

GS III & ESSAY

SYLLABUS: AWARENESS IN THE FIELDS OF IT, SPACE.

ARTIFICIAL INTELLIGENCE

THE HINDU, PG.NO: 8,9.

News: "Global consensus must to face challenges in using AI for governance."

News: "AI will drive innovation, revolutionise business and make life better."

"Impact of AI on humanity is likely to be as fundamental as fire, shift towards automation and processing was inevitable."

Issues:

- **Need for global consensus on usage of AI due to:**
 - **Copy right issues, data protection, and cyber risks.**
 - AI has always had **issues of bias, fairness, and risks.**
 - Issues related to **data exporting, usage, and localisation are extremely critical.**
 - Lack of global consensus leads **countries to become digital slaves.**
- **Quality data is crucial for AI accuracy:**
 - Data is like **oxygen for AI.**
 - **Human oversight** is essential to monitor their progress.
- **AI Data Centres issues:**
 - Average data center uses **300,000 gallons of water a day** to keep cool.
 - India lacks data centres to **process vast amounts** of data for AI.
- **AI phishing campaigns:** used to generate convincing responses.
- **AI overlooking empathetic view remains a concern.** Eg. AI denial of credit to poor entrepreneur on basis of ability to repay.
- **Lack of qualified AI trainers** in institutions in imparting skills.
- **Current state of AI models overlooks cultural importance.**

Applications of AI in Indian context:

- **AI for India's Health Goals:**
 - **TB free India by 2035:**
 - 45 mobile vans, each equipped with a digital X-ray machine, are being deployed in remote areas.
 - These vans offer a **higher rate of detection compared to traditional models.**
 - **India's is Diabetes capital of world:**
 - AI offers solutions to build diabetic retinopathy.
 - AI to maintain **electronic medical records.**
 - AI could **screen refractive eye errors** in children and **detect pregnancy-induced hypertension.**
- **Conservation of Biodiversity:**
 - **Prevent elephant deaths** on railway tracks in Elephant corridors.
- **Achieving sustainability goals in business operations:**
 - **Reducing waste** and optimising energy usage.
- **Coexistence of Human intelligence and AI:**
 - India will be the **largest source of working-age human capital** in the world, both will complement each other.
- **AI algorithms are used for credit scores for loans**, helps to detect potential NPAs.

Suggestions:

- **Need for collaboration of States** in expansion of AI.
- **AI skills could be a complementary tool** and not a replacement.

- **Incorporation of AI in the academic curriculum:**
 - Allows hands-on experience.
 - Bridging skill gaps.
- **Key performance indicators to measure the success of AI initiatives:**
 - Financial metrics.
 - Customer engagement and satisfaction.
 - Sustainability and increasing productivity of the people.
- **"Set a thief to catch a thief," one can use Artificial Intelligence (AI) to combat:**
 - AI phishing campaigns.
 - Alert people who inadvertently enter their credentials online, suspicious sites etc.
- **Quality data is crucial for AI accuracy:**
 - A manufacturing company employs a team to inspect vehicle quality, while every organization should also have a few dedicated individuals verify data accuracy.
- **Indians consume the most generative AI today**, but we should explore how India can generate AI technologies instead.

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GS III & ESSAY

SYLLABUS: CONSERVATION, ENVIRONMENTAL POLLUTION AND DEGRADATION.

ENVIRONMENT POLLUTION AND HEALTH

THE HINDU, PG.NO: 12.

News: "India needs an environmental health regulatory agency."

"India's rapid economic growth underscores the interconnectedness of climate, environment, health, and the economy but capacities to address these issues holistically are limited."

Concerns of Environment Pollution:

- India has seen over 6% more GHGs emissions than the previous year — **Emissions Gap Report 2024**.
 - There is a **disconnect between environmental monitoring, health impact assessments, and emissions control**:
 - Air pollution:**
 - 1.5 million deaths annually in India due to air pollution" — **WHO report 2019**.
 - In November 2024, Air pollution in Delhi was 17 times WHO's limit. Few areas in NCR reached an **AQI of 1700**.
 - Water and groundwater pollution:**
 - Heavy toxic materials:** Ganga, Yamuna, Godavari — **CPCB 2023**.
 - Groundwater contamination:** overuse of fertilisers & pesticides.
 - Microplastics:** Threatens **FoodWeb (Bioaccumulation)**, Breach of Blood Brain Barrier.
 - Waste Generation:** eg. **Landfills** impacting the Right to clean environment of citizens nearby.
 - Vector-borne diseases:** Eg. **Dengue, malaria** etc in urban localities.
 - Effects of persistent organic chemicals and heavy metal exposures** in the context of changing land-use patterns, PCBs, DDT etc.
 - Shift from a one-size-fits-all** approach in planning of policies to address **local problems and needs**.
 - Red-tapism:** lack of inter-ministerial coordination, cross-sectoral cooperation.
- #### Creation of Awareness:
- Educating citizens** on environmental health risks.
 - Empowering communities** to advocate cleaner air, water, and healthier living conditions.
 - NGOs play a pivotal role** in starting accountability from the local bodies and panchayat levels.
 - The role of media** is crucial in highlighting and supporting the initiatives.
- #### Case studies:
- Above **concerns demands for establishment of Environmental Health Regulatory Agency (EHRA)** that focuses simultaneously on pollution control and health risk mitigation.
 - Agency like EHRA is seen in countries like:**
 - USA:** U.S.Environmental Protection Agency (EPA).
 - Germany:** Federal Environment Agency (UBA).

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SYLLABUS: ROLE OF MEDIA AND SOCIAL NETWORKING SITES IN INTERNAL SECURITY CHALLENGES.

SOCIAL MEDIA (CHALLENGES)

THE HINDU, PG.NO: 13.

News: "Is social media doing more harm than good to democracy?"

Challenges with Users:

- Promotion of disturbing content:** Eg. **Racism, conspiracy theories** on X, Facebook etc.
- Communal violence:** **Delhi riots in 2020**.
- Misinformation & Fake news** : 2018 mob lynching rumours, **COVID Vaccine efficacy misinformation**.
- Hate speech** in the name of Freedom of Speech
- Political influence:** Eg. **weaponising social media**.
- Mainstream Media too shifted in focus on social media:** rather, focus on extensive reporting shifted to **opinion-seeking on issues**. Eg. Opinion on Gaza, Art. 370 dilution etc.
- Cyberbullying and Online Harassment:** female politicians and journalists have been targeted on X platform.
- Mental Health issues:** 36% of adolescents in India experienced **sleep disturbances, anxiety** due to social media — **Journal of Psychiatry 2019**.

Challenges with Intermediaries:

- Lack of Accountability:** lead to the unchecked spread of harmful content, **insufficient responsiveness to legal and ethical obligations** etc. Eg. **TheGuardian**, took a decision to stop posting on the social media platform X
- Lack of Social Responsibility:** by prioritising user engagement and **profit** at expense of their well-being.
- Privacy concerns:** Eg. **Whatsapp updated privacy policy** 2021, data sharing with parent company (Meta).
- Dilemma over Encryption and Security Concerns:** intermediaries prioritise user privacy's, govt. demands traceability of encrypted messages.
- Platforms claim moderation of content is less effective** due to **diversity of languages in India**.
- Question of Ownership:** The algorithm of X has been tweaked to ensure that everyone on X CEO's posts.
- Huge mismatch between the editorial standards and values** of the platforms.
- Problem is centralisation of information: platforms decentralised systems — **RBI Norms 2018**.
- Content Moderators:** during Sri Lankan riots, Facebook did not have a single moderator.

"A thriving democracy is closely linked to a reliable information ecosystem. Media and social media act as a bridge, enabling informed decision-making."

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ENVIRONMENT

PRE-CONTEXT

AIR POLLUTION

THE HINDU, PG.NO: 14, 24.

News: "Is Delhi becoming an uninhabitable city?"

News: "A primer on how to survive the declining air quality in India."

Commission on Air Quality Management in NCR (CAQM):

- A **Statutory body** established under the **NCR & Adjoining Areas Act 2021**.
- **This body frames GRAP** (Graded Response Action Plan).
- CAQM is **constituted by Central Govt.** by notification in NCR and adjoining areas.
- Chairperson appointed by **Central govt.**
- No powers to punish activities related pollution.

Multiple reasons for winter Air pollution in Delhi:

- Slow wind speed, **temperature inversion** (traps pollutants).
- Bursting of firecrackers, **Stubble burning**.
- **Emissions from vehicles (contribute 60%)**, coal-based power plants, brick kilns etc.
- Household sources, **dust (Roads, construction activities)**.
- Of all, **stubble burning** in Punjab and Haryana is **responsible for ~40% of the pollution** during **October and November**.
- In November 2024, **Air pollution in Delhi was 17 times WHO's limit**. Few areas in NCR **reached an AQI of 1700**.
- **Partially unburned exhaust of automobiles** with nitrogen oxides leading to ozone formation.

National Clean Air Programme:

- Launched by **MoEFCC** in 2019.
- **Implementation:** by CPCB under **Air (Prevention and control of Pollution) Act 1981**.
- **131 Non Attainment Cities: cities that exceed the NAAQS for 5 consecutive years**. They are identified by CPCB.
- Aims to **reduce PM10 and PM2.5 concentrations** to 40% by 2025-26.
- **PRANA** (Portal for Regulation of Air-pollution in Non Attainment Cities) to monitor the implementation of NCAP.

National Ambient Air Quality Standards (NAAQS):

- **Air Act 1981** mandated CPCB to set standards for air quality.
- In 1982 **CPCB notified standards for following pollutants** (revised with time).
 - SO_x, NO_x, PM 2.5 & 10, Ozone, Lead, Cobalt, Arsenic, Nickel, Benzene, Benzopyrene, Ammonia.

CPCB:

- **Statutory body** created under **Water (Prevention and Control of Pollution) Act 1974**.
- Also entrusted with powers and functions under the **Air Act, 1981**.
- Works under **Ministry of Environment, Forest, and Climate Change**.
- **Advises** Central govt., on water & air pollution.

Powers of Board:

- Has **nationwide jurisdiction** but works in coordination with **State Pollution Control Boards**.
- Advices, coordinates & technical assistance for prevention of water pollution.
- **Amended in 1977:** imposes **"Cess"** on industries.
- Power to **punish, fine & imprisonment**.

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Functions:

- Setting standards for notified pollutants under **National Ambient Air Quality Standards** for air quality.
- Sets environment criteria for products under **Ecomark scheme**.
- Monitors the usage of **single-use plastics**.

Initiatives by CPCB:

- **Comprehensive Pollution Index:** ranks industrial clusters based on the level of environmental pollution they cause.
- **National Air Quality Monitoring Program (NAMP):** Monitors ambient air quality at various locations across India.
- **National Water Quality Monitoring Program (NWMP):** Monitors water quality at different rivers, lakes and water bodies.
- **Graded Response Action Plan (GRAP):** dealing with severe air pollution levels in the National Capital Region (NCR).
- **National Clean Air Programme (NCAP):** to reduce PM10 & PM 2.5 by 20-30% by 2024.

Note:

- **Ministry of Road Transport and Highways** acts as a nodal agency to **control air pollution from vehicles** under **Motor Vehicle Act 1988**.

Case study: Beijing's approach to controlling air pollution.

- Beijing was once notorious for its **yellow and thick smog, especially during the winter months**.
- **Now in Beijing, its current AQI is around 60** standing well below global. Recommendations.

Approach:

- **Targeting primary pollutants**, with the govt playing the main role.
- **Later, the focus shifts to secondary pollutants**, or particulate matter leading to toxic smog, primarily PM_{2.5}, which requires a regional mechanism.
- **Beijing's techno-political management system**, which builds public awareness to deal with toxicity.
 - **First**, forecasting severe smog levels through warnings issued at least 24 hours in advance with over 1000 PM 2.5 sensors throughout the city.
 - **Second**, Beijing has over 30,000 low-floor buses, five times the number operated by DelhiTransport Corporation.
 - **Third**, both Beijing and Delhi, as transit centres with no peak-hour traffic, require additional measures to manage regional transportation.

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DEFENCE

PRE-CONTEXT

ICBM

THE HINDU, PG.NO: 20.

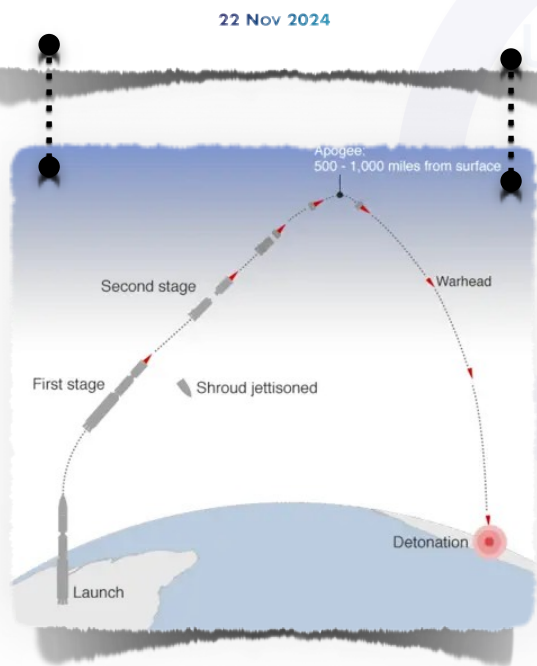
News: "Russia launched an ICBM for the first time: Ukraine."

Characteristics of Inter-Continental Ballistic Missile:

- **Range:** greater than 5,500 km, *with striking distance across globe.*
- **Payloads:** Nuclear warheads, Conventional warheads, Multiple Independently Targetable Reentry vehicles (MIRVs).
- **Delivery systems:** from *Land, Air and Submarine launched.*
- **Path:** *parabolic trajectory.*

Countries with ICBM:

- USA, Russia, China, France, *India (AGNI-V)*, North Korea, UK.



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ENVIRONMENT

PRE-CONTEXT

NTCA

THE HINDU, PG.NO: 12.

News: "NTCA letter on relocation from tiger zones draws ire."

National Tiger Conservation Authority(NTCA):

- Created under *WLPA, 1972.*
- Chaired by "*Environment Minister*".
- **Apex body for Tiger conservation body.**
- **Approves New Tiger Reserve & Tiger Conservation Plans.**
- Approves and coordinates research and monitoring including "*Tiger census.*"

Tiger Reserve:

- Currently there are **53 Tiger Reserves in India (2024).**
- **Largest Tiger Reserve:** Nagarjuna Sagar-Srisaillam Tiger Reserve.

Core zone:

- Tribals cannot live and activities like hunting and collecting forest produce is banned.
- **Nagarjuna Sagar-Srisaillam Tiger Reserve** has largest core habitat area.

Buffer zone:

- Concentric circle outside the "core zone"
- Here **restrictions are eased but regulated.**
- Manas Tiger Reserve has largest Buffer Zone.

Highest number of(2023):

- **Tiger population in State of:** Madhya Pradesh.
- **Tiger Reserves:** Madhya Pradesh.
- **Tiger population by Reserve:** Jim Corbett, Uttarakhand.

Project Tiger:

- **Centrally Sponsored Scheme** of MoEFCC.
- Tiger(EN) is schedule 1 animal under WLPA, 1972.
- India is home to **80% of tigers in the world.**
- Centre merged **Project Tiger** and **Project Elephant.**
- Tiger census is conducted for every 4 years.
- **M-STRIPES:** An android app for monitoring.
- **Project 'E-Bird':** UAVs a Surveillance and Monitoring tool.
- **Conservation Genetics:** Used in low tiger density areas to detect tiger presence.

Wildlife Protection Act and Relocation of Tribes:

- Under WLPA 1972, **Core areas should remain undisturbed** by human activities.
- Act also stipulates that this relocation must be "**voluntary**" and **carried out on "mutually agreed terms and conditions."**

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ART AND CULTURE

PRE-CONTEXT

ROCK CUT ARCHITECTURE

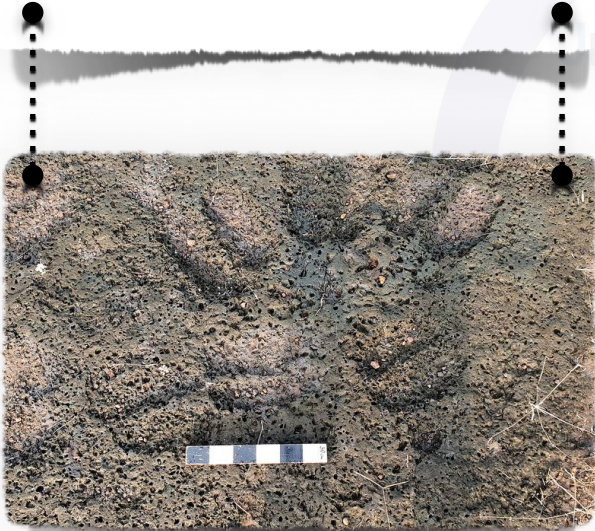
THE HINDU, PG.NO: 6.

News: "Rock-cut footprints, human figure dating back to Megalithic period unearthed at Kerala's Kanhirapoil."

About finding:

- **2,000-year-old rock art** sheds light on the **lives and artistic expressions** of early inhabitants of **Kanhirapoil in Kerala**.
- Where **24 pairs of prehistoric footprints and human figure** have been found carved into rock on private property.
- **Carvings, made with iron tools**, include footprints varying in size from six to 10 inches, suggesting representations of both children and adults

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EXAMPLES FROM TODAY'S NEWS PAPER

THE HINDU, PG.NO: 10.

News: "World should embrace Buddhist doctrines to resolve conflicts."

- Sectarianism is **characterized by excessive attachment to a particular sect, religion or faction**, which often leads to discrimination, intolerance, and conflict among different religious, ethnic, or ideological groups.

Characteristics of sectarianism:

- **Exclusivity:** superiority of one's own group over others.
- **Discrimination:** Unequal treatment based on sectarian affiliations.
- **Intolerance:** Lack of acceptance for differing beliefs and practices.
- **Conflict:** Potential for both verbal and physical confrontation.

Buddhism: A Path to Counter Sectarianism.

- **Principle of Ahimsa (Non-Violence):** Encourages peaceful dialogue and reconciliation over aggression.
- **Doctrine of Anatta (No-Self):** Reinforces the idea that all beings are interconnected.
- **Cultivation of Metta (Loving-Kindness):** Fosters genuine empathy and compassion towards all individuals.

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Thank you!