



# INSIGHTSIAS

SIMPLIFYING IAS EXAM PREPARATION

## **BUMBLEBEES**

According to a new study, bumblebees demonstrate resilience to common pesticides.

15 APR - 20 APR 2024

# WEEKLY CURRENT AFFAIRS

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# INSIDE

## GENERAL STUDIES – 1

Topics: Distribution of key natural resources across the world (including South Asia and the Indian subcontinent)

1. India's Arctic Expedition: Exploring New Frontiers 3

## GENERAL STUDIES – 2

Topics: Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.

1. Defence Diplomacy by India 4

## GENERAL STUDIES – 4

1. Sibling Relationships are Important 6
2. Ethical concerns regarding Misuse of social media 7
3. Voluntary Code of Ethics for social media platforms 8
4. Examples of Ethics 9

## CONTENT FOR MAINS ENRICHMENT

1. Kusum Jain 10
2. 4Ps (Political Leadership, Public Financing, Partnerships, and Participation) 11
3. Innovation Trap 11

## FACTS FOR PRELIMS

### GS-1

1. Kuchipudi 12
2. Volcanic vortex rings 12
3. Giant rogue waves 12
4. Fourth global mass coral bleaching event 13
5. Rivers in News 14
6. Srinagar (considered for World Craft City) 14

### GS-2

1. Adjudicating Authority under PMLA, 2002 17
2. Home voting 17
3. Prerana Program 18

### GS-3

1. Hydrogel 18
2. Gravitational waves 18
3. Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) satellite 18

4. Doxxing 19
5. Health drinks 19
6. Shrinkflation 19
7. Special Rupee Vostro Account (SRVA) 19
8. Gopi Thotakura (1<sup>st</sup> Indian Space Tourist) 20
9. Radiation Therapy 20
10. Satellite Calls 20
11. Ringwoodite 20
12. Ashwagandha 21
13. Soil Acidification 21
14. Organ Donation to Foreigners in India 21
15. Reports in News 22
16. Pink bollworm 24
17. Inter-Agency Space Debris Coordination Committee (IADC) 25
18. Space weather 25
19. Nitroplast 25
20. Gray Slender Loris 26
21. Bumblebees 26
22. Three new fish species were spotted using tools 26
23. FDI in the space sector 27
24. Sugar in baby food 27
25. GPS spoofing 27
26. 'Sleeping giant' black hole 27
27. Nigeria introduced Men5CV vaccine 27
28. Submersible Platform for Acoustic Characterisation and Evaluation (SPACE) 28
29. Vasuki Indicus 28
30. Gross Fixed Capital Formation (GFCF) 28
31. Tachyons 28
32. Artemis Accords 29
33. Indigenous Technology Cruise Missile (ITCM) 29
34. Exoskeleton 29

## MAPPING

### International

1. Bharati station (Antarctica) 30
2. Zimbabwe's Lake Kariba 30
3. Nagorno-Karabakh Region 30
4. Aral Sea 31

### Indian

5. Mudumalai Tiger Reserve 31

## GENERAL STUDIES – 1

Topics: Distribution of key natural resources across the world (including South Asia and the Indian subcontinent)

### 1. INDIA'S ARCTIC EXPEDITION: EXPLORING NEW FRONTIERS

#### Context:

India recently concluded its **first winter expedition to the Arctic in March 2024**, marking a significant milestone in its Arctic exploration endeavours.

#### What is an expedition?

An expedition is a journey undertaken **for a specific purpose, often involving exploration, scientific research, or achieving a particular goal**. It typically involves travel to **remote or unfamiliar areas**, often with a team of individuals equipped for the challenges of the journey. Expeditions can vary widely in scope, ranging from scientific expeditions to mountaineering expeditions to polar explorations.

The expedition, undertaken by **four Indian climate scientists**, involved rigorous acclimatization and living in extremely cold conditions, including the challenging period of **polar nights with no sunlight**.

#### India's engagement in the Arctic:

- India's engagement with the Arctic **began when it signed the Svalbard Treaty** in February 1920 in Paris between Norway, the US, Denmark, France, Italy, Japan, the Netherlands, Great Britain, and Ireland, and the British overseas Dominions and Sweden concerning Spitsbergen. Ever since then, India has been closely monitoring all the developments in the Arctic region.
- India initiated its Arctic research program in 2007** with a focus on climate change in the region.
- The objectives included **studying teleconnections between the Arctic climate and the Indian monsoon**, to characterize sea ice in the Arctic using satellite data, and to estimate the effect on global warming.
- India has set up a **research station Himadri at Ny-Ålesund, Svalbard, in 2008**
- In May 2013, India became an observer state of the Arctic Council** along with five others including China.
- India launched its inaugural multi-sensor moored observatory** and northernmost atmospheric laboratory in 2014 and 2016 respectively

- Till last year, **thirteen expeditions to the Arctic** were successfully conducted.



#### Significance of the Arctic region significant to India:

| Key Reasons                  | Significance of the Arctic Region for India   |
|------------------------------|---|
| <b>Climate Impact</b>        | Though <b>none of India's territory directly falls in the Arctic region</b> , it is a crucial area as the Arctic influences atmospheric, oceanographic and biogeochemical cycles of the earth's ecosystem.<br><br>Establishing research bases and observing Arctic ice systems and glaciers are crucial components of India's research on Monsoon |
| <b>Natural Resources</b>     | The region holds vast unexplored hydrocarbon reserves and valuable minerals, contributing to India's resource needs.  |
| <b>Economic Development</b>  | India aims to utilize Arctic Sea routes, particularly the <b>Northern Sea Route</b> , to facilitate Indian trade.   |
| <b>Historical Engagement</b> | India's connection dates back to the Svalbard Treaty in 1920, with ongoing scientific studies and Arctic Council participation.   |
| <b>Global Influence</b>      | By engaging in Arctic affairs, India can assert its global presence and contribute to discussions on climate change and resource management.<br><br><b>China's investments in the Arctic and Russia's collaboration</b> with China in granting access to the Northern Sea Route have raised concerns in India                                     |

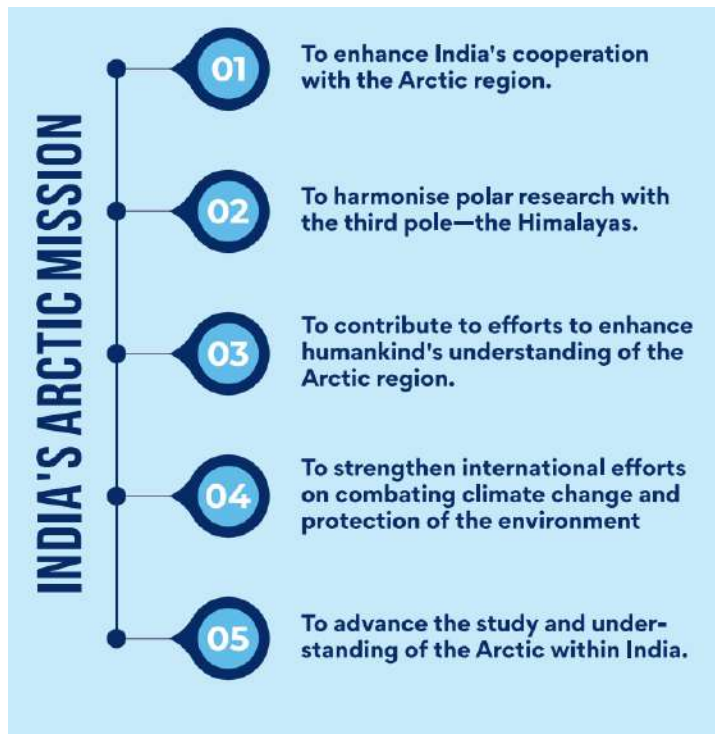
#### Challenges posed by Arctic Region:

- Arctic Amplification:** Rapid warming in the Arctic, known as Arctic amplification, surpasses global warming rates. Thawing permafrost releases greenhouse gases like carbon and methane, accelerating ice melt and further warming.
- Rising Sea Level Concern:** Melting Arctic ice contributes to rising sea levels, exacerbating coastal erosion and storm surges. India, with its extensive coastline and port cities, faces significant risks

from sea level rise, which exceeds the global average rate along its shores.

3. **Emerging geopolitical Race:** The opening of Arctic shipping routes has intensified geopolitical competition among major powers like the US, China, and Russia.
4. **Threat to Biodiversity:** Arctic warming threatens biodiversity, impacting animal life, plants, and birds dependent on sea ice. Polar bears, in particular, face habitat loss, while shifting fish populations disrupt the **Arctic food web**. Environmental changes, including storms and wildfires, further endanger Arctic ecosystems, such as tundra habitats.

Last Year, India released its **Arctic Policy**, with the aim of enhancing the country's cooperation with the resource-rich and rapidly transforming region.



**Suggestions for India:**

1. **Collaborate with Norway for Arctic research,** to enhance research capabilities and knowledge sharing in the Arctic region
2. **Align with Arctic nations on green initiatives:** Foster cooperation with Arctic countries, particularly Denmark and Finland, to promote green energy, sustainable industries, and environmental conservation efforts.
3. **Promote sustainable resource extraction:** Advocate for responsible and sustainable practices in resource extraction in the Arctic.
4. **Ensure policy coherence with the Arctic Council:** Ensure that India's Arctic policy aligns with the objectives and principles of the Arctic Council.

5. **Establish a dedicated nodal body:** Create a specialized agency or department within the Indian government to oversee Arctic research, development, and coordination.
6. **Expand beyond scientific focus:** Broaden India's approach to the Arctic beyond scientific research. Advocate for the **rights of Arctic indigenous communities** and integrate their perspectives into policymaking processes.
7. **Advocate for a global ocean treaty:** Support international efforts to establish a comprehensive global ocean governance framework, with a focus on addressing the unique challenges posed by the Arctic region.

**Insta Link:**

- [What is happening to Arctic Sea ice?](#)

**Mains Link:**

Q. How do the melting of the Arctic ice and glaciers of the Antarctic differently affect the weather patterns and human activities on the Earth? Explain. (2021)

Q. What are the economic significances of the discovery of oil in the Arctic Sea and its possible environmental consequences? (2015)

**Prelims Link:**

The term 'IndARC', sometimes seen in the news, is the name of (USPC 2015)

- (a) an indigenously developed radar system inducted into the Indian Defence
- (b) India's satellite to provide services to the countries of the Indian Ocean Rim
- (c) a scientific establishment set up by India in the Antarctic region
- (d) India's underwater observatory to scientifically study the Arctic region

**Ans: D**

**GENERAL STUDIES - 2**

Topics: Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.

**1. DEFENCE DIPLOMACY BY INDIA**

**Context:**

Recently, India announced that it will **send 16 Defence Attachés (DA)** to a number of its missions in Africa and other countries (such as Ethiopia, Djibouti, Mozambique, Ivory Coast, Philippines, Armenia, Poland etc.) **for the first time** in a sign of **expanding focus on military/defence diplomacy**

**What are Defence Attachés (DA) and what are their functions?**

Defence Attachés (DAs) are **military officers assigned to foreign embassies and diplomatic missions** to represent their country’s defence interests abroad. Their primary role is to:

1. **Foster defence cooperation**, promote dialogue, cooperation, and mutual understanding
2. **Facilitate military-to-military relations** (facilitate defense procurements, and promote defense exports)
3. **Gather intelligence** on defence-related matters in the host country
4. **Serve as liaisons** between their home country’s defence establishment and the host nation’s defence authorities
5. **Provide strategic advice** to their governments on defence policy, regional security issues, and emerging threats

**Status of DAs:**

The number of **Defense Attachés from other countries in India exceeds 120**, in contrast, India previously had just around 50 defence wings abroad.

**The Vienna Convention on Diplomatic Relations, 1961**, grants diplomatic status to Defense Attachés (DAs). According to the Convention, DAs are classified as members of the diplomatic staff, affording them full immunity while serving in their diplomatic capacity.

**Need for additional Defence Attachés by India:**

| Need  | Description   |
|---|---|
| 1. <b>Enhanced Defence Engagement</b>       | India’s increasing defence engagement with multiple countries necessitates more military attachés to effectively manage and strengthen these relationships.   |
|   | India has <b>defence cooperation agreements</b> of one kind or the other with over <b>50 countries</b> .  |
| 2. <b>Achieving Defence Targets</b>         | The target for <b>2024-25 is Rs 1,75,000 crore worth of total annual defence production</b> , which would include an <b>export target</b> of worth ₹35,000 crore.   |
| 3. <b>Facilitating Defence Procurements</b> | Several African countries have <b>expressed interest in buying Indian military equipment, hardware, and platforms</b> . India has provided a <b>line of credit to African countries</b> to buy military platforms and weaponry from India |

|  |   |
|--|---|
| 4. <b>Securing Supply Chains</b>             | In light of emerging challenges to global supply chains esp. strategic minerals such as Gold, <b>Cobalt (in Ghana)</b> etc.   |
| 5. <b>Mitigating National Security Risks</b> | With the changing dynamics of national security threats, more attachés can help identify and mitigate potential risks by enhancing intelligence gathering and sharing.  |
|  | E.g., In Central Asia, <b>India has an air force facility</b> and a military hospital, to manage risks from Afghanistan and other countries   |
| 6. <b>Strengthening Defence Diplomacy</b>    | Additional attachés can bolster India’s defence diplomacy efforts by expanding its presence in key strategic regions and enhancing bilateral and multilateral cooperation.  |
| 7. <b>Defending partner countries</b>        | E.g., As per the terms of the <b>Indo-Bhutan treaty</b> , India has discharged its obligation to defend the security of Bhutan. It has maintained a <b>key Indian military training</b> establishment in Bhutan since 1969. |

**What is Defence Diplomacy?**

Defence diplomacy is the **strategic use of a country’s military capabilities** to advance its foreign policy objectives through cooperation with other nations.

**India’s steps towards defence diplomacy:**

1. **Establishment of additional Military Wings:** These wings are optimized from existing billets and aim to bolster defence cooperation and presence in these regions.
2. **Engagement through Joint Exercises:** Indian armed forces have been participating in joint exercises with foreign armies, **engaging with 110 countries** through defence cooperation activities (E.g., military exercises like Milan and Malabar)
3. **Multilateral Engagement:** India has been actively engaging in multilateral forums and conferences such as the **Indo-Pacific Armies Chiefs Conference (IPACC) and the India-Africa Army Chiefs’ Conclave (IACC)**
4. **Defense Exports:** E.g., Recent deals with countries like the **Philippines for Brahmos cruise missiles** demonstrate India’s growing defense export capabilities and partnerships.
5. **Regional Focus:** India has been focusing on enhancing defense ties with Southeast Asian nations (through its **SAGAR doctrine** initiative), particularly in the context of the South China Sea disputes. This includes supplying defense platforms,

joint production initiatives, and conducting naval war drills with countries in the region.

6. **Strategic Partnerships:** India has been deepening defense cooperation with countries like **Vietnam, Indonesia, and Malaysia** through various agreements, joint exercises, and supply contracts. These partnerships aim to bolster maritime security and counter aggressive behaviour in the region, particularly from China.
7. **Support for International Law:** India has expressed support for international law, including the **United Nations Convention on the Law of the Sea (UNCLOS)**, particularly in the context of the South China Sea disputes.
8. **Humanitarian Assistance:** India leads **in Humanitarian Assistance and Disaster Relief (HADR) operations** in the region, coordinating with partner countries and conducting exercises like **PANEX-21 with BIMSTEC nations**.
9. **Engagement in West Asia:** India fosters security cooperation with West Asian monarchies through joint naval exercises, signalling a shift from traditional dynamics and addressing emerging challenges in the region.
10. India has a substantial presence in **UN Peacekeeping Forces**

To know about [India's Defence Exports Reaching an All-time High: Click Here](#)

### Conclusion:

India is focusing on **managing the fallout from Afghanistan while addressing Chinese assertiveness in the Indo-Pacific**. Leveraging defence forces for regional diplomacy, India aims **to sustain cooperative engagement and partnerships**, requiring increased investment in naval capabilities. The **Russo-Ukraine war underscores** the need for India to diversify its defence portfolio and prioritize indigenous technology. To align foreign and defence policies, national interests should be paramount.

### Mains Link:

**Q. Foreign Direct Investment (FDI) in the defence sector is now set to be liberalized: What influence this is expected to have on Indian defence and economy in the short and long run? (UPSC 2014)**

### Prelims Link:

**Q1. Consider the following in respect of the Indian Ocean Naval Symposium (IONS): (UPSC 2017)**

1. The inaugural IONS was held in India in 2015 under the chairmanship of the Indian Navy.
2. IONS is a voluntary initiative that seeks to increase maritime cooperation among navies of the littoral states of the Indian Ocean Region.

**Which of the above statements is/are correct?**

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

**Ans: B**

**Q2. Which one of the following is the best description of 'INS Astradharini', that was in the news recently? (UPSC 2016)**

- (a) Amphibious warfare ship
- (b) Nuclear-powered submarine
- (c) Torpedo launch and recovery vessel
- (d) Nuclear-powered aircraft carrier

**Ans: C**

## GENERAL STUDIES - 4

### 1. SIBLING RELATIONSHIPS ARE IMPORTANT

#### Context:

A recent study proves that **Sibling Rivalry is Good for Children**

Sibling relationships offer a **blend of camaraderie and competition**, shaping identity and social skills while providing companionship and support. Celebrations like **National Siblings Day in the U.S., Brothers and Sisters Day in Europe, and Raksha Bandhan in India** highlight the importance of cherishing these bonds.

**Fighting among siblings is not just inevitable, it is educational. How?**

| Aspect   | Explanation   |
|--|---|
| <b>Development of Conflict Resolution Skills</b> | Sibling fights often serve as a training ground for conflict resolution. Children learn <b>negotiation, compromise, and problem-solving skills</b> by resolving disputes with their siblings.   |
|  | For example, two siblings arguing over sharing toys might learn to negotiate and find a compromise where they take turns playing with the toys.   |
| <b>Understanding of Different Perspectives</b>   | Sibling conflicts provide opportunities for children to <b>understand different viewpoints and empathize with others</b>  |
|  | For instance, if siblings disagree over which TV show to watch, they learn to consider each other's preferences and compromise, enhancing their empathy and understanding.  |
| <b>Assertion of Personal Boundaries</b>          | Sibling fights <b>help children establish and assert personal boundaries</b> . Through disagreements, they learn to communicate their needs and preferences assertively, fostering independence and self-confidence.  |
|  | For example, if siblings argue over borrowing clothes, they learn to respect each other's belongings and set boundaries.  |
| <b>Preparation for Real-world Challenges</b>     | Dealing with conflicts among siblings prepares children for <b>challenges they may encounter in other relationships and social settings</b> . By navigating disagreements with siblings, children develop skills to handle conflicts with peers, colleagues, and friends in the future. |
|  | For instance, resolving disputes over chores with siblings can teach children how to negotiate and collaborate in group projects at school or work.   |
| <b>Cultivation of Resilience</b>                 | Sibling conflicts teach children to <b>cope with adversity and bounce back from disagreements</b> . Through conflicts, they learn to manage emotions, adapt to changing situations, and maintain relationships despite disagreements, fostering resilience.                             |
|  | For example, siblings who argue over sharing snacks may learn to forgive and forget, strengthening their bond and resilience.   |

Sibling rivalry arises from competition for **parental attention, resources, and status**. It can stem from perceived inequalities or differences in treatment. While it may lessen with age, it can persist into adulthood, albeit in different forms such as jealousy or comparison.

**Views of Thinkers:**

| Thinker                    | Perspective   |
|----------------------------|---|
| <b>Confucius</b>           | Emphasized the importance of family harmony and <b>filial piety</b> , considering sibling relationships as foundational for societal harmony  |
| <b>Mahatma Gandhi</b>      | Advocated for strong family bonds, including sibling relationships, as a <b>source of support and solidarity</b>  |
| <b>Rabindranath Tagore</b> | Highlighted the role of siblings in <b>shaping one's identity and values</b> : Bonds formed in childhood have a lasting impact on an individual's character and worldview.                                    |
| <b>Sigmund Freud</b>       | Acknowledged the <b>complex dynamics of sibling relationships</b> : Rivalry and affection playing crucial roles in shaping behaviour.   |
| <b>Jean Piaget</b>         | Noted that sibling interactions <b>contribute to cognitive development</b> , as children learn social skills, perspective-taking, and problem-solving through their interactions and conflicts with siblings. |
| <b>Margaret Mead</b>       | Recognized siblings as influential <b>socializing agents, shaping attitudes, beliefs, and behaviours</b> , and contributing to the transmission of cultural norms and values within a family and society.     |

**2. ETHICAL CONCERNS REGARDING MISUSE OF SOCIAL MEDIA**

**Context:** The Supreme Court has expressed concern over the **misuse of social media platforms**, initiating contempt proceedings against an Assam legislator for a misleading Facebook post about a pending case.

**Factors responsible for misuse of Media:**

The misuse of social media platforms stems from various factors, including the **rapid growth of the internet coupled with the anonymity it provides, the expanding user base, and the ambiguity surrounding the legal responsibilities** of social media platforms. Additionally, advancements in artificial intelligence, such as **deepfake technology**, have exacerbated the issue, while the **absence of robust grievance redressal mechanisms** further compounds the problem.

**Negative Impact of Misuse of Media:**

The negative impacts of this misuse are far-reaching, leading to the propagation of prejudiced narratives based on incomplete or inaccurate information, excessive trolling, and unjustified public opinions. Furthermore, it results in **defamation, invasion of privacy, the dissemination of morphed images**, and disrespect to religious sentiments. There is also a growing concern about the fear of bias in judicial decisions due to public pressure and the spread of disharmony, financial fraud, and incitement of violence.

In response, governments have implemented measures such as the **Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules 2021 and the establishment of PIB’s Fact Check Unit** to address misinformation. They have also issued advisories to intermediaries and taken actions like blocking OTT platforms from publishing obscene or vulgar content.

**The ethical issues in the case include:**

1. **Misuse of Freedom of Expression:** Posting misleading information on social media under the guise of freedom of speech can mislead the public and undermine the integrity of the judiciary.
2. **Integrity of the Judiciary:** False claims about court proceedings can erode public trust in the judicial system and compromise the administration of justice.
3. **Accountability of Public Figures:** Elected officials, like the Assam legislator in this case, have a responsibility to uphold ethical standards and avoid spreading misinformation, especially regarding legal matters.
4. **Social Media Abuse:** The case highlights the broader issue of social media abuse, including trolling and spreading false information, which can have serious consequences for individuals and institutions.

**Views of Thinkers:**

| Thinker                      | Perspective   |
|------------------------------|---|
| <b>Mahatma Gandhi</b>        | Warned about the <b>potential misuse of technology</b> for nefarious purposes, emphasizing the need for ethical considerations and responsible use to prevent harm to society.                            |
| <b>Plato</b>                 | Expressed concerns about the <b>power of rhetoric and persuasion</b> in shaping public opinion, <b>cautioning against the manipulation of truth and dissemination of false information through media.</b> |
| <b>S w a m i Vivekananda</b> | Highlighted the <b>importance of moral and ethical values in technological advancements</b> , urging individuals to use social media responsibly and ethically to promote positive social change.         |
| <b>Marshall McLuhan</b>      | Introduced the <b>concept of the “global village” and the pervasive influence of media on society</b> , raising concerns about the homogenization of culture and the loss of critical thinking skills.    |
| <b>Amartya Sen</b>           | Stressed the <b>importance of freedom of expression in a democratic society</b> but cautioned against the unchecked spread of misinformation, advocating for measures to ensure media accountability.     |

**3. VOLUNTARY CODE OF ETHICS FOR SOCIAL MEDIA PLATFORMS**

**Context:**

The Election Commission of India (EC) requested X (formerly Twitter) to take down four election-related posts, citing violations of the **Model Code of Conduct (MCC)**. X complied with the requests but disagreed with the orders, citing freedom of expression. The EC reminded X of the **Voluntary Code of Ethics for social media platforms, established in 2019**, which includes rules for spreading awareness about elections and timely action on legal requests.

**The Internet & Mobile Association of India (IAMAI)** and its members agreed to adhere to the **“Voluntary Code of Ethics” during all future elections.**

**Aim:** The code, aimed at addressing paid advertisements that breach Election Commission norms, was implemented during the last Lok Sabha polls in 2019.

**Social media platforms took action on 909** reported violations during the last Lok Sabha polls, marking the first voluntary adoption of such norms by internet-based companies for online poll campaigns.

**Features of the Code of Ethics:**

| Feature  | Description  |
|--|--|
| <b>No political campaign in the last 48 hours before polling</b> | Social media platforms will not allow any political campaigns to run during this period to enable voters to make informed decisions without campaign influence.                          |
| <b>Information, education, and communication campaigns</b>       | Platforms will conduct campaigns to raise awareness about electoral laws and related instructions.   |
| <b>Dedicated grievance redressal channel</b>                     | Platforms have established a channel to address complaints reported by the Election Commission of India (ECI) with high priority.  |
| <b>Notification mechanism for potential violations</b>           | ECI can notify platforms of potential violations of electoral laws, including <a href="#">Section 126 of the Representation of the People Act, 1951</a> , through a dedicated mechanism. |
| <b>Pre-certification of political advertisements</b>             | All political advertisements must be pre-certified by the Media Certification and Monitoring Committees, following the Supreme Court's directions.                                       |
| <b>Transparency in paid political advertisements</b>             | Platforms will ensure transparency in paid political advertisements, utilizing their existing labels/disclosure technology for such ads.   |

**Challenges in enforcing the Code of Ethics:**

Enforcing the code of ethics on social media presents significant challenges due to its **extensive penetration and the ability of anyone to upload content**, making regulation by the Election Commission of India (ECI) or social media platforms nearly impossible. The ECI can only address content brought to its attention, leaving much unregulated. **Fake news proliferates** despite government efforts and political proxy advertisements via fan pages complicate matters. Social media platforms express concerns about **encroachment on their freedoms, including privacy and freedom of speech**. Establishing and staffing a monitoring mechanism for social media content is daunting, and the effectiveness of such monitoring remains uncertain.

**Suggestions:**

The way forward involves **social media platforms promptly adhering to the Election Commission of India's (ECI) directives** regarding content and taking swift action accordingly. Users must be **educated to differentiate between fake and accurate news**. Social media platforms are urged to **operate within moral frameworks during elections**, fostering constructive engagement. They should also ensure **content alignment with global peace and harmony**. Political parties should commit to fair social media usage. Monitoring public content is essential for fair elections. Like candidate expenditure limits, political parties should have similar restrictions. ECI should enforce a 48-hour ban on political advertisements on social platforms. Additionally, dedicated ECI machinery is necessary to manage political content on social media during elections.

**4. EXAMPLES OF ETHICS**

**Example 1: Longevity India Initiative**

**Context:** The [Indian Institute of Science \(IISc\)](#) has launched the '**Longevity India Initiative**' to promote **healthy ageing by researching** overcoming challenges associated with growing older. The initiative focuses on **identifying early disease indicators, researching ageing biomarkers, and developing new therapeutics and technologies**.

**Ethical Values exhibited by the Initiative are:**

1. **Respect for Human Dignity:** By challenging the idea that ageing is inevitable and aiming to increase human healthspan
2. **Collaboration and Partnership:** The involvement of multiple stakeholders, including researchers, clinicians, industry partners, philanthropists, and civil society
3. **Equity and Inclusivity:** By considering factors like lifestyle and culture, especially in a diverse country like India
4. **Responsibility and Accountability:** The initiative recognizes the urgency of addressing the growing burden of ageing in the country and emphasizes the need for diverse stakeholders to come together and take responsibility for developing solutions.

**Example 2: Misuse of Public Money by three IAS officers**

**Context:** **Three senior IAS officers** from the Chandigarh Administration made unauthorized expenditures of over Rs 6 lakh during a trip to Paris in 2015. The recent audit report highlighted **that they changed hotels and overstayed for a meeting meant for a lower-ranking official**.

**The ethical issues highlighted in this case:**

- Misuse of Authority:** The senior IAS officers **misused their authority** by making unauthorized expenditures and changing the purpose of the trip to Paris.
- Financial Impropriety:** The officers incurred unauthorized expenses amounting to over Rs 6 lakh, which were not justified and did not follow proper procedures.
- Lack of Transparency:** The officers did not obtain proper approvals or certificates regarding the visit, and the **purpose of the trip was misrepresented.**
- Breach of Trust:** By overstaying and switching hotels without proper authorization, the officers breached the trust placed in them by the government and taxpayers.
- Violation of Norms:** The officers exceeded the allowed duration for foreign travel, did not obtain necessary approvals, and disregarded established norms and procedures.

**Example 3: Nestle infant milk in poorer countries has a higher sugar content compared to developed countries.**

**Context:** Public Eye, a Swiss investigative organization, along with the International Baby Food Action Network, uncovered this issue. The **World Health Organization (WHO)** warns that early exposure to sugar can lead to a lifelong preference for it, heightening the risk of obesity and other chronic diseases.

**Ethical Issues in this case:**

- Health Impact:** Higher sugar content in infant milk can lead to health issues such as obesity and chronic illnesses, especially considering the vulnerability of infants.
- Transparency:** There's a lack of transparency regarding the nutritional content of Nestle infant milk, particularly in poorer countries
- Targeting Vulnerable Populations:** Marketing products with higher sugar content to poorer countries, where health resources and education might be limited, can be seen as exploitative and unethical.
- Equity:** Discrepancies in sugar content between products sold in different countries can raise questions about equity and fairness in access to healthier nutritional options.
- Breach of trust:** Selling an inferior product breaches consumer trust.

**Regulations:** The **Codex Alimentarius** sets global standards for food safety and quality, established by the joint effort of the **Food and Agriculture Organization and WHO**. In India, the **Food Safety and Standards Act 2006** defines regulations and establishes the Food Safety and Standards Authority of India as the apex regulatory body for ensuring food safety and quality.

**CONTENT FOR MAINS ENRICHMENT**

| Why in News?                | How to Use in Answers?  |
|-----------------------------|---|
| <p><b>1. KUSUM JAIN</b></p> | <p><b>Context:</b> Kusum Jain, a champion for children’s rights, founded the <b>Parents Forum for Meaningful Education (PFME)</b> to address injustices faced by school children. She fought against corporal punishment and challenged exam secrecy laws, aiming to ensure transparency and dignity for students. Despite facing challenges and personal injury, she remained steadfast in her advocacy, leaving behind a legacy of tireless dedication to the cause.</p> <p><b>Ethical Values Shown by Her:</b></p> <ol style="list-style-type: none"> <li><b>Advocacy:</b> Kusum Jain demonstrated a commitment to advocating for children’s rights and well-being.</li> <li><b>Courage:</b> She showed bravery in challenging entrenched systems and fighting for meaningful change.</li> <li><b>Persistence:</b> Despite facing obstacles and setbacks, Kusum Jain remained steadfast in her pursuit of justice for children.</li> <li><b>Compassion:</b> She exhibited care and concern for the welfare of children affected by injustices in the education system.</li> <li><b>Integrity:</b> Kusum Jain maintained a strong sense of moral principles and honesty in her advocacy efforts.</li> </ol> |

**2. 4PS (POLITICAL LEADERSHIP, PUBLIC FINANCING, PARTNERSHIPS, AND PARTICIPATION)**

**Context:** India’s development strategy, characterized by the 4Ps (Political Leadership, Public Financing, Partnerships, and Participation), has led to significant success in national programs.

**Explanation of each of the 4Ps using Swachh Bharat Mission (SBM) Example:**

| P                             | Explanation  | Examples   |
|-------------------------------|--|--|
| <b>Political Leadership</b>   | Setting the vision, direction, and institutional framework for development initiatives.                      | Government’s initiative to tackle open defecation through the <u>Swachh Bharat Mission</u> . Creation of institutional mechanisms to implement large-scale programs.         |
| <b>Public Financing</b>       | Allocation of financial resources by the government towards development projects and initiatives.            | Allocation of <b>approximately \$20 billion towards sanitation initiatives</b> under the SBM. Investment in infrastructure development for poverty reduction.                |
| <b>Partnerships</b>           | Collaborative efforts involving multiple stakeholders to achieve development goals.                          | Collaboration with international organizations like the <b>World Bank, NGOs, and local administrations</b> for implementing the SBM. Partnership with communities and media. |
| <b>People’s Participation</b> | Engagement and involvement of communities in development activities, fostering ownership and sustainability. | Empowering communities to build toilets and end open defecation under the SBM. <b>Women and girls leading efforts</b> to declare villages open defecation-free.              |

**Usage:** The **4Ps** framework can be used to explain the success of schemes in India e.g. Swachh Bharat Mission, Mission Lifestyle etc.

**3. INNOVATION TRAP**

**What is the Innovation trap?**

It refers to **a situation where organizations strive to innovate but inadvertently fall into patterns of thinking and behaviour that stifle genuine creativity** and progress. This trap often arises when organizations prioritize conformity, rely too heavily on past successes, or resist challenging the status quo.

**Explanation using example:**

**Kodak’s downfall** can be attributed to its reluctance to embrace digital photography despite inventing the first digital camera in 1975. Instead of capitalizing on this innovation, Kodak continued to focus on its traditional film business, believing that digital photography was just a passing fad. This lack of foresight and innovation allowed competitors like Canon and Nikon to gain a foothold in the digital camera market.

**How does the “Elephants in Denmark” trick demonstrate ‘Herd Mentality’?**

It is a **mental exercise that demonstrates herd behaviour and conformity** in decision-making. Participants are **asked to follow a series of steps** involving multiplication, addition, subtraction, and association with letters and words, **ultimately leading them to think of a grey elephant in Denmark**. The trick reveals how individuals, despite believing they are making unique choices, often end up following a predetermined pattern or suggestion, akin to herd mentality.

**How to Overcome Innovation Trap and Herd Mentality?**

1. **Encourage alternative thinking:** Foster a culture that values diverse perspectives and encourages employees to challenge conventional wisdom.
2. **Empower outliers:** Identify individuals who challenge the status quo and support them in developing and implementing innovative ideas.
3. **Create a culture of experimentation:** Promote a mindset where failure is seen as a learning opportunity, and provide resources for experimentation and exploration.
4. **Measure outcomes, not just outputs:** Shift focus from simply generating ideas to evaluating the impact and effectiveness of those ideas in achieving organizational goals.
5. **Establish structured recognition programs:** Reward and recognize individuals and teams that demonstrate innovative thinking and drive meaningful change.
6. **Foster collaboration and open communication:** Encourage cross-functional collaboration and create channels for sharing ideas and feedback across the organization.

## FACTS FOR PRELIMS

### GS-1

## 1. KUCHIPUDI

**Context:**

**Kuchipudi**, a traditional dance-drama performance, has evolved from being male-dominated to a **classical dance form with the prominence of female dancers across India**.

- However, in the **village of Kuchipudi in Krishna district, Andhra Pradesh**, the art form faces challenges, **including a lack of interest among the younger generation and insufficient government support**.

**Kuchipudi**

**Context:** In the village of Kuchipudi in Krishna district, Andhra Pradesh, where the art form of Kuchipudi originated faces challenges.

**About Kuchipudi**

Kuchipudi is a **classical Indian dance form**.

It is a dance-drama that **combines Nritta (pure dance), Nritya (expressional dance), and Natya (drama)**.

The dance is characterized by its **intricate footwork, graceful movements, and subtle facial expressions**.

It is also known for its **faster tempo and requires dancers to sing and lip sync the lyrics while dancing**.

The Sangeet Natak Academy recognizes eight classical dance in India- Bharatanatyam, Kathak, Kuchipudi, Odissi, Kathakali, Sattriya, Manipuri and Mohiniyattam

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## 2. VOLCANIC VORTEX RINGS

**Context:**

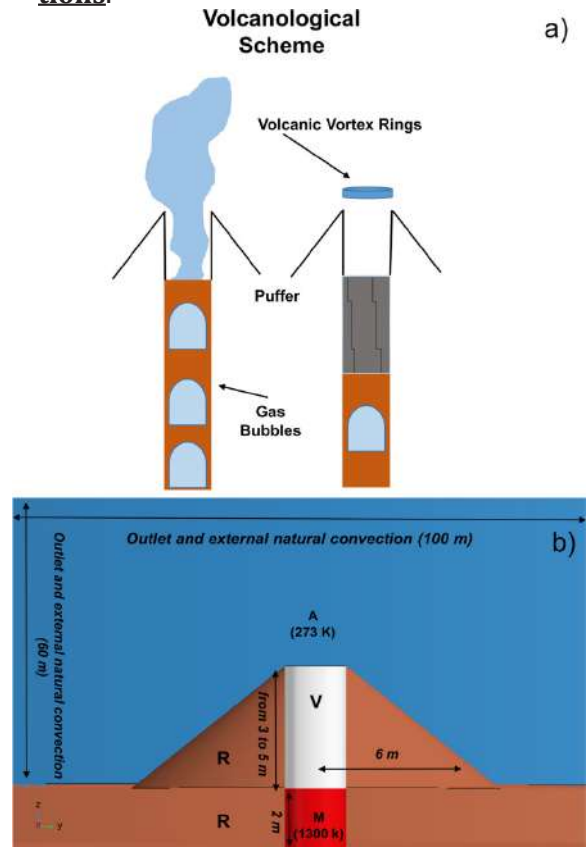
Mount Etna, **Europe's largest and among the most active volcanoes**, has been producing **rare smoke rings known as volcanic vortex rings**.

- These circular rings of gas, **primarily water vapour, emerge from a newly formed pit crater on the volcano's north side**.

**How Volcanic Vortex Rings are formed?**

- The phenomenon occurs **when gas is rapidly released through a nearly circular vent, forming perfectly circular rings**.
- **Volcanic vortex rings were first observed at Etna in 1724** and have since been documented at various volcanoes worldwide.
- They can **linger in the air for up to 10 minutes**

**but may disintegrate quickly in windy conditions.**



**About Mount Etna:**

Mount Etna is an **active volcano on the east coast of Sicily, Italy**, and the **tallest active volcano in Europe at 3,329 meters (11,014 feet)**.

It's also the **largest of Italy's three active volcanoes** and is **about twice the height of Mount Vesuvius**.

Mount Etna is known for its volcanic activity, which has been documented **since 1500 BCE**, and is a **UNESCO World Heritage Site**

## 3. GIANT ROGUE WAVES

**Context:**

A University of Melbourne expedition to the Southern Ocean has uncovered that **wind is a significant factor in the creation of massive rogue waves**.

- The team utilized **advanced technology to capture three-dimensional images** of ocean waves, revealing insights into their behaviour.
- They found that **rogue waves arise from strong winds and unpredictable waveform patterns**, with the **wind playing a crucial role in their formation during the 'young' stage of waves**.

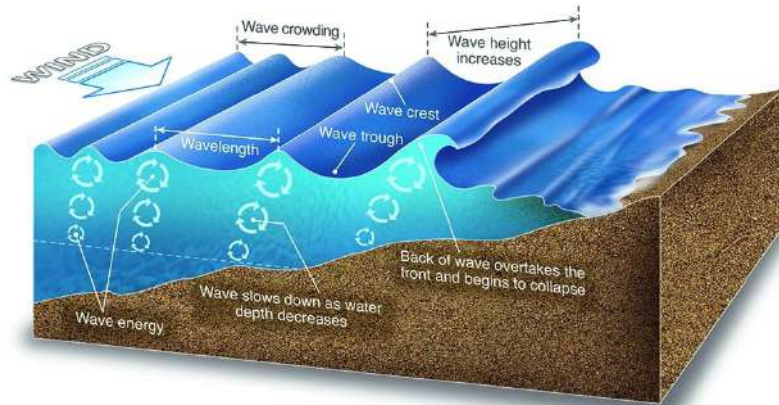
**About Rogue Waves:**

Rogue waves are **large, unpredictable, and dangerous ocean waves** that are **at least twice the height of the**

surrounding waves.

They can be formed when **multiple wave crests pass through a single point**, or from a **combination of waves and currents**.

Rogue waves are rare, **but they can be a threat to ocean liners, capital ships, and land structures.**



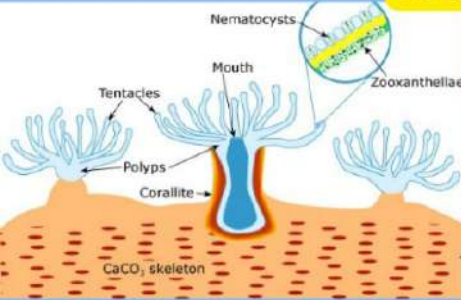
## 4. FOURTH GLOBAL MASS CORAL BLEACHING EVENT

**Context:**

**NOAA's Coral Reef Watch (CRW)** and the **International Coral Reef Initiative (ICRI)** have confirmed the **occurrence of the fourth global mass coral bleaching event in 2023-2024.**

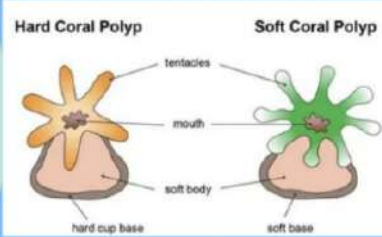
- This event, the second in the last decade, **coincides with unprecedented ocean heat recorded in 2023 and 2024.**

CORALS




**Base of the coral is attached to a rock or some other sturdy surface.**  
**Tentacles:** Top end is a mouth surrounded by tentacles (help in gathering food).  
**Nematocysts:** They are stinging structures that paralyze prey.

**Hard Corals** extract calcium carbonate from seawater to build hard, white coral exoskeletons  
**Soft Corals** attach themselves to hard skeletons and older skeletons built by their ancestors

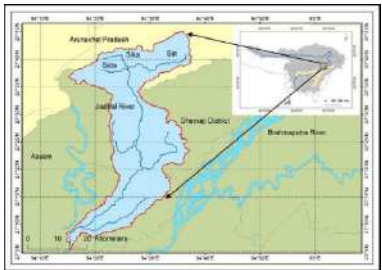



Types of Corals



**Great Barrier Reef has seen the highest level of coral cover in the past 36 years**

## 5. RIVERS IN NEWS


| River Name      | Jiadhal River  | Noyyal River   |
|-----------------|--|--|
| Issues          | Disruption of flow due to climate change   | Pollution and choking by plastics and sewage   |
| Origin          | Lower Himalayan ranges in Arunachal Pradesh  | Velliangiri Hills (South-Kailash) in Tamil Nadu  |
| Tributary of    | Brahmaputra (northern tributary)   | Joins the Cauvery River  |
| Flows Through   | Assam, meets Brahmaputra near Majuli Island  | Coimbatore, Tiruppur, Karur, Erode districts   |
| Characteristics | Flashy river; prone to sudden floods with high sediment load and debris, frequently changes course during flash floods | The Central Government provides financial assistance from the <b>National River Restoration Fund</b> , managed by the Ministry of Jal Shakti |
|                 |                                       |    |


## 6. SRINAGAR (CONSIDERED FOR WORLD CRAFT CITY)

**Context:**

Srinagar is being considered for the **prestigious World Craft City (WCC) title** by the **World Crafts Council International (WCCI)**.

**Arts and Crafts of Srinagar City:**

| Craft                  | Description   |
|------------------------|---|
| <b>Pashmina shawls</b> | Luxurious woollen shawls made from the wool of Pashmina goats are known for their softness and warmth.<br> |

|                                    |   |
|------------------------------------|---|
| <p><b>Carpets</b></p>              | <p>Hand-woven carpets featuring intricate designs and vibrant colours, often showcasing traditional motifs.</p>                                    |
| <p><b>Papier mâché</b></p>         | <p>Decorative objects crafted using molded and painted paper pulp.</p>    |
| <p><b>Walnut wood carving</b></p>  | <p>Beautiful furniture pieces, decorative panels, and small items such as boxes and bowls.</p>   |
| <p><b>Hand-knotted carpets</b></p> | <p>Meticulously handcrafted carpets with elaborate patterns and designs, made using traditional techniques passed down through generations.</p>  |

|  |  |
|--|--|
| <p><b>Kani shawls</b></p>                          | <p>Shawls are woven using the Kani technique, where each thread is individually looped and woven into the fabric, creating intricate patterns and designs.</p>  |
| <p><b>K h a t a m b a n d (wooden ceiling)</b></p> | <p>Traditional woodwork features intricate geometric patterns and designs, commonly seen in ceilings and architectural features.</p>                            |
| <p><b>Sozni embroidery</b></p>                     | <p>Delicate embroidery is done with fine needlework, embellishing fabrics with intricate patterns and motifs.</p>   |
| <p><b>Crewel embroidery</b></p>                    | <p>Embroidery style using wool threads to create elaborate designs on fabrics like cotton or silk (typically features floral motifs)</p>                      |

**About WCC:**

**The World Craft City (WCC)** initiative was **launched in 2014 by the World Crafts Council International (WCCI)**, a Kuwait-based organization. It acknowledges the contributions of **local authorities, craftspeople, and communities** to cultural, economic, and social development worldwide. WCC aims to **establish a network of craft cities** globally, promoting the principles of the creative economy and preserving traditional crafts.

GS-2

# 1. ADJUDICATING AUTHORITY UNDER PMLA, 2002

**Context:**

The Adjudicating Authority under the [Prevention of Money Laundering Act, 2002](#) (PMLA) has confirmed the attachment of assets belonging to the Congress party-promoted National Herald newspaper.

**What is Adjudicating Authority under PMLA, 2002?**

The Adjudicating Authority under the [Prevention of Money Laundering Act, 2002 \(PMLA\)](#) is responsible for **confirming provisional attachment orders** (within 180 days) issued by the **Enforcement Directorate (ED)** in cases of suspected money laundering. It ensures that assets suspected to have been acquired through proceeds of crime are properly dealt with according to the law. Once confirmed by the authority, the attachment order allows the ED to take possession of the assets, leading to potential confiscation if the accused is convicted.

The accused can **continue to use the property until the adjudicating authority** approves the seizure. After, the **adjudicating authority's approval, ED will take control of it.**

**After the Adjudicating Authority confirms the attachment, the accused can take the following actions:**

- Right to appeal:** The accused can challenge the confirmation order at the PMLA's Appellate Tribunal within **45 days**
- Appellate tribunal:** If the Appellate Tribunal confirms the order, the accused can appeal to the High Court.
- Status of property:** The owner cannot access the property until the trial is completed unless it's released.
- Final confirmation:** Once confirmed, for residential property, the ED takes possession after the owner vacates.
- Conviction outcome:** If convicted, the trial court may order confiscation and transfer ownership to the central government.



# 2. HOME VOTING

**Context:**

The [Election Commission of India \(ECI\)](#) has introduced a **ground-breaking initiative** for the **2024 Lok Sabha elections**, providing the option of **home voting for elderly citizens above 85 years of age and Persons with Disabilities (PwDs) with a 40% benchmark disability.**

- This initiative aims to **enhance inclusivity and accessibility in the electoral process.**

**Additional steps taken by the Election Commission (EC) to promote inclusive voting include:**

- Abolishing Form-M requirement for Kashmiri migrants** residing in Jammu and Udhampur, simplifying the voting process for them.
- Implementing Systematic Voter's Education and Electoral Participation (SVEEP)** to engage Persons with Disabilities (PwDs) and educate their friends, families, and polling officials.
- Introducing the proposed Multi-Constituency Remote Electronic Voting Machine (RVM),** enabling migrant voters to vote from their current place of residence.
- Allowing voting by postal ballot for special voters, service voters** (including members of the armed forces, police forces serving outside their states, and government employees serving outside India), voters on election duty, and electors subjected to preventive detention.

5. **Facilitating proxy voting**, allowing registered electors, particularly service voters, to delegate their voting rights to a representative of their choice.

### 3. PRERANA PROGRAM

**Context:**

Recently the **inaugural alumni meet** of the **Prerana Program** was conducted virtually.

- The event aimed to **assess the program's impact and facilitate the exchange of insights among participants.**
- It featured **students sharing positive experiences and the transformative effects of the program on their lives.**

**About Prerana Program:**

- The **Prerana Program**, which began its pilot phase in January 2024, **has involved students from various states and Union Territories, focusing on nine value-based themes.**
- It aimed to **foster mentorship, encourage alumni engagement, and highlight the program's influence in driving positive change within communities.**

## GS-3

### 1. HYDROGEL

**Context:**

Researchers at the **Indian Institute of Science (IISc)** have developed a **sustainable hydrogel** to address the **issue of microplastic pollution in water.**

- Microplastics, posing significant threats to **human health and the environment**, can **enter our bodies through water consumption.**
- The **three-layer polymer hydrogel**, consisting of **chitosan, polyvinyl alcohol, and polyaniline**, forms an **interpenetrating polymer network (IPN) architecture.**
- Infused with **nanoclusters of copper substitute polyoxometalate (Cu-POM)**, the **hydrogel can bind and degrade microplastics under UV light irradiation.**
- The team ensured **efficient microplastic removal and degradation** by tracking their **adsorption and degradation using fluorescent dye.**
- The hydrogel exhibited high efficiency, **removing about 95% and 93% of two different microplastic types at near-neutral pH levels.**

Hydrogels are **three-dimensional networks** composed of **hydrophobic polymers** synthesized by **crosslinking water-soluble polymers.**

Hydrogels can retain a **large quantity of water** within

their network **without disturbing their original structure.**

This imparts **flexibility and swelling properties** to the **hydrogel structures.**

### 2. GRAVITATIONAL WAVES

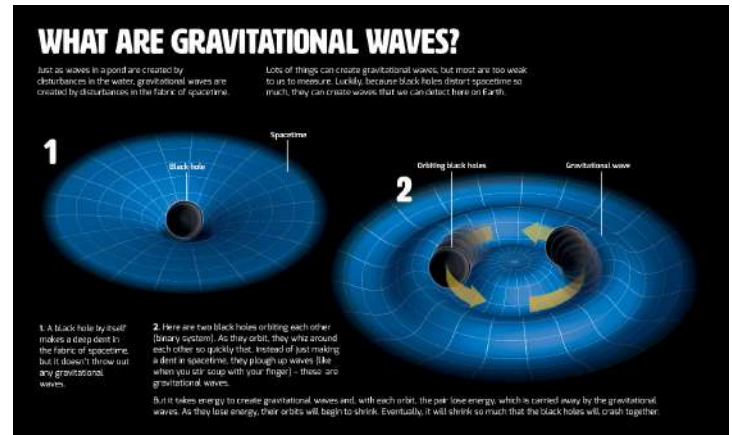
**Context:**

An **international team of astrophysicists**, has made a **ground-breaking discovery using gravitational waves.**

- They detected a **merger between a neutron star and a mysterious object** located in the **"mass gap,"** which is the **range between the heaviest neutron stars and the lightest black holes.**
- Named **GW230529**, this merger occurred **about 650 million light-years away from Earth.**
- While the **lighter object is likely a neutron star, the more massive one could be a black hole** within the mass gap, **possibly the lightest ever discovered.**

Gravitational waves are **ripples in space-time** caused by the **acceleration of massive objects, such as black holes or neutron stars.**

They are **so faint that Albert Einstein**, who first predicted their **existence in 1916, believed they would never be detected.**



### 3. PLANKTON, AEROSOL, CLOUD, OCEAN ECOSYSTEM (PACE) SATELLITE

**Context:**

NASA's **PACE satellite** is now providing publicly available data, offering unprecedented insights into **ocean health, air quality, and climate change effects.**

- Equipped with advanced instruments, **including the Ocean Color Instrument (OCI) and two multi-angle polarimeters**, **PACE can detect various wavelengths** of light to study microscopic life in the ocean and atmospheric particles.

## 4. DOXXING

### Context:

**Doxxing**, the act of publicly revealing a person's private information online, poses significant risks to **victims, including physical, digital, and emotional harm.**

- Perpetrators often share **personal data such as addresses, phone numbers, and financial information obtained through illegal means like hacking.**
- Victims may **face harassment, threats, and even job loss as a result.**

Platforms like **Meta and Google offer tools for reporting and removing doxxing content,** and **victims can also seek legal recourse** through cybercrime reporting portals.

## 5. HEALTH DRINKS

### Context:

The **Indian government,** has instructed **e-commerce platforms to stop categorizing certain beverages, including Bournvita, as "health drinks" on their sites.**

- This directive follows **clarification from the Food Safety and Standards Authority of India (FSSAI)** that there are **no defined standards for the term "health drink."**
- The government **aims to prevent misleading information and ensure transparency for consumers,** prompting e-commerce platforms to remove such beverages from the health drinks category.

The **Food Safety and Standards Authority of India (FSSAI)** is a **statutory body** that regulates the manufacture, storage, distribution, sale, and import of food, and establishes standards to ensure food safety.

It is administered by the **Ministry of Health and Family Welfare.**

## 6. SHRINKFLATION

### Context:

**Shrinkflation,** the reduction in product sizes while maintaining prices, is resurfacing in the **fast-moving consumer goods (FMCG) industry** due to rising input costs.

- Brands like Clear, Frooti, and Smooth are **introducing smaller packaging at the same or slightly reduced prices to cope with inflation.**
- The trend is attributed to various factors, **including rising prices of commodities like crude oil, palm oil, coffee, cocoa, and sugar, alongside global supply chain disruptions and geopolitical tensions.**

Shrinkflation refers to the **practice employed by manufacturers** wherein the **size or quantity of a product is reduced while keeping its price the same or slightly adjusted.**

This strategy **allows companies to maintain profit**

**margins amid rising production costs.**

Shrinkflation often **goes unnoticed** by consumers initially but can **lead to dissatisfaction as they realize they are receiving less for the same amount of money.**

## 7. SPECIAL RUPEE VOSTRO ACCOUNT (SRVA)

### Context:

The Indian government has simplified the payment mechanism for traders **importing pulses from Myanmar by implementing the Rupee/Kyat direct payment system** through the **Special Rupee Vostro Account (SRVA)** via Punjab National Bank.

### What is SRVA?

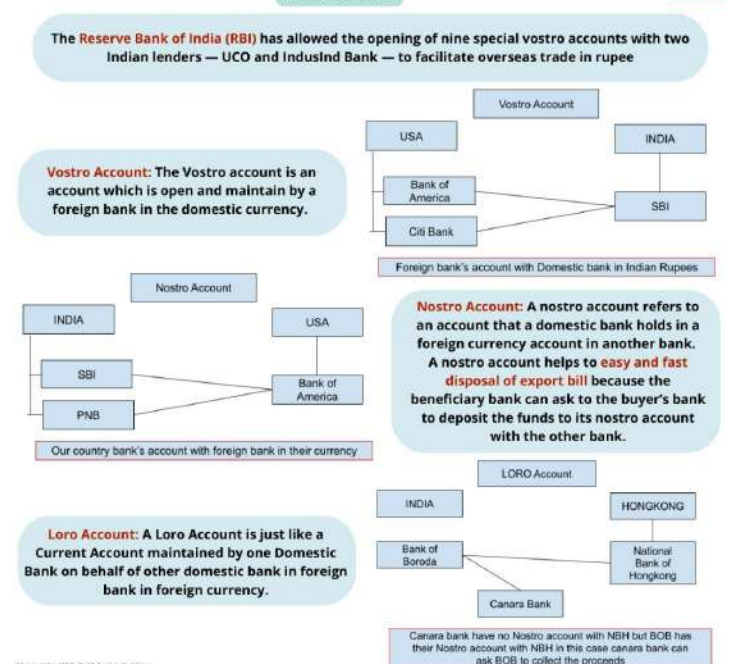
SRVA is an account that **domestic banks hold for foreign banks in the former's domestic currency, the rupee,** which **allows domestic banks to provide international banking services** to their clients who have global banking needs without having to be physically present abroad. The SRVA is an additional arrangement to the existing system that uses freely convertible currencies and works as a complimentary system.

### It has three important components:

1. All exports and imports must be denominated and **invoiced in domestic currency** (e.g. Rupee)
2. The **exchange rate** between the currencies of the trading partner countries would be **market-determined**
3. **The final settlement** also takes place in **domestic currency** (e.g. Rupee)

This mechanism aims **to streamline trade transactions and reduce costs** associated with currency conversions.

### Different Types of Accounts for International Transactions



## 8. GOPI THOTAKURA (1<sup>ST</sup> INDIAN SPACE TOURIST)

**Context:** Gopi Thotakura, an entrepreneur and pilot, is set to be the first Indian space tourist on the NS-25 mission by Blue Origin (an American Space startup, founded in 2000 by Jeff Bezos, the founder of Amazon).

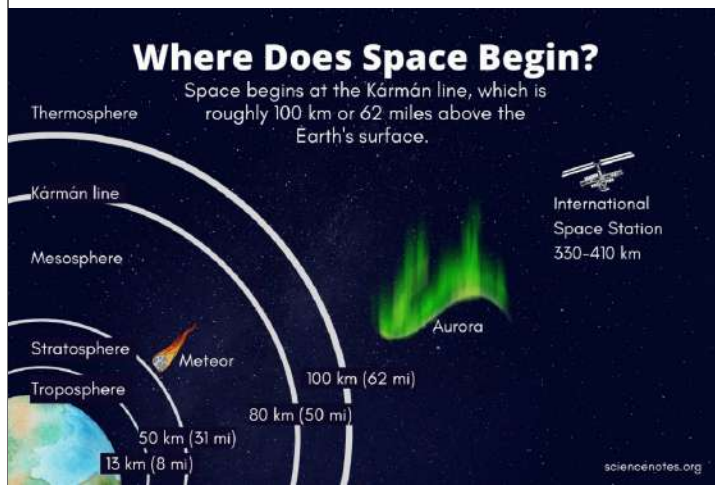
Space tourism is a burgeoning sector allowing individuals to experience space travel for recreational or business purposes. It encompasses:

1. Suborbital space flights (altitude of 100 km referred to as Karman Line)
2. Orbital Space Flights (altitudes over 400 kilometres)
3. Lunar space tourism (trips to the moon).

Challenges facing space tourism include its high cost, environmental concerns regarding rocket emissions, and safety issues. Despite these challenges, the space tourism market is growing rapidly, with increasing interest from both tourists and industry players.

### About Kármán Line

It is the boundary between Earth's atmosphere and outer space, located approximately 100 kilometres (62 miles) above sea level. It is named after Hungarian-American engineer and physicist Theodore von Kármán, who first calculated the altitude where the atmosphere becomes too thin to support conventional aircraft flight.



## 9. RADIATION THERAPY

### **Context:**

Lady Hardinge Medical College in Delhi has inaugurated its Radiation Therapy facility, providing treatment to cancer patients using Brachytherapy equipment.

### About Radiation therapy (Radiotherapy):

It is a cancer treatment that kills cancer cells by expos-

ing them to ionizing radiations like X-rays, gamma rays, high-energy electrons, or heavy particles. There are two main types: External (Teletherapy), which uses a linear accelerator to send radiation from a distance to target cells, and Internal (Brachytherapy), where the radiation source is placed inside the body.

This treatment is highly effective for various cancers, including brain, breast, head, neck, and cervical cancers, while minimizing damage to healthy tissues. However, it can lead to side effects like fatigue, nausea, hair loss, and loss of appetite.

## 10. SATELLITE CALLS

### **Context:**

Chinese scientists have developed the world's first satellite that enables smartphones to make direct calls through it, bypassing mobile towers.

- This innovation aims to address communication challenges during emergencies, such as natural disasters.
- The satellite, part of the Tiantong Project, symbolizes China's commitment to enhancing communication resilience.
- The Tiantong-1 series, involving three satellites, orbits synchronously at 36,000 kilometres altitude, potentially revolutionizing communication across the Asia-Pacific region.
- Huawei introduced the first satellite-compatible smartphone, followed by other Chinese manufacturers.

## 11. RINGWOODITE

### **Context:**

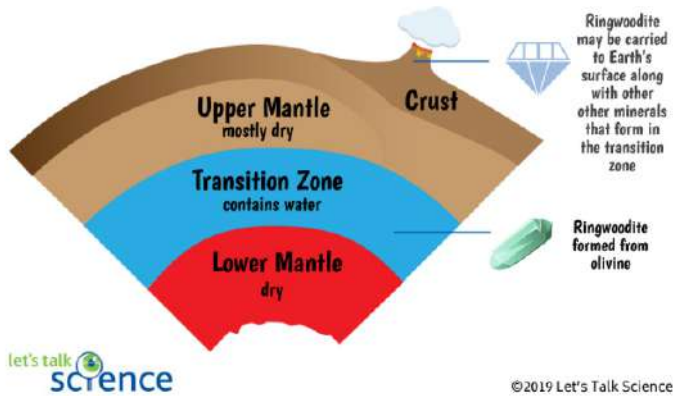
Scientists have made a ground-breaking discovery of a gigantic ocean lying 700 kilometres beneath the Earth's surface, hidden within a rock called ringwoodite.

- This subterranean reservoir, three times the volume of all the planet's surface oceans combined, was revealed through studies of seismic activity.
- Ringwoodite's unique properties allow it to trap water like a sponge.
- This discovery suggests a whole-Earth water cycle and sheds light on the abundance of liquid water on the planet's surface.

Ringwoodite is a mineral that forms in the Earth's mantle at high temperatures and pressures. It's a water-rich mineral that can contain iron and hydrogen.



Where does ringwoodite come from?



## 12. ASHWAGANDHA

**Context:**

**Ashwagandha, a 3000-year-old Indian herb,** is gaining global attention and popularity for its **numerous health benefits.**

- Scientific research highlights its **potential in stress management, cognitive function, physical performance, and more.**

**About Ashwagandha:**

It is an **evergreen shrub found in parts of India, Africa, and the Middle East.**

Used as a **medicinal plant,** especially in traditional Ayurvedic medicine.

Its supplements are often promoted for **stress and anxiety, sleep, male infertility, athletic performance, etc.**

## 13. SOIL ACIDIFICATION

**Context:**

The study highlights the **potential loss of soil inorganic carbon (SIC) in Indian soils due to acidification, impacting soil health, crop growth, and carbon sequestration.**

- Soil acidification, **driven by industrial activities and intense farming,** could lead to the **depletion of 3.3 billion tonnes of SIC from the top 0.3 meters of soil over the next 30 years.**
- Acidic soils **affect approximately 30% of cultivable land in India,** with the northeastern region being particularly affected.

Soil acidification is a **natural process that occurs when the concentration of hydrogen ions in the soil increases.**

This reduces the soil's pH.

Soil acidification can be **accelerated by some agricultural practices,** such as:

Removing plant and animal products, Leaching excess nitrate, Adding some nitrogen-based fertilizers, Building up mostly plant-based organic matter, and Using ammonium-based fertilizers.

## 14. ORGAN DONATION TO FOREIGNERS IN INDIA

**Context:**

The Ministry of Health and Family Welfare has **initiated an investigation into organ transplants** involving **foreign nationals** following concerns about potential commercial dealings.

**National Organ & Tissue Transplant Organization (NOTTO) data** shows a significant rise in **foreign nationals receiving organ transplants** from private hospitals, with reports suggesting unauthorized **“commercial dealings.”**

**What is Organ transplantation?**

Organ transplantation is the surgical procedure of **removing an organ from one person and implanting it into another person's body.**

**Laws regarding Organ Transplantation in India:**

The primary law governing organ transplants in India is the **Transplantation of Human Organs Act (THOA), 1994.** India ranks **third globally in the number of transplants conducted.** Overall, organ transplants, including both deceased and living donors, increased from **4,990 in 2013 to 15,561 in 2022.**

**Eligibility:**

- Organ donation eligibility is primarily based on the **donor's physical condition** (and not age), with **both living (above 18 years) and deceased individuals** being eligible.
- Consent from the family is required** for deceased organ donation.
- According to the latest guidelines, **individuals above 65 years can receive organs** for transplantation from deceased donors, and the **requirement of state domicile for patient registration was removed.**

**Measures to be taken:**

- Compliance with THOTA:** Authorities should ensure compliance with the **Transplantation of Human Organs & Tissues Act (THOTA), 1994,** investigating any breaches and taking appropriate action.
- Unique ID:** Health authorities must ensure the

generation of a unique NOTTO-ID for both **organ donors and recipients** in all transplant cases to enhance transparency and traceability.

- Data Sharing:** Ensure regular collection and sharing of transplant data, including cases involving foreigners, with NOTTO to enhance transparency and accountability.

**NOTTO (National Organ & Tissue Transplant Organization)** is a national-level organization under the **Ministry of Health and Family Welfare**. It coordinates and networks for organ and tissue procurement and distribution nationwide. Additionally, it maintains a registry of organ and tissue donation and transplantation activities.

## 15. REPORTS IN NEWS

| Reports   | Description   |
|---|---|
| <b>Land Conflict Watch database on FRA</b>              | <p>A recent analysis by Land Conflict Watch (LCW) highlights a <b>strong connection between land conflicts and the enforcement of the Forest Rights Act (FRA)</b> in India</p>  |
|   | <p><b>Key findings:</b><br/> <b>Conflict Causes:</b> About 44% of conflicts in FRA constituencies stem from conservation and forestry projects, while over 88% result from <b>non-implementation or violation of FRA provisions</b>, including evictions and lack of prior consent for land use.</p>  |
|   | <p><b>States Most Affected:</b> Maharashtra, Odisha, and Madhya Pradesh have the highest number of core FRA constituencies. Odisha, Chhattisgarh, and Jammu and Kashmir face significant forest rights issues.</p>  |
|   | <p><b>Conflict Nature:</b> Reserved constituencies witness disputes over common land, while unreserved ones experience conflicts over private land. Infrastructure projects, particularly in the mining and power sectors, often trigger conflicts.</p>   |
|   | <p><b>Economic Activities Involved:</b> Infrastructure development, including mining and power projects, is a major cause of conflict. Additionally, disputes arise from issues related to the collection of minor forest produce.</p>  |
|   | <p><b>About <span style="float: right;">FRA:</span></b><br/>                     The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition Of Forest Rights) Act, commonly known as FRA, was enacted in 2006, placing the responsibility of <b>implementation on state governments and UT administrations</b>. As per the Ministry of Tribal Affairs, around <b>23.43 lakh land titles have been distributed</b> across states, encompassing individual and community rights.</p>   |
| <b>Trade and Development Report Update (April 2024)</b> | <p><b>Published by the</b> United Nations Conference on Trade and Development (<a href="#">UNCTAD</a>)</p>  |
|   | <p><b>Key Findings:</b><br/> <b>Global merchandise trade decline:</b> In 2023, global merchandise trade decreased by approximately 1% in real terms <b>due to trade tensions among major economies, subdued global demand</b>, and disruptions in key shipping routes.</p>  |
|   | <p><b>Impact of developed economies' monetary policy on developing countries:</b> Rapid and simultaneous tightening of monetary policy by major developed economies has led to <b>higher debt servicing costs and challenges in securing new financing options</b> for developing countries. Additionally, <b>increased interest rates in developed countries</b> have depreciated currencies in developing nations, and double-digit interest rates set by central banks in many developing countries have negatively affected domestic demand, employment, and household incomes.</p> |
|   | <p><b>Global debt crisis:</b> Developing countries' governments are struggling with increasing debt payment obligations. This year marked the first instance of <b>a net negative resource transfer</b> from developing to developed countries since 2008. By 2023, nine low-income countries had fallen into debt distress, with an additional 25 on the brink.</p>  |
|   | <p><b>UNCTAD (founded 1964; HQ: Geneva)</b> is an intergovernmental organization within the United Nations Secretariat that promotes the interests of developing countries in world trade.</p>  |

|  |   |
|--|---|
| <b>Bias Watch India study on Women in STEM</b>   | <b>Key findings:</b><br><b>Gender Gap in Indian STEM Faculties:</b> A study by BiasWatchIndia revealed that only <b>13.5%</b> of faculty members across 98 universities and institutes in India are women. This underrepresentation extends to prestigious institutions like <b>IITs, IISc, and TIFR</b> , and is more pronounced compared to countries like the US and UK.   |
|  | <b>The factors responsible are:</b><br>Social biases within certain <b>STEM fields discourage women from pursuing higher education and research</b> , while the challenges of balancing family planning with career aspirations during the postdoc to faculty transition limit their progression. Additionally, <b>toxic work environments</b> , characterized by disrespect and limited advancement opportunities, often prompt senior women to leave STEM academia. Moreover, the <b>absence of a centralized database tracking women faculty in STEM</b> hampers efforts to address the gender gap, alongside the lack of dedicated resources and leadership commitment needed to achieve gender equity. |
|  | India has the <b>highest percentage of women STEM graduates</b> globally, at about 40%. However, their representation in STEM jobs within the country is low, standing at only 14%. The gradual dropout of women from the STEM workforce is termed the ' <b>Leaky Pipeline Syndrome</b> '.  |
| <b>Strengthening the Bretton Woods Institutions (BWIs) to Meet 21st-Century Global Challenges Report</b> | <b>By Bretton Woods Committee (BWC)</b> (it was <b>created in 1983</b> , and is a non-profit organization). This is the <b>first report from BWC's Multilateral Reform Working Group (MRWG)</b>   |
|  | Multilateralism spearheaded by <b>International Financial Institutions</b> has propelled significant growth and globalization, benefiting the global populace. However, the report underscores <b>two challenges</b> to this progress: crises in the global commons and slow progress in addressing them.<br><br><b>The Bretton Woods Institutions (BWIs)</b> were established in 1944 by 43 countries to aid in post-war economic reconstruction and foster international economic cooperation. They comprise the <b>World Bank and the International Monetary Fund (IMF)</b>  |

| Report                               | Description   |
|--------------------------------------|---|
| <b>Survival International Report</b> | Survival International <b>accuses UNESCO of complicity in illegal eviction</b> and abuse of Indigenous people in a report on World Heritage Day 2024 (18 <sup>th</sup> April). The six sites are:                             |
|                                      | <b>Ngorongoro Conservation Area (Tanzania):</b> A UNESCO World Heritage Site known for its stunning landscape and wildlife, including the Ngorongoro Crater, where diverse species thrive within an ancient volcanic caldera. |
|                                      | <b>Kahuzi-Biega National Park (Democratic Republic of the Congo):</b> Home to the endangered eastern lowland gorillas, this park faces conservation challenges amid conflict and human encroachment.                          |
|                                      | <b>Odzala-Kokoua National Park (Republic of Congo):</b> A biodiverse wilderness area with dense forests, savannas, and rivers, providing habitat for numerous species, including forest elephants and gorillas.               |
|                                      | <b>Kaeng Krachan Forest Complex (Thailand):</b> One of the largest protected areas in Thailand, known for its rich biodiversity, including rare and endangered species of flora and fauna.                                    |
|                                      | <b>Kaziranga National Park (India):</b> Famous for its population of Indian one-horned rhinoceroses, this park is a UNESCO World Heritage Site and a significant conservation area for various wildlife species.              |
|                                      | <b>Chitwan National Park (Nepal):</b> A renowned UNESCO World Heritage Site in Nepal, recognized for its diverse ecosystems and conservation efforts, including the protection of Bengal tigers and one-horned rhinoceroses   |
|                                      | <b>Survival International is a human rights organisation</b> formed in 1969, a London-based charity that campaigns for the rights of Indigenous and/or tribal peoples and uncontacted peoples.                                |

|   |   |
|---|---|
| <p><b>State of World Population 2024 report</b></p> | <p>Released by the <a href="#">United Nations Population Fund's (UNFPA)</a></p> <p>The report, titled <b>“Interwoven Lives, Threads of Hope: Ending Inequalities in Sexual and Reproductive Health (SRH) and Rights,”</b> highlights women’s sexual and reproductive health and rights (SRHR), encompassing freedom from torture, right to health, privacy, education, life, and discrimination prohibition.</p> <p><b>Key findings include:</b><br/>         India’s leading global <b>population of 1.44 billion</b>, is projected to <b>double in 77 years</b>, with 68% aged 15-64 and 26% aged 10-24.<br/> <b>India’s Total Fertility Rate is 2.0</b>, with life expectancy at birth estimated at <b>71 and 74 years for men and women</b>, respectively.<br/> <b>Child marriage</b> rates <b>averaged 23% from 2006-2023</b>.<br/> <b>Women with disabilities face up to 10 times</b> more gender-based violence.</p> <p><b>UNFPA, headquartered in New York, USA</b>, was established in 1969 as the United Nations sexual and reproductive health agency. Its mandate, established by the United Nations Economic and Social Council (ECOSOC), includes supporting access to various sexual and reproductive health services, such as voluntary family planning, maternal health care, and comprehensive sexuality education.</p> |
| <p><b>Arctic’s Plastic Crisis Report</b></p>        | <p>Released by <a href="#">Alaska Community Action on Toxics (ACAT)</a> and the <a href="#">International Pollutants Elimination Network (IPEN)</a> (a global network aiming to build a global movement for a toxics-free future)</p> <p><b>Key findings:</b> Petrochemical industries are polluting the Arctic with environmental violations like <b>oil spills and hazardous substance releases</b>. Plastic and toxic chemicals from around the world are also accumulating in the Arctic. These substances, transported by atmospheric and oceanic currents, endanger indigenous communities like <b>Aleut, Yupik, and Inuit</b>, affecting their food security due to rapid Arctic warming.</p>  |
| <p><b>Global Forest Watch (GFW) Report</b></p>      | <p><b>Key Findings:</b><br/>         India has <b>lost 2.33 million hectares (Mha)</b> of tree cover since 2000, marking a <b>6% decrease during 2001-2023</b>.<br/>         Notably, five states—<b>Assam, Mizoram, Arunachal Pradesh, Nagaland, and Manipur</b>—contributed to 60% of all tree cover loss between 2001-2023.<br/> <b>Deforestation and climate change</b>, leading to extreme heat and wildfires, are major drivers of tree cover loss, with Odisha and Arunachal Pradesh experiencing the highest tree cover loss due to fires according to GFW.</p> <p><b>The World Resources Institute (WRI)</b> established <a href="#">Global Forest Watch (GFW)</a> in 1997 as an <b>online platform offering data and tools to monitor forests</b>. GFW provides access to near real-time information on global forest changes, enabling users to track and analyze forest dynamics worldwide.</p>   |

## 16. PINK BOLLWORM

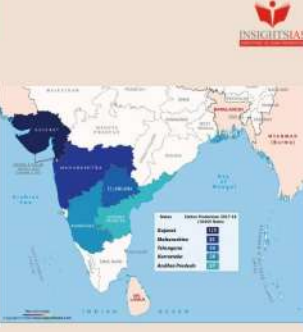
**Context:**

Cotton farmers in North India are **considering shifting to crops like paddy, maize, and guar for the upcoming 2024-25 kharif season** due to various challenges.


- These challenges include **weak prices for cotton, severe infestation of pink bollworm (PBW) during the previous season, and increasing labour costs.**
- In Punjab, the **cotton area for the 2023-24 kharif season decreased by 32% compared to the previous year.**

### Cotton

- **Type:** Kharif Crop
- **Climate:** 21-30 degree C and minimum of 180 frost-free days
- **Rainfall:** 50-100 cm (nearly 65% of cotton cropped area is rain-fed)
- **States:** Guj> MH> Telangana> Andhra> RJ
- **India's position:** 2nd (China is largest cotton producer)
- **Soil:** Black cotton soil (high water retention)
- **Species of Cotton** (all four are grown in India): **Asian Cotton** (*Gossypium arboreum* and *G. herbaceum*); **Egyptian Cotton** (*G. barbadense*); **American Upland Cotton** (*G. hirsutum*)



\*Maps - For representation purpose only.



Cotton belts of the world

**About Pink Bollworm:**  
 The pink bollworm (PBW), or *Pectinophora gossypiella*, is a **moth that is a major pest to cotton in many regions of the world.**  
 It is **known as "Pinky" because the larvae develop pink bands as they mature.**  
 The larvae are **small white caterpillars with eight pairs of legs and pink bands along their backs.**  
 The PBW lays **eggs on cotton bolls**, which hatch into larvae that burrow into the bolls and squares, destroying the seeds and staining the lint. The larvae take on pinkish bands as they mature.

## 17. INTER-AGENCY SPACE DEBRIS COORDINATION COMMITTEE (IADC)

**Context:**  
 India, through ISRO, **aims to achieve debris-free space missions by 2030**, as declared at the **42nd Inter-Agency Space Debris Coordination Committee (IADC) annual meet.**

- This initiative **seeks the participation of all Indian space actors, governmental and non-governmental, to ensure long-term sustainability in outer space.**
- ISRO has a **comprehensive plan for space exploration and utilization**, with a focus on **disposing of non-functional spacecraft and preventing the creation of debris.**

The **Inter-Agency Space Debris Coordination Committee (IADC)** is an international intergovernmental forum that **coordinates activities related to man-made and natural debris in space.**

The IADC was founded on **October 25, 1993**, to coordinate

efforts to **deal with debris in orbit around the Earth.**

The IADC is recognized as the **internationally recognized technical authority on space debris.**

## 18. SPACE WEATHER

**Context:**

A study has found that the **loss of 38 out of 49 Starlink satellites launched by SpaceX** was influenced by multiple factors, **including poor space weather conditions.**

- The study reveals that **moderate geomagnetic storms**, which persisted for **several days before and during the launch**, caused persistent **currents in the near-Earth atmosphere.**
- These **currents heated the upper atmosphere, leading to higher atmospheric density at Low Earth Orbit (LEO)**, resulting in **increased atmospheric drag and subsequent de-orbiting** of the newly launched satellites.

Space weather refers to **the environmental conditions in space**, primarily influenced **by the Sun's activity**, that can have **various effects on technological systems and infrastructures both in space and on Earth.**

These conditions include **solar flares, coronal mass ejections (CMEs), geomagnetic storms, and solar wind.**

Space weather phenomena can **interfere with satellite operations, disrupt radio communications, impact power grids, and even pose risks to astronauts.**

## 19. NITROPLAST

**Context:**

Scientists have discovered a **new organelle, termed a nitroplast**, within **algae** that can **convert nitrogen gas into a form usable for cell growth.**

- This ground-breaking finding challenges the **conventional belief that only bacteria and archaea can perform nitrogen fixation.**
- The **nitroplast, found in the algae Braarudosphaera bigelowii**, is considered the **first nitrogen-fixing organelle in eukaryotes.**
- It evolved from a **symbiotic relationship between the algae and a bacterium called UCYN-A around 100 million years ago.**

The study, published in *Science*, demonstrates that **the nitroplast meets the criteria for an organelle**, as it is inherited **through generations and relies on host-provided proteins for its function.**

## 20. GRAY SLENDER LORIS

**Context:**

A Gray Slender Loris was rescued by forest officials in North Goa.

**About Gray Slender Loris:**

The gray slender loris (Loris lydekkerianus) is a small primate native to India and Sri Lanka that lives in sub-tropical and tropical forests.

Gray slender lorises are nocturnal hunters and foragers that use their large, forward-facing eyes to detect prey.

They are insectivores that eat mostly ants and termites, but also eat beetles, spiders, mollusks, and other small vertebrates.

The Gray Slender Loris is listed on the Red List of the International Union for Conservation of Nature (IUCN) and is protected under the Wildlife Protection Act of 1972.



## 21. BUMBLEBEES

**Context:**

According to a new study, bumblebees demonstrate resilience to common pesticides.

- Researchers exposed bumblebee colonies to individual and combined insecticides and fungicides, finding no negative effects on learning ability or flight activity.

**About Bumblebees:**

Bumblebees are social insects known for their important role as pollinators in ecosystems.

They belong to the genus Bombus and are characterized by their robust bodies, dense fur, and distinctive black and yellow colouration.

Bumblebees are vital for the pollination of a wide variety of flowering plants, including many crops such as tomatoes, peppers, and berries.

Unlike honeybees, which have perennial colonies, bumblebee colonies are annual, with a single queen

establishing a nest each year.



## 22. THREE NEW FISH SPECIES WERE SPOTTED USING TOOLS

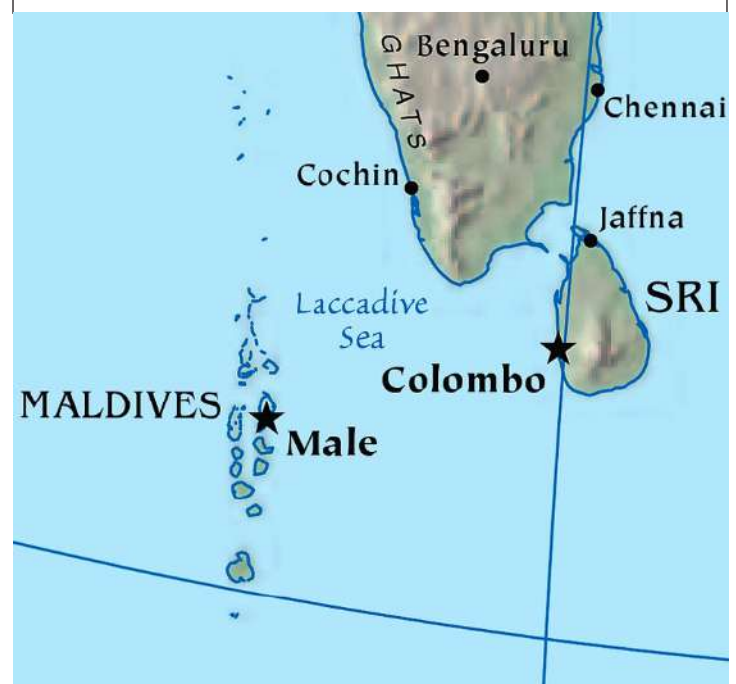
**Context:**

Three fish species in the Laccadive Sea have been observed using tools, a rare occurrence in aquatic animals.

- The Jansen's wrasse, checkerboard wrasse, and moon wrasse were seen using live or dead coral structures as anvils to crack open sea urchin shells for food.

This discovery challenges the perception that fish are less intelligent and highlights the need for further exploration of tool-use behaviours in marine species.

The Laccadive Sea, also known as the Lakshadweep Sea, is a body of water that borders India, the Maldives, and Sri Lanka.



## 23. FDI IN THE SPACE SECTOR

### Context:

The Ministry of Finance has notified **Foreign Direct Investment (FDI) regulations in the space sector** under the **Foreign Exchange Management Rules**, allowing **Indian space start-ups to access global capital**.

- **74% FDI for satellite manufacturing**, up to **49% for launch vehicles**, and up to **100% for component and system manufacturing**.
- Investment beyond 49% for spaceports requires government approval.

A foreign direct investment is a **substantial, lasting investment made by a company or government into a foreign concern**.

FDI investors typically **take controlling positions in domestic firms or joint ventures** and are actively **involved in their management**.

## 24. SUGAR IN BABY FOOD

### Context:

Nestlé's baby food products **in Asia, Africa, and Latin America** were found to **contain added sugars, while those sold in Europe did not**.

- Added sugars in **baby food pose health risks**, including **obesity and non-communicable diseases like diabetes**.
- **Excessive sugar** intake can lead to **unhealthy diets and increase the risk of diseases later in life**.

**WHO** advises **against introducing added sugars before the age of 2**, emphasizing the importance of a diverse diet for babies.

## 25. GPS SPOOFING

### Context:

Israel **reportedly used GPS jamming** to confuse Iran's missile targeting teams ahead of **Iran's direct attack on Israel**.

- This technique, similar to **what the US allegedly did during India's Kargil war** in 1999, **can hinder military operations by degrading GPS signals**.
- The US initially employed "**selective availability**" to **degrade GPS accuracy** for India during the Kargil war, **prompting India to develop its own navigation system called NavIC**.
- In the recent incident, **Israeli locals found their GPS showing them in Cairo or Beirut, causing confusion about throwing off Iran's missiles**.

### About GPS Spoofing:

GPS spoofing, also known as **GPS simulation**, involves **manipulating or tricking a GPS receiver by broadcasting false GPS signals**.

This leads the receiver to believe it is located somewhere it is not, **resulting in inaccurate location data**.

This **cyberattack undermines the reliability of GPS data, critical for navigation, time synchronization, and more**.

While initially a **theoretical threat**, GPS spoofing has become a **practical concern due to affordable software and hardware capable of transmitting fake signals**.

This evolution poses risks and security challenges for **industries, governments, and individuals**.

## 26. 'SLEEPING GIANT' BLACK HOLE

### Context:

Astronomers have discovered the **most massive known stellar black hole nicknamed "Sleeping Giant"** in the **Milky Way galaxy, named Gaia BH3**, located **1,926 light-years away in the Aquila constellation**.

- Its mass is **nearly 33 times that of the sun**, making it the **second-closest black hole on Earth**.
- This discovery was made through observations from the Gaia space telescope, **detecting a wobble in space caused by the gravitational influence of Gaia BH3 on its companion star**.
- The study offers insights into the **formation of such massive black holes and their connection to metal-poor stars**.

## 27. NIGERIA INTRODUCED MEN5CV VACCINE

### Context:

Nigeria has introduced the world's first vaccine **against all strains of meningitis (Men5CV vaccine)**, aiming to alleviate the disease burden in Africa's meningitis belt.

The Men5CV vaccine, **approved by the WHO**, safeguards against five strains of meningococcus bacteria in one shot, surpassing earlier vaccines. Its introduction coincides with WHO's aim to **eradicate meningitis by 2030**, vital amid rising cases in the region.

### What is Meningitis?

It is a **severe infection affecting the brain and spinal cord's protective membranes**. While various pathogens

like bacteria, fungi, or viruses can cause it, bacterial meningitis poses the greatest global threat. Common bacteria responsible include *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Neisseria meningitidis*.

## 28. SUBMERSIBLE PLATFORM FOR ACOUSTIC CHARACTERISATION AND EVALUATION (SPACE)

### Context:

DRDO inaugurated a **Submersible Platform for Acoustic Characterisation and Evaluation (SPACE)** at the **Underwater Acoustic Research Facility in Kerala**.

- Designed by the Naval Physical & Oceanographic Laboratory, **SPACE is a premier testing and evaluation hub for sonar systems for the Indian Navy.**
- It consists of **two platforms - one floating on the water surface and the other submersible up to 100 meters** using winch systems.
- SPACE facilitates the **evaluation of complete sonar systems and scientific packages**, supporting survey, sampling, and data collection of various parameters.

Equipped with modern instrumentation, it **enhances Anti-Submarine Warfare research capabilities for the Indian Navy.**

## 29. VASUKI INDICUS

### Context:

A **fossil vertebrae discovered in Gujarat** has been confirmed as **belonging to the largest snake to have ever lived, named 'Vasuki Indicus.'**

- Unearthed in 2005 by scientists from IIT-Roorkee, **the snake is estimated to have been 11-15 meters (about 50 feet) in length and weighed around 1 tonne.**
- Vasuki likely lived as an **ambush predator in marshy swamps during a time of higher global temperatures.**

The **fossil's size rivals that of Titanoboa**, a snake from **Colombia measuring about 43 feet long and weighing over one tonne.**

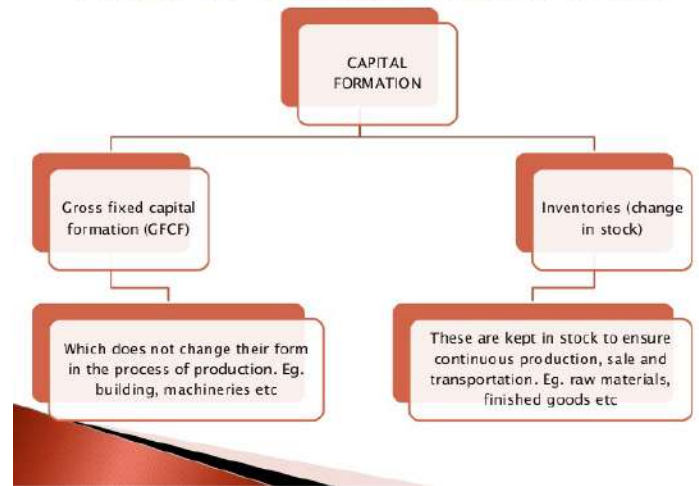
## 30. GROSS FIXED CAPITAL FORMATION (GFCF)

**Context:** Private investment in India, measured by **Gross Fixed Capital Formation (GFCF) as a percentage of GDP**, has seen a decline since 2011-12. Despite government efforts **like corporate tax cuts, private investment hasn't picked up.**

### What is GFCF?

**Gross Fixed Capital Formation, measures the growth in fixed capital in an economy**, including assets like **buildings and machinery**. It serves as an **indicator of private sector investment willingness** and includes government investment. GFCF is important because **fixed capital boosts economic growth** by increasing **productivity and living standards**. Developed economies tend to have more fixed capital per capita compared to developing ones.

### TYPES OF CAPITAL FORMATION



Historically, **private investment surged after the 1990s** economic reforms but dropped post-2008 financial crisis. It **peaked at 27% of the economy** in 2007-08 but declined after 2011-12, **reaching a low of 19.6% in 2020-21.**

### Reasons for Decline:

Private investment decline is attributed to low consumer spending, poor government policies and uncertainty.

## 31. TACHYONS

### Context:

A new paper suggests that the universe may be **dominated by particles called tachyons, which move faster than light.**

### About Tachyons:

They are **hypothetical subatomic particles** that **move faster than the speed of light**. Coined by **physicist Gerald Feinberg in 1967**, they're **distinct from bradyons**, which travel slower than light. While bradyons include **familiar particles like protons and electrons**, tachyons have never been observed. Tachyons violate known **principles like causality** and are proposed as a **potential explanation for dark matter.**

According to special relativity, **particles with mass can't exceed light speed in a vacuum** due to infinite energy. Tachyons, however, are believed to have **imaginary mass, allowing faster-than-light travel without violating known physics laws**. They would slow down with energy gain and accelerate with energy loss.

Experiments using **cerenkov detectors** have attempted to detect tachyons by measuring particles' speeds in mediums, where they could exceed light speed, causing **cerenkov radiation**, akin to a sonic boom or ship bow shock wave.

## 32. ARTEMIS ACCORDS

### Context:

**Sweden joined the Artemis Accords, becoming the 38th country** to do so. These non-binding arrangements aim to establish norms for outer space activities.

### About the Artemis Accords:

The Artemis Accords are **non-binding principles** based on the **Outer Space Treaty (OST)** of 1967, aiming to guide civil space exploration in the 21st century.

1. They are a **US-led international partnership** (introduced in 2020 by NASA) – signed by 38 countries till now, including **India (signed in 2023)**, Japan, Australia, the UK, France, and Canada – on planetary exploration and research.
2. **They are a set of 13 principles**, closely linked to the 2018 US Artemis Program, which **aims to return astronauts to the lunar surface**, build a space camp there, and carry out deep space exploration.

### Other Such treaties on Outer Space:

1. **Outer Space Treaty (1967)**: Provides the basic framework for international space law. India has signed and ratified it
2. **Rescue Agreement (1968)**: Aimed at rescuing and assisting astronauts in distress. India has signed and ratified it
3. **Liability Convention (1972)**: States that the launching State is absolutely liable to pay compensation for damage caused by its space objects. India has signed and ratified it
4. **Registration Convention (1976)**: Requires registration of objects launched into outer space. India has signed and ratified it
5. **Moon Agreement (1979)**: Establishes the Moon and its resources as the common heritage of humankind. **India has signed but NOT ratified it**

## 33. INDIGENOUS TECHNOLOGY CRUISE MISSILE (ITCM)

### Context:

DRDO conducts a successful test of an **indigenous long-range subsonic cruise missile (Indigenous Technology Cruise Missile (ITCM))** from Chandipur, Odisha. The missile, similar to **Nirbhay**, showcased low-altitude sea-skimming flight with all subsystems performing as expected.

### About ITCM:

**It has been developed by DRDO's Aeronautical Development Establishment (ADE)** and is a **long-range subsonic cruise missile** featuring an indigenous propulsion system from the **Gas Turbine Research Establishment**. Cruise missiles are unmanned and fly within the atmosphere, capable of flying just meters above ground.

## 34. EXOSKELETON

### Context:

DRDO organized the first international workshop on 'Emerging Technologies & Challenges for Exoskeleton' in Bengaluru.

### What is Exoskeleton?

An exoskeleton is a **mobile machine resembling an insect's exoskeleton**, worn by a person. It's powered by motors, hydraulics, or pneumatics to aid limb movement. Applications include **aiding people with disabilities, assisting soldiers in carrying heavy loads**, and use in factories and assembly lines.



## MAPPING

### International

## 1. BHARATI STATION (ANTARCTICA)

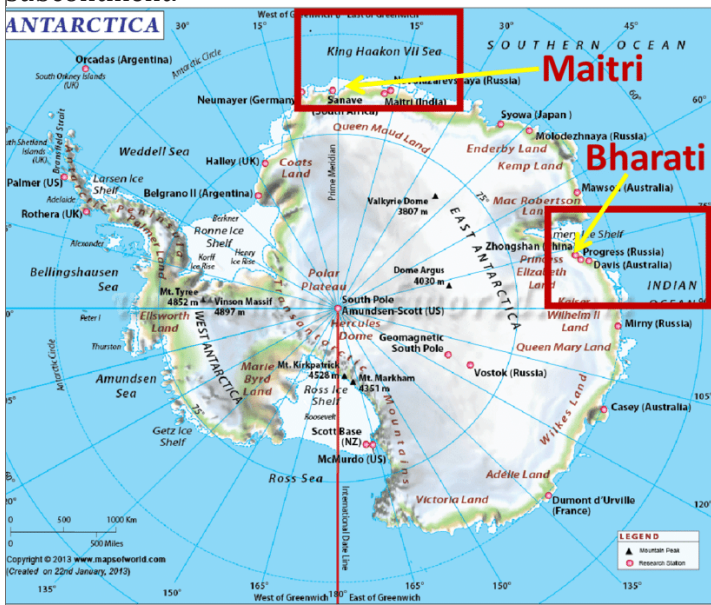
#### Context:

India Post recently **inaugurated a post office at its Bharati station in Antarctica**, coinciding with the **24th Foundation Day of the National Centre for Polar and Ocean Research (NCPOR), Goa**. This adds to the existing post offices at Dakshin Gangotri Station established in 1984 and Maitri Station set up in 1990.

#### Significance:

- Now, with a new post office at the **Bharati research station, letters will have a new PIN code, MH-1718**. These post offices, **part of the Goa postal division**, serve a unique purpose, allowing letters to be sent and 'cancelled' from Antarctica.
- It serves to **assert India's presence on the continent**.

**Bharati (opened in 2012) is India's third Antarctic research station**, alongside Maitri, commissioned by India. Located near Larsemann Hills, it focuses on **oceanographic studies** and the **geological history** of the Indian subcontinent.



## 2. ZIMBABWE'S LAKE KARIBA

#### Context:

**The recent El Nino drought** has drastically reduced water levels in Zimbabwe's Lake Kariba, prompting Zimbabwe to declare a **national disaster**.

**Lake Kariba, situated between Zambia and Zimbabwe**, has seen its water levels **plummet to just 13% of its capacity** due to an El Nino-induced drought. It was formed by damming the Zambezi River in 1955 (Kariba Dam). Lake Kariba serves as a crucial source of hydroelectric power for **both Zambia and Zimbabwe**. It is the **world's largest artificial lake** and reservoir by volume.

**Zimbabwe** is a landlocked country in Southern Africa, bordered by South Africa, Botswana, Zambia, and Mozambique.



## 3. NAGORNO-KARABAKH REGION

#### Context:

Russian peacekeepers have **commenced withdrawal from Nagorno-Karabakh following Azerbaijan's recapture** of the disputed territory last year.

The withdrawal comes after Azerbaijan's lightning one-day offensive last September, triggering a refugee crisis and altering the area's demographic landscape. The move also reflects **ruptured ties between traditional allies Russia and Armenia, with Armenia suspending its participation in the Moscow-led Collective Security Treaty Organisation (CSTO)** and joining the International Criminal Court (ICC).

**The Nagorno-Karabakh conflict is an ethnic and territorial dispute between Armenia and Azerbaijan**. It centres on the **Nagorno-Karabakh region, predominantly Armenian-populated but within Azerbaijan's borders**. A ceasefire mediated by Russia in 1994 left the region under Armenian control, though it's still recognized as part of Azerbaijan. The area is now governed by separatist Armenians and called the "Nagorno-Karabakh Autonomous Oblast."



## 4. ARAL SEA

### Context:

The drying of the **Aral Sea in Central Asia** has led to the emergence of the **Aralkum Desert**, making the region much dustier.

Dust emissions from the desert have almost **doubled over the past 30 years**, impacting **air quality and climate**. The dust contains **residues of fertilizers and pesticides** from former agriculture, making it more hazardous.

### About Aral Sea

It was once a **large saltwater lake** (an **endorheic lake**: a closed basin lake that retains water and does not have an outflow) **in Central Asia**, and now lies on the boundary between **Kazakhstan and Uzbekistan**. It has drastically **shrunk due to human activities** like excessive irrigation. It was once the **world's fourth-largest lake**. **UNESCO** has recognized the environmental tragedy of the Aral Sea by adding historical documents to its Memory of the World Register.

Other important lakes that have also shrunk in the last few decades include **Lake Urmia** in northwestern Iran, situated in a large central depression, and **Lake Hamoun**, a freshwater lake on the Iran-Afghanistan border.



## Indian

## 5. MUDUMALAI TIGER RESERVE

### Context:

In Mudumalai Tiger Reserve, Asiatic wild dogs are affected by mange disease, likely spread by feral dogs.

### About Mange Disease

**It is a skin disease caused by mite infestations**, leading to inflammation, itching, and hair loss. It can be severe, caused by **Sarcoptes scabiei mites**, which also cause **human scabies**. It affects various domestic animals and spreads through direct contact or contaminated objects. Treatment is available in most forms.

### About Asiatic wild dogs:

**It is also called Indian wild dogs**, and are found in forests across central, south, and southeast Asia. They're known by various names like **red wolf or mountain wolf**. They're clustered in India's Western and Eastern Ghats, central Indian landscape, and North East India. They're **endangered according to the IUCN Red List**, protected under the Wildlife Protection Act 1972, and listed under CITES Appendix II.

### About Mudumalai Tiger Reserve

**Mudumalai Tiger Reserve is located in the Nilgiris District of Tamil Nadu** state at the tri-junction of three states, viz, Karnataka, Kerala and Tamil Nadu. It is a part of the **Nilgiri Biosphere Reserve (1st Biosphere Reserve in India)**. The Reserve has tall grasses, commonly referred to as **'Elephant Grass'**

