NEXT IAS

SUMMARY OF DOWN TO EARTH

[16–31 JANUARY, 2025]

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Table of Content

Rupee Slide Impacts Agricultural Trade

Extreme Heat Reached New Heights in 2024

e-KYC Verification: Burden of Proof

Sacred Groves in India

Renewable and Non-Fossil Fuel-Based Energy in India

Environmental Emergency After Oil Spill

Poverty Lines in India

Natural Calamity in India

PRELIM

Human Metapneumovirus (HMPV)

Highly Pathogenic Avian Influenza (HPAI)

Sulphur Dioxide (SO_2) Emission

Indian Flapshell Turtles

Siang Upper Multipurpose Project (SUMP)

Indian Vultures & Use of Nimesulide

SUBJECTIVE QUESTIONS

MCQs

RUPEE SLIDE IMPACTS AGRICULTURAL TRADE

Context

- Recently, the Union Cabinet approved the **extension of a subsidy package** of Rs 3,500 per tonne on **di-ammonium phosphate (DAP)** for companies amid a fall in the value of the Indian currency against the US dollar and a global rise in DAP prices.

Di-Ammonium Phosphate (DAP)

- It is a fertilizer that provides essential nutrients—**Nitrogen** (18%); **and Phosphorus** (46% through Phosphorus Pentoxide).
  - It is highly soluble in water, making it readily available for plant uptake **(Agricultural Use).**
- **Chemical Formula:** $(NH_4)_2HPO_4$

Non-Agricultural Uses

- Fire Retardant; Industrial Processes such as metal finishing and soldering; and Food Industry

Rupee Slide Impacts Agricultural Trade

- The depreciation of the Indian rupee against major global currencies has raised significant concerns, particularly in the agricultural sector.
- As a critical driver of the Indian economy, agriculture is intricately linked to both domestic and international markets.
- The weakening rupee's ripple effects are now being felt across the supply chain, impacting exports, imports, and the overall trade balance.

Export Gains or Challenges?

- **Higher Input Costs:** Many Indian farmers rely on imported fertilizers, pesticides, and agricultural machinery.
  - It has led to a significant rise in the cost of these inputs, eroding the profit margins of exporters.
- **Global Competition:** Competing nations with stable or depreciating currencies are also vying for market share, limiting the extent to which Indian agricultural exports can capitalize on the rupee's slide.

Import Woes

- India is a major importer of agricultural commodities like edible oils, pulses, and certain cereals to meet domestic demand.
- A weaker rupee has made these imports costlier, directly impacting food prices and inflation.
- Edible oils, for instance, constitute a large portion of India's agricultural imports, and their rising costs are straining household budgets and increasing dependency on subsidies.

Strategies for Mitigation

- **Diversifying Import Sources:** Exploring alternative sources for agricultural inputs to reduce dependency on imports from countries with stronger currencies.
- **Promoting Local Production:** Encouraging the domestic production of essential agricultural inputs to reduce reliance on imports.
- **Enhancing Financial Support:** Providing additional financial support to farmers and fertiliser companies to help them cope with the increased costs.
- **Currency Hedging:** Encouraging exporters and importers to hedge against currency risks to manage volatility.
- **Incentivizing Local Production:** Promoting domestic production of high-demand imported commodities to reduce dependency on global markets.

EXTREME HEAT REACHED NEW HEIGHTS IN 2024

Context

- According to analysis by research consortium **World Weather Attribution (WWA)** and non-profit Climate Central, globally, climate change **added on average 41 additional days of dangerous heat in 2024**, threatening people's health.

About

- According to data from the **Copernicus Climate Change Service (C3S)**, 2024 saw a global average temperature of 15.10°C, surpassing the previous record set in 2023.
  - This increase of 0.12°C above the previous highest annual value highlights the accelerating impacts of climate change.

Record-Breaking Temperatures

- 2024 was not only the warmest year on record but also the first year with an average temperature exceeding **1.5°C above the pre-industrial level, a threshold set by the Paris Agreement** to significantly reduce the risks and impacts of climate change.
- It underscores the urgent need for global action to mitigate climate change.

Impact on Extreme Weather Events

- The extreme heat of 2024 fueled a series of devastating weather events, including heatwaves, droughts, wildfires, storms, and floods.
- These events resulted in significant human and economic losses, with thousands of lives lost and millions of people displaced.
- Climate change contributed to the deaths of at least 3,700 people and the displacement of millions in 26 weather events studied in 2024.

Regional Variations

- The impact of extreme heat was felt globally, with regions experiencing varying degrees of temperature increases.
- For instance, Europe saw record-high temperatures, while South Asia faced severe heatwaves that affected agriculture and water availability.
- The Amazon region experienced a historic drought, exacerbated by climate change.

Urgency for Action

- The exceptional year of extreme weather in 2024 highlights the urgent need to move away from fossil fuels and adopt sustainable practices.
- The analysis by Climate Central revealed that climate change added an average of 41 additional days of dangerous heat in 2024, threatening people's health and livelihoods.
    - From Kathmandu to Dubai to Rio Grande do Sul to the Southern Appalachians, the last 12 months have been marked by a large number of devastating floods.
    - In the first week of January, Brazil, Indonesia, Serbia and China all reported 2024 as their hottest year on record.
    - **India,** Germany, the Czech Republic and Australia also report 2024 to be one of the warmest years since their respective temperature records began.
- **Small islands and developing states**, which are highly vulnerable to climate change, experienced the highest number of dangerous heat days.

E-KYC VERIFICATION: BURDEN OF PROOF

Context

- The government's drive for e-KYC verification to ensure rightful targeting of beneficiaries has proved exclusionary for many.

About e-KYC Verification

- **e-KYC, or electronic Know Your Customer**, is a digital process used by businesses to verify the identity of their clients.
- It involves the use of biometrics, digital document uploads, and verification through government databases, such as the Aadhaar database in India.
- The **primary goal of e-KYC** is to ensure that clients are who they claim to be, thereby mitigating risks such as fraud and money laundering.

Burden of Proof in e-KYC

- One of the critical issues with e-KYC verification is the burden of proof.
- Traditionally, the burden of proof in identity verification rested with the individual, who had to provide documents such as passports, utility bills, and bank statements.
- With e-KYC, the burden of proof shifts to the service provider, who must ensure that the digital verification process is accurate and secure.

Challenges and Concerns

- **Data Security:** The digital nature of e-KYC raises concerns about data security and privacy.
    - Ensuring that biometric and personal data are protected from breaches and misuse is a significant challenge.
- **Accuracy of Verification:** The accuracy of e-KYC verification can be compromised by technical glitches, errors in government databases, and issues with biometric recognition.
    - It can lead to false positives or negatives, affecting the credibility of the verification process.
    - Digital data mismatch cases are emblematic of a growing number of errors linked to the use of Aadhaar and biometrics for beneficiary identification in rural India.
- **Accessibility:** Not all individuals have access to the necessary technology or internet connectivity to complete e-KYC verification.
    - It can create barriers for certain segments of the population, particularly those in rural or underserved areas.
- **Legal and Regulatory Compliance:** Ensuring that e-KYC processes comply with local and international regulations is a complex task.
    - Businesses must navigate a maze of legal requirements to avoid penalties and maintain compliance.

Addressing the Burden of Proof

- To address the burden of proof in e-KYC verification, businesses and regulators must work together to develop robust frameworks that ensure data security, accuracy, and accessibility.
- It includes implementing multi-factor authentication, regular audits of verification processes, and providing support for individuals who face barriers to accessing e-KYC services.

SACRED GROVES IN INDIA

Context

- The Supreme Court has recommended that the Union government create a comprehensive policy for the governance and management of sacred groves across the country.

About the Sacred Groves

- These are patches of land dedicated by local communities to deities, nature or ancestral spirits. The communities preserve these areas with near natural-state of vegetation.
- These preserve biodiversity, regulate climate, conserve water, support livelihoods, protect cultural heritage, and promote environmental awareness.
- These include: *Dev Vans of Himachal, the Bugyals of Uttarakhand, the Sarpa Kavu of Kerala, Kovil Kavu of Tamil Nadu, Devarakadu in Karnataka, Sarna in Madhya Pradesh, Oran in Rajasthan, Devrai in Maharashtra, Umanglai in Manipur, Law Kyntang/Law Lyngdoh in Meghalaya* are a few examples of sacred groves in India.

Threats to Sacred Groves

- **Urbanization and Encroachment:** Increasing human settlements and infrastructure development have led to the loss of sacred grove areas.
- **Deforestation and Resource Exploitation:** Unsustainable extraction of wood, medicinal plants, and other resources threatens the ecological balance.
- **Cultural Erosion:** Changing socio-cultural values and diminishing community practices weaken traditional protections.

Supreme Court Ruling

- The court recommended protection of sacred groves under the **Wildlife Protection Act, 1972,** particularly through **Section 36-C,** which enables the declaration of **'community reserves'.**
- The preservation of these groves was seen as critical for maintaining biodiversity and safeguarding the cultural heritage of entire communities.

India's Current Policy on Forest Protection

- Under the **Wildlife Protection Act, 1972,** state governments can declare any private or community land as a community reserve to protect biodiversity and cultural values.
- The **National Forest Policy of 1988** encourages local communities to protect and improve forest patches through customary rights.
- The Supreme Court, through the **T.N. Godavarman Thirumulpad** case and other judgments, has reinforced the role of communities in protecting forest ecosystems.

Constitutional Safeguards

- **Directive Principles of State Policy (DPSP): Article 48A** of the Constitution directs the State to protect and improve the environment and to safeguard the forests and wildlife of the country.
- **Fundamental Duties: Article 51A(g)** enjoins citizens to 'protect and improve the natural environment including forests, lakes, rivers, and wildlife, and to have compassion for living creatures'.

Examples of Successful Community Efforts

- **Piplantri Village, Rajasthan:** Local efforts transformed barren land into lush green groves, demonstrating the power of community-driven conservation.
- **Mawphlang Sacred Grove:** Located in the East Khasi Hills district of Meghalaya, this grove is a popular tourist destination and an important educational center

RENEWABLE AND NON-FOSSIL FUEL-BASED ENERGY IN INDIA

Context

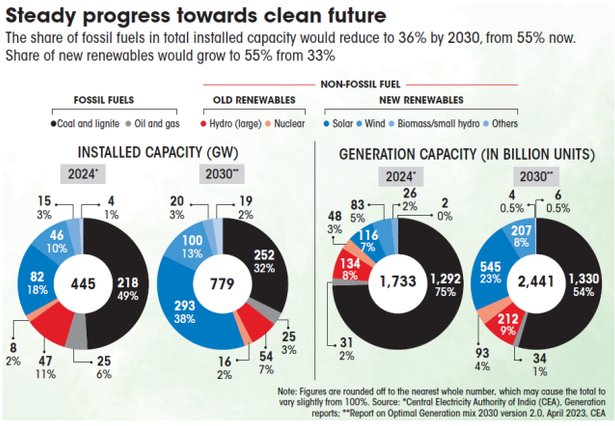
- India submitted to the UNFCCC its target to reduce the emissions intensity by 45% by 2030 (compared to 2005 levels), and to achieve 50% of cumulative electric power capacity from non-fossil fuel sources by 2030.

About

- India has made significant strides in transitioning to renewable and non-fossil fuel-based energy sources. It is crucial for reducing greenhouse gas emissions, enhancing energy security, and promoting sustainable development.
- The Indian government has set an ambitious target of achieving 500 GW from non-fossil fuel sources by 2030.

Current Status

- As of October 2024, India's total renewable energy capacity has crossed the 200 GW (gigawatt) mark, accounting for 46.3% of the country's total installed electricity generation capacity.
- It reflects the country's commitment to clean energy and its progress in building a greener future.



Why Invest in Renewable Energy?

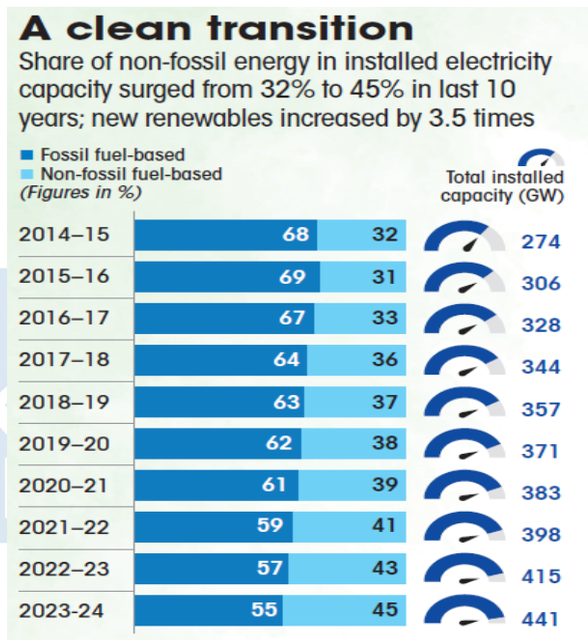
- **Liberal FDI Policy:** 100% FDI permitted under the automatic route;
- **Assured Demand Driven By Government:** Bids for 50 GW per annum Renewable Energy capacity, with at least 10 GW per annum Wind power capacity, to be issued each year from 2023-24 to 2027-28.
- **Indigenous Supplier Ecosystem:** Existence of an Indigenous supplier ecosystem across solar, wind, and green hydrogen.
- **Forward-looking Policies:** Forward-looking policies including waiver of Inter-state transmission charges, Renewable Purchase Obligations and Production Linked Incentives.

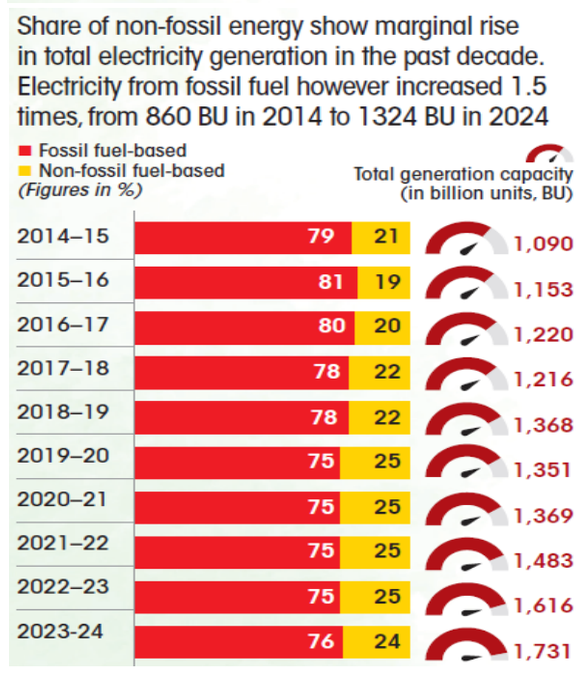
Key Renewable Energy Sources

- **Solar Power:** India has achieved a solar power installed capacity of 94.17 GW, with a total capacity (including pipeline projects) reaching 261.15 GW.
- **Wind Power:** The installed wind power capacity stands at 47.96 GW, with a total capacity (including pipeline projects) of 74.44 GW.
- **Bioenergy:** Bioenergy capacity has grown to 11.34 GW, contributing to the diversification of India's energy mix.
- **Hydroelectric Power:** Large hydro projects have an installed capacity of 46.97 GW, with a total capacity (including pipeline projects) of 67.02 GW.
- **Nuclear Energy:** The nuclear energy installed capacity has increased to 8.18 GW, with a total capacity (including pipeline projects) of 22.48 GW.

Government Initiatives

- **Transmission Schemes:** Plans for integrating 66.5 GW of renewable generation in states like Rajasthan, Gujarat, Maharashtra, Madhya Pradesh, Karnataka, Andhra Pradesh, and Tamil Nadu.
- **Renewable Energy Zones:** Identification of 181.5 GW potential Renewable Energy Zones in states like Andhra Pradesh, Karnataka, Telangana, Rajasthan, Maharashtra, Madhya Pradesh, and offshore wind at Gujarat & Tamil Nadu.





Still import reliant

India is breaking into the global photovoltaic cell and module market, but it heavily depends on imports for meeting domestic requirements

Import (in millions)	2019-20	2020-21	2021-22	2022-23
Photovoltaic cells not assembled in modules or made up into panels	795.82	739.05	773.48	1233.81
Photovoltaic cells assembled in modules or made up into panels	NA*	NA	99.83	7.95
Export (in millions)	**2019-20**	**2020-21**	**2021-22**	**2022-23**
Photovoltaic cells not assembled in modules or made up into panels	6.91	1.05	0.84	1.86
Photovoltaic cells assembled in modules or made up into panels	NA	NA	0.97	5.75

*Not available
Source: Ministry of Commerce and Industry, Export Import Data Bank

Future Prospects

- India's green investments are projected to reach Rs 31 lakh crore by 2030, driven by renewable energy, transport, and oil & gas sectors.
- This substantial investment will support the country's transition to non-fossil fuel-based energy sources and help achieve its net-zero goals.

ENVIRONMENTAL EMERGENCY AFTER OIL SPILL

Context

- **Peru** on December 26, 2024, declared a 90-day environmental emergency for its northern **province of Talara**, six days after an oil spill from a state oil company refinery.

About Oil Spill

- Oil spills occur when liquid petroleum is accidentally released into the environment, particularly marine areas.
  - These incidents arise from shipwrecks, pipeline leaks, offshore drilling rig malfunctions, or accidents during the transportation of crude oil and refined products.
- These are among the most catastrophic environmental disasters, causing widespread harm to marine ecosystems, coastal habitats, and human communities.

Environmental Impacts of Oil Spills

- **Marine Ecosystems:** Thick oil slicks coat the fur and feathers of marine animals, such as otters and seabirds, destroying their insulating and buoyancy abilities.
  - Toxic compounds in oil poison fish, plankton, and other organisms critical to the aquatic food chain.
  - Coral reefs—often referred to as the "rainforests of the sea"—suffer lasting damage when exposed to hydrocarbons.
- **Coastal Habitats:** When oil reaches the shoreline, it devastates wetlands, mangroves, and beaches.
  - These habitats, home to diverse flora and fauna, face long-term degradation.
  - Mangroves, which act as carbon sinks, lose their capacity to combat climate change when contaminated by oil.
- **Human Health and Livelihoods:** Oil spills harm communities dependent on fishing and tourism.
  - Tainted seafood affects local economies, while the exposure to volatile organic compounds (VOCs) during cleanup operations can cause respiratory, neurological, and skin-related health issues among workers and nearby populations.

Major Oil Spill Incidents

- **Exxon Valdez (1989):** It released 11 million gallons of crude oil into Prince William Sound, Alaska, remains one of the most infamous ecological disasters.
  - It killed thousands of seabirds, marine mammals, and fish and left a toxic legacy in the region.
- **Deepwater Horizon in Gulf of Mexico (2010):** It stands as the largest accidental marine oil spill in history.
  - Approximately 4.9 million barrels of oil leaked over 87 days, causing catastrophic damage to marine biodiversity and local economies.

Response and Mitigation Strategies

- **Emergency Cleanup Efforts:** Immediate responses to oil spills involve mechanical containment methods such as booms and skimmers, chemical dispersants to break down oil, and bioremediation techniques using microorganisms to degrade oil naturally.
- **Preventative Measures:** Enhanced safety protocols, stricter regulations, and robust oversight of oil transportation and drilling activities are vital.

  - Technological advancements like real-time monitoring systems for pipelines and double-hulled tankers reduce the risk of spills.
- **International Cooperation:** Conventions such as the **International Convention for the Prevention of Pollution from Ships (MARPOL)** and regional response agreements ensure collective preparedness and resource-sharing during emergencies.

Preparedness: A Long-Term Vision

- **Policy Advocacy:** Governments must adopt stringent environmental policies that emphasize spill prevention and rapid response mechanisms.
- **Community Engagement:** Local communities need training in oil spill response to build resilience and ensure timely action.
- **Research Investment:** Scientists must develop innovative cleanup technologies, such as magnetic nanoparticles and oil-eating bacteria, to revolutionize spill response.
- **Transition to Clean Energy:** Reducing global dependence on oil is the most effective way to prevent spills. Expanding the use of wind, solar, and other renewable sources will mitigate the environmental risks associated with oil production and transportation.

POVERTY LINES IN INDIA

Context

- The concept of poverty lines in India has been a subject of intense debate and scrutiny over the years.
- The poverty line is a monetary threshold below which an individual is considered poor, and it is used to measure the extent of poverty in the country.

About Historical Context

- The poverty line in India has evolved over time, with various committees and methodologies being employed to determine it.
- The **Tendulkar Committee (2009)** was one of the earliest to propose a methodology for estimating poverty, which was later updated by the **Rangarajan Committee (2014).**
- These committees have faced criticism for their methodologies and the thresholds they set.

Current Estimates

- Recent estimates of poverty in India vary widely due to differences in methodologies and data sources.
- The **State Bank of India (SBI) Research** estimated India's poverty rate at 4-4.5% based on the **Household Consumption Expenditure Survey (2023-24)**.
  - It translates to a monthly **per capita consumption expenditure (MPCE)** of Rs 4,122 for rural areas and Rs 6,996 for urban areas.
- However, other estimates, such as those by the **Foundation for Agrarian Studies (FAS)**, suggest that 26.4% of Indians live in poverty using the **Rangarajan method.**

Methodological Differences

- The differences in poverty estimates arise from the methodologies used to calculate the poverty line.
- The Tendulkar Committee's methodology, which was based on calorie intake, has been criticized for not accounting for other essential needs like health and education.
- The **Rangarajan Committee's methodology,** on the other hand, included a broader basket of goods and services but was still contested for its thresholds.

Implications

- The varying estimates of poverty have significant implications for policy-making and resource allocation.
- Accurate poverty data is crucial for directing development programs and social welfare schemes to the right population groups.
- The lack of consensus on poverty lines also affects the credibility of poverty statistics and the effectiveness of poverty alleviation measures.

NATURAL CALAMITY IN INDIA

Context

- Recently, the Chief Minister of Odisha announced that the unseasonal rain in the state was a **'natural calamity'** enabling compensation distribution to affected farmers from the **State Disaster Response Fund (SDRF).**

About the Natural Calamity in India

- India faces a range of disasters that cause significant loss of life, property, and economic disruption.
- Odisha frequently experiences cyclones, floods, and unseasonal rains, which have devastating effects on agriculture, infrastructure, and the livelihoods of its residents.

- In December 2023, Odisha faced unprecedented unseasonal rainfall, leading to widespread crop damage across the state.
- Odisha's Chief Minister declared this weather event a natural calamity during the **'Krushi Odisha Conclave'** in Bhubaneswar.
- Approximately 6,66,720 farmers reported crop losses of 33% or more, affecting around 2,26,791 hectares of farmland.
- The government has committed approximately Rs 291 crore from the SDRF to assist affected farmers.

Types of Natural Calamities

- **Cyclones:** Coastal regions, particularly the eastern coast, are prone to cyclones. The Bay of Bengal is a hotspot for tropical cyclones, which can cause widespread destruction.
- **Floods:** Heavy monsoon rains often lead to severe flooding, especially in the northern and northeastern states. The Brahmaputra and Ganga rivers are particularly prone to flooding.
- **Earthquakes:** The Himalayan region is vulnerable to earthquakes due to its tectonic activity. The 2001 Gujarat earthquake and the 2011 Sikkim earthquake are notable examples.
- **Droughts:** Parts of central and western India frequently experience droughts, affecting agriculture and water supply.
- **Landslides:** The hilly regions of the Himalayas and Western Ghats are susceptible to landslides, often triggered by heavy rains.
- **Tsunamis:** The Indian Ocean tsunami of 2004 caused massive devastation along the southern coast, particularly in Tamil Nadu and the Andaman and Nicobar Islands.

Government Response and Disaster Management

- The **National Disaster Management Authority (NDMA)** and **State Disaster Management Authorities (SDMAs)** play a crucial role in coordinating relief efforts and implementing disaster preparedness measures.
- **State Disaster Response Fund (SDRF):** It was established under the **Disaster Management Act, 2005**
- SDRF is divided into three **sub-allocations:**
  - Response and Relief (40%);
  - Restoration and Reconstruction (30%); and
  - Preparedness and Capacity-building (10%).
- The remaining 20% is allocated to the State Disaster Mitigation Fund (SDMF).

Long-Term Strategies and Preparedness

- The recent natural calamity underscores the need for improved agricultural policies and disaster preparedness.
- Enhanced forecasting, better crop insurance schemes, and support for sustainable farming practices can help protect farmers from future calamities.
- The Odisha State Disaster Management Authority (OSDMA) is working with different stakeholders to reduce disaster risk and increase the wellbeing and safety of the people.

PRELIMS

HUMAN METAPNEUMOVIRUS (HMPV)

Context

- China in mid-December 2024 announced a surge in human metapneumovirus (HMPV) infections in its northern regions.

About the Human Metapneumovirus (HMPV)

- It is a **common respiratory virus** that primarily affects young children, older adults, and individuals with **weakened immune systems**.
- First identified in 2001, it belongs to the **Pneumoviridae family**, which also includes the **respiratory syncytial virus (RSV).**

Symptoms and Transmission

- HMPV typically causes **upper respiratory infections,** such as cough, runny nose, sore throat, and fever.
- In some cases, it can lead to more severe **lower respiratory infections like bronchitis or pneumonia**.
- The virus spreads through infectious respiratory particles, such as those from coughing or sneezing, and can also be transmitted by touching contaminated surfaces.

Seasonality and Prevalence

- HMPV circulates primarily during the winter and early spring months, similar to other respiratory viruses like influenza and RSV.
- While most cases are mild, about **5% to 16% of children** infected with HMPV develop lower respiratory tract infections.
- **Adults over 65 and individuals with underlying health conditions** are also at higher risk for severe illness.

HIGHLY PATHOGENIC AVIAN INFLUENZA (HPAI)

Context

- Recently, three tigers and a leopard died at the **Balasaheb Thackeray Gorewada International Zoological Park in Nagpur**, after contracting the **Highly Pathogenic Avian Influenza (HPAI) H5N1** or bird flu virus.

About the Highly Pathogenic Avian Influenza (HPAI) H5N1

- It is commonly known as **bird flu**, is a severe and highly **contagious viral disease** that poses significant threats to **both poultry and public health**.
- It is caused by **influenza A viruses** that primarily affect birds, including domestic poultry such as chickens, turkeys, and ducks, as well as wild birds.
- The virus spreads through direct contact with infected birds, their droppings, or contaminated surfaces, equipment, and clothing.
- Infected birds shed the virus in their saliva, mucus, and feces, which can contaminate the environment and facilitate further transmission.

About Influenza Virus

- There are four types of influenza viruses: types A, B, C and D.
  - **Influenza A** viruses infect humans and many different animals.
  - **Influenza B** viruses circulate among humans and cause seasonal epidemics. Recent data showed seals also can be infected.
  - **Influenza C** viruses can infect both humans and pigs but infections are generally mild and are rarely reported.
  - **Influenza D** viruses primarily affect cattle and are not known to infect or cause illness in people.

Human Health Risks

- While human infections with HPAI H5N1 are rare, they can occur, particularly in individuals who have close contact with infected birds.
- Symptoms in humans can include severe respiratory illness, and in some cases, the infection can be fatal.
- However, there is currently no evidence of sustained human-to-human transmission of HPAI H5N1.

Prevention and Control Measures

- Preventing the spread of HPAI H5N1 requires a combination of **biosecurity practices and public health measures**.
- Poultry farmers are advised to enhance biosecurity protocols, such as washing hands and boots before and after entering poultry areas, buying birds from reputable sources, and having a written biosecurity plan in place.
- Additionally, public health authorities recommend avoiding unnecessary contact with wild birds and reporting any sick or dead birds to local authorities.

SULPHUR DIOXIDE (SO_2) EMISSION

Context

- Recently, the Union Ministry of Environment, Forest and Climate Change (MoEF&CC) issued an extension for thermal power plants (TPPs) to comply with sulphur dioxide emission norms.

Background and Implementation

- MoEF&CC introduced the **first set of emission norms for SO_2, NO_x (nitrogen oxides), and mercury** control for coal-based TPPs in 2015.
- These norms mandated the installation of **Flue Gas Desulphurisation (FGD) systems** to reduce SO_2 emissions.
- The initial deadline for compliance was set for December 2017, but due to various challenges, including delays and limited vendor capacity, the deadline has been extended multiple times.

Compliance Deadlines and Extensions

- The compliance deadlines for SO_2 emission norms vary based on the location of the TPPs.
- Plants within a 10-kilometer radius of the National Capital Region (NCR) or cities with populations over a million were initially required to comply by December 2019.
  - However, the deadline has been **extended to December 2024** for these plants.
- For TPPs in critically polluted areas, the deadline has been extended to December 2025, and for other areas, it has been **extended to December 2026.**

Environmental and Health Impacts

- SO_2 is a precursor to fine **particulate matter (PM2.5)**, which has been linked to **respiratory and cardiovascular diseases**.
- Reducing SO_2 emissions is crucial for improving air quality and protecting public health.

- The implementation of FGD systems in TPPs is expected to significantly reduce SO_2 emissions and mitigate their harmful effects.

Challenges and Progress

- Despite the extensions, progress in installing FGD systems has been slow.
- As of November 2024, only a small percentage of coal-fired power plants have installed the necessary pollution control equipment.
- The repeated extensions reflect systemic issues in managing air pollution from TPPs and highlight the need for more effective implementation strategies.

INDIAN FLAPSHELL TURTLES

Context

- Recently, Uttar Pradesh police arrested three individuals for trafficking 297 **rare Indian flapshell turtles** from a pond in **Karhal, Mainpuri**, and were illegally exporting them to China via Uttarakhand at a price of Rs 10,000 a turtle.

About the Indian Flapshell Turtles (Lissemys Punctata)

- It is a **freshwater species** found **across South Asia**, including India, Pakistan, Bangladesh, Nepal, and Myanmar.

- These are known for their distinctive **'flap-shelled' appearance,** with flaps of skin covering their limbs when they retract into their shells.
- They are particularly common in the Indus and Ganges drainages and have been introduced to the Andaman and Nicobar Islands.

Protection Status

- IUCN Red List: Least Concern
- CITES: Appendix II;
- Indian Wildlife (Protection) Act, Schedule I

SIANG UPPER MULTIPURPOSE PROJECT (SUMP)

Context

- As India pushes for a **mega-dam on the Siang river** to counter China's upstream projects, the **Adi tribal community of Arunachal Pradesh** fears losing ancestral land.

Adi Tribe

- They are indigenous peoples in the state of **Arunachal Pradesh** in East Siang and Lower Dibang Valley districts**,** believed to have **come from southern China** in the 16th century.

Language: Tibeto-Burman

Festivals:

- Solung: Harvesting festival where animal sacrifices and rituals are performed;
- Aran: A hunting festival where all the male members of the family go for hunting;

Siang Upper Multipurpose Project (SUMP)

- It is located in the **Upper Siang district of Arunachal Pradesh,** which is in the northeastern part of India.
  - **Siang is a tributary of the Brahmaputra River.**
- It originates near **Mount Kailash in Tibet**, where it is known as the **Yarlung Tsangpo.**
  - It traverses over 1,000 km eastward before entering Arunachal Pradesh as the Siang.
  - Further downstream, in Assam, it joins tributaries like the Dibang and Lohit to become the Brahmaputra.
- **Capacity of SUMP:** Exceeding 10,000 MW;
- **Multipurpose Nature:** Flood Control; Irrigation; Water Supply

Environmental and Social Concerns

- **Displacement of Local Communities:** The construction of dams and reservoirs result in the displacement of people who live along the river.
- **Ecological Impact:** Alterations to the river ecosystem affect biodiversity, fisheries, and downstream water availability.
- **Seismic Risks**: The region is earthquake-prone, raising concerns about the safety of large dams in such an area.

Context

- Despite reporting net gains in green cover, the latest forest survey shows degradation of natural forests, particularly in ecologically sensitive hotspots.

Forest Survey of India

- FSI was established in 1981 and is under the MoEF&CC.
- It succeeded the **Pre-investment Survey of Forest Resources (PISFR)**, initiated in 1965 with **Food and Agriculture Organization (FAO) and United Nations Development Programme (UNDP)** support.

- It is published every two years by the **Forest Survey of India.**
- **Headquartered: Dehradun**
- The **first survey** was published in 1987, and **ISFR 2023 is the 18th** such report in the series.
  - It contains information on forest cover, tree cover, mangrove cover, growing stock, carbon stock in India's forests, instances of forest fire, Agroforestry, etc.
- It conducts surveys and research to monitor India's forest and land resources, providing data for national planning, conservation, and sustainable management.

Major Findings of India State of Forest Report (ISFR) 2023

- **Forest and Tree Cover:**
  - **Total Forest and Tree Cover:** The combined forest and tree cover of the country is 8,27,357 sq km, which constitutes 25.17% of the geographical area.
  - **Forest Cover:** The forest cover is 7,15,343 sq km, accounting for 21.76% of the geographical area.
  - **Tree Cover:** The tree cover is 1,12,014 sq km, making up 3.41% of the geographical area.
  - **Increase in Cover:** Compared to the 2021 assessment, there has been an increase of 1,445 sq km in the total forest and tree cover, with 156 sq km increase in forest cover and 1,289 sq km increase in tree cover.
- **State-wise Analysis:**
  - **Top States:** The states with the largest forest and tree cover are Madhya Pradesh (85,724 sq km), Arunachal Pradesh (67,083 sq km), and Maharashtra (65,383 sq km).
  - **Top States for Increase:** The states showing the maximum increase in forest and tree cover are Chhattisgarh (684 sq km), Uttar Pradesh (559 sq km), Odisha (559 sq km), and Rajasthan (394 sq km).
  - **Highest Forest Cover Percentage:** Lakshadweep (91.33%), Mizoram (85.34%), and Andaman & Nicobar Islands (81.62%) have the highest forest cover percentages.

Too good to be true

The latest forest assessment report claims that 481.13 sq km of open forest and 44.43 sq km of non-forest areas transitioned to very dense forests within recorded forest areas between 2021 and 2023. Experts argue that such rapid change is ecologically impossible

Forest cover change matrix inside recorded forest area (RFA) and green wash (GW) between 2021 and 2023 assessments (in sq km)

FOREST CLASSES	2023 ASSESSMENT INSIDE RECORDED FOREST AREA/GREEN WASH*					TOTAL FOR 2021
	VDF	MDF	OF	SCRUB	NF	
Very dense (VDF)	85,568.45	2,570.74	201.20	21.86	231.18	88,593.43
Moderately dense (MDF)	4,930.17	2,33,135.56	4,232.44	233.80	2,246.83	2,44,778.80
Open forests (OF)	481.13	7,269.84	1,72,692.54	1,090.99	5,451.31	1,86,985.81
Scrub	0.75	72.08	2,910.18	19,155.54	1,578.35	23,716.90
Non-forest	44.43	495.63	5,760.18	2,009.95	1,88,877.68	1,97,187.87
Total for 2023	91,024.93	2,43,543.85	1,85,796.54	22,512.14	1,98,385.35	7,41,262.81
Net change	2,431.50	-1,234.95	-1,189.27	-1,204.76	1,197.48	

* Currently, digitised boundaries of recorded forest areas are available for 25 states. For the others, Forest Survey of India has adopted an alternative approach, using the "green wash" boundaries, which are areas represented in green on the Survey of India topographic sheets, as a proxy for recorded forest areas.
Source: "India State of Forest Report 2023", Forest Survey of India

- **Carbon Stock:**
  - **Forest Carbon Stock:** The forest carbon stock is estimated at 7,285.5 million tonnes, with an increase of 81.5 million tonnes compared to 2021.
  - **Total Carbon Stock:** India's carbon stock has reached 30.43 billion tonnes of CO2 equivalent, exceeding the 2005 base year by 2.29 billion tonnes, nearing the 2030 target of 2.5–3.0 billion tonnes.
- **Mangrove Cover:** The total mangrove cover is 4,921 sq km, with 3,554 sq km in the mainland and 1,367 sq km in the islands.
- **Forest Fires Alerts:** The report highlights the use of advanced technology for near real-time fire alerts and forest fire services.
- **Agroforestry Area:** The area under agroforestry is 1,94,575 sq km, which includes 1,49,777 sq km of land under agroforestry and 44,798 sq km under homestead agroforestry.

INDIAN VULTURES & USE OF NIMESULIDE

Context

- Recently, the Union government banned the manufacture, sale and distribution of all formulations of **Nimesulide, a painkiller administered to animals,** after studies conducted by an institute of ICAR that confirmed its **toxicity to vultures.**

About Nimesulide

- It is a **non-steroidal anti-inflammatory drug (NSAID)** commonly used to treat pain and inflammation in livestock.
  - It is the fourth such non-steroidal anti-inflammatory drug banned in the country since 2006.
- It is highly toxic to vultures. It **remains in their carcasses**, when livestock treated with nimesulide die.
  - It causes renal failure and death in vultures, contributing significantly to their population decline.
- Vultures, which primarily feed on animal carcasses, inadvertently ingest the drug, leading to severe health issues.

Vultures

- Vultures play a crucial ecological role by scavenging on animal carcasses, thereby preventing the spread of diseases.
- Their decline has had negative repercussions on biodiversity and ecosystems, highlighting the importance of their conservation.

Types

- Vultures are one of the 22 species of large carrion-eating birds that live mostly in the tropics and subtropics.
- India is home to **nine species of Vulture** namely the Oriental white-backed, Long-billed, Slender-billed, Himalayan, Red-headed, Egyptian, Bearded, Cinereous and the Eurasian Griffon.

Conservation Status

- Bearded, Long-billed, Slender-billed, Oriental white-backed are protected in the **Schedule-1 of the Wildlife Protection Act 1972**.
  - Rest are protected under 'Schedule IV'.
- According to **IUCN,** Oriental White-backed Vulture, Long-billed Vulture, Slender-billed Vulture and Red-headed Vulture are **Critically endangered.**
  - **Egyptian Vulture** is '**Endangered'** and Eurasian Griffon is least concerned while remaining are '**Near Threatened'**.

■■■■

SUBJECTIVE QUESTIONS

1. **Analyze the impact of natural calamities in India, focusing on their socio-economic consequences and the effectiveness of disaster management strategies employed by the government.**
2. **Analyze the impact of a depreciating Indian Rupee on India's agricultural trade, considering both potential benefits and drawbacks. Discuss the implications for farmers, exporters, and the overall economy.**
3. **Discuss the legal and ethical considerations surrounding the burden of proof in e-KYC verification processes. Analyze the potential risks and benefits of different approaches, such as shifting the burden of proof to the customer versus the service provider.**
4. **Discuss the significance of sacred groves in India, highlighting their ecological, cultural, and socio-economic importance. Analyze the threats they face and suggest measures for their conservation and sustainable management.**
5. **Critically analyze the current state of renewable and non-fossil fuel-based energy sources in India. Discuss the challenges faced in their widespread adoption and suggest potential solutions to overcome these hurdles.**

MCQs

1. Consider the following pairs:

	Sacred Grooves	Indian States
1.	Sarpa Kavu	Kerala
2.	Kovil Kavu	Tamil Nadu
3.	Bugyals	Uttarakhand
4.	Devrai	Maharashtra

How many of the above pairs are correctly matched?
(a) Only one pair
(b) Only two pairs
(c) Only three pairs
(d) All fours

Ans (d)

2. With reference to the Human Metapneumovirus (HMPV), consider the following statements:
1. It is a common respiratory virus that primarily affects individuals with weakened immune systems.
2. It belongs to the Pneumoviridae family, which also includes the respiratory syncytial virus (RSV).

Which of the statements given above is/ are correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Ans (c)

3. Adi tribes, sometimes appeared in the news, primarily live in:
(a) Meghalaya
(b) Arunachal Pradesh
(c) Assam
(d) Manipur

Ans (b)

4. Consider the following statements:
1. Siang river is a tributary of the Brahmaputra River.
2. It originates near Mount Kailash in Tibet.

Which of the statements given above is/ are correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Ans (c)

5. Consider the following pairs:

	Vultures	-	IUCN Status
1.	Long-billed Vulture	-	Critically endangered
2.	Egyptian Vulture	-	Endangered
3.	Eurasian Griffon	-	Near Threatened

How many of the above pair(s) is/are correctly matched?
(a) Only one
(b) Only two
(c) All three
(d) None

Ans (c)