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GS 1: ART & CULTURE, HISTORY, INDIAN SOCIETY AND GEOGRAPHY

1. Himalayan biodiversity loss

Context: The Eastern Himalayan Region, known for its unique and diverse flora and fauna, forms a part of the Himalayan Biodiversity Hotspot. Monsoon showers, the low-lying floodplains of the Brahmaputra, the steep mountains, and the rain-shadow effect on the northern slopes of the Himalayas contribute to exceptionally diverse faunal and floral biodiversity in the Eastern Himalayas. The region harbours about 450 species of birds that are not found in the western Himalayas. Species diversity, richness, and distribution patterns of biodiversity in the Eastern Himalayan forests are regulated by altitude and environmental factors.

Key points

- **Overview:** Climate change, anthropogenic activities and habitat destruction are posing a grave threat to ecosystems and livelihoods in the Eastern Himalayan region. The Himalayas are experiencing rapid warming and biodiversity loss, prompting immediate conservation efforts to protect ecosystems and their essential functions for global and local well-being.

- **Biodiversity of the Himalayas:** The biodiversity of the Himalayas is extremely rich and diversified, with a vast range of species adapted to different elevations and ecological conditions.
- **Plant Diversity:** The Himalayas host around 10,000 vascular plant species, showing a remarkable variety of flora adapted to different elevations and climatic zones. This plant diversity includes a wide range of trees, shrubs, herbs, and other vegetation types, contributing to the unique landscapes of the region.
- **Bird Species:** The Himalayan region is a haven for bird diversity, with approximately 979 bird species identified. These birds inhabit diverse habitats within the Himalayas, ranging from dense forests to alpine meadows and high-altitude cliffs.
- **Mammalian Diversity:** The Himalayas are home to about 300 mammal species, including iconic and endangered species like the snow leopard, red panda, Himalayan tahr (a type of wild goat), and Himalayan monal (a colourful pheasant). Other notable mammals in the region include various species of deer, bears, wild cats, and small mammals adapted to mountainous terrain.
- **Importance of Himalayan Biodiversity:** The importance of Himalayan biodiversity cannot be overstated, given its unique ecological significance and the vital services it provides to local communities and the broader global ecosystem.

Biodiversity Hotspot - The Himalayas are recognized as a global biodiversity hotspot, harbouring a remarkable diversity of plant and animal species, including many endemic and sensitive varieties. The region's diverse ecosystems, ranging from tropical forests to alpine meadows, support a wealth of biodiversity adapted to varying elevations and climatic conditions.

Ecosystem Services - Himalayan ecosystems provide critical ecosystem services such as carbon sequestration, water regulation, soil conservation, and genetic diversity. The mountains act as natural water towers, supplying freshwater to millions of people in South Asia through major river systems originating from the Himalayas.

- **Challenges Faced by Himalayan Ecosystems:** The Himalayan ecosystems face several significant challenges that threaten their biodiversity and ecological stability.

Accelerated Warming and Climate Change - The warming rate in the Himalayas is reported to be three times higher than the global average, leading to rapid changes in temperature and precipitation patterns. This accelerated warming forces many plant and animal species to migrate to higher elevations where temperatures are cooler and more suitable for survival.

Species Displacement and Habitat Loss - As temperatures rise, species native to the Himalayas are pushed to higher elevations in search of suitable habitats, disrupting ecological balances and potentially leading to range contractions and local extinctions.

Socio-Economic Impacts - Local communities in the Himalayas depend on natural resources and ecosystem services for their livelihoods, including agriculture, forestry, and tourism. Environmental changes and biodiversity loss can undermine the socio-economic well-being of communities, increasing vulnerability to food insecurity, water scarcity, and natural disasters.

- **Conservation efforts:** Conservation efforts in the Himalayas must strike a careful balance between ecological preservation and local socio-economic interests.

Integrated Conservation Planning - Adopt holistic conservation approaches that consider ecological needs, biodiversity conservation, and socio-economic factors. Develop conservation plans in collaboration with local communities, scientists, policymakers, and conservation organisations to ensure comprehensive and inclusive strategies.

Promotion of Green Infrastructure - Invest in green infrastructure projects that mitigate climate change impacts, such as afforestation, reforestation, and watershed management. Enhance natural carbon sequestration and water regulation functions of forests, wetlands, and other ecosystems to support climate resilience and sustainable development.

- **Conclusion:** Preserving the biodiversity of the Himalayas is not only essential for the well-being of local communities but also holds immense global significance. Conservation initiatives must prioritise the protection of these fragile mountain ecosystems to safeguard biodiversity, ecosystem services, and the resilience of our planet in the face of environmental challenges.

GS 1: ART & CULTURE, HISTORY, INDIAN SOCIETY AND GEOGRAPHY

2. Tourism potential

Context: The 12th International Tourism Mart (ITM) being held at Kaziranga is a welcome platform that can showcase the region's potential in tourism, especially in the Nature and culture segments. With the event bringing together tourism professionals from across the world, one expects the region's potential to get some much-needed exposure globally. Other than Kaziranga National Park, places such as the Charaideo Moidams (now a World Heritage Site) and other nearby historical relics, tea estates, etc., are being promoted through the event before a wider audience, enabling them to have an authentic experience of the cultural and environmental legacy of our region.

Key points

- **Overview:** The 12th edition of the International Tourism Mart (ITM) is set to take place between 26th to 29th November 2024 in Kaziranga, Assam.
- **International Tourism Mart (ITM):** It is an annual event organised by the Ministry of Tourism, Government of India. It is a premier platform for showcasing Northeast India's vibrant cultures, stunning landscapes, and rich heritage. It aims to promote sustainable development and unlock the immense tourism potential of Northeast India. The event is held in rotation among the eight Northeastern states. The first-ever ITM was held in January 2013 in Guwahati, Assam.
- **The 12th edition of ITM: Objective** - Highlight Northeast India's unique charm, promote sustainable tourism and position the region as a gateway to Eastern and Southeastern Asia.

Participation - About 400 participants, including domestic and international tour operators, hoteliers, homestay owners, influencers, opinion leaders, and government officials.

Features - It will include state presentations, B2B meetings, panel discussions, cultural evenings, live music, food demonstrations, and a Northeast Bazaar.

Technical visits for participants to iconic sites like **Charaideo Moidam (India's newest UNESCO World Heritage Site)**, Kaziranga National Park (celebrating 50 years as a National Park), Hathikuli Tea Estate, and the Orchid and Biodiversity Park will be organised.

Sustainable tourism - Aligned with the Ministry of Tourism's Travel for Life initiative, ITM 2024 will emphasize sustainability, employing energy-efficient practices, eliminating single-use plastics, and providing shuttle services to minimize environmental impact.

- **Government initiatives to boost tourism in Northeast India:** *Swadesh Darshan 2.0* - To promote cultural, adventure, and eco-tourism. It includes the Gangtok Cultural Village, Meghalayan age Cave Experience, and Waterfall Trails Experience.

PRASHAD (Pilgrimage Rejuvenation and Spiritual Heritage Augmentation Drive) - For development of pilgrimage and heritage tourism infrastructure to sites like the Kamakhya Temple in Assam and Zunheboto in Nagaland.

UDAN-RCS scheme (Ude Desh Ka Aam Nagrik – Regional Connectivity Scheme) 4.0 - Aims at enhancing air connectivity to Northeast India, the hilly states, and the islands.

Assistance to Central Agencies for Tourism Infrastructure Development - To enhance tourism-related infrastructure across Northeast India. ₹44.44 crore was allocated for the development of 22 viewpoints across Northeastern states

Assistance for Organizing fairs / festivals/ tourism related events - Financial assistance of up to ₹80 lakh per state and ₹50 lakh per UT provided by the Ministry of Tourism, Government of India.

Travel for LiFE Initiative - To promote sustainable tourism in the country.

IMPEDIMENTS ON ASSAM'S SILK ROUTE

The country's rich handloom heritage is our national pride, and Assamese handloom is an integral part of the rich Indian heritage. The history of Assam silk is several centuries old and can be traced to the 3rd century BC in Kautilya's Arthashastra and in the 7th century in the narratives of Hiuen Tsang. During the Ahom rule in the 13th century, the handloom industry received royal patronage. Places like Sualkuchi in Assam grew to become a prominent producer of silk and silk products. The Ahoms, after the invasion of Assam, wore black, like the Tais of Yunnan and Burma. Later, they adopted muga, and the Ahom kings took special initiatives to develop the muga silk industry.

GS 2: POLITY, GOVERNANCE, SOCIAL JUSTICE, INTERNATIONAL RELATIONS/INSTITUTIONS

3. What is centers new mission to promote natural farming?

Context: The Union cabinet on Monday approved the launch of the National Mission on Natural Farming (NMNF) as a standalone centrally sponsored scheme under the Ministry of Agriculture & Farmers Welfare. The Ministry has defined natural farming as a "chemical-free" farming that only uses inputs produced using livestock and plant resources. Consequently, NMNF will be implemented across districts with high fertiliser consumption. Under NMNF around 2000 NF model demonstration farms shall be established at Krishi Vigyan Kendra (KVKs), agricultural universities and farmer's fields.

Key points

- **Overview:** The Union Cabinet approved the launch of the National Mission on Natural Farming (NMNF) as a standalone Centrally Sponsored Scheme under the Ministry of Agriculture & Farmers' Welfare. The mission aims to promote natural farming practices across India in a focused, mission-mode approach.
- **Natural Farming:** The Agriculture Ministry defines natural farming as a "chemical-free" farming system that only uses inputs produced using livestock and plant resources. It is a system where the laws of nature are applied to agricultural practices. This method works along with the natural biodiversity of each farmed area. It encourages the complexity of living organisms, both plants, and animals that shape each ecosystem to thrive along with food plants.
- **Natural Farming in India:** There are many working models of natural farming all over the world, the zero-budget natural farming (ZBNF) is the most popular model in India. ZBNF was popularized by Subhash Palekar in India.

- **Way forward:** *Economic Benefits* - Reduces input costs for farmers by minimizing dependency on externally purchased fertilisers and pesticides.
Soil and Environmental Health - Improves soil health, fertility, and quality. Increases soil carbon content, enhances biodiversity, and promotes microorganisms. Builds resilience to climate risks such as waterlogging, floods, and droughts.
Health and Nutrition - Reduces health risks associated with fertilisers and pesticides. Provides nutritious food for farmers' families.

National Mission on Natural Farming (NMNF)

- **Background:** NMNF builds on the Bhartiya Prakritik Krishi Paddhti (BPKP), launched under the Paramparagat Krishi Vikas Yojna (PKVY). In her Budget Speech (2024-25), Finance Minister Nirmala Sitharaman announced a plan to initiate one crore farmers countrywide into natural farming in the next two years.
- **About:** The government launched the NMNF within 100 days of returning to power in 2024, with a target to initiate one crore farmers into natural farming over the next two years. This initiative will include certification, branding, and the establishment of 10,000 bio-input resource centres, implemented via scientific institutions and gram panchayats.
- **Mission Objectives:** Promote sustainable agriculture through natural farming. Create a robust infrastructure for training, certification, and branding of chemical-free produce. Develop a large-scale adoption model through effective farmer support and community engagement.
- **Infrastructure and Implementation Plans:** *Model Demonstration Farms* - Establish 2,000 farms at Krishi Vigyan Kendras (KVKs), Agricultural Universities (AUs), and farmers' fields. Supported by experienced Farmer Master Trainers.
Farmer Training Programs - Train 18.75 lakh farmers in natural farming practices and input preparation (e.g., Jeevamrit, Beejamrit).
Community Engagement - Deploy 30,000 Krishi Sakhis/Community Resource Persons (CRPs) for awareness, mobilization, and handholding.
Bio-Input Resources - Farmers will use livestock resources or procure inputs from Bio-Input Resource Centres (BRCs).
- **Key Differences Between NMNF and Earlier Initiatives:** Higher Budgetary Allocation - Total outlay: Rs. 2,481 crores (Central share: Rs. 1,584 crores; State share: Rs. 897 crore) until the 15th Finance Commission (2025-26). Broader Target Group - Aims to benefit over 1 crore farmers.
- **Focus on Ecosystem Development:** Establishes scientifically supported standards for natural farming practices. Simplifies certification for chemical-free produce. Proposes a single national brand for natural produce.

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4. Using body's defences against cancer

Context: A study from Northwestern University in Chicago, published in the November issue of The Journal of Clinical Investigation, has gained attention for discovering that white blood cells activated by severe COVID-19 demonstrate cancer-fighting abilities. Researchers showed that the spread of cancer, also known as metastasis, could be slowed by a specialised type of white blood cell called induced non-classical monocytes (I-NCMs). These cells can be generated through severe infections like COVID-19 or by using

certain chemicals. Once activated, I-NCMs can leave blood vessels and migrate to tumours, where they launch an attack on cancer cells.

Key points

- **Potential of immunotherapy:** The University research showed that injecting a specific type of white blood cell, I-NCMs, into mice was effective in combating cancer metastasis. I-NCMs are derived from monocytes which circulate in the bloodstream. When these are exposed to certain bacterial or viral infections or chemicals, a small number of these monocytes transform into I-NCMs.
 - *Monocytes* – Monocytes are involved with fighting off infections, immune regulation and repairing damaged tissue.
- **CAR-T Cell Therapy:** CAR-T cell therapy, also known as chimeric antigen receptor T-cell therapy, is a type of immunotherapy that uses a patient's own immune system to fight cancer.

Significance - CAR T-cell therapy has been approved for leukaemias (cancers arising from the cells that produce white blood cells) and lymphomas (arising from the lymphatic system).

Procedure - Procedure: It is a complex and personalised treatment process that involves:

 - *Collecting T cells:* T cells, a type of white blood cell that helps fight infection, are extracted from the patient's blood through a process known as Apheresis.
 - *Genetic Engineering:* In the laboratory, the T cells are genetically modified to express a special protein called a chimeric antigen receptor (CAR) on their surface.
 - *Expansion:* The engineered T cells are multiplied in large numbers in the lab.
 - *Infusion:* The expanded CAR-T cells are then infused back into the patient's bloodstream, where they can identify and attack cancer cells that express the targeted antigen.
- **Development in India:** NexCAR19, an indigenously developed therapy for B-cell cancers, has been collaboratively developed by ImmunoACT, Indian Institute of Technology Bombay (IIT-B), and Tata Memorial Hospital.
- **Other Indian Government's Initiatives Related to Cancer:** National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke, National Cancer Grid, Encouraging Cervical Cancer Vaccination for girls (9-14 years) (Interim Budget 2024-25).

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5. Census 2025 as a comprehensive citizen registry

Context: The 2025 Census includes an exercise to update the National Population Register (NPR), which is the first step for the establishment of the National Register of Indian Citizens (NRIC). Grasping the full scope and implications of this initiative is essential. NRIC draws the mandate from the Citizenship Act 1955. Initially conceptualised after the 1951 Census, after that NRIC gained renewed significance following recommendations by the Subrahmanyam Committee in the aftermath of the Kargil war (1999). These recommendations eventually led to the addition of Section 14A to the Act, which mandated the compulsory registration of all Indian citizens.

Key points

- **Overview:** The 2025 Census, a crucial demographic exercise, incorporates the updating of the National Population Register (NPR). It marks the first step toward the establishment of the National Register of Indian Citizens (NRIC), a key initiative aimed at distinguishing citizens from non-citizens and providing a robust framework for governance and security.

- **Historical Context and Legislative Basis of NRIC:** The concept of the NRIC originates from the Citizenship Act of 1955, initially conceptualised after the 1951 Census. It gained renewed momentum following the Kargil War (1999), with the Subrahmanyam Committee emphasising the need for a comprehensive database of citizens and non-citizens to enhance national security.

- **Objectives and Benefits of NRIC:** *Enhancing National Security* - The foremost objective of the NRIC is to enhance national security by maintaining a verified and authenticated registry of Indian citizens. In a world increasingly vulnerable to illegal immigration, identity fraud, and cross-border threats, the NRIC serves as a safeguard.

Streamlining Identity Verification - Another key objective of the NRIC is to establish a single, definitive identity verification system that reduces reliance on multiple documents. This unified approach eliminates ambiguities in verifying citizenship, a step that becomes particularly valuable in addressing legal disputes, property ownership issues, and entitlement claims.

Facilitating Targeted Welfare Programs - A significant benefit of the NRIC is its potential to make welfare programs more efficient and effective. By accurately identifying citizens, the NRIC ensures that public resources are allocated to the intended beneficiaries. This reduces leakages and improves the reach of schemes in areas such as healthcare, education, and social security.

- **Challenges of Implementing Nationwide NRIC:** *Documentation Challenges* - Many individuals, especially in rural areas, lack proper documentation to prove their citizenship.

Privacy and Data Security - A nationwide NRIC would involve collecting and managing vast amounts of sensitive demographic and citizenship data.

Exclusion Fears - Large-scale verification exercises risk alienating vulnerable populations, including those with limited education, financial resources, or access to legal aid.

- **Way Forward:** *Lessons from Assam on the Challenges of Implementation* - The Assam experience with the National Register of Citizens (NRC) offers valuable insights into the potential challenges of a nationwide NRIC. The Assam NRC, updated in 2019 under the Assam Accord, aimed to identify illegal immigrants, particularly from Bangladesh.

Addressing Privacy Concerns - Privacy concerns also persist, despite the Supreme Court's guidelines in the Aadhaar case. Privacy concerns also persist, despite the Supreme Court's guidelines in the Aadhaar case.

Citizen Engagement and Moving Forward - For the NRIC initiative to succeed, citizen participation is paramount. Transparency and fairness depend on citizens staying informed, verifying their records, and understanding their rights.

- **Conclusion:** The 2025 Census and the NRIC initiative represent a significant step toward establishing a comprehensive and verified citizen registry. While it promises to enhance governance and national security, challenges related to data privacy, exclusion, and logistical execution cannot be overlooked. Drawing lessons from the Assam experience and maintaining transparency throughout the process will be crucial.