

**CLIMATE CHANGE****Context: India's need for climate-smart agriculture****Introduction**

The two most significant problems facing humanity in the twenty-first century are food insecurity and climate change. According to reports, severe drought is occurring on the world's southern continents as a result of climate change, which has a detrimental effect on agricultural output and farmers' livelihoods.

**Climate change's effects on food systems:**

- The greater demand for food is a result of both dietary changes and population growth. The productivity of conventional farming methods is declining due to climate change. To lessen the adverse effects of climate change, farmers are implementing a range of adaptation strategies.
- The simultaneous difficulties of climate change adaptation and mitigation, coupled with the urgent need to increase agricultural productivity by 60% by 2050 to meet food demand, necessitate a comprehensive approach.

**A practical choice**

- Climate-smart agriculture (CSA) offers a comprehensive framework and is a feasible option.
- "Climate smart agriculture is an approach for transforming food and agriculture systems to support sustainable development and safeguard food security under climate change," the Food and Agriculture Organization (FAO) stated in 2019.

**Three pillars or aims make up CSA:**

1. Increase agricultural revenues and productivity in a sustainable manner
  2. Develop resilience and adapt to climate change
  3. Eliminate or minimize greenhouse gas emissions whenever feasible.
- Water smart, weather smart, energy smart, and carbon smart practices are some aspects of climate smart practices. They address land degradation, raise productivity, and enhance soil health.

**Climate change's future effects on agricultural productivity:**

- India may see a 9% decrease in crop yield between 2010 and 2039 as a result of climate change. A major transformation of the agriculture industry is needed to mitigate climate change and sustainably increase agricultural revenue and output.
- The foundation of CSA is the achievement of the Sustainable Development Goals (SDGs), which are intended to end hunger and improve environmental management through sustainable agriculture and rural development.
- In India's adaptation strategies, the National Action Plan on Climate Change (NAPCC) highlights the importance of climate resilient agriculture.
- Precision nutrient management is used by initiatives like the Soil Health Card Scheme (SHC) to maximize agricultural practices. In India, the idea of precision farming is still relatively new.

**Climate smart agriculture's (CSA) benefits include:**

- Agricultural diversification, increased water efficiency, and the integration of drought-resistant agricultural varieties are all encouraged by CSA, which helps mitigate the disruptive impacts of climate change.
- Because it may boost agricultural productivity while preserving ecological stability—a critical component of long-term food security and sustainable resource use on a warming planet—CSA is significant.
- CSA improves resistance to long-term stressors including shorter seasons and unpredictable weather patterns by lowering exposure to climate-related risks and shocks.
- CSA also contributes to farmers' increased economic independence. The CSA drastically alters the economic and social structure of farming communities by disseminating knowledge about and facilitating access to climate resilient practices.
- Farmers, especially those who are already disadvantaged, stand to gain much from the adoption of climate smart strategies as the climate changes. The growing acceptance of CSA is a positive sign for the preservation of biodiversity in the future.

- The ecosystem-based strategy and diversity of crop varieties employed by CSA facilitate the coexistence of wild regions with agriculture. This cooperative effort lessens the effects of habitat degradation, protects native plant species, and maintains stable pollinator populations.

**Changes in climate and agriculture:**

- CSA improves the carbon storage capacity of farmland. The success of the CSA is strongly linked to the Paris Agreement's goal of limiting global warming to 2 degrees Celsius over pre-industrial levels via lowering GHG emissions.
- Two examples of CSA practices that could assist India in fulfilling its international commitments and aiding in the worldwide battle against climate change are agro forestry and carbon sequestration.

**An exceptional occasion**

- Small or marginal farmers make up the bulk of Indian farmers. As a result, CSA can be quite helpful in assisting them in growing their profits.
- Several government initiatives in India that focus on climate change adaptation include the National Adaptation Fund for Climate Change, National Innovation on Climate Resilient Agriculture, Soil Health Mission, Pradhan Mantri Krishi Sinchayee Yojana, Paramparagat Krishi Vikas Yojana, Biotech-KISAN, and Climate Smart Village.
- The implementation of CSA is also being pushed by a number of public and commercial sector organizations, including NGOs and farmer producer organizations (FPOs).

**Conclusion:**

Through the integration of sustainability, resilience, and innovation, CSA has the potential to provide food security, empower farmers, and safeguard our fragile ecosystems. The CSA's trajectory is noteworthy as a source of transformation and inspiration for people worldwide striving to secure a sustainable future in the face of climate change.

**INTERNATIONAL RELATIONS**

**Context: Changing Dynamics of China-US Relations, Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.**

**In News, why?**

- India is concerned about the "changing dynamics" in China-US relations following China and the US's recent bilateral meeting in San Francisco, California, on the fringes of the Asia-Pacific Economic Cooperation (APEC) summit.
- Over the past few decades, there have been substantial changes and complications in the relationship between China and the US, indicating a combination of competitiveness, collaboration, and tense times.

**Which aspects of the meeting stood out the most?**

- New Areas of Engagement: Artificial intelligence (AI) regulation was one of the main topics of discussion during the summit, as it has the potential to significantly influence worldwide AI laws and technological developments.

**Consensus on Energy:**

- An deal to drastically boost clean energy, phase out fossil fuels, and cut emissions that contribute to global warming was announced by the US and China.
- When combined, they produce 38% of the greenhouse gasses in the globe.
- In order to "accelerate the substitution for coal, oil, and gas generation," the nations decided to "pursue efforts to triple renewable energy capacity globally by 2030."

**How have ties between the US and China been recently?**

- The US has taken a more aggressive stance in recent years, launching a trade war, going after Chinese tech companies, and contesting China's territorial claims. Human rights concerns exacerbated tensions between China and Hong Kong, particularly with reference to Xinjiang.
- On a number of fronts, including trade, technology, and human rights, the US has remained resolute in its pursuit of collaboration on international problems such as climate change.

**What worries does India have about the US-China relationship changing?**

- Potential G-2 Dynamics: India continues to be wary of the rise of a strong Sino-American alliance in Asia, dubbed the "G-2," which might marginalize other international actors and jeopardize India's strategic objectives.
- US-China Cooperation on AI Regulation: India is keeping an eye on emerging US-China cooperation, especially in the field of AI regulation.
- Possible agreements in this area between the two countries might have a big impact on global AI regulations and technical developments, which would affect India's IT scene.

**US-China Business Relations:**

- India is concerned about China's efforts to entice US corporate leaders back to China. In the event that it is successful, it could lessen India's appeal to Western investors and influence business dealings.
- If the 'China option' is no longer an option for Western corporations, India cannot afford to become complacent.
- Maintaining India's attractiveness to Western investors is still vital, and this calls for ongoing attempts to cooperate effectively with Western business interests.

**Taiwan and Indo-Pacific Dynamics:**

- It is concerning that regional security negotiations have not produced any meaningful progress, particularly when it comes to delicate subjects like Taiwan.
- India keenly monitors the US-China conversation regarding the Indo-Pacific, cognizant of its consequences for the stability and security dynamics of the area.

**The Way Ahead**

- India needs to be constantly evaluating the shifts in the great power relations, particularly those involving the US, China, and Russia.
- India should prioritize managing its challenging relations with China, preserving its long-standing connections with Russia, and seizing the opportunity to deepen its ties with the US.
- India's forward route entails taking a measured and aggressive stance, making use of international alliances, economic expansion, deft diplomacy, and strategic manoeuvring to negotiate a shifting global landscape, protect its interests as a nation, and advance stability and advancement on a global scale.

**PRELIM FACTS****1. Lysozyme**

**Context:** Recently, researchers have achieved a significant breakthrough in disease study through the creation of a two-dimensional (2D) protein monolayer using lysozyme molecules.

- Lysozyme is a naturally occurring enzyme found in various bodily secretions like tears, saliva, mucus
- It plays a crucial role in the body's defense system against bacteria.
- This enzyme works by breaking down the cell walls of certain bacteria, essentially disrupting their structure and leading to their destruction.
- It is also the principal component of airway fluid, serving as a model protein in investigating diseases like Amyloidosis, which trigger multi-organ dysfunction.
- Amyloidosis refers to a group of rare conditions characterized by the accumulation of abnormal protein clumps called amyloids in various organs and tissues throughout the body.
- These amyloid proteins, typically made up of misfolded proteins, can disrupt normal organ function such as the heart, kidneys, liver, spleen and cause damage over time.
- Scientists assembled lysozyme molecules into a 2D monolayer at the interface of a pure water subphase.
- These meticulously arranged layers of lysozyme, positioned at different interfaces, provide an exceptional model for delving into the complexities of Amyloidosis.

**2. Amaterasu**

**Context:** Scientists recently detected the most powerful cosmic ray seen in more than three decades, which has been named 'Amaterasu'.

- It is one of the highest-energy cosmic rays ever detected.

- It has been named Amaterasu after the Japanese sun goddess.
- It has an energy exceeding 240 exa-electron volts (EeV). That is millions of times more than particles produced in the Large Hadron Collider, the most powerful accelerator ever built, and equivalent to the energy of a golf ball travelling at 95mph.
- It comes only second to the Oh-My-God particle, another ultra-high-energy cosmic ray that came in at 320 EeV, detected in 1991.
- Amaterasu appears to have emerged from the Local Void, an empty area of space bordering the Milky Way galaxy.

### **3. Constitution Day or Samvidhan Divas**

India celebrates Constitution Day or Samvidhan Divas on November 26.

#### **About Constitution Day:**

- Constitution Day, also known as Samvidhan Divas or National Law Day, is celebrated in India on November 26th each year.
- This day commemorates the adoption of the Constitution of India on November 26, 1949. The Constitution came into force on January 26, 1950.
- In 2015, the government decided to celebrate this day to promote constitutional values among citizens.

#### **Constituent Assembly (CA) of India:**

- The Constituent Assembly (CA) was set up in 1946 under the Cabinet Mission Plan of 1946.
- The Assembly held its first meeting on December 9, 1946, and elected Dr. Sachidanand Sinha, the oldest member of the Assembly, as the Provisional President.
- On December 11, 1946, the Assembly elected Dr. Rajendra Prasad as its permanent Chairman.
- The CA took 3 years (1946-49) to complete the drafting.
- The CA had 299 elected members from provincial legislative assemblies.
- The CA had 13 committees, including the drafting committee headed by Dr B.R. Ambedkar.
- The Constitution was adopted in 1949 when 284 members signed it, marking the completion of the Constitution-making process.

#### **Interesting Facts about Indian Constitution:**

- It is the world's longest: The original copy of the Indian Constitution is 251 pages long; it is the most detailed in the world.
- It is completely handwritten and designed.
- Sh. Prem Behari Narain Raizada, a master of calligraphic art, singlehandedly handwrote the Constitution.
- Sh. Nand Lal Bose, a pioneer of modern Indian art, designed the borders of every page of the Constitution and adorned it with art pieces.
- The original manuscript of the Constitution was written on parchment sheets measuring 16 X 22 inches, having a lifespan of a thousand years. It weighed 3.75 kg.

### **4. Real Estate Investment Trusts (REITs)**

**Context:** The Sebi Board recently approved amendments to the SEBI (Real Estate Investment Trusts) Regulations 2014 (REIT Regulations) to create a new regulatory framework for small and medium REITs.

#### **About Real Estate Investment Trusts (REITs):**

- A REIT is a company that owns and typically operates income-producing real estate or related assets.
- They pool money from the investors and invest it in commercial real estate projects.
- These may include office buildings, shopping malls, apartments, hotels, resorts, self-storage facilities, warehouses, and mortgages or loans.
- Unlike other real estate companies, a REIT does not develop real estate properties to resell them. Instead, a REIT buys and develops properties primarily to operate them as part of its own investment portfolio.
- REITs provide a way for individual investors to earn a share of the income produced through commercial real estate ownership without actually having to go out and buy commercial real estate.
- In general, REITs specialize in a specific real estate sector. However, diversified and specialty REITs may hold different types of properties in their portfolios, such as a REIT that consists of both office and retail properties.

- Most REITs are publicly traded like stocks, which makes them highly liquid (unlike physical real estate investments). REITs are like shares that are listed on the stock exchange, which means you can buy or sell them anytime on the exchange.

### **5. World Cashew Day**

**Context:** Recently, the chairman of Agricultural and Processed Food Products Export Development Authority said that APEDA facilitated exporting of over 30 tonnes of cashew on World Cashew Day.

- It is native to Brazil in Latin America and was introduced to India by the Portuguese in the 16th century (1570).

### **Climatic condition**

- Soil and climate: Well-drained deep sandy loam soils are the best for growing cashew. In general, all soils from sandy to laterite are well suited for this crop.
- It is very well adapted to Indian coastal area under hot humid conditions.
- Temperature: In the range of 20 to 38 C, relative humidity in the range of 60 to 95%.
- Rain fall: Annual precipitation in the range of 2000 to 3500mm.
- Extreme low temperature and frost are not conducive to raise cashew plantations.
- The cultivation of this crop is being extended to non-traditional areas in the plains of Karnataka, Madhya Pradesh, Chhattisgarh and some parts of North East hill region.
- India holds the second-largest share in the world's cashew nut production and export.
- The country's top export destinations include the UAE, the Netherlands, Japan, and Saudi Arabia.

## **ANSWER WRITING**

**Q.e-governance, as a critical tool of governance, has ushered in effectiveness, transparency and accountability in governments. What inadequacies hamper the enhancement of these features?**

### **Introduction:**

Smart governance with increased accountability, transparency, and reaction times is the goal of e-Government, which is characterized by a heavy reliance on information and communication technology.

### **E-government advantages**

**Effectiveness:** Lower operating costs and increased accessibility lead to a larger reach, which improves governance effectiveness.

**Transparency:** With the majority of government applications and procedures now being traceable online, corrupt practices are less likely to occur.

**Accountability:** The real-time tracking of files and ongoing initiatives has improved official accountability.

### **Inadequacies in e-governance**

**Insufficient Coverage:** Inadequate coverage in remote and rural locations causes different social groups to be isolated.

**Downtime:** Technical problems such as slow internet access, power outages, server malfunctions, etc., frequently result in downtime that affects how well e-governance systems work.

**Privacy:** Because the internet is vulnerable to hacking and trespassing, privacy has always been a problem when using it.

**Infrastructure Cost and Maintenance:** Hardware and software upgrades must be performed on a regular basis, which results in ongoing maintenance expenses.

**Accessibility:** A key component of successful governance is creating a channel of communication to reach the last person. When the general public has low levels of digital literacy, this presents a dilemma.

### **Conclusion:**

Despite the fact that e-governance benefits society, its shortcomings must be taken into consideration to ensure that it is available to all members of society equally.

## **MCQs**

1. Consider the following statements about Lysozyme
  1. Lysozyme is a naturally occurring enzyme found in various bodily secretions like tears, saliva and mucus.
  2. It plays a crucial role in the body's defense system against bacteria.
  3. It serves as a model protein in investigating diseases like Amyloidosis, which trigger multi-organ dysfunction.

- How many of the statements given above are correct?  
a) Only one                      b) Only two                      c) **All three**                      d) None of the above
2. Amaterasu, recently seen in news is?  
a) A recently discovered supernova by American Astronomical Society  
**b) One of the highest-energy cosmic rays ever detected**  
c) Newly discovered 63 new giant radio galaxies  
d) One of the four major asteroids discovered between the orbits of Mars and Jupiter
3. With reference to Real Estate Investment Trusts (REITs), consider the following:  
1. A REIT is a company that owns and typically operates income-producing real estate assets.  
2. They pool money from the investors and invest it in commercial real estate projects.  
3. They are not publicly traded like stocks, which makes them less liquid.  
How many of the above statements are correct?  
a) Only one                      **b) Only two**                      c) All three                      d) None
4. Consider the following statements regarding Indian Constitution:  
1. It came into force on November 26, 1949.  
2. Sh. Nand Lal Bose singlehandedly handwrote the Constitution.  
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. With reference to Cashew crop, consider the following statements:  
1. It requires well-drained deep sandy loam soils for its growth.  
2. It can grow in extreme low temperature regions.  
3. In India, it is cultivated in parts of North East hill region.  
How many of the above statements are correct?  
a) Only one                      **b) Only two**                      c) All three                      d) None
6. Which one of the following states organized the Kambala buffalo race during the winter months when farmers harvest their paddy crops?  
**a) Karnataka**                      b) Kerala                      c) Chhatisgarh                      d) Madhya Pradesh
7. Consider the following statements regarding Gandhara style of art.  
1. The Gandhara school drew upon the anthropomorphic traditions of Roman religion and dressed Buddha in garments resembling those seen on Roman imperial statues.  
2. This style of art was closely associated with Hinayana Buddhism.  
3. Bamiyan Buddha statues is an example of the Gandhara style of art.  
How many of the above statements is/are correct?  
a) Only one                      **b) Only two**                      c) All three                      d) None
8. The world's biggest single structure made by living organisms which is also a World Heritage site is  
(a) Lord Howe Island Group  
(b) The Sundarbans  
(c) Tropical Rainforest Heritage of Sumatra  
**(d) The Great Barrier Reef**
9. Rayagajakesari and Dayagajakesari are titles associated with which of the following dynasties?  
(a) Vijayanagara                      (b) Rashtrakuta                      **(c) Kakatiya**                      (d) Gajapati
10. Regarding Guru Teg Bahadur consider the following statements:  
1. His writings are housed in the sacred text, 'Guru Granth Sahib,' in the form of 116 poetic hymns.  
2. In the year 1675, Guru Tegh Bahadur was executed in Delhi under the orders of the Mughal Emperor Aurangzeb.  
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