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DAILY CURRENT AFFAIRS

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

1. A Hot winter

Context: Its certain that 2024 will be the warmest year on record. Latest data from the EUs Copernicus Climate Change Service (C3S) show that last November was the 16th month in a 17-month period when the average global temperature rise was more than 1.5 degrees Celsius above the pre-industrial revolution period. The Paris Pact commits its 196 signatories to keep global heating to below 1.5 degrees to limit the impact of climate disasters. With the temperature rise in the first 11 months of 2024 exceeding 1.6 degrees, C3S has issued a warning that there will be a default on the Paris benchmark. A report from the Swiss Re Institute estimated that climate change cost the world $320 billion this year.

Key points

- **Overview:** Recently, the Copernicus Climate Change Service (C3S) said that the world witnessed its warmest-ever June last month with the average temperature being 0.67°C above the 1991-2020 average.
- **Copernicus Climate Centre Service (C3S):** It is one of six thematic information services provided by the Copernicus Earth Observation Programme of the European Union. It supports society by providing authoritative information about the past, present and future climate in Europe and the rest of the World.
- **Copernicus Programme:** It is the European Union's Earth Observation Programme. It consists of a complex set of systems that collect data from multiple sources: earth observation satellites and in situ sensors, such as ground stations, airborne and sea borne sensors. Copernicus processes this data and provides users with information through a set of services that address six thematic areas: land, marine, atmosphere, climate change, emergency management and security.
- **Other reports:** *State of the Climate 2024 Report* - It was released by the World Meteorological Organisation (WMO) during the United National Climate Conference (COP29) in Baku. The year 2024 is on track to be the warmest year on record after an extended streak of exceptionally high monthly global mean temperatures.
  Data recorded - From January to September of this year, the global average temperature was 1.54 degrees above the pre-industrial level, with climate warming boosted by the El Niño weather pattern. The loss is attributed to extreme melting in North America and Europe.

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

2. Reservation must not be based on religion

Context: An observation was made by the Supreme Court on Monday that reservation must not be based on religion. This observation was made while hearing an appeal filed by the State of West Bengal against a Calcutta High Court judgment striking down its policy to include several castes, largely Muslim communities, in the State's Other Backward Classes (OBC) list. The High Court's decision concluded that religion was the "sole criterion for declaring these communities as OBC", the HC also stated that the "selection of 77 classes of Muslims as backwards an affront to the Muslim community as a whole".

Indian Constitution on Religion-based Reservations

- **About:** The IC of 1949 dropped the word 'minorities' from Article 296 of the draft constitution (Article 335 of the present IC). Article 16(4) enables the state to make "any provision for reservation in favour of any backward class of citizens which is not adequately represented in the services under the state". Article 15 specifically prohibits the state from discriminating against citizens based on religion and caste (along with sex, race, and place of birth).
  - The **1st Constitutional Amendment Act** Inserted Article 15(4); it empowered the state to make "any special provision for the advancement of any socially and educationally backward classes of citizens or the SCs and the STs".
- **Equality Vs Equity:** The IC moved away from equality, which refers to equal treatment for all, to equity, which ensures fairness and may require differential treatment or special measures for some groups.
  - **Formal equality** concerns the equality of treatment—treating everyone the same, regardless of outcomes — which can, at times, lead to severe inequalities for historically disadvantaged groups.

- **Substantive equality**, on the other hand, concerns equality of outcomes. Affirmative action promotes this idea of substantive equality.

- **Judicial Intervention:** Some of these reservation policies have faced legal challenges, particularly regarding the criteria used for determining backwardness and the extent of reservation. Courts have emphasised the importance of ensuring that reservation policies are based on objective criteria and do not violate the constitutional principles of equality and non-discrimination.
  - *Example* – M R Balaji vs State of Mysore, 1962: The HC stressed that social backwardness should not solely rely on caste considerations, a significant departure from the traditional understanding. The court acknowledged that the Muslim community could be socially backward in certain states, thereby broadening the scope of social backwardness.
- **Centre's intervention on special provisions for Muslims:** *Justice Rajinder Sachar Committee, 2006* - The Muslim community was almost as backward as SCs and STs and more backward than non-Muslim OBCs.
  Justice Ranganath Misra Committee, 2007 - It suggested a 15% reservation for minorities, with 10% specifically for Muslims.
  Executive Order, 2012 - The GOI issued an order providing a 4.5% reservation for minorities within the existing 27% OBC quota.
  Presidential order, 1950 - It specified that only Hindus could be included in the SC list. However, Sikhs were included within SCs in 1956 and Buddhists in 1990.

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

3. India used 114 mg of antibiotics for every kg of meat in 2020

Context: The overuse of antibiotics in livestock increases the risk of disease in animals and humans in several ways. Antibiotics are often used as a cheap substitute for basic animal welfare practices, such as giving animals enough space, keeping their living environments clean, and ensuring that barns are well-ventilated. A failure to maintain hygienic conditions on farms increases the risk of disease for both livestock and humans. It can also increase the risk of bacteria that are resistant to treatment. That threatens the health of the animals but can also be a risk for humans for crossover diseases. This raises a growing concern that these bacteria will become resistant to the drugs we use against them.

Key points

- **Overview:** India has world's largest population of livestock. India is largest producer of buffalo meat and 2nd largest producer of goat meat. One of the key challenges in understanding the extent and risks of antibiotic resistance in livestock is the lack of transparent data sharing from countries.
- **Significance of Livestock Sector in India:** *Contribution to GDP* - Contribution to total Livestock GVA (at constant prices) was 30.19% of Agricultural and Allied Sector GVA and 5.73% of Total GVA in 2021-22.
  Employment Generation - Livestock rearing is a major source of livelihood for over 70% of rural households in India, with a significant proportion being small and marginal farmers and landless labourers.
  Interlinkages with Agri-activities - Livestock sector is crucial for production of organic inputs like manure and agricultural waste is used as fodder for animals.
  Food and Nutritional Security - Livestock products such as milk, meat, and eggs are rich in essential nutrients, playing a crucial role in combating malnutrition, especially among children and women.

- **Concerns over Antimicrobial Resistance:** Prior to the discovery of penicillin by Alexander Fleming in 1928, infections due to minor cuts could lead to bloodstream infections or death. Yet, today, these life-saving drugs are losing their efficacy due to their misuse and overuse in different sectors. It can originate in animal, human or plant populations, and then pose a threat to all the other species.
- **Health and Veterinary Issues:** High economic losses due to animal diseases: E.g., Haemorrhagic Septicaemia, Foot and Mouth Disease, Brucellosis, etc.
  Inadequate infrastructure and human resources - India has less than 60 recognized veterinary colleges in India, which are inadequate to turn out the required number of vets.
  Rise of Anti-Microbial Resistance - India ranks 4th in antibiotics use in animals, wherein poultry sector is the largest reservoir of antibiotics.
- **Initiatives to Tackle Antimicrobial Resistance:** *National Programme on AMR Containment* - Launched in 2012. Under this programme, AMR Surveillance Network has been strengthened by establishing labs in State Medical College.
  World Antimicrobial Awareness Week (WAAW) - Held annually since 2015, WAAW is a global campaign that aims to raise awareness of antimicrobial resistance worldwide and encourage best practices among the public, health workers and policy makers to slow the development and spread of drug-resistant infections.
- **Measures to Address Antimicrobial Resistance:** *Enhanced Surveillance and Monitoring* - Establish robust systems for monitoring and tracking the emergence and spread of resistant organisms.
  Rational Use of Antibiotics - Promote responsible use of antibiotics in human and animal health, ensuring they are prescribed and used only when necessary.

GS 3: ECONOMY, ECOLOGY, SCIENCE & TECHNOLOGY, DEFENCE, SECURITY AND DISASTER MANAGEMENT

4. Antimatter idea offers scientists clue to cracking cosmic mystery

Context: One of the most astonishing facts about the natural world is the existence of antiparticles. It was first theorised by English physicist Paul A.M. Dirac in 1928 and observed in cosmic rays by American physicist Carl Anderson in 1932. An antiparticle is a 'partner' of a particle type that has the same mass but opposite charge, for ex, the antielectron is the antiparticle of the electron; it has the same mass and is positively charged.

Key points

- **Overview:** Scientists have detected the heaviest antimatter nucleus ever observed, named antihyperhydrogen-4, in particle accelerator experiments at the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory, New York.
  - *Antihyper Hydrogen-4* - Antihyper Hydrogen-4 is made up of an antiproton, two antineutrons and one antihyperon (a baryon that contains a strange quark).
  - *Key findings* - Both hyperhydrogen-4 and its antimatter counterpart antihyper hydrogen-4 seem to wink out of existence very quickly.
- **Antimatter:** Antimatter is like ordinary matter but with the opposite electric charge, often referred to as "mirror matter."
  Examples - The antimatter counterpart of an electron (which has a negative charge) is the **positron**, which has the same mass as an electron but carries a positive charge. The antimatter equivalents of protons and neutrons are known as **antiprotons** and **antineutrons**, respectively. Collectively, these are known as **antiparticles**.

- **Antimatter Formation and Properties:** *Creation* - Both matter and antimatter were created in equal amounts during the Big Bang. However, a slight imbalance allowed more matter to survive, forming the universe as we know it.
  Coexistence - Matter and antimatter cannot exist together for long; they annihilate each other upon contact, releasing vast amounts of energy in the form of gamma rays or elementary particles.
  Human-made antimatter - Scientists can create antimatter particles in high-energy environments, such as particle accelerators like the Large Hadron Collider (LHC) operated by CERN near Geneva. These collisions simulate the conditions shortly after the Big Bang, allowing the brief creation of antimatter.
  Natural antimatter - Apart from laboratory conditions, antiparticles are also naturally produced sporadically throughout the universe.

GS 3: ECONOMY, ECOLOGY, SCIENCE & TECHNOLOGY, DEFENCE, SECURITY AND DISASTER MANAGEMENT

5. IT ministry to prepare roadmap for power supply to AI data centres

Context: The IT ministry is in discussions with the ministries of power, new and renewable energy, and other related agencies to prepare a roadmap to ensure that the growing numbers of data centres in India are offered enough power supply. As per, the International Energy Agency, data centre electricity usage could double by 2026, making the challenge for companies to become net zero or carbon negative by 2030 increasingly unattainable. The government is looking to subsidise setting up of data centres to capitalise on the AI boom and make access easier for smaller entities like start-ups and research institutions. As per a September report by S&P Global, India currently has a leased data centre capacity of 1-3 GW, which is highest compared to other emerging markets like Indonesia, Malaysia, Philippines, etc.

Key points

- **Overview:** Given the data centre sector's expansion in emerging economies, India may become a major player in the data centre market in the years to come. However, it may also face stiff competition from nations like Malaysia and Vietnam.
- **Data Centres:** Data centres are vital facilities designed to store, organize, and share digital information, forming the backbone of today's digital economy. They support a wide range of services, from cloud computing to Internet of Things (IoT) projects. These centres consist of interconnected computer servers and storage devices, ensuring reliable access to data for businesses, governments, and individuals. Key characteristics of modern data centres include scalability, robust security measures, and energy efficiency.
- **Rise of Data Centre Demand:** India's economic expansion is closely tied to a surge in digital adoption across industries, driving massive data consumption. With strong foreign exchange reserves exceeding USD 622.5 billion (as of February 2024) and government investment in infrastructure, the country's Gross Fixed Capital Formation (GFCF) reached a record 34.1% of GDP in FY2024.
- **Indian data centre market:** India's data centre market is growing at a fast pace and is expected to grow from $4.35 billion in 2021 to $10.09 billion by 2027, as per CAGR of 15.07%. The total data centre stock is likely to reach ~1,370 MW by the end of 2024, up from ~1,030 MW in 2023 and thus offers massive opportunities for operators and investors.
  AI Boom - Lots of data are generated, and this calls for well-equipped data centres with an improved storage and processing capacity.

Support by Government - Indian government is advancing digital infrastructure, national connectivity, and reliable power access. This forms a strong base for booming data centres.

Cloud Adoption - Adoption of cloud solutions by industries and societies forms another key growth driver of demand for data centres.

Policy support - With incentives and policies towards data centres, confidence of investors increases.

- **Challenges in the Data Centre Industry:** *High Costs* - The significant upfront and ongoing operational expenses present hurdles, particularly for smaller enterprises. This highlights the need for more cost-effective cloud hosting options.

  Data Security - Protecting sensitive data is a top priority, requiring continuous investment in security systems to comply with stringent regulations.

- **Way Forward:** Cloud computing, edge computing, and AI solutions form the transformational backdrop in India's digital economy. The biggest challenge remains infrastructure limitations and cybersecurity threats. Effective proactive investments in robust infrastructure and security measures are the need of the hour. This will involve strategic cooperation between data centre companies, government agencies, and education institutions, hence contributing to the establishment of a resilient data infrastructure, which will foster economic growth and position India at the top of the global data centre industry.

Q: India’s data centre ambitions are pivotal to its digital economy. Discuss the growth, challenges, and opportunities for India's data centre sector. (প্রশ্নঃ ভাৰতৰ ডাটা চেণ্টাৰৰ উচ্চাকাংক্ষা ইয়াৰ ডিজিটেল অর্থনীতিৰ বাবে গুৰুত্বপূর্ণ। ভাৰতৰ ডাটা চেণ্টাৰ খণ্ডৰ বিকাশ, প্রত্যাহ্বান আৰু সুযোগসমূহৰ বিষয়ে আলোচনা কৰক।)