

The Hindu Important News Articles & Editorial For UPSC CSE

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The International Criminal Court issued arrest warrants against Israeli Prime Minister Benjamin Netanyahu, his former Defence Minister Yoav Gallant and Hamas officials – accusing them of war crimes and crimes against humanity linked to the Gaza conflict.

- Israel and the U.S., non-members of the ICC, rejected the charges, complicating ceasefire negotiations. The decision spotlights alleged humanitarian violations during the ongoing hostilities.

More About International Criminal Court:

- **Established:** 2002 under the Rome Statute.
- **Headquarters:** The Hague, Netherlands.
- **Purpose:** Prosecutes individuals for genocide, war crimes, crimes against humanity, and aggression.
- **Membership:** 124 states; notable non-members include the U.S., Russia, China, Israel and India.
- **Jurisdiction:** Cases referred by member states, UN Security Council, or ICC Prosecutor.
- **Independent:** Not part of the United Nations system.
- **Structure:** Composed of the Presidency, Judicial Divisions, Office of the Prosecutor, and Registry.
- **Criticism:** Accused of bias against African nations; struggles with enforcement due to reliance on state cooperation.
- **Notable Cases:** Includes leaders like Sudan's Omar al-Bashir and Uganda's Joseph Kony.

ICC issues arrest warrants against Netanyahu, Gallant, and Hamas leaders



Serious charges: Benjamin Netanyahu and Yoav Gallant during a press meet in the Kirya military base in Tel Aviv in 2023. REUTERS

Associated Press THE HAGUE

The International Criminal Court issued arrest warrants on Thursday for Israeli Prime Minister Benjamin Netanyahu, his former Defence Minister Yoav Gallant and Hamas officials, accusing them of war crimes and crimes against humanity over their 13-month war in Gaza and the October 7, 2023 attack on Israel, respectively.

Mr. Netanyahu condemned the arrest warrant against him, saying Israel "rejects with disgust the absurd and false actions". In a statement released by his office, he said: "There is nothing more just than the war that Israel has been waging in Gaza."

The decision turns Mr. Netanyahu and the others into internationally wanted suspects and is likely to further isolate them and complicate efforts to negotiate a cease-fire to end the fighting. But its practical implications could be limited since Israel and its major ally, the U.S., are not members of the court and two of the Hamas officials were killed in the conflict.

Mr. Netanyahu and other Israeli leaders have condemned ICC Chief Prosecutor Karim Khan's request for warrants as "disgraceful" and "anti-Semitic". U.S. President Joe Biden blasted the prosecutor and expressed support for Israel's right to defend itself against Hamas.

The three-judge panel issued a unanimous decision to issue warrants for Mr. Netanyahu and Mr. Gallant. "The Chamber considered that there are reasonable grounds to believe that both individuals intentionally and knowingly deprived the civilian population in Gaza of objects indispensable to their survival, including food, water, and medicine and medical supplies," the decision said.

The court also issued a warrant for Mohammed Deif, one of the leaders of Hamas, over the October 2023 attacks that triggered Israel's offensive in Gaza. The ICC chief prosecutor withdrew his request for warrants for two other senior Hamas figures, Yahya Sinwar and Ismail Haniyeh, after they were both killed in the conflict.

A significant prehistoric discovery has been made at Kanhirapoil in Kerala, uncovering 24 pairs of footprints and a human figure carved into rock, likely from the Megalithic period. Experts suggest these carvings honour the dead, offering cultural insights. The site bears similarities to other prehistoric rock art in South India.

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

C.P. Sajit
KASARAGOD

A remarkable archaeological discovery has come to light at Kanhirapoil in Madikkai grama panchayat of Kerala where 24 pairs of prehistoric footprints and a human figure have been found carved into rock on private property. Experts believe these carvings date back to the Megalithic period, providing a fascinating glimpse into ancient culture.

The find was first reported by local archaeology enthusiast Satheesan Kaliyanam recently, following which archaeologist Professor Ajith Kumar and history Professor Nanda-



Archaeological discovery: Megalithic era rock-cut footprints discovered at a private property in Kanhirapoil in Kasaragod.

kumar Koroth confirmed its significance during a site visit.

The carvings, made with iron tools, include footprints varying in size from six to 10 inches, sug-

gesting representations of both children and adults. At the end of the footprints, a human figure has been intricately etched, accompanied by four circular pits around it.

Mr. Kumar said that the footprints represent souls of dead people and have been carved out to honour them. All the footprints are pointing towards the west. However, local people believe these footmarks to be that of a goddess.

He further said these carvings bear similarities to prehistoric rock art found in Avalakki Pera in Udupi district in Karnataka. Notably, this discovery aligns with earlier findings in north Kerala, including a temple decoration at Erikkulam Valiyapara in Kasaragod, a running tiger near Bangalam Government Higher Secondary School in Neeleswaram, human figures in Cheemeni Ariyit-

tapara, bull figures at Ettukudukka in Kannur, and the celebrated carvings at Edakkal Caves in Wayanad.

He said the 2,000-year-old rock art sheds light on the lives and artistic expressions of early inhabitants of Madikkai grama panchayat and Kerala as a whole.

These carvings and artefacts found here have long been attributed to the Megalithic period, indicating a shared cultural heritage in prehistoric north Kerala, Mr. Kumar said. He added that this discovery reinforces the historical significance of the area and invites further exploration into the region's ancient past.

Analysis of the news:

- **Location:** Kanhirapoil in Madikkai grama panchayat, Kerala.
- **Discovery:** 24 pairs of prehistoric footprints and a human figure carved into rock.
- **Everything You Need To Know About**
- **Dating:** Believed to date back to the Megalithic period (~2,000 years old).
- **Reported by:** Satheesan Kaliyanam, confirmed by archaeologist Prof. Ajith Kumar and historian Prof. Nandakumar Koroth.
- **Features:** Footprints (6-10 inches) represent children and adults, pointing west; accompanied by a human figure and four circular pits.
- **Significance:** Likely carved to honour souls of the dead; local belief attributes the footprints to a goddess.
- **Similarity:** Comparable to prehistoric rock art in Udupi (Karnataka) and sites in north Kerala like Edakkal Caves.

➔ **Insight:** Highlights the artistic and cultural heritage of ancient Kerala.

Page 04 : GS 2 : Governance & International Relations

The AI Summit 2024 highlighted the critical role of Artificial Intelligence in governance, addressing challenges like copyright, data protection, and ethical concerns.

- ➔ Experts discussed AI applications in healthcare and wildlife conservation, stressing the need for robust infrastructure and data localisation.
- ➔ India aims to transition from an AI consumer to a global innovator.

'Global consensus must to face challenges in using AI for governance'

The Hindu Bureau
CHENNAI

Global consensus is required in formulating regulations for using Artificial Intelligence (AI) in governance to face emerging challenges such as copyrights, data protection, and cyber vulnerability issues, and it is time to think of expanding the usage of AI to newer areas, said panellists at the *The Hindu* AI Summit 2024 here on Thursday.

During a panel discussion on the topic 'AI Driven Governance-Concept to Practical Application', moderated by Ramya Kannan, Chief of Bureau, Tamil Nadu, *The Hindu*, Supriya Sahu, Additional Chief Secretary, Department of Health and Family Welfare, Government of Tamil Nadu, said the Health Department, in 2022, had introduced AI in

diagnosing tuberculosis in six districts in the State.

"We have 45 mobile vans fitted with digital X-ray machines to go around in remote and inaccessible areas. Out of these, six vans have been fitted with an AI tool, and more than 56,000 people have been screened by this tool in the last two years. The rate of detection, in comparison to the traditional models, is twice, and it is as precise as it would be done manually."

Expanding use

Ms. Sahu said it is time to think of expanding the use of AI to newer areas.

"We were wondering what we can do to prevent elephant deaths on railway tracks in Coimbatore district, where the railway tracks pass through the forest and divide two reserve forest patches. Elephants migrate from one patch to



Call for regulation: Thamaraiselvan S., AVP, Infosec Governance; Hasti Trivedi, President, Chief Digital and AI Officer, Firstsource; B. Ravindran, head, Department of Data Science and AI, IIT-M; and Supriya Sahu, Additional Chief Secretary, Department of Health and Family Welfare, at a session moderated by Ramya Kannan (left), Chief of Bureau, Tamil Nadu, *The Hindu*, in Chennai on Thursday. AKHILA EASWARAN

another to drink water and forage. There were accidents resulting in the death of elephants. But AI came to our rescue," she said.

She said in the health sector, AI had the potential to play an important role in screening refractive eye errors among children and detecting pregnancy-induced hypertension (PIH).

Stressing the need to build adequate digital infrastructure before AI can have an impact, B. Ravindran, head, Data Science and Artificial Intelligence, Indian Institute of Technology-Madras, urged governments to actively work towards this.

"AI is not a single technology, but a slew of different things. We don't need AI to solve all problems.

We have to figure out what is the right solution that we need, especially in governance... What we see in most of the places where AI has made an impact, the actual AI solution itself is about 20 to 30% of the system," he said.

A note of caution

He also sounded a note of caution that pushing the

current state of AI models into governance would institutionalise models and is likely to ignore our cultural map. "We can talk about building AI models for the Indian condition. But we need to put in a lot of effort trying to build these safeguards for India. There is so much that is unique, like language, cuisine, literature to every State and re-

gion in this country that we need to capture." He also said the Union government is planning to set up an AI safety institute soon.

Hasit Trivedi, president, Chief Digital and AI Officer, Firstsource, said India has taken the lead in getting a global consensus on AI in governance. "The bias, fairness, and risks have always been there since the birth of AI. But new things which came because of generative AI are copyright issues, data protection issues, and cyber vulnerability, and they require global consensus... From the Indian context, we have to be very careful because we should not be exporting the data. Data protection, usage, and localisation are extremely critical. I think we should ensure that we as a country do not become digital slaves."

He also said, only the United States of America,

China, and India have the potential to create AI technologies. "The U.S. has already created AI. China is in the race. India is the potential third country which can make a meaningful contribution to global AI."

S. Thamaraiselvan, Assistant Vice-President, Infosec Governance, Hexaware, said: "The accuracy of the output that AI provides depends on the amount of data fed. In this context, we are already witnessing the digitisation in government sectors that is yielding results in terms of the efficiencies in consuming various services... Indians are the largest consumers of generative AI today. But we should explore how India can become a generator of AI technologies rather than consuming it. Even if we are consuming the data, we should explore to localise it to the Indian context."

Global Consensus on AI Regulations

- ➔ At the AI Summit 2024 panellists emphasised the need for a global consensus on regulating Artificial Intelligence (AI) to address challenges such as copyright issues, data protection, and cyber vulnerabilities.
- ➔ Expanding AI's application into newer areas of governance was a recurring theme during the discussions.

AI in Governance: Health Sector Applications

- ➔ AI has been effectively implemented in diagnosing tuberculosis, improving detection rates twofold compared to traditional methods.
- ➔ AI tools in mobile X-ray vans screened over 56,000 people, showcasing the technology's precision in healthcare diagnostics.
- ➔ Potential applications include screening for refractive eye errors in children and detecting pregnancy-induced hypertension (PIH).

AI for Wildlife Conservation

- ➔ AI solutions are being used to prevent elephant deaths on railway tracks in forested regions, mitigating human-wildlife conflict effectively.
- ➔ These initiatives highlight AI's versatility in addressing complex challenges across diverse sectors.

Infrastructure and Contextual Safeguards

- The success of AI in governance depends on building robust digital infrastructure.
- Experts stressed the importance of creating AI models tailored to India's unique cultural and regional diversity, including language, cuisine, and literature.
- A proposed AI safety institute by the Union government aims to ensure secure and ethical AI deployment.

Risks and Ethical Concerns

- AI presents challenges like bias, fairness, and risks exacerbated by generative AI, including issues of copyright, data protection, and cyber vulnerabilities.
- Safeguards are necessary to prevent misuse and to protect sensitive data, ensuring data localisation to avoid dependency on foreign entities.

India's Role in Global AI Development

- India is positioned as a potential global leader in AI technologies alongside the U.S. and China.
- India should transition from being a consumer of AI to becoming a generator of AI technologies.
- Digitisation in governance is yielding efficiency gains, but data localisation and ethical frameworks are critical to achieving sustainable progress.

Way Forward

- AI should be deployed selectively, ensuring it addresses governance challenges effectively.
- Global collaboration and regulatory frameworks are essential for addressing emerging challenges while capitalising on AI's transformative potential.

UPSC Mains PYQ : 2023

Ques : Introduce the concept of Artificial Intelligence (AI). How does AI help clinical diagnosis? Do you perceive any threat to privacy of the individual in the use of AI in healthcare?

GEO IAS
—It's about quality—

The Hindu AI Summit 2024 highlighted Artificial Intelligence's transformative impact on business operations, sustainability, and job markets.

- Experts emphasised leveraging AI to optimise processes, enhance productivity, and integrate modern systems, while addressing workforce concerns and legacy challenges.

AI's Role in Driving Business Innovation

- Artificial Intelligence (AI) is set to revolutionise business operations, delivering innovative and efficient solutions.
- Businesses can leverage AI to enhance operational efficiency and drive innovation across key functions.
- A focus on three pillars—people, process, and technology—is essential for integrating AI effectively.

Transitioning from Legacy Systems

- Industries must identify bottlenecks in their processes and optimize existing systems.
- Migration from legacy systems to digital platforms is critical for achieving innovation.
- Digital transformation requires iterative implementation and careful planning, not just replacing old technologies with new ones.

Contribution to Sustainability Goals

- AI-powered solutions can optimise energy usage and reduce waste in business operations.
- Metrics-based approaches help optimise processes and leverage technology for sustainable practices.

Enhancing Business Models

- AI enables companies to rethink traditional models, fostering greater confidence and efficiency.
- Successful implementation of AI requires organisations to align goals and investment with their digital-first ambitions.

Impact on Jobs and Workforce Efficiency

- AI complements human intelligence, enabling coexistence while enhancing employee efficiency.



Quality check: Saravanakumar Krishnamurthy, Rajan Sethuraman, Rajiv R.G., and Santhosh T.G. at the summit. R. RAGU

'AI can be an effective tool if availability of clean data is ensured'

The Hindu Bureau
CHENNAI

Data is like oxygen and for artificial intelligence (AI) to be useful, one needs "oxygenated data", the "clean data" that is available with a company, said Santhosh T.G., Chief Digital Officer, Switch Mobility, at *The Hindu* AI Summit 2024 on Thursday.

During a panel discussion on 'AI in Decision-Making: Enhancing Data-Driven Strategies', he said, "Data plays a major role. When a manufacturing company can have a battalion of people to check vehicle quality, I think it is the right time that every organisation also had a couple of people to check that the quality of data coming is also correct."

Stating that AI is still a co-pilot, Rajiv R.G., Chief Information Officer, Bawan Cybertek, said the question whether "AI can make a decision with an empath-

etic view" remains to be answered.

"I came across a person in an interior village who runs a door-to-door beauty parlour set up [after] seeking a loan in the microfinance industry. She was denied the loan by AI because her credit exposure is high, but a salesperson said that she was a good customer and has scope to expand and that she would also be able to repay the loan. The empathy angle is missed," he said.

In the discussion, moderated by Nagaraj N., Vice-President, Content Analytics & Data, The Hindu Group, Saravankumar Krishnamurthy, Chief Information Security Officer, Vivriti Capital, said, AI will not replace human touch.

Rajan Sethuraman, Chief Executive Officer, Latent View, said he "wouldn't worry too much about the quality of the data as a major stumbling block".

Daily News Analysis

- ➡ It drives cost savings and improves processes by handling massive data and solving complex problems.
- ➡ Far from replacing jobs, AI creates new opportunities and increases workforce productivity.

Measuring Success of AI Initiatives

- ➡ Key performance indicators for AI success include improved business optimization, financial metrics, customer engagement, and sustainability goals.
- ➡ AI reduces the cost of hyper-personalised customer services, enabling better outcomes with fewer resources.

Breaking the Legacy Mindset

- ➡ Legacy systems no longer pose barriers, as modern systems can manage structured and unstructured data effectively.
- ➡ Adopting AI requires breaking the traditional mindset and prioritizing motivation for digital transformation.

UPSC Mains Practice : 2023

Ques : Introduce the concept of Artificial Intelligence (AI). How does AI help clinical diagnosis? Do you perceive any threat to privacy of the individual in the use of AI in healthcare?

Delhi's air pollution is becoming a severe health crisis, with the city experiencing consistently poor air quality, especially in winter.

Is Delhi becoming an uninhabitable city?

Delhi is perhaps going to become, if it has not already, an uninhabitable city for two different reasons. In the winters, pollution levels peak, while during summers, the heat waves are unbearable, both affecting Delhi's poor disproportionately

EXPLAINER

Rohit Azad
Shouvik Chakraborty

Air quality index (AQI), according to the Central Pollution Control Board (CPCB), is a measure of the concentration of eight pollutants – particulate matter (PM₁₀), PM_{2.5}, nitrogen dioxide (NO₂), sulphur dioxide (SO₂), carbon monoxide (CO), ozone (O₃), ammonia (NH₃), and lead (Pb) – in the air at a monitoring location. A sub-index is calculated for each of these pollutants (not all may be measured at every station); and the worst among them is the AQI for that location. So, AQI transforms complex air quality data into an index we can understand.

How uninhabitable is Delhi?

Delhi is perhaps going to become, if it has not already, an uninhabitable city for two different reasons. In winters (October-February), pollution levels peak, while during summers (April-June), the heat waves are unbearable, both affecting Delhi's poor disproportionately. This piece concerns itself with air pollution. This article will focus on the PM_{2.5} in particular because it dominates the AQI reading in Delhi and is quite dangerous as it is likely to travel to the deeper parts of the lungs owing to its extremely small size, the largest of which is 30 times thinner than human hair.

Chart 1 shows how the quality of air has been over a period of seven years (2017-2023). AQI is categorised in six ranges in India. We have combined some of them to represent as good (0-50), satisfactory to moderate (51-200), and poor to severe (201 and above). A few things stand out. One, Delhi has had only two days of healthy air per year. Two, more than half a year people are inhaling air unfit for breathing. Three, and quite remarkably, even for 2020, a lockdown year, things were only marginally better. It's clear there is something systemically wrong with the system.

Why is Delhi's air quality so poor?
The government often tells us that stubble burning in Punjab, Haryana, and U.P. is responsible for Delhi's pollution. It's a half-truth. We pick the most intense days of November this year when stubble burning's contribution to PM_{2.5} has been at its peak (in the range of 15-35%). Chart 2 plots the actual AQI against a hypothetical scenario of zero stubble burning, and the result is startling. Not even on one of these days would the AQI have fallen below the very poor AQI benchmark (300). This exercise is not to downplay the role of stubble burning. It is to show that it is a red herring used by the two warring political parties, one which runs the Union Territory and the other this country, to avoid acting on the problem in any serious manner.

What are the factors contributing to the AQI other than stubble burning?
An extensive 2022 report prepared by IIT Kanpur, IIT Delhi, TERI New Delhi, and Airshed Kanpur shows that, even during winter months, when sources of pollution external to Delhi are at their peak, half of the PM_{2.5} levels can be apportioned to Delhi itself (Chart 3). Vehicles alone contribute 58% – 34% from the exhaust and 24% due to wear and tear of tyres/brakes – to this total. The only realistic solution to air pollution is a massive shift in the way Delhi travels, that is, from private (cars and motorcycles) to

Death by breath in Delhi

While Delhi's death rate attributable to household pollution is negligible in comparison to the Indian average, it is higher than the Indian average for ambient PM pollution, which reiterates the unhealthy levels of persistent exposure one has to PM_{2.5} and PM₁₀ throughout the year.

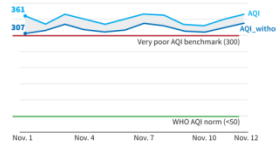
Chart 1: Quality of Delhi's air over time

Average number of days per year (2017-2023)



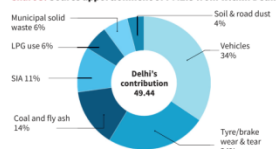
Chart 2: Stubble burning and Delhi's AQI

AQI with and without stubble burning (hypothetical)



1. PM_{2.5} figures are for Delhi ITO area 2. To construct the hypothetical AQI series without stubble burning, we have deducted the day specific contribution of stubble burning from PM_{2.5} and then converted those readings into CPCB's AQI calculator

Chart 3: Source apportionment of PM_{2.5} from within Delhi



public transport running on cleaner energy, with last mile connectivity, a step which will bring the number of vehicles on the road down significantly.

Why are the winters so much worse?

The concentration of pollutants in the air depends not just on emissions but also on many meteorological factors – temperature, wind direction/speed, and rain, among other things. Hot air, being lighter, moves up (thereby carrying the pollutants with it), whereas cold air traps pollutants and keeps them closer to the ground. Similarly, wind can disperse the pollutants, while rain can force the most common air pollutants, like PM_{2.5} and PM₁₀, to the ground. Cold air with slow wind speed and no rains make Delhi a pot of pollution with a lid on.

Chart 4 shows that for the months which have a moderate AQI, either the wind speed is relatively higher (February-June) or rainfall is greater (July-September) than the rest of the year. Both these factors, aided by warmer air, lift the air quality of Delhi from poor/severe to moderate. Given that Delhi's own emissions are not winter-specific, its air quality would have been poor throughout the year but for these favourable factors from March through September.

What is the impact?
According to the WHO, 'almost every organ in the body can be impacted by air

Chart 4: Weather factors and Delhi pollution

Wind speed and rainfall play a role in bringing AQI down

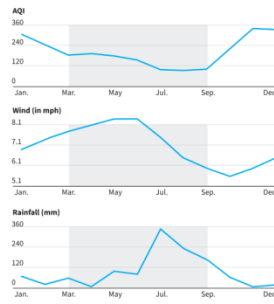


Chart 5: Death rates attributable to air pollution

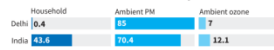
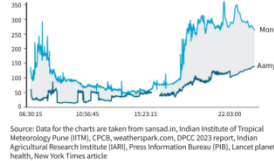


Chart 6: Exposure to PM_{2.5} by Monu and Aamya

24 hour monitoring on December 3, 2019



pollution' and some air pollutants can enter the bloodstream via the lungs which can lead to systemic inflammation and carcinogenicity.

A study in the *Lancet Planet Health* journal shows that, in 2019, an estimated 1.67 million deaths in India were attributable to pollution, and one out of 10 deaths were caused by ambient particulate matter (PM) pollution. The study categorises the deaths attributable to ambient PM, household, and ambient ozone pollution. Chart 5 contrasts the death rates (number of deaths per 1,00,000 population) at the all-India level with those of Delhi.

While Delhi's death rate attributable to household pollution is negligible in comparison to the Indian average, it is higher than the Indian average for ambient PM pollution, which reiterates the unhealthy levels of persistent exposure to PM_{2.5} and PM₁₀ one has throughout the year. More importantly, this health impact is not differentiated across class. The poor and the marginalised suffer disproportionately more than the others. Based on a photo data essay in the *New York Times*, Chart 6 plots the real-time exposure to PM_{2.5} for two similar-aged children in Delhi, Monu, who comes from a poor neighbourhood across the Yamuna and Aamya who comes from a more affluent family living in Greater Kailash. The shaded area between the two lines in Chart 6 is the class gap to pollution

exposure. With some simplifying assumptions, the article argues that this kind of consistent exposure over a long term could shorten Monu's life by around five years, compared to Aamya (whose life expectancy also gets shortened). Children whose lungs are still developing get adversely affected, and within those, poor children lose much more than their more affluent counterparts.

Calling Delhi a gas chamber is, therefore, definitely not an exaggeration. Surely, we don't want our kids (or residents in general) to lose precious years of their lives because of what is a controllable problem. But it requires a political will and an imagination. Stopping measures of odd-even, red-light on engine-off, water sprinklers every winter by the AAP government, which has now been in power for almost a decade, or distribution of masks by the BJP are mostly measures aimed at media management, which will have little to no impact on the problems at hand. The Modi government, by shifting the blame on the AAP government without taking any proactive steps itself, shows its absolute lack of sensitivity to the well-being of the citizens, including those who are based in the city.

Rohit Azad is a faculty at the Centre for Economics Studies and Planning, Jawaharlal Nehru University, New Delhi and Shouvik Chakraborty is a Research Assistant Professor at the Political Economy Research Institute, Amherst, U.S.

THE GIST

➤ An extensive 2022 report prepared by IIT Kanpur, IIT Delhi, TERI New Delhi, and Airshed Kanpur shows that, even during winter months, when sources of pollution external to Delhi are at their peak, half of the PM_{2.5} levels can be apportioned to Delhi itself.

➤ According to the WHO, 'almost every organ in the body can be impacted by air pollution' and some air pollutants can enter the bloodstream via the lungs which can lead to systemic inflammation and carcinogenicity.

➤ Children whose lungs are still developing get adversely affected, and within those, poor children lose much more than their more affluent counterparts.

- While stubble burning is often blamed, internal sources like vehicular emissions contribute significantly to the issue.
- Effective solutions require systemic changes in transport, governance, and policy.

Delhi's Air Quality: A Growing Concern

- Delhi is on the verge of becoming an uninhabitable city, primarily due to severe air pollution in winter and extreme heat waves in summer. These conditions disproportionately affect the city's poorer population.

Daily News Analysis

- In winter (October-February), pollution levels peak, with PM2.5 playing a dominant role in the AQI readings.
- PM2.5 particles are hazardous due to their microscopic size, making them more dangerous as they can reach the deeper parts of the lungs.

Air Quality Index (AQI) and its Significance

- The Air Quality Index (AQI) measures the concentration of pollutants in the air, including PM10, PM2.5, nitrogen dioxide (NO₂), sulphur dioxide (SO₂), carbon monoxide (CO), ozone (O₃), ammonia (NH₃), and lead (Pb).
- Each pollutant is assigned a sub-index, and the worst sub-index determines the overall AQI for a location, helping to simplify complex air quality data into an understandable index.
- Trends in Delhi's Air Quality (2017-2023) Over the past seven years (2017-2023), Delhi has recorded only two days of healthy air per year.
- More than half of the year, residents breathe air deemed unfit for health.
- Even during the 2020 lockdown, when human activity reduced, the air quality barely improved, suggesting systemic issues beyond temporary reductions in emissions.

Stubble Burning vs. Other Pollutants

- The government often blames stubble burning in neighboring states for Delhi's pollution, but this is only part of the problem.
- Stubble burning contributes 15-35% to PM2.5 levels, but even on peak pollution days, Delhi's air quality would remain very poor without stubble burning.
- The government uses stubble burning as a scapegoat to avoid addressing systemic causes of pollution.

Internal Pollution Sources in Delhi

- A 2023 report revealed that half of the PM2.5 pollution in Delhi during winter comes from internal sources.
- Vehicles contribute 58% of this pollution, with 34% from exhaust and 24% from tire and brake wear.
- The need for a shift from private vehicles to public transport running on cleaner energy is emphasised as a solution.

Winter Pollution and Meteorological Factors

- During the winter months, cold air traps pollutants close to the ground, worsening air quality. Low wind speed and lack of rainfall further contribute to the concentration of pollutants in Delhi's air.

Health Impact of Air Pollution

- Air pollution impacts almost every organ in the body and can lead to systemic inflammation and even cancer.
- In 2019, 1.67 million deaths in India were attributed to pollution, with PM pollution being a major contributor.
- Delhi's death rate from ambient PM pollution is significantly higher than the national average, underlining the health risks posed by prolonged exposure to pollutants.

Class-Based Disparities in Exposure

Daily News Analysis

- ➡ Poor children in Delhi experience significantly higher exposure to PM2.5 compared to wealthier children, with this exposure potentially reducing their life expectancy by up to five years.

Political and Administrative Response

- ➡ The political response to Delhi's air pollution remains insufficient, with stopgap measures like odd-even traffic rules, engine-off policies, and mask distribution failing to address the root causes.
- ➡ Both the Delhi and central governments have been criticised for lacking political will to implement long-term solutions to the pollution crisis.

Conclusion

- ➡ Delhi's air quality crisis is a complex issue requiring systemic changes in transportation, energy policies, and governance.
- ➡ Effective solutions demand strong political action and public cooperation, going beyond short-term, media-driven measures.

India needs an environmental health regulatory agency

The 2024 Conference of Parties (COP 29) ends in Baku, Azerbaijan today. As a global voice for developing countries, India will push for ambitious climate mitigation financing from developed nations. At the same time, pollutants in our air, water and land continue to pose grave health risks. According to the Emissions Gap Report 2024 from the United Nations Environment Programme, India has seen over 6% more greenhouse gas emissions than the previous year. These two examples show that India is at a critical juncture in its environmental and public health journey.

As a nation, India continues to experience rapid economic growth, so the interdependencies between climate, environment, health, and the economy are undeniable but capacities to address these issues holistically are limited. It is time for India to establish an environmental health regulatory agency (EHRA), which could lead to more comprehensive and cohesive environmental governance that focuses simultaneously on pollution control and health risk mitigation.

The urgency of integration

There are profound and immediate environmental health challenges to address in India. Numerous epidemiological studies conducted across multiple States and rural and urban populations have uncovered the detrimental health effects of exposure to air, water and soil pollutants, which include a wide range of non-communicable diseases. For example, exposure to air pollution, PM_{2.5} in particular, is now known to be associated with respiratory, cardiovascular and metabolic diseases, pregnancy outcomes, child growth and development and even mental health disorders. This poses risks to the most vulnerable populations, such as children, the elderly, and financially poor groups.

Building on efforts of the Central Pollution Control Board (CPCB) and the Ministry of Environment, Forest and Climate Change (MoEFCC), India's current environmental governance model needs to be more integrated with health. The CPCB focuses on pollution control, while the MoEFCC handles broader environmental policies, and the Ministry of Health and Family Welfare (MoHFW) undertakes integrated disease surveillance and management. There is a disconnect between environmental monitoring, health impact assessments, and emissions control, given little to no data flow across these Ministries.

A centralised agency such as an EHRA could integrate environmental and health data, allowing policymakers to track, regulate, and mitigate these impacts effectively, with much-needed inter-disciplinarity.

There are examples to inspire us: the U.S. Environmental Protection Agency (EPA),

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Having such an agency in India, which it currently lacks, would look at the interlinked issues of climate, environment, health and the economy in a holistic way

Germany's Federal Environment Agency (UBA), and Japan's Ministry of the Environment (MOE) provide robust frameworks that bridge environmental management with public health protection.

The EPA's approach covers a lot of ground – it regulates air and water quality, manages waste, and controls toxic substances while relying on integrated science assessments that include health together with vigorous enforcement. Germany's UBA focuses on environmental policy, managing air, water and waste regulations while championing sustainable energy and climate initiatives. Japan's MOE tackles pollution, chemical safety, and ecosystem protection. It collaborates with health and science agencies to monitor environmental health, enforce pollution controls, and address urban pollution and radiation issues.

The explicit integration of environment and health is part of the routine operational framework at these global agencies. Having an agency such as an EHRA in place could help India formulate a unified response to all types of pollution, advocate cumulative accountability mechanisms and collaborate with international bodies to negotiate for and adopt best practices that simultaneously address health and environment.

A data-driven, evidence-based framework

Effective regulation is built upon reliable and context-specific data. In this context, significant global funding is invested in environmental health effects research to establish a robust evidence base for policies. Even though organisations such as the Indian Council of Medical Research (ICMR) provide essential support for environmental health research, their impact is somewhat limited without a central body to bring together and translate this data into practical policies.

An EHRA would enable India to adopt an evidence-informed and science-driven regulatory framework, commissioning studies specific to the nation's unique environmental health challenges, such as poor air quality, vector-borne diseases, effects of persistent organic chemicals and heavy metal exposures in the context of changing land-use patterns and the consequences of climate change on health systems. Integrating health impact assessments (HIAs) into all significant projects, such as urban development and infrastructure planning, would allow decision-makers to understand and mitigate health risks before they escalate.

Contrary to concerns that environmental regulation may impede economic growth, an EHRA could promote sustainable practices that drive innovation, create green jobs, and support long-term financial resilience. For instance, the U.S. EPA has shown that its presence and work do not hinder economic growth but spur investments in renewable energy, sustainable

agriculture, and pollution prevention while also increasing life expectancy.

India's economic trajectory need not be at odds with environmental health. An incentivised energy transition and public health campaigns around environmental health could encourage enterprises to transition to cleaner technologies. An EHRA can develop policy instruments that will help the nation align environmental health objectives with economic policies, which in turn would promote sustainable development that benefits the environment, public health, and the economy at the same time.

Involving the public is essential for the success of environmental health initiatives. In India, an EHRA could be critical in educating citizens on environmental health risks and empowering communities to advocate cleaner air, water, and healthier living conditions. Citizen initiatives and the role of non-governmental organisations are pivotal, given the need for accountability to start bottom-up, from the local bodies and panchayat levels. The role of communicators and journalists is crucial in highlighting and supporting these initiatives.

India has signed the Paris Agreement and has committed to the Sustainable Development Goals. An EHRA would be instrumental in helping India meet these commitments by aligning national policies with global standards. It would also contribute to collective efforts to tackle climate and health challenges including addressing transboundary issues.

Environmental health issues vary significantly across India's regions, so we must move from a one-size-fits-all approach and localise interventions. An EHRA could work closely with State and municipal governments to ensure the development and enforcement of policies that are tailored to environmental solutions for the unique needs of each area. By developing a granular national platform for monitoring and accountability, India could track health outcomes in detail, leading to more effective and timely responses to local needs

Building accountability

Establishing an EHRA in India would not be without challenges, from bureaucratic inertia to resistance from industry stakeholders wary of regulation. However, clear frameworks for inter-ministerial coordination, measurable objectives, and cross-sectoral cooperation could help overcome these barriers. An EHRA should be operationally independent, guided by scientific expertise, and empowered to enforce policies that prioritise public health.

India's recent successes in meeting renewable energy targets highlight the nation's capacity for ambitious, systemic change. An EHRA could build on these achievements to strengthen India's governance of its environmental health crisis by framing pollution control as both a public health imperative and an economic opportunity.

GS Paper 02 : Governance,

GS Paper 02 : Environment

UPSC Mains Practice Question: Discuss the importance of establishing a centralised Environmental Health Regulatory Agency (EHRA) in India. How can it address the challenges of environmental pollution and public health while fostering sustainable economic growth? (150 Words /10 marks)

Context :

- ▶ India, facing rising greenhouse gas emissions and severe pollution-induced health risks, is advocating for ambitious climate financing at COP 29.
- ▶ The article emphasises the need for a centralised Environmental Health Regulatory Agency (EHRA) to integrate environmental monitoring with health governance.
- ▶ This could enhance accountability, promote sustainability, and align with global commitments.

Introduction

- ▶ The 2024 Conference of Parties (COP 29) ends in Baku, Azerbaijan today. As a global voice for developing countries, India will push for ambitious climate mitigation financing from developed nations.
- ▶ At the same time, pollutants in our air, water and land continue to pose grave health risks. According to the Emissions Gap Report 2024 from the United Nations Environment Programme, India has seen over 6% more greenhouse gas emissions than the previous year.
- ▶ These two examples show that India is at a critical juncture in its environmental and public health journey.
- ▶ As a nation, India continues to experience rapid economic growth, so the interdependencies between climate, environment, health, and the economy are undeniable but capacities to address these issues holistically are limited.
- ▶ It is time for India to establish an environmental health regulatory agency (EHRA), which could lead to more comprehensive and cohesive environmental governance that focuses simultaneously on pollution control and health risk mitigation.

The urgency of integration

- ▶ **Environmental health challenges in India:** There are profound and immediate environmental health challenges to address in India.

Daily News Analysis

- Numerous epidemiological studies conducted across multiple States and rural and urban populations have uncovered the detrimental health effects of exposure to air, water and soil pollutants, which include a wide range of non-communicable diseases.
- For example, exposure to air pollution, PM2.5 in particular, is now known to be associated with respiratory, cardiovascular and metabolic diseases, pregnancy outcomes, child growth and development and even mental health disorders.
- This poses risks to the most vulnerable populations, such as children, the elderly, and financially poor groups.
- ➡ **India's environmental governance model:** Building on efforts of the Central Pollution Control Board (CPCB) and the Ministry of Environment, Forest and Climate Change (MoEFCC), India's current environmental governance model needs to be more integrated with health.
 - The CPCB focuses on pollution control, The MoEFCC handles broader environmental policies, and The Ministry of Health and Family Welfare (MoHFW) undertakes integrated disease surveillance and management.
 - There is a disconnect between environmental monitoring, health impact assessments, and emissions control, given little to no data flow across these Ministries.
- ➡ **Proposed solution – Environmental Health Regulatory Agency (EHRA):** A centralised agency such as an EHRA could integrate environmental and health data, allowing policymakers to track, regulate, and mitigate these impacts effectively, with much-needed inter-disciplinarity.
- ➡ **Global best practices:** There are examples to inspire us:
 - the U.S. Environmental Protection Agency (EPA),
 - Germany's Federal Environment Agency (UBA), and
 - Japan's Ministry of the Environment (MOE)
- ➡ Provide robust frameworks that bridge environmental management with public health protection.
- ➡ **The EPA's approach:** It covers a lot of ground — it regulates air and water quality, manages waste, and controls toxic substances while relying on integrated science assessments that include health together with vigorous enforcement.
 - Germany's UBA focuses on environmental policy, managing air, water and waste regulations while championing sustainable energy and climate initiatives.
 - Japan's MOE tackles pollution, chemical safety, and ecosystem protection.
 - It collaborates with health and science agencies to monitor environmental health, enforce pollution controls, and address urban pollution and radiation issues.
- ➡ **Integration of environment and health:** The explicit integration of environment and health is part of the routine operational framework at these global agencies.
 - Having an agency such as an EHRA in place could help India formulate a unified response to all types of pollution, advocate cumulative accountability mechanisms and collaborate with international bodies to negotiate for and adopt best practices that simultaneously address health and environment.

A data-driven, evidence-based framework

- **Importance of reliable data for effective regulation:** Effective regulation is built upon reliable and context-specific data. In this context, significant global funding is invested in environmental health effects research to establish a robust evidence base for policies.
 - Even though organisations such as the Indian Council of Medical Research (ICMR) provide essential support for environmental health research, their impact is somewhat limited without a central body to bring together and translate this data into practical policies.
- **Role of EHRA in Science-Driven regulatory framework:** An EHRA would enable India to adopt an evidence-informed and science-driven regulatory framework, commissioning studies specific to the nation's unique environmental health challenges, such as poor air quality, vector-borne diseases, effects of persistent organic chemicals and heavy metal exposures in the context of changing land-use patterns and the consequences of climate change on health systems.
 - Integrating health impact assessments (HIAs) into all significant projects, such as urban development and infrastructure planning, would allow decision-makers to understand and mitigate health risks before they escalate.

Economic Growth and Environmental Health

- Contrary to concerns that environmental regulation may impede economic growth, an EHRA could promote sustainable practices that drive innovation, create green jobs, and support long-term financial resilience.
- For instance, the U.S. EPA has shown that its presence and work do not hinder economic growth but spur investments in renewable energy, sustainable agriculture, and pollution prevention while also increasing life expectancy.
- Aligning economic policies with environmental health: India's economic trajectory need not be at odds with environmental health.
- An incentivised energy transition and public health campaigns around environmental health could encourage enterprises to transition to cleaner technologies.
- An EHRA can develop policy instruments that will help the nation align environmental health objectives with economic policies, which in turn would promote sustainable development that benefits the environment, public health, and the economy at the same time.

Public Involvement in Environmental Health Initiatives

- Involving the public is essential for the success of environmental health initiatives.
- In India, an EHRA could be critical in educating citizens on environmental health risks and empowering communities to advocate cleaner air, water, and healthier living conditions.
- Citizen initiatives and the role of non-governmental organisations are pivotal, given the need for accountability to start bottom-up, from the local bodies and panchayat levels.
- The role of communicators and journalists is crucial in highlighting and supporting these initiatives.

Aligning with Global Commitments

- India has signed the Paris Agreement and has committed to the Sustainable Development Goals.
- An EHRA would be instrumental in helping India meet these commitments by aligning national policies with global standards.
- It would also contribute to collective efforts to tackle climate and health challenges including addressing transboundary issues.

Regional Variations in Environmental Health

- Environmental health issues vary significantly across India's regions, so we must move from a one-size-fits-all approach and localise interventions.
- An EHRA could work closely with State and municipal governments to ensure the development and enforcement of policies that are tailored to environmental solutions for the unique needs of each area.
- By developing a granular national platform for monitoring and accountability, India could track health outcomes in detail, leading to more effective and timely responses to local needs

Way Forward: Building accountability

- Establishing an EHRA in India would not be without challenges, from bureaucratic inertia to resistance from industry stakeholders wary of regulation.
- However, clear frameworks for inter-ministerial coordination, measurable objectives, and cross-sectoral cooperation could help overcome these barriers.
- An EHRA should be operationally independent, guided by scientific expertise, and empowered to enforce policies that prioritise public health.

Conclusion

- India's recent successes in meeting renewable energy targets highlight the nation's capacity for ambitious, systemic change. An EHRA could build on these achievements to strengthen India's governance of its environmental health crisis by framing pollution control as both a public health imperative and an economic opportunity.
- India's establishment of an Environmental Health Regulatory Agency (EHRA) is essential for addressing pollution's dual impact on public health and economic growth, fostering sustainable, integrated solutions.