

WEEKLY NEWS

September 08-14, 2024

Indigenous Electronic Warfare (EW) Systems



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Mission Mausam




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HIGHLIGHTS

- Initiatives Launched Under I4C
- REAIM Summit 2024

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WMO's Air Quality and Climate Bulletin

● Why in News?

- ➔ The World Meteorological Organization (WMO) released its fourth annual Air Quality and Climate Bulletin.
- ➔ The report highlights the global state of air quality and its connections to climate change.

● Key Findings

➔ Global PM2.5 Concentrations:

Europe and China show reduced PM2.5 pollution.

North America and India report increased emissions due to anthropogenic activities.

PM2.5 refers to Particulate Matter smaller than 2.5 micrometers in diameter.

- ➔ Global PM Hotspots: Major hotspots include Central Africa, Pakistan, India, China, and South-East Asia.
- ➔ Impact on Crops: PM2.5 pollution reduces sunlight reaching crops, leading to a 15% reduction in crop yields.
- ➔ Aerobiology Advancements: New technologies enable real-time bioaerosol monitoring, improving our understanding of airborne particles affecting health and biodiversity.

● About Aerobiology

- ➔ Aerobiology is the study of airborne biological particles, or bioaerosols, and their effects on human, animal, and plant health.

Examples of bioaerosols include bacteria, fungal spores, pollen grains, and viruses.

Bioaerosols are sensitive to climate changes and reflect shifts in biodiversity and flowering patterns.

● New Observational Techniques

- ➔ Advanced technologies for better bioaerosol understanding include:

High-resolution image analysis

Holography

Multi-band scatterometry

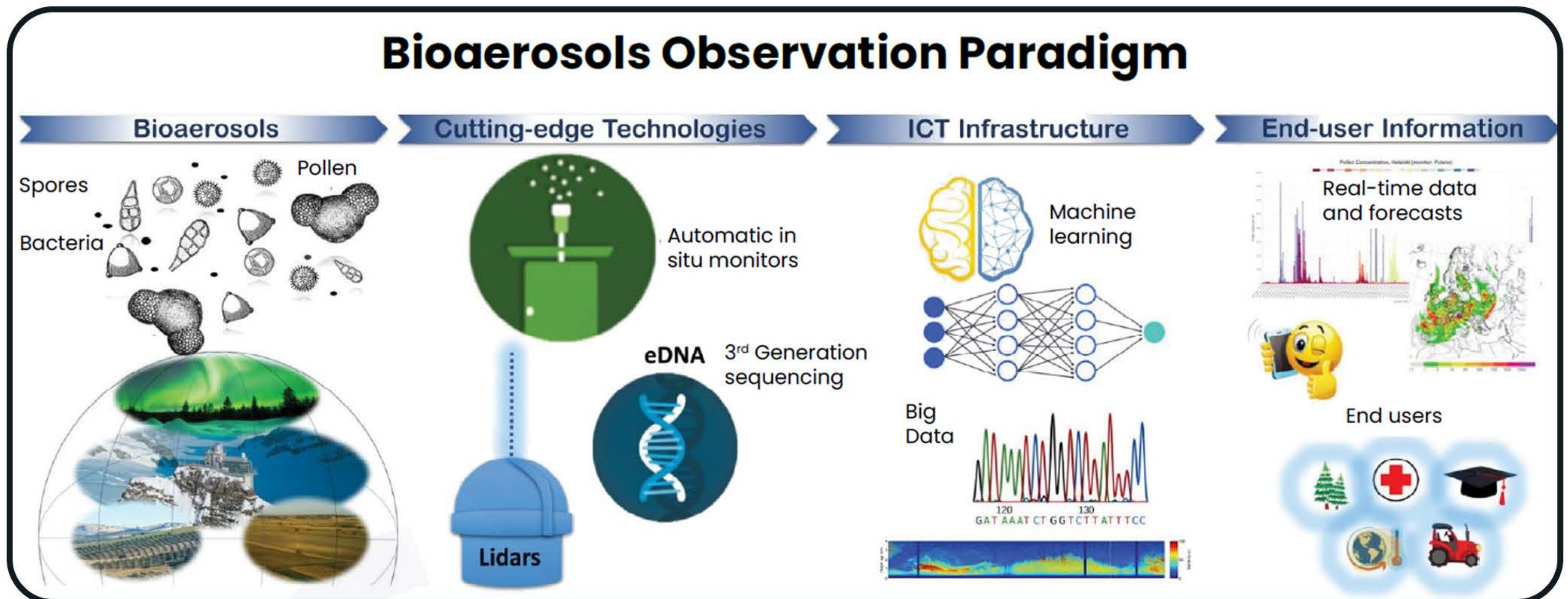
Fluorescence spectrometry

Nanotechnology for DNA sequencing



● **Way Forward**

- ➔ **Enhanced Technology:** Continued development of new observational tools for better forecasting and climate change impact assessments.
- ➔ **Global Collaboration:** Strengthening international efforts to reduce PM2.5 emissions and mitigate its environmental and agricultural impacts.
- ➔ **Research and Monitoring:** Expanding research into the effects of bioaerosols and improving real-time monitoring for more accurate data.



India's EV Sector Growth

● Why in News?

- ➔ **Global Trade Research Initiative (GTRI)** released a flagship report titled "India's Strategy to Avoid Harm in the Global EV Market Shake-Up."
- ➔ The report calls for allowing **market forces** to drive India's Electric Vehicle (EV) sector growth to prevent dependency on China, avoiding the risk of becoming an "**EV Colony**."

● Brief Background

➔ China's Dominance in EV Market:

In 2023, China exported **1.6 million EVs**, valued at **USD 36.7 billion**.

Western countries like the USA, EU, and Canada have imposed **tariffs and restrictions** on imports of Chinese EVs and parts.

China is shifting **production and assembly units** to countries like **India** and **ASEAN nations** in response.

- ➔ **Chinese Influence on India's EV Market:** Chinese units in India will still rely on **70-80% imports** of parts from China, including batteries.

● India's Unique EV Challenges

➔ Environmental Concerns:

India's heavy reliance on **coal-based electricity** reduces the environmental benefits of EVs.

Battery production has a high **carbon footprint**, starting from the **mining stages**.

➔ Dependence on China:

More than **80%** of an EV's cost comes from **batteries and components** produced in China.

Risk of **China dumping** excess EVs into India as access to **developed markets tightens**.

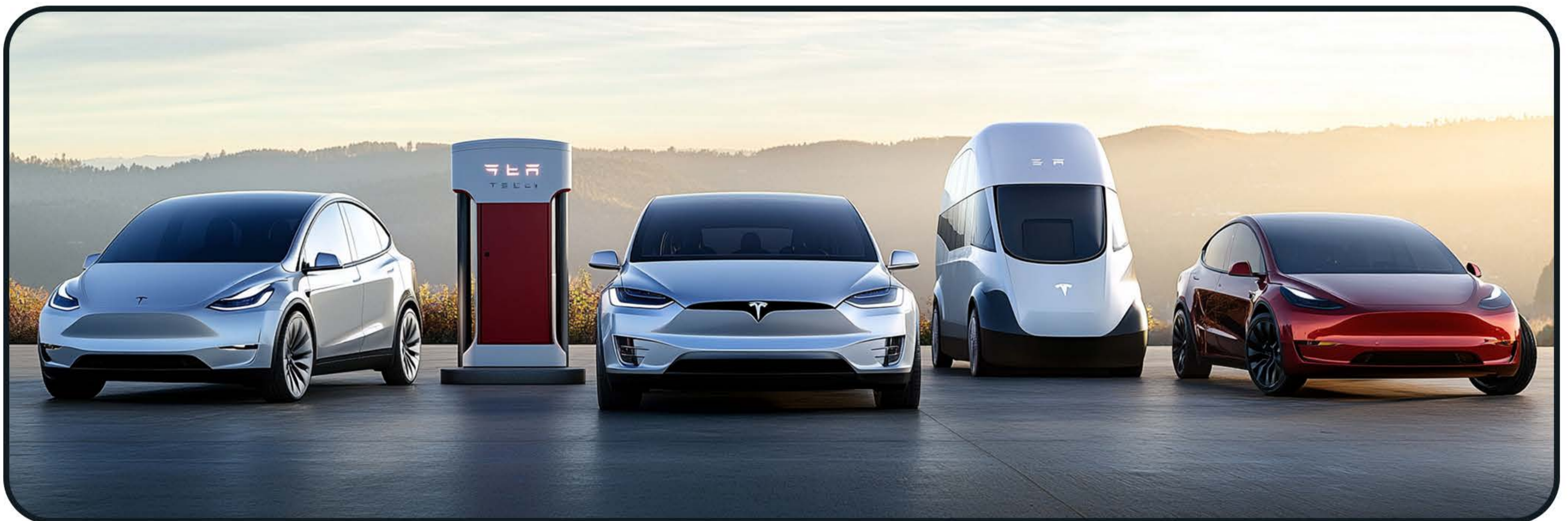


● Key Recommendations

- ➡ Invest in R&D for advanced battery technologies, such as **solid-state batteries** and **hydrogen fuel cells**.
- ➡ **Battery Recycling:** Build infrastructure for **battery recycling** and support **clean energy sources** for powering EV charging stations.
- ➡ **Lifetime Environmental Assessment:** Conduct thorough assessments of the **environmental impact** of EVs to prioritize **long-term sustainability** over short-term gains.

● Way Forward

- ➡ **Encourage Local Manufacturing:** Focus on creating a **self-reliant EV ecosystem** to reduce dependency on Chinese imports.
- ➡ **Strengthen EV Policies:** Implement policies promoting **R&D and infrastructure** to support **advanced battery technology** and sustainable practices.
- ➡ **Balance Imports and Domestic Production:** Develop a strategy to balance **imports** with **local manufacturing** to avoid becoming a production hub for Chinese EVs.



Teal Carbon Study

● Why in News?

- ➔ India's first study on **teal carbon** was conducted at **Keoladeo National Park (KNP)**, Rajasthan.
- ➔ The study highlights the **potential of teal carbon** in mitigating climate change by controlling **anthropogenic pollution** in wetlands.

● Key Findings of the Study

- ➔ **Teal Carbon as a Climate Mitigation Tool:** The study emphasizes the potential of **teal carbon** to reduce climate change impacts if pollution in freshwater wetlands is minimized.
- ➔ **Methane Emissions:** Elevated methane emissions from wetlands can be controlled using a specialized form of **biochar**, a type of charcoal.

● About Teal Carbon

- ➔ **Definition:** Teal carbon is **carbon stored in non-tidal freshwater wetlands**, including carbon sequestered in:
 - Vegetation**
 - Microbial biomass**
 - Dissolved and particulate organic matter**
- ➔ **Color-based Terminology:** The term "teal" reflects the classification of carbon based on its **functions and location**, rather than its physical properties.
- ➔ **Comparison with Other Carbon Types:**
 - Black and brown carbon** are produced through incomplete combustion and contribute to **global warming**.



● **Significance of Teal Carbon**

➡ **Environmental Benefits:**

Increases groundwater levels

Flood mitigation

Reduces urban heat islands

Supports **sustainable urban adaptation** by maintaining the wetland ecosystem.

● **About Keoladeo National Park**

➡ **Established:** Declared a national park in **1982** and a **UNESCO World Heritage Site** in **1985**.

➡ **Biodiversity:** Home to over **370 species of birds** and wildlife, including animals like **pythons** and **Siberian cranes**.

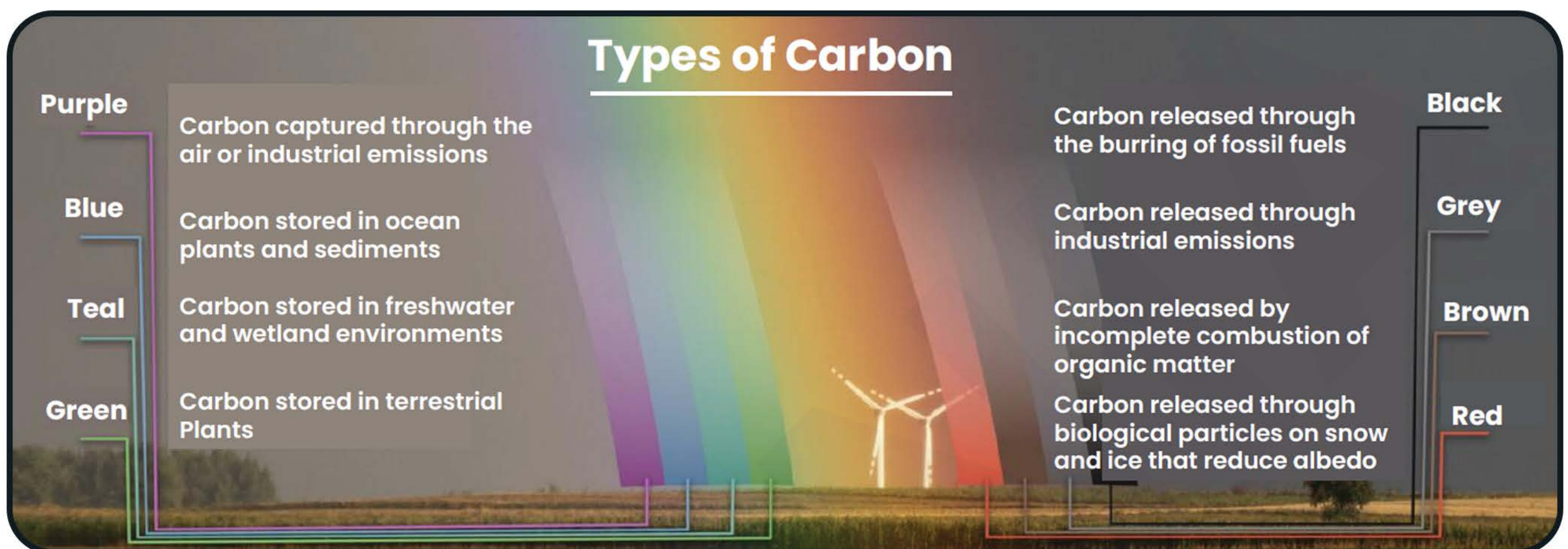
➡ **Montreux Record:** Listed in the **Montreux Record** under the **Ramsar Convention** in 1990 due to issues related to **water shortage** and **unbalanced grazing regimes**.

● **Way Forward**

➡ **Pollution Control:** Efforts should focus on reducing **anthropogenic pollution** in wetlands to maximize the potential of teal carbon in climate change mitigation.

➡ **Wetland Management:** Implementing **biochar technology** to reduce methane emissions could be crucial in managing wetland ecosystems effectively.

➡ **Restoration and Conservation:** Continued research and conservation efforts are essential to **restore wetland ecosystems**, promote **carbon sequestration**, and sustain biodiversity.



PM-Kisan Maan-Dhan Yojana

● Why in News?

- ➔ PM-KMY completed **five years** since its launch in **2019**.
- ➔ Total of **23.38 lakh farmers** have enrolled in the scheme as of August 6, 2024.

● About PM-KMY

- ➔ **Launch Year:** 2019, by the **Ministry of Agriculture & Farmers Welfare**.
- ➔ **Objective:** Provides **old age protection** and **social security** to **Small and Marginal Farmers (SMFs)**.

● Key Features of the Scheme

- ➔ **Minimum Assured Pension:** Rs. **3,000 per month** after the farmer reaches the age of **60**.
- ➔ **Eligibility:**
 - Small and Marginal Farmers (SMFs)** aged **18-40 years**.
 - Must possess up to **2 hectares of cultivable land**.
- ➔ **Fund Manager:** Managed by **Life Insurance Corporation (LIC)**.
- ➔ **Voluntary and Contributory Pension Scheme:**
 - Monthly contribution by farmers: Rs. **55 to 200**, depending on the age of entry.
 - Matching contribution** from the **Central Government**.

● Family and Disability Provisions

- ➔ **Family Pension:** Spouse is entitled to **50%** of the pension in case of subscriber's death.
- ➔ **Disability Provision:** Spouse can continue the scheme if the subscriber becomes disabled before reaching the age of **60**.



● **Eligibility Exclusions**

- ➡ Former/present holders of **constitutional posts**.
- ➡ Former/present **legislators or ministers** at the **Central/State level**.
- ➡ Those who paid **income tax** in the last assessment year.
- ➡ **Mayors and Chairpersons of Municipal Corporations/District Panchayats**.
- ➡ **Institutional landholders**.
- ➡ Farmers covered under other statutory social security schemes like **NPS**.
- ➡ Farmers enrolled in **Pradhan Mantri Shram Yogi Maandhan Yojana** or **Pradhan Mantri Vyapari Maandhan**.

● **Way Forward**

- ➡ Continue **raising awareness** to increase participation of small and marginal farmers.
- ➡ Ensure **timely pension disbursements** and improvements in registration processes.



MIGA and ISA to Boost Global Solar Projects

● Why in News?

- ➔ **MIGA** (Multilateral Investment Guarantee Agency) and the **International Solar Alliance (ISA)** announced the creation of the **MIGA-ISA Solar Facility**, a multi-donor trust fund aimed at supporting solar projects globally.

● About MIGA-ISA Solar Facility

- ➔ **Objective:** To accelerate the adoption of solar energy, including advanced solar technologies, by combining ISA's **technical expertise** with MIGA's **financing capacity**.
- ➔ **Initial Focus:** Sub-Saharan Africa, with plans for **global expansion**.
- ➔ **Funding:**
 - Seed funding of **\$2 million** from ISA.
 - Goal to raise **\$10 million** for the facility.
- ➔ **Significance:**
 - First initiative under the **Global Solar Facility (GSF)** of ISA, which targets raising **\$200 million** for projects in Africa.
 - GSF focuses on providing **payment guarantees, insurance, and investment funds** to catalyze solar investments, particularly in underserved regions.

● Significance of the Facility

- ➔ **Risk Mitigation:** Provides **cost-effective risk mitigation instruments** (including political risk insurance and credit enhancement) to support the growth of solar projects in ISA member countries.
- ➔ **Private Investment:** Attracts private investment by offering **concessional financing**, such as **first-loss instruments** and **reinsurance capacity**, helping to reduce costs and close the energy gap in underserved regions.



● **About International Solar Alliance (ISA)**

⇒ **Conceptualized:** Co-founded by **India** and **France** at **CoP21 (Paris, 2015)** of the UNFCCC.

⇒ **Aim:**

Guided by the "Towards 1000" strategy, which aims to:

Mobilize **USD 1,000 billion** investments in solar energy solutions by **2030**.

Deliver **energy access to 1,000 million** people using clean energy.

Install **1,000 GW of solar energy** capacity globally.

⇒ **Members:** 100 countries have ratified the **ISA Framework Agreement** (including India).

All UN member states are eligible to join following the amendment of the agreement in 2020.

● **Way Forward**

⇒ Expand the **MIGA-ISA Solar Facility** to other regions beyond Sub-Saharan Africa.

⇒ Raise additional funds to meet the target of **\$200 million** for solar projects.

⇒ Mobilize private sector participation through **risk mitigation and concessional financing** to drive solar adoption globally.



Blueprint for Action: REAIM Summit 2024

● Why in News?

- ➔ **Announcement:** The Responsible AI in the Military Domain (REAIM) Summit 2024, held in Seoul, South Korea, introduced a legally non-binding "Blueprint for Action" to guide the responsible use of AI in military contexts.
- ➔ **Background:** REAIM, which hosted its inaugural summit in 2023, aims to facilitate global discussions among stakeholders on the responsible application of AI in the military domain.

● Key Highlights of the 'Blueprint for Action'

➔ Impact on International Peace and Security:

AI in military applications should be developed and used in ways that preserve international peace, security, and stability.

AI applications must address both foreseeable and unforeseeable risks, including potential arms races, miscalculations, escalation, and the lowering of conflict thresholds.

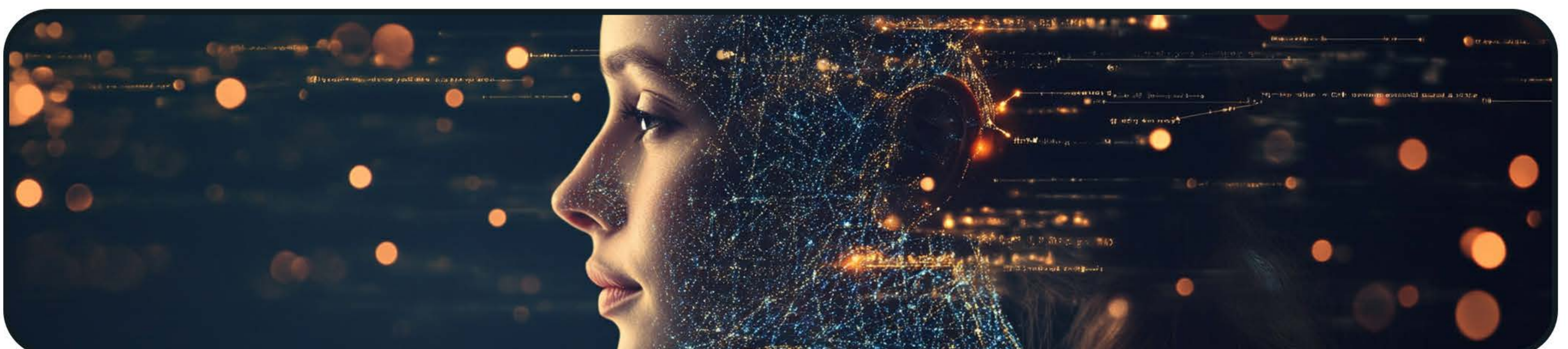
- ➔ **Human Control and Involvement:** Essential to maintain human oversight in critical decisions, particularly those related to nuclear weapons, while striving towards a world free from nuclear arms.

- ➔ **Ethical and Human-Centric AI Implementation:** AI applications in the military should adhere to ethical standards, comply with national and international laws, and involve rigorous testing and evaluation protocols.

➔ Future Governance and Cooperation:

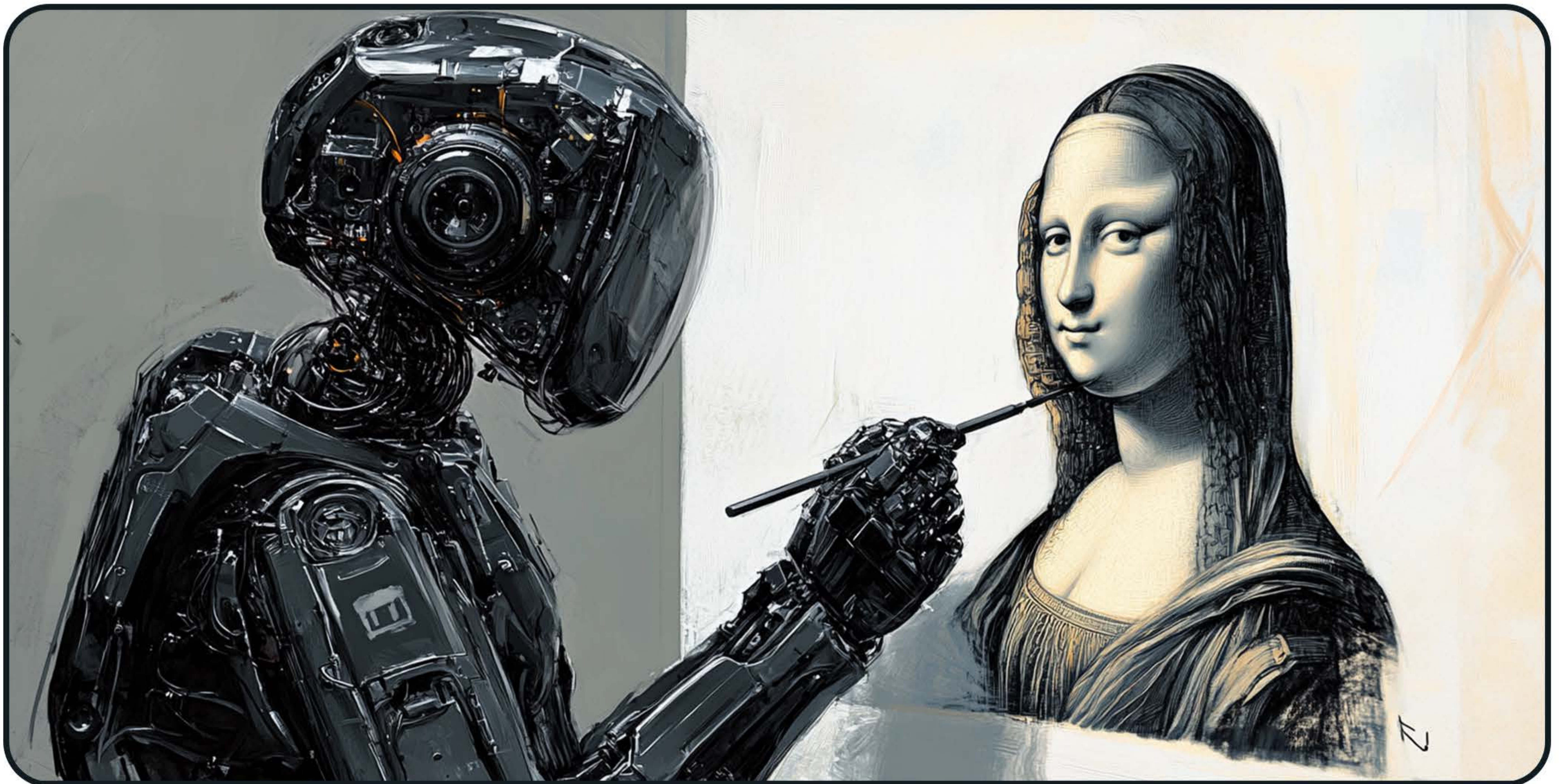
Governance discussions should be open and inclusive, reflecting diverse perspectives.

Strengthen international cooperation and capacity-building to bridge knowledge gaps in the responsible development and deployment of military AI.



● **Way Forward:**

- ➔ **Promote Ongoing Dialogue:** Encourage continuous dialogue on AI's role in military contexts and establish robust testing and evaluation mechanisms.
- ➔ **Enhance International Collaboration:** Foster global cooperation to address challenges and share best practices in the responsible use of AI in military settings.
- ➔ **Build Capacity and Knowledge:** Work towards reducing gaps in knowledge through international cooperation and capacity-building initiatives.



India-GCC Joint Action Plan 2024-2028

● Why in News?

- ➔ **Adoption of Joint Action Plan:** The 1st India-Gulf Cooperation Council (GCC) Joint Ministerial Meeting for Strategic Dialogue has adopted the Joint Action Plan for 2024-2028.
- ➔ **Purpose:** The plan outlines collaborative activities across various sectors, enhancing strategic ties between India and GCC countries.

● Key Outcomes of the Ministerial Meeting:

➔ Joint Action Plan 2024-2028:

Areas of Cooperation: Includes health, trade, security, agriculture, food security, transportation, energy, culture, and more.

Future Expansion: Additional areas of cooperation may be incorporated based on mutual agreement.

➔ 3P Framework:

Concept: India emphasized the framework of 3Ps—People, Prosperity, and Progress—to strengthen the partnership with GCC.

➔ Humanitarian Concerns:

Gaza Crisis: India's External Affairs Minister reiterated India's consistent position, emphasizing responses should align with humanitarian law principles.



● **About the Gulf Cooperation Council (GCC):**

- ➔ **Establishment:** Founded in 1981.
- ➔ **Headquarters:** Riyadh, Saudi Arabia.
- ➔ **Objective:** To promote unity among member states based on shared political and cultural identities.



Four Major Initiatives Launched Under I4C

● Why in News?

- ➔ **New Initiatives by I4C:** On the foundation day of the **Indian Cyber Crime Coordination Centre (I4C)**, the Union Home Minister launched four major initiatives to enhance cybercrime prevention and response.
- ➔ **Significance:** The initiatives aim to strengthen national cyber security and support coordinated efforts between various law enforcement agencies.
- ➔ **Background:** The I4C scheme was approved in 2018 and operationalized in 2020 to combat cybercrime and improve collaboration among law enforcement agencies across India.

● Key Initiatives Launched

➔ Cyber Fraud Mitigation Centre (CFMC)

Purpose: Established for quick action and improved coordination to tackle online financial crimes.

Significance: CFMC will embody the spirit of "Cooperative Federalism" in law enforcement by promoting collaboration across states and institutions.

➔ 'Cyber Commandos' Program

Goal: Creation of a specialized wing of trained 'Cyber Commandos' in States, Union Territories, and Central Police Organizations (CPOs).

Function: The commandos will address emerging cyber threats and enhance national cyber security.



● **Key Initiatives Launched**

⇒ **Samanvay Platform (Joint Cybercrime Investigation Facilitation System)**

Function: A web-based module designed as a central portal for cybercrime data, facilitating data sharing, crime mapping, analytics, and cooperation among law enforcement agencies.

Objective: To create a streamlined process for handling cybercrime investigations across the country.

⇒ **Cyber Suspect Registry**

Purpose: A national registry for cybercrime suspects, developed using data from the National Cybercrime Reporting Portal (NCRP) in collaboration with banks and financial intermediaries.

Objective: To strengthen fraud risk management and safeguard the financial ecosystem.

● **How Cyber Security is Integral to National Security**

⇒ **Infrastructure Protection**

Importance: Safeguarding critical infrastructure like power grids, water systems, and transportation networks from digital attacks.

Example: The 2019 malware attack on the Kudankulam Nuclear Power Plant highlighted the risks to national infrastructure.

⇒ **Economic Security**

Importance: Protecting businesses and financial institutions from cyber threats to maintain economic stability.

Example: The 2017 WannaCry ransomware attack affected various industries worldwide, underscoring the need for robust economic cybersecurity.

⇒ **National Defence**

Importance: Securing military communications, weapon systems, and other strategic information from cyber threats.

Example: The Stuxnet worm attack on Iranian nuclear facilities demonstrated the vulnerability of national defence systems to cyberattacks.

● **Way Forward**

⇒ **Enhance Cooperation:** Strengthen collaboration among law enforcement agencies, financial institutions, and technology experts to effectively combat cyber threats.

⇒ **Capacity Building:** Invest in training programs for cyber commandos and other security personnel to stay ahead of evolving cyber risks.

⇒ **Public Awareness:** Increase awareness about cyber risks among businesses and the public to mitigate vulnerabilities in the digital ecosystem.



Antibiotic Pollution from Manufacturing

● Why in News?

- ➔ **WHO's First Guidance:** The World Health Organization (WHO) has released its first-ever guidance to address antibiotic pollution from manufacturing processes, a key driver of the growing Antimicrobial Resistance (AMR) crisis.

● Key Aspects of Antibiotic Pollution and AMR

➔ AMR from Pharmaceutical Manufacturing

Source: Wastewater from antibiotic manufacturing contains antibiotic residue, which pollutes water bodies like rivers and seeps into land.

Regulation Gaps: Antibiotic pollution from manufacturing remains largely unregulated, and current quality assurance criteria do not address environmental emissions.

➔ About Antimicrobial Resistance (AMR)

Definition: AMR occurs when bacteria, viruses, fungi, and parasites become resistant to antimicrobial medicines, rendering them ineffective (as per WHO).

Natural Process: AMR occurs naturally through genetic changes but is accelerated by human activities, especially the misuse and overuse of antimicrobials.

Superbugs: The emergence of “superbugs” is a major concern, leading to poor health outcomes, particularly in patients with multiple diseases.

● Concerns Related to AMR

➔ Human and Animal Health

Global Threat: WHO identifies AMR as one of the top 10 threats to global health.

Impact: In 2019, 1.27 million deaths were directly caused by drug-resistant infections worldwide.

➔ Environmental Impact

Biodiversity: AMR pollution threatens biodiversity and contributes to the rise of zoonotic diseases.

➔ Food and Nutrition Security

Agriculture: AMR poses a significant risk to agriculture and animal husbandry, threatening global food security.

➔ Economic and Social Impact

Economic Burden: AMR leads to productivity losses, increased healthcare costs, and exacerbates poverty due to healthcare inefficiencies and job losses.



● **Initiatives to Tackle AMR**

➡ **One Health Approach**

Integrated Focus: This approach aims to balance and optimize the health of people, animals, and ecosystems in a sustainable manner.

➡ **WHO Good Manufacturing Practices (GMP), 2020**

Environmental Focus: These guidelines now include environmental aspects of manufacturing, particularly waste management.

➡ **India's National Action Plan on Containment of Antimicrobial Resistance (NAP-AMR), 2017**

Ban on Fixed Dose Combinations (FDCs): A ban was placed on 40 FDCs deemed inappropriate.

Ban on Colistin: Colistin was banned as a growth promoter in poultry farming.

➡ **Development of Antimicrobial Vaccine (AV0328)**

Bharat Biotech Initiative: In collaboration with a US firm, Bharat Biotech is working on developing an antimicrobial vaccine.

● **Way Forward**

➡ **Stricter Regulations:** Implement stricter regulations for antibiotic discharge from pharmaceutical manufacturing to control AMR pollution.

➡ **Global Collaboration:** Foster international cooperation to tackle AMR through coordinated action on health, environmental, and economic fronts.

➡ **Public Awareness:** Raise awareness on the dangers of AMR and promote the responsible use of antimicrobials in healthcare and agriculture.



India-UAE Energy Sector Agreements

● Why in News?

- ➔ Four key agreements were signed between **India** and the **UAE** in the energy sector during the **Crown Prince of Abu Dhabi's official visit** to India.

● Key Agreements Signed

- ➔ **Long-term LNG Supply:** Agreement between **Abu Dhabi National Oil Company (ADNOC)** and **Indian Oil Corporation Limited (IOCL)** for **diversified LNG sources**.
- ➔ **Production Concession Agreement:** Signed between **Urja Bharat** and **ADNOC** for **Abu Dhabi Onshore Block 1**, ensuring crude oil supply to India, enhancing the country's **energy security**.
- ➔ **MoU on Crude Storage:** MoU between **ADNOC** and **India Strategic Petroleum Reserve Limited (ISPRL)** for **crude oil storage in India** and renewal of the storage agreement.
- ➔ **MoU on Nuclear Cooperation:** Agreement to enhance cooperation in the **operation and maintenance of nuclear power plants**.

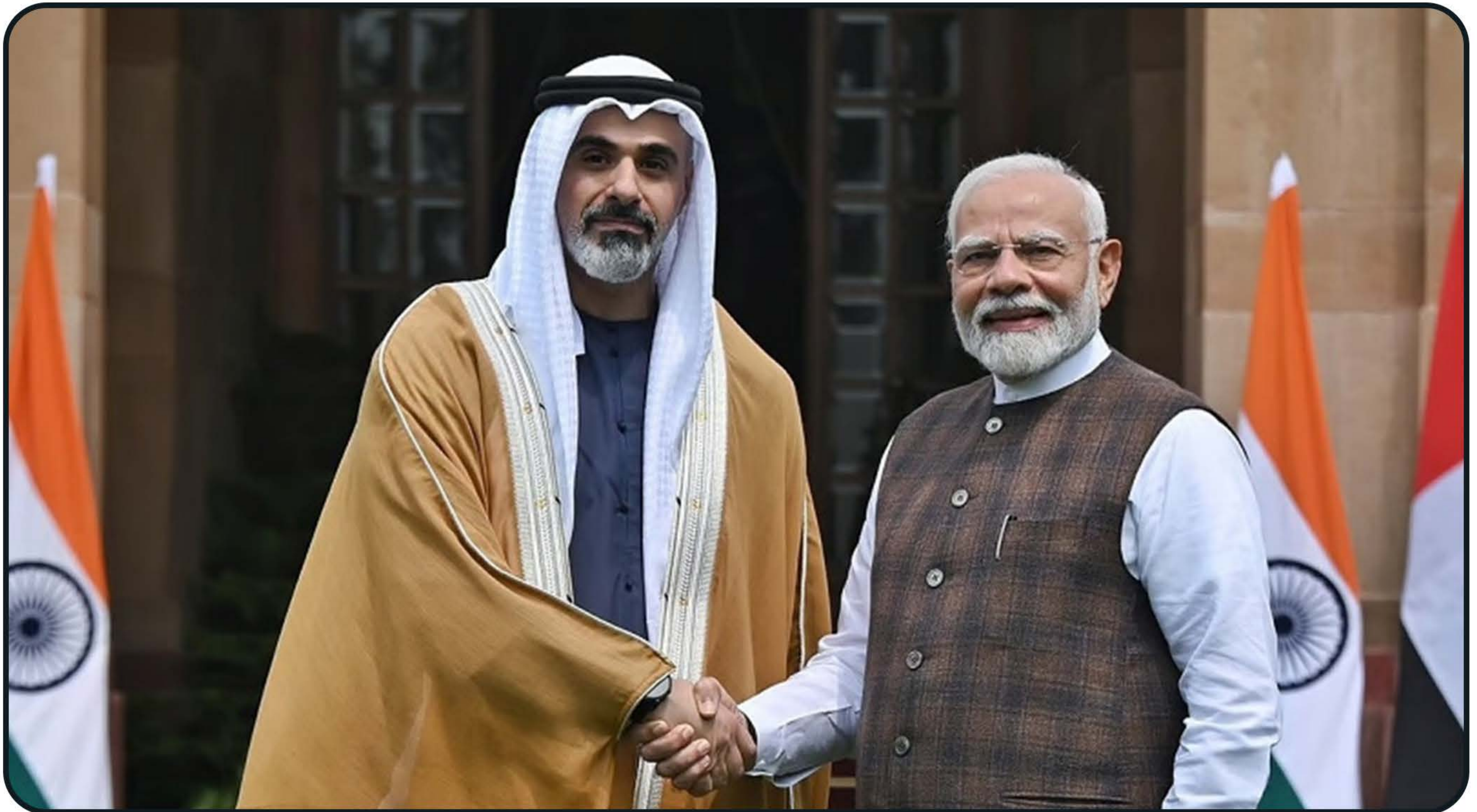
● India-UAE Relations

- ➔ **Comprehensive Strategic Partnership:** A new strategic partnership between India and UAE began in 2015.
- ➔ **Trade Relations:**
 - UAE is India's **second largest export destination** after the US.
 - India is the UAE's **second largest trading partner**.
 - In **2022**, a **Comprehensive Economic Partnership Agreement (CEPA)** was signed to enhance bilateral trade.
- ➔ **Foreign Direct Investment (FDI):** In **FY23**, the UAE was the **fourth largest foreign investor** in India.
- ➔ **Indian Diaspora:** **30% of the UAE's population** (around **3.5 million Indians**) reside in the UAE, making up approximately 35% of the population.
- ➔ **Multilateral Cooperation:** Both countries are active participants in platforms like **BRICS**, **I2U2** (India-Israel-UAE-USA), and the **UFI** (UAE-France-India) Trilateral.
- ➔ **Defense Cooperation:** India and UAE conduct joint military exercises, including **Desert Flag** and **Desert Cyclone**.



● **Way Forward**

- ➡ **Energy Diversification:** The agreements aim to further diversify India's energy sources, strengthen **energy security**, and enhance nuclear cooperation.
- ➡ **Strategic Cooperation:** Continued collaboration in multilateral platforms and defense will help deepen bilateral relations.
- ➡ **Economic Growth:** The CEPA and FDI from the UAE will boost trade, investment, and economic opportunities between the two nations.



PM E-DRIVE Scheme

● Why in News?

- ➡ The **Union Cabinet** has approved the **PM Electric Drive Revolution in Innovative Vehicle Enhancement (PM E-DRIVE) Scheme**, with an outlay of ₹10,900 crore for two years.
- ➡ The scheme aims to promote **electric mobility** and replace the earlier **FAME** programme.

● Key Features of PM E-DRIVE Scheme

- ➡ **Subsidies/Demand Incentives:** Financial support for **e-2Ws, e-3Ws, e-ambulances, e-trucks**, and other emerging electric vehicles (EVs).
- ➡ **Charging Infrastructure:** Installation of **Electric Vehicle Public Charging Stations (EVPCS)** in selected cities and along highways.
- ➡ **e-Bus Procurement:** Facilitates the procurement of **e-buses** by public transport agencies through **Convergence Energy Services Limited (CESL)**.
- Modernization of Test Agencies:** Upgrading test agencies to handle **new and emerging technologies** and promote **green mobility**.

● PM-eBus Sewa Payment Security Mechanism (PSM) Scheme

- ➡ Approved for the **procurement and operation** of **e-buses** to support clean mass mobility.

● Significance of PM E-DRIVE Scheme

- ➡ **Promotion of e-Trucks:** Encourages the use of **e-trucks** for freight transport.
- ➡ **Mass Mobility:** Supports **public transportation** through the procurement of e-buses.
- ➡ **Environmental Benefits:** Reduces the **environmental impact** of transportation, contributing to **better air quality**.
- ➡ **Domestic Manufacturing:** Incorporates a **Phased Manufacturing Programme (PMP)** to encourage **domestic production** and build a robust EV supply chain.

● Challenges in Promoting EVs

- ➡ **Coal-based Electricity:** A significant portion of India's electricity is generated by **coal**.
- ➡ **Underdeveloped Charging Infrastructure:** Insufficient public **charging stations** across the country.
- ➡ **Battery Technology:** **Suboptimal battery technology** limits EV performance and range.



● **Other Initiatives in the EV Sector**

- ➔ **National Electric Mobility Mission Plan (NEMMP):** Encourages widespread adoption of EVs.
- ➔ **Production-Linked Incentive (PLI) Scheme:** Supports the auto and auto component industry, boosting **domestic manufacturing**.
- ➔ **PLI Scheme for Advanced Chemistry Cell (ACC) Batteries:** Promotes the manufacturing of **high-performance batteries** in India.

● **Way Forward**

- ➔ **Infrastructure Development:** Focus on **expanding charging infrastructure** and improving **battery technology**.
- ➔ **Clean Energy Transition:** Integrate more **renewable energy sources** into the power grid to reduce reliance on coal.
- ➔ **Public Awareness:** Promote the benefits of **electric mobility** to encourage wider adoption of EVs.



Mission Mausam

● Why in News?

- ➔ **Approval of Mission Mausam:** The Union Cabinet has approved 'Mission Mausam' with an outlay of Rs. 2,000 crore over two years. The initiative aims to significantly enhance India's weather and climate science, research, and services.

● About 'Mission Mausam'

➔ Focus Areas:

Deliver precise weather and climate data, including forecasts for monsoons, air quality alerts, extreme event warnings.

Manage fog, hail, rain, and other weather phenomena while improving capacity-building and public awareness.

➔ Key Components

Next-Gen Technology: Deploy advanced radars and satellite systems with cutting-edge sensors.

Supercomputers: Implement high-performance computing systems to improve Earth system models for accurate forecasting.

GIS-Based Support System: Develop an automated, GIS-based Decision Support System for real-time data dissemination.

➔ Implementing Agencies

Three institutes under the Ministry of Earth Sciences (MoES) will execute Mission Mausam:

1. India Meteorological Department (IMD)
2. Indian Institute of Tropical Meteorology (IITM)
3. National Centre for Medium-Range Weather Forecasting (NCMRWF)

● Significance of 'Mission Mausam'

- ➔ **Multi-Sector Impact:** Beneficial for sectors like agriculture, disaster management, defence, aviation, environment, and water resources.
- ➔ **Enhanced Preparedness:** Enables stakeholders to better tackle the impacts of extreme weather events and climate change.
- ➔ **Improved Accuracy:** Sets a new standard for highly accurate weather predictions, aiding data-driven decisions in urban planning, transport, and more.



● **Other Initiatives to Improve Weather Forecasting**

- ➔ **Monsoon Mission (2012):** Aimed at enhancing dynamic modelling systems for more accurate short-range to seasonal monsoon forecasting.
- ➔ **WINDS (Weather Information Network and Data System):** Developed to generate long-term, hyper-local weather data for precise analysis.
- ➔ **Earth Observation Satellites:** INSAT-3D (2013), INSAT-3DR (2016), and INSAT-3DS (2024) have been launched to strengthen weather forecasting capabilities.
- ➔ **Supercomputing Systems:** MoES operationalized the Pratyush and Mihir supercomputers in 2018 to support weather forecasting and climate modelling.

● **Way Forward**

- ➔ **Technology Upgrades:** Continuous investment in next-generation radars, satellites, and supercomputers will help improve weather forecasting accuracy.
- ➔ **Capacity Building:** Training stakeholders and the public on utilizing climate data effectively will enhance disaster preparedness and resilience to extreme events.
- ➔ **International Collaboration:** Leveraging partnerships with global climate research organizations can improve data-sharing and weather prediction models.



Future Pandemic Preparedness

● Why in News?

- ➔ **NITI Aayog Report:** NITI Aayog has released a report from an Expert Group focusing on future pandemic preparedness, reflecting on the challenges faced during the COVID-19 pandemic and proposing a comprehensive strategy for the future.

● Key Issues Faced During COVID-19

➔ Legislative Gaps

Inadequate Laws: Provisions under the National Disaster Management Act (NDMA) and the Epidemic Diseases Act (EDA) were not fully suited for handling public health emergencies like COVID-19.

➔ Surveillance and Data Management

Poor Integration: Multiple data sources were not well integrated, impacting decision-making during the pandemic.

➔ Research and Innovation

Industry Gaps: Research institutions were not well linked with industries, hindering the rapid development of diagnostics and vaccines.

● Key Recommendations

➔ Governance:

New Public Health Law: Enactment of a Public Health Emergency Management Act (PHEMA) to address not only epidemics but also non-communicable diseases, disasters, and bioterrorism.

Empowered Group: Creation of an Empowered Group of Secretaries on Pandemic Preparedness and Emergency Response (PPER), chaired by the Cabinet Secretary.

Special Fund: Establishment of a dedicated PPER fund for pandemic and emergency responses.

➔ Data Management, Surveillance, and Early Warning

Integrated Surveillance: Develop a well-connected and integrated surveillance network for early detection of emerging health threats.

Predictive Modeling: Build robust forecasting and modeling networks for the early prediction of disease outbreaks.



● **Key Recommendations**

➡ **Research and Innovation**

New Platforms: Establish an Institute of Innovation for developing new platform technologies and vaccines.

Skill Development: Set up Centers of Excellence to train human resources in key areas where gaps have been identified.

● **Existing Framework for Epidemic/Pandemic Management**

➡ **Legislative Provisions**

State Role: "Public Health and Sanitation" falls under Entry 6 of the State List in the Seventh Schedule.

Concurrent Powers: Entry 29 of the Concurrent List allows both the Center and States to legislate on the prevention of infectious diseases across state borders.

➡ **International Health Regulation (IHR) 2005:** Provides a legal framework for managing public health emergencies at the international level.

➡ **Epidemic Diseases Act (EDA) 1897:** The main legislation governing the management of epidemics and pandemics in India.

➡ **Integrated Disease Surveillance Programme (IDSP):** A national program aimed at strengthening disease surveillance and improving data collection to predict and manage health threats.

● **Way Forward**

➡ **Strengthen Legal Frameworks:** Update public health laws to encompass a broader range of health emergencies, including pandemics, disasters, and bioterrorism.

➡ **Enhance Data Integration:** Improve the integration of health data systems to enable real-time decision-making during future health crises.

➡ **Research and Innovation:** Foster closer collaboration between research bodies and industries to accelerate the development of diagnostics, vaccines, and treatments.

➡ **Capacity Building:** Focus on creating Centers of Excellence for training health professionals and building human resources in critical areas.



AB PM-JAY

● Why in News?

➡ The **Union Cabinet** has approved a **₹5 lakh health cover** for senior citizens under the **Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB PM-JAY)**.

This expansion is set to benefit around 6 crore senior citizens across the country.

● Key Features of the Scheme Expansion

➡ **Eligibility:** All **senior citizens aged 70 and above** are eligible, regardless of their income.

➡ Health Cover:

Each senior citizen will receive a **family-based cover of ₹5 lakh annually** for medical expenses.

Those already covered by AB PM-JAY will get an **additional ₹5 lakh top-up**, separate from their family's existing cover.

➡ Ease of Access:

Eligible senior citizens will be issued a **distinct health card**.

Senior citizens already availing other public health insurance schemes can choose between their existing scheme and **AB PM-JAY**.

Senior citizens under **private health insurance** or **Employees' State Insurance** schemes are also eligible for AB PM-JAY benefits.

● About AB PM-JAY Scheme

➡ **Ministry:** Ministry of Health & Family Welfare

➡ **Type:** Centrally Sponsored Scheme under the **Ayushman Bharat Mission**

➡ **Target:** Covers **12 crore families** (around **55 crore beneficiaries**).

➡ **Objective:** To achieve **Universal Health Coverage (UHC)**.

➡ Benefits:

Provides **₹5 lakh/family/year** for secondary and tertiary care hospitalization.

Covers **3 days of pre-hospitalization** and **15 days of post-hospitalization** expenses, including diagnostics and medicines.

Recognized as the **world's largest publicly funded health assurance scheme**.



● **Other Schemes for Senior Citizens**

- ➡ **Atal Vayo Abhyuday Yojana:** Aims to improve the quality of life for senior citizens.
- ➡ **Senior Aging Growth Engine (SAGE):** Promotes and incentivizes senior care products and services.
- ➡ **SACRED Portal:** Connects senior citizens with job providers in the private sector under the **Senior Able Citizens for Re-Employment in Dignity** initiative.

● **Way Forward**

- ➡ **Awareness Campaigns:** Promote awareness of the expanded health coverage benefits among senior citizens.
- ➡ **Improved Access:** Simplify the process of card issuance and access to healthcare services for senior citizens.
- ➡ **Monitoring and Support:** Regularly monitor the scheme’s implementation to ensure that beneficiaries receive timely and quality healthcare.



Neuromorphic Computing

● Why in News?

- ➡ Indian Institute of Science (IISc) scientists reported a major breakthrough in **neuromorphic computing**.
- ➡ They developed **Memristor semiconductor devices** using **metal-organic films**, which offer an alternative to traditional silicon-based technology.

● Key Highlights of the Development

➡ Memristor Devices:

These devices mimic the way the **biological brain processes information**, using networks of **neurons and synapses**.

The use of **metal-organic films** enhances the ability to replicate brain-like computing.

● What is Neuromorphic Computing?

➡ Neuromorphic Computing:

Mimics the **structure and function** of the human brain.

Involves designing hardware and software that simulate **neural networks** and **synapses** to process information.

➡ How It Works:

Utilizes hardware like **spiking neural networks (SNNs)**, consisting of nodes (spiking neurons) connected by artificial synapses.

Data is encoded through **analog signal changes**, unlike binary systems used in traditional computers.

● Benefits of Neuromorphic Computing

- ➡ **Adaptability:** Can quickly adapt to new stimuli, excelling at solving **real-time problems**.
- ➡ **Event-driven Computation:** Only active parts consume energy, ensuring **efficient power usage**.
- ➡ **High Performance:** Integrates **memory and processing** in neurons, reducing latency.
- ➡ **Parallel Processing:** Processes multiple tasks across different neurons simultaneously for **faster operation**.

● **Challenges of Neuromorphic Computing**

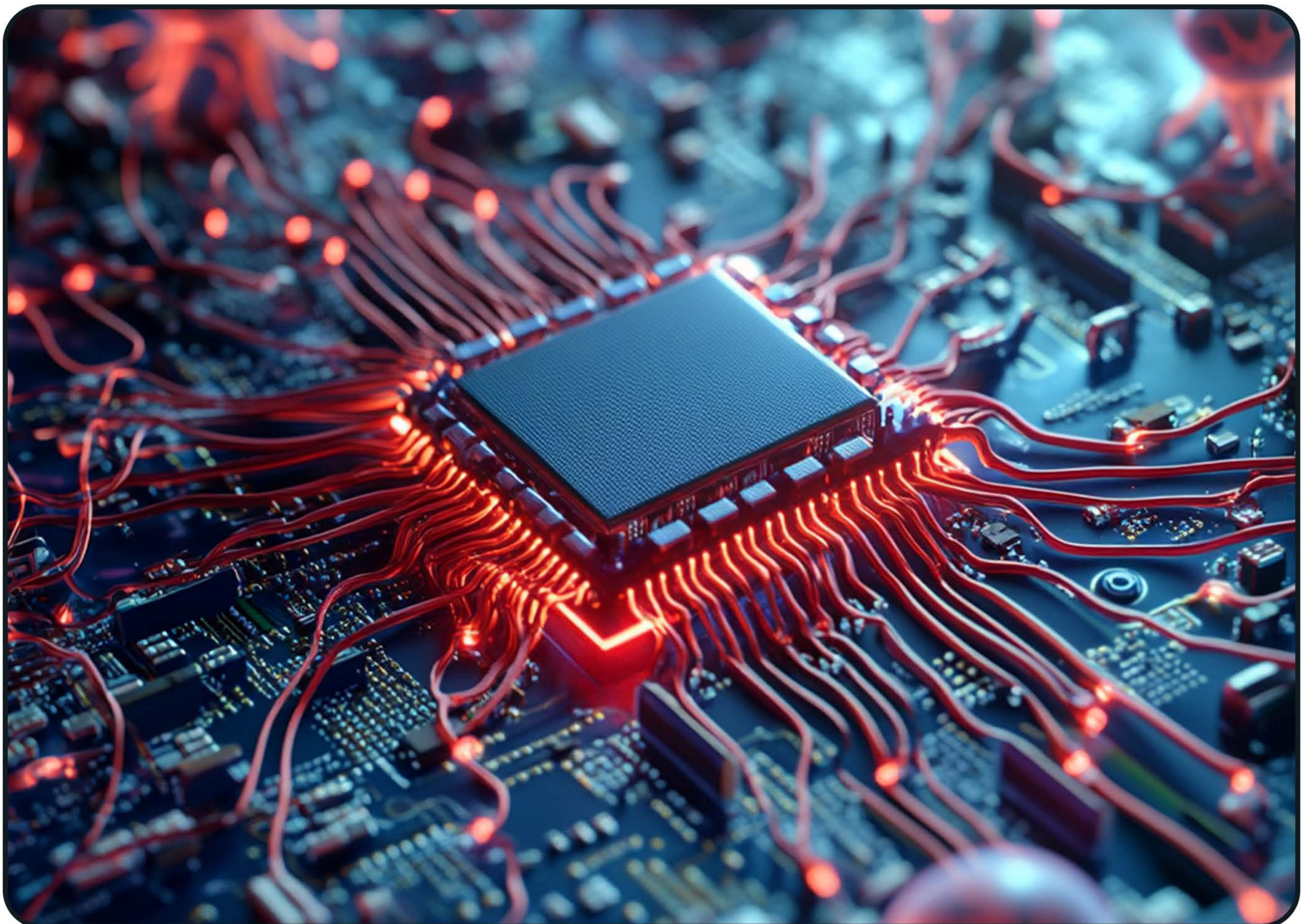
- ➡ **Lack of Standards:** Absence of **benchmarks** and standards for development.
- ➡ **Limited Accessibility:** Difficulties in accessing suitable software and hardware.
- ➡ **Decreased Accuracy:** Current technology may lack the precision of conventional computing systems.

● **Brain's Information Processing**

- ➡ **Neurons:** The basic units of the brain and nervous system, responsible for **relaying information** between different parts of the brain and body.
- ➡ **Synapses:** The network of connection points through which neurons communicate via **chemical and electrical signals**.

● **Way Forward**

- ➡ **Standardization:** Establishing benchmarks and standards for neuromorphic computing.
- ➡ **Technology Development:** Advancing software and hardware accessibility for wider adoption.
- ➡ **Research Expansion:** Encouraging further research to enhance accuracy and performance in real-world applications.



Indigenous Electronic Warfare (EW) Systems

● Why in News?

- ➔ The Spectrum EW Conference, with the theme "**EW: Trends, Technologies & Maintenance Challenges**," highlighted Electronic Warfare (EW) as a crucial pillar of air strategy and emphasized the need to develop indigenous EW systems with the collaboration of Indian academia, Defence Public Sector Undertakings (DPSUs), and Indian private industries.

● About Electronic Warfare (EW)

- ➔ **Definition:** EW refers to military actions involving the use of electromagnetic energy to identify, exploit, reduce, or block the hostile use of electromagnetic spectrum signals, such as radio, infrared, or radar.

➔ Three Major Areas of EW:

Electronic Support Measures (ESM or Passive EW):

Involves intercepting and analyzing electromagnetic signals for threat recognition, intelligence gathering, and operational planning.

Electronic Countermeasures (ECM or Active EW):

Uses cyber and multispectral tools to defend against jamming, deception, and to protect friendly forces' communications.

Electronic Counter-Countermeasures (ECCM):

Utilizes electromagnetic signals or directed energy to neutralize enemy electromagnetic capabilities and safeguard friendly operations.

● Challenges Faced by EW Systems

- ➔ Rapid technological advancements necessitate continuous updates in EW capabilities.
- ➔ Vulnerability to cyber-attacks requires robust cyber defense integration.

● Need for EW Systems in India

- ➔ **Strengthening National Defense:** EW is essential to counter advanced threats in the electromagnetic spectrum posed by enemy nations, such as China's Y-9LG electronic warfare platform.



● **Indigenous EW Systems of India**

- ➡ **Shakti EW System:** Provides an electronic layer of defense against modern radars and anti-ship missiles.
- ➡ **Programme Sangraha:** A joint initiative by DRDO and the Indian Navy to design and develop five different types of indigenous EW systems.
- ➡ **Integrated Electronic Warfare System (IEWS):** Designed to operate in plains, semi-desert regions, and mountainous terrain.
- ➡ **Other Systems:**
 - Himshakti (IEWS):** Designed for mountainous terrain operations.
 - Samyukta:** A multi-functional system capable of performing a variety of jamming tasks.

● **Way Forward**

- ➡ **Indigenous Development:** Accelerating the development of indigenous EW systems with contributions from Indian academia, DPSUs, and private industries to ensure self-reliance in defense technology.
- ➡ **Collaboration and Innovation:** Continuous collaboration between government and industry to adapt to rapid technological changes and emerging cyber threats in the EW domain.
- ➡ **Capacity Building:** Strengthening capabilities in threat recognition, communication defense, and countermeasures to safeguard India’s national security in the evolving electromagnetic spectrum battlefield.






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