored to the unique ecological, social, and economic conditions of each State.
- ⇒ **Alignment:** SAPCCs align with the National Action Plan on Climate Change (NAPCC), which was released in 2008 and outlines India's national climate adaptation strategy.
- ⇒ **Funding:** Provided under the Climate Change Action Plan scheme.
- ⇒ **Current Status:** 34 States/UTs have prepared their SAPCCs.

● Barriers to Implementation

- ⇒ **Leadership and Political Will:** The top-down approach of SAPCCs and existing climate strategies often result in a lack of leadership and political commitment.
- ⇒ **Lack of Clear Actions:** SAPCCs are often not specific enough to facilitate effective implementation.
- ⇒ **Resource Constraints:** States assumed that funding would be provided by the central government or other sources, leading to financial challenges.

● Way Forward

- ⇒ **International Climate Finance:** Could cover additional costs of adaptation.
- ⇒ **Nodal Officers:** Nominate officers within each key department to address institutional bottlenecks and act as focal points for climate change.
- ⇒ **Project Reports and Updates:** Develop detailed project reports and ensure regular updates to the plan.

● **Significance of State-Level Climate Strategies/Plans**

- ➡ **Just Transition:** Example: Swaniti initiative in Jharkhand mobilized INR 45 Crores for renewable energy and sustainability interventions.
- ➡ **Integrating Climate Action:** Example: Carbon Neutral Meenangadi project in Kerala integrates climate action into decentralized development planning.
- ➡ **Conservation Efforts:** Example: Maharashtra's Mangrove cell focuses on mangrove and marine biodiversity conservation.



Health Ministry Bans 156 Fixed Dose Combination Drugs (FDCs)

● Why in News?

- ➡ The Health Ministry has banned 156 Fixed Dose Combination (FDC) drugs due to concerns about their irrationality and potential health risks. This follows previous bans on 344 combination drugs in 2016 and 14 FDCs in 2023.

● About Fixed Dose Combination (FDC) Drugs

- ➡ **Definition:** FDCs are drugs that combine two or more Active Pharmaceutical Ingredients (APIs) in fixed ratios. They are also known as "cocktail drugs."
- ➡ **Active Pharmaceutical Ingredients (APIs):** These are the biologically active components of a drug that produce the desired therapeutic effects.

● Benefits of FDCs

- ➡ **Targeting Multiple Disease Pathways:** FDCs can improve response rates and provide rapid action by addressing multiple disease mechanisms simultaneously.
- ➡ **Minimizing Pill Burden:** Fewer pills can lead to better patient adherence and improved health outcomes. For example, a single pill combining treatments for fever, cough, and pain can enhance compliance.
- ➡ **Treatment of Chronic Illnesses:** FDCs are particularly useful in treating chronic conditions like tuberculosis (TB) and diabetes.
- ➡ **Pharmacokinetic Advantage:** FDCs can offer pharmacokinetic benefits, which involve the absorption, distribution, metabolism, and excretion of drugs in the body.

● Concerns with FDCs

- ➡ **Physiological or Chemical Reactions:** Antagonistic combinations within an FDC can lead to enhanced toxicity, reduced efficacy, or adverse reactions.
- ➡ **Decreased Shelf Life:** Chemical incompatibility between the combined drugs can shorten the shelf life of the product.
- ➡ **Antibiotic Resistance:** The sale of unapproved or banned FDCs containing antibiotics can contribute to growing antibiotic resistance.

● **Way Forward**

- ➔ **Strengthening Regulation:** Continued evaluation and regulation of FDCs are necessary to ensure the safety and efficacy of these drugs.
- ➔ **Public Awareness:** Educating healthcare providers and patients about the risks and benefits of FDCs can improve decision-making and adherence to safer alternatives.
- ➔ **Research and Development:** Encouraging the development of safer, more effective drug combinations that address multiple disease pathways without compromising patient safety.



Watch the Explained Video on YouTube 



Reducing Pesticide Use: A Call to Action by FSSAI

● Why in News?

- ➡ FSSAI has urged states to form an Inter-ministerial Committee focused on reducing pesticide use, implementing control measures, and regulating pesticide application at the farmer level. The initiative aims to ensure food safety, promote sustainable agricultural practices, and protect consumers from health risks.

● Pesticide Usage in India

- ➡ Pesticides, including insecticides, fungicides, herbicides, and bio-pesticides, are widely used to control pests.
- ➡ **Herbicides** dominate the market, with a 44% share as of 2023.
- ➡ India uses over 60,000 tonnes of chemical pesticides annually, with a consumption rate of 0.5 kg/hectare.
- ➡ States with the highest consumption include Maharashtra, Uttar Pradesh, Punjab, and Telangana.
- ➡ Pesticides are regulated under the **Insecticides Act, 1968**.

● Impact of Pesticides

- ➡ **Human Health:** Linked to cancer, hormonal disruptions, and other health risks. For example, Acephate is classified as a potential carcinogen by the US EPA.
- ➡ **Agriculture:** Contributes to the decline of pollinators and other essential species.
- ➡ **Environment:** Causes contamination of surface and groundwater and affects non-target plants and animals.

● Measures to be Taken

- ➡ Promote **Integrated Pest Management** and the use of bio-pesticides.
- ➡ Establish an appropriate body to administer the **Insecticides Act, 1968** and enhance oversight.
- ➡ Consider the Act under the Department of Agriculture and Farmers Welfare, separate from the Department of Chemicals and Petrochemicals.

● **Initiatives Taken**

➡ Global Level

Stockholm Convention on Persistent Organic Pollutants.

FARM Programme by UNEP, financed through the Global Environment Facility (GEF).

➡ India

Pesticide Management Bill, 2020.

National Pest Surveillance System (AI-based platform).

● **Way Forward**

➡ Strengthening regulations and adopting sustainable practices are crucial to reducing pesticide use and mitigating its harmful effects on health, agriculture, and the environment.

➡ Collaboration between various ministries and stakeholders is essential to achieving these goals.



Microplastics in the Human Brain

● Why in News?

- ➔ Researchers have found alarming levels of microplastics accumulating in critical human organs, including the brain, raising concerns about their potential health impacts.

● About Microplastics

- ➔ **Definition:** Microplastics are tiny plastic particles, typically up to 5 mm in diameter.

- ➔ **Types and Sources:**

Primary Microplastics: Manufactured intentionally for use in products like cosmetics, personal care items, detergents, insecticides, toothpastes, printer inks, spray paints, and injection moldings.

Secondary Microplastics: Created from the breakdown of larger plastic items such as fishing gear, plastic debris (e.g., bottles, bags, food containers).

● Potential Hazards

- ➔ **Physical Properties:** Microplastics can cause harm due to their small size and presence in particulate air pollution.
- ➔ **Chemical Composition:** These particles often contain harmful chemicals like BPA, phthalates, and heavy metals.



● **Importance of Surveillance Systems**

➡ **On Humans:**

- Increased risk of cancer.
- Disruption of the endocrine and immune systems.
- Destruction of brain cells, leading to impaired learning.
- Negative effects on maternal and fetal health.

➡ **On Aquatic Ecosystems:**

- Bioaccumulation in aquatic species.
- Compromised immune and digestive systems in marine life.
- Differential gene expression and growth inhibition in organisms.

➡ **On Benthic Organisms:**

- Disruption of critical oceanic processes such as trophic energy transfer and nutrient remineralization.

➡ **On the Environment:**

- Entry into the food chain, affecting various species.
- Accelerated evaporation of water in soil, leading to environmental degradation.

● **Way Forward**

- ➡ **Regulation and Policy:** Implement stricter regulations on plastic production and waste management to reduce the release of microplastics.
- ➡ **Public Awareness:** Educate the public about the sources and risks of microplastics, encouraging reduced use of plastic products.
- ➡ **Research and Development:** Support further research on the health impacts of microplastics and develop innovative solutions to mitigate their effects.
- ➡ **Sustainable Alternatives:** Promote the use of biodegradable materials and encourage industries to adopt sustainable practices.

Watch the Explained Video on YouTube 



RHUMI-1

● Why in News?

- ➔ **Launch Event:** India's first reusable hybrid rocket, RHUMI-1, developed by Tamil Nadu-based start-up **Space Zone India** in collaboration with **Martin Group**, was successfully launched from **Thiruvudandai, Chennai**.
- ➔ **Mission Payload:** The rocket carried **3 Cube Satellites** and **50 PICO Satellites** aimed at collecting data on global warming and climate change.

● About RHUMI-1

- ➔ **Hybrid Rocket Engine:** RHUMI-1 utilizes a combination of **solid and liquid propellants**, enhancing efficiency and reducing operational costs.
- ➔ **Adjustable Launch Angle:** The rocket features precise adjustments from **0 to 120 degrees**, allowing meticulous control over its trajectory.
- ➔ **Electrically Triggered Parachute System:** A **cost-effective** and **eco-friendly descent mechanism** that ensures the safe recovery of rocket components.
- ➔ **Environmentally Friendly:** RHUMI-1 is **100% pyrotechnic-free** and contains **0% TNT**, emphasizing its commitment to sustainability.

● Reusable Rockets

- ➔ **Concept:** Reusable rockets are designed to release their payload, return to Earth, and be re-launched with a new payload.

Benefits:

Cost Savings: Up to **65% cheaper** than constructing a new rocket for each launch.

Reduction in Space Debris: Minimizes discarded rocket components.

Increased Launch Frequency: Faster turnaround times allow for more frequent launches.

● Cube and PICO Satellites

- ➔ **Cube Satellites:** A class of **nano-satellites** weighing between **1-10 kg**.
- ➔ **PICO Satellites:** Smaller satellites typically weighing between **0.1-1 kg**, used for specific data collection tasks.



● **Way Forward**

- ➡ **Innovation and Collaboration:** Continued collaboration between start-ups, private companies, and research institutions to advance reusable rocket technology in India.
- ➡ **Focus on Sustainability:** Emphasize the development of eco-friendly and cost-effective space exploration solutions.
- ➡ **Global Impact:** Leveraging satellite data for critical global challenges like climate change and environmental monitoring.






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