



Guiding Dreams, Empowering Future
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India's National Supercomputing Mission (NSM)

WHY IN NEWS

- India plans to achieve complete indigenisation of high-performance computing systems by 2030.
- At present, around 50% of components are indigenous and this is expected to cross 70% by 2030.
- India aims to deploy nearly 90 petaflops of computing capacity under NSM by March 2026.

About National Supercomputing Mission

- NSM was launched in 2015 to build strong supercomputing capacity in India.
- It is jointly implemented by the Department of Science and Technology and the Ministry of Electronics and Information Technology.
- C-DAC Pune and IISc Bengaluru are the main implementing agencies.

Objectives

- Achieve self-reliance in the design, development and manufacturing of supercomputers.
- Provide advanced computing power for research and development across the country.
- Support applications of national importance in academic, research and government institutions.

Indigenous Technologies

- Trinetra is an indigenous high-speed interconnect network developed by C-DAC.
- Trinetra-A provides 100 Gbps speed



and is used in PARAM Rudra at Pune.

- Trinetra-B will provide 200 Gbps speed and is planned for larger systems.
- Rudra is the first indigenously designed and manufactured HPC server with an Indian software stack.

Major Supercomputer

Installations

- PARAM Rudra (2024) is deployed in Pune, Delhi and Kolkata.
- PARAM Pravega (2022) is a 3.3 peta-flop supercomputer at IISc Bengaluru.
- PARAM Shivay (2019) was the first NSM supercomputer installed at IIT BHU, Varanasi.

Human Resource Development

- Five HPC training centres operate in Pune, Kharagpur, Chennai, Palakkad and Goa.
- More than 22,000 people have been trained in HPC and AI skills.

AIRAWAT AI Computing Platform

- AIRAWAT is a national AI computing platform for research and innovation.
- It supports academia, start-ups, industry and government institutions.
- The platform has 200 AI petaflops capacity and can scale up to 790 AI petaflops.
- AIRAWAT ranked 75th globally in the Top500 supercomputers list at ISC 2023.

Objectives of Pax Silica

- Reduce China's dominance in critical technology and mineral supply chains.
 - Prevent coercive dependencies in semiconductors, energy inputs and logistics.
 - Promote innovation-driven and secure high-technology ecosystems.
- Scope of the Initiative
- Covers critical minerals, semiconductors, advanced manufacturing and AI infrastructure.
 - Encourages joint ventures and strategic co-investments among member countries.
 - Protects sensitive technologies and critical infrastructure from countries of concern.

Member Countries

(as of December 2025)

▶ United States, Japan, South Korea, Singapore and Netherlands, United Kingdom, Israel, United Arab Emirates and Australia.

India's Exclusion

- ▶ India has not been included in Pax Silica despite other Quad members being part of it.
- ▶ The exclusion has drawn political and



Why in News

- India was excluded from the US-led Pax Silica initiative at its inaugural summit in 2025.
- The exclusion has raised concerns related to geopolitics, critical minerals and technology supply chains.

What is Pax Silica?

- ▶▶ Pax Silica is a US-led strategic initiative to build a secure and resilient silicon and high-technology supply chain.
- ▶▶ It focuses on trusted partnerships in semiconductors and advanced technologies.

strategic criticism.

India and Minerals Security Partnership (MSP)

- ▶ MSP is a US-led initiative launched in 2022 to secure critical mineral supply chains.
- ▶ India joined the MSP in June 2023.
- ▶ MSP partners include Japan, Australia, the EU, the UK and Canada.

Strategic Significance for India

- ▶ MSP focuses on minerals such as lithium, cobalt, nickel and rare earth elements.
- ▶ The partnership aims to reduce China's dominance in rare earth processing.
- ▶ India may follow a similar path and join Pax Silica at a later stage.

Deepavali Inscribed on UNESCO Intangible Cultural Heritage (ICH) List :



Why in News...?

- Deepavali was inscribed on UNESCO's Representative List of the Intangible Cultural Heritage of Humanity.
 - The inscription took place at the 20th session of the UNESCO Intergovernmental Committee held at Red Fort, New Delhi, on 12 December 2025.
 - This was the first time India hosted the ICH Committee session.
 - The event marked 20 years of India's ratification of the 2003 UNESCO Convention for Safeguarding Intangible Cultural Heritage.
- UNESCO Intangible Cultural Heritage

(ICH) List :

- The ICH List was created under the 2003 UNESCO Convention.
- It aims to safeguard living cultural traditions such as festivals, rituals, performing arts, crafts, and social practices.
- The list promotes cultural diversity, community participation, and intercultural dialogue.
- Nominations require community consent, safeguarding measures, and proof of cultural value.

Deepavali: Features

- Deepavali is the festival of lights celebrated on Kartik Amavasya during

October–November.

- It symbolizes the victory of light over darkness and good over evil.
- The festival strengthens social harmony, generosity, and community bonding.
- It supports traditional crafts such as lamps, decorations, sweets, and handi-crafts.

India and UNESCO ICH Process

- India nominated Deepavali under the 2024–25 nomination cycle.
- Each State Party can submit only one nomination every two years.
- India follows a community-based safeguarding model for ICH elements.

EXERCISE EKATHA 2025 : India–Maldives Naval Cooperation



Why in News

- India's Deputy Chief of Naval Staff attended the closing ceremony of Exercise Ekatha 2025 in the Maldives.
- The event highlighted strengthening naval and maritime cooperation between India and the Maldives.

Exercise Ekatha:

Overview

- Exercise Ekatha is an annual bilateral maritime military exercise between India and the Maldives.
- It is conducted between the Indian Navy and the Maldives National Defence Force (MNDF).
- The exercise was first launched in 2017.

Exercise Ekatha 2025

- The 8th edition of Exercise Ekatha was held in the Maldives in 2025.
- It focused on joint maritime operations and special forces cooperation.

Objectives of

Exercise Ekatha :

- Enhance interoperability between marine commandos of both countries.
- Improve skills in diving operations and special forces tactics.
- Strengthen preparedness against asymmetric and maritime security threats.

Strategic Significance :

- ▶ The exercise supports India's MAHASAGAR vision for security and growth in the Indian Ocean Region.
- ▶ It reinforces India's Neighborhood First Policy.
- ▶ It contributes to maritime stability and regional security.

Maldives: Geographic:

- ▶ The Maldives is an archipelagic nation in the Indian Ocean with capital at Male.
- ▶ It consists of about 1,200 coral islands grouped into 26 natural atolls.

- ▶ It has one of the world's largest and most diverse coral reef systems.

Strategic Location and

Vulnerability :

- ▶ The Eight Degree Channel separates India's Minicoy Island from the Maldives.
- ▶ This channel is strategically important for major sea lanes of communication.
- ▶ The Maldives is the world's flattest country with an average elevation of about 1.5 meters.
- ▶ It is highly vulnerable to sea-level rise and climate change.

India–Maldives Defence

Engagements :

- Exercise EKUVERIN is a bilateral military exercise between India and the Maldives.
- Exercise DOSTI is a trilateral maritime exercise involving India, Sri Lanka and the Maldives.
- Exercise MILAN is a multilateral naval exercise hosted by India.

PM Dhan-Dhaanya Krishi Yojana (PM-DDKY)



Why in News...?

- PM Dhan-Dhaanya Krishi Yojana (PM-DDKY) is a major agriculture initiative for the period 2025–26 to 2030–31.
- The Ministry of Agriculture and Farmers' Welfare hosted the PM-DDKY – FPO Sangam on 11 December 2025.
- More than 72 Farmer Producer Organizations from 15 states participated in the event.

About PM-DDKY :

- PM-DDKY is an integrated farm scheme combining multiple agriculture-related programmes.
- It aims to improve productivity, sustainability, and farmer incomes.
- The scheme emphasizes market linkage and institutional support through FPOs.

FPO Sangam: Features

- FPO Sangam connects Farmer Producer Organizations with buyers, processors, and retail chains.
- It supports long-term partnerships and stable market access for farmers.
- It strengthens collective bargaining power of small and marginal farmers.

Funding Allocation :

- 40% of funds are allocated for subsidies.
- 30% is earmarked for agriculture and allied infrastructure development.
- 20% is allocated for credit support and loans.
- 10% is dedicated to training, capacity building, and market linkages.

Primary Objectives :

- Increase agricultural productivity and encourage crop diversification.
- Improve post-harvest storage, value addition, and allied sector participation.
- Promote involvement of women and youth in agriculture.
- Achieve self-sufficiency in foodgrains, pulses, and oilseeds.

District Selection Criteria :

- Districts with crop productivity below the national average.
- Districts with cropping intensity below 1.55 cycles per year.
- Districts where farmer credit access is below 30%.

Implementation Mechanism :

- District DDKY Samiti implements the scheme at the district level.
- The Samiti is chaired by the District Collector.
- A District Agriculture Development Plan is prepared for execution.
- Oversight is provided by around 100 Central Nodal Officers, mainly Joint Secretaries.

Hybrid Mutual Funds

Why in News

- Hybrid mutual funds are gaining popularity as equity markets are at record highs.
- Wealth managers recommend them for investors who find portfolio rebalancing difficult.

What are Hybrid Mutual Funds?

- Hybrid mutual funds invest in more than one asset class, mainly equity and debt.
- Some schemes also invest in gold, REITs, or InvITs.
- They aim to balance growth and stability through diversification.
- They are also known as asset allocation funds.

Working Mechanism :

- These funds maintain a fixed or flexible mix of equity and debt.
- Equity component supports capital growth.
- Debt component provides stability and regular income.
- Fund managers rebalance portfolios to manage risk automatically.

Significance :

- Provide diversification across asset classes.
- Show lower volatility compared to pure equity funds.
- Offer relatively stable long-term returns.

Taxation Benefits :

- Income from debt funds or bonds is taxed as per the investor's income slab.
- Hybrid funds with more than 65% equity are taxed as equity-oriented funds.
- The debt portion gets long-term capital gains benefits.
- Hybrid funds are more tax-efficient than traditional debt instruments.

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INDIA'S FIRST Indigenous Hydrogen Fuel-Cell Vessel :

Why in News

- India's first indigenous hydrogen fuel-cell vessel was flagged off in Varanasi on 12 December 2025.
- The vessel was inaugurated by the Union Minister for Ports, Shipping and Waterways.
- It marks a major step towards clean and green inland water transport in India.

About the Vessel :

- The vessel is fully designed and built in India.
- It has been developed by Cochin Shipyard Limited in collaboration with

the Inland Waterways Authority of India.

- It uses hydrogen fuel-cell technology for propulsion.

Features :

- Operates with zero emissions, producing only water vapour as a by-product.
- Reduces dependence on fossil fuels in inland water transport.
- Represents advanced indigenous capability in clean maritime technology.

Policy Alignment :

- The project aligns with the Maritime India Vision 2030.

- It also supports the Maritime Amrit Kaal Vision 2047.

■ Both visions emphasize sustainable shipping and use of alternative fuels. Significance :

- Strengthens India's green waterways initiative.
- Supports national goals for decarbonisation and clean energy transition.
- Enhances eco-friendly mobility for pilgrims and tourists in Varanasi.
- Positions Varanasi as a model city for sustainable inland water transport.

► From P4

Major Types of Hybrid Mutual Funds :

- Equity Savings Fund: Invests around 10–25% in equity, rest in debt and arbitrage; low risk.
- Balanced Hybrid Fund: Invests 40–60% each in equity and debt; moderate risk.
- Aggressive Hybrid Fund: Invests 65–80% in equity; higher growth and higher risk.

• Dynamic Asset Allocation Fund: Changes equity-debt mix based on market conditions.

• Multi-Asset Allocation Fund: Invests in at least three asset classes like equity, debt, and gold.

PYQ (UPSC Prelims 2023)

Q. In finance, 'beta' measures the volatility of a stock compared to the overall market.

A) the process of simultaneous buying and selling of an asset from different platforms.

B) an investment strategy of a portfolio manager to balance risk versus reward

C) a type of systemic risk that arises where perfect hedging is not possible

D) a numeric value that measures the fluctuations of a stock to changes in the overall stock market.

PONDURU KHADI RECEIVES GI TAG



Why in news...?

- Ponduru Khadi received the Geographical Indication (GI) tag on 15 December 2025.
- The GI tag was granted by the Geographical Indications Registry.
- Ponduru Khadi originates from Ponduru village in Srikakulam district, Andhra Pradesh.



About Ponduru Khadi :

- ▶ Ponduru Khadi is a traditional hand-spun and handwoven cotton fabric.
- ▶ It is locally known as 'Patnulu'.
- ▶ The fabric is made entirely through manual processes, preserving traditional skills.

Raw Material Used :

- It is made from indigenous varieties of cotton.
- These include hill cotton, punasa cotton, and red cotton.

Unique Production Features :

- Cotton is cleaned using the jawbone of the Valuga fish.

- This method is globally unique to Ponduru.
- Ponduru is the only place in India using a single-spindle Gandhi Charkha with 24 spokes.
- The yarn count ranges from 100 to 120, giving extreme fineness to the fabric.

Historical & Cultural Significance :

- ▶ Ponduru Khadi was praised by Mahatma Gandhi during the pre-Independence period.
- ▶ It was mentioned in the journal 'Young India'.
- ▶ It is closely linked with the Swadeshi

movement and the idea of self-reliance. About Geographical Indication (GI)

Tag :

- GI tags protect products that have unique qualities linked to a specific geographical origin.
- They help prevent misuse of traditional names and products.
- GI status supports artisans by improving market value and recognition.
- Significance of GI Tag for Ponduru Khadi
- Helps preserve traditional weaving and spinning practices.
- Boosts rural livelihoods and local economy in Andhra Pradesh.
- Encourages promotion of indigenous handicrafts at national and global levels.

National Energy Conservation Awards 2025

Why in News?

- On National Energy Conservation Day 2025, observed on 14 December, the President of India presented the National Energy Conservation Awards in New Delhi.
- The awards highlight India's efforts to promote energy efficiency and conservation.
- National Energy Conservation Awards :
 - The awards were instituted in 1991 by the Bureau of Energy Efficiency (BEE).
 - They recognise organizations that reduce

energy consumption while maintaining or improving productivity.

- The awards cover sectors such as industry, commercial buildings, transport, institutions and appliances.

Bureau of Energy Efficiency (BEE) :

- BEE is a statutory body established on 1 March 2002.
- It was created under the Energy Conservation Act, 2001.
- BEE works under the Ministry of Power.

Functions of BEE

- Promotes energy efficiency standards and best practices across sectors.
- Implements the Standards and Labeling (S&L) Programme for appliances.
- Implements Demand Side Management (DSM) programmes.

- Conducts public awareness and capacity-building initiatives.

Energy Efficiency Schemes

- The Perform, Achieve and Trade (PAT) scheme promoted industrial energy efficiency.
- PAT has now been replaced by the Carbon Credit Trading Scheme (CCTS), notified in 2023.
- CCTS aims to create a market-based mechanism for reducing emissions.

Significance of the Awards :

- Encourage industries and institutions to adopt energy-efficient technologies.
- Help reduce greenhouse gas emissions and energy intensity of the economy.
- Support India's climate commitments and sustainable development goals.

Mangroves as Ecological Buffers

Why in News...?

- A study published in the journal *Current Biology* explains how mangroves survive extreme salinity.
- The findings provide inputs for developing salt-tolerant crops amid climate change and sea-level rise.

Scientific Findings :

- ▶▶ Mangroves have smaller epidermal pavement cells and thicker cell walls, giving strength in saline conditions.
- ▶▶ They manage salt through two strategies: exclusion of salt at roots and excretion through leaf glands.
- ▶▶ Some species store salt and later remove it through specialised glands on leaves.
- ▶▶ Mangroves have evolved independently more than 30 times over 200 million years.
- ▶▶ Unlike drought-tolerant plants, mangroves do not rely on increased stomatal density.

Implications for Agriculture and Policy :

- Mangrove cell traits can guide development of salt-tolerant crops like rice, wheat and pulses.
- Supports the National Mission on Sustainable Agriculture (NMSA).
- Contributes to SDG 13 by promoting climate-resilient agriculture and food security.

Facts about Mangroves :

- ✓ Mangroves are salt-tolerant trees and shrubs found in intertidal coastal zones.
- ✓ They grow mainly in tropical and subtropical regions.
- ✓ They thrive in areas with high rainfall, warm temperatures and tidal flooding.
- ✓ Common habitats include estuaries,

tidal flats and river deltas.

Adaptations of Mangroves :

- ✓ Pneumatophores help in respiration in waterlogged soils.
- ✓ Prop roots provide mechanical support and stability.
- ✓ Lenticellated bark and salt-secreting glands manage oxygen and salinity.
- ✓ Roots trap silt and help stabilize coastlines.
- ✓ Mangroves show vivipary, where seeds germinate on the parent plant.

Distribution and Status in India

- ✓ Mangroves are limited to tropical and subtropical latitudes.
- ✓ India's mangrove cover is 4,991.68 square kilometers as per ISFR 2023.
- ✓ West Bengal has the largest share, followed by Gujarat and Andaman and Nicobar Islands.

Legal and Policy Protection :

- ▶ Mangroves are protected under the Environment (Protection) Act, 1986.
- ▶ A 50-metre buffer is mandated where mangrove cover exceeds 1,000 square meters.
- ▶ Compensatory afforestation is required in a 3:1 ratio if mangroves are damaged.
- ▶ Additional protection is provided under wildlife, forest and biodiversity laws.

(PYQ 2015) Q. Which one of the following regions of India has a combination of mangrove forest, evergreen forest and deciduous forest? (2015)
(a) North Coastal Andhra Pradesh
(b) South-West Bengal
(c) Southern Saurashtra
(d) Andaman and Nicobar Islands

India-Jordan Relations



Why in News.?

Prime Minister Narendra Modi recently visited Amman in December 2025, marking the first Indian Prime Ministerial visit to Jordan in 37 years and coinciding with the 75th anniversary of India-Jordan diplomatic relations established in 1950.

Outcomes of the Visit and MoUs Signed During the Visit :

- Agreement to double bilateral trade from USD 2.8 billion to USD 5 billion within five years.
- Five MoUs signed covering renewable energy, water resources, digital solutions, culture, and heritage site twinning.
- MoU on Technical Cooperation in New and Renewable Energy.
- MoU on Cooperation in Water Resources Management and Development.
- Twinning Agreement between Petra (Jordan) and Ellora (India).
- Renewal of Cultural Exchange Programme (2025–2029).
- Letter of Intent on sharing population-scale digital solutions for digital transformation.

Fertilizer and Critical Minerals Security :

- ▶ Decision to strengthen the Jordan India Fertiliser Company (JIFCO).
- ▶ JIFCO is an USD 860 million joint venture between IFFCO and Jordan Phosphate Mines Company.
- ▶ Ensures long-term phosphoric acid supply amid global fertilizer shortages.

Digital Public Infrastructure Cooperation :

- ▶ Proposal for interoperability between India's UPI and Jordan's CliQ payment system.
- ▶ Aims to enable seamless digital payments and remittances.
- ▶ Letter of Intent signed to share population-scale digital solutions.

Global Initiatives and Geopolitical Dimensions :

- Joint condemnation of terrorism and extremism.
- Support for peace and stability in West Asia.
- Jordan reiterated support for India's permanent membership in the UN Security Council.
- Jordan expressed interest in India-led initiatives.
- Includes International Solar Alliance (ISA) and Global Biofuel Alliance.

Cultural and People-to-People Ties :

- ▶ Renewal of Cultural Exchange Programme for 2025–2029.
- ▶ Petra–Ellora twinning to promote tourism, heritage conservation, and cultural exchanges.