KEY FACTS ABOUT GLOBAL NUCLEAR ARSENAL

- At the start of 2025, **nine states** together possessed approximately **12,241 nuclear weapons.**
- **Which countries have nuclear warheads?** As per the report, the nine nuclear-armed states are the **US, Russia**, the **United Kingdom** (UK), **France, China, India, Pakistan,** the Democratic People's Republic of Korea (**North Korea), and Israel.**

- How many nuclear warheads do these countries have?
  - **Russia: 5,459** nuclear weapons
  - **US: 5,177** nuclear weapons
  - **China: 600** nuclear weapons
  - France: 290 nuclear weapons
  - UK: 225 nuclear weapons
  - **India: 180** nuclear weapons
  - **Pakistan: 170** nuclear weapons
  - Israel: 90 nuclear weapons
  - **North Korea: 50** nuclear weapons
- The report said that these **countries "continued intensive nuclear modernisation programmes** in 2024, upgrading existing weapons and adding newer versions".
- The report further revealed that of the **total global inventory** of an estimated **12,241 warheads** in January 2025, about **9,614 were in military stockpiles for potential use.**
- **China's nuclear arsena**l is **growing faster than any other** countries, by about **100 new warheads a year since 2023.**
- It also mentioned that **India** is believed to have once again **slightly expanded** its nuclear arsenal in 2024 and **continued to develop new types of nuclear delivery systems**, including potentially canisterised missiles capable of carrying multiple warheads.

- **Russia and the USA** together possess around **90 percent of all nuclear weapons.**
- The U.S. has 1,770 deployed and 1,930 stored warheads, while its inventory stands at 5,177 in 2025 compared with 5,328 in 2024.
- Russia has 1,718 deployed and 2,591 stored warheads, and its inventory stands at 5,459, as against 5,580 in 2024.
- Overall, the number of **nuclear warheads in the world continues to decline**, due to the **USA and Russia dismantling retired warheads.**

WHAT IS THE PM-WANI SCHEME?

- The **Prime Minister Wi-Fi Access Network Interface (PM-WANI)** scheme was launched by the **Department of Telecommunication** in December 2020.
- The scheme aims to **enhance the proliferation of public WiFi hotspots** to create robust digital communications infrastructure in the country, especially in rural areas.
- Through better access to public hotspots, the government aims to increase employment for small and micro-entrepreneurs and **provide low-cost internet to the underserved urban poor and rural households.**
- The scheme **encourages local shops and establishments to provide Wi-Fi** for last-mile internet delivery, which does **not require a licence or charge a registration fee.**

How can you access the PM-WANI internet?

  - A user who wants to access broadband through public wifi will need to **download the relevant app, get authenticated,** and thereafter **access broadband at any public wifi hotspot.**
  - When the user reaches a public wifi hotspot, the **app** on the mobile phone **will show various available networks.**
  - The **user can then choose** the wifi network of choice, **pay an amount**—either online or through voucher—and **use the network till the balance is exhausted.**

INTERNATIONAL ENERGY AGENCY (IEA)

- It is an **autonomous intergovernmental organisation** established in 1974 **within** the **framework of the** Organisation for Economic Co-operation and Development (**OECD**).
- It is based in **Paris, France.**
- It was **created in 1974** to help coordinate a **collective response to** major **disruptions in the supply of oil.**
- The IEA has **four main areas** of focus: **energy security, economic development, environmental awareness, and engagement worldwide.**
- Taking an all-fuels, all-technology approach, the IEA **recommends policies** that enhance the **reliability, affordability, and sustainability of energy.**
- It **examines** the full **spectrum issues, including renewables, oil, gas** and **coal supply and demand, energy efficiency, clean energy** technologies, **electricity systems** and markets, access to energy, demand-side management, and much more.
- One of the flagship programs of the IEA has been the **International Energy Program,** according to which its **members agree to withhold large stocks of oil** in order to respond to any future unforeseen disruption in the oil supply.
- **Membership**:
  - The IEA is made up of **32 member countries**.
  - It also includes **thirteen Association countries, including India and China.**
- **Criteria for Membership:** A candidate country to the IEA **must be a member** country **of the OECD.** In addition, it must demonstrate several requirements. These are:
- **Funding**: IEA is funded by its **member countries** and **voluntarily by non-member countries** and **stakeholders** such as energy companies and **private donations.**

QUANTUM COMMUNICATION

- It is a way to send information using the **tiniest particles** in the universe, like light particles (**called photons**), in a super secure way.
- It is an umbrella term for any scheme that uses **the concepts of quantum physics**, but **especially entanglement,** to make a given communication channel leak-proof.
- It can be used to **create communication channels** that are protected against computational attacks since any attempt to tap the quantum channel will itself be revealed. Thus they have great value in defence settings.
- If any third party intercepts one of the photons, the other photon will immediately be disturbed as well and the **channel will be revealed as insecure.**

Applications of Quantum Communication

- **Military and government**: It is used for transmitting **highly sensitive information**, providing secure communication channels that are immune to eavesdropping.
- **Banking:** Protects **financial transactions from cyber-attacks** by using quantum key distribution (QKD) to secure online banking and international transactions.
- **Power grids:** Secures communication within the power industry, safeguarding against cyber-attacks that could lead to outages or damage to the electrical grid.
- **Consumer privacy:** Enhances the **security of personal data transmitted over the internet**, such as in cloud services or when shopping online.
- **Scientific collaboration:** Allows secure sharing of research data between institutions, especially when dealing with proprietary or sensitive information.
- **Navigation:** Quantum communication could be **used to enhance the security of signals in GPS systems**, providing tamper-proof navigation data.

CYBER SURAKSHA

- It is a **multi-phased proactive** step towards bolstering **cyber resilience** at national level.
- It encompasses the conduct of **targeted training sessions**, evaluation and an engaging capsule for leadership.
- It is designed to simulate **real-world cyber threats**, **reinforce secure practices,** and test the analytical and defensive cyber skills of participants in a high-paced, gamified environment.
- Combining structured learning with dynamic hands-on challenge environments will empower participants to act decisively in the face of cyber threats.
- It was **organized by the Defence Cyber Agency** and it plans to conduct such exercises on a regular basis to maintain a state of readiness and cultivate a security-first culture across all levels.

What is the Defence Cyber Agency?

- It is a **tri-service command** of the Indian Armed Forces and tasked with handling **cyber security threats.**
- It was **formally created in 2019,** and its establishment marked a significant milestone in the country's efforts to strengthen its cybersecurity posture.
- It was fully operational with respective Cyber Emergency Response Teams (CERT) set up by each military branch.
- The DCyA draws **personnel from all three branches** of the Armed Forces.
- The head of the DCyA is an **officer of two-star rank**, and reports to the **Chief of Defence Staff** (CDS) through the Integrated Defence Staff (IDS).
- **Headquarter:** New Delhi.

57% OF INDIAN DISTRICTS FACE EXTREME HEAT RISK

A recent study by the Council on Energy, Environment and Water (CEEW), titled '**How Extreme Heat is Impacting India**', reveals that 57% of Indian districts, home to 76% of the population, face high or very high risk from extreme heat.

States facing the highest risk include Delhi, Maharashtra, Goa, Kerala, Gujarat, Rajasthan, Tamil Nadu, Andhra Pradesh, Madhya Pradesh, and Uttar Pradesh.

CEEW, based in New Delhi, is one of the world's leading and best-managed independent climate think tanks.

Understanding Heat Risk: Not the Same as Heatwaves or Heat Stress

- **Heatwaves**
  - While they do not have a universal definition, heatwaves are essentially prolonged periods of abnormally high temperatures in a specific region.
- **Heat Stress**
  - Occurs when the body temperature exceeds 37°C.
  - Body struggles to release excess heat, causing discomfort, cramps, and exhaustion.
  - If body temperature exceeds 40°C, it may lead to heat stroke.
- **Heat Risk**
  - According to the CEEW study, heat risk refers to the probability of heat-related illness or death due to extreme temperatures.
  - It is determined by three key factors:
    - Intensity of heat and compounding effects (e.g., humidity),
    - Degree of exposure, and
    - Vulnerability of affected communities (e.g., age, health conditions).

Key Factors Driving Heat Risk in India

- **Rise in Very Warm Nights**

- Warm nights prevent the body from cooling down after hot days, increasing the risk of heat strokes and worsening non-communicable diseases like diabetes and hypertension.

- **Increase in Relative Humidity in North India**
  - Relative humidity in the Indo-Gangetic Plain rose from 30–40% (1982–2011) to 40–50% (2012–2022).
  - High humidity hampers cooling through sweat, intensifying heat stress, especially when body temperature exceeds 37°C.
- **Urbanisation and Population Density**
  - Cities like Mumbai and Delhi face higher exposure due to dense populations.
  - Rapid urbanisation in tier II and III cities has led to increased night-time heat due to heat-absorbing concrete infrastructure.
- **Socio-Economic and Health Vulnerabilities**
  - Districts in Andhra Pradesh, Maharashtra, Haryana, Punjab, Chhattisgarh, Bihar, and Uttar Pradesh are particularly vulnerable.
  - Factors include a high share of elderly populations and prevalence of chronic health conditions (e.g., diabetes, hypertension).
- **Inadequate Heat Action Plans (HAPs)**
  - India's HAPs (early warning and preparedness plans) are often:
    - Lacking long-term strategies, or
    - Poorly implemented, even when they exist.
  - According to the Sustainable Futures Collaborative (SFC), this weakens India's response to growing heat threats.
- **Future Risks**
  - Without stronger planning and execution, heat-related deaths may rise.
  - The country faces increasing threats from more frequent, intense, and prolonged heatwaves.

A CHANCE TO REBUILD THE TRUST, RESTORE FAITH IN AIR TRAVEL

- The **crash of Air India flight AI171 on June 12, 2025**, in Ahmedabad has **sent shockwaves across the aviation community and the general public.**
- While investigators await definitive data from flight recorders, **speculative media coverage and widespread misinformation have begun shaping public perception,** leading to heightened fear and mistrust.
- Amid these developments, it is **important to analyse the circumstances surrounding the crash, explore plausible technical causes based on available data,** draw parallels to a historical incident, highlighting media responses, and transparency and patience as investigations unfold.
- Amid this climate of speculation, it is **crucial to await findings from official sources.**
- The **recovery of the Digital Flight Data Recorder (DFDR)** and the Cockpit Voice Recorder (CVR) provides the foundation for an authoritative analysis.

Plausible Technical Causes Based on Available Data

- **Technical Clues**
  - One of the **most compelling eyewitness accounts comes from the sole survivor**, who reported a loud thud shortly after take-off, accompanied by flickering lights.
  - **Supplementary evidence** from amateur footage and CCTV recordings shows that **the aircraft used the full length of the runway before lifting off.**
  - These **elements suggest an abnormality in take-off performance**, potentially linked to engine malfunction or external interference.
- **Early Indicators from the Crash**
  - The **temperature on the day of the crash was 37°C**, reducing effective runway length significantly due to decreased air density and engine performance, a factor explicitly addressed in ICAO's Doc. 9157.
  - The **landing gear was reportedly not retracted post lift-off,** increasing aerodynamic drag.

- Furthermore, **visual cues from the video suggest a swing to the right during rotation**, a potential sign of left engine failure.
- A **dust cloud visible behind the aircraft, followed by the cessation of exhaust emission from the left engine,** supports the theory of debris or bird ingestion causing sequential engine failure.

- **The Weight Factor and Procedural Concerns**
  - Another important angle is the **aircraft's potential overloading.**
  - While official data is yet to confirm this, **reports suggest passengers were carrying excess cabin baggage,** which, combined with duty-free purchases, may have added over two tonnes of unaccounted weight.
  - Moreover, **questions remain regarding cockpit response**. Why was slow acceleration not detected in time to abort take-off?
  - **Why was the landing gear not retracted after liftoff, increasing drag** and compromising climb rate?

Media Responsibility and Public Trust

- The **role of the media in shaping narratives around air disasters is critical**. In the case of AI171, many outlets abandoned journalistic caution in favour of sensationalism.
- Not only does this erode public trust, **but it also undermines confidence in one of the safest modes of transport.**
- The **aviation community, regulators, and manufacturers now face a dual responsibility: to transparently investigate and report on the AI171 tragedy** and to actively counteract misinformation that can destabilise public confidence.

Conclusion

- The crash of Air India flight AI171 is a **sobering reminder of the complex interplay between human decisions, mechanical systems,** and environmental variables.
- **The air travel continues to be far safer** than most other forms of transportation.
- **This tragedy, while devastating, should prompt reflection, not panic,** and ultimately lead to a stronger, safer aviation ecosystem.