

DAILY CURRENT AFFAIRS (DCA)

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NATIONAL TECHNOLOGY DAY

Context

- Recently, the **Technology Development Board (TDB)** of the Department of Science and Technology (DST) celebrated the **National Technology Day (2024)**.

About

- It is celebrated annually on **11th May**, dedicated to honouring the relentless efforts of scientists, engineers, and innovators who work tirelessly to advance technology and simplify our lives.
- The **Rashtriya Vigyan Puraskar** Awards, akin to the prestigious Padma awards, are announced annually on National Technology Day.
- Theme for 2024:** 'Promoting Clean and Green Technologies for a Sustainable Future'.

Brief History

- The inception of National Technology Day dates back to **May 11, 1998**, when India successfully conducted **Pokhran-II Nuclear Tests** under the codename '**Operation Shakti**'.
- The then Prime Minister, Atal Bihari Vajpayee, declared **May 11 as National Technology Day**, and since then, the day has been **celebrated annually to highlight India's technological progress**.
 - The **Indira Gandhi Centre for Atomic Research (IGCAR)** and the **Bhabha Atomic Research Centre (BARC)** played pivotal roles in advancing nuclear science within the country.

Major Highlights of India's Technological Progress Since 1998

- Since 1998, India has continued steadily in its journey of technological developments.
- Among the visible examples of India's impactful technological progress are the **digital payment gateways** that have **democratised financial transactions** like never before, and exemplify India's leadership in the world in this area.
- Other lesser-known milestones** that have quietly been achieved are making of indigenous BioJet fuels, mapping of subsurface water channels for sustainable use of water, making of indigenous light combat aircraft, development of variety of crops by traditional methods of breeding, digitisation of many aspects of trade, and moving firmly towards a Hydrogen economy.

- Supercomputing** in India began in the **mid-1980s** when access to the CRAY supercomputer was denied.
 - The **Centre for Development of Advanced Computing (C-DAC)** launched **PARAM 10,000 in 1998** that is capable of performing 100-gigaflop operations, demonstrating India's capacity to build high-performance computing systems.
- India is currently making progress in **more advanced and sophisticated technologies** such as **neutrino, gravitational waves, scramjets, tokamak and sending human missions into space**.

Technology Development Board (TDB)

- It was constituted in 1996 under the **Technology Development Board Act, 1995**, as a **statutory body**, to promote development and commercialization of indigenous technology and adaptation of imported technology for wider application.
 - It is the **first organisation** of its kind within the government framework with the **sole objective of commercialising the indigenous research**.
- It provides **equity capital or loans** (*at a simple interest rate of 5% per annum*) to industrial concerns and financial assistance to research and development institutions.

Importance of Clean and Green Technologies

- Clean and green technologies, often referred to as '**Greentech**' or '**clean technology**', are crucial for a sustainable future, offering innovative solutions that protect our environment while also providing economic and health benefits.
- Mitigating Climate Change Impacts:** These technologies reduce greenhouse gas emissions, a major contributor to global warming.
 - By utilising renewable energy sources such as solar, wind, and hydro power, we can significantly cut down our reliance on fossil fuels, thereby reducing our carbon footprint.
- Conserving Natural Resources:** These '**Greentech**' promote the efficient use of resources.
 - For instance, water-saving technologies can help conserve water, a precious resource that is becoming increasingly scarce due to climate change and overuse.

- **Economic Growth:** Green technologies can contribute to economic growth.
 - ♦ They can create new industries and jobs, stimulate innovation, and provide opportunities for investment and trade.

Major Hurdles

- **Funding Challenges:** The level of investment in research and development in India is often insufficient to support cutting-edge scientific endeavours and technological innovations.
- **Educational Variability:** Disparities in the quality of science and technology education across the country hinder the development of a skilled workforce.
- **Infrastructure Issues:** Lack of adequate infrastructure can pose a significant challenge to technological progress.
- **Navigating Synthetic Media:** In an era dominated by synthetic media, discerning authenticity in a landscape inundated with manipulated content is a significant challenge.
- **Technical Debt to Technical Wellness:** The transition from managing technical debt to prioritising technical wellness emerges as a guiding principle, fostering sustainable technology ecosystems that can adapt and thrive in the face of evolving challenges.

Major Steps towards Clean and Green Technologies in India

- **National Electric Mobility Mission Plan and Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME)** to promote electric mobility and manufacturing of electric & hybrid vehicles and their components, and to support the transport sector in adopting green technologies.
- **Green Hydrogen Mission** which focuses on using green hydrogen as an energy source, and India's journey towards a **net-zero target by 2070**.
- **Carbon Capture Utilisation and Storage (CCUS) Technologies** that involve the capture of CO₂, generally from large point sources like power generation or industrial facilities that use either fossil fuels or biomass as fuel.
- **Other major initiatives** like Pradhan Mantri Ujjwala Yojana, Make in India program, Energy Transition and Energy Storage Projects, Renewable Energy

Evacuation, Green Credit Program, PM-PRANAM and GOBARdhan Scheme, Bhartiya Prakritik Khedi Bio-Input Resource Centres, MISHTI, Amrit Dharohar, Coastal Shipping, and Vehicle Replacement are focusing on various aspects of green technology, including waste management, heritage conservation, maritime transport, and vehicle replacement.

Source: PIB

STREAMLINING THE PHARMA SECTOR IN INDIA

Context

- Recently, the **Central Drugs Standard Control Organisation (CDSCO)** has withdrawn powers delegated to State licensing authorities making itself the sole authority for issuing manufacturing licences for drugs meant for export.

About the Indian Pharmaceutical Sector

- India's pharmaceutical industry is the **third-largest in the world** in terms of volume and the 14th largest in terms of value.

Central Drugs Standard Control Organization (CDSCO)
<ul style="list-style-type: none"> • It is the Central Drug Authority for discharging functions assigned to the Central Government under the Drugs and Cosmetics Act (1940). • It works under the administrative control of the Union Ministry of Health & Family Welfare (MoH&FW). • It has nine zonal offices, seven sub-zonal offices, 18 port offices, seven central laboratories and six mini labs under its control.
Functions <ul style="list-style-type: none"> • <i>Regulatory control over the import of drugs;</i> • <i>Approval of new drugs and clinical trials;</i> • <i>Meetings of Drugs Consultative Committee (DCC) and Drugs Technical Advisory Board (DTAB);</i> • <i>Approval of certain licences as Central License Approving Authority;</i>

- It contributes about **2% to India's GDP** and around **8% to merchandise exports**.
- The domestic industry contributes **3.5% to global export of drugs and medicines**.
- It encompasses a vast network of 3,000 drug companies and 10,500 manufacturing units.
- Approximately 500 Active Pharmaceutical Ingredient (API) manufacturers play a significant role and contribute **around 8% to the global API industry**.

- The **current market size** of the Indian pharmaceutical industry is **around \$50 billion**.
- Due to its role in supplying cost-effective generic medicines globally, India has earned the moniker of **'pharmacy of the world'**.

Growth Prospects

- It has seen a massive expansion over the last few years and is expected to reach about 13% of the size of the global pharma market while enhancing its quality, affordability, and innovation.
- India aims to grow the pharmaceutical industry by about four times to **\$200 billion by 2030**.
- The industry's focus on generic drug manufacturing has significantly improved access to essential medicines, especially in developing countries.

Key Challenges in the Pharma Sector of India

- Despite its impressive growth, the Indian pharmaceutical sector faces several challenges, including pricing pressures in the US generics market, scarcity of foreign currency in several African countries, and significant depreciation of local currencies. These include:
 - **Dependence on Imports: APIs and Key Starting Materials (KSMs)** import dependence exposes the industry to vulnerabilities related to supply chain disruptions and price fluctuations.
 - **Slow Pace of Development:** Indian pharmaceutical industry has been relatively **slow in the development of biologics, biosimilars, and other emerging products**.
 - ♦ It can potentially hinder the industry's ability to keep pace with global trends and meet the evolving needs of the healthcare sector.
 - **Regulatory Inefficiencies:** These pose another significant challenge for the Indian pharmaceutical industry that can lead to **delays in drug approvals, increased costs, and reduced competitiveness in the global market**.
 - ♦ Recently, **CDSCO (India's drug regulator)** withdrew powers delegated to State licensing authorities to issue **'No Objection Certificates (NOCs)'** for the manufacture of unapproved, banned, or new drugs for export purposes.
 - **Access to Funding** for innovation in the **Pharma-MedTech domain** is another area of concern.
 - ♦ Limited access to capital can stifle innovation and hinder the development of new drugs and therapies.

- **Skilled Human Resource:** Indian pharmaceutical industry requires a highly skilled workforce to drive research and development, manage operations, and ensure quality control.

Major Initiatives in the Pharma Sector of India

- **Production Linked Incentives (PLI) Scheme:** It aims to promote domestic manufacturing by providing incentives on incremental sales.
 - ♦ It is expected to benefit manufacturers of bulk drugs and medical devices, thereby reducing India's dependence on imports.
- **Foreign Direct Investment (FDI):** Government initiatives such as allowing **100% FDI through automatic routes for greenfield pharmaceutical projects**.
- **Bulk Drug Parks:** Government has proposed the establishment of three bulk drug parks to provide world-class infrastructure for the pharmaceutical industry that are expected to lead to substantial cost savings in drug production.
- **Pharmaceutical Technology Upgradation Assistance Scheme (PTUAS):** It aims to facilitate the upgrade of technology in the pharmaceutical industry and is expected to enhance the industry's competitiveness and ensure the production of high-quality drugs.
- **National R&D Policy:** It is designed to promote research and development in the pharmaceutical sector which aims to foster innovation and the development of new drugs, thereby positioning India as a global leader in the pharmaceutical industry.
- **Promotion of Research and Innovation in Pharma-MedTech (PRIP) Scheme:** It aims to promote research and innovation in the Pharma-MedTech domain and is expected to drive the development of innovative medical devices and pharmaceutical products.
- **Vision Pharma 2047:** Government aims to make India a global leader in the manufacturing of affordable, innovative & quality pharmaceuticals & medical devices by the year 2047.
 - ♦ It includes introducing natural products, ensuring accessibility & affordability of patient-centric products for better healthcare outcomes, and contributing to the Health System to attain a union of equity, efficacy, and efficiency.

Way Ahead

- According to a study conducted by the **Department of Pharmaceuticals**, India needs to get ready to take advantage of drug sales worth \$251 billion going off-patent this coming decade.
 - ♦ The **expiry of patents** is very promising for the Indian generic drug market as it is **expected to expand and grow further** with the inclusion of these new drugs.
- India's pharmaceutical industry is moving towards transparency and visibility, embracing stringent anti-pollution norms, resulting in improved conditions within pharmaceutical plants.
 - ♦ **Automation and technological advancements** are contributing to increased efficiency and reduced reliance on manual labour.

Source: TH

ISRO TESTS 3D-PRINTED ROCKET ENGINE

In News

- Indian Space Research Organisation (ISRO) successfully tested a liquid rocket engine made with the help of **Additive Manufacturing Technology** — **commonly known as 3D printing**.

About Rocket Engine

- The PS4 engine, designed for the fourth stage of the **Polar Satellite Launch Vehicle (PSLV)**, was redesigned by ISRO for production using 3D printing.
 - ♦ The PS4 engine uses a bipropellant combination of nitrogen tetroxide as the oxidizer and monomethyl hydrazine as the fuel
- **Laser Powder Bed Fusion technique** used in the manufacturing process. **Laser Powder Bed Fusion (LPBF)** is a metal 3D printing technique where a laser selectively melts and fuses metal particles together, building up a **3D object layer by layer**.
- The technology helped ISRO bring **down the number of parts in the engine** from 14 to a single piece.

What is 3D Printing?

About:

- The term 3D printing is typically used to refer to all types of additive manufacturing.

- It refers to the transformation of a **digital CAD (Computer-Aided Design) file into a three-dimensional physical** solid object or part.
- It typically does this by depositing material layer by layer in precise geometric shapes using a printhead, nozzle, or other printing technology.
 - ♦ It is an additive process, in which layers of a material like plastic, composites or bio-materials are built up to construct objects that range in shape, size, rigidity, and colour.

Process:

- The process of 3D printing a building involves the use of computer-aided design (CAD) software to create a digital blueprint.
 - ♦ This blueprint is then converted into a format the 3D printer can understand, typically a .STL or .OBJ file.

Application:

- It has widely been applied towards the agricultural, biomedical, automotive, and aerospace industries
- There are numerous applications of 3D printing technology for producing biomedical products such as drugs, artificial skin, bone cartilage, tissue, and organs, and in cancer research and education.
 - ♦ It is used widely in the manufacturing industry and medical education field.
- It has been used to create complex walls, endodontic guides, sport shoes, engine parts for the aviation industry, and tumour reconstruction.

Benefits

- 3D printing technology, which has the potential to revolutionize the construction industry, offers unprecedented design freedom, reduces material waste, and significantly reduces construction time.
- It enables the creation of complex architectural forms that would be challenging to achieve with traditional methods.
- It allows for the customization and optimization of building components.
- The layer-by-layer approach of 3D printing allows precise control over material distribution and structural integrity, resulting in highly efficient and robust structures.

How 3D Printing Works

3D printing, the process of making a three-dimensional solid object from a digital model, is set to revolutionize the way industries manufacture parts. Here's how 3D printing works:

- 1 A 3D image is created using a computer-aided design software.
- 2 The CAD file is sent to the printer.
- 3 The printer lays down successive layers of liquid, powder, paper or metal material and builds the model from a series of cross sections.

Types of additive processes

Several different 3D-printing processes have been invented since the late 1970s.

TYPE	PROCESS	MATERIAL
Extrusion; wire	Uses a plastic filament or metal wire that is wound on a coil and unreels to supply material to an extrusion nozzle.	Thermoplastics, eutectic metals, edible materials, metal alloy
Granular	Uses selective fusing of materials in a granular bed. The technique fuses parts layer by layer until the object is built.	Metal alloy, titanium alloys, thermoplastics, metal powders, ceramic powders, plaster
Laminated	Laminates objects using layers of thin plastic, paper or metal sheets.	Paper, metal foil, plastic film
Light polymerized	Vat of liquid polymer is repeatedly exposed to light. The exposed liquid polymer hardens in small increments until the model has been built. The remaining liquid polymer is drained from the vat, leaving the solid model. Another system sprays photopolymer materials in ultra-thin layers until the model is completed.	Photopolymer

The next Industrial Revolution?

Intellectual-property issues and the quality of printed objects continue to be concerns, but 3D printing has already had a huge impact on manufacturing, industrial design and even medicine. Here are some potential uses for the technology:

A working gun
The world's first 3D-printed gun was successfully tested in March 2013.

Stem cell
The device works by creating uniform droplets of living embryonic stem cells, which researchers can use to test drugs or to build miniature scraps of tissue. The eventual goal is to grow whole organs from scratch.

Bionic ear
The bionic ear - made from calf cells, a polymer gel and silver nanoparticles - can pick up radio signals beyond the range of human hearing.

Lunar base
The 3D-printing concept is being tested for more efficient lunar-base construction. The base would be 3D-printed from lunar soil.

SOURCES: WIKIPEDIA.ORG, HOWSTUFFWORKS.COM
R. TORO / © LiveScience.com

Challenges

- The slow adoption in India can be attributed to the lack of understanding about 3D printing.
- In the 3D printing industry, parts to build the printer are still very expensive.
- Lack of investment and fewer R&D centres for 3D printing are some of the additional factors that are holding back large scale adoption.

Future Outlook

- 3D printing technology has emerged in recent years as a flexible and powerful technique in advanced manufacturing.
- The future demand for 3D printing lies in its capability to perform different print functions and "print-it-all" structures.
 - ◆ These functions are progressively perceived as the driving force for researchers and practitioners .
- A better understanding of 3D printing technology and its applications among users will definitely help increase its adoption
- The successful hot testing of the 3D printed PS4 engine is a significant step in leveraging additive manufacturing technology for rocket engines in the future.
 - ◆ This paves the way for the induction of the additively manufactured PS4 engine into the regular PSLV program, ushering in a new era of advanced manufacturing techniques for India's space endeavours

Source:IE

MEGHALAYA COAL MINING DAMAGE

Context

- **Justice Katakey committee** has flagged the lack of progress in restoring the environment damaged by rat-hole coal mining in the northeastern State.

Background

- **The National Green Tribunal (NGT)** banned the practice of rat-hole coal mining in **2014** as it causes environmental degradation and is a threat to the life of miners.
- The Meghalaya High Court appointed a single-member committee under justice **Brojendra Prasad Katakey** in 2022 to recommend measures to the state government in compliance with the directions issued by NGT.

What is rat-hole mining?

- The term “rat hole” refers to the narrow pits (3-4 feet high) dug into the ground, typically just large enough for one person to descend and extract coal.
- Once the pits are dug, miners descend using ropes or bamboo ladders to reach the coal seams.
- The coal is then manually extracted using primitive tools such as pickaxes, shovels, and baskets.

Concerns of Rat hole mining

- **Safety Concerns:** Rat hole mining is often carried out in very small and unstable tunnels, lacking safety measures such as proper ventilation, structural support, or safety gear for the workers.
 - ♦ In **2018**, around 15 rat hole miners died inside a coal mine in the **East Jaintia Hills district in Meghalaya**.
- **Environmental issues:** The mining process can cause land degradation, deforestation, and water pollution.
 - ♦ Rat-hole mining in **Meghalaya** had caused the water in the **Kopili river** (it flows through Meghalaya and Assam) to turn acidic.
- **Loss of lives:** This method of mining has faced severe criticism due to its hazardous working conditions, and numerous accidents leading to injuries and fatalities.
- **Child labor:** Due to the small size of the tunnels, Children are employed in the as they can crawl through these cramped spaces on their knees.

Reasons for the persistence of rat hole mining

- **Lack of Alternative Livelihood:** In some areas, there are limited alternative employment opportunities. Hence it is difficult for miners to transition to other professions.
- **Lack of political will:** For many regions rat hole mining is the main source of revenue. Thus authorities do not take strict action to regulate the practice.
- **Poverty:** Economic challenges and poverty drives individuals to engage in rat hole mining as a means of survival.
- **Economic Viability:** No other method would be economically viable in Meghalaya, where the coal seam is extremely thin. Removal of rocks from the hilly terrain and putting up pillars inside the mine to prevent collapse would be costlier.

Key issues highlighted by the Committee

- The people living in areas around the mines continue to **suffer due to continued acid mine drainage** from the mine pits that have not been closed yet.
- It underlined the non-utilisation of the **Meghalaya Environment Protection and Restoration Fund (MEPRF)**.
- The transportation of re-assessed or re-verified inventoried coal to the designated depots has not been completed yet.

Way Ahead

- There is a need to take necessary steps for restoring the mining-affected ecology of Meghalaya with ₹400 crore in the MEPRF and another ₹100 crore with the Central Pollution Control Board.
- The panel recommended the **conduct of the drone survey** immediately after the completion of the transportation of re-assessed or re-verified inventoried coal to the Coal India Limited-designated depots.
- The objective of the survey is to locate deposits of coal illegally mined after the imposition of the NGT ban and to take the required steps including the seizure of such coal under the provisions of the **Mines and Minerals (Development and Regulation) Act, 1957**.

Source:TH

AFFORDABLE HOUSING SCHEMES IN INDIA (PMAY)

Context

- According to the Indian Council for Research on International Economic Relations (ICRIER), India's urban housing shortage rose by **54%** from **18.78 million in 2012** to **29 million in 2018**.

Housing scenario in India

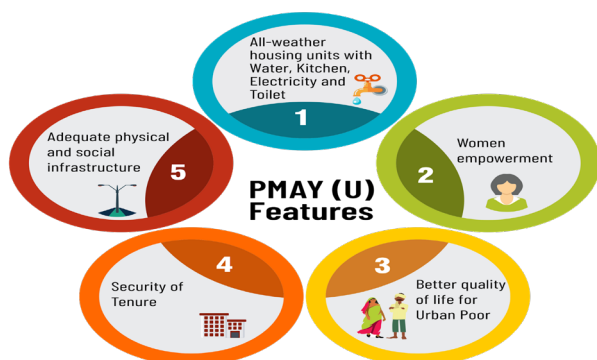
- The **2011** census found that over **65 million** people, about **5%** of India's total population, lived in slums.
- India has around **1.7 million** homeless people, as per the **2011 Census**. Even for people with houses, the quality of build, congestion, and inadequate infrastructure remain major concerns.
- As Per the government's definition, affordable housing properties are those with an area not more than **60 sq.m**, with the price capped at ₹45 lakh.

History of housing schemes in India

- **A right to housing** has been held to be a part of the **fundamental right to life** under **Article 21** of the Constitution by the Supreme Court.
- The first policy intervention from the Government came in **1985**, with the **Indira Awaas Yojana**, which was focused on **rural housing**.
- **Urban housing** came into focus with programmes such as the **Jawaharlal Nehru National Urban Renewal Mission (JNNURM)**, launched in **2005**.
- In **2008**, the **Parekh Committee report** on housing led to urban housing interventions such as the **Rajiv Awas Yojana and Rajiv Rinn Yojna**.
- **The Housing for All schemes (2015-22)** were launched with two wings
 - ◆ Pradhan Mantri Awas Yojana- Gramin (PMAY-G) and,
 - ◆ Pradhan Mantri Awas Yojana-Urban (PMAY-U).

What is PMAY-U?

- **The Ministry of Housing and Urban Affairs (MoHUA)** launched the Pradhan Mantri Awas Yojana – Urban (PMAY-U) in 2015, as a flagship Mission of the Government of India.
- **Objective:** It addresses urban housing shortage among the Economically Weaker Section (EWS)/ Low Income Group (LIG) category including the slum dwellers by ensuring a pucca house to eligible urban households.
- **Components** of the scheme are as;
 - ◆ In-situ Slum Redevelopment (ISSR)
 - ◆ Credit Linked Subsidy Scheme (CLSS)
 - ◆ Affordable Housing in Partnership (AHP)
 - ◆ Beneficiary-led Individual House Construction/ Enhancement (BLC-N/ BLC-E)
- **Implementation period:** The scheme was earlier from 25.06.2015 to 31.03.2022. Now it has been extended up to 31.12.2024, except Credit Linked Subsidy Scheme (CLSS) vertical, to complete all the houses sanctioned under the scheme.



Status of the PMAY

- Around 83% of the houses to be constructed under PMAY-U are not meant for the urban landless poor, but rather for families having access to capital and land.
- The slum rehabilitation scheme within PMAY-U has sanctioned only 2.96 lakh homes.
- Under PMAY-G more than 2.94 crore houses have already been sanctioned to the eligible beneficiaries by the States/UTs and over 2.55 crore houses have already been completed as on 01.02.2024.

What is PMAY-G?

- **The Ministry of Rural Development** is implementing Pradhan Mantri Awas Yojana-Gramin (PMAY-G) to provide assistance to eligible rural households with an overall target to construct **2.95 crore pucca houses** with basic amenities.
- The beneficiaries are provided financial Assistance of Rs.1.20 lakh in plain areas and Rs.1.30 lakh in hilly States.

Schemes launched by the State

- The Andhra Pradesh government has undertaken schemes such as the Navaratnalu-Pedalandariki Illu.
- Under this, the State had taken up construction of 21.76 lakh houses, with an outlay of ₹56,700 crore.

Challenges in implementation of the schemes

- **Acquiring land** for housing projects at affordable rates, especially in urban areas, poses a significant challenge.
- **Identifying and verifying eligible beneficiaries** is a complex process. Many potential beneficiaries are not aware of the PMAY.
- Delays in implementation of the projects due to lack of funds, bureaucratic red tape etc.
 - ◆ The PMAY-U promised houses for 1.18 crore families by December 2024. As of March 2024, it has **only achieved around 67% of its target**, that is, around 80 lakh.

Way Ahead

- Continuous monitoring and evaluation of the scheme's progress are essential to identify bottlenecks, measure outcomes, and make necessary course corrections.

- Also Incorporating sustainability measures and environmental considerations into housing projects is important for long-term viability.
- Ensuring equitable distribution and addressing the needs of marginalized communities are critical for the success of PMAY.

Source: TH

NEWS IN SHORT

VIBRANT VILLAGE PROGRAMME

Context

- Recently, the Union **Ministry of Home Affairs (MHA)** informed that India is likely to spend over ₹2 crore on each kilometre of road to be constructed along the China border in Uttarakhand and Sikkim under the **Vibrant Village Programme**.

About the Vibrant Village Programme

- It is a **Centrally Sponsored Scheme** aimed at the comprehensive development of villages in **India's border regions** by improving the quality of life of people residing in select villages in the region.
- It focuses on **creating opportunities for livelihood generation** through the promotion of tourism & cultural heritage, skill development & entrepreneurship, agriculture, horticulture and the development of cooperative societies.
- Vibrant Village Programme covers select villages in 46 blocks across 19 districts in the states of Arunachal Pradesh, Himachal Pradesh, Sikkim, Uttarakhand, and the Union Territory of Ladakh.
- It has been allocated a financial outlay of 4800 crore for the financial years 2022-23 to 2025-26.

Impact of Programme

- Vibrant Village Programme is expected to have a transformative impact on the villages it covers and **expected to stop migration** in the population residing along the border.
- It aims to be integrated with the **Prime Minister Gati Shakti** mega project that brings major Ministries together for integrated planning and coordinated implementation of infrastructure connectivity projects.

Source: TH

DIGILOCKER

Context

- As of early May 2024, DigiLocker has over 270 million registered users, while nearly 6.7 billion documents have been retrieved through it.

About DigiLocker

- It is a **flagship initiative** launched in 2015 of the **Ministry of Electronics & IT (MeitY)** under the Digital India programme.
- It is a digital platform and a paperless solution designed to ensure that a user can access the latest and updated versions of their documents online.
- It aims to provide a digital wallet to every citizen so that all lifelong documents, including educational, identity, health records, insurance policy papers, PAN records, and driving licences and certificates, can be accessed anywhere, anytime.

Features and Benefits

- DigiLocker helps in keeping at bay fake, poor quality print copies, and outdated documents that miss key details.
- The issued documents in the DigiLocker system are **deemed to be at par with original physical documents**.
 - ♦ It means these digital documents are **no less valid than their originals**.
 - ♦ Additionally, using the app can **help with faster service delivery**.

Security Aspects

- DigiLocker is a government-approved application and is ideally maintained with strict security protocols framed by officials.
- As per the MEITY, 'DigiLocker ties into **Digital India's** vision of providing citizens a secure document access platform on a public cloud'.

Source: TH

HYBRID ANNUITY MODEL (HAM)

Context

- The pace of national highway construction is expected to slow because of the Hybrid annuity model (HAM).

Hybrid annuity model (HAM)

- A public-private partnership (PPP) model that combines **engineering, procurement, and construction (EPC)** and **build, operate, transfer (BOT) models**.
- **40%** the Project Cost is to be provided by the Government as Construction Support during the construction period and the balance **60% as annuity payments** over the operations period along with interest thereon to the concessionaire.

Build, operate, transfer (BOT) Model

- Under a BOT contract, an entity—usually a government—grants a concession to a private company to finance, build, and operate a project.
- The company operates the project for a period of time (typically 20 or 30 years) with the goal of recouping its investment, then transfers control of the project back to the public entity.

Engineering, Procurement, and Construction (EPC) Model

- EPC is a type of project delivery model (or contract agreement) where contractors are responsible for the project from start to finish.
- EPC contracts often get expensive, and the government has less control over the construction.

Source: [BL](#)

CAENORHABDITIS ELEGANS WORM

Context

- Researchers have reported that after *C. Elegans* worms ate a disease-causing strain of bacteria, its children inherited the 'knowledge' to avoid making the same mistake, up to four generations.

About

- *Caenorhabditis elegans* is a free-living transparent nematode about **1 mm in length** that lives in temperate soil environments.
- It was the first multicellular organism to have its **full genome sequenced** and neural wiring mapped.
- *C. elegans* grows within **3-5 days from a fertilized egg** to a millimeter-long adult.

Source: [TH](#)

ASEAN-INDIA TRADE IN GOODS AGREEMENT

In News

- The 4th Joint Committee meeting for the review of AITIGA (ASEAN-India Trade in Goods Agreement) was held in Malaysia

About ASEAN-India Trade in Goods Agreement

- It was signed and entered into force on 1 January 2010.
- Under the Agreement, [ASEAN Member States](#) and India have agreed to open their respective markets by progressively reducing and eliminating duties on 76.4% coverage of goods.
- In September 2022, both sides tasked the AITIGA Joint Committee to undertake the review with the aim of making the Agreement more trade facilitative and mutually beneficial.
 - A total of eight Sub-committees have been constituted under the AITIGA Joint Committee for undertaking negotiations on different policy areas related to the Agreement.

Importance

- ASEAN is one of the major trade partners of India with a share of 11% in India's global trade.
- The bilateral trade stood at USD 122.67 Bn during 2023-24.
- The upgradation of AITIGA will further boost bilateral trade.

Do you know ?

- The Framework Agreement on Comprehensive Economic Cooperation between ASEAN and India was signed in October 2003 and served as legal basis to conclude further agreements, including **Trade in Goods Agreement, Trade in Services Agreement, and Investment Agreement that form the ASEAN-Indian Free Trade Area (AIFTA)**
 - **The ASEAN-India Trade in Services Agreement** was signed in November 2014. It contains provisions on transparency, domestic regulations, recognition, market access, national treatment and dispute settlement.
 - **The ASEAN-India Investment Agreement** was also signed in November 2014.
- The Investment Agreement stipulates protection of investment to ensure fair and equitable treatment for investors, non-discriminatory treatment in expropriation or nationalisation as well as fair compensation.

Source: [PIB](#)

AURORA LIGHTS IN INDIA

In News

- Indian Astronomical Observatory captured the **aurora borealis** on camera in Ladakh above Mount Saraswati.

About

- Northern lights were also witnessed in other parts of the world, including in the United States and the United Kingdom.
- Meanwhile, southern lights, or aurora australis, were spotted in countries such as New Zealand and Australia.

About Auroras

- Auroras are brilliant ribbons of light.
- These lights primarily **appear near the poles of both the northern and southern** hemispheres all year round but sometimes they expand to lower latitudes.
 - ♦ In the north, the display is called the **aurora borealis**; in the south, it is known as the **aurora australis**.

- It can be seen in a range of colours, including blue, red, yellow, green, and orange.
 - ♦ The colours depend on the type of gas and its altitude. Oxygen glows red or blue; nitrogen can be green, blue, or pink
- **Causes:** It is caused by collisions between fast-moving electrons from space with the oxygen and nitrogen in Earth's upper atmosphere.
 - ♦ They are caused by magnetic storms that have been triggered by solar activity, such as solar flares (explosions on the Sun) or coronal mass ejections (ejected gas bubbles).
 - Energetic charged particles from these events are carried from the Sun by the solar wind.
- **Occurrence:** Auroras have been observed on Jupiter, Saturn, and Uranus
 - ♦ The aurora borealis is usually visible in high-latitude regions around the Arctic and Antarctic.

