



Guiding Dreams, Empowering Future
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EXCLUSIVE CURRENT AFFAIRS BULLETIN

US-Iran Islamabad MoU & Its Implications

Important Features of Islamabad MoU

Ceasefire and De-escalation

- Both countries agreed towards ending military confrontation.
- Focus on preventing further escalation in West Asia.
- Promotes diplomatic resolution instead of military conflict.

Negotiation Framework

- The agreement creates a platform for further negotiations.
- Focus areas include:
 - Regional security
 - Nuclear-related concerns
 - Economic issues
 - Long-term diplomatic engagement

Maritime Security

- Stability around the Strait of Hormuz remains an important concern.
- The agreement aims to reduce risks to international shipping and energy routes.

Nuclear Issue

- Iran's nuclear programme remains a major area of discussion.
- International concerns focus on nuclear transparency and monitoring mechanisms.

Importance of Iran in Global Geopolitics

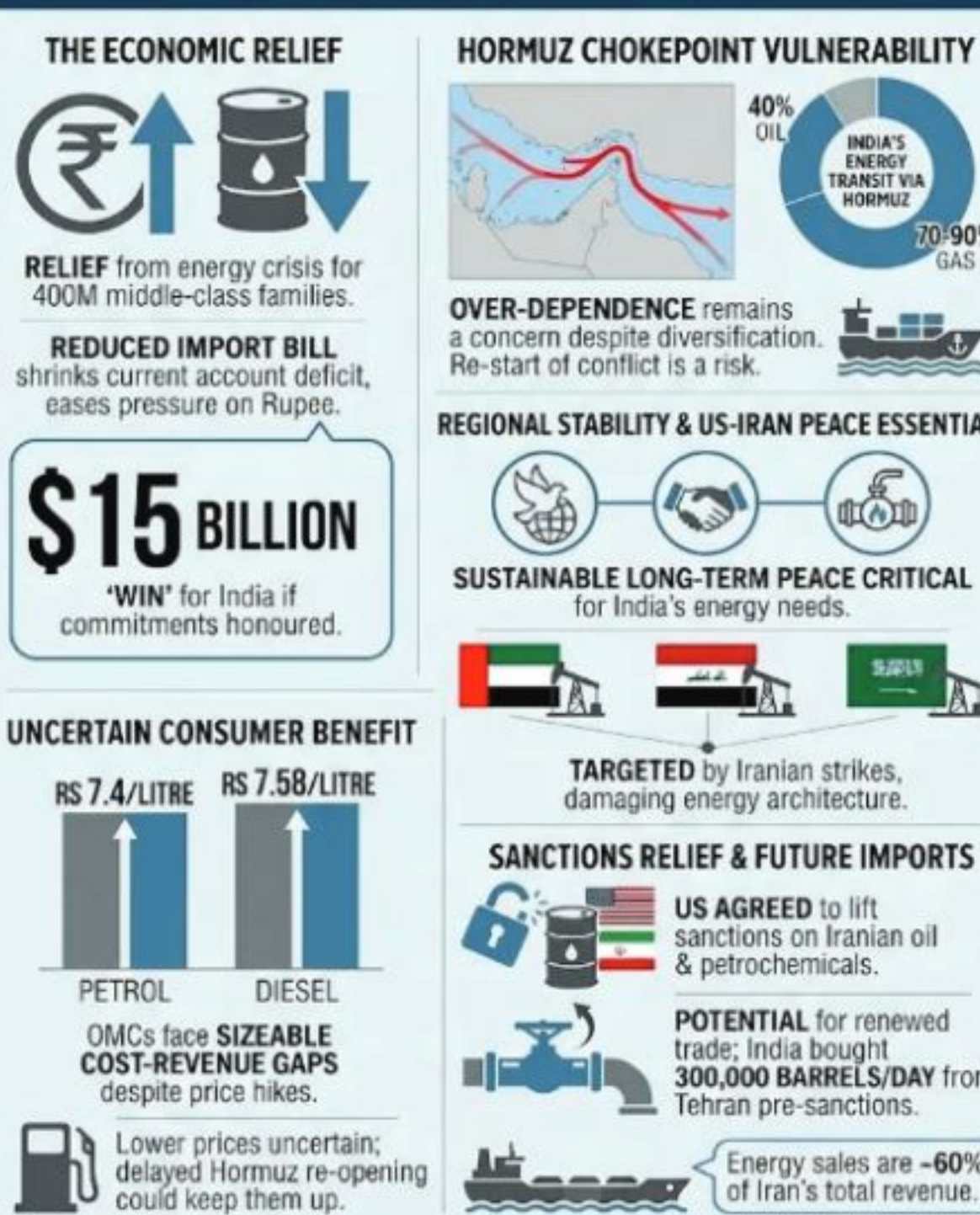
Strategic Location

- Iran connects West Asia, Central Asia

Background

- The United States and Iran signed the Islamabad Memorandum of Understanding (MoU) aimed at reducing tensions in West Asia.
- The agreement came after a period of military tensions and diplomatic negotiations.
- Pakistan played the role of mediator in facilitating talks.
- The MoU is significant for regional stability, global energy security and international diplomacy.

INDIA'S \$15 BILLION ENERGY 'WIN' & REGIONAL RISKS



and South Asia.

- Located near the Strait of Hormuz, one of the world's most important energy corridors.

Strait of Hormuz

- Connects Persian Gulf with Gulf of Oman and Arabian Sea.
- Important route for global oil and LNG transportation.
- Any instability affects global energy markets.

Iran and Regional Influence

- Iran plays an important role in:
 - West Asian geopolitics
 - Energy security
 - Regional security calculations

Impact on Global Politics

Diplomatic Impact:

- Shows importance of negotiation and conflict resolution.
- May reduce geopolitical tensions in West Asia.

Economic Impact:

- Stability can reduce uncertainty in oil markets.
- Improves confidence in global supply chains.

Security Impact:

- Reduces possibility of wider regional conflict.
- Supports maritime security.

Importance for India

Energy Security

- India depends heavily on imported crude oil.
- Stability in West Asia helps maintain affordable and secure energy supplies.

Indian Diaspora

- Millions of Indians live and work in Gulf countries.
- Regional peace is important for their safety and livelihood.

Trade and Connectivity

- Iran is important for India's connectivity strategy.

Chabahar Port

- Developed with Indian involvement.
- Provides India access to Afghanistan and Central Asia.
- Reduces dependence on traditional routes.

Balanced Foreign Policy

- India maintains relations with:
 - United States as a strategic partner.
 - Iran as an energy and connectivity partner.
 - Gulf countries for trade and diaspora interests.



India's Diplomatic Approach

- Support peaceful dialogue.
- Encourage diplomatic solutions.
- Maintain strategic autonomy.
- Balance relations with multiple global powers.

Challenges Ahead

Implementation Challenge:

- Building trust between the US and Iran remains difficult.

Regional Complexity:

- Interests of other West Asian powers

influence outcomes.

Nuclear Concerns:

- Long-term settlement of Iran's nuclear issue is essential.

Geopolitical Competition:

- Major power competition affects regional stability.

Way Forward

- Strengthen diplomatic dialogue.
- Ensure transparent nuclear mechanisms.
- Promote regional cooperation.
- Protect freedom of navigation.
- Encourage peaceful conflict resolution through international institutions.

Conclusion

The US-Iran Islamabad MoU represents an important diplomatic effort to reduce instability in West Asia. For India, peace

between the US and Iran supports energy security, protects diaspora interests and strengthens connectivity projects like Chabahar Port. Long-term success will depend on trust-building, implementation and sustained diplomatic engagement.

Prelims Practice Question

Q. Which one of the following countries has a coastline on the Persian Gulf?

- (a) Jordan
- (b) Iran
- (c) Yemen
- (d) Syria

Answer: (b) Iran

Background

- International Day of Yoga (IDY) is celebrated every year on 21 June.
- The 12th International Day of Yoga was observed in 2026.
- The theme for 2026 is "Yoga for Healthy Ageing".
- The theme highlights yoga's role in promoting physical health, mental resilience and overall well-being across all age groups.

Origin of International Day of Yoga

- India proposed the idea of International Day of Yoga at the United Nations General Assembly in 2014.
- The United Nations General Assembly adopted the resolution in December 2014.
- The first International Day of Yoga was celebrated on 21 June 2015.

Why 21 June?

- 21 June is associated with the Summer Solstice in the Northern Hemisphere.
- It is one of the longest days of the year.
- It carries traditional significance in yogic philosophy.

Meaning & Concept of Yoga

- The word Yoga comes from the Sanskrit root "Yuj", meaning to join or unite.
- It represents harmony between:

- Mind and body
- Human beings and nature
- Physical and mental well-being

Major Components of Yoga

Asanas:

- Physical postures improving flexibility, strength and balance.

Pranayama:

- Breathing practices supporting respiratory control and relaxation.

Meditation:

- Helps improve concentration, emotional stability and mental peace.

International Day of Yoga 2026



Lifestyle Discipline:

- Encourages balanced and healthy living.

Importance of 2026

Theme – Yoga for Healthy Ageing

Physical Benefits:

- Improves flexibility and mobility.
- Helps maintain strength and balance.
- Supports active ageing.

Mental Health Benefits:

- Helps reduce stress.
- Improves mindfulness.
- Supports emotional well-being.

Public Health Importance:

- Promotes preventive healthcare.
- Helps address lifestyle-related diseases.
- Supports healthy ageing population.

Yoga & Indian Cultural Heritage

- Yoga is an ancient Indian knowledge system.
- It is connected with Indian philosophy and traditional practices.
- It reflects India's contribution to global wellness.

Yoga as India's Soft Power

- International Yoga Day increased global recognition of Indian culture.
- It strengthens cultural diplomacy.

- It promotes India's image as a contributor to global health and peace.

UNESCO Recognition

- Yoga was added to UNESCO's Representative List of Intangible Cultural Heritage of Humanity in 2016.
- It recognises yoga as a valuable cultural tradition.

Government Initiatives Related to Yoga

Ministry of AYUSH:

- Promotes traditional systems of medicine and wellness.
- Coordinates International Day of Yoga activities.

WHO M-Yoga Application:

- Developed with cooperation between WHO and India.
- Promotes access to yoga learning resources.

Integration with Healthcare:

- Yoga is promoted as part of preventive and holistic healthcare.

Global Significance of Yoga

Health:

- Supports physical and mental well-being.

Society:

- Encourages harmony and balanced lifestyle.

Sustainable Living:

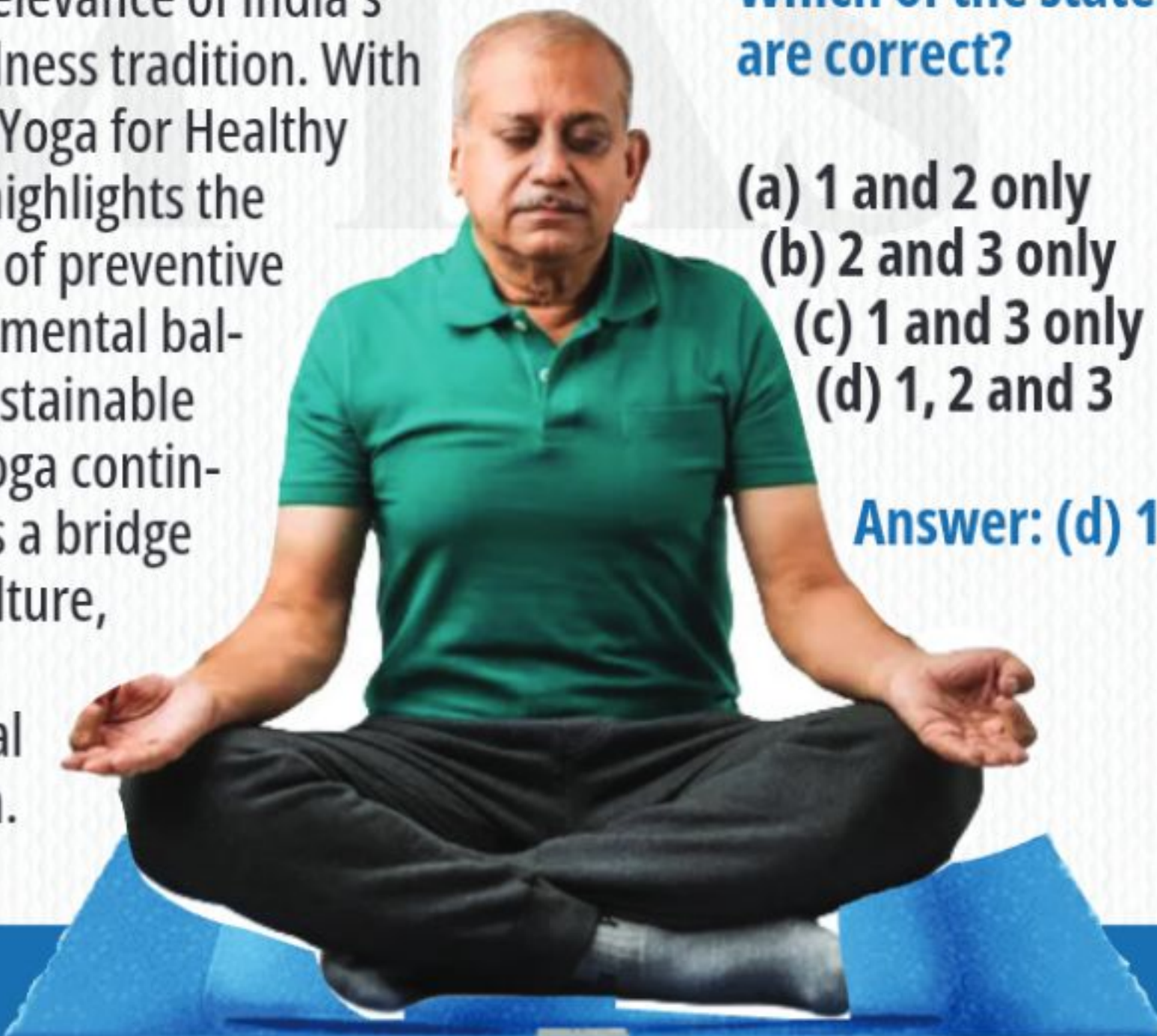
- Promotes connection between humans and nature.

International Relations:

- Strengthens people-to-people connections.

Conclusion

International Day of Yoga 2026 reflects the global relevance of India's ancient wellness tradition. With the theme "Yoga for Healthy Ageing", it highlights the importance of preventive healthcare, mental balance and sustainable lifestyles. Yoga continues to act as a bridge between culture, health and international cooperation.



Prelims Practice Question

Q. With reference to Yoga, consider the following statements:

1. The United Nations declared 21 June as International Day of Yoga in 2014.
2. Yoga has been included in UNESCO's Representative List of Intangible Cultural Heritage of Humanity.
3. The first International Day of Yoga was celebrated in 2015.

Which of the statements given above are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Answer: (d) 1, 2 and 3

TELEGRAM BAN & Section 69A of the IT Act, 2000

Background

- The temporary restriction on Telegram brought Section 69A of the Information Technology Act, 2000 into focus.
- The issue highlights the balance between cyber security, regulation of digital platforms and protection of fundamental rights.
- Digital platforms have become important areas for governance due to misinformation, cybercrime and unlawful activities.

Section 69A of Information Technology Act, 2000

About

- Empowers the Central Government or authorised officers to direct blocking of public access to online information.
- Blocking can apply to websites,

applications or online content.

Grounds for Invoking Section 69A

- Sovereignty and integrity of India
- Defence of India
- Security of the State
- Friendly relations with foreign States



- Public order
- Preventing incitement to cognisable offences

Procedure and Safeguards

- Governed by Information Technology (Procedure and Safeguards for Blocking for Access of Information by Public) Rules, 2009.
- Blocking decisions follow an official review mechanism.
- Intermediaries are required to comply with lawful directions.

Information Technology Act, 2000

Importance

- Provides legal recognition to electronic records and digital transactions.
- Deals with cyber offences and electronic governance.
- Regulates responsibilities of digital intermediaries.

Intermediaries

Meaning:

- Platforms that receive, store or transmit electronic information on behalf of users.

Examples:

- Social media platforms
- Messaging applications
- Search engines
- Digital service platforms

Telegram Ban Issue – Analysis Government Perspective

- Prevent misuse of technology.
- Control cyber-enabled crimes.
- Maintain public order.
- Protect integrity of important systems.

Digital Rights Perspective

- Need to protect freedom of expression.
- Importance of transparency in restrictions.
- Blocking actions should follow proportionality principles.

Constitutional Link

Article 19(1)(a)

- Provides freedom of speech and expression.

Article 19(2)

- Allows reasonable restrictions for:
 - Security of State
 - Public order
 - Sovereignty and integrity of India

Important Supreme Court Judgement

Shreya Singhal vs Union of India (2015)

Important Points:

- Supreme Court struck down Section 66A of the IT Act.
- Section 69A was upheld due to procedural safeguards.
- Strengthened debate on internet freedom and reasonable restrictions.

Importance of Section 69A

National Security

- Helps address threats emerging through digital platforms.

Cyber Governance

- Creates legal mechanism to regulate harmful online content.

Platform Accountability

- Ensures cooperation of intermediaries with lawful authorities.

Concerns Related to Section 69A

- Transparency issues regarding blocking orders.
 - Possibility of excessive restrictions.
 - Need to balance security and civil liberties.
 - Requirement of stronger accountability mechanisms.

India's Digital Governance Framework

Important Areas:

- IT Act, 2000
- IT Blocking Rules, 2009
- IT Rules, 2021
- Digital Personal Data Protection Act, 2023
- Cyber security initiatives

Way Forward

- Balance national security and digital freedom.
- Improve transparency in blocking mechanisms.
- Strengthen oversight mechanisms.
- Promote responsible platform governance.
- Build a secure and open digital ecosystem.

Conclusion

The debate around Telegram and Section 69A of the IT Act, 2000 shows the growing importance of digital governance in India. Effective regulation must protect national security while ensuring transparency, accountability and constitutional freedoms in the digital space.

Prelims PYQ

Q. With reference to Section 69A of the Information Technology Act, 2000, consider the following statements:

1. It empowers the Government to block public access to online information under specified conditions.
2. It was declared unconstitutional by the Supreme Court in Shreya Singhal vs Union of India case.
3. Blocking orders under it are related to grounds such as sovereignty, security and public order.

Which of the statements given above are correct?

- (a) 1 and 2 only
- (b) 1 and 3 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

Answer: (b) 1 and 3 only



World Day to Combat Desertification & Drought 2026

Background

- World Day to Combat Desertification and Drought is observed every year on 17 June.
- It was proclaimed by the United Nations General Assembly in 1994.
- The day creates awareness about desertification, drought, land degradation and sustainable land management.
- It is promoted under the United Nations Convention to Combat Desertification (UNCCD).

2026 Theme : "Rangelands: Recognize. Respect. Restore."

Theme Analysis

- **Recognize:**
 - Understand ecological, economic and social importance of rangelands.
 - Rangelands support biodiversity, livestock, pastoral communities and climate resilience.
- **Respect:**
 - Acknowledge traditional knowledge of pastoralists and indigenous communities.
 - Promote sustainable management of grasslands and drylands.
- **Restore:**
 - Restore degraded ecosystems.
 - Improve soil fertility, water conservation and carbon storage capacity.

What are Rangelands?

- Natural ecosystems dominated by grasses, shrubs and open vegetation.
- Include grasslands, savannas, shrublands and some dryland ecosystems.
- Provide:
 - Food security through livestock systems
 - Habitat for wildlife
 - Carbon storage
 - Water cycle regulation
 - Livelihood support for rural communities

Desertification

- Desertification means land degradation in arid, semi-arid and dry sub-humid areas due to climatic variations and human activities.

Major Causes

- Deforestation
- Overgrazing
- Unsustainable agriculture
- Excessive groundwater extraction
- Climate change
- Soil erosion
- Poor land management practices

Impacts of Desertification and Drought Environment:

- Loss of biodiversity
- Decline in soil fertility
- Increased dust storms
- Ecosystem degradation

Agriculture:

- Reduced crop productivity
- Threat to food security
- Farmer vulnerability increases

Society and Economy:

- Rural poverty
- Migration pressure
- Water conflicts
- Livelihood loss

United Nations Convention to Combat Desertification (UNCCD)

- Adopted: 1994
- Came into force: 1996
- Objective:
 - Combat desertification
 - Reduce impact of drought
 - Promote sustainable land management

Important Features:

- One of the three Rio Conventions along with:
 - UN Framework Convention on Climate Change (UNFCCC)
 - Convention on Biological Diversity (CBD)

Land Degradation Neutrality (LDN)

- Aim: Maintain or improve the amount and quality of productive land resources.
- Connected with Sustainable Development Goal 15 – Life on Land.

India and Desertification

Major Challenges:

- Large areas face land degradation due to erosion, vegetation loss and water stress.
- Dryland regions are more vulnerable due to climate variability.

Government Measures:

- National Action Programme to Combat Desertification
- Soil Health Card Scheme
- Watershed Development Programmes
- National Afforestation Programme
- Green India Mission
- Promotion of sustainable agriculture practices

Way Forward

- Climate-resilient farming
- Restoration of degraded lands
- Community-based conservation
- Efficient water management
- Protection of grasslands and rangelands



- Integration of traditional knowledge with modern science

Conclusion

World Day to Combat Desertification and Drought 2026 highlights that healthy land is essential for food security, biodiversity protection and climate resilience. Protecting and restoring rangelands through sustainable land management

and community participation is necessary to achieve environmental security and sustainable development.

Prelims PYQ

Q. With reference to the United Nations Convention to Combat Desertification (UNCCD), consider the following statements:

1. It is one of the outcomes of the Rio Earth Summit.
 2. It aims to combat desertification and mitigate the effects of drought.
 3. It is legally binding on its parties.
- Which of the statements given above are correct?
- (a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Answer: (d) 1, 2 and 3

10th India-Thailand Defence Dialogue

Background

- The 10th India-Thailand Defence Dialogue was held in Bangkok, Thailand on 16 June 2026.
- The dialogue reviewed the complete range of bilateral defence cooperation between India and Thailand.
- Both countries discussed regional and global security issues with special focus on the Indo-Pacific region.
- The meeting reflects growing defence and strategic cooperation under India's Act East Policy.

Important Highlights of 10th Defence Dialogue

Defence Cooperation

- Both sides reviewed progress in:
 - Military-to-military cooperation
 - Training exchanges
 - Capacity-building programmes
 - Maritime security cooperation
 - Defence technology partnership

Defence Industry Cooperation

- India and Thailand agreed to strengthen collaboration in:
 - Defence manufacturing
 - Research and development
 - Innovation
 - Capability development



- It supports India's vision of promoting defence partnerships and indigenous defence ecosystem.

Indo-Pacific Security Cooperation

- Both countries discussed the changing security situation in the Indo-Pacific.
- They highlighted the importance of:
 - Peace and stability
 - Maritime security
 - Rules-based international order
 - Regional cooperation

India-Thailand Relations

Historical and Cultural Link

- India and Thailand share centuries-old cultural and civilizational relations.



- Buddhism, trade and cultural exchanges have strengthened people-to-people ties.

Diplomatic Relations

- Formal diplomatic relations were established in 1947.
- Relations have expanded from cultural cooperation to strategic and security partnership.

Strategic Importance of Thailand for India

Act East Policy

- Thailand is an important partner in India's Act East Policy.
- It acts as a bridge between India and

Southeast Asia.

Indo-Pacific Vision

- Thailand supports cooperation in the Indo-Pacific region.
- Both countries support a free, open and inclusive Indo-Pacific.

ASEAN Connection

- Thailand is an important member of ASEAN.
- Strong India-Thailand ties help strengthen India-ASEAN cooperation.

Defence Cooperation Between India and Thailand

Important Military Exercises Exercise MAITREE

- Joint military exercise between Indian Army and Royal Thai Army.
- Focuses on counter-terrorism and military cooperation.

India-Thailand Coordinated Patrol (CORPAT)

- Conducted between Indian Navy and Royal Thai Navy.
- Enhances maritime security cooperation.

Siam Bharat Exercise

- Air force cooperation between India and Thailand.

Maritime Importance

Why Thailand Matters for India?

- Located close to important sea routes.
- Important for Indian Ocean security.
- Supports connectivity between South Asia and Southeast Asia.
- Helps address challenges such as:
 - Piracy
 - Illegal fishing
 - Maritime threats

Regional and Multilateral Cooperation

Important Platforms:

- ASEAN
- ASEAN Defence Ministers' Meeting Plus (ADMM-Plus)
- BIMSTEC
- Indo-Pacific regional cooperation mechanisms

BIMSTEC Importance

- Both India and Thailand are members of BIMSTEC.
- Connects South Asia with Southeast Asia.
- Supports cooperation in trade, connectivity and security.

Importance for India

Strategic Importance:

- Strengthens India's presence in Southeast Asia.
- Balances regional security challenges.
- Improves defence diplomacy.

Economic Importance:

- Supports trade and investment.
- Improves connectivity projects.
- Enhances technology cooperation.

Security Importance:

- Strengthens maritime domain awareness.
- Supports counter-terrorism cooperation.
- Improves defence preparedness.

Challenges in India-Thailand Relations

- Need to improve connectivity projects.
- Increasing geopolitical competition in Indo-Pacific.
- Maritime security challenges.

- Need for higher trade and investment cooperation.

Way Forward

- Increase defence technology cooperation.
- Strengthen joint military exercises.
- Expand maritime security partnership.
- Improve India-ASEAN connectivity.
- Promote defence industry collaboration.
- Strengthen cooperation in emerging technologies.
- ASEAN membership
- Act East Policy
- Indo-Pacific cooperation

Conclusion

The 10th India-Thailand Defence Dialogue represents the growing strategic partnership between the two countries. Enhanced cooperation in defence manufacturing, maritime security and Indo-Pacific stability strengthens India's Act East Policy and contributes to a peaceful and secure regional order.

Prelims Practice Question

Q. Consider the following countries:

1. Bangladesh
2. India
3. Myanmar
4. Thailand

Which of the above are members of BIMSTEC?

- (a) 1 and 2 only
- (b) 2, 3 and 4 only
- (c) 1, 2, 3 and 4
- (d) 1 and 4 only

Answer: (c) 1, 2, 3 and 4

Indian Ocean Rim Association (IORA)

About Indian Ocean Rim Association (IORA)

Formation:

- Established on 7 March 1997.
- Origin of the idea is linked with former South African President Nelson Mandela's vision for Indian Ocean

Background

- Indian Ocean Rim Association (IORA) came into focus due to discussions on expanding cooperation and strengthening regional engagement in the Indian Ocean Region.
- IORA promotes economic cooperation, sustainable development and maritime collaboration among countries bordering the Indian Ocean.
- The Indian Ocean Region is strategically important for global trade, energy routes and geopolitical stability.

cooperation.

- Earlier known as Indian Ocean Rim Association for Regional Cooperation (IOR-ARC).

Nature:

- Intergovernmental regional organisation.
- Promotes cooperation among governments, businesses and academic communities.

Headquarters:

- IORA Secretariat is located at Ebene, Mauritius.

Membership:

- Consists of 23 member states from Asia, Africa and Oceania.
- Includes countries located around the Indian Ocean Rim.

Objectives of IORA

- Promote sustainable and balanced development.
- Strengthen regional economic cooperation.
- Improve trade and investment relations.
- Promote peaceful and stable Indian Ocean Region.
- Encourage cooperation in common areas of interest.

Priority Areas of IORA

Maritime Safety and Security:

- Cooperation against maritime threats.
- Protection of sea routes.
- Maritime domain awareness.

Trade and Investment Facilitation:

- Improve regional economic integration.
- Promote investment opportunities.

Fisheries Management:

- Sustainable use of marine resources.
- Protection of fish stocks.

Disaster Risk Management:

- Cooperation against natural disasters.
- Improve disaster preparedness.

Academic, Science and Technology Cooperation:

- Promote research collaboration and knowledge exchange.

Tourism and Cultural Exchange:

- Strengthen people-to-people relations.

Additional Focus Areas:

- Blue Economy.
- Women's economic empowerment.

Importance of Indian Ocean Region

Strategic Importance:

- Connects Africa, Middle East, South Asia and Southeast Asia.
- Contains important Sea Lines of Communication.

Energy Security:

- Major route for global oil and energy transportation.



- Stability of the region affects global energy markets.

Economic Importance:

- Supports international trade.
- Provides opportunities in shipping, fisheries, minerals and tourism.

Importance of IORA for India

Act East and Neighbourhood Policy:

- Strengthens India's engagement with Indian Ocean countries.

SAGAR Vision:

Security and Growth for All in the Region

India promotes:

- Maritime cooperation
- Regional development
- Security partnerships

Indo-Pacific Strategy:

- IORA supports India's vision of a free, open and inclusive Indo-Pacific.

Blue Economy:

- Helps India utilise ocean resources sustainably.
- Supports fisheries, renewable energy and marine industries.

Maritime Security:

- Helps counter challenges such as:
 - Piracy
 - Illegal fishing
 - Maritime terrorism
 - Human trafficking

IORA Institutional Structure

Council of Ministers:

- Highest decision-making body.
- Consists of foreign ministers of member countries.

Committee of Senior Officials:

- Supports implementation of IORA decisions.

Troika Mechanism:

- Includes current chair, previous chair and future chair.
- Ensures continuity in functioning.

Important IORA Initiatives

Indian Ocean Dialogue:

- Platform for strategic discussions among stakeholders.

IORA Sustainable Development Programme:

- Supports development needs, especially of less-developed member countries.

Challenges Before IORA

- Different economic capacities of member countries.
- Geopolitical competition in Indian Ocean.
- Limited financial and institutional capacity.
- Maritime security challenges.
- Climate change and ocean degradation.

Way Forward

- Strengthen maritime cooperation.
- Improve disaster response mechanisms.
- Promote sustainable blue economy.
- Enhance technology sharing.
- Increase connectivity among member nations.
- Strengthen rules-based maritime order.

Conclusion

The Indian Ocean Rim Association plays an important role in promoting cooperation, security and sustainable development in the Indian Ocean Region. For India, IORA is a significant platform to advance maritime diplomacy, strengthen SAGAR vision and contribute towards a stable and inclusive Indo-Pacific order.

UPSC Civil Service Prelims PYQ (Related)

Q. Consider the following statements regarding the Indian Ocean Rim Association (IORA):

1. It is an intergovernmental organisation of countries around the Indian Ocean Region.
2. Its Secretariat is located in Mauritius.
3. Maritime security and blue economy are important areas of cooperation under IORA.

Which of the statements given above are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Answer: (d) 1, 2 and 3



Green Hydrogen Certification Portal of India

Background

- India launched the Green Hydrogen Certification Portal to strengthen transparency and credibility in the green hydrogen ecosystem.
- It has been developed by the Ministry of New and Renewable Energy (MNRE).
- The portal supports implementation of the Green Hydrogen Certification Scheme of India under the National Green Hydrogen Mission.
- It aims to ensure proper certification, monitoring and verification of green hydrogen production.

About Green Hydrogen Certification Portal

Objectives:

- Provide digital platform for certification of green hydrogen.
- Ensure transparency and traceability in production.
- Build trust among producers, investors and global markets.
- Support India's goal of becoming a global hub for green hydrogen.

Functions:

- Registration of green hydrogen producers.
- Submission of production and emission data.
- Verification process through accredited agencies.
- Issuance of green hydrogen certificates.

Green Hydrogen Certification Scheme of India

Nodal Ministry:

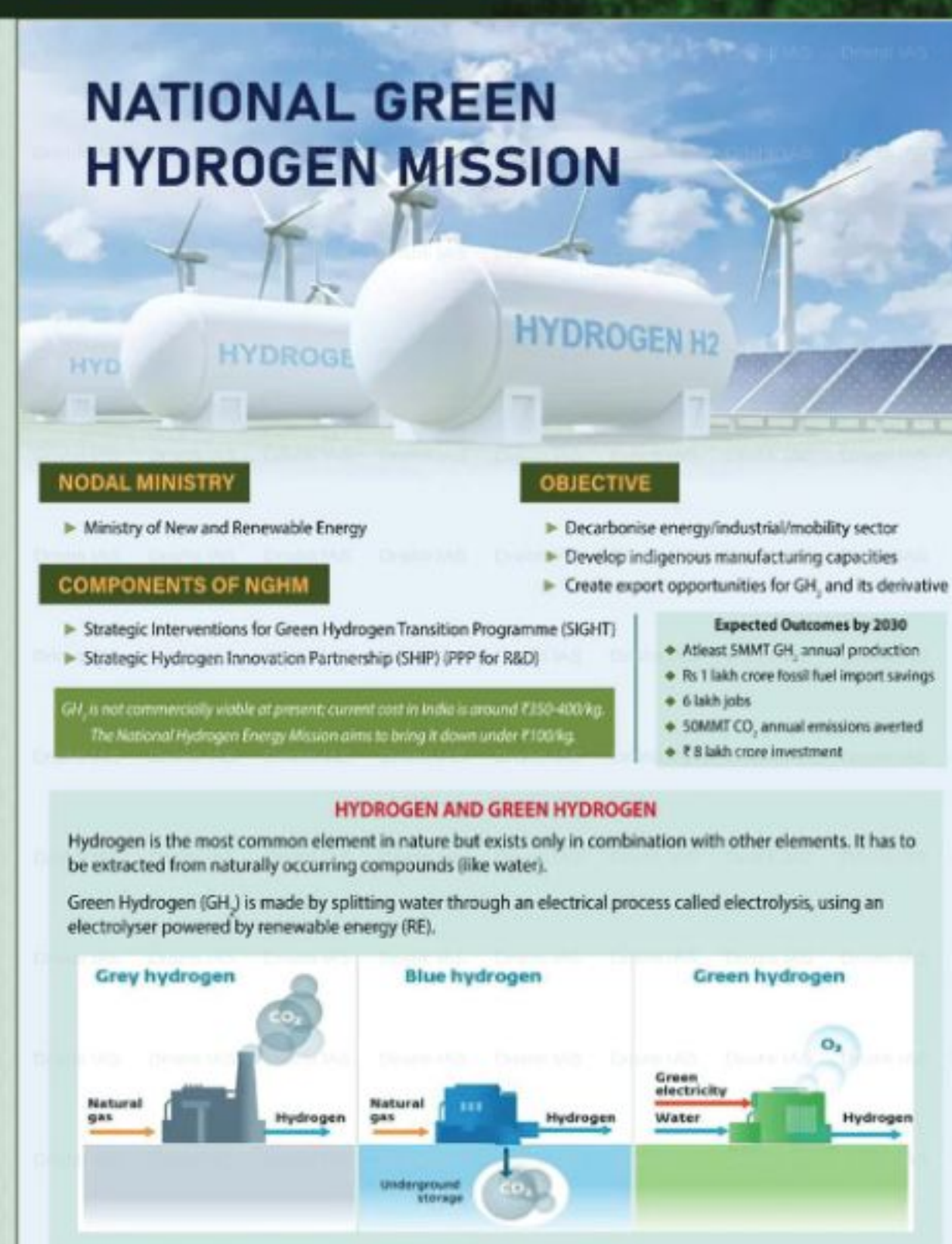
- Ministry of New and Renewable Energy (MNRE).

Purpose:

- Establish a standard mechanism to verify that hydrogen qualifies as green.
- Prevent greenwashing.
- Promote international acceptance of Indian green hydrogen.

Emission Standard:

- Hydrogen is classified as green if greenhouse gas emissions are not more than 2 kg CO₂ equivalent per kg of hydrogen.



- Emission calculation considers production-related processes.

Production Pathways:

- Electrolysis using renewable energy.
- Biomass-based hydrogen production.

Verification Mechanism:

- Accredited Carbon Verification agencies verify compliance.
- Monitoring, Reporting and Verification (MRV) framework ensures reliability.

What is Green Hydrogen?

Meaning:

- Green hydrogen is hydrogen produced using renewable energy sources with minimal carbon emissions.

Production:

- Water electrolysis splits water into:

- Hydrogen
- Oxygen
- Renewable electricity such as solar and wind power is used.

Types of Hydrogen

Green Hydrogen:

- Produced using renewable energy.
- Low carbon emissions.

Grey Hydrogen:

- Produced from fossil fuels.
- High carbon emissions.

Blue Hydrogen:

- Produced from fossil fuels with carbon capture technology.

National Green Hydrogen Mission

Launched:

- 2023

Implemented By:

- Ministry of New and Renewable Energy.

Vision:

- Make India a global centre for production, use and export of green hydrogen.

Major Focus Areas:

- Green hydrogen production.
- Electrolyser manufacturing.
- Research and innovation.
- Industrial use.
- Export development.

Importance of Green Hydrogen for India

Energy Security:

- Reduces dependence on imported fossil fuels.
- Diversifies energy sources.

Climate Action:

- Supports India's Net Zero target by 2070.
- Helps reduce greenhouse gas emissions.

Industrial Decarbonisation:

Useful for difficult-to-decarbonise sectors:

- Steel
- Fertiliser
- Refinery
- Heavy transport
- Shipping

Economic Opportunities:

- Creates green jobs.
- Encourages clean technology investment.
- Supports future export markets.

Importance of Certification System

Market Confidence:

- Confirms authenticity of green hydrogen.

Global Trade:

- Helps Indian hydrogen meet international standards.

Transparency:

- Ensures accurate emission reporting.

Investment:

- Provides confidence for clean energy investors.

Challenges in

Green Hydrogen Sector

High Production Cost:

- Electrolyser and renewable infrastructure costs remain high.

Technology Challenge:

- Need for efficient and affordable electrolysers.

Storage and Transport:

- Hydrogen requires specialised infrastructure.

Water Requirement:

- Large-scale production requires sustainable water management.

Global Competition:

- Countries are competing to dominate future hydrogen markets.

Way Forward

- Increase renewable energy capacity.
- Promote domestic electrolyser manufacturing.
- Strengthen research and development.
- Build hydrogen storage and transport infrastructure.
- Encourage public-private partnerships.
- Develop international cooperation and standards.

Conclusion

The Green Hydrogen Certification Portal is an important step towards creating a

transparent and reliable green hydrogen ecosystem in India. By ensuring credible certification and supporting the National Green Hydrogen Mission, it can accelerate clean energy transition, reduce carbon emissions and strengthen India's position in the global green economy.

Prelims Practice Question

Q. With reference to green hydrogen, consider the following statements:

1. Green hydrogen can be produced through electrolysis of water using renewable electricity.
2. Green hydrogen can help reduce carbon emissions from hard-to-abate industrial sectors.
3. Green hydrogen is mainly produced by burning coal without emission control.

Which of the statements given above are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Answer: (a) 1 and 2 only

Kudankulam Nuclear Power Project Unit-5 Milestone

Background

- Kudankulam Nuclear Power Project (KKNPP) Unit-5 achieved an important construction milestone with the installation of the Reactor Pressure Vessel (RPV).
- The project is located at Kudankulam in Tirunelveli district, Tamil Nadu.
- It is operated by Nuclear Power Corporation of India Limited (NPCIL).
- The project represents India-Russia cooperation in peaceful nuclear energy.

About Kudankulam Nuclear Power Project

- It is India's largest nuclear power generation complex.
- Developed with Russian collaboration.
- Uses VVER (Water-Water Energetic Reactor) technology.
- Planned capacity after completion of all six units: about 6000 MW.
- Each unit has a capacity of around 1000 MW.

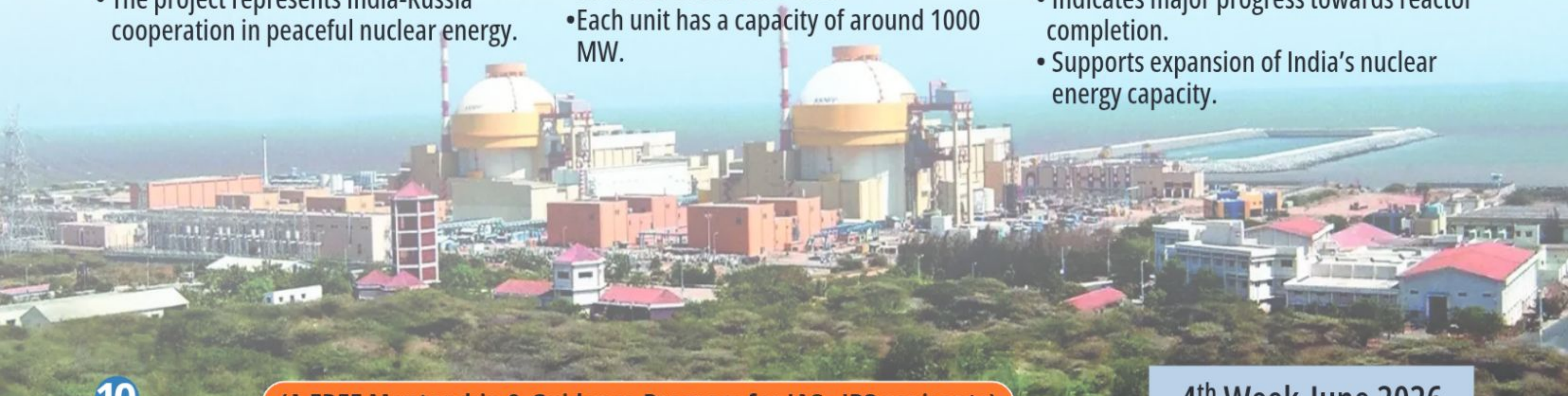
Unit-5 Milestone

Reactor Pressure Vessel Installation

- Reactor Pressure Vessel is a major component of a nuclear reactor.
- It contains:
 - Nuclear fuel assemblies
 - Reactor core
 - Coolant system components

Importance:

- Indicates major progress towards reactor completion.
- Supports expansion of India's nuclear energy capacity.



- Strengthens clean energy transition goals.

VVER Reactor Technology

About:

- Russian-designed Pressurised Water Reactor technology.
- Uses ordinary water as coolant and moderator.
- Known for advanced safety systems.

Features:

- Multiple safety barriers.
- Emergency cooling systems.
- Stable electricity generation capacity.

Importance of Nuclear Energy for India

Energy Security:

- Provides reliable base-load electricity.
- Reduces dependence on fossil fuels.

Climate Goals:

- Low carbon source of energy.
- Supports India's Net Zero target by 2070.

Economic Development:

- Supports industrial growth.
- Diversifies energy sources.

India-Russia Nuclear Cooperation

- Russia has been a long-term partner in India's civil nuclear programme.
- Kudankulam represents strategic cooperation between both countries.
- Cooperation includes:
 - Reactor technology
 - Equipment supply
 - Technical expertise

India's Nuclear Energy Framework

Major Institutions:

Department of Atomic Energy (DAE)

- Responsible for nuclear energy policy and programmes.

Nuclear Power Corporation of India Limited (NPCIL)

- Public sector enterprise under DAE.
- Responsible for construction and operation of nuclear power plants.

Atomic Energy Regulatory Board (AERB)

- Regulates nuclear safety.

India's Three-Stage Nuclear Programme

Stage 1:

- Pressurised Heavy Water Reactors.
- Uses natural uranium.

Stage 2:

- Fast Breeder Reactors.
- Uses plutonium.

Stage 3:

- Thorium-based reactors.
- Important due to India's large thorium reserves.

Challenges of Nuclear Energy

- High construction cost.
- Radioactive waste management.
- Nuclear safety concerns.
- Requirement of advanced technology.
- Public acceptance issues.

Safety Measures

- Strong reactor design.

- Emergency shutdown systems.
- Radiation monitoring.
- Regulatory supervision by AERB.
- International safety standards.

Conclusion

The Kudankulam Unit-5 milestone is an important step in India's nuclear energy expansion and clean energy transition. The project strengthens India-Russia strategic cooperation while contributing to energy security, low-carbon development and long-term sustainable growth.

Prelims PYQ

Q. To meet its rapidly growing energy demand, some argue that India should pursue research and development on thorium-based nuclear energy. In this context, what advantage does thorium hold over uranium?

1. Thorium is more abundant in India than uranium.
2. Thorium can directly be used as fuel in all nuclear reactors.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (a) 1 only

Jharkhand Gets GI Tags for 11 Traditional Products



Background

- Jharkhand's 11 traditional products received Geographical Indication (GI) recognition.
- The recognition highlights the cultural heritage, tribal knowledge, handicrafts and traditional industries of Jharkhand.
- GI recognition provides legal protection and improves national and global visibility of regional products.

11 GI Tagged Traditional Products of Jharkhand

1. Kuchai Silk Saree and Fabrics

- Traditional silk product associated with Jharkhand.
- Represents local weaving skills and silk heritage.

2. Bhagaiya Saree and Fabrics

- Traditional handloom textile.
- Linked with local craftsmanship and rural livelihood.

3. Dumka Chadars

- Traditional textile product from Jharkhand.
- Reflects indigenous weaving techniques.

4. Panchi Parhan – Panchi Saree and Fabrics

- Traditional dress associated with tribal culture.
- Represents identity and cultural practices of communities.

5. Jharkhand Tussar Silk Saree and Fabrics

- Jharkhand is a major producer of Tussar silk.
- Supports forest-based livelihood and women workers.
- 6. Jharkhand Dokra Craft**
 - Ancient metal craft using lost-wax casting method.
 - Represents tribal artistic tradition.
- 7. Tribal Jewellery of Jharkhand**
 - Traditional ornaments reflecting tribal culture and identity.
 - Connected with indigenous craftsmanship.
- 8. Jharkhand Bamboo Craft**
 - Eco-friendly craft using locally available bamboo.
 - Promotes sustainable rural entrepreneurship.
- 9. Koderma (Jhumri Tilaiya) Kesariya Kalakand**
 - Traditional food product.
 - Recognition helps preserve regional food identity.
- 10. Jharkhand Benu**
 - Traditional cultural product associated with local heritage.
- 11. Jadopatia Painting**
 - Traditional tribal scroll painting.
 - Represents storytelling, beliefs and cultural expressions.

Geographical Indication (GI) Tag Meaning:

- GI is an intellectual property right given to products having a specific geographical origin and unique qualities linked to that region.
- It protects traditional knowledge and prevents unauthorized use.

Legal Framework in India

- Governed by Geographical Indications of Goods (Registration and Protection) Act, 1999.
- Came into force: 2003.
- Administered by Geographical Indication Registry, Chennai under DPIIT, Ministry of Commerce and Industry.



- GI registration is valid for 10 years and can be renewed.

International Linkage

- GI protection is recognised under WTO's TRIPS Agreement.
- Helps protect regional products in global markets.

Importance of GI Tags

Cultural Importance:

- Protects traditional knowledge.
- Preserves tribal and regional identity.
- Encourages continuation of traditional skills.

Economic Importance:

- Improves income opportunities for artisans and producers.
- Promotes rural employment.
- Supports exports and branding.

Social Importance:

- Empowers local communities.
- Encourages women and tribal entrepreneurship.

Consumer Benefit:

- Ensures authenticity and quality of products.

GI Tag and Intellectual Property Rights

- GI is a collective community right.
- Unlike trademarks owned by individuals or companies, GI belongs to producers of a specific geographical area.

Jharkhand and Traditional Economy

- Jharkhand has rich tribal heritage and forest-based resources.

- Handloom, silk, bamboo and craft industries provide livelihood support.
- GI recognition strengthens local economy through cultural preservation.

Conclusion

GI recognition for Jharkhand's 11 traditional products is an important step towards protecting India's diverse cultural heritage and strengthening rural economies. By combining traditional knowledge with modern branding and market access, GI products can promote sustainable development and empower local communities.

Prelims Practice Question

Q. Which of the following statements is/are correct regarding Geographical Indications (GI) in India?

1. GI registration provides legal protection to goods originating from a particular geographical area.
2. GI registration in India is governed by the Geographical Indications of Goods (Registration and Protection) Act, 1999.
3. A registered GI is valid permanently and does not require renewal.

Select the correct answer:

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Answer: (a) 1 and 2 only

Climate-Resilient Coral Reef Ecosystems

Background

- A recent global study identified climate-resilient coral reef ecosystems that have better capacity to survive climate change impacts.
- Around 1,66,000 sq km of coral reefs globally show relatively higher climate resilience.

- These reefs are important for future marine conservation planning because they can resist and recover from environmental stress.

What are Coral Reefs?

- Coral reefs are marine ecosystems created by colonies of coral polyps.
- Coral polyps are tiny marine animals

belonging to phylum Cnidaria.

- Reef-building corals form calcium carbonate structures.
- They live in a mutual relationship with microscopic algae called zooxanthellae.
- Zooxanthellae provide food through photosynthesis and give corals their colour.

Conditions Required for Coral Growth

- Warm tropical waters
- Clear and shallow ocean regions
- Adequate sunlight
- Normal marine salinity
- Low sedimentation

Types of Coral Reefs

Fringing Reef:

- Develop close to coastline.
- Most common type of coral reef.

Barrier Reef:

- Located parallel to coastline but separated by deep lagoon.
- Example: Great Barrier Reef, Australia.

Atoll:

- Ring-shaped coral reef surrounding a lagoon.
- Common in oceanic islands.

Climate-Resilient Coral Reefs

Meaning:

- Coral reefs that have greater ability to withstand climate stress and recover after disturbances.

Reasons Behind Higher Resilience:

- Better heat tolerance capacity.
- Healthy coral diversity.
- Strong genetic adaptation.
- Presence of resistant coral species.
- Better ecosystem connectivity.

Importance of

Climate-Resilient Reefs

- Act as natural laboratories for climate adaptation.
- Support restoration of damaged coral ecosystems.
- Protect marine biodiversity.
- Maintain fisheries and coastal livelihoods.
- Provide natural protection from waves and storms.

Importance of Coral Reef Ecosystems

Biodiversity:

- Coral reefs support nearly one-fourth of marine biodiversity despite covering a very small ocean area.

Coastal Protection:

- Reduce impact of waves, storms and coastal erosion.

Economic Importance:

- Support fisheries, tourism and coastal communities.

Climate Role:

- Healthy marine ecosystems contribute to ocean balance and carbon cycling.

Coral Reefs
(Rainforests of the seas)

About

- Large underwater structures – made of skeletons of colonial marine invertebrates 'coral' – individually called polyp
- Symbiotic Relationship with algae 'zooxanthellae' (responsible for beautiful colours of corals)
- Support over 25% of marine biodiversity

Hard Corals vs Soft Corals

- Hard Corals - Rigid skeleton made of CaCO_3 - reef-building corals
- Soft Corals - Non reef-building

Great Barrier Reef (Australia)

- Largest Coral Reef in the World
- World Heritage Site (1981)
- Endures Mass Coral Bleaching

Corals in India

- Present in the areas of Gulf of Kutch, Gulf of Mannar, Andaman & Nicobar, Lakshadweep Islands and Malvan

Significance

- Coral reefs protect coastlines from storms/erosion, provide jobs, offer opportunities for recreation
- Source of food/medicines

Threats

- Natural: Temperature, Sediment Deposition, Salinity, pH, etc.
- Anthropogenic: Mining, Bottom Fishing, Tourism, pollution, etc.

Coral Bleaching

- Corals under stress - expel algae - thus turning white (bleached)
- Bleached corals - not dead - but, more risk of starvation/disease

Initiatives to Protect Corals

Technology

- Cryomesh: Storage of the coral larvae at (-196°C) - Can be later reintroduced to the wild
- Bioreef: Creating artificial reefs on which coral can grow rapidly

Global

- International Coral Reef Initiative
- The Global Coral Reef R&D Accelerator Platform

Indian

- National Coastal Mission Programme

Threats to Coral Reefs

Climate Change:

- Rising sea temperature causes coral bleaching.

Ocean Acidification:

- Increased CO_2 absorption reduces calcium carbonate formation.

Pollution:

- Plastic waste, sewage and chemical runoff damage reefs.

Overfishing:

- Disturbs ecological balance.

Coastal Development:

- Increases sedimentation and habitat destruction.

Coral Bleaching

Meaning:

- Coral bleaching occurs when stressed corals remove zooxanthellae algae from their tissues.
- Corals lose colour and become white.
- Long-term bleaching can cause coral death.

Major Causes:

- Marine heatwaves
- Rising ocean temperature
- Pollution
- Change in ocean chemistry

Coral Reefs in India

Major Locations:

- Gulf of Mannar
- Gulf of Kutch
- Lakshadweep Islands
- Andaman and Nicobar Islands

India's Conservation Measures

- Marine Protected Areas
- Coastal Regulation Zone rules
- Integrated Coastal Zone Management Programme
- Coral restoration activities
- Biodiversity conservation initiatives

Global Conservation Efforts

International Coral Reef Initiative (ICRI):

- Global partnership for protection and sustainable management of coral reefs.

Coral Reef Breakthrough:

- Aims to strengthen global coral conservation and restoration efforts.

30 by 30 Target:

- Global goal to conserve 30% of land and oceans by 2030.

Way Forward

- Reduce greenhouse gas emissions.
- Expand marine protected areas.
- Control ocean pollution.
- Promote coral restoration technology.
- Protect climate-resilient reef zones.
- Strengthen scientific monitoring.

Conclusion

Climate-resilient coral reefs provide hope for protecting marine biodiversity in the era of climate change. Conservation of these ecosystems through emission reduction, sustainable ocean management and restoration measures is essential for maintaining ecological balance and securing coastal livelihoods.

Prelims PYQ

Q. Consider the following statements:

1. Most of the world's coral reefs are located in tropical oceans.
2. Coral reefs require clear and shallow waters for their growth.
3. Coral bleaching occurs due to the loss of symbiotic algae from corals.

Which of the statements given above are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Answer: (d) 1, 2 and 3