



STATE PCS CA

(CONSOLIDATION)

MADHYA PRADESH

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Cabinet Approves Railway Projects

Why in News?

Recently, The **Cabinet Committee on Economic Affairs** has approved three projects of the Ministry of Railways with a total cost of approximately Rs 7,927 crore.

- The projects include **Jalgaon-Manmad fourth line (160 km)**, **Bhusawal-Khandwa third and fourth lines (131 km)** and **Prayagraj (Iradatganj)-Manikpur third line (84 km)**.

Key Points

- The proposed multi-tracking projects **aim to ease railway operations and reduce congestion**, addressing critical infrastructural needs on the high-traffic Mumbai-Prayagraj route.
- **Project Coverage and Network Expansion:**
 - The projects span seven districts across **Maharashtra, Madhya Pradesh, and Uttar Pradesh**, expanding the Indian Railways network by approximately 639 km.
 - Connectivity will be enhanced to **two aspirational districts, Khandwa and Chitrakoot**, benefiting **1,319 villages and a population of around 38 lakh**.
 - These routes are **vital for transporting agricultural products, fertilizers, coal, steel, cement, and containers**.
 - Improved connectivity on the Mumbai-Prayagraj-Varanasi route will facilitate additional passenger trains, **benefiting pilgrims visiting major religious sites** such as **Nashik (Trimbakeshwar)**, **Khandwa (Omkareshwar)**, **Varanasi (Kashi Vishwanath)**, **Prayagraj, Chitrakoot, Gaya, and Shirdi**.
- **Tourism Promotion:**
 - The projects will boost tourism by enhancing access to prominent attractions, including **Khajuraho, Ajanta & Ellora Caves, Devgiri Fort, Asirgarh Fort, Rewa Fort, Yawal Wildlife Sanctuary, Keoti Falls, and Purwa Falls**.

Yawal Wildlife Sanctuary

- **Location:**
 - It is located in the **Jalgaon district of Maharashtra**, on the **banks of the Anner and Manjar rivers**, and near the border of Madhya Pradesh.
- **Size:**
 - It covers an area of about **176 square kilometers**.

➤ Protection status:

- It was officially recognized as a **protected area in 1969**.

➤ Wildlife:

- It is home to a variety of wildlife, including **sambhar, leopards, wild boars, barking deer, porcupines, and serpents**.

➤ Flora:

- It includes **ain, bamboo, dhawda, lendia, tiwas, salai, teak, sterculia, and kusum**.

Compressed Biogas Plant in Gwalior

Why in News?

Recently, **India's first modern and self-sufficient gaushala** with a state-of-the-art **Compressed Biogas (CBG) plant** was launched in Gwalior, Madhya Pradesh.

Key Points

➤ Location and Management:

- The CBG plant is located at **Adarsh Gaushala**, the **largest cowshed in Gwalior**, managed by the **Gwalior Municipal Corporation**. It houses over **10,000 cattle**.

➤ Unique Achievement:

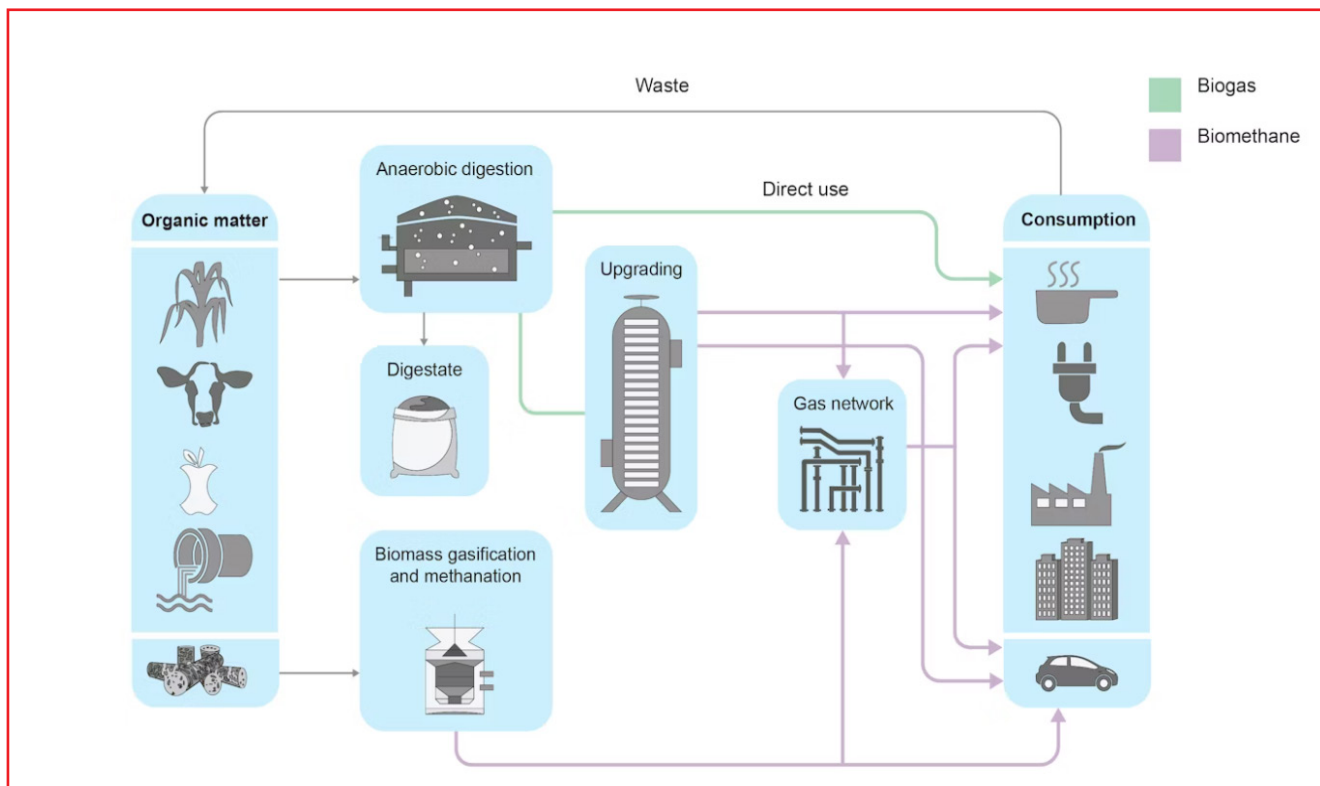
- **Madhya Pradesh's first CBG plant** producing **biogas from cattle dung and organic waste** like vegetable and fruit waste collected from local mandis and homes.
- **Technology and Output:**
 - **Produces 2-3 tons of Bio-CNG daily** from 100 tons of cattle dung.
 - **Generates 10-15 tons of dry bio-manure daily**, supporting organic farming.
 - Incorporates **windrow composting** for additional organic waste processing.
 - **Windrow composting** is a method of composting organic waste that involves **stacking the waste into long, narrow piles called windrows** and regularly turning them.
 - It is considered to be a **cost-effective method of composting**, but it can also produce the most emissions.

Note:

- **Environmental Benefits:**
 - Converts cow dung and organic waste into **Bio-CNG** and **organic manure**, reducing **carbon emissions** significantly.
 - Provides a **cleaner, eco-friendly alternative to fossil fuels**, contributing to **climate change mitigation**.
 - Transforms underutilized resources like cow dung into valuable energy and fertilizer, **promoting circular economy practices**.
- **Economic and Social Impact:**
 - **Creates jobs for locals, boosting the economy** while promoting green energy skills.
 - Provides affordable **bio-manure to farmers** in nearby districts, encouraging organic farming practices.
- **Model for Sustainable Development:**
 - As **India's first self-reliant gaushala**, the Laltipara plant serves as a **pioneering model for other regions to adopt**.

Biogas

- Biogas is a renewable energy source that's produced when organic matter breaks down in the absence of oxygen. This process is called **anaerobic digestion**.
- Biogas is also known as **renewable natural gas (RNG)** or **biomethane**. It's made up of mostly **methane (CH₄)** and **carbon dioxide (CO₂)**.



Aadhaar Card Not Proof of Age: Madhya Pradesh HC

Why in News?

Recently, the **Madhya Pradesh High Court** ruled that **Aadhaar Card** can be used to establish identity but was **not as a proof of date of birth**.

Note:

Key Points

- Background:
 - A widow filed a petition seeking compensation under the **Jan Kalyan (Sambal) Yojana 2018**, for her husband's death by electrocution.
 - Her application was rejected as her husband's age, according to other documents like the **Voter ID and ration card**, exceeded the eligibility limit of 64 years.
 - The petitioner argued that the age recorded in the Aadhaar card should be considered, which would have made her eligible for the compensation.
- Legal Precedence and Supreme Court Ruling:
 - The High court referenced an October 2024, **Supreme Court** ruling stating that Aadhaar cannot be used as proof of age.
 - The ruling considered earlier judgments by various High Courts and a circular issued by **Unique Identification Authority of India (UIDAI)** in August 2023.
- The High Court observed that any **executive instruction allowing Aadhaar to be used as proof of age under state schemes cannot override Court judgments.**

Aadhaar

- Aadhaar is a **12 digit individual identification number** issued by the **Unique Identification Authority of India (UIDAI)** on behalf of the Government of India. The number serves as a **proof of identity and address**, anywhere in India.
- Aadhaar card, which is a biometric document, **stores an individual's personal information on a government database.**
- An Aadhaar card can be issued to any person **residing in the country for more than six months continuously**, provided he/she submits one of the 18 listed identity cards and an address proof.
 - Foreign nationals are eligible to obtain one **if they have been living in India for half a year.**
- Aadhaar number will help the residents to avail various services provided by banking, mobile phone connections and other Govt and Non-Govt services in due course.

Excavation of Diamond

Why in News?

Recently, a farmer and his associates have discovered a valuable **diamond**, weighing 7.44 carats, in the **Panna district of Madhya Pradesh.**

Key Points

- **About Diamond:**
 - Diamond, an **allotrope of carbon**, is the **hardest naturally occurring substance** on Earth.
 - Formed in the **Earth's mantle** and brought to the surface through **volcanic activity**, it is found in volcanic landforms like **dykes and sills.**
 - **Uses:**
 - In jewelry, metal polishing, gem cutting, and industrial applications such as cutting edges for drills.
 - **Diamond Rich Locations in India:**
 - The **Panna belt (Madhya Pradesh), Wajrakarur Kimberlite field**, and the **Krishna River basin (Andhra Pradesh).**
 - The **cutting and polishing industry** is centered in **Surat, Navsari, Ahmedabad, and Palampur.**
 - **Leading Producers:**
 - Russia, Botswana, Canada, Australia, South Africa, and the Democratic Republic of Congo (DRC).
- **Panna's Diamond Industry:**
 - Panna has been a **diamond mining center** for centuries.
 - The district's diamond deposits have **dwindled due to over-mining**, making large discoveries rare.
 - Mining serves as an alternative income source for the **largely tribal population**, with modest daily earnings of **Rs 250-300.**



Note:



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Diamond Industry in India

- India is the **world's largest cutting and polishing center for diamonds**, accounting for over 90% of polished diamond manufacturing globally.
 - According to Indian Minerals Yearbook 2019, diamond fields of India are grouped into four regions:
 - Central Indian tract of **Madhya Pradesh**, comprising Panna belt.
 - South Indian tract of **Andhra Pradesh**, comprising parts of Anantapur, Kadapa, Guntur, Krishna, Mahabubnagar and Kurnool districts.
 - Behradin-Kodavali area in Raipur district and Tokapal, Dugapal, etc. areas in Bastar district of **Chhattisgarh**.
 - Eastern Indian tract mostly of **Odisha**, lying between **Mahanadi** and **Godavari valleys**.

Mass Vaccination of Stray Dogs in Panna Tiger Reserve

Why in News?

To prevent the spread of **Canine Distemper Virus (CDV)** infection among wild animals, a **mass vaccination campaign for stray dogs** has been launched in and around **Panna Tiger Reserve (PTR)**, Madhya Pradesh.

Key Points

- **Canine Distemper Virus (CDV):**
 - It is a **highly contagious and potentially fatal viral infection** affecting a dog's respiratory, gastrointestinal, and nervous systems.
 - In 2015, one tiger and two leopards in PTR died due to CDV, highlighting the threat posed by the virus.
 - The aim is to curb the spread of CDV and protect wild animals in and around the reserve.
- **Vaccination Plan:**
 - Approximately 1,150 stray dogs in 36 forested villages in the buffer zone of PTR will be vaccinated.
 - The campaign will be carried out over three and a half months in two phases.
- **Panna Tiger Reserve (PTR):**
 - Panna National Park was **established in 1981**. It has a geographical extension in the **districts of Panna and Chhatarpur**.
 - This national park was declared as **Tiger Reserve in the year 1994** by the Central Government.
 - **UNESCO** designated the **Panna Tiger Reserve as a Biosphere Reserve on August 25, 2011**.
 - PTR **now houses 62 tigers and over 500 leopards**, making it critical to safeguard them from infections.
 - Tiger Reintroduction:
 - PTR became famous for **successfully reintroducing tigers** after poaching wiped out the population in 2009.
 - The Panna Tiger Project began with three relocated tigers: two tigresses from **Bandhavgarh and Kanha National Parks** and a male tiger from **Pench National Park**.
 - Between 2009 and 2015, three additional tigresses and one male tiger were relocated to PTR from other national parks in Madhya Pradesh.
 - The tiger population in PTR has grown from zero in 2009 to 62 in 2024.

Kanha National Park

- It stretches over an area of 940 square km in the **two districts - Mandla and Balaghat - of Madhya Pradesh**.
- The present-day Kanha area **was divided into two sanctuaries, Hallon and Banjar**. **Kanha National Park was created in 1955** and in **1973** was made the **Kanha Tiger Reserve**.
 - Kanha National Park is the **largest National Park in Central India**.

Note:



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Pench National Park

- It is located in **Nagpur District** of Maharashtra and **named after the pristine Pench River**.
 - The Pench river flows right through the middle of the park.
 - It **descends from north to south**, thereby **dividing the reserve into equal eastern and western parts**.
- PTR is the **joint pride of both Madhya Pradesh and Maharashtra**.
 - The Reserve is located in the southern reaches of the **Satpura hills** in the Seoni and Chhindwara districts in Madhya Pradesh, and continues in Nagpur district in Maharashtra as a separate Sanctuary.
- It was **declared a National Park by the Government of Maharashtra in 1975** and the identity of a **tiger reserve was granted to it in the year 1998-1999**.
- However, PTR Madhya Pradesh was granted the same status in 1992-1993. It is one of the major Protected Areas of **Satpura-Maikal ranges** of the Central Highlands.
- It is among the sites notified as **Important Bird Areas (IBA) of India**.
 - The IBA is a programme of **Birdlife International** which **aims to identify, monitor and protect a global network of IBAs for conservation of the world's birds** and associated diversity.

Project Cheetah

Why in News?

Recently, the **Wildlife Institute of India (WII)** have assessed **Project Cheetah** in **Kuno National Park**, Madhya Pradesh, and claim it has been a successful initiative by the central government.

- This has inspired the government to **accelerate plans to implement a similar project in the Gandhi Sagar Wildlife Sanctuary (GSWS)**.

Key Points

- **Project Cheetah:**
 - It is a **central government initiative aimed at reintroducing cheetahs**, extinct from India, back into the country to contribute to **global cheetah conservation**.
 - The **first batch** of cheetahs arrived in **Kuno National Park**, Madhya Pradesh, **in 2022 from Namibia**, followed by a **second batch from South Africa in 2023**.
- **Key Outcomes:**
 - The **mortality rate** among the introduced cheetahs has been **lower than the expected 50%** threshold within the first year.
 - **Out of the 20** imported cheetahs, **12 have survived**, indicating a **survival rate of around 60%**, exceeding initial expectations.
 - **17 cubs have been born** to the cheetahs introduced in Kuno, with **12 currently surviving**.
- **Wildlife Institute of India:**
 - It is an autonomous institution under the **Ministry of Environment, Forest and Climate Change**.
 - It was established in **1982**.
 - It is based in **Dehradun, Uttarakhand**.
 - It offers training programs, academic courses, and advisory in wildlife research and management.

Note:

Gandhi Sagar Wildlife Sanctuary



➤ **Location:**

- Notified in 1974, encompassing the districts of **Mandsaur and Neemuch** in western Madhya Pradesh, bordering Rajasthan.
- The **Chambal River** bifurcates the sanctuary into two nearly equal parts, with the Gandhi Sagar Dam situated within the sanctuary.

➤ **Ecosystem:**

- Its ecosystem is characterised by its **rocky terrain** and **shallow topsoil**, which supports a **savanna ecosystem**.
- This comprises **open grasslands** interspersed with **dry deciduous trees** and shrubs. Additionally, the riverine valleys within the sanctuary are evergreen.

➤ **Ideal Habitat for Cheetahs:**

- The sanctuary's resemblance to the **Maasai Mara**, a renowned national reserve in **Kenya** known for its savanna wilderness and abundant wildlife, highlights its suitability for cheetahs.

Note:



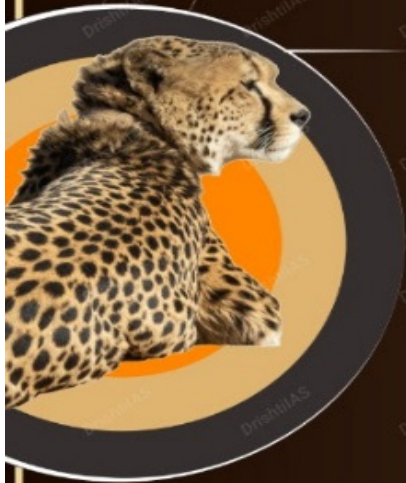
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Cheetah

Common Name – Cheetah

Scientific Name – *Acinonyx jubatus*

- *Acinonyx jubatus jubatus* (African Cheetah)
- *Acinonyx jubatus venaticus* (Asiatic Cheetah)



Reintroduction of Cheetah to India:

- The "Action Plan for Introduction of Cheetah in India" was released by MoEF&CC at the 19th meeting of the National Tiger Conservation Authority (NTCA) (January 2022).
 - Such a plan was first proposed in 2009.
- In September 2022, eight cheetahs landed in India from Namibia.
 - The 8 cheetahs have been relocated to the Kuno-Palpur National Park, Madhya Pradesh.
 - The relocation of cheetahs to India from Namibia is the world's first inter- continental large wild carnivore translocation project.

Slightly brownish and golden skin; thicker than the Asiatic Cheetahs

More prominent spots and lines on the face

Found all over the African continent

IUCN Red List Status – Vulnerable



African Cheetah

Slightly smaller than the African ones.

Pale yellowish fawn coloured skin – more fur under body, belly specifically.

Found only in Iran; the country claims there are only 12 of them left. Year 1952 – Asiatic Cheetah officially declared extinct from India.

IUCN Red List Status – Critically Endangered



Asiatic Cheetah

Leopard Died in Bandhavgarh Tiger Reserve

Why in News?

- Recently, a **leopard** died at Madhya Pradesh's **Bandhavgarh Tiger Reserve (BTR)**.
- Earlier a **group of elephants** had also died in the BTR due to toxicity from over consumption of **fungal-infected kodo millet plants**.

INTERNATIONAL BIG CAT ALLIANCE

The International Big Cat Alliance is a multi-country, multi-agency coalition aimed at conserving big cat species and their habitats.

Launched by
India (2023)

Headquarters
India

Member states
96 countries

Structure
Consists of Assembly of Members
Standing Committee & Secretariat



FUNCTIONS

- Secure the future of big cats (Tigers, Lions, Leopards, Snow Leopards, Pumas, Jaguars, and Cheetahs)
- Mitigate the adverse effects of climate change
- Advocate for policy initiatives
- Attain the United Nations-mandated Sustainable Development Goals

THREATS TO BIG CATS

- Poaching
- Habitat loss & fragmentation
- Human-Leopard conflict
- Climate change & Deforestation

Conservation Status of Big Cats

| Species | Scientific Name | IUCN Red List | CITES | Indian Wildlife (Protection) Act, 1972 |
|----------------------|-------------------------|-----------------|--|--|
| Tigers | <i>Panthera tigris</i> | Endangered | Appendix-I | Schedule-I |
| Lions | <i>Panthera leo</i> | Vulnerable | Appendix-I | Schedule-I |
| Leopards | <i>Panthera pardus</i> | Vulnerable | Appendix-I | Schedule-I |
| Snow Leopards | <i>Panthera uncia</i> | Vulnerable | Appendix-I | Schedule-I |
| Pumas | <i>Puma concolor</i> | Least Concerned | Appendix II (P. c. Costaricensis and cougar: Appendix-I) | NA |
| Jaguars | <i>Panthera onca</i> | Near Threatened | Appendix-I | NA |
| Cheetahs | <i>Acinonyx jubatus</i> | Vulnerable | Appendix-I | Schedule-I |

Other Conservation Efforts in India

- Project Tiger (1973)
- Asiatic Lion Reintroduction Project (2004)
- Project Snow Leopard (2009)
- Project Cheetah (2022)



Note:

Key Points

➤ About Leopard:

- The leopard (*Panthera pardus*) is the smallest of the Big Cat family (of genus **Panthera** namely the **Tiger, Lion, Jaguar, Leopard, and Snow Leopard**), and is known for its ability to adapt in a variety of habitats.
- A **nocturnal animal**, feeds on smaller species of herbivores found in its range, such as the chital, hog deer and wild boar.

➤ Melanism in Leopards:

- Melanism is a common occurrence in leopards, wherein the entire skin of the animal is black in colour, including its spots.
 - A melanistic leopard is often called a **black panther** and is mistakenly thought to be a different species.

➤ Geographical Extent:

- Members of the cat family, leopards live in Asia, **sub-Saharan Africa**, Southern Russia, and the Indian subcontinent.
 - The **Indian leopard (*Panthera pardus fusca*)** is found extensively across the Indian subcontinent.

➤ Population in India:

- As per the '**Status of Leopards in India, 2022**', India's leopard population rose by **8% from 12,852 in 2018 to 13,874 in 2022**.
 - About **65% of the leopard population** is present outside protected areas in the **Shivalik landscape**. Only about a **third of the leopards are within protected areas**.
- **Madhya Pradesh has the highest number of leopards (3,907)**, followed by Maharashtra, Karnataka, and Tamil Nadu.

➤ Threat:

- Habitat loss
- **Poaching**
- **Human-wildlife conflict**

➤ Protection Status:

- **IUCN Red List:** Vulnerable
- **CITES:** Appendix I
- **Wildlife Protection Act 1972:** Schedule I

Sirpur Lake

Why in News?

Recently, on the **National Green Tribunal's** order, a team from the **Indore Municipal Corporation** removed **encroachments** and cleared stalls from the catchment area of **Sirpur Lake**.

- It was designated a **Ramsar site** under the **Ramsar Convention** on **January 7, 2022**.

Key Points

➤ About Sirpur Wetland:

- It is a **Human-made wetland**, often called **Pakshi Vihar (bird sanctuary)**. It is located in **Indore district of Madhya Pradesh**.
- It is more than 130 years old, made by **Maharaja Shivaji rao Holkar** to generate water supply for the city of Indore.
- It is a **shallow, alkaline, nutrient-rich lake** that floods during **monsoon**.

➤ Biodiversity:

- Hosts around **175 terrestrial plant species** and six types of macrophytes.
- Supports **30 fish species** (natural and cultured), and eight species of **reptiles and amphibians**.
- Home to **130 bird species**, including resident and migratory birds such as, **Common pochard (*Aythya ferina*)**, **Egyptian vulture (*Neophron percnopterus*)**, **Indian river tern (*Sterna aurantia*)**.
- Attracts a **large congregation of waterbirds in winter**, making it a significant **seasonal habitat**.

➤ Benefits to Local Communities:

- Provides fisheries and **medicinal plants**.
- Acts as a **flood buffer** and helps regulate the local microclimate.
- Offers opportunities for spiritual enrichment, recreation, and educational activities.

➤ Conservation Status:

- The site currently **lacks a formal management plan** and does not have national legal conservation status.

Note:



RAMSAR CONVENTION

About

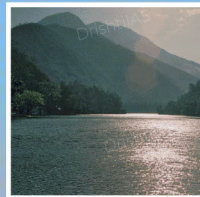
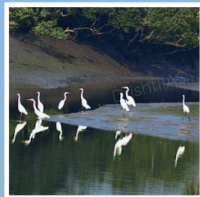
- Also known as the Convention on Wetlands.
- An intergovernmental treaty, adopted in 1971, in Ramsar, Iran.
 - Entered into force in 1975.
- Wetlands that are of international importance are declared as Ramsar sites.
- Largest Ramsar Site in World: Pantanal: South America

Montreux Record

- Adopted in Montreux (Switzerland) in 1990.
- Identifies Ramsar sites that need priority conservation attention at national or international level.

Wetlands

- A place in which the land is covered by water – salt, fresh, or somewhere in between – either seasonally or permanently.
- Take many forms including rivers, marshes, bogs, mangroves, mudflats, ponds, swamps, billabongs, lagoons, lakes, and floodplains.
- World Wetlands Day: **2nd February**



India & Ramsar Convention

- Came into force in India: **1982**
- Total Number of Ramsar Sites: **85**
 - Chilika Lake (Odisha), Keoladeo National Park (Rajasthan), Harike Lake (Punjab), Loktak Lake (Manipur), Wular Lake (Jammu and Kashmir), etc.
- Related Framework in India
 - The Ministry of Environment, Forest and Climate Change (MoEF&CC) has notified Wetlands (Conservation and Management) Rules, 2017 under the provisions of the Environment (Protection) Act, 1986 as regulatory framework for conservation and management of wetlands.
 - The 2017 Rules decentralise wetlands management and provide for the constitution of the State Wetlands Authority or Union Territory Wetlands Authority.

Key Facts

- Largest Ramsar Site: Sunderbans, West Bengal
- Smallest Ramsar Site: Vembannur Wetland Complex, Tamil Nadu
- State with the maximum number of Ramsar Sites: Tamil Nadu (14)
- Wetlands in Montreux Record:
 - Keoladeo National Park: Rajasthan
 - Loktak Lake: Manipur



MP-Rajasthan Joint Panel on Cheetah Conservation

Why in News?

Following recent incidents of **cheetahs** from Madhya Pradesh straying into Rajasthan, a **joint corridor management committee** has been established by both states to support **cheetah conservation**.

Key Points

- **About the Joint Corridor Management Committee:**
 - The committee will assess suitable areas for the future relocation of cheetahs from **Madhya Pradesh's Kuno National Park (KNP)** and **Gandhi Sagar Sanctuary**.
 - Recommendations will include habitat improvements, particularly for the pre-augmentation base.
 - The committee will evaluate options for joint tourist routes, potentially covering border areas like the **National Chambal Gharial Sanctuary**, KNP, and **Ranthambore National Park**.
- **Cheetah Reintroduction Project in KNP:**
 - As part of the reintroduction project, **eight cheetahs from Namibia were brought to KNP** in September 2022, followed by twelve cheetahs from South Africa in February 2023.
 - The initiative **aims to restore the cheetah population**, which was declared extinct in India in 1952.

Note:



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- However, since its inception, the **project has faced numerous challenges**, including the deaths of many adult cheetahs and the mortalities of cubs reported over the past two years.
 - As of now, **KNP is home to 24 cheetahs**, including cubs.

Kuno National Park (KNP)

- KNP which is **located in Madhya Pradesh's Sheopur district** is home to several cheetahs translocated from Namibia and South Africa.
- It was initially established as a **wildlife sanctuary in 1981** and later **designated as a national park in 2018**.

Shifting Patterns in Stubble Burning

Why in News?

Madhya Pradesh has seen a sharp increase in **Stubble burning cases**, surpassing Punjab with over 10,000 farm fires reported.

Key Points

- The changing trends in stubble burning have added complexity to the **harvest-season practice**, which heavily contributes to North India's **air pollution**.
- Regional Trends:
 - **Alarming Rise in Madhya Pradesh:** Madhya Pradesh recorded 506 stubble-burning cases surpassing its previous high of 296 cases, indicating a significant rise.
 - **Positive Reduction in Punjab:** Punjab reduced its stubble-burning incidents from 587 to 262, showing a **promising decline in crop residue burning**.
 - **Increases in Uttar Pradesh and Rajasthan:** Uttar Pradesh's cases jumped from 16 to 84 in a day, while Rajasthan's incidents rose from 36 to 98, marking the season's second-highest count.
 - **Progress in Haryana:** Haryana reported a downward trend, with cases dropping from 42 to 13, reflecting **progress in managing stubble burning**.

Stubble Burning

➤ About:

- **Stubble (parali) burning** is a method of **removing paddy crop residues** from the field to sow wheat from the **last week of September to November**, coinciding with the withdrawal of **southwest monsoon**.
- Stubble burning is a **process of setting on fire the straw stubble**, left after the harvesting of grains, like paddy, wheat, etc. It is usually required in areas that use the combined harvesting method which leaves crop residue behind.
- It is a common **practice in October and November across North West India**, but primarily in Punjab, Haryana, and Uttar Pradesh.

➤ Effects of Stubble Burning:

- **Pollution:** Emits large amounts of toxic pollutants in the atmosphere which contain harmful gases like **methane (CH₄), Carbon Monoxide (CO), Volatile Organic compounds (VOC)** and carcinogenic polycyclic aromatic hydrocarbons.
 - These pollutants disperse in the surroundings, may undergo a physical and chemical transformation and eventually adversely affect human health by causing a thick blanket of smog.
- **Soil Fertility:** Burning husk on the ground destroys the nutrients in the soil, making it less fertile.
- **Heat Penetration:** The heat generated by stubble burning penetrates into the soil, leading to the loss of moisture and useful microbes.

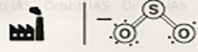
➤ Alternatives to Stubble Burning:

- **In-Situ Treatment of Stubble:** For example, crop residue management by zero-tiller machine and Use of bio-decomposers.
- **Ex-Situ (off-site) Treatment:** For example, Use of rice straw as cattle fodder.
- **Use of Technology:** For example **Turbo Happy Seeder (THS) machine**, which can uproot the stubble and also sow seeds in the area cleared. The stubble can then be used as mulch for the field.

Note:

Air Pollutants

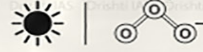
Sulphur Dioxide (SO₂)



It comes from the consumption of fossil fuels (oil, coal and natural gas). Reacts with water to form acid rain.

Impact: Causes respiratory problems.

Ozone (O₃)



Secondary pollutant formed from other pollutants (NO_x and VOC) under the action of the sun.

Impact: Irritation of the eye and respiratory mucous membranes, asthma attacks.

Nitrogen Dioxide (NO₂)



Emissions from road transport, industry and energy production sectors. Contributes to Ozone and PM formation.

Impact: Chronic lung disease.

Carbon Monoxide (CO)



It is a product of the incomplete combustion of carbon-containing compounds.

Impact: Fatigue, confusion, and dizziness due to inadequate oxygen delivery to the brain.

Ammonia (NH₃)



Produced by the metabolism of amino acids and other compounds which contain nitrogen.

Impact: Immediate burning of the eyes, nose, throat and respiratory tract and can result in blindness, lung damage.

Lead (Pb)



Released as a waste product from extraction of metals such as silver, platinum, and iron from their respective ores.

Impact: Anemia, weakness, and kidney and brain damage.

Particulate Matter (PM)



PM10: Inhalable particles, with diameters that are generally 10 micrometers and smaller.

PM2.5: Fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller.

Source: Emitted from construction sites, unpaved roads, fields, fires.

Impact: Irregular heartbeat, aggravated asthma, decreased lung function.

Note: These major air pollutants are included in the Air quality index for which short-term National Ambient Air Quality Standards are prescribed.



Note:

Death of Elephants due to Kodo Millet Poisoning

Why in News?

Recently, a group of **elephants** in Madhya Pradesh's **Bandhavgarh Tiger Reserve** died due to suspected **kodo millet** poisoning, a grain that can become toxic under certain environmental conditions.

Key Points

- **About Kodo Millet:**
 - Kodo millet known as *Paspalum scrobiculatum* is a resilient, **drought-tolerant crop with high yield and excellent storage**, often serving as a staple for tribal and economically disadvantaged communities in India.
 - **India, particularly Madhya Pradesh**, is one of its largest producers.
 - Apart from MP, the millet is cultivated in **Gujarat, Karnataka, Chhattisgarh, and parts of Tamil Nadu**.
- **Kodo Millet's Toxicity:**
 - Millets, especially kodo millet, are prone to **fungal infections** like **ergot**, which can produce toxins that harm grain yield and cause poisoning if consumed. These infections are particularly damaging in humid conditions.
 - Toxicity arises when environmental conditions foster fungal growth, producing the **mycotoxin cyclopiazonic acid (CPA)**.
 - CPA affects the nervous and **cardiovascular systems**, causing symptoms like **vomiting, tremors, and cold extremities in animals**.
- **Historical Cases of Kodo Poisoning:**
 - Documented cases date back to 1922, with both humans and animals affected by **mycotoxin-laden millet**.
 - Kodo millet poisoning has led to periodic wildlife fatalities, including an elephant death in 2022.
- **Detection and Prevention:**
 - Detection requires chemical analysis, such as **chromatography** or rapid methods like **ELISA**.

- To prevent contamination, experts advise proper storage and **biocontrol methods**, which involve beneficial organisms that limit fungal spread.

Millet

➤ About:

- It is a collective term referring to a number of small-seeded annual grasses that are cultivated as grain crops, primarily on marginal lands in dry areas in temperate, **subtropical and tropical regions**.
- Some of the common millets available in India are Ragi (Finger millet), Jowar (Sorghum), Sama (Little millet), Bajra (Pearl millet), and Variga (Proso millet).
 - The earliest evidence for these grains has been found in **Indus civilization** and was one of the first plants domesticated for food.
- It is grown in about 131 countries and is the traditional food for around 60 crore people in Asia & Africa.
- India is the largest producer of millet in the world.
 - It accounts for 20% of global production and 80% of Asia's production.

➤ Global Distribution:

- India, Nigeria and China are the largest producers of millets in the world, accounting for more than 55% of the global production.
- For many years, India was a major producer of millets. However, in recent years, millet production has increased dramatically in Africa.

President Murmu's Visit to Chhattisgarh

Why in News?

Recently, **President** of India Droupadi Murmu undertook a two-day official visit to Chhattisgarh, focusing on educational and cultural engagements.

Note:



Key Points

- **Events in Raipur:**
 - President Murmu attended the **10th convocation ceremony of AIIMS Raipur**, where she addressed students and staff.
- **Cultural Honors:**
 - In her itinerary, she paid respects at Mahamaya Temple and participated in events highlighting the **state's rich tribal heritage**.
- **Focus on Health & Education:**
 - Her discussions emphasized the advancement of **healthcare education and infrastructure in Chhattisgarh**.

President of India

- The **Constitution of India, 1950 (COI)** provides a detailed framework for the election, powers, and functions of the President, ensuring a balance between ceremonial duties and substantial powers in times of necessity.
- The President of India is the executive head of State and the supreme commander of the Indian Armed Forces.
- All the executive business of the country are carried out in the name of the president.
- Article 52 of the COI states that there shall be a president.

Elephant Deaths in Bandhavgarh Tiger Reserve**Why in News?**

Recently, a group of elephants was found dead in **Bandhavgarh Tiger Reserve, Madhya Pradesh**, prompting a thorough investigation by wildlife officials and conservation teams.

Key Points

- **Bandhavgarh Tiger Reserve:**
 - Located in Madhya Pradesh, **Bandhavgarh Tiger Reserve** spans an area rich in biodiversity and serves as one of India's premier tiger habitats.
 - **Elephant Population:**
 - Originally devoid of elephants, the reserve saw its first elephant herd migration from Chhattisgarh in 2018, marking the start of a permanent elephant population within the reserve.
 - The initial herd numbered around 15-20 elephants and has since been observed in both core and buffer areas of the reserve.
- The elephants were located in **Reserved Forest (RF) 384 and Protected Forest (PF) 183 A**, in the Salakhaniya Beat of Khitauli and Pataur core ranges.

Bandhavgarh Tiger Reserve (BTR)

- It is located in the **Umaria district of Madhya Pradesh** and is spread over the Vindhya hills.
- **In 1968**, it was notified as a national park and in 1993 was declared a tiger reserve- under the Project Tiger Network at the neighbouring Panpatha Sanctuary.
- It is known for the **Royal Bengal Tigers**. The density of the tiger population at Bandhavgarh is the highest known in India as well as in the world.
- The important prey species consists of **chital, sambhar, barking deer, nilgai, chinkara, wild pig, chowsingha, langur and rhesus macaque**.
 - Dependent upon them are the major predators like tiger, **leopard**, wild dog, wolf and jackal.

Note:

ELEPHANT



Drishti IAS

4 Main Species of Elephant

| Species | Found in | IUCN Red List Status | Habitat |
|----------------|----------|---|--|
| Indian | Asia | EN (CITES - Appendix I, WPA - Schedule I) | Subtropical broadleaf forest, tropical broadleaf moist forest, dry forest, grassland |
| Sumatran | Asia | CR | Broadleaf moist tropical forests |
| Savanna (Bush) | Africa | EN | All sub-Saharan Africa except for Central Africa's dense tropical forest |
| Forest | Africa | CR | Dense Tropical Forests |

Indian Elephant (*Elephas maximus*)

Largest Land Mammal on Asian Continent
National Heritage Animal of India

Top 5 Indian States by Maximum Elephant Population:

(As per elephant census 2017)

- Karnataka > Assam > Kerala > Tamil Nadu > Odisha

Social Structure:

- Female elephants are more social than males; form herd (generally 5-7)
 - Led by the oldest female, the 'matriarch'
- Males usually live alone

Threats:

- Habitat Fragmentation
- Poaching for Ivory
- Human-Elephant Conflict
- Mistreatment in Captivity

Conservation Efforts:

- Gaj Soochna App (2022)
- Gaj Yatra (2017)
- Hathi Mere Sathi campaign (2011)
- National Elephant Corridor project (2005)
- Monitoring the Illegal Killing of Elephants (MIKE) Programme (2003)
- Project Elephant (1992)

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Note:



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