

ENVIRONMENT AND ECOLOGY

Context: Eight-Point Plan for GRAP Stage IV in the NCR and Adjacent Regions, Air pollution-related initiatives of the Indian government, including the Graded Response Action Plan stages.

Why in News?

In an effort to prevent further deterioration in the region's air quality, the Commission for Air Quality Management in the National Capital Region (NCR) and Adjoining Areas has implemented an eight-point action plan that is in line with Stage-IV of the Graded Response Action Plan (GRAP).

The Graded Response Action Plan (GRAP): What is it?

About:

- The GRAP is a set of emergency protocols intended to stop the Delhi-NCR region's air quality from declining after hitting certain thresholds.
- In 2017, the GRAP received notification from the Ministry of Environment, Forests & Climate Change (MoEF&CC).
- The GRAP is carried out by the Commission for Air Quality Management in NCR & Adjoining Areas (CAQM).

Implementation It is carried out in four phases

Good 0-50	Satisfactory 51-100	Moderate 101-200
Poor 201-300	Very Poor 300-400	Severe 401-500
<p>STAGE I (AQI 201-300) Agencies to strictly enforce orders by NGT, SC on keeping vehicles older than 10 years (for diesel) and 15 years (petrol) off roads.</p>		
<p>STAGE II (AQI 301-400)</p> <ul style="list-style-type: none"> • Measures to curb air pollution at hot spots • Diesel generators of more than 19KW cannot be used unless they run on dual fuel or have emission control devices. 	<p>STAGE III (AQI 401-450)</p> <ul style="list-style-type: none"> • BS-III petrol, BS-IV diesel private cars to be banned in NCR. Last year, the rule was optional for state governments • Schools will likely be closed for children up to Class 5. 	
<p>STAGE IV (AQI OVER 450)</p> <ul style="list-style-type: none"> • Light commercial vehicles registered outside Delhi will be restricted except those that are EVs/CNG/ BS-VI diesels. Vehicles carrying essentials or providing essential services to be allowed • Educational institutions will likely be closed. Non-emergency commercial activities and odd-even vehicle policy may be rolled out. 		

Because GRAP is incremental in nature, the actions outlined in both sections must be taken when the air quality falls from "poor" to "very poor."

What is the GRAP Stage IV Eight Point Action Plan?

- Restricting truck traffic into Delhi to only those carrying LNG, CNG, or electric vehicles and necessary goods and services.
- Limiting the entry of non-Delhi-registered Light Commercial Vehicles (LCVs) into Delhi, with the exception of essential service carriers, unless they are EVs, CNG, or BS-VI diesel.

- Prohibiting the use of diesel Medium Goods Vehicles (MGV) and Heavy Goods Vehicles (HGV) registered in Delhi, with the exception of those carrying necessities.
- Prohibiting the use of construction and demolition (C&D) techniques on linear public projects, such as pipelines, flyovers, roads, and power transmission.
- Encouraging the GNCTD and NCR State Governments to switch from holding in-person classes for grades VI through XI to online ones.
- Directing NCR State Governments/GNCTD to take into account permitting 50% of the workforce to work from public, municipal, and private offices while the remaining employees do so remotely.
- Giving the Central Government the authority to determine policies regarding employees' ability to work from home in Central Government offices.
- State governments should be encouraged to consider other emergency measures, like closing schools and non-essential businesses and instituting an odd-even car registration number system.

What are Delhi-NCR Region's Primary Causes and Sources of Air Pollution?

➤ **Stubble burning:**

- Although much less common now, burning crop residue by farmers in the neighbouring states of Punjab, Haryana, and Uttar Pradesh is still a major contributor to increased air pollution in the nation's capital in October and November, which is brought on by north-westerly winds.
- In 2021, stubble burning was responsible for 25% of Delhi's pollution, according to SAFAR.
- The System of Air Quality and Weather Forecasting and Research is known by its acronym, SAFAR. The Ministry of Earth Sciences (MoES) launched a nationwide initiative to deliver location-specific air quality data in almost real-time.

➤ **Vehicle Emissions:**

- Another major source of air pollution is the substantial number of cars, trucks, buses, and two-wheelers that travel the roads of Delhi and the NCR.
- A study that was published in the Observer Research Foundation states that Delhi's transportation sector is the primary source of PM2.5 emissions, accounting for 28% of total emissions.
- The NCR region and its surrounding areas are home to numerous industries, which contribute to the release of harmful emissions into the atmosphere. A significant amount of air pollution is caused by the various pollutants that industries emit, including sulphur dioxide (SO₂), nitrogen oxides (NO_x), and particulate matter.

➤ **Construction Activities:**

- High levels of pollution are produced by construction sites, particularly by brick kilns located in the outskirts.
- The issue is exacerbated by incomplete waste management, noncompliance with environmental regulations, and short construction project timelines.

➤ **Landfills and Open Burning of Waste:**

- Improper waste disposal releases airborne particulate matter and hazardous gases that have a substantial negative impact on air quality.
- The landfill in Ghazipur is one example.

➤ **Geographical and Meteorological Factors:**

- The NCR region's geographic location and particular meteorological conditions, like temperature inversion during the winter, help to trap pollutants close to the ground, which raises pollution levels.
- In Delhi-NCR, October 2023 saw the highest pollution levels since 2020, in part because of the little rainfall.
- Generally speaking, rain helps to settle dust and particulate matter, improving the Air Quality Index.

- ❖ Worldwide studies have linked childhood non-Hodgkin lymphoma and acute myeloid leukaemia to air pollution, mainly because of particulate matter, benzene, and NO_x. When compared to areas with lower pollution levels, Delhi stands out for having a high number of paediatric cases of lymphoma and leukaemia.

What air pollution-related initiatives is the Indian government working on?

- The SAFAR Portal is the system for air quality and weather forecasting and research.
- The Odd-Even Policy as an emergency measure (for Delhi), BS-VI vehicles, and pushing for electric vehicles (EVs) are some of the strategies recommended by the Air Quality Index to reduce vehicular pollution.
- Farmers receive a subsidy for purchasing a Turbo Happy Seeder (THS) machine in order to lessen stubble burning.

- Program for Monitoring Air Quality Nationwide (NAMP)

Way Forward**Strict Emission Control Policies:**

- To reduce the amount of pollutants released into the atmosphere, industries, cars, and construction activities must strictly adhere to emission standards.
- Public transportation and traffic management: Increasing and promoting public transportation use as a means of lowering emissions from moving vehicles. Reducing emissions and traffic can be achieved through enhancing and growing public transportation systems.
- An important step in the right direction has been taken with the recent initiative in Delhi, which includes more electric buses and more trips for Delhi Metro.

Trash Management and Regulation:

- Tight rules and efficient enforcement in the field of waste management to reduce emissions from landfills and open burning of waste.
- Promoting waste-to-energy, composting, and recycling programs in order to reduce the amount of waste burned in open air.

Crop Residue Management:

- Happy Seeder is a cost-effective and sustainable substitute for crop burning that farmers can use to reduce residue.
- Promoting and rewarding these practices can help to considerably lessen the need for burning.

SCIENCE AND TECHNOLOGY**Context: Deep fakes, Deep fake technology's effects, handling deep fakes, ethical issues,****Why in news?**

Outrage and concerns about the misuse of artificial intelligence (AI) to produce realistic-looking but fake videos, or "deepfakes," have been aroused by a deepfake video featuring an Indian actress.

What are Deepfakes?**About:**

Artificial intelligence (AI) is used in "deepfakes," or synthetic media, to create and manipulate audio and visual content, usually with the goal of tricking or misleading people.

Deepfake Creation:

- Generative adversarial networks (GANs) are a technique that uses two competing neural networks, a discriminator and a generator, to create deepfakes.
- While the discriminator attempts to discern between real and fake images and videos, the generator attempts to produce fakes that appear realistic.
- The generator adjusts its output based on the discriminator's feedback until it fools the discriminator.
- Deepfakes need a lot of information about the source and the target, which is typically gathered from the internet or social media without the subjects' knowledge or consent. This information can take the form of images or videos.
- Deepfakes are a subset of Deep Synthesis, which generates text, images, audio, and video to create virtual scenes using technologies like augmented reality and deep learning.
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Benefits of Using Deep Learning:

- Positive developments like voice restoration and historical figure recreation have been made possible by deep learning technology.
- To improve artistic expression, deep learning techniques have been used in gaming, comedy, music, and film.
- People with mental or physical impairments will be able to express themselves online with the aid of synthetic avatars.
- It produces realistic and varied medical images, which improves medical training and simulation. In order to simulate medical conditions and procedures, it also generates virtual patients and scenarios, which increases the effectiveness of training.

- It can also be applied to improve gaming applications' immersion and interaction with augmented reality (AR).

Concerns About the Deepfakes

- Deepfakes are problematic because they can be used for a variety of nefarious activities, including disseminating fake news and propaganda, swaying public opinion and elections, blackmailing and extorting people or organizations, harming the credibility and reputation of politicians, celebrities, activists, and journalists, and producing non-consensual and revenge pornography.
- Deepfakes can undermine the rule of law and human rights, as well as erode public confidence in democracy, the media, and institutions.
- Deepfake technology has the potential to violate people's right to privacy, dignity, and reputation. It can also negatively impact the victims' mental health and general wellbeing, particularly women who are frequently the targets of such malicious manipulation.

Identifying:

- Look for discrepancies in the media's audio and visual content.
- To locate the original source or related images, use reverse image search.
- Analyse the authenticity, consistency, and quality of the photos or videos using AI-based tools.
- Block chain technology or digital watermarking can be used to confirm the media's integrity and source.
- Learn about the implications of deepfake technology for both yourself and other people.

What are the International Methods for Regulating Deepfake?**India:**

- The country does not currently have any laws or regulations that specifically prohibit or restrict the use of deepfake technology.
- A worldwide framework for the development of "ethical" AI tools has been demanded by India.
- Certain aspects of deep fakes, like defamation and publishing explicit material, may be subject to existing laws, such as Sections 67 and 67A of the Information Technology Act (2000).
- Defamation is punishable under Indian Penal Code (1860) Section 500.
- The Digital Personal Data Protection Act, provides some protection against the misuse of personal data.
- According to the Information Technology Rules, 2021, content that impersonates other people and images that have been artificially morphed must be removed within 36 hours.
- India should create a thorough legal framework that targets deepfakes specifically, taking into account the possible effects on social stability, privacy, national security, and democracy.

World:

- The first-ever AI Safety Summit 2023, which brought together 28 major nations, including the US, China, and India, decided that international action was required to address the possible risks associated with AI.
- The summit's Bletchley Park Declaration recognized the dangers of purposeful abuse and the loss of control over artificial intelligence (AI) technologies.

European Union

- Tech companies that sign up to the European Union's Code of Practice on Disinformation are required to combat deepfakes and fake accounts within six months of doing so.
- Tech companies risk fines of up to 6% of their yearly global turnover if they are found to be in violation.

United States:

- In order to support the Department of Homeland Security in combating deepfake technology, the United States introduced the bipartisan Deepfake Task Force Act.

China

- China enacted extensive deep synthesis regulations that will go into effect in January 2023.
- The regulation mandates traceability of deep synthesis content and clear labelling in an effort to combat misinformation.
- Under the Regulations, both suppliers and consumers of so-called "deep synthesis technology" are subject to requirements.

Tech Businesses:

- Prominent digital corporations such as Meta and Google have declared plans to tackle the problem of deeply phony content.

- Nonetheless, their systems still have flaws that let this kind of content to spread.
- Google has released watermarking and metadata as tools for detecting fake content.
- While metadata gives original files additional context, watermarking embeds information directly into the content to prevent editing.

Way Forward

- Balancing the right to free speech and expression with the development and implementation of comprehensive laws and regulations that specifically target the production and dissemination of deepfakes.
- Raising media literacy and public awareness of the possible dangers and effects of deepfakes, as well as promoting critical thinking and media source and content verification.
- Developing and implementing technological standards and solutions, like block chain and digital watermarks, that can identify, stop, and eliminate deepfakes.
- Fostering the moral and responsible application of artificial intelligence and deep learning technologies, as well as developing guidelines and best practices for those who produce and utilize deepfakes.
- Promoting cooperation and coordination between different stakeholders to address the opportunities and problems brought about by deepfakes, including governments, the media, civil society, academic institutions, and business.

PRELIM FACTS

1. Investors in INDUS-X met

- In order to promote cooperation in defence innovation, the US Department of Defence and Innovations for Defence Excellence (iDEX) arranged the first-ever INDUS-X Investors Meet in New Delhi.
- The INDUS-X Educational Series (Gurukul) was introduced at the event with the goal of assisting businesses and innovators in the military ecosystems of the US and India.
- To make it easier for entrepreneurs to navigate the defence ecosystems, professionals from both countries will lead sessions as part of the Gurukul Educational Series.
- Panel talks centred on how to create a long-term business basis for co-production and collaboration, as well as investment potential in the security sector.
- Launched in June 2023, the India-US military Acceleration Ecosystem (INDUS-X) programme seeks to strengthen military industry cooperation and key technological partnerships between India and the US.

2. Pauradhvani program

Context: To develop knowledgeable and self-sufficient citizens, the Kerala State Literacy Mission (KSLM) is introducing the "Pauradhvani" programme in Ernakulam and eight other districts.

Goal:

- This programme seeks to instill in the populace a sense of constitutional ideals, independence, secularism, scientific aptitude, democratic spirit, and rights consciousness.
- The six-point slogan of "Pauradhvani" emphasises the following: the rights of marginalized groups; democracy; brotherhood; and creating an equal society.
- Topics covered in the programme include the fight for independence, rights related to forests, regulations pertaining to coastal areas, laws pertaining to women, and rights and laws pertaining to children, health, and nutrition.

3. Geoglyph

Context: Near Mudichu Thalapalli in the Medchal-Malkajgiri region of Telangana, an amazing archaeological find was made when a 3,000-year-old geoglyph in the shape of a circular design was discovered.

What is Geoglyph?

A geoglyph is a sizable, complex pattern or design made on the surface of the ground, frequently by arranging natural objects or changing the surrounding environment. The Nazca Lines in Peru and the Uffington White Horse in England are two famous examples.

Regarding the discovered Geoglyph:

- This is the first of its sort to be found in Telangana. It has a diameter of 7.5 metres, a flawless circular shape, and two triangles inside.
- Its estimated date is 1000 BCE, or the Iron Age. Experts speculated that when megalithic tribes planned their circular burial grounds, it may have served as a model.

Significance:

Geoglyphs can be used for artistic, ceremonial, or navigational purposes, among other things. Geoglyph demonstrates the creative abilities and etching methods of the Iron Age settlers in the area.

4. Electoral Trusts (ET):

Context: The UPA government instituted the Electoral Trusts (ET) Scheme in 2013, which emphasised openness and regulated individual and corporate donations to political parties, before the Electoral Bond Scheme.

Scheme for Electoral Trusts (ET):

- Introduced in 2013.
- Available to Indian residents and corporations registered under Section 25 of the corporations Act, 1956.
- Once every three fiscal years, trusts are required to renew their registration.
- Political parties recognized under the Representation of the People Act, 1951 receive 95% of all donations collected in a given fiscal year.
- Transparency is given priority by Electoral Trusts, which require contributions and recipients to disclose to the Indian Election Commission. In contrast, the Electoral Bonds (EB) Scheme allows political donations to be made anonymously.

What is a Electoral bond?

- The Electoral Bond Scheme was presented by the government in the Finance Bill of 2017 and went into effect in 2018.
- Election bonds, which are instruments or securities used to give money to political parties, are issued under this programme.
- These bonds resemble promissory notes or bearer bonds in that the political party receiving payment is paid by the issuer, which in this case is a bank.
- Since electoral bonds are bearer securities, the holder of the bond is regarded as the owner and no ownership information is kept on file.
- Electoral bonds are anonymous since the donor's name and other information are not recorded on the document.
- An electoral bond is a financial tool used to make donations to political parties
- Election bonds may also be issued by the general public to support qualified political parties.
- To obtain electoral bonds, a political party that is qualified to compete for office must register in accordance with Section 29A of the Representation of the People Act, 1951.
- Electoral bonds function similarly to banknotes in that they are demand-free and interest-free for the bearer.
- These bonds are available for purchase digitally, by check or money order, or by any individual.

What Is Shown by the Trend?

- The ET and EB programmes are operating concurrently. Between 2017–18 and 2021–22, more than five times as much money was donated through EBs as through Electoral Trusts.
- Parties got a total of Rs 1,631 crore from ETs during the same period, while EBs contributed Rs 9,208 crore

5. WHO hails tuberculosis (TB) management in India?

Context: The World Health Organisation (WHO) has acknowledged India's efforts to manage tuberculosis (TB) internationally in their "Global TB Report 2023."

The achievements of India

- 16% decrease in tuberculosis cases between 2015 and 2022, almost twice as fast as the 8% global drop rate
- During that time, India's TB death rate dropped by 18%.
- The percentage of anticipated cases receiving TB treatment has risen to 80%, a 19% increase from the previous year

Concerning TB

- It is mainly lung-related, airborne, and caused by the Mycobacterium tuberculosis bacteria. Ethambutol, pyrazinamide, rifampin, and isoniazid are common TB drugs. The only approved method of preventing tuberculosis is the Bacillus Calmette-Guerin (BCG) vaccine.
- Diabetes, HIV infection, undernourishment, and tobacco use are risk factors for tuberculosis.

- Multidrug-resistant (MDR), extensively drug-resistant (XDR), and fully drug-resistant (TDR) strains of tuberculosis are classified as drug-resistant.
- Over 24 lakh TB cases were reported in India in 2022, accounting for 27% of all TB cases worldwide.

India's status

- The successful management of tuberculosis in India is facilitated by various initiatives such as the PM TB Mukta Bharat Abhiyan, TB Mukta Panchayat Abhiyan, TB Harega Desh Jeetega Campaign, and the National Strategic Plan for Tuberculosis Elimination
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ANSWER WRITING

Q. Integrity and ethics are essential components of public administration. Talk about the importance of ethics and integrity in maintaining responsible and efficient governance. Give instances to back up your claims.

Introduction

In the field of public administration, ethics and integrity are crucial components that support responsible and efficient governance. These values direct public servant behaviour and guarantee accountability, equity, and openness in decision-making.

Keeping the Public Trust:

- Integrity and ethics promote public trust, the cornerstone of efficient government.
- When public servants act morally, people gain faith in the system and are more willing to participate and work together.
- Leaders who uphold high ethical standards in their administration, for example, foster public trust and increase adherence to rules and regulations.

Fair and Transparent Decision-Making:

- Fairness and openness in the decision-making process are encouraged by ethics and integrity.
- Decisions made by public administrators who follow ethical standards are free from the influence of their own prejudices or special interests.
- By maintaining their integrity, public servants put the good of the public before their own interests, which produces just and equitable policies.
- An ethical approach to public procurement, for instance, guarantees fairness for all vendors and guards against favoritism and corruption.

Accountability and Responsiveness:

- Public servants are held responsible for their actions by ethics and integrity. These values foster a culture of accountability in which public servants are held accountable and required to act in society's best interests. Integrity acts as a catalyst for effective and responsive governance when it is recognized and promoted.
- For example, moral leaders create strong channels for citizen feedback so they can respond quickly to complaints and make the necessary changes.

Ethical Leadership:

- Ethical public administrators create a positive work environment and serve as role models for others.
- Integrity and ethics are highly valued by leaders, who foster a culture in which moral conduct, professionalism, and honesty are expected. An environment such as this fosters creativity, collaboration, and teamwork, all of which increase the overall effectiveness of public administration.
- Leaders who model moral behaviour and uphold them, for instance, encourage others to follow suit, which improves the administration's morale and efficiency.

Conclusion

Integrity and ethics are essential for responsible and efficient governance in public administration. These values preserve public confidence, guarantee impartial decision-making, encourage responsibility, and develop moral leadership. Public administrators can foster a culture of accountability, openness, and responsiveness by highlighting these principles, which will eventually result in a more effective and equitable system of governance. It is imperative that public administrators uphold ethics and integrity not only to preserve public trust but also to advance the welfare and overall development of society.

MCQs

1. Consider the following statements regarding Foreign Contribution Regulation Act.
 1. In 1976, during the Emergency, the FCRA was passed.
 2. Only associations are permitted to receive foreign donations by law; individuals are not.
 3. Details of the movable and immovable assets acquired with the help of foreign contributions must be disclosed by NGOs and associations that are registered to receive them.
 How many of the above statements is/are correct?
 - a) 1 only
 - b) 1 and 2
 - c) 2 and 3
 - d) **1 and 3**
2. Consider the following statements
 1. Creating standards for Biofuels is outside the purview of the Bureau of Indian Standards (BIS).
 2. The Global Biofuel Alliance (GBA) was established by the G7 leaders with the goal of accelerating the global adoption of biofuels.
 3. Globally, the top producers and users of Biofuels are Brazil, India, and the United States.
 How many of the above statements is/are correct?
 - a) 1 only
 - b) 1 and 2
 - c) **3 only**
 - d) 1 and 3
3. Consider the following statements
 1. To create green hydrogen, you need deionized water and sustainable electricity.
 2. India's first green hydrogen-powered bus was unveiled by the Council of Scientific and Industrial Research (CSIR).
 3. The only byproduct of a green hydrogen-powered bus is water vapour.
 How many of the above statements is/are not correct?
 - a) 1 and 2 only
 - b) **2 only**
 - c) 3 only
 - d) 1, 2 and 3
4. Consider the following statements
 1. Kerala is the location of the Kole wetland.
 2. A Ramsar site of worldwide significance, the Kole Wetland is renowned for its rich biodiversity.
 3. The invasive alien plant species Cabomba furcata, also referred to as Pink Bloom, a threat to the Kole wetland.
 How many of the above statements is/are correct?
 - a) Only one
 - b) Only two
 - c) **All three**
 - d) None
5. Consider the following countries:

1. Lebanon	2. Jordan
3. Syria	4. Iraq

 How many of the above-mentioned countries share border with Israel?
 - a) **1, 2 and 3 only**
 - b) 2 and 3 only
 - c) 1 and 3 only
 - d) 1, 3 and 4 only
6. With reference to 'Tanzania' consider the following statements
 1. It is an African country situated on the south of Equator.
 2. Lake Tanganyika is situated between Uganda and Tanzania.
 How many of the above statements is/are correct?
 - a) **Only one**
 - b) Only two
 - c) All three
 - d) None
7. Air Defender 23 which was recently in news is a multilateral exercise by
 - a) European Union
 - b) **NATO**
 - c) ASEAN
 - d) G7
8. With reference to 'Pusa-2090' consider the following statements
 1. The Punjab Agricultural University produced this particular strain of paddy.
 2. It is crossed with the Japonica rice line's Pusa-44 and CB-501.
 3. It might lessen stubble burning in the Delhi, NCR area.
 How many of the above statements is/are correct?
 - a) 1 and 2 only
 - b) 2 only
 - c) 3 only
 - d) **2 and 3**
9. Consider the following statements
 - a) Historically, North East India has been an organic region with significantly lower chemical usage than the rest of the nation.
 - b) Organic food imports and sales in India are governed by the Food Safety and Standards Authority of India (FSSAI).
 - c) A chemical-free agricultural technique called "zero-budget natural farming" is based on age-old Indian customs.
 How many of the above statements is/are correct?
 - a) Only one
 - b) Only two
 - c) **All three**
 - d) None
10. The 'Production gap report' is released by which of the following?
 - a) **United Nations Environment Programme**
 - b) United Nations Development Programme
 - c) World Meteorological Organization
 - d) Green Peace