DAILY CURRENT AFFAIRS ANALYSIS

LAKSHYA ACADEMY®

27 FEBRUARY 2024

1 – Report on Gyanvapi Mosque by ASI:

GS II

Government Policies and Interventions

- **Context:**

- During a recent examination of the Gyanvapi mosque complex, the Archaeological examination of India (ASI) discovered 55 stone carvings, including idols of Hindu deities.

- According to the ASI study, a temple "appears to have been destroyed in the 17th century, during the reign of Aurangzeb, and part of it was modified and reused in the existing structure."

- **Which aspects of the ASI Report stand out the most?**

- **Finding Broken Idols:**

- Within the mosque complex, the survey discovered pieces of what appear to be Hindu deity statues, such as those of Hanuman, Ganesha, and Nandi.
- Numerous statues and sculptures, including those of Hanuman, Krishna, Ganesha, Vishnu, and Shiva linga, were discovered in varied levels of deterioration.

- **Shiva Linga and Yonipattas:**

- During the survey, several yonipattas—the foundation of a shivling—were found.
- There was also a missing lower portion of a shiv linga discovered.

- **Indian Seal:**

- Thirty-two inscriptions in Telugu, Kannada, Grantha, and Devanagari scripts.
- In actuality, these are inscriptions that were previously present on a Hindu temple's stone that were utilised again throughout the building and restoration of the current building.
- The repurposing of older inscriptions within the structure implies that the previous structures were demolished and their components were used for the building and restoration of the current structure.

- **Trident and Swastik Marks:**

- The trident and the Swastika were among the marks discovered on the building.

- The Swastika is one of the world's oldest symbols, having been utilised by all ancient civilizations.
- Hindus frequently utilise the trishula, or trident, as one of their primary symbols. Shaivites and Shaktas in especially employ it. The trident is the distinctive weapon of Lord Shiva.

- **Coins and Persian-Inscribed Sandstone Slab:**

- During the survey, artefacts including coins and a Persian-inscription on a slab of sandstone were found.
- Persian inscriptions on stone slabs were discovered, and they told the story of the temple's destruction in the seventeenth century, during the reign of Mughal Emperor Aurangzeb.

- **The Archaeological Survey of India (ASI): What is it?**

- The nation's leading organisation for archaeological study and the preservation of its cultural legacy is ASI, which is housed inside the Ministry of Culture.
- The operation of ASI is governed by the Ancient Monuments and Archaeological Sites and Remains (AMASR) Act, 1958.
- Over 3650 historically significant monuments, archaeological sites, and relics are under its administration.
- Surveys of antiquarian remnants, the discovery and excavation of archaeological sites, the preservation and upkeep of protected monuments, and other tasks are among its activities.
- Alexander Cunningham, the initial Director-General of ASI, established it in 1861. Another title for Alexander Cunningham is "Father of Indian Archaeology."
- Which Approach Was Employed for the Gyanvapi Mosque Survey?
- In order to ascertain whether the Gyanvapi mosque in Varanasi was constructed on top of a temple, the ASI carried out a thorough non-invasive assessment of the building.
- When conducting studies inside a constructed structure and no excavation is allowed, non-invasive techniques are employed.

- **Categories of Techniques:**

- Active Methods: Measure the reaction after injecting energy into the ground. The techniques yield an estimate of the density, electrical resistance, and wave velocity of the ground's substance.
- Seismic Techniques: Examine subsurface structures by using shock waves.
- Measure electromagnetic reactions following energy injection using electromagnetic methods.
- Measure current physical qualities using passive methods.
- Use magnetometry to find magnetic anomalies brought on by underground constructions.
- Measure the differences in gravitational force caused by subsurface features using gravity surveying.

- **GPR, or ground-penetrating radar:**

- ASI created a 3-D representation of hidden archaeological features using GPR.
- In order to record the time and magnitude of return signals from the subsurface, GPR works by sending a brief radar impulse through a surface antenna.
- The radar beam causes reflections before the antenna crosses the target because it extends like a cone.
- Cone-shaped radar beams cause reflections that might not accurately reflect physical dimensions, producing erroneous images.
- **Carbon-based dating:**

- Method based on the radioactive decay of carbon-14 (C-14) to determine the age of biological materials.

- **What's the dispute over the Gyanvapi Mosque?**

- **Temple demolition:**

- According to popular legend, the ancient Vishweshwar temple was demolished and replaced with the Gyanvapi Mosque in 1669 by Aurangzeb, the Mughal ruler.
- Not long after Aurangzeb's death in 1707, Saqi Mustaid Khan wrote a Persian-language history called Maasir-i-Alamgiri. In it, he reported that Aurangzeb had ordered Governor Abul Hassan to destroy the temple in 1669.
- As per the ASI research, an Arabic-Persian inscription discovered within a mosque room indicates that the mosque was constructed during the 20th royal year of Aurangzeb (1676-77 CE).
- According to historian Audrey Truschke, Aurangzeb destroyed most of the Vishvanatha Temple (also known as Visheshwar) at Benares in 1669. The temple was constructed by Raja Man Singh during Akbar's reign. It is widely claimed that Singh's great-grandson, Jai Singh, assisted Shivaji in escaping the Mughal court in 1666.

- **Legal Conflict:**

- The Gyanvapi mosque case dates back to 1991, when three individuals—among them, a descendant of the Kashi Vishwanath temple priests—filed a lawsuit in Varanasi civil court, arguing that Aurangzeb had destroyed Lord Vishweshwar's temple and erected a mosque there, and that they should be given their land back.
- Five women petitioned the same Varanasi court on August 18, 2021, requesting to be allowed to worship at Mata Shringar Gauri's temple. The petition was accepted, and the court appointed a panel to investigate the current state of the Mata Shringar Gauri Temple.
- The Varanasi court had requested that the Commission provide the survey report that included a video of the Gyanvapi complex and the idol of Mata Shringar Gauri.

- An extensive map of the Gyanvapi complex has been submitted as evidence in court by the Hindu side. Hindu temples dedicated to deities may be found near the mosque entrance; other notable locations include Gyankoop (Mukti Mandap), the Vyas family basement, the Vishweshwar temple, and the well-known Nandi monument.
- The Muslim side contended that the Places of Worship Act, 1991 precluded making a resolution regarding the dispute.
- It is forbidden to transform a place of worship into a place of worship for a different religious denomination or a different class within the same religious denomination under Section 3 of the Places of Worship (Special Provisions) Act, 1991.
- The Gyanvapi Case is still proceeding in court.

Source → The Hindu

2 - Kairali Artificial Intelligence Chip:

GS III

Science and Technology

LAKSHYA ACADEMY®

- **Context:**

- The state's first silicon-proven artificial intelligence (AI) chip, the Kairali AI Chip, which delivers speed, power efficiency, and scalability for a variety of applications, was recently launched by the Digital University Kerala.

- **A Kairali AI Chip: What is it?**

- This chip offers low power consumption and good performance for a variety of applications by utilising edge intelligence, often known as edge AI.
- The application of artificial intelligence (AI) in an edge computing environment, also known as AI at the edge, enables computations to be completed near to the location of data collection rather than at an offsite data centre or centralised cloud computing facility.
- Instead of depending on cloud computing, it involves implementing machine learning algorithms on the edge device where the data is created.
- In addition to preserving user and data security and privacy, edge intelligence can process data more quickly and effectively.

- **Possible Uses:**

- Agriculture: By enabling real-time monitoring of crop health, soil conditions, and environmental factors, the chip can facilitate precision farming practices. This has the potential to improve crop yields and optimise resource utilisation.
- Mobile Phone: By enabling cutting-edge capabilities like real-time language translation, improved picture processing, and AI-powered personal assistants, the chip can increase the effectiveness and performance of smartphones.
- Aerospace: By offering cutting-edge processing capability for navigation, data collecting, and real-time decision-making, all with minimal power consumption, the chip can improve the capabilities of Unmanned Aerial Vehicles (UAVs) and satellites. Additionally, the chip can improve the drones' autonomous decision-making and navigational abilities, which is beneficial for applications like environmental monitoring and delivery services.
- Automobile: By offering the processing capacity required for real-time analysis of sensory data, which is crucial for safe and effective autonomous driving, the chip has the potential to revolutionise the field of autonomous vehicles.
- Security and surveillance: By utilising its edge computing power, the chip can provide real-time analytics, threat detection, and facial recognition algorithms that are quicker and more effective.

- **AI chips: what are they?**

- In order to facilitate deep learning-based applications, AI chips are constructed with a specialised design and integrated AI acceleration.
- Deep learning is a subset of machine learning and falls under the larger category of artificial intelligence. It is sometimes referred to as active neural networks (ANN) or deep neural networks (DNN).

- **Uses:**

- It incorporates a number of algorithms or computer commands that increase brain activity and structure.
- During the training phase, DNNs pick up new skills from the data that already exists.
- After gaining these skills through deep learning training, DNNs can then infer by using them to generate predictions against untrained data.
- Large-scale data collection, analysis, and interpretation can be sped up and simplified with the help of deep learning.
- These chips enable the integration of artificial intelligence (AI) into a wide range of applications, converting data into information and ultimately into knowledge. This is made feasible by their hardware architectures, complementing packaging, memory, storage, and interconnect technologies.

LAKSHYA ACADEMY®

- **Different Kinds of AI Chips Made for a Range of AI Uses:**

- CPUs, GPUs, Field-Programmable Gate Arrays (FPGAs), and Application-Specific Integrated Circuits (ASICs).

- **Uses:**

- Natural Language Processing (NLP), computer vision, robotics, and network security are just a few of the industries that use artificial intelligence (AI). These industries include automotive, IT, healthcare, and retail.

- **What Advantages Do AI Chips Offer?**

- **Quicker Calculation:**

- Complex training models and algorithms are often executed in parallel computing environments by artificial intelligence applications.
- When compared to typical semiconductor devices at comparable price points, AI hardware offers more parallel processing capabilities, which is expected to have up to 10 times more competing power in ANN applications.

- **High-bandwidth memory:**

- It is predicted that specialised AI gear will allot 4-5 times more bandwidth than conventional CPUs.
- This is required because AI applications demand much more bandwidth between processors for efficient performance because they require parallel processing.

Source → The Hindu

3 - IMD's weather monitoring:

GS I

Geography related issues

- **Context:**

- The India Meteorological Department (IMD) has warned that there is a good chance of "very dense fog" in Delhi, Chandigarh, and Haryana.

- Additionally, maps from the INSAT 3D and occasionally the INSAT 3DR satellites have been included with IMD notifications.

- **INSAT-3DR: What is it?**

- The IMD forecasts and monitors the weather using INSAT-3D and INSAT-3DR satellite data.
- Like INSAT-3D, INSAT-3DR is a sophisticated meteorological satellite from India that is outfitted with an atmospheric sounder and an image system.
- An atmospheric sounder records the changes in an air column's physical characteristics with height.
- It has one visible band and multiple infrared channels ranging from longwave to shortwave wavelengths.

- **The noteworthy enhancements integrated into INSAT-3DR are:**

- Middle Infrared imaging to provide images of low clouds and fog at night.
- Two thermal infrared bands can be imaged to improve the accuracy of sea surface temperature (SST) estimation.

- **The INSAT-3DR Imaging System's Mechanism:**

- The ratio of solar energy incident on a surface to the quantity of solar energy reflected by it is known as solar reflectance.
- The link between an object's surface brightness and temperature is known as brightness temperature.

- **Forecasting and Tracking of Clouds and Snow:**

- In the visible spectrum, snow and clouds have comparable solar reflectance.
- Shortwave infrared light is heavily absorbed by snow.
- Using their RGB imager, the INSAT 3D and INSAT 3DR satellites use microphysics modes for both day and night operations.
- Day Microphysics: Three wavelengths of solar reflectance are examined in data from INSAT 3D: visible at 0.5 µm, shortwave infrared at 1.6 µm, and thermal infrared at 10.8 µm.
- The amount of green hue depends on how strong the visible signal is.
- The degree of blue colour and the thermal infrared signal strength.
- Night Microphysics: The strength of the difference between two signals is used to determine this aspect of the satellite's operation, rather than relying on a single signal.
- The difference between two thermal infrared signals is used by the computer to determine how much red there is.
- The amount of green hue varies based on how a heat infrared signal differs from a medium infrared signal.

- The intensity of a thermal infrared signal at a wavelength determines the quantity of blue colour rather than a difference.

- **Temperature, Humidity, and Water Vapour Measurements:**

- It is possible to identify the presence of variously shaped moisture droplets and temperature variations over time by integrating day and night microphysics data.
- It is useful for monitoring the development, progression, and dissipation of cyclones and other meteorological phenomena.
- Radiometers are used by both INSAT 3D and INSAT 3DR to measure spectra.
- An instrument that detects electrical activity or temperature is called a radiometer. There are atmospheric sounders on both satellites as well.
- These are instruments that monitor humidity and temperature as well as the relationship between heights above the ground and water vapour concentration.

- **What Other Techniques Are There for Weather Forecasting?**

- In addition to monitoring satellite data, IMD works with ISRO to obtain ground-based observations from the Automatic Weather Stations (AWS), a component of the Global Telecommunication System (GTS) that monitors humidity, temperature, sunshine, wind direction, and speed.
- In the meantime, additional observations are provided by the Doppler Weather Radar (DWR) and Agro-meteorological Tower (AGROMET) systems.
- By altering the current two-stage forecasting approach, IMD developed a new plan in 2021 for releasing monthly and seasonal operational forecasts for the southwest monsoon rainfall.
- The recently created Multi-Model Ensemble (MME)-based forecasting system and the current statistical forecasting system serve as the foundation for the new approach.
- The Monsoon Mission Climate Forecasting System (MMCFS) model from IMD is one of the coupled global climate models (CGCMs) that are used by the MME method. These models are sourced from several global climate prediction and research institutes.
- The National Monsoon Mission (NMM) was launched in 2012, and since then, significant technological advancements have been made possible.

Source → The Hindu

4 - Pradhan Mantri Suryodaya Yojna:

GS II

Government Policies and Interventions

- **Context:**

- The Indian Prime Minister recently unveiled the ground-breaking 'Pradhan Mantri Suryodaya Yojana,' a national programme designed to install rooftop solar power systems in one crore homes.

- **Rooftop solar panels: what are they?**

- Photovoltaic panels mounted on a building's roof and connected to the main power supply unit are known as rooftop solar panels.
- Benefit: It lowers grid-connected electricity use and lowers customer electricity costs.
- According to the metering provisions, excess solar power units produced by the rooftop solar plant may be exported to the grid.
- In accordance with current legislation, the consumer may be compensated monetarily for the excess exported electricity.
- Related Government Initiatives: The Rooftop Solar Programme was introduced by the government in 2014 with the goal of reaching a cumulative installed capacity of 40 gigawatts (GW) or 40,000 megawatts (MW) by 2022.
- Nevertheless, it was not possible to meet this goal. The administration decided to extend the deadline from 2022 to 2026 as a result.
- Some reports suggest that the Pradhan Mantri Suryodaya Yojana is an attempt to assist in achieving the 40 GW rooftop solar capacity objective.

- **What is India's current solar capacity?**

- **Present Solar Capacity of India:**

- Rooftop Solar Capacity: As of December 2023, the total installed rooftop solar capacity was approximately 11.08 GW.
- With 2.8 GW, Gujarat leads the list, followed by Maharashtra with 1.7 GW.
- Only 20% of rooftop solar capacity installations are in the residential sector, with the bulk occurring in the commercial and industrial sectors, according to a recent research by the Council on Energy, Environment, and Water (CEEW).

- According to the analysis, just one-third of the 637 GW of solar energy that could be installed on rooftops by India's 25 crore households could be used to supply all of the nation's residential electricity needs.
- Total total Capacity: As of December 2023, India's total solar power capacity was estimated by the Ministry of New and Renewable Energy to be approximately 73.31 GW.
- Rajasthan has the highest overall solar capacity (18.7 GW). Gujarat, at 10.5 GW, is in second place.
- Gujarat leads the way with 2.8 GW of rooftop solar capacity, followed by Maharashtra with 1.7 GW.

- **India's Exploding Need for Energy:**

- The International Energy Agency predicts that during the next three decades, India's energy demand would expand at the fastest rate in the world.
- India is committed to reaching 500 GW of renewable energy capacity by 2030, even with a rise in coal production.
- Additionally, the nation wants to generate 50% of its electricity from non-fossil fuel sources by 2030 (it is now at 43%), with 30% coming from renewable sources.
- To supply the soaring demand for electricity, renewable capacity must expand quickly, particularly in the solar energy sector.

LAKSHYA ACADEMY®

Source → The Hindu