

GS PAPER3-ENVIRONMENT-CLIMATE CHANGE**Recent Global Temperature Trends and Climate Change**

The article discusses how the global temperature between July 2023 and June 2024 was the highest ever recorded. It highlights the ongoing rise in temperatures and the urgent need for stronger climate adaptation measures. It also notes that India, like many places, is very vulnerable to climate disasters and must improve its response to protect its people.

What are the Recent Global Temperature Trends?

1. The global average temperature between July 2023 and June 2024 was the highest on record. The planet was 1.64 degrees Celsius warmer than pre-industrial levels, according to the European Union's Copernicus Climate Change Service.
2. Although this does not mean the Paris Climate Pact's 1.5 degrees threshold has been breached permanently, as the pact considers decadal averages, it is a significant indicator of warming.
3. June of last year was the hottest June ever recorded. Although the onset of La Nina might cool some regions temporarily, the overall trend shows a warming climate.

What Are the Current Challenges in Climate Policy?

1. Global efforts to reduce greenhouse gas emissions have been insufficient, with **no clear agreement on which countries should bear the majority of the decarbonization efforts.**
2. The IPCC's latest reports suggest that current strategies to build resilience against climate change are too small and short-term, focusing mainly on immediate risks.

What is the Situation in India?

1. Over 80% of India's population is at risk from climate-related disasters, with many areas having low capacity to adapt.
2. India has a climate adaptation plan, but frequent natural disasters like landslides, floods, and heat waves show more improvements are needed.
3. Cities like Delhi, Mumbai, and Bangalore struggle with infrastructure that cannot handle extreme weather, such as heavy rainfall.

GS PAPER3-INDIAN ECONOMY-INFLATION**Factors affecting food production and its price outlook**

The article discusses how India's high food prices keep overall inflation high, making it hard for the Reserve Bank of India to lower inflation to their target of 4%. It explains that weather changes, like poor monsoon rains and climate-related events, increase food prices, which needs addressing through better farming methods and infrastructure.

What is the current economic situation in India?

1. **Inflation Dynamics:** The overall inflation target by the Reserve Bank of India (RBI) is 4%, but the actual rate is currently at 4.8%.
2. **Persistent Food Inflation:** Food inflation remains high, averaging 6.4% between 2020-21 and 2023-24, which significantly influences overall inflation.
3. **Recent Trends:** In 2023-24, while the overall Consumer Price Index (CPI) fell to 5.4%, food inflation increased to 7.5% and further to 8.7% in the early months of the current fiscal year, highlighting the ongoing challenge of controlling food prices.

How significant is food inflation?

1. **High Weight in CPI:** Food accounts for nearly 40% of the Consumer Price Index (CPI) basket, making it a significant factor in overall inflation.
2. **Historical Data:** In years when CPI was close to the 4% target, food inflation was also low. For example, during 2000-2006, CPI averaged 3.9% with food inflation at 2.5%.
3. **Recent Spike:** After the pandemic, food inflation surged to an average of 6.4%, with food prices exceeding 6% for 28 out of 50 months, highlighting its persistent impact on overall inflation levels.

What are the factors affecting food production and its price outlook?

1. **Monsoon Reliability:** Traditionally a key determinant of agricultural success, the monsoon's unpredictability, exacerbated by climate change, affects crop yields.
2. **Water Resources:** Heatwaves have depleted groundwater levels, essential for irrigation, affecting crops like wheat and impacting dairy and poultry outputs.
3. **Crop Damage:** Unseasonal rains have damaged crops during critical harvesting and transportation stages, leading to increased food prices.
4. **Global Warming Effects:** Events like El Niño, intensified by global warming, have resulted in significant weather anomalies, influencing food production negatively.

What should be done to control climate change's impact on food?

1. **Enhance Agricultural Infrastructure:** Upgrade facilities from production to storage and transportation to better withstand climate impacts.
2. **Develop Climate-Resistant Crops:** Promote and expand the use of heat-resistant and drought-tolerant crop varieties to maintain productivity under changing climate conditions.
3. **Increase Irrigation Coverage:** Expand irrigation infrastructure to ensure water availability even during adverse weather conditions, with only 57% of agriculture currently covered.
4. **Boost Research and Development:** Increase investment in agricultural R&D, currently at just 0.5% of agriculture GDP, to innovate better farming practices and technologies.
5. **Improve Food Processing and Storage:** Encourage development in food processing and cold storage to reduce wastage and stabilize supply chains.

GS PAPER3- INDIAN ECONOMY – ISSUES RELATING TO MOBILIZATION OF RESOURCES**India's GST system needs further reform**

The article discusses the need for further reforms in India's GST system. It highlights increased revenue but points out that more changes are needed to reduce distortions, simplify rates, and expand the tax base to improve efficiency and compliance.

What is the current status of GST revenue?

1. GST has replaced 14 indirect taxes, leading to a streamlined tax system.
2. In April 2024, GST collections reached a record high of ₹22.1 trillion, marking a 15.5% increase compared to the previous year.
3. For the first quarter of the financial year, GST revenues were ₹85.57 trillion, slightly higher than the ₹85.05 trillion collected in the same period last year.
4. This represents a 10.2% growth in GST collections, surpassing the estimated nominal GDP growth.
5. Such growth in revenues is attributed to robust economic performance and enhanced compliance facilitated by improved tax administration and technology integration.

What changes are required for a better GST system?

1. **Expand the GST Base:** Include sectors like petroleum products, electricity, and real estate in the GST. Currently, petroleum products are excluded due to their significant contribution to state revenues (over 40%), but their inclusion could reduce the cascading effect of taxes on other sectors.
2. **Rationalize Rates:** Reduce the number of GST rates to simplify the system. For instance, merging the 12% and 18% rates into a 16% rate could be revenue neutral, while increasing the items taxed at 5% to 8% could enhance revenue without major disruptions.
3. **Limit Exemptions:** Exemptions should be confined to unprocessed foods and perishables. Taxing other items, previously exempted, at a lower rate of 8% can broaden the tax base and increase revenue without impacting price stability significantly.
4. **Focus on Major Taxpayers:** By keeping thresholds high, the system can concentrate on larger taxpayers. Data from Karnataka shows that although 93% of GST dealers were small businesses, they accounted for only a small portion of the turnover and tax paid. This approach ensures that compliance efforts are efficiently targeted.

GS PAPER3-DISASTER AND DISASTER MANAGEMENT**Reasons and solutions for floods in the National Capital Region (NCR) of India**

The article discusses the recurring issue of flash floods in the National Capital Region (NCR) of India. It traces the problem back to historical flood patterns and modern urban development, suggesting long-term solutions to manage and mitigate flooding, rather than completely preventing it.

What are the reasons for floods in the National Capital Region (NCR) of India?

1. **Historical Patterns:** Traditionally, the Indo-Gangetic floodplain, where the NCR is located, experienced quick floods that receded fast, enhancing soil fertility.
2. **Developmental Changes:** Early public works during British rule, like building canals and railways with embankments, disrupted natural drainage patterns.
3. **Urbanization:** Rapid city expansion has led to increased waterlogging, exacerbated by blocked drainage and inadequate infrastructure.
4. **Geographical Features:** The NCR's location on a flat floodplain far from the sea limits natural water drainage options.

5. **Climate Factors:** Excessive rainfall quickly saturates the ground and phreatic water table, leading to overflow since the extra water cannot be absorbed or drained away efficiently.

What are the Long-Term Solutions for It?

1. **Upstream Reservoirs:** Building reservoirs in the hills to regulate river flow and mitigate downstream flooding.
2. **Enhancing Water Storage:** Increasing the area and capacity of ponds, wells, lakes, and other water-harvesting structures to hold excess water during the monsoon.
3. **Reducing Impervious Surfaces:** Minimizing concrete and asphalt cover in urban areas to enhance the natural recharge of sub-surface water.
4. **Improving Drainage Systems:** Clearing and maintaining natural drainage paths and designing urban infrastructure to prevent water accumulation in low-lying areas.
5. **Regular Maintenance:** Ensuring that drainage systems are free of obstructions to maintain efficient water flow.

PRELIM FACT

1. Equity Mutual Funds

The Association of Mutual Funds in India (Amfi) recently reported that inflows into India’s equity mutual funds reached a record high of Rs 40,608 crore (about \$5 billion) in June, marking a 17% sequential increase.

About Equity Mutual Funds

1. **About:** Equity mutual funds are investment vehicles that collect money from multiple investors to buy a portfolio of stocks, also known as equity securities.

2. **Purpose:** They allow individuals to invest in a diversified collection of stocks managed by professionals.

3. Benefits of Equity Mutual Funds:

i) **Professional Management:** These funds are managed by experts who make investment decisions on behalf of the investors.

ii) **Diversification:** By holding stocks from various companies, equity funds reduce the risk associated with any single stock’s poor performance.

4. Types of Equity Funds:

i) **Actively Managed Funds:** These funds have portfolio managers who actively research, analyze, and select stocks with the goal of outperforming a benchmark index (e.g., the S&P 500). They charge higher fees due to their hands-on approach.

ii) **Passively Managed Funds (Index Funds):** These funds aim to replicate the performance of a specific market index (e.g., S&P 500) by holding the same stocks in the same proportions. They have lower fees and track the index closely without trying to outperform it.

4. Risk and Returns:

i) **Long-Term Growth:** Equity funds can offer attractive long-term returns, making them a popular choice for investors with longer time horizons.

ii) **Market Volatility:** The value of equity funds can fluctuate due to stock market changes, posing a risk to investors.

iii) **Suitability:** Best suited for investors who can tolerate market ups and downs and are investing for the long term to maximize growth potential.

2. Veerangana Durgavati Tiger Reserve

The Madhya Pradesh government has launched an inquiry into allegations of tiger poaching and irregularities in the newly established Veerangana Durgavati Tiger Reserve.

	Description
Aspects About	1. The reserve spans across Sagar, Damoh, and Narsinghpur districts in Madhya Pradesh. 2. It covers a vast area of 2,339 square kilometers, incorporating regions from the Nauradehi Wildlife Sanctuary and Durgavati Wildlife Sanctuary. 3. It is the seventh tiger reserve in Madhya Pradesh. It is named after Rani Durgavati, the queen of the Gond people.
Features	1. The reserve features a variety of landscapes, including hills, valleys, rivers, streams, waterfalls, and grasslands. 2. A green corridor will be developed to link the Panna Tiger Reserve with Durgavati, facilitating the natural movement of tigers between the reserves. 3. It includes parts of the Narmada and Yamuna River basins. The historic Singorgarh Fort is located within the reserve.

Vegetation	The vegetation is primarily dry deciduous.
Fauna	Key plant species include Teak, Saja, Dhaora, Ber, and Amla.
Flora	1. The reserve is home to tigers, leopards, wolves, jackals, Indian foxes, striped hyenas, Nilgai, Chinkara, Chital, Sambhar, Black Buck, Barking deer, Common Langur, and Rhesus Macaque. 2. It is one of the few places where the critically endangered White-Rumped and Indian Vultures are found.
Importance of the Reserve	1. As the seventh tiger reserve in Madhya Pradesh, it plays a crucial role in protecting and conserving tigers. 2. The reserve supports a wide range of flora and fauna, contributing to the region's ecological balance. 3. The presence of Singorgarh Fort and the reserve's name honor the historical and cultural significance of the area.

3. India's Deep Drilling Project in Maharashtra

India is conducting a deep-drilling project in Karad, Maharashtra.

India's Deep Drilling Project in Maharashtra

1. India is conducting a deep-drilling project in Karad, Maharashtra, under the Borehole Geophysics Research Laboratory (BGRL) to study reservoir-triggered earthquakes in the Koyna-Warna region.
2. The goal is to drill a 6-km deep borehole to gather data on earthquakes and the Earth's crust.

About Scientific deep-drilling Technique

1. Scientific deep-drilling involves strategically digging boreholes to examine the deeper layers of the Earth's crust.
2. This process provides opportunities to study earthquakes and enhances our understanding of the planet's history, rock formations, energy resources, life forms, climate change patterns, and more.

3. Importance of Deep Drilling

- i) **Earthquake Study:** Deep drilling allows scientists to directly observe and study the Earth's interior, helping understand and predict earthquakes, especially those in the interior of tectonic plates.
- ii) **Comprehensive Analysis:** It provides insights into rock types, geological history, energy resources, and climate change.

4. Techniques and Methods

- i) **Drilling Strategy:** A hybrid of mud rotary drilling and air hammering is used.
- ii) **Mud Rotary Drilling:** Uses a rotating rod with a diamond drill bit, cooled by drilling mud, which also brings rock cuttings to the surface.
- iii) **Air Hammering:** Uses compressed air to deepen the borehole and remove debris.
- iv) **Drilling Equipment:** The project uses a rig capable of both techniques, adjusting methods based on rock type and other conditions.

5. Challenges

- i) The Earth's interior is hot, dark, and high-pressure, making long-term drilling difficult.
- ii) Issues include maintaining drilling pressure, handling rock cores, and dealing with water inflow and fault zones.
- iii) Skilled personnel are required for continuous, on-site engagement for extended periods.

6. Findings and Benefits

- i) The pilot borehole revealed ancient Deccan trap lava flows and granitic basement rocks. Measurements provided data on rock properties, fluid composition, temperature, stress regimes, and fracture orientations.
- ii) Acoustic and micro-resistivity techniques captured detailed images of the borehole wall.
- iii) Water was found at a depth of 3 km, indicating deep percolation. The region is critically stressed, meaning even small stress changes can trigger earthquakes.

7. Future Prospects

- i) Data from the pilot borehole will guide future drilling. Researchers are studying rock samples to understand earthquake mechanics and microbial life in extreme environments.
- ii) Global researchers are interested in using the core samples for studies, including carbon capture and storage.

4. Mitochondrial donation

Mitochondrial disease (Mito) encompasses a group of disorders that impair mitochondria's ability to produce the energy necessary for organs to function, potentially leading to organ failure.

A new procedure called mitochondrial donation offers a cure for Mito.

Mitochondrial Disease:

- Types: Caused by faulty genes in nuclear DNA (inherited from both parents) or mitochondrial DNA (inherited from the mother).
- Symptoms: Affects 1 in 5,000 people, impacting energy-intensive organs like the heart, brain, and muscles.

Mitochondrial Donation:

- Procedure: An IVF-based technique allowing parents with faulty mitochondrial DNA to have genetically related children without passing on the disease.
- Process: Involves transferring nuclear DNA from an egg with faulty mitochondria to a donor egg with healthy mitochondria. The resulting child inherits nuclear DNA from the parents and mitochondrial DNA from the donor.

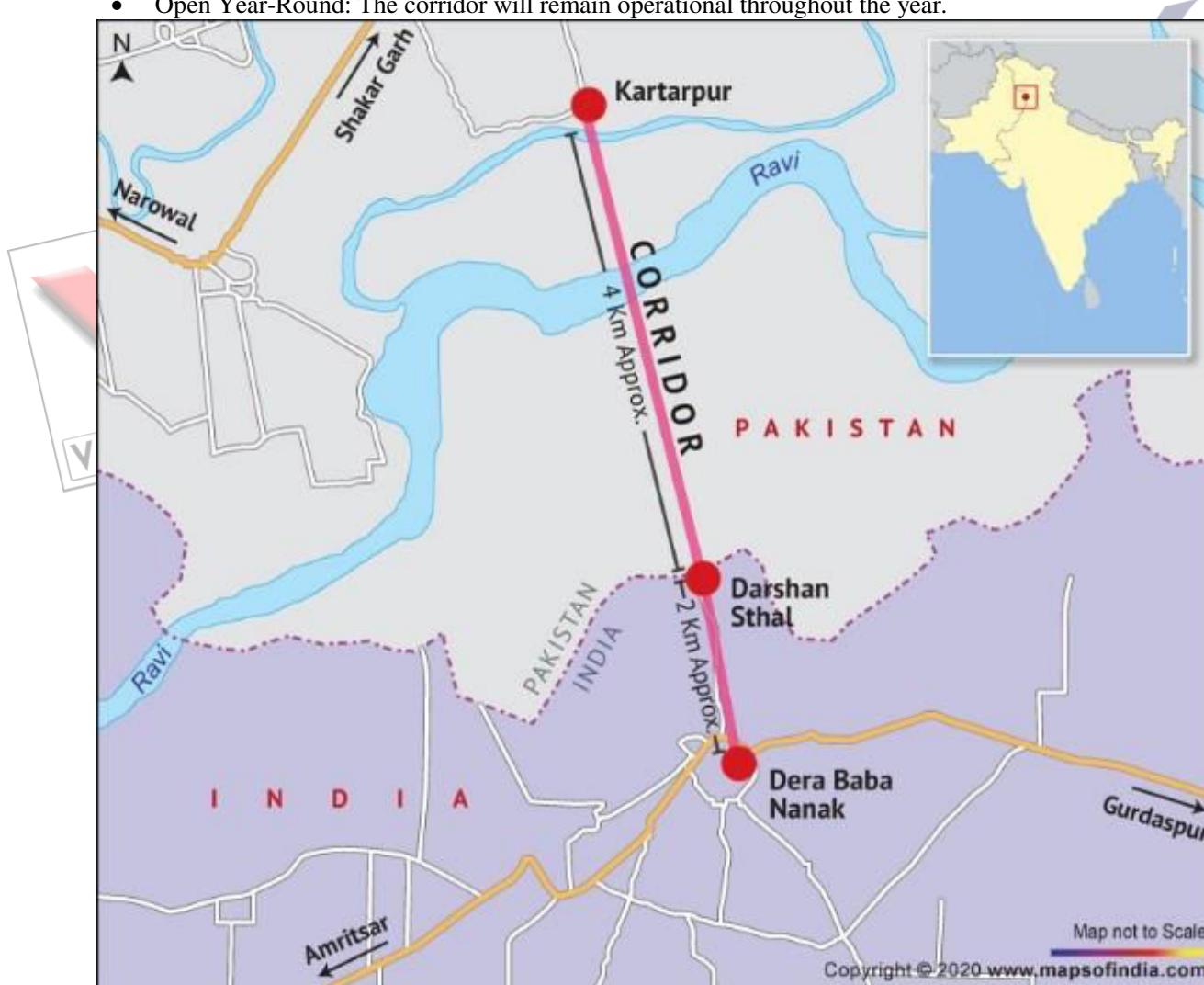
5. Kartarpur Corridor

Pakistan has completed the 420-meter-long bridge at the zero line of the Kartarpur Corridor after a delay of two and a half years.

- The bridge was necessary due to the area’s susceptibility to flooding, ensuring a safe passage for visitors to the Gurdwara Darbar Sahib.

About Kartarpur Corridor:

- Connects Darbar Sahib Gurdwara in Pakistan with Dera Baba Nanak shrine in India’s Punjab.
- Visa-Free Movement: Indian pilgrims need only a permit to cross into Pakistan.
- Commemoration: Built to celebrate the 550th birth anniversary of Guru Nanak Dev on November 12, 2019.
- Open Year-Round: The corridor will remain operational throughout the year.



ANSWER WRITING

Q. India's journey towards achieving Sustainable Development Goals (SDGs) is intricately linked with its demographic dynamics. Critically examine the challenges and opportunities presented by India's population trends in the context of SDG implementation.

India's path to realising the Sustainable Development Goals (SDGs) is deeply intertwined with its demographic trends. The nation's vast and diverse population presents both significant challenges and unique opportunities in the pursuit of these global objectives. Managing and leveraging these demographic dynamics is crucial for India's progress towards sustainable development, impacting various sectors including health, education, employment, and environmental sustainability.

Challenges:

- **Population Growth:** Strain on **resources** and **infrastructure** due to **increasing demand** for healthcare, education, and housing, leading to **environmental degradation** and **resource overuse**.
For example: Delhi's air quality crisis has worsened over the years due to high **population density** and increased **vehicular emissions**.
- **Youth Bulge:** Requires substantial **investments** in education and skill development to avoid high **unemployment rates**, **social unrest**, and **economic instability**.
- **Ageing Population:** Rising **healthcare** and **social security costs** necessitate policies to support elderly care, ensuring **financial** and **social security**.
For example: The National Programme for Health Care of the Elderly (NPHCE) addresses healthcare needs of the ageing population.
- **Urbanisation:** Rapid urban growth leads to the proliferation of **slums**, inadequate **urban infrastructure**, and increased pressure on essential **urban services**.
For example: Mumbai's slums, such as **Dharavi**, face severe sanitation and housing challenges due to rapid urbanisation.
- **Regional Disparities:** Uneven **population growth** and **development** across regions create disparities in **access to resources, services, and opportunities**.
For instance: Bihar and Kerala show stark contrasts in **development indicators**, highlighting regional disparities.
- **Health Challenges:** **Overburdened** healthcare systems and **high out of pocket expenditure** cause hindrance in addressing the needs of a large, diverse population, impacting overall **health outcomes**.
For example: The COVID-19 pandemic highlighted the strain on India's **healthcare infrastructure**.
- **Education Inequality:** Disparities in **educational access** and **quality** hinder the potential of youth, affecting long-term **socio-economic development**.
For instance: Rural schools often lack **basic facilities** and **trained teachers** compared to urban counterparts.
- **Employment Generation:** Creating sufficient **job opportunities** to match the growing workforce is challenging, leading to **underemployment** and **informal sector** growth.
For instance: Recent growth of India's economy is often termed as "**Jobless Growth**".
- **Social Infrastructure:** **Inadequate social infrastructure** in rural and urban areas hampers efforts to improve **living standards** and achieve **SDG targets**.
For instance: Access to clean drinking water, specially in summers remains a significant issue in many rural areas.

Opportunities:

- **Demographic Dividend:** A large **working-age population** can drive **economic growth**, enhancing **productivity** and **innovation** with proper education and training.
For example: India's IT sector benefits from a young, skilled workforce, contributing significantly to the economy.
- **Gender Equality:** Empowering **women** leads to more **inclusive** and **equitable growth**, improving **maternal** and **child health outcomes** significantly.
For example: The Beti Bachao Beti Padhao initiative promotes the education and welfare of girls.
- **Technological Advancements:** **Digital initiatives** enhance **access to education** and **healthcare**, while **e-governance** improves **service delivery** and **transparency**.
For example: The Digital India program aims to transform the country into a **digitally empowered society**.

- **Sustainable Urban Development:** Smart city initiatives address urbanisation challenges, promoting **green infrastructure** and **sustainable practices** to mitigate environmental impacts.
For example: The **Smart Cities Mission** focuses on **sustainable** and **inclusive** urban development.
- **Renewable Energy:** Leveraging a young, **innovative** workforce to develop and implement **renewable energy solutions** can drive **sustainable development** and **energy security**.
For instance: India's **solar power capacity** has rapidly expanded, contributing to energy security and sustainability.
- **Agricultural Innovation:** Modernising agriculture through **technology** and **sustainable practices** can boost **productivity**, ensure **food security**, and improve **rural livelihoods**.
For example: The **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)** aims to enhance **water use efficiency** and **agricultural productivity**.
- **Healthcare Improvements:** Investments in **healthcare infrastructure** and **services** can address population health challenges, improving overall **well-being** and **productivity**.
For example: The **Ayushman Bharat** scheme provides **health insurance coverage** to millions of **low-income families**.
- **Educational Reforms:** Enhancing **educational access** and **quality** can unlock the potential of youth, fostering a **knowledgeable** and **skilled workforce**.
For example: The **New Education Policy (NEP) 2020** aims to overhaul the education system to meet global standards.
- **Skill Development:** Focused skill development programs can equip the workforce with relevant skills, enhancing **employability** and **economic growth**.
For example: The **Pradhan Mantri Kaushal Vikas Yojana (PMKVY)** provides **industry-relevant skill training**.
- **Inclusive Policies:** Implementing policies that promote **social inclusion** and **equity** can ensure that all demographic groups benefit from development initiatives.
For example: The **Jan Dhan Yojana** aims to increase **financial inclusion** by providing banking services to the **unbanked population**.

India's demographic dynamics offer a complex mix of challenges and opportunities in the context of SDG implementation. Addressing population-related issues through strategic planning, investments in human capital, and sustainable policies is essential. By harnessing the potential of its demographic dividend and ensuring inclusive growth, India can make significant strides towards achieving the SDGs, thereby securing a prosperous and sustainable future for its citizens.

MCQS

1. Consider the following statements:
 1. Guru Nanak Dev was the founder of Sikhism.
 2. Guru Nanak Dev's teachings were compiled into the Guru Granth Sahib during his lifetime.
 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
2. Consider the following statements about the National Bank for Agriculture and Rural Development (NABARD):
 1. The National Bank for Agriculture and Rural Development (NABARD) is fully owned by Reserve Bank of India
 2. It functions under the Department of Financial Services (DFS) under the Ministry of Finance.
 Which of the statements given above is/are correct?
 - a) Only one
 - b) Only two
 - c) All three
 - d) None
3. Consider the following statements:
 1. Mitochondria store genetic information in the form of DNA.
 2. Mitochondria are involved in the synthesis of lipids and proteins.
 3. Mitochondria play a role in programmed cell death.
 How many of the above statements is/are correct?
 - a) Only one
 - b) Only two
 - c) All three
 - d) None
4. In the context of hereditary diseases, consider the following statements:

1. Passing on mitochondrial diseases from parent to child can be prevented by mitochondrial replacement therapy either before or after in vitro fertilization of the egg.
2. A child inherits mitochondrial diseases entirely from mother and not from father.
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
5. Consider the following statements regarding Kartarpur Sahib pilgrim corridor.
 1. It is a visa-free border crossing and secure corridor, connecting the Gurdwara Darbar Sahib in Pakistan to the border with India.
 2. The gurdwara in Kartarpur stands on the bank of the river Ravi.
 3. The place holds significance because the first guru of Sikhism, Guru Nanak was born in Kartarpur.Which of the above statements is/are correct?
 - a) 1 and 2 only**
 - b) 2 and 3 only
 - c) 1 and 3 only
 - d) 1, 2 and 3
6. Which of the following statements about NABARD is/are correct?
 1. NABARD provides refinance to banks for loans extended to the agriculture sector.
 2. NABARD is involved in the implementation of the government's rural development schemes.
 3. NABARD directly lends to farmers for agricultural purposes.Select the correct answer using the code below:
 - a) 1 only
 - b) 1 and 2 only**
 - c) 2 and 3 only
 - d) 1, 2 and 3
7. Consider the following statements.
 1. People with blood disorders like thalassemia, haemophilia, and sickle cell disease are eligible for job reservations in government roles under the Persons with Disabilities category.
 2. As per rules regarding Reservations for disabled people, 4% reservation in government jobs is available for people with disabilities.
3. The Rights of Persons with Disabilities Act includes Intellectual disability and Mental illnesses as benchmark disabilities.
How many of the above statements is/are correct?
 - a) Only one
 - b) Only two**
 - c) All three
 - d) None
8. Consider the following statements:
 1. Divorced woman is not entitled to a claim of maintenance under the Code of Criminal Procedure (CrPC), 1973, against her former husband.
 2. Article 15(3) read with Article 39(e) manifests a constitutional commitment towards special measures to ensure a life of dignity for women at all stages of their lives.
 3. Muslim Women (Protection of Rights on Divorce) Act guarantees the payment of maintenance to a divorced Muslim woman by her former husband during the period of iddat.How many of the statements given above is/are correct?
 - a) Only one
 - b) Only two**
 - c) All three
 - d) None
9. Consider the following statements with reference to application of scientific deep-drilling:
 1. To observe and analyse deeper parts of the earth's crust.
 2. Provides access to study earthquakes and deepen understanding of the planet's history.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
10. Veerangana Durgavati tiger reserve is located in which of the following state?
 - a) Odisha
 - b) Chhatisgarh
 - c) Jharkhand
 - d) Madhya Pradesh**