IAEA urges vigilance against nuclear material theft

IAEA's **Incident and Trafficking Database (ITDB)** reported 168 incidents by 31 states in 2023.

- ITDB (estd 1995) provides information on **illicit trafficking and unauthorized activities involving nuclear and radioactive materials** outside regulatory control.

Challenges caused due to nuclear theft

- Elevated risk due to Co-existence of **terrorism and weapons of mass destruction.**
- Can lead to an **arms race between nations.**
- Improper radiological dispersal or exposure may **lead to injury, loss of life.**
- **May promote transnational organized** crime such as illicit drugs, money laundering, illegal arms etc.

IAEA and its role in nuclear safety

International Atomic Energy Agency (IAEA) is the main international organization responsible for promoting peaceful uses of nuclear energy and preventing its use for any military purpose.

- **Genesis:** Autonomous organization established in 1957.
- **Reporting:** Reports annually to the UN General Assembly and UN Security Council.
- **Functions**
  - Encourages and assists **research, development, and practical application** of atomic energy for peaceful uses.
  - Provides **independent, international verification that governments** are abiding by their commitments to the peaceful use of nuclear technology.
  - Enhances national, regional, and international capacities **to respond to nuclear and radiological incidents.**

> **Treaties to stop nuclear proliferation**
> - **Non-Proliferation of Nuclear Weapons** only binding treaty with the goal of disarmament by the nuclear-weapon States.
> - **Missile Technology Control Regime** to limit the risks of proliferation of weapons of mass destruction.
> - **Nuclear Supplier Groups** to prevent nuclear exports for commercial and peaceful purposes from being used to make nuclear weapons.
> - **The Treaty on the Prohibition of Nuclear Weapons by the UN, bans** the use, possession, testing, and transfer of nuclear weapons.

European Union (EU) investigates Meta platforms over child safety

Meta platforms like Facebook and Instagram may have breached the **Digital Services Act (DSA).**

- DSA was enacted last year by EU that makes digital companies **liable for disinformation, shopping scams, child abuse and other online harms.**

Reasons for the investigation against Meta platforms

- Concerns regarding the **platform's age-verification tools.**
  - Users are meant to be **at least 13 years old** to use Facebook or Instagram.
- Could exploit the **weaknesses and inexperience of children and stimulate addictive behavior.**
- Could reinforce children **to watch increasingly disturbing content** (Rabbit hole effect).

Social media's Impact on children

- **Cyberbullying and Online Harassment:** that can lead to emotional distress, anxiety, and even depression.
- **Phones replacing child cuddling: cuddling** releases the 'Bonding hormone Oxytocin' which helps children manage stress.
- **Excessive screen time:** can lead to reduced physical activity, poor sleep patterns, and other health-related issues like obesity, diabetes, etc.
- **Distorted sense of reality:** that leads to difficulty in children in deciding what is normal and what is not normal.
- **Enhancing creativity:** children express their creativity, share their ideas, and showcase their talents through various mediums such as art, writing, or video content on social media.

> **Indian Government initiative to protect children online**
> - **Section 67B of the Information Technology (IT) Act, 2000:** Provides stringent punishment for publishing, transmitting or viewing Child sexual abuse material online.
> - **The Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021:** empower the users to make social media platforms accountable for their safety.
> - **Digital Personal Data Protection Act, 2023:** Verifiable consent needed from the legal guardian before processing the personal data of a child.

World Hydrogen Summit 2024 held in Rotterdam, Netherlands

It was organised by **Sustainable Energy Council** in partnership with **Netherlands government.**

- At summit, Ministry of New & Renewable Energy set up Indian pavilion showcasing **country's advancements in green hydrogen technology.**

Green Hydrogen (GH$_2$)

- Defined as **hydrogen produced by splitting water into hydrogen and oxygen using renewable electricity.**
- **Produced** using solar or wind-powered photo-catalysis and electro-catalysis of water, etc.
- **Uses:**
  - Serve as **fuel for internal combustion engines.**
  - Blend of H$_2$ and Natural gas can be used to generate **heat with lower emissions** than using natural gas alone.
  - Used in **H$_2$ fuel cells to run vehicles.**
- **Bureau of Energy Efficiency has been designated as Nodal Authority** responsible for accreditation of agencies for monitoring, verification and certification of processes for GH$_2$ production projects.

Steps taken by India to promote GH$_2$

- **National Green Hydrogen Mission (NGHM), 2023** to achieve GH$_2$ production capacity of 5 MMT (Million Metric Tonnes) by 2030.
  - Under it, **Strategic Interventions for Green Hydrogen Transition Programme (SIGHT)** provides for financial incentive for manufacturing of electrolysers and production of GH$_2$.
- **Dedicated Portal for NGHM,** serve as one-stop location for information on Mission.
- **Department of Science and Technology** has initiated **Hydrogen Valley Innovation Clusters** to foster innovation and promote GH2 ecosystem in India.

About Hydrogen

- **Colourless, odourless, tasteless, flammable gas.**
- Most abundant element in universe and **third most abundant on surface** of globe.
- **Resembles alkali metals** and **halogens.**

Why India need H$_2$ based fuel?

- Alternative to fossil fuels and to **meet India's National Energy Security.**
- **Reduce emissions intensity** to 45% by 2030.
- **Reduce Import bill** as India imports 80% of crude oil(3rd in world)and 54% of natural gas.

Concerns with H$_2$ based fuel

- Lack of infrastructure for production, transportation, flammability and storage of hydrogen, High cost etc.

World Bank released report titled 'Water For Shared Prosperity'

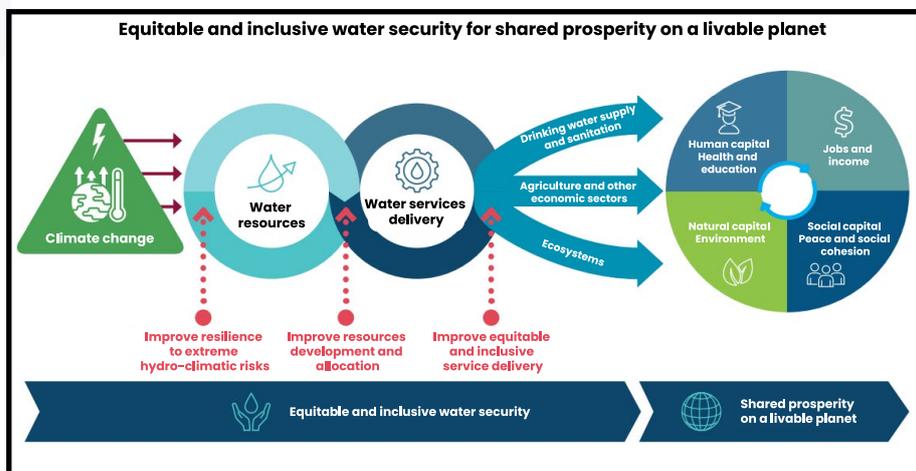Report was released at **10th World Water Forum** in **Bali, Indonesia.**

- World Bank defines **Shared prosperity** as boosting prosperity, particularly for poorest, to achieve more equitable societies.

Key findings

- **Defines Four interconnected building blocks of prosperity:** Health and Education (human capital), Jobs and Income, Peace and Social cohesion (social capital), and Environment (natural capital).
- **Population growth, urbanization, and climate change** are causing **disparity in global water access.**
  - In 2022, 197 million people lacked safe drinking water, and 211 million lacked basic sanitation.
  - Globally, about 450 million **people live in high-poverty and low-water-access hotspots.**
  - In **low-income countries,** access to **water services is available in less than half of schools.**
    - Inadequate and unsaf**e water affects early childhood development.**
  - Climate change leads to extreme weather events like floods, droughts, further disrupting children's learning leading to school dropouts, damaging crops, increasing conflicts etc.

Recommendations for inclusive water security

- **Improve resilience to extreme hydro-climatic risks** by setting up early warning systems.
- **Improve water resources development and allocation** by integrating nature-based solutions and adopt water accounting method.
- **Safely managed water supply and sanitation** by reforming water information systems to target pro-poor.

Equitable and inclusive water security for shared prosperity on a livable planet

World Water Forum

- It is **held every three years**, and **Co-hosted by World Water Council** and a **host country.**
- **Objectives:** Raise importance of water on political agenda; Support discussions towards resolution of international water issues; etc.

Gopichand Thotakura becomes First Indian Space Tourist

Hailing from Andhra Pradesh, he was one of six crew members selected for sub-orbital space flight of Blue Origin New Shepard -25 (NS-25) Mission.

- NS-25 is a **rocket system** that has been designed to **take astronauts and research payloads** past the **Karman line.**
- Karman line **lies nearly 100 kilometres above sea level** and is considered as **boundary between Earth's atmosphere and outer space.**

Space Tourism

- It refers to **commercial activity** of **sending private individuals to space for recreational,** adventure, or leisure purposes.
- **Types of space tourism**
  - ⊕ **Sub-orbital spacecraft**: It takes passengers **just beyond Kármán line.**
    - ◆ **NS-25 mission** is a **sub-orbital mission.**
  - ⊕ **Orbital spacecraft:** It takes passengers much **further than Kármán line.**

Benefits of Space Tourism

- Production of advanced spacecraft will help to **generate employment, stimulate innovation, and drive investment.**
  - ⊕ For instance, **NASA is helping small businesses** for developing technologies to advance space exploration, climate research, and more.
- **Raise public awareness** of space science.

Steps taken by India in line with Space tourism

- **Gaganyaan** aims to send astronauts to an orbit of 400km for 3 days mission.
- **Indian National Space Promotion and Authorisation Centre (IN-SPACe)** facilitates participation of private players.

Challenges of Space Tourism

- **High cost per seat** (at least a million dollars) to reach outer space.
- **Depletion of ozone layer** and increase in harmful UV radiation on Earth's surface.
- **Lack of responsibility and regulation** to ensure the safety of passengers and environment.

F-16 fighter jet controlled by Artificial Intelligence (AI) Pilot operated experimentally

The AI-controlled F-16 (**Fourth generation fighter jet** of the USA) is **called Vista.**

AI-based technologies in defence can be used for training, surveillance, logistics, cybersecurity, UAV, advanced military weaponry, autonomous combat vehicles, robotics, etc.

Significance of AI in Defence	Challenges of AI in Defence
- **Warfare systems such as** weapons, sensors, Uses AI to make operations more efficient and less reliant on human input. - **Autonomous decision-making r**educes the chance of human error. - **Assist humans** to take precise and appropriate warfare decisions. - **Military robots** having AI can undertake operations saving human lives.	- **Ethical and legal concerns** such as the potential for autonomous weapon systems to make life-or-death decisions. - It relies on **vast amounts of data** that can become a vulnerability in warfare. - Proliferation of AI technology, especially in military contexts, raises concerns **about its spread to non-state actors and rogue nations.**

AI Adoption in the Indian Military

- In 2019, a **Defence AI Project Agency (DAIPA) and a Defence AI Council (DAIC)** were established.
- In 2022, the government published a list of **75 priority projects related to using AI for defence**.
- **Defence Research and Development Organisation** has dedicated laboratories for application-oriented research in AI such as Centre for Artificial Intelligence and Robotics (CAIR), Bengaluru.

Also in News

International Criminal Court (ICC)

ICC prosecutor seeks arrest warrants for Israel's Prime Minister and Hamas leaders.

About ICC

- ICC is a **permanent international court established to investigate, prosecute and try individuals** accused of committing crime of genocide, crimes against humanity, war crimes and crime of aggression.
- **Headquarters:** The Hague, Netherlands.
- **Established by Rome Statute** of ICC in 1998.
- **Membership:** 124 countries are States Parties to Rome Statute of ICC. **India is not a member.**
- There are **18 judges** who serve **9-year, non-renewable terms.**
- ICC does **not replace national criminal justice systems;** rather, it complements them.

Lushai Tribe

A rare hemi-parasitic terrestrial plant **(Phtheirospermum lushaiorum)** has been found in Phawngpui National Park of Mizoram.

- **Lushaiorum** is named after **"Lushai" tribe of Mizoram.**

About Lushai tribe

- Tribe under **Kuki-Chin group of tribes.**
- Commonly known as **Mizos** and racially they are known to be under **Mongoloid origin.**
- Main occupations are **Jhum** and **orange Cultivation.**
- Lushai are known as **Head Hunter community.**
- Popular Dance is **Bamboo Dance (Cheraw-dance).**
- Basic unit of Lushai (Mizo) society is a **patrilocal joint family with patrilineal descent and inheritance rules.**
- Lushai (Mizo) society is **patrilocal joint family with patrilineal descent and inheritance rules.**

Koundinya Wildlife Sanctuary

Sri Lankan golden backed frog has been rediscovered after 200 years in India at Koundinya Wildlife Sanctuary.

About Koundinya Wildlife Sanctuary

- It lies in **Kuppam and Palmaner Range**s of **Chittoor district, Andhra Pradesh.**
- It is the **only sanctuary in Andhra Pradesh** known for **harboring Asian elephants.**
- **Kaundinya** and **Kaigal** tributaries of Palar River flow through it.
- **Fauna:** Birds (Partidges, Quails etc.), Mammals (Indian Elephant, Panther, Sloth bear, Wild boar, Nilgai, Hyena, Jackal) etc.
- **Forest:** Dry Deciduous forests with thorny scrub.

Meitei Sagol

The Manipur Government has collaborated with different organizations to protect the **Manipuri Pony, also known as Meitei Sagol.**

About Meitei Sagol

- They are **one of seven recognised horse and pony breeds of India.**
  - **Others:** Marwari Horse, Kathiawari Horse, Zanskari Pony, Spiti Pony, Bhutia Pony and Kachhi-Sindhi Horse.
- **They are of short height,** however, known for their unique stamina, agility, intelligence, speed, etc.
- Regarded as the original polo pony as modern polo is derived from the traditional **Sagol Kangjei of Manipur.**
- **Threat:** Shrinkage of wetlands, lack of polo grounds, etc.

Furlough

The Supreme Court has set aside the furlough extension of double murder convict.

About Furlough

- The furlough system is defined by The **Prisons Act of 1894.**
- It is given in cases of **long-term imprisonment.**
- A prisoner's sentence is considered to be **remitted during his furlough time.**
- Every State has formulated its **own set of rules/guidelines for getting furlough.**

Doppler effect

The Consumer Affairs Ministry seeks public feedback on draft regulations for **Doppler radar equipment used for measuring vehicle speeds.**

- Doppler radar uses the Doppler effect to gather velocity data.

About Doppler effect

- It refers to the **change in wave frequency** during the relative motion between a wave source and its observer.
- First proposed by **Johann Christian Doppler** in 1842.
- The phenomenon is **observed in sound waves and electromagnetic waves.**
- **Application:** Astrophysics, by police to check over speeding of vehicles, etc.

Baobab tree

According to a study, baobab trees **endemic to Madagascar** reached **Africa and Australia around 12 million years ago.**

About Baobab tree

- **Long-lived deciduous,** small to large trees from **20 to 100 ft tall with broad trunks** and **compact tops.**
- **Massive root systems** slow down **soil erosion** and **enable nutrient recycling.**
- **Also known as upside-down tree,** because in dry season they are devoid of leaves, and their bare grey and gnarled branches resemble roots.
- **Fiber from the bark** is used to make **rope, baskets, cloth, musical instrument strings, and waterproof hats.**

Venus

According to a new study **Venus is losing water much faster** than previously thought.

About Venus

- Venus is the **nearest to earth** and **2nd from the Sun.**
- It is the **brightest planet in the night sky.**
- It has **no satellite of its own.**
- Its atmosphere consists mainly of **carbon dioxide,** with **clouds of sulfuric acid droplets.**
- **Unlike others, Venus** and **Uranus** rotate from **east to west.**
- Venus, along with Mercury, Earth and Mars are called the **inner planets (Terrestrial planets).**

Places in News — 📰 Iran (Capital: Tehrān)

Iran President Dies In Helicopter Crash.

- **Political Features**
  - **Land Boundaries:** Armenia, Azerbaijan, Turkmenistan (North); Afghanistan and Pakistan (East); Iraq (West); Turkey (Northwest).
  - **Maritime Borders:** Bahrain, Kuwait, Oman, Qatar, and Saudi Arabia.
  - Surrounding water bodies: Persian Gulf and Gulf of Oman.
- **Geographical Features**
  - **Highest Peak**: Mount Damavand in Alburz Mountain Range. It is also the **highest volcano in Middle East.**
  - **Major Rivers:** Dez, Karkheh, Karun, Diyala
  - **Natural resources:** Oil and natural gas, coal, chromium, copper, iron ore, lead, manganese, zinc and sulphur.

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