

SUMMARY OF DOWN TO EARTH

[01 – 15 July, 2024]

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SUBJECTIVE QUESTIONS

MCQS

SLOWING DOWN OF WIND CIRCULATIONS ACROSS GLOBE

Context

- Recent scientific observations reveal that wind circulations are slowing in a warming world, adding to the frequency and intensity of extreme events.

About

- Wind circulations play a crucial role in shaping our climate, affecting everything from local weather patterns to global ocean currents.
- Recently, scientists have been closely monitoring changes in wind speeds and patterns, and the evidence suggests that wind circulation is indeed slowing down.

Atlantic Meridional Overturning Circulation (AMOC)

- One of the most significant surface-to-deep ocean currents is AMOC that circulates water within the Atlantic Ocean, bringing warm water northward and cold water southward.
- It includes key components like the Gulf Stream, which flows along the east coast of North America, and the North Atlantic Current, which carries warm water toward Europe.
- All the **three near-surface wind systems** — **Hadley cells along the equator, Ferrel cells in mid-latitudes and polar cells** — show signs of weakening.
- Temporary wind systems** like monsoons, storms and tropical cyclones occur within large permanent wind systems of Hadley Cell, Ferrel Cell, Polar Cell and Jet Streams, which are **now undergoing changes**.
- Jet streams**, which are a byproduct of the three wind systems and move at about 10 km above the surface, meander in large waves, but some of their fast moving winds are moving faster.
- Winter Western Disturbances** have increased significantly over the Western and Central Himalaya and the Hindu Kush in the last 70 years. This trend is attributed to a **strengthening of the subtropical jet**.

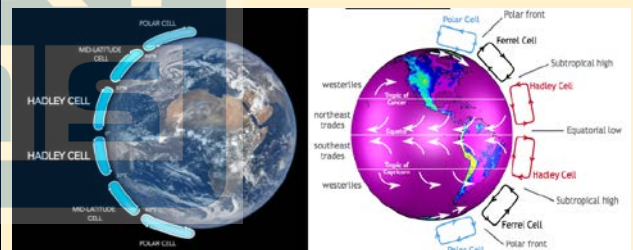
PLANETARY WIND SYSTEMS AND ASSOCIATED CHANGES

Hadley Cell

- It is **located along the equator**, and is the **strongest of the three wind systems**.
- Warm air rises from the equator, the hottest place on Earth, and sinks at 30° north and south latitudes, creating the Hadley cell.
- The wind belt associated with this cell comprises the **trade winds**, which have shaped the **world's geography and history**.
- Trade winds bring copious rainfall to the equator region, making it the wettest place on Earth.
- Known for their **consistency in force and direction**, trade winds and associated ocean currents help sailors hasten their voyages.

Changes in Hadley Cell

- Trade winds are now becoming weaker, resulting in reduced rainfall in tropical areas, making heat waves severe and hurricanes frequent and intense.



Ferrel Cell

- These lie in **between the Hadley and polar cells**, and are formed by parts of the **rising air at 60° north or south latitudes** and **sinking cold air at 30° north or south latitudes**.
- The wind belt associated with these cells is the **westerlies**, which **balance the energy distribution between low and high latitude regions** and **govern subtropical ocean gyres** (large ocean circulations) that transport heat, nutrients and oxygen from one part of the ocean to the other.

Changes in Ferrel Cell

- Westerlies are weakening.

- In the northern hemisphere, this could hasten the collapse of AMOC that brings warm water northwards. Its pole-ward shift could reduce precipitation in mid-latitude regions.
- In the southern hemisphere, westerlies can bring carbon-dioxide-rich deepwater to the surface in southern oceans, adding to global warming.

Polar Cell

- In the polar regions, the cold and dry air sinks, creating a high pressure region.
- These cold winds known as polar easterlies blow along the surface to reach 60° north or south latitudes, where they become warm, rise up and flow back towards the poles, forming the polar cell.
- It is the smallest and the weakest of the cells, but without it the polar regions would freeze solid as it brings warmer air.

Changes in Polar Cell

- Polar easterlies, the prevailing wind belt in the cell, are weakening, leading to decrease in evaporative heat fluxes in Antarctica.

Jet Streams

- These are **fast-flowing west-to-east bands of winds** in the middle to upper troposphere. They exist because of density gradients between tropical warm moist air and polar cold and dry air. Jet streams act as the **conveyor belt for weather systems across the world**.
- There are **four different jet streams encircling the planet**. Two are over the North (Arctic) and South (Antarctica) Polar regions, while the other two are in lower latitudes and are known as **subtropical jet streams**.

Changes in Jet Streams

- With equatorial air warming faster than the polar air in the upper atmosphere, some winds in jet streams are moving faster. Strengthening of subtropical jet streams in winters is making western disturbances frequent in western and

central Himalayas.

- Polar jet streams are becoming weaker, blocking weather patterns in mid-latitude regions, causing simultaneous floods and heatwaves.

Why Does It Matter?

- The health of the AMOC is **vital for maintaining Earth's climate equilibrium**. If the AMOC weakens substantially, it could lead to significant climate changes.
- **Temperature Redistribution:** A weaker AMOC would reduce the mixing of warm and cold waters. Warmth would stay concentrated in the tropics, potentially making hot regions even hotter and cold areas colder.
- **Precipitation Patterns:** Changes in ocean circulation impact precipitation. A slowdown in the AMOC could alter rainfall patterns, affecting ecosystems and agriculture.
- **Storm Intensity:** A weakened AMOC might influence storm behaviour. Stronger storms could occur, impacting coastal regions.
- **Sea Level Rise:** The AMOC helps regulate sea level along the North American Atlantic coast. A decline could exacerbate rising sea levels.

Global 'Stilling'

- Beyond the Atlantic, there's evidence of a broader phenomenon known as 'global stilling'. It affects almost every aspect of our lives—from unpredictable rainfall to excess heat waves to frequent or missing storms.
- It even affects wind energy production and the aviation sector.
- Research from 1978 to 2010 showed that **surface winds worldwide decreased by about 2.3% per decade**.
- Surprisingly, the culprits behind this slowdown **aren't skyscrapers or urban development; instead, it's new trees**. As forests expand, they create friction that slows down surface winds.
- While this may not directly impact the wind power industry, it does affect air pollution dispersion and local climates.

Conclusion

- Understanding wind circulations and their changes is crucial for predicting climate shifts. As we continue to monitor these trends, scientists work tirelessly to unravel the complex interactions between wind, ocean currents, and our changing planet.

PROTECTING LIVESTOCK FROM HEAT STRESS IN INDIA

Context

- States and private firms are implementing insurance schemes to protect livestock rearers against milk production losses caused by heat stress.

About the Livestock in India

- India boasts one of the largest and most diverse livestock populations globally. It's not just about cows and buffaloes—our livestock includes cattle, buffaloes, sheep, goats, pigs, poultry, and more. These animals serve various purposes, from milk and meat production to draught power and fibre.

Economic Significance

- **Milk Production:** India is the largest milk producer globally, with millions of small and marginal dairy farmers contributing to this feat.
- **Meat and Poultry:** The meat and poultry industry is growing steadily, meeting the protein needs of a large population.
- **Employment:** Livestock rearing provides employment to millions, especially in rural areas.

Challenges Faced by Livestock Sector

- **Feed and Nutrition:** Ensuring proper feed and nutrition for animals remains a challenge, especially during droughts or feed shortages.
- **Healthcare:** Disease management, vaccination, and veterinary services are critical for maintaining healthy livestock.
- **Climate Change: Extreme weather events** affect livestock productivity and well-being.

- **Market Access:** Access to markets and fair prices for livestock products is crucial for farmers.
- **Contribution to GHG emissions:** According to a report submitted to the UNFCCC, the **agriculture sector accounts for 14% of total GHG emissions in India.**

Key Government Initiatives

- **National Livestock Mission (NLM):** It focuses on entrepreneurship development and breed improvement in poultry, sheep, goat, and piggyery. It operates through three sub-missions:
 - **Breed Development of Livestock & Poultry:** This sub-mission incentivizes individuals, farmer producer organisations (FPOs), self-help groups (SHGs), and companies to engage in entrepreneurship development and breed improvement. State governments also receive support for breed improvement infrastructure.
 - **Research & Development, Livestock Insurance, Extension, and Innovation:** Incentivizing research institutes, universities, and organisations working on livestock, feed, and fodder sectors.
 - **Rashtriya Gokul Mission (RGM):** It aims to conserve and enhance the productivity of indigenous bovine breeds. Its goal is to improve milk production and make dairying more remunerative for rural farmers. The initial budget for this mission was Rs 500 crore, with a focus on indigenous cattle breeds.
 - **Godhan Nyay Scheme (Chhattisgarh):** It was introduced with the aim to increase farmers' income, promote organic compost, reduce chemical fertiliser usage, and improve soil health. It's a step toward sustainable and natural farming practices in the state.
 - **Livestock Census:** Regular livestock censuses provide data on population, breed distribution, and productivity.
 - **Integrated Sample Survey:** This survey helps assess livestock-related parameters.
 - **Kisan Credit Cards:** Farmers can access credit for livestock-related activities.

- **Entrepreneurial Activities:** Encouraging entrepreneurship in livestock-related ventures.

Sustainable Practices

- **Organic Farming:** Organic feed and sustainable practices benefit both animals and the environment.
- **Animal Welfare:** Ensuring humane treatment and proper housing conditions.
- **Breeding Programs:** Focusing on high-yield breeds and conservation of indigenous breeds.
- **Livestock and Climate Change:** Livestock contribute to greenhouse gas emissions, but sustainable practices can mitigate this impact. Efficient feeding, better waste management, and afforestation are crucial.

SPACE EXPLORATION NORMS AND PLANETARY PROTECTION

Context

- Space agencies and private players must adhere to exploration norms to ensure integrity of space research.

About

- The **United Nations Office for Outer Space Affairs (UNOOSA)** serves as a central hub for space-related matters.
- One of its essential functions is to collect and disseminate information on national space laws, policies, and regulations.
- In 2022, UNOOSA launched the **Accessing Space Treaty Resources Online (ASTRO)** platform, which compiles national space laws from member states of the Committee on the Peaceful Uses of Outer Space (COPUOS).
- These laws cover everything from satellite registration to liability for space objects. Each country contributes its unique legal framework, reflecting its approach to space exploration.

COSPAR and Planetary Protection

- The **Committee on Space Research (COSPAR)** collaborates with various space agencies to address planetary protection requirements.

COSPAR identifies, prioritises, and plans research and technology development related to planetary protection.

NASA's Earth Observation Data and UNOOSA

- NASA, with its wealth of publicly available Earth observation data, has joined forces with UNOOSA. They signed a MoU emphasising peaceful uses of space.
- It recognises that space exploration isn't just about rockets and rovers; it's also about understanding our home planet better.
- By sharing data and expertise, NASA and UNOOSA contribute to responsible space activities.

Space Law Treaties and Principles

- The **Committee on the Peaceful Uses of Outer Space (COPUOS)** has developed several international treaties and principles related to space activities. These include:
 - **Outer Space Treaty:** It is a **legally binding agreement** and a foundational treaty, **adopted in 1967**, establishes space as a realm for peaceful purposes and prohibits the placement of nuclear weapons in space.
 - One of the most important principles is safeguarding the solar system from contamination by Earth life, and Earth from possible extraterrestrial life forms, as enshrined in Article IX of the Outer Space Treaty.
 - A total of 116 nations have ratified OST and are now responsible for ensuring that private organisations within their territories adhere to the principles of planetary protection.
 - **Rescue Agreement:** Ensures the safe return of astronauts and the recovery of space objects.
 - **Liability Convention:** Addresses liability for damage caused by space objects.
 - **Registration Convention:** Requires countries to register their space objects with the UN.

National Space Laws Around the World

- **Argentina:** It has laws covering everything from creating a National Commission on Space Activities to regulating cultural heritage related to meteorites and celestial bodies.
- **India:** The **Indian Space Research Organization (ISRO)** operates under the Space Activities Act, which governs satellite launches, remote sensing, and space exploration.
- **United States:** NASA operates within a legal framework that includes the National Aeronautics and Space Act and various executive orders.

level of scientific interest in the origin of life and concerns that contamination can compromise future investigations or the safety of Earth.

Planetary Protection: Safeguarding Our Cosmic Neighbors

- Planetary protection refers to the policy and practice of ensuring that our exploration activities don't inadvertently contaminate other planetary bodies with Earth-based biology.
- At the same time, it aims to protect our own biosphere from potential harmful contamination by returning spacecraft.
- Essentially, it's like maintaining cosmic quarantine protocols to prevent unintended cross-contamination.

Planetary Protection Policy

- It was developed by a panel comprising scientists and representatives of 12 space agencies, has existed since the 1960s and was last updated in 2021.
- It is the only internationally-agreed standard available for reference and use by countries. The panel works under the COSPAR, a scientific body set up by Paris-based non-profit International Council of Scientific Unions (now International Science Council) in 1958.
- The panel helps spacefaring nations and private players comply with OST.
- It has classified space missions into various categories, corresponding to the

Changing Landscape

- **Bold Missions:** NASA, international agencies, and commercial entities are planning ambitious missions to explore our solar system. These missions involve sample return from other planets and moons, which necessitates careful handling **to avoid contamination**.
- **Artemis Program:** NASA's Artemis program aims to send humans back to the Moon and eventually to Mars. With human presence, the stakes for planetary protection become even higher.
- **Ocean Worlds:** As we're looking at icy moons like **Europa around Jupiter** and **Enceladus around Saturn** as potential habitats for life. Ensuring we don't accidentally introduce Earth life there is critical.

Recommendations and Guidelines

- Recently, **NASA's Planetary Protection Independent Review Board (PPIRB)** released a report with recommendations.
- **Sample Return and Strict Protocols:** As we bring back samples from Mars and other celestial bodies, strict protocols are essential. The bit carousel on NASA's Mars 2020 mission, for instance, contains tools for sampling the Martian surface without contaminating it.
- **Robotic Missions:** Whether it's exploring asteroids, comets, or other planets, robotic missions must adhere to planetary protection guidelines.
- **Human Missions:** When astronauts set foot on Mars, there is a need for robust **procedures to prevent Earth microbes** from hitching a ride.

PRELIMS

GOLDEN JACKALS (CANIS AUREUS)

Context

- Recent findings reveal that 120-150 golden jackals (estimated) are able to adapt to an urbanised area and coexist with other species Central Ridge Reserve Forest in Delhi.

About the Golden Jackals



- These are widespread species that are fairly common throughout most of its range with high densities observed in areas with abundant food and cover.
- Its range covers parts of the **Palaearctic, South Asia, and northeastern Africa**. In Southeast Europe, they thrive in a mosaic of small cultivations, dense scrub, and lowland wetlands with ample vegetation cover.
- The **Balkan Peninsula**, particularly its southern and eastern regions, hosts some of the largest jackal populations.
- Greece**, in particular, has been a stronghold for golden jackals, although it has faced population declines over the last few decades.

Ecology and Behavior

- They are medium-sized canids, displaying both predator and omnivore traits.
- They adapt well to moderately modified agrosystems with minimal human disturbance.
- Their diet includes small mammals, birds, fruits, and carrion.

- Jackals are **primarily nocturnal**, using dense vegetation for cover during the day.

Threats and Challenges

- Habitat loss due to changes in human agropastoral activities;
- Reduced day-cover availability and potential food scarcity;
- Urbanisation, large cultivated areas without cover, and established wolf populations.
- IUCN Red List Status:** 'Least Concern'

GREEN DEAL OF EUROPEAN UNION

Context

- The European Union is due to set an ambitious target for 2040 to help the bloc become net zero by 2050.

About the European Green Deal

- It was approved by the European Commission in 2020, is a comprehensive set of policy initiatives aimed at transforming the European Union (EU) into a climate-neutral entity by the year 2050.
- The ultimate goal is to achieve **Climate Neutrality by 2050**, where greenhouse gas emissions are balanced out by removals (like planting trees or using carbon capture technologies).
- At least 55% reduction in net greenhouse gas emissions compared to 1990 levels by 2030.

Policy Overhaul

- Circular Economy:** The EU wants to promote circularity—making products that last longer, are repairable, and can be recycled. It is based on “**reduce, reuse, recycle**”.
- Building Renovation:** Better insulation, smarter heating systems, and solar panels on rooftops, and retrofitting old buildings to be energy-efficient.
- Biodiversity:** The EU aims to halt biodiversity loss to save endangered species, protect habitats, and restore ecosystems.

- **Farming:** Agriculture gets a green makeover. Sustainable practices, organic farming, and reducing chemical use.
- **Innovation:** The EU wants to be the Silicon Valley of green tech. From electric cars to clean energy breakthroughs, innovation is the key.
- It includes **initiatives** like REPowerEU; Green Deal Industrial Plan; EU Action to Address Energy Crisis etc.

AVIAN INFLUENZA

Context

- Recently, the World Health Organization (WHO) confirmed a human case of avian influenza (aka bird flu), in a four-year-old child in West Bengal.

About the Avian Influenza (Bird Flu)

- It refers to a disease caused by infection with avian (bird) influenza Type A viruses. These viruses naturally occur among wild aquatic birds worldwide and can infect domestic poultry and other bird species.

Virus Types and Reservoirs

- Avian influenza A viruses have been isolated from over 100 different species of wild birds globally.
- Wild aquatic birds, including ducks, geese, swans, gulls, and terns, serve as reservoirs for these viruses. They can carry the virus in their intestines and respiratory tracts without getting sick themselves.
- Some species, like ducks, may not exhibit symptoms even when infected, but they can shed the virus in their saliva, nasal secretions, and faeces.

Subtypes and Lineages

- Influenza A viruses are divided into subtypes **based on two surface proteins: hemagglutinin (HA) and neuraminidase (NA)**.
- Among birds, 16 HA and 9 NA subtypes have been identified. For instance:
 - **H5N1:** This subtype has caused significant concern. It has led to outbreaks in poultry

and has occasionally infected humans. The current public health risk from H5N1 remains low, but monitoring is crucial.

- **H7N2, H3N8, and others:** These subtypes also circulate among birds and occasionally cause infections in other animals like horses and dogs.

Virus Classification

- **Low Pathogenicity Avian Influenza (LPAI):** These viruses cause mild or no signs of disease in poultry. However, some LPAI viruses can mutate into highly pathogenic strains.
- **Highly Pathogenic Avian Influenza (HPAI):** HPAI viruses cause severe disease and high mortality in infected poultry. Only specific subtypes (such as H5 and H7) are classified as HPAI.

Transmission and Contagiousness

- Avian influenza A viruses are highly contagious among birds. Infected birds can transmit the virus to susceptible birds through direct contact or contaminated surfaces.
- Domesticated bird species, such as chickens, ducks, and turkeys, can become sick and even die from avian influenza.
- Poultry workers and bird outbreak responders should follow strict biosecurity measures to prevent the spread of the virus.

TAXATION ON GREENHOUSE GAS EMISSIONS

Context

- Recently, New Zealand has scrapped a plan to impose tax on greenhouse gas emissions from livestock.

Reasons for Imposing Tax on GHGs From Livestock

- It was introduced by New Zealand to lower carbon footprint through curtailing methane emissions from ruminant species.
- Nearly half of New Zealand's greenhouse gas emissions come from their livestock rearing.

- Methane is a potent greenhouse gas responsible for 30% of warming since preindustrial times, second only to carbon dioxide.

Livestock Emission Challenge

- Livestock—cows and sheep, in particular—are major contributors to New Zealand’s greenhouse gas emissions. These animals emit methane during digestion, primarily through burps.
- Methane is a potent greenhouse gas, with a global warming potential much higher than carbon dioxide over shorter time frames.
- Given that New Zealand has more livestock than people (10 million cattle and a whopping 26 million sheep), addressing these emissions is crucial.

Methane Emissions from Ruminants

- Ruminants have a specialised digestive system that has four compartments, one of which, the rumen.
- Rumen is involved in microbial fermentation and releases methane through belching.

Tacking Methane Emissions

- Initiatives like Global Methane Pledge aims to cut methane emissions by at least 30% by 2030 from the 2020 levels.

PANTANAL WETLAND

Context

- Nearly 32,000 hectares have been destroyed by wildfires in Brazil's Pantanal wetland at a time when the country is under widespread drought.

About the Pantanal Wetland



- It is the **world's largest tropical wetland**, located in the heart of South America, this vast wetland stretches across **Brazil, Paraguay, and Bolivia**.
- The Pantanal boasts the **highest concentration of wildlife on the continent**. Jaguars, giant anteaters, piranhas, howler monkeys, green anacondas and capuchin monkeys including the **hyacinth macaw** (a blue parrot), and **Giant river otters**.

Concerns

- In recent years, the Pantanal faced **unprecedented, early and intense wildfires**. Lack of wet-season rainfall dried out vegetation, allowing fires to spread well before the typical fire season. Over 3,500 square kilometres of the Pantanal burned in early 2024 alone, threatening its delicate balance.
- **El Niño’s Role:** El Niño (2023–24) brought **drier and hotter conditions** to the Pantanal. Irregular rains and an overall precipitation deficit left the region parched.
 - Almost the entire Pantanal was classified as experiencing extreme drought. These conditions predisposed the wetland to a longer and stronger dry season, elevating the fire risk.

GLOBAL GENDER GAP REPORT 2024

Context

- Recently, the World Economic Forum (WEF) released the 'Global Gender Gap Report 2024'.

About the Global Gender Gap Index

- It is an annual benchmark that assesses gender parity across four critical dimensions:
 - Economic Participation and Opportunity;
 - Educational Attainment;
 - Health and Survival;
 - Political Empowerment.

Key Findings

- Global Results and Time to Parity:** The overall global gender gap score in 2024 stands at 68.5% closed. It means that, on average, we've closed 68.5% of the gender gap worldwide.
- While **no country has achieved full gender parity**, 97% of the economies included in this edition have closed more than 60% of their gap (compared to 85% in 2006).
 - Iceland** continues to lead the index, having closed over 90% of its gender gap.
- Based on current data, it will **take approximately 134 years to reach full parity** – that's roughly five generations beyond the 2030 Sustainable Development Goal target.

India's Performance

- India, with its population of over 1.4 billion, has closed 64.1% of its gender gap in 2024.
 - However, **India** slipped two places from last year, ranking **129th** out of 145 countries on the index. **India** now **stands below Bangladesh, Nepal, Sri Lanka and Bhutan** among Asian countries.
- The decline was primarily due to **small drops in the 'Educational Attainment' and 'Political Empowerment' parameters**, although there were **slight improvements** in **'Economic Participation'** and **'Opportunity'** scores.

- Notably, India showed commendable gender parity in terms of secondary education enrollment.
- On the political front, India scored well in the head-of-state indicator but still faces challenges in women's representation at the federal level, ministerial positions, and parliament.

CHEETAH GANDHI SAGAR WILDLIFE SANCTUARY

Context

- Recently, **Madhya Pradesh** said preparations are complete at the **Gandhi Sagar Wildlife Sanctuary in Chenpuriya to bring in more cheetahs from Africa** as part of India's project to reintroduce the animal.

About

- The **cheetah**, once native to India, was declared **extinct in the country in 1952**. However, India has embarked on an ambitious plan to reintroduce these magnificent creatures to their historical habitat. As part of the **Cheetah Reintroduction Project**, efforts are underway to create suitable environments where cheetahs can thrive once again.

Role of Gandhi Sagar Wildlife Sanctuary

- It is situated in **Mandsaur district, Madhya Pradesh**, approximately 270 kilometres away from the **Kuno National Park (KNP)**. This sanctuary covers an expansive area of 64 square kilometres.
- It has been meticulously developed to provide a safe haven for cheetahs, as a wired fence surrounds the area, ensuring their protection, at a cost of ₹17.72 crore.
- Gandhi Sagar Wildlife Sanctuary boasts a thriving ecosystem. Animals like **chitals (spotted deer)** abound, providing **ample prey for the cheetahs**.

Do You Know?

- Cheetah Reintroduction:** In September 2022, eight Namibian cheetahs (five females and three males) were released into enclosures at

Kuno National Park. These pioneers marked the beginning of the cheetah's return.

- **South African Connection:** In February 2023, another batch of 12 cheetahs arrived from South Africa, adding to the growing population.
- **Challenges and Losses:** Unfortunately, since March 2023, seven adult cheetahs and three cubs have passed away in Kuno National Park due to various reasons. These losses highlight the importance of creating additional habitats like Gandhi Sagar.

AEOLUS 1 SATELLITE PROJECT

Context

- Recently, scientists observed that the **Aeolus 1, a satellite-based wind observation technology**, data was improved by 5%.

About the Aeolus: Profiling Earth's Winds

- The Aeolus satellite, launched by the **European Space Agency (ESA)**, embarked on a groundbreaking mission to study Earth's winds from space.
- Aeolus became the **first-ever satellite** to acquire **Vertical Wind Profiles of Earth** on a global scale. By measuring wind speeds and directions at different altitudes, it provided crucial data for weather forecasting and climate research.
- The tropics, with their complex atmospheric dynamics, had long posed challenges for wind measurements. Aeolus filled this gap, offering valuable insights into wind patterns in these regions.
- The wind data from Aeolus **significantly enhanced global weather forecasts**. Accurate wind profiles are essential for predicting storms, understanding atmospheric circulation, and improving climate models.

What's Next?

- **Phase F:** Aeolus now enters Phase F, following its operational Phase E2. The goal is to provide

high-quality, validated wind and aerosol/cloud products.

- These data will continue to impact numerical weather prediction and enable new atmospheric dynamics studies. **Phase F will run until the end of 2028.**

SUBJECTIVE QUESTIONS

1. How might the slowing down of wind circulations across the globe impact global weather patterns and climate systems? Consider the potential effects on temperature distribution, precipitation, and extreme weather events.
2. Given the increasing frequency and intensity of heatwaves in India, what are the most effective and sustainable strategies for protecting livestock from heat stress, particularly in rural areas with limited resources?

MCQS

1. Recently, Gandhi Sagar Wildlife Sanctuary was in news to bring in more cheetahs from Africa, is located in:
 - (a) Maharashtra
 - (b) Madhya Pradesh
 - (c) Odisha
 - (d) Chhattisgarh
2. The 'Global Gender Gap Report 2024' was released by:
 - (a) United Nations Department of Economic and Social Affairs (UNDESA)
 - (b) International Monetary Fund (IMF)
 - (c) World Bank
 - (d) World Economic Forum (WEF)
3. With reference to the 'Global Gender Gap Report 2024', consider the following statements:

1. Iceland continues to lead the index, having closed over 90% of its gender gap.
 2. India stands below Bangladesh, Nepal, Sri Lanka and Bhutan among Asian countries.
- 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
4. The term '*Green Deal*' of the European Union envisaged *Climate Neutrality* by which of the following year?
 - (a) 2050
 - (b) 2070
 - (c) 2030
 - (d) 2040
 5. Which one of the following countries has scrapped a plan to impose tax on greenhouse gas emissions from livestock?
 - (a) Sweden
 - (b) New Zealand
 - (c) Norway
 - (d) Japan
 6. Recently, *Pantanal wetland* sometimes appeared in the news, is located in:
 - (a) Brazil
 - (b) Argentina
 - (c) Paraguay
 - (d) Ecuador

Answer Key: _____

1. (b) 2. (d) 3. (c) 4. (a) 5. (b) 6. (a)

