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Guiding Dreams, Empowering Future
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EXCLUSIVE CURRENT AFFAIRS BULLETIN

CONTEXT

The United Arab Emirates (UAE) officially announced its withdrawal from OPEC and OPEC+ with effect from 1 May 2026, ending nearly six decades of membership in the world's most influential oil-producing cartel system. The UAE stated that the decision was taken in accordance with its national interests, long-term economic strategy, and evolving energy priorities.

The move is considered a major geopolitical and economic development because the UAE is among the largest oil producers in West Asia and one of the most important exporters in the global energy market. Analysts believe the withdrawal could weaken OPEC's collective influence over global oil prices and reshape energy geopolitics in the coming decade.

OPEC: ORGANIZATION OF THE PETROLEUM EXPORTING COUNTRIES

Formation

- Established in 1960 during the Baghdad Conference.

Founding Members

- Iran
- Iraq
- Kuwait
- Saudi Arabia
- Venezuela

Headquarters

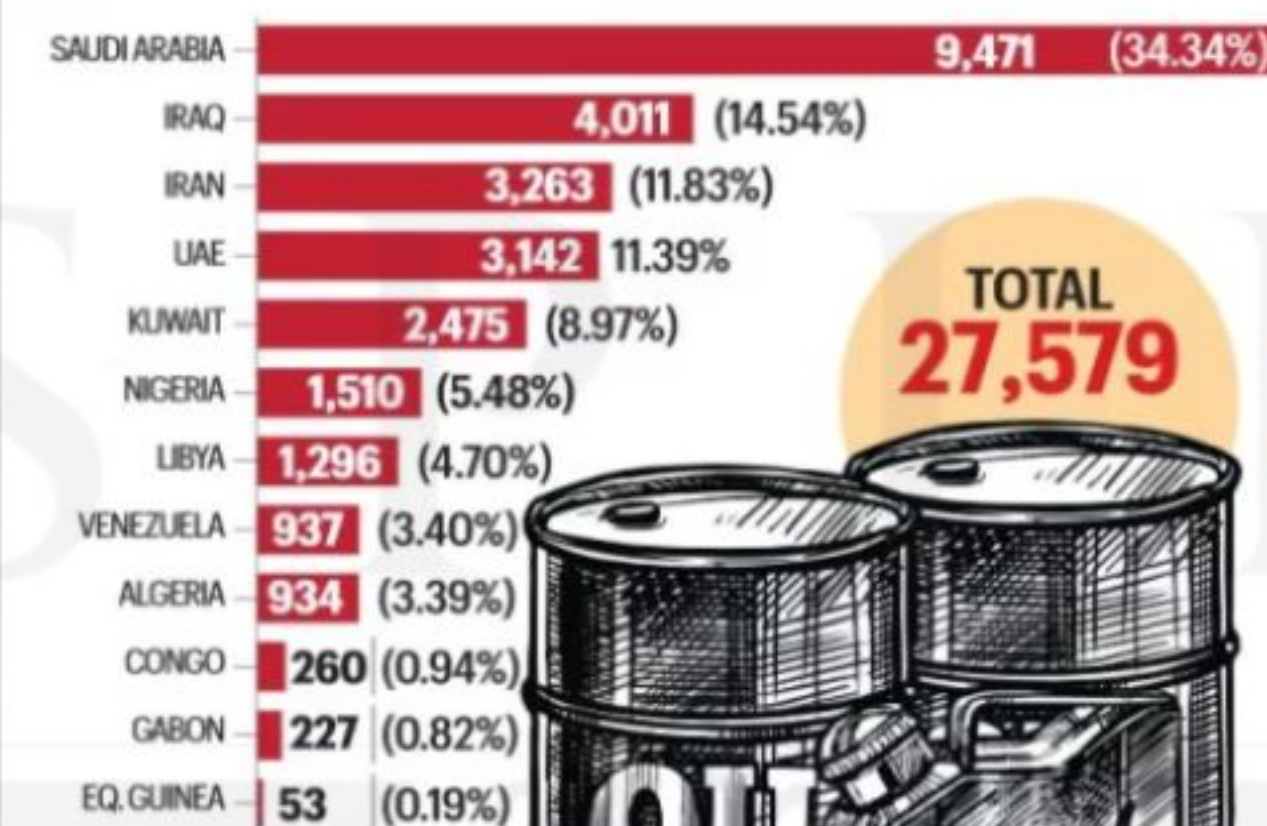
- Vienna, Austria

Objective

OPEC was created to coordinate petroleum policies among member nations, stabilize international crude oil prices, ensure fair revenue for oil-producing countries, and maintain regular oil supply to consuming nations.

UAE EXIT FROM OPEC & OPEC+ (2026)

• OPEC's 2025 crude production (thousand barrels/day)



SOURCE: OPEC
NOTE: DATA COMPILED BY OPEC BASED ON SECONDARY SOURCES



Nature of Organization

OPEC functions as a commodity cartel that influences oil prices by regulating production levels among member states.

Importance of OPEC

- Controls a significant share of global crude reserves
- Influences international oil pricing
- Plays a major role in global energy security
- Impacts inflation and economic growth worldwide

OPEC+ :

Formation

- Created in 2016.

Composition

Includes OPEC member states and major non-OPEC oil producers.

Major Non-OPEC Members

- Russia
- Kazakhstan
- Oman
- Mexico

Purpose

OPEC+ was formed to expand collective control over oil production, counter declining oil prices, manage market volatility, and coordinate production cuts.



UAE'S ROLE IN OPEC

The UAE joined OPEC in 1967 and gradually emerged as one of the organization's most technologically advanced and financially powerful producers.

Key Features of UAE Oil Sector

- Major oil reserves concentrated in Abu Dhabi
- Low extraction cost
- Advanced refining and export infrastructure
- Strong sovereign wealth backing
- High spare production capacity

WHY DID UAE EXIT OPEC & OPEC+?

1. Production Quota Restrictions

The UAE invested billions in increasing production capacity, but OPEC restrictions limited actual production and reduced potential revenue generation.

2. National Economic Strategy

The UAE increasingly prioritizes economic diversification, long-term energy monetization, expansion of sovereign wealth, and investment in future technologies.

3. Energy Transition and "Peak Oil"

Concerns

Global transition toward renewable energy, electric vehicles, green hydrogen, and net-zero commitments has encouraged oil exporters to maximize production while demand remains strong.

4. Strategic Autonomy

The UAE has increasingly pursued an independent foreign policy and reduced dependence on Saudi-dominated collective decision-making.

5. Saudi Arabia-UAE Differences

Tensions existed over production allocations, oil pricing strategy, regional leadership, and economic competition.

6. Strait of Hormuz and Regional Instability

The announcement came during heightened tensions in West Asia and disruptions around the Strait of Hormuz.

GLOBAL IMPLICATIONS OF UAE EXIT

Weakening of OPEC : The withdrawal weakens collective discipline, production management, Saudi Arabia's dominance, and OPEC's bargaining power.

Increased Oil Market Volatility : Without quota restrictions, UAE may significantly increase exports, creating excess supply and price fluctuations.



Possibility of Oil Price War : Competition between Saudi Arabia and UAE may trigger aggressive production increases and discounted crude exports.

The UAE exit indicates weakening cartel cohesion and the rise of national-interest energy policies.

Rise of Non-OPEC Producers

Global oil markets are increasingly influenced by US shale oil and other non-OPEC exporters.

IMPLICATIONS FOR INDIA

India is the world's third-largest crude oil importer and imports more than 85% of its oil requirements.

Positive Implications

- Lower crude prices
- Reduced import bill
- Lower inflation
- Better energy security
- Improved fiscal stability

Negative Implications

- Oil price volatility
- Gulf instability
- Increased shipping and insurance costs

STRAIT OF HORMUZ

Location

Connects the Persian Gulf, Gulf of Oman, and Arabian Sea.

Strategic Importance

- One of the world's most important oil chokepoints
- Nearly 20% of global oil trade passes through it

KEY TERMS FOR PRELIMS

- OPEC – Organization of the Petroleum Exporting Countries
- OPEC+ – OPEC plus non-OPEC producers
- Cartel – Group controlling production

and prices

- Production Quota – Limit imposed on production
- Barrel per Day (bpd) – Standard unit of oil production
- Spare Capacity – Additional production capability
- Strait of Hormuz – Strategic maritime oil chokepoint

UPSC MAINS ANALYSIS

GS Paper II

- India and Gulf relations
 - West Asian geopolitics
 - Strategic autonomy
- GS Paper III
- Energy security
 - Oil price volatility
 - Impact of crude prices on Indian economy
 - Global energy transition

CONCLUSION

The UAE's withdrawal from OPEC and OPEC+ marks a major turning point in global energy politics. The move reflects the growing importance of national strategic interests over cartel discipline in an era of energy transition and geopolitical competition

PRELIMS PYQ

Q. OPEC stands for:

- Organization of Petroleum Exporting Countries
- Oil Producing and Exporting Cartel
- Organization of Pacific Energy Companies
- Oil and Petroleum Exporting Consortium

Answer: (a) Organization of Petroleum Exporting Countries.



International Workers' Day 2026 (May Day)

CONTEXT

International Workers' Day, also known as Labour Day or May Day, is observed every year on 1st May across the world to honour workers, labour movements, and struggles for workers' rights. The observance highlights issues related to fair wages, safe working conditions, social security, dignity of labour, and workers' welfare.

The International Labour Organization (ILO) theme for 2026 is "Ensuring a Healthy Psychosocial Working Environment," emphasizing workplace mental health, stress management, burnout prevention, and worker well-being in modern workplaces.

HISTORY OF MAY DAY

- Origin traces back to the Haymarket Affair in Chicago (1886).
- Workers protested demanding an 8-hour workday.
- Violence occurred after a bomb explosion during a workers' rally.
- In 1889, the Second International declared 1st May as International Workers' Day.
- Symbolized the principle: "8 hours work, 8 hours rest, 8 hours personal life."

INTERNATIONAL LABOUR DAY IN INDIA

- First celebrated in India on 1st May 1923 in Madras (Chennai).
- Organized by the Labour Kisan Party of Hindustan.
- Led by Malayapuram Singaravelu Chettiar.
- Also known as:
 - Kamgar Divas
 - Antarrashtriya Shramik Diwas
 - Kamgar Din

SIGNIFICANCE OF INTERNATIONAL WORKERS' DAY

- Recognizes contribution of workers in nation-building.
- Promotes labour rights and social justice.

- Raises awareness about fair wages and safe workplaces.
- Highlights issues of contract labour and informal workforce.
- Encourages gender equality and social security in workplaces.
- Reinforces the concept of dignity of labour.
- Focuses on worker welfare amid automation and digital economy.

CHALLENGES FACED BY WORKERS IN INDIA

- Large informal workforce with limited legal protection.
- Contractualization and gig economy expansion.
- Wage inequality and gender wage gap.
- Child labour and bonded labour in some sectors.

INTERNATIONAL LABOUR ORGANIZATION (ILO)

- Established in 1919 under Treaty of Versailles.
- Headquarters: Geneva, Switzerland.
- Became first specialized agency of United Nations in 1946.
- Works for social justice and internationally recognized labour rights.
- India is a founding member of ILO.
- Nobel Peace Prize awarded to ILO in 1969.

FOUR NEW LABOUR CODES IN INDIA

The Government of India consolidated 29 central labour laws into four labour codes to simplify labour regulations and improve ease of doing business.

1. Code on Wages, 2019

- Ensures universal minimum wage framework.
- Applies to organized and unorganized sectors.
- Introduces floor wage concept.

2. Industrial Relations Code, 2020

- Regulates trade unions and industrial disputes.
- Increases threshold for prior government approval for layoffs from

- 100 to 300 workers.
- Introduces fixed-term employment.

3. Occupational Safety, Health and Working Conditions Code, 2020

- Merges laws related to workplace safety and welfare.
- Covers health standards, working conditions, and welfare provisions.
- Includes provisions for migrant workers.

4. Code on Social Security, 2020

- Extends social security benefits to gig workers and platform workers.
- Covers EPFO, ESIC, maternity benefits, and gratuity.
- Enables social security schemes for unorganized workers.

CRITICISM OF FOUR LABOUR CODES

- Trade unions allege dilution of workers' rights.
- Easier layoffs may reduce job security.
- Concerns over weakening collective bargaining.
- Critics argue codes favour employers over workers.
- Concerns regarding implementation in informal sector.
- Debates over extended working hours and contract labour.

CONCLUSION

International Workers' Day remains an important reminder of the historic struggles of workers and the continuing need for labour rights, social security, and humane working conditions. In the era of globalization, automation, and platform-based employment, balancing economic growth with labour welfare has become a major governance challenge for countries like India.



CONTEXT

Sikkim has become the first state in India to adopt a fully paperless judiciary system. The announcement was made by Chief Justice of India Justice Surya Kant during the National Conclave on Technology and Judicial Education held in Gangtok. The development marks a major milestone in India's digital justice delivery system and reflects the growing integration of technology within the judiciary. The initiative aligns with the broader objectives of Digital India, judicial reforms, and the e-Courts Mission Mode Project.

WHAT IS A PAPERLESS JUDICIARY?

A paperless judiciary refers to a completely digital judicial ecosystem where all court-related processes are conducted electronically without dependence on physical paperwork.

The system includes:

- E-filing of cases
- Digital case records
- Virtual hearings
- Electronic orders and judgments
- Digital signatures
- Automated workflow systems
- Online case tracking
- Digital archiving of records

Under this system, the entire lifecycle of a case is managed electronically.

HISTORIC SIGNIFICANCE

- Sikkim became the first Indian state with a fully paperless judiciary.
- The initiative represents a major achievement in judicial modernization.
- It strengthens technology-driven governance in the justice sector.
- The model is expected to serve as a benchmark for other states.
- The announcement coincided with Sikkim's 50th Statehood anniversary, adding symbolic importance to the initiative.

NATIONAL CONCLAVE ON TECHNOLOGY AND JUDICIAL EDUCATION

The declaration was made during the National Conclave on Technology and Judicial Education held in Gangtok.

The conclave was organized by:

- High Court of Sikkim
- Sikkim Judicial Academy

The event focused on:

- Digital transformation in judiciary
- Use of Artificial Intelligence in courts
- Judicial education and training

Sikkim Becomes India's First Paperless Judiciary State



- Technology-enabled justice delivery
- Future of digital courts in India

OBJECTIVES OF PAPERLESS JUDICIARY

- Improve efficiency in justice delivery.
- Reduce delays and case pendency.
- Increase transparency and accountability.
- Provide faster access to judicial records.
- Reduce dependence on physical files.
- Ensure easier access for litigants in remote regions.
- Promote environmentally sustainable governance.
- Improve judicial administration and workflow management.

DIGITAL COMPONENTS OF THE SYSTEM

1. E-Filing System : Litigants and lawyers can file cases electronically without physically visiting courts.
2. Digital Case Records : All case documents are digitally stored and retrieved electronically.
3. Virtual Hearings : Court proceedings can be conducted through video conferencing platforms.
4. Automated Workflow : Digital systems automate scheduling, notifications, and procedural management.

5. Electronic Orders and Judgments : Judicial orders and judgments are digitally signed and electronically accessible.

6. Online Case Tracking : Citizens can track case progress through digital platforms.

IMPORTANCE FOR SIKKIM

Sikkim's difficult Himalayan terrain historically created barriers in accessing courts and judicial services.

The paperless judiciary helps:

- Reduce geographical barriers.
- Improve access to justice in remote areas.
- Save travel time and litigation costs.
- Increase convenience for litigants.
- Strengthen digital governance in hilly regions.

The initiative demonstrates how technology can improve judicial accessibility in geographically challenging regions.

ROLE OF THE e-COURTS MISSION MODE PROJECT

The paperless judiciary initiative is closely linked to the e-Courts Mission Mode Project.

About e-Courts Project:

- Launched in 2007 under the National e-Governance Plan (NeGP).
- Implemented by the Department of Justice.
- Guided by the e-Committee of the

CINBAX-II 2026 – India–Cambodia Joint Military Exercise

CONTEXT

The Indian Army participated in the second edition of the India–Cambodia Joint Military Exercise CINBAX-II 2026 conducted in Kampong Speu Province, Cambodia. The exercise reflects expanding defence cooperation between India and Cambodia under India's broader Act East Policy and Indo-Pacific strategic outreach.

ABOUT CINBAX-II 2026

- CINBAX stands for Cambodia–India Bilateral Army Exercise.

- It is a bilateral military exercise between the Indian Army and the Royal Cambodian Army.
- The 2026 exercise was conducted from 4 May to 17 May 2026 in Cambodia.
- The inaugural edition was held in Pune, India, in December 2024.
- The exercise is conducted at company level under the framework of modern

UN peacekeeping operations.

PARTICIPATING CONTINGENTS

Indian Contingent

- Around 120 personnel participated from India.
- Major participation came from the Maratha Light Infantry Regiment.
- Around 160 personnel participated from the Royal Cambodian Army.

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Supreme Court of India.

Objectives:

- Digitization of courts
- Faster justice delivery
- Improved transparency
- Better access to judicial services
- Reduction in pendency

Phase III of the e-Courts Project was approved with an outlay of approximately ₹7,210 crore.

Social Advantages :

- Better access to justice
- Increased transparency
- Citizen-friendly judiciary
- Improved trust in institutions

IMPACT ON JUDICIAL REFORMS

The paperless judiciary initiative supports broader judicial reform efforts in India. It contributes to:

- Faster justice delivery
- Reduction in case pendency
- Modernization of court infrastructure
- Technology-enabled governance
- Greater judicial transparency
- Improved efficiency and accountability

The initiative is part of India's transition toward a digital justice ecosystem.

CHALLENGES ASSOCIATED

WITH DIGITAL JUDICIARY

1. Digital Divide : Limited digital literacy and internet access may affect inclusiveness.
2. Cybersecurity Risks :Digital records require strong cybersecurity protection against hacking and data breaches.
3. Infrastructure Gaps : Many courts still face shortages of hardware, internet connectivity, and technical staff.
4. Resistance to Change : Transition from traditional paper-based systems may face institutional resistance.
5. Training Requirements :Judges, lawyers, and court staff require continuous digital training.
6. Data Privacy Concerns :Sensitive judicial data must be securely protected.

SIGNIFICANCE FOR GOVERNANCE

The initiative reflects:

- Digital India vision
- Technology-driven governance
- Ease of access to justice
- Citizen-centric administration
- Sustainable governance practices
- Institutional modernization

It also highlights the growing role of Artificial Intelligence and digital systems in public administration.

CONCLUSION

Sikkim becoming India's first paperless judiciary state marks a major milestone in judicial modernization and digital governance. The initiative strengthens transparency, accessibility, and efficiency in justice delivery while supporting the broader goals of Digital India and judicial reforms. It reflects how technology can bridge geographical barriers and make governance more citizen-centric, transparent, and sustainable.

PRELIMS PYQ

Q. With reference to the e-Courts Mission Mode Project, consider the following statements:

1. It was launched under the National e-Governance Plan.
 2. The project aims to digitize judicial processes in India.
 3. The Department of Justice is the nodal implementing agency.
- 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

Mission Drishti: World's First OptoSAR Satellite



CONTEXT

Indian space-tech startup GalaxEye successfully launched Mission Drishti, the world's first OptoSAR satellite, aboard a SpaceX Falcon 9 rocket from Vandenberg Space Force Base, California. The mission marks a major milestone in India's private space sector and Earth observation capabilities. Mission Drishti represents a technological breakthrough because it combines optical imaging and Synthetic Aperture Radar (SAR) technology in a single satellite platform. The launch demonstrates the growing role

of Indian private companies in advanced space technologies and geospatial intelligence systems.

ABOUT MISSION DRISHTI

- Developed by Bengaluru-based startup GalaxEye.
- Launched on: 3 May 2026.
- Launch Vehicle: SpaceX Falcon 9.
- Launch Site: Vandenberg Space Force Base, California.
- Weight: Approximately 190 kg.
- India's largest privately built Earth observation satellite.
- First operational OptoSAR satellite in the

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OBJECTIVES OF CINBAX-II 2026

- Enhance interoperability between the two armies.
- Improve operational coordination.
- Achieve tactical and operational synergy.
- Exchange best military practices.
- Share experiences in counter-terrorism operations.
- Strengthen bilateral defence cooperation.
- Improve capabilities in sub-conventional warfare environments.

FOCUS AREAS OF THE EXERCISE

- Counter-Terrorism operations
- Jungle warfare
- Joint operations in semi-urban environments
- Tactical coordination
- UN peacekeeping operations
- Drone operations
- Sniper tactics
- Mortar handling
- Joint mission planning

CHAPTER VII OF THE UN CHARTER

The exercise is conducted under Chapter VII of the United Nations Charter. Chapter VII empowers the UN Security Council to take measures for maintaining or restoring international peace and security.

Measures may include:

- Economic sanctions
- Diplomatic restrictions
- Military intervention
- Collective security operations



SIGNIFICANCE FOR INDIA

- Strengthens India's Act East Policy.
- Expands defence cooperation with ASEAN countries.
- Enhances India's Indo-Pacific strategic outreach.
- Improves military interoperability and preparedness.
- Strengthens India's strategic presence in Southeast Asia.
- Promotes defence diplomacy and regional security cooperation.

INDIA-CAMBODIA RELATIONS

- India and Cambodia share historical civilizational ties.
- Diplomatic relations were established in 1952.
- Cooperation exists in defence, culture, trade, and capacity building.
- India has supported restoration of Angkor Wat heritage sites.
- CINBAX has become an important pillar of defence cooperation between the two countries.

IMPORTANCE OF MILITARY EXERCISES

Joint military exercises help countries:

- Improve combat readiness.
- Build mutual trust.
- Enhance interoperability.
- Exchange operational experiences.
- Develop coordinated response mechanisms.
- Strengthen defence diplomacy.

CONCLUSION

CINBAX-II 2026 reflects the strengthening defence partnership between India and Cambodia and highlights India's growing strategic engagement in Southeast Asia under the Act East Policy. The exercise improves interoperability, counter-terrorism preparedness, and regional security cooperation while reinforcing India's role as an important security partner in the Indo-Pacific region.

PRELIMS PYQ

Q. With reference to the "Act East Policy" of India, consider the following statements:

1. It focuses on strengthening relations with ASEAN countries.
 2. It includes strategic and defence cooperation.
 3. It aims to enhance India's engagement in the Indo-Pacific region.
- 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

world.

The satellite combines:

- Optical imaging technology
 - Synthetic Aperture Radar (SAR) imaging
- This integration allows simultaneous multi-sensor Earth observation.

WHAT IS OptoSAR TECHNOLOGY?

OptoSAR is a hybrid Earth observation technology that combines:

- Optical sensors
- Synthetic Aperture Radar (SAR)

Traditional Earth observation satellites generally use either optical imaging or radar imaging separately. Mission Drishti integrates both technologies into one platform.

This enables:

- High-resolution imaging
- All-weather observation
- Day-and-night surveillance
- Simultaneous data collection
- Faster and more accurate geospatial intelligence

OPTICAL IMAGING

Optical satellites capture images using reflected sunlight, similar to digital cameras.

Advantages:

- Natural and detailed images
- Better visual interpretation
- Useful for mapping and urban planning

Limitations:

- Cannot function effectively during cloudy weather.
- Ineffective at night.
- Dependent on sunlight and atmospheric conditions.

SYNTHETIC APERTURE RADAR (SAR)

SAR is an active remote sensing technology that uses microwave radar signals.

Features:

- Works during day and night.
- Can penetrate clouds and rain.
- Provides all-weather imaging capability.
- Useful for surveillance and disaster management.

SAR systems transmit microwave signals toward Earth and capture reflected signals to create high-resolution images.

WHY OptoSAR IS A BREAKTHROUGH

Mission Drishti solves major limitations of conventional Earth observation systems.

The integration of optical and SAR sensors provides:

- Simultaneous multi-modal imaging
- Better accuracy in data analysis



- Improved target identification
- Faster geospatial intelligence generation
- Reduced need for combining data from separate satellites

The satellite produces analysis-ready fused imagery with higher information quality than standalone systems.

IMPORTANCE OF EARTH OBSERVATION SATELLITES

Earth observation satellites collect information about Earth's surface, atmosphere, oceans, and environment.

Applications include:

- Weather forecasting
- Agriculture monitoring
- Disaster management
- Urban planning
- Border surveillance
- Environmental monitoring
- Infrastructure mapping
- Climate studies
- Resource management

APPLICATIONS OF MISSION DRISHTI

1. Defence and National Security

- Border monitoring
 - Maritime surveillance
 - Strategic intelligence gathering
 - Monitoring hostile activities
2. Disaster Management
 - Flood monitoring
 - Cyclone assessment
 - Landslide mapping
 - Forest fire monitoring
 - Damage assessment during disasters
 3. Agriculture
 - Crop health monitoring
 - Soil moisture assessment
 - Precision farming
 - Drought monitoring
 4. Urban Planning
 - Infrastructure development
 - Smart city planning
 - Land-use mapping
 5. Environmental Monitoring
 - Deforestation tracking
 - Glacier monitoring
 - Coastal erosion studies
 - Climate change assessment

SIGNIFICANCE FOR INDIA

Mission Drishti is important for India because:

- Strengthens India's private space eco-

system.

- Enhances indigenous satellite capabilities.
- Improves geospatial intelligence capacity.
- Reduces dependence on foreign satellite data.
- Supports strategic and defence requirements.
- Promotes innovation-driven space economy.

The mission demonstrates India's transition from a government-dominated space sector to a collaborative public-private space ecosystem.

ROLE OF PRIVATE SECTOR IN INDIA'S SPACE PROGRAMME

India's private space sector has expanded significantly after space sector reforms introduced in 2020.

Major developments include:

- Opening of space sector to private participation.
- Creation of IN-SPACE (Indian National Space Promotion and Authorization Centre).
- Promotion of start-up ecosystem.
- Increased private satellite manufacturing.

Commercial launch opportunities. Mission Drishti reflects the emergence of startups as major contributors to India's space ambitions.

ABOUT IN-SPACE

IN-SPACE stands for Indian National Space Promotion and Authorization Centre.

- Established in 2020.
- Functions under Department of Space.
- Acts as a regulatory and facilitation body for private sector participation.

Functions:

- Authorizes private space activities.
- Promotes industry participation.
- Provides infrastructure support.
- Facilitates collaboration with ISRO.

ROLE OF ISRO

The Indian Space Research Organisation (ISRO) continues to play a central role in:

- Technology development
- Space infrastructure support
- Launch services
- Scientific missions

- Capacity building
- ISRO increasingly collaborates with private startups to strengthen India's commercial space ecosystem.

SPACE SECTOR REFORMS IN INDIA

Major reforms introduced after 2020 include:

- Liberalization of space sector.
 - Private participation in satellite launches.
 - Commercialization of space technologies.
 - Promotion of NewSpace economy.
 - Enhanced international collaboration.
- Objectives:
- Increase India's share in global space economy.
 - Encourage innovation and entrepreneurship.
 - Develop commercial space capabilities.

GEOSPATIAL INTELLIGENCE

Geospatial Intelligence (GEOINT) refers to the collection and analysis of geographically referenced information.

It combines:

- Satellite imagery
- Mapping systems
- Artificial Intelligence
- Remote sensing technologies

Applications:

- Military intelligence
- Disaster response
- Infrastructure planning
- Resource management
- National security

IMPORTANCE FOR NATIONAL SECURITY

Mission Drishti significantly strengthens India's strategic surveillance capabilities.

Advantages include:

- Continuous monitoring capability
- Better border surveillance
- Improved maritime domain awareness
- Real-time intelligence gathering
- Reduced dependence on foreign imaging systems

All-weather surveillance capability is es-

pecially important during cloudy or hostile conditions.

ADVANTAGES OF OptoSAR SATELLITES

- All-weather operational capability
- Day-and-night imaging
- High-resolution data generation
- Better data reliability
- Faster disaster response
- Enhanced surveillance
- Reduced imaging gaps
- Improved geospatial intelligence

The technology improves situational awareness across civilian and defence sectors.

CHALLENGES

- High development cost
- Complex sensor integration
- Large data processing requirements
- Need for advanced AI-based analytics
- Cybersecurity concerns
- Space debris and orbital congestion risks

CONCLUSION

Mission Drishti represents a major breakthrough in India's private space sector and Earth observation capabilities. By integrating optical and radar imaging into a single platform, the mission strengthens India's geospatial intelligence, disaster management, and surveillance capabilities. It reflects the growing role of private startups in India's space ecosystem and highlights the country's transition toward innovation-driven space governance and strategic technological leadership.

PRELIMS PYQ

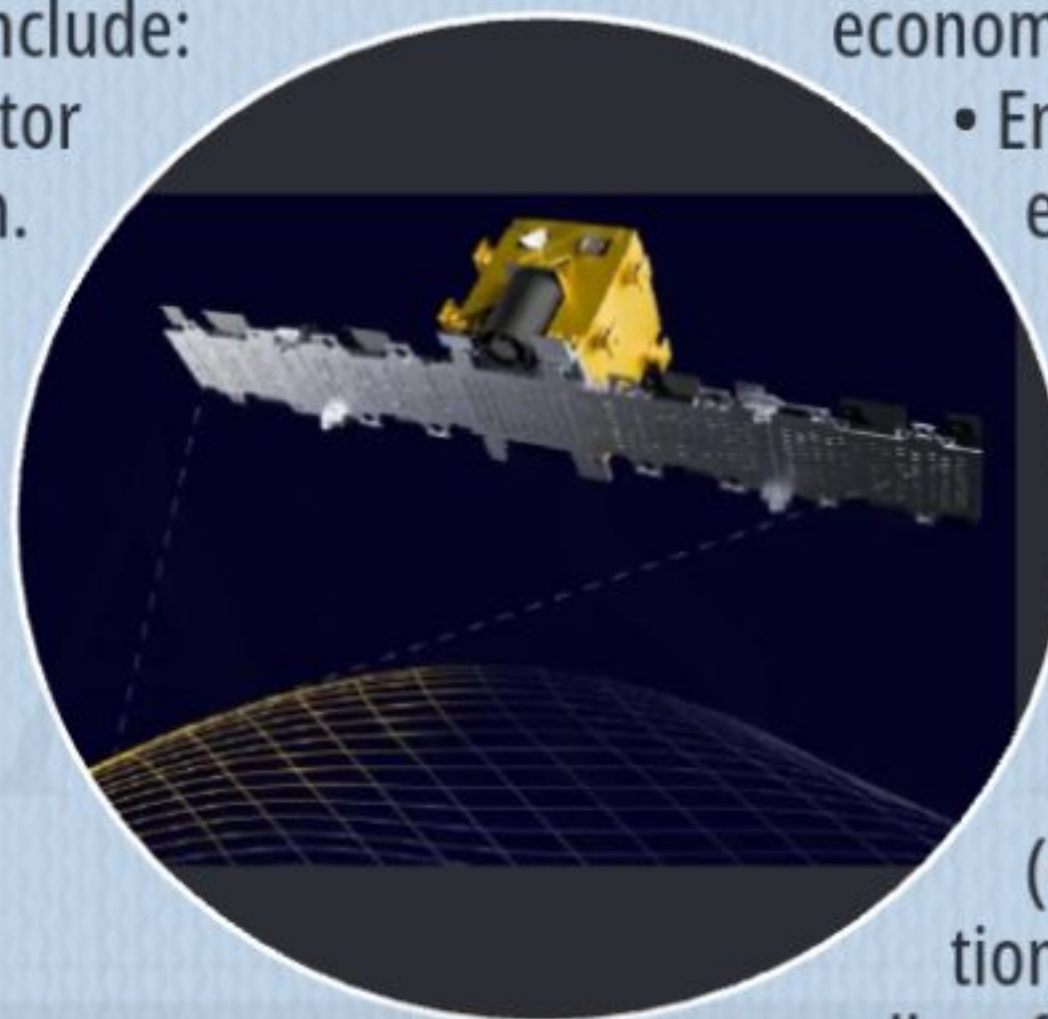
Q. With reference to Synthetic Aperture Radar (SAR), consider the following statements:

1. SAR can capture images during both day and night.
2. SAR imaging is affected by cloud cover and rainfall.
3. SAR uses microwave signals for Earth observation.

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



INDIA'S 1ST GREEN METHANOL PRODUCTION PLANT

CONTEXT

India is establishing its first Green Methanol Production Plant at the Deendayal Port Authority (DPA), Kandla, Gujarat.

The project represents a major milestone in India's transition towards clean energy, green shipping, and low-carbon industrial fuel systems.

The project is significant because it combines renewable energy goals, waste-to-wealth initiatives, biomass utilization, green hydrogen mission objectives, and maritime decarbonization strategies.

ABOUT THE GREEN METHANOL PLANT

- Location: Deendayal Port Authority (Kandla), Gujarat
- Initial Capacity: 5 tonnes per day (TPD)
- Nature: Demonstration/Pilot Project
- Technology Used: Biomass gasification technology
- Future Scaling Target: 100–500 TPD commercial-scale plants

The plant will convert biomass into synthesis gas (syngas), which is then processed into methanol.

The project aims to establish India as a future hub for green shipping fuels and low-carbon industrial feedstocks.

RAW MATERIAL / FEEDSTOCK

The project uses biomass feedstock, especially the invasive shrub *Prosopis juliflora* (locally called Gando Baval), abundantly found in the Banni Grasslands of Kutch.

Why is this important?

- The plant converts an ecologically harmful invasive species into clean fuel.
- Supports environmental restoration of grasslands.
- Creates a waste-to-energy ecosystem.
- Reduces dependence on imported fossil fuels.

HOW GREEN METHANOL IS PRODUCED

Step 1: Biomass Gasification

Biomass is heated in limited oxygen conditions to produce syngas.

Step 2: Syngas Formation

Syngas mainly contains:

- Hydrogen (H₂)
- Carbon Monoxide (CO)
- Carbon Dioxide (CO₂)

Step 3: Methanol Synthesis

The syngas is chemically processed to produce methanol.

Step 4: Green Fuel Utilization

The produced methanol can be used in:

- Shipping fuel
- Power generation
- Chemical industries
- Fuel blending applications

WHAT IS GREEN METHANOL?

Green Methanol is a low-carbon, renewable liquid fuel produced using:

- Biomass
- Green hydrogen
- Captured carbon dioxide

It is considered a cleaner alternative to conventional fossil-fuel-based methanol.

Green methanol can reduce greenhouse gas emissions by nearly 60–95% compared to conventional methanol.

IMPORTANCE OF GREEN METHANOL

- Cleaner marine fuel alternative
- Helps reduce carbon emissions
- Supports net-zero goals
- Reduces fossil fuel dependency
- Enables decarbonization of



hard-to-abate sectors

- Promotes circular economy and biomass utilization
- Supports green shipping initiatives

Green methanol is increasingly viewed as an important transition fuel for the shipping industry.

RELEVANCE TO SHIPPING SECTOR

The International Maritime Organization (IMO) has set ambitious decarbonization targets for global shipping.

Methanol is emerging as an alternative marine fuel because:

- Lower sulphur emissions
- Reduced carbon intensity
- Easier storage compared to hydrogen
- Existing shipping adaptability

India aims to position itself within emerging green shipping corridors such as:

- Singapore–Rotterdam corridor
- Indian Ocean shipping routes

NATIONAL GREEN HYDROGEN MISSION (NGHM)

Approved in 2023, the National Green Hydrogen Mission aims to make India a global hub for green hydrogen production.

Major Targets:

- 125 GW renewable energy capacity by 2030
- 8 lakh crore investment potential
- Creation of nearly 6 lakh jobs
- Reduction in fossil fuel imports
- Significant reduction in greenhouse gas emissions

Green methanol and green ammonia are important derivatives under this mission.

GREEN METHANOL STANDARDS

The Ministry of New and Renewable Energy (MNRE) notified standards for Green Methanol in 2026.

Emission Threshold:

- Maximum allowed emissions: 0.44 kg CO₂ equivalent per kg of methanol

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10 YEARS OF PRADHAN MANTRI UJJWALA YOJANA (PMUY)

CONTEXT

The Prime Minister highlighted the transformational journey of the Pradhan Mantri Ujjwala Yojana (PMUY) over the last 10 years. The scheme has evolved from being merely a welfare programme to becoming a major instrument of women-led clean energy empowerment in India.

PMUY has become one of the largest clean cooking fuel programmes in the world and is often referred to as the “Blue Flame Revolution” because of its role in expanding LPG access to poor households on a massive scale.

ABOUT PRADHAN MANTRI UJJWALA YOJANA (PMUY)

- PMUY is a flagship welfare scheme launched in May 2016.
- It is implemented by the Ministry of Petroleum and Natural Gas (MoPNG).
- Objective is to provide clean cooking fuel (LPG) to poor households.
- The scheme aims to replace traditional fuels such as firewood, coal, dung cakes, and biomass.
- LPG connections are issued in the name of the adult woman of the household.
- The government provides financial assis-



tance of ₹1,600 per LPG connection.

- Ujjwala 2.0 was launched in 2021 with simplified documentation and migrant-friendly provisions.
- Beneficiaries under Ujjwala 2.0 receive the first refill and hotplate free of cost.

OBJECTIVES OF PMUY

- Reduce indoor air pollution caused by biomass fuels.
- Improve health of women and children.
- Reduce respiratory diseases and eye-related illnesses.
- Promote dignity, convenience, and safety of women.
- Reduce drudgery involved in collecting firewood.
- Encourage clean energy transition in rural India.
- Support gender empowerment and financial inclusion.

TARGET BENEFICIARIES

The scheme primarily targets:

- Below Poverty Line (BPL) households

- Scheduled Castes (SCs)
- Scheduled Tribes (STs)
- Forest dwellers
- Most backward classes
- Tea garden and island communities
- Migrant workers and vulnerable groups

The beneficiaries are identified through the SECC database and other approved categories.

MAJOR ACHIEVEMENTS OF PMUY IN 10 YEARS

- More than 10.54 crore LPG connections released by April 2026.
- Additional 25 lakh connections approved for 2025–26 to achieve universal coverage.
- LPG coverage in India increased from nearly 62% in 2016 to almost universal levels.
- LPG distributor network significantly expanded in rural and remote areas.
- Women became direct beneficiaries and decision-makers in household energy use.
- PMUY strengthened Direct Benefit Transfer (DBT) systems through JAM Trinity (Jan Dhan–Aadhaar–Mobile).
- Average LPG consumption among PMUY households increased over the years.
- The scheme reduced dependence on traditional polluting fuels.
- Improved rural health indicators linked to indoor air pollution exposure.

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Eligible Carbon Sources:

- Biomass-based carbon
- Direct Air Capture (DAC)
- Industrial carbon capture systems

The standards provide regulatory clarity for investors and industries.

ADVANTAGES OF THE PROJECT

Environmental Benefits

- Reduction in carbon emissions
- Biomass waste utilization
- Grassland ecosystem restoration
- Cleaner shipping fuel

Economic Benefits

- Reduced methanol imports
- New green fuel industry
- Employment generation
- Rural biomass economy development

Strategic Benefits

- Energy security
- Maritime fuel independence
- Supports India's climate commitments
- Helps India become a green fuel export hub

CHALLENGES

- High production cost
- Need for large-scale renewable energy
- Technology scalability issues

- Biomass supply chain management
- Competition from fossil-fuel-based methanol
- Infrastructure limitations for methanol fuel adoption

CONCLUSION

India's first Green Methanol Production Plant represents a major step toward clean energy transition, green shipping, and sustainable industrial development. The project integrates biomass utilization, climate goals, renewable energy, and circular economy principles. It also strengthens India's ambition to emerge as a global leader in green hydrogen and alternative fuel technologies.

HEALTH IMPACT OF PMUY

Traditional cooking fuels generate toxic smoke and particulate matter, causing severe health risks.

PMUY has contributed to:

- Reduction in indoor air pollution.
- Decline in respiratory illnesses among women and children.
- Reduction in eye irritation and lung infections.
- Better maternal health by reducing smoke exposure during pregnancy.
- Improved quality of life and cleaner household environment.

Indoor smoke exposure from traditional chulhas is often compared with smoking hundreds of cigarettes annually.

WOMEN EMPOWERMENT DIMENSION

PMUY is not merely an energy scheme but also a women empowerment initiative.

The scheme has:

- Reduced time spent on collecting firewood.
- Increased women's dignity and social status.
- Improved safety by reducing exposure to forest-related risks.
- Allowed women to devote more time to education, income generation, and childcare.
- Promoted financial inclusion as LPG connections are issued in women's names.

ENVIRONMENTAL SIGNIFICANCE

- Reduced dependence on biomass fuels.
- Lower deforestation pressure in rural areas.
- Reduction in black carbon and particulate emissions.
- Supports India's climate and clean energy goals.
- Contributes to Sustainable Development Goals (SDGs), especially:
 - SDG 3: Good Health and Well-being
 - SDG 5: Gender Equality
 - SDG 7: Affordable and Clean Energy
 - SDG 13: Climate Action

UJJWALA 2.0

Launched in 2021, Ujjwala 2.0 focused on simplifying access to LPG.

Major Features:

- Simplified KYC norms.
- Migrants allowed self-declaration as proof of address.

- Free first refill and hotplate.
- Faster and paperless processing.
- Expansion to unreached households.

This phase aimed to improve inclusiveness and portability for migrant populations.

SUBSIDY SUPPORT

- Government continues targeted LPG subsidy support under PMUY.
- In 2025–26, Cabinet approved ₹300 subsidy per 14.2 kg cylinder.
- Subsidy applicable for up to 9 refills annually.
- Subsidy transferred directly into beneficiaries' bank accounts through DBT.

CHALLENGES ASSOCIATED WITH PMUY

1. Refill Affordability

Many poor households find refill costs expensive despite subsidies.

2. Fuel Stacking

Beneficiaries often continue using firewood along with LPG to reduce costs.

3. Import Dependence

India imports more than half of its LPG requirements, making domestic prices vulnerable to global energy crises.

4. Last-Mile Delivery Issues

Remote tribal and hilly regions still face delivery and accessibility challenges.

5. Cultural Preferences

In some regions, people continue preferring traditional chulhas due to cooking habits and taste preferences.

6. Ghost or Inactive Connections

Some connections remain inactive or underutilized after initial installation.

FUEL STACKING: A MAJOR POLICY CONCERN

Fuel stacking refers to simultaneous use of LPG and traditional biomass fuels.

Examples:

- LPG used for tea or quick cooking.
- Firewood used for rotis or long-duration cooking.

Why it is a concern:

- Indoor pollution continues despite LPG access.
- Health risks are not completely eliminated.
- Limits the environmental benefits of PMUY.
- Indicates affordability and behavioural barriers.

MEASURES REQUIRED TO IMPROVE PMUY

- Introduce dynamic subsidy mechanism during global price rise.

- Promote smaller 5 kg LPG cylinders for affordability.
- Strengthen rural LPG distribution infrastructure.
- Expand doorstep delivery in remote areas.
- Increase awareness campaigns through Self-Help Groups (SHGs).
- Integrate PMUY with renewable energy initiatives.
- Promote clean cooking alternatives such as biogas and electric cooking.
- Improve behavioural awareness regarding health impacts of biomass smoke.

BROADER GOVERNANCE SIGNIFICANCE

PMUY reflects:

- Women-led development model.
- Inclusive welfare governance.
- Technology-enabled subsidy delivery.
- Convergence of health, gender, and energy policy.
- Targeted welfare through JAM architecture.
- Transition from welfare distribution to empowerment-oriented governance.

CONCLUSION

The Pradhan Mantri Ujjwala Yojana has transformed India's clean cooking energy landscape by improving women's health, dignity, and energy access at an unprecedented scale. The scheme represents a shift from welfare delivery to women-centric empowerment and clean energy governance. However, ensuring affordable and sustained LPG usage remains essential for achieving complete energy justice and long-term public health benefits.

UPSC CIVIL SERVICES PRELIMS PYQ

Q. With reference to the Pradhan Mantri Ujjwala Yojana (PMUY), consider the following statements:

1. It is implemented by the Ministry of Petroleum and Natural Gas.
2. LPG connections are issued in the name of the adult woman of the household.
3. The scheme aims to reduce indoor air pollution caused by traditional cooking fuels.

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 & 3

Colombia's Hippo Crisis & Vantara's Relocation Proposal

CONTEXT

The Vantara wildlife rescue and rehabilitation centre in Jamnagar, Gujarat, proposed relocating nearly 80 invasive hippos from Colombia after the Colombian government decided to cull a section of the rapidly growing hippo population due to ecological concerns. The issue has attracted global attention because it combines themes of invasive alien species, wildlife conservation, biodiversity management, ethical treatment of animals, ecosystem imbalance, and international wildlife relocation.

BACKGROUND OF

COLOMBIA'S HIPPO CRISIS

The hippo crisis in Colombia traces its origin to the 1980s when notorious drug trafficker Pablo Escobar illegally imported four hippopotamuses from Africa to his private estate, Hacienda Nápoles.

After Escobar's death in 1993:

- The animals escaped into the wild.
- Colombia lacked a proper management strategy.
- The hippos began reproducing rapidly in the Magdalena River Basin.

From an initial population of four, the number has now increased to nearly 170–200 hippos.

Scientists estimate that if no action is taken, the population may cross 1,000 by 2035.

WHY HIPPOS ARE

A PROBLEM IN COLOMBIA

Hippos are not native to Colombia and are classified as an invasive alien species.

Major ecological concerns include:

- Disruption of local ecosystems
- Competition with native species
- Alteration of aquatic ecosystems
- Water pollution due to massive organic waste
- Increased eutrophication in water bodies
- Threats to biodiversity
- Risks to local communities and livestock

Hippos are highly territorial and aggressive animals, especially in aquatic environments. They are considered among the world's most dangerous large mammals.

WHAT IS AN INVASIVE ALIEN SPECIES?

An invasive alien species refers to a non-native organism introduced into an ecosystem where it spreads rapidly and causes ecological, economic, or environmental harm.

Characteristics:

- Non-native to ecosystem
- Rapid reproduction and spread
- Lack of natural predators
- Ecosystem disruption
- Threat to native biodiversity

Examples in India:

- Lantana camara
- Water hyacinth
- Prosopis juliflora
- African catfish

HIPPOTAMUS

AMPHIBIUS

Scientific Name:

- Hippopotamus amphibius

Features:

- Native to Sub-Saharan Africa
- Semi-aquatic herbivorous mammal
- Second-largest land mammal after elephants
- Adult males can weigh up to 3,000 kg
- Spend most of the day submerged in water

Behaviour:

- Highly territorial
- Extremely aggressive in water
- Mostly herbivorous
- Require freshwater ecosystems for temperature regulation

Ecological Role:

Hippos act as ecosystem engineers by transferring nutrients between land and water systems through waste deposition.

IUCN AND CITES STATUS

- IUCN Red List Status: Vulnerable
 - Listed under CITES Appendix II
- Threats in native habitats include:
- Habitat loss
 - Illegal hunting
 - Human-wildlife conflict

COLOMBIA'S RESPONSE TO THE HIPPO POPULATION

The Colombian government declared the hippos an invasive species in 2022.

Measures attempted include:

1. Sterilization Programme

- Use of GonaCon contraceptive vaccine.
- Expensive and logistically difficult.
- Limited success due to large population growth.

2. Relocation Proposals

- Plans to relocate hippos to foreign sanctuaries.
- High transportation and adaptation costs.

3. Culling

- Colombian authorities proposed controlled culling.
- Generated strong opposition from animal rights activists.

The government argues that ecological damage and safety risks require urgent intervention.

VANTARA'S RELOCATION PROPOSAL

Vantara, located in Jamnagar, Gujarat, offered to relocate around 80 hippos from Colombia to India.



The proposal aims to:

- Prevent mass culling
- Provide long-term rehabilitation
- Ensure humane treatment of animals
- Reduce ecological pressure in Colombia

The proposal highlighted international cooperation in wildlife rescue and conservation management.

ABOUT VANTARA

Vantara is a large-scale wildlife rescue, conservation, and rehabilitation initiative located in Jamnagar, Gujarat.

Developed by:

- Reliance Foundation
- Led by Anant Ambani

Features:

- One of the world's largest wildlife rescue centres
- Houses thousands of rescued animals
- Focuses on rehabilitation and conservation
- Includes veterinary hospitals and rescue infrastructure

The facility has handled:

- Elephants
- Big cats
- Reptiles
- Exotic wildlife
- Injured and rescued animals

CHALLENGES IN HIPPO RELOCATION

Relocating large semi-aquatic mammals across continents is extremely complex.

Major challenges include:

1. Sedation Risks

- Hippos are highly sensitive during transportation.
- Sedation may create fatal complications.

2. Transportation Logistics

- Requires specialized aircraft and containment systems.

- Extremely expensive operation.

3. Climate Adaptation

- Need for suitable freshwater ecosystems.
- Adaptation to new environmental conditions.

4. Social Behaviour

- Hippos live in social groups.
- Separation may create stress and aggression.

5. Long-Term Management

- Need for extensive space and veterinary care.
- Continuous monitoring and habitat management required.

ECOLOGICAL

DIMENSIONS

The Colombia hippo crisis highlights larger concerns related to biological invasions and ecosystem imbalance.

Ecological impacts include:

- Nutrient imbalance in rivers
 - Algal blooms
 - Threats to fish populations
 - Disruption of native species
 - Changes in river ecology
- The issue demonstrates how invasive species can permanently alter ecosystems if left unmanaged.

ETHICAL AND CONSERVATION DEBATE

The crisis has triggered debates between:

- Wildlife conservationists
- Ecologists
- Animal rights activists
- Government authorities

Two major approaches emerged:

1. Ecological Protection Approach

Supports population control to protect biodiversity.

2. Animal Rights Approach

Opposes culling and supports relocation or sterilization.

The debate reflects the challenge of balancing ecosystem conservation with humane treatment of animals.

CONCLUSION

Colombia's hippo crisis represents one of the world's most unusual invasive species challenges and highlights the complex relationship between biodiversity conservation, ecosystem management, and animal ethics. Vantara's relocation proposal reflects innovative global conservation cooperation, but the long-term solution ultimately depends on scientific management, ecological sustainability, and balanced wildlife governance.

PRELIMS PYQ

Q. With reference to invasive alien species, consider the following statements:

1. Invasive alien species are non-native organisms introduced into an ecosystem.
 2. They may threaten native biodiversity and ecosystem stability.
 3. Water hyacinth and Lantana camara are examples of invasive species in India.
- 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

