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IMPORTANT INSIGHTS

India Considers Qualified MFN Clause to Balance Investor Protection, FDI Attractiveness and Regulatory Autonomy

Recent Developments:

- India is considering a **broader restructuring of its Bilateral Investment Treaty (BIT) framework**, including the introduction of a **Qualified Most Favoured Nation (MFN) provision** instead of restoring the open-ended MFN approach removed under the **2015 Model BIT**.
- The proposed reforms seek to make India's investment regime more predictable for foreign investors while preserving the **regulatory autonomy of the State**.
- India currently has an active and evolving network of international investment agreements; UNCTAD's database records recently concluded BITs with countries including **Israel, Uzbekistan and the United Arab Emirates**, underlining the continuing importance of investment treaty policy.
- The reform debate is also significant because India has faced multiple treaty-based investor-State disputes, highlighting the need to balance **investor confidence, dispute management and sovereign policy space**.

Bilateral Investment Treaty (BIT):

Meaning and Purpose:

- A **Bilateral Investment Treaty (BIT)** is an agreement between two countries that establishes reciprocal rules for the **protection and treatment of investments** made by investors of one country in the territory of the other country.
- BITs aim to reduce political and regulatory uncertainty by providing foreign investors with a predictable legal framework while defining the obligations and policy space of the host State.
- Such treaties are an important component of the wider system of **International Investment Agreements (IIAs)**, which regulate cross-border investment relationships.

Major Areas Covered by BITs:

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- **Non-discrimination:** Investors are generally protected against discriminatory treatment compared with similarly situated domestic or foreign investors.
- **Expropriation:** Treaties may regulate direct or indirect State actions that substantially deprive investors of the value or control of their investments.
- **Fair and Equitable Treatment (FET):** Traditional BITs often contain obligations requiring a certain minimum standard of treatment for foreign investors.
- **Transfer of Funds:** BITs may protect the ability of investors to transfer investment-related funds, profits and returns subject to treaty conditions.
- **Investor-State Dispute Settlement (ISDS):** Certain treaties allow foreign investors to initiate international arbitration against the host State for alleged treaty violations.

India's 2015 Model BIT:

Background:

- India adopted a new **Model BIT in 2015** after concerns emerged regarding the broad interpretation of investor protection provisions under earlier investment treaties.
- The Model BIT was designed to move away from excessively open-ended treaty obligations and provide greater protection to the **State's regulatory authority**.
- The Department of Economic Affairs continues to maintain the 2015 Model BIT as the central reference framework for India's investment treaty policy.

Key Policy Approach:

- The 2015 Model BIT adopted a comparatively cautious approach towards **MFN treatment, FET obligations and ISDS**.
- India avoided an unrestricted MFN clause that could enable investors to rely on more favourable provisions contained in unrelated treaties concluded with third countries.
- The framework sought to ensure that India's treaty obligations remained primarily limited to provisions **expressly negotiated by the concerned treaty partners**.
- This approach reflected India's attempt to prevent international arbitral tribunals from expanding treaty commitments beyond the intended scope of the agreement.

Most Favoured Nation (MFN) Principle:

Meaning:

- The **Most Favoured Nation (MFN) principle** generally requires a country to provide investors from one treaty partner treatment that is **no less favourable** than the treatment provided to investors from another country in comparable circumstances.
- The principle is based on **non-discrimination among foreign investors** and seeks to prevent arbitrary preferences between investors from different countries.

Illustrative Example:

- Suppose **Country A** provides more favourable investment protection to investors from **Country B** under a later treaty.
- If investors from **Country C** have access to an applicable and broadly drafted MFN clause in their treaty with Country A, they may attempt to claim similar treatment.
- This possibility of drawing favourable provisions from third-country treaties is often described as the **importation of treaty provisions**.

Why Broad MFN Clauses Became Controversial:

- Investment tribunals have adopted different interpretations regarding whether an MFN clause can be used to import not only substantive protections but also **procedural provisions relating to dispute settlement**.
- Such interpretation may allow investors to seek access to more favourable provisions that were never specifically negotiated between the two States concerned.
- UNCTAD has identified the use of MFN clauses to import more favourable ISDS provisions from third-country treaties as a major source of treaty interpretation controversy.

Qualified MFN Provision:

Meaning:

- A **Qualified MFN clause** would retain the principle of non-discrimination while placing explicit limitations on the scope and operation of MFN treatment.
- It represents a middle path between **completely unrestricted MFN treatment** and the complete absence of an MFN provision.

Possible Safeguards:

- The revised clause could explicitly specify **which categories of treaty provisions can be relied upon through MFN treatment**.
- It could clarify whether investors can import **substantive protections, procedural rights, or neither category** from third-country treaties.
- It could specify whether the provision applies to **future treaties, existing treaties or both**.
- It could prevent the retrospective application of favourable treaty provisions unless expressly permitted.
- It could clarify whether settled disputes can be reopened through subsequently negotiated treaty protections.
- It could define the relevant **“like circumstances”** or comparable-investor standard for determining discrimination.
- It could expressly exclude the use of MFN provisions for expanding **ISDS jurisdiction or dispute-settlement procedures**.

Significance:

- A Qualified MFN clause can provide foreign investors with greater confidence regarding non-discriminatory treatment without allowing unlimited treaty shopping.
- It can preserve the ability of India to negotiate different commitments with different countries based on strategic, economic or reciprocal considerations.
- Clear drafting could reduce uncertainty and minimise inconsistent interpretations by arbitral tribunals.

Proposed Changes to Investor-State Dispute Settlement (ISDS):

Reduction in Domestic Remedies Period:

- The proposed framework seeks to reduce the period during which investors must pursue domestic legal remedies before initiating international arbitration from **five years to one year**.
- The objective is to reduce delays and make investment-related dispute resolution more efficient.

Institutional Challenge:

- A shorter domestic remedies period would increase the importance of efficient **Indian courts, tribunals and alternative dispute-resolution mechanisms**.
- Unless domestic dispute-resolution institutions can resolve commercial and investment disputes efficiently, investors may still prefer international arbitration after the one-year period.
- The global importance of ISDS reform has increased significantly; UNCTAD recorded more than **1,300 known treaty-based ISDS cases by the end of 2023**, while UNCITRAL continues its multilateral work on ISDS reform.

Longer Post-Treaty Protection:

Proposed Survival Period:

- The draft proposal seeks to extend investor protection after the expiry or termination of a BIT from **five years to 10 years**.
- Such provisions are commonly intended to provide continuity and legal certainty for investments made while the treaty was operational.

Policy Implication:

- A longer survival period can increase investor confidence by reducing the risk that treaty protection will disappear immediately after termination.
- However, it can also prolong a State's exposure to treaty obligations after its investment policy priorities have changed.

Wider Definition of Investment:

Proposed Expansion:

- The revised framework may expand the definition of **investment** to include **portfolio investments and other financial assets**.
- This could potentially extend treaty protection beyond traditional foreign direct investment involving substantial ownership, management or long-term commercial presence.

Implications:

- Minority shareholdings and certain financial interests may potentially receive treaty protection, depending on the final wording.
- A wider definition could increase investor confidence and expand the range of protected capital flows.
- At the same time, broader coverage could increase the number and complexity of potential investment disputes.

Ban on Third-Party Funding:

Meaning:

- **Third-party funding** occurs when an external entity finances an investor's legal claim in return for a potential share of the compensation awarded.
- The proposed framework seeks to prohibit such funding in investment-related litigation or arbitration.

Rationale:

- The measure may discourage speculative or commercially motivated investment claims.
- It could reduce conflicts of interest and concerns regarding excessive litigation.
- However, restrictions may also affect smaller investors that lack sufficient financial resources to pursue legitimate claims.

India's Investment Policy Context:

Need for Greater Predictability:

- Investment decisions depend not only on market size and economic opportunities but also on **legal certainty, regulatory consistency and dispute-resolution mechanisms**.
- India's revised BIT framework is therefore relevant to its broader objective of attracting productive and long-term foreign investment.
- India's international investment treaty network has continued to evolve, while new investment agreements are increasingly being linked with wider economic partnerships and trade arrangements.

Growing Overseas Investments by Indian Companies:

- Indian companies are increasingly investing and operating in foreign markets, making investment protection important not only for inward investment but also for **Indian investors abroad**.
- A stronger and carefully negotiated BIT network can therefore provide India with reciprocal negotiating leverage while protecting legitimate overseas investments of Indian enterprises.

Strategic Balance Between Investor Protection and Sovereignty:

Arguments Supporting Reform:

- **Investor confidence:** Clear treaty protections can reduce uncertainty associated with arbitrary or discriminatory treatment.
- **FDI attractiveness:** A predictable investment regime can improve India's competitiveness as an investment destination.
- **Reciprocity:** Indian investors abroad may benefit when India negotiates stronger and balanced protections with major partner economies.
- **Reduced ambiguity:** Carefully drafted qualifications can reduce inconsistent arbitral interpretations.
- **Efficient dispute settlement:** Reforms can attempt to reduce prolonged uncertainty for both investors and the State.

Concerns Requiring Caution:

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- **Regulatory chill:** Excessively broad investment protections may discourage governments from adopting legitimate regulations in areas such as environment, taxation, public health and welfare.
- **Fiscal exposure:** Adverse arbitral awards can create significant financial liabilities for the State.
- **Expanded litigation:** A wider definition of investment could enlarge the pool of potential claimants.
- **Institutional weakness:** Shorter domestic-remedy periods require stronger domestic mechanisms for commercial dispute resolution.
- **Drafting ambiguity:** Poorly drafted Qualified MFN provisions could recreate the interpretative uncertainty that the reform seeks to prevent.

Way Forward:

Design a Precisely Drafted Qualified MFN Clause:

- India should clearly define the **scope, beneficiaries, comparator, temporal application and exclusions** applicable to MFN treatment.

- The treaty should explicitly state whether MFN treatment applies to substantive investment protection, ISDS provisions or both.

Strengthen Domestic Dispute Resolution:

- Commercial courts and specialised dispute-resolution mechanisms should be strengthened to ensure faster and predictable outcomes.
- Greater institutional efficiency would reduce excessive dependence on international arbitration.

Protect Legitimate Public Policy Regulation:

- BITs should clearly preserve the State's **right to regulate** for public health, environmental protection, national security, financial stability and social welfare.
- Treaty drafting should distinguish between legitimate regulation and genuinely discriminatory or arbitrary State conduct.

Adopt a Calibrated Investment Definition:

- Any expansion to portfolio investment should contain appropriate thresholds and exclusions.
- Protection should not unintentionally cover speculative or purely temporary capital movements in the same manner as long-term productive investment.

Ensure Treaty Consistency:

- India's future BITs should maintain sufficient consistency to reduce fragmentation and contradictory interpretations.
- At the same time, country-specific flexibility should remain available where justified by reciprocity and strategic interests.

Value Addition for UPSC:***Prelims Pointers:***

- **BIT:** Agreement between two countries governing protection and treatment of investments.
- **MFN:** Principle requiring non-discriminatory treatment compared with investors from other treaty partners.
- **FET:** Fair and Equitable Treatment standard used in investment treaties.
- **ISDS:** Mechanism through which foreign investors may bring treaty-based claims against host States.
- **Model BIT 2015:** India's framework emphasising greater regulatory autonomy and narrower investor protections.

Potential UPSC Mains Question: “Bilateral Investment Treaties can promote investor confidence but may also constrain the regulatory autonomy of developing countries. Examine the significance of India's proposed Qualified MFN approach in achieving an appropriate balance.”

Aditya-L1 Solar-Flare Research Strengthens India's Understanding of Solar Activity, Space Weather and Technological Risks

Recent Developments:

- Researchers from **Manipal Academy of Higher Education, Indian Space Research Organisation, Department of Space and other institutions** have used **Aditya-L1 data** to study the processes preceding **solar flares**.
- The recent findings indicate that repeated **small-scale and short-lived energy releases** in solar active regions may gradually destabilise magnetic fields and contribute to the triggering of major solar flares.
- The study combines observations from the **Solar Ultraviolet Imaging Telescope, the Solar Low Energy X-ray Spectrometer** and the **High Energy L1 Orbiting X-ray Spectrometer**, enabling scientists to examine the relationship between lower atmospheric activity and energy release in the solar corona.
- According to the **Indian Space Research Organisation**, continuous multi-wavelength observations by **Aditya-L1** can improve scientific understanding of solar eruptive events and their potential implications for **space-weather forecasting**.

Aditya-L1 Mission:

Overview and Launch:

- **Aditya-L1** is India's first dedicated space-based mission designed primarily for the comprehensive study of the **Sun and its outer atmosphere**.
- The spacecraft was launched on **2 September 2023** from the **Satish Dhawan Space Centre, Sriharikota**, aboard the **Polar Satellite Launch Vehicle-C57** in its **extra-large configuration**.
- On **6 January 2024**, the spacecraft was successfully inserted into a large **halo orbit** around the **first Sun-Earth Lagrange point**, located approximately **1.5 million kilometres** from Earth towards the Sun.

Significance of the Lagrange Point 1 Location:

- The **Sun-Earth Lagrange Point 1** is a region where the gravitational influences of the Sun and Earth allow a spacecraft to maintain a suitable orbital configuration with relatively efficient station-keeping.
- A spacecraft in a halo orbit around this point can observe the Sun almost continuously without regular **eclipses or occultations by the Earth**.
- This uninterrupted observational capability is particularly valuable for monitoring rapidly evolving solar phenomena such as **solar flares, coronal mass ejections and variations in the solar wind**.

Scientific Objectives of Aditya-L1:

Major Areas of Investigation:

- Aditya-L1 studies the **solar corona and chromosphere**, including the mechanisms responsible for coronal heating and solar eruptive phenomena.
- The mission examines the **origin, development and dynamics of coronal mass ejections and solar flares**.
- It seeks to understand the sequence of physical processes occurring across different layers of the solar atmosphere before major eruptive events.
- The spacecraft also studies the **solar wind, energetic particles and magnetic field environment** around the Lagrange Point 1.
- These observations contribute to a better understanding of the physical drivers of **space weather**.

Payloads on Aditya-L1:

Remote-Sensing and In-Situ Instruments:

- Aditya-L1 carries **seven scientific payloads**, comprising **four remote-sensing instruments** for observing the Sun and **three in-situ instruments** for studying the local space environment.
- The remote-sensing payloads include the **Visible Emission Line Coronagraph**, the **Solar Ultraviolet Imaging Telescope**, the **Solar Low Energy X-ray Spectrometer** and the **High Energy L1 Orbiting X-ray Spectrometer**.
- The in-situ payloads include the **Aditya Solar Wind Particle Experiment**, the **Plasma Analyser Package for Aditya** and the **Advanced Tri-axial High Resolution Digital Magnetometers**.

Important Instruments for Solar-Flare Studies:

- The **Solar Ultraviolet Imaging Telescope** observes the Sun in **11 near-ultraviolet filters**, enabling observations of atmospheric layers extending from the upper photosphere to the chromosphere.
- The **Solar Low Energy X-ray Spectrometer** measures relatively lower-energy solar X-ray emissions associated with energetic solar activity.
- The **High Energy L1 Orbiting X-ray Spectrometer** monitors higher-energy X-ray emissions and assists in detecting intense solar-flare processes.
- The combined use of ultraviolet and X-ray observations allows scientists to study the connection between activity in the lower solar atmosphere and energy release in the corona.

Solar Flares:

Meaning and Formation:

- **Solar flares** are sudden and intense eruptions involving the release of large amounts of electromagnetic energy from the Sun.
- They are generally associated with the rapid reconfiguration and release of energy stored in the Sun's highly dynamic **magnetic fields**.
- Solar flares can release energy in the form of electromagnetic radiation and high-energy particles, producing intense emissions across different wavelengths.
- The Earth's atmosphere blocks much of the harmful high-energy radiation from reaching the surface, making space-based observations essential for detailed study of several solar emissions.

Relationship with Coronal Mass Ejections:

- Solar flares are often associated with **coronal mass ejections**, although the two phenomena are distinct and do not always occur together.
- A coronal mass ejection involves the large-scale expulsion of plasma and magnetic fields from the Sun into interplanetary space.
- When directed towards Earth, a sufficiently intense coronal mass ejection can interact with Earth's magnetic environment and trigger a **geomagnetic storm**.
- Such storms can affect satellites, navigation systems, communication infrastructure and electrical power systems.

Connection with the Solar Cycle:

- Solar activity varies approximately in an **11-year solar cycle**, during which the frequency and intensity of solar phenomena change.
- Solar flares generally become more frequent during periods of increased solar activity, particularly near the **solar maximum**.
- Monitoring the solar cycle is therefore important for anticipating changes in the probability of significant space-weather events.

Classification of Solar Flares:

Five Major Categories:

- Solar flares are classified into **A, B, C, M and X classes**, arranged broadly from the least intense to the most intense.
- Each successive class represents approximately a **tenfold increase in energy output or X-ray intensity**, depending on the measurement classification used.

X-Class Flares:

- **X-class flares** are the most powerful category and can produce severe radio blackouts and intense radiation-related disturbances.
- Major X-class events can significantly affect the upper atmosphere and technologies dependent on radio communication and space-based systems.

M-Class Flares:

- **M-class flares** are medium-to-large events that can produce brief radio blackouts, particularly affecting communications in vulnerable regions.
- Strong M-class events may also be associated with additional radiation-related disturbances.

C-Class, B-Class and A-Class Flares:

- **C-class flares** are relatively small and generally produce limited consequences on Earth.
- **B-class flares** are approximately ten times weaker than C-class events.
- **A-class flares** represent the lowest category and are generally close to background levels with no significant observable consequences on Earth.

How Aditya-L1 Observes Solar Flares:

Continuous Multi-Wavelength Observation:

- Aditya-L1's location around the **Sun-Earth Lagrange Point 1** provides an uninterrupted view of solar activity over extended periods.
- The mission can observe solar phenomena across multiple wavelengths, allowing scientists to investigate different atmospheric layers and physical processes simultaneously.
- Different wavelengths originate from different regions and heights of the solar atmosphere, making multi-wavelength observations essential for understanding the evolution of solar flares.

Role of the Solar Ultraviolet Imaging Telescope:

- The **Solar Ultraviolet Imaging Telescope** observes the Sun in **11 near-ultraviolet filters**, covering scientific observations of the upper photosphere and chromosphere.
- Near-ultraviolet radiation is largely absorbed by Earth's atmosphere, which makes space-based observation particularly important.
- The instrument can identify changes and transient brightening in active solar regions before the onset of major flares.

Role of X-Ray Spectrometers:

- The **Solar Low Energy X-ray Spectrometer** and **High Energy L1 Orbiting X-ray Spectrometer** monitor X-ray emissions produced by energetic processes in the solar atmosphere.
- X-ray emissions increase significantly when solar magnetic energy is released during flare-related processes.
- Combining X-ray observations with near-ultraviolet data helps scientists trace the relationship between lower atmospheric disturbances and energy release in the corona.

Recent Scientific Findings:

Pre-Flare Warning Signals:

- Researchers identified numerous **small and short-lived transient brightenings** in active regions before the onset of major solar flares.
- These repeated small-scale energy releases may represent an important part of the physical processes through which solar magnetic fields gradually approach instability.
- The observations suggest that major solar flares may be preceded by measurable signatures rather than always occurring as completely unpredictable events.

Scientific Significance:

- The findings strengthen understanding of the processes linking the **photosphere, chromosphere and solar corona** during the development of solar flares.
- Multi-wavelength observations can help scientists distinguish between ordinary solar activity and changes potentially associated with the build-up towards a major eruptive event.
- Improved identification of pre-flare signatures could eventually contribute to more reliable **solar-flare and space-weather forecasting**.

Impacts of Solar Flares and Space Weather:

Communication and Navigation:

- Intense solar flares produce strong X-ray and extreme-ultraviolet radiation that can alter the ionosphere and degrade or temporarily block **high-frequency radio communication**.
- Disturbances in the ionosphere can also reduce the accuracy and reliability of satellite-based navigation and positioning systems.
- Such disruptions can affect aviation, maritime operations, emergency communications and other sectors dependent on reliable radio signals.

Satellites and Space Infrastructure:

- High-energy particles associated with severe solar activity can affect satellite electronics and increase operational risks for spacecraft.
- Strong space-weather events can also heat and expand Earth's upper atmosphere, increasing atmospheric drag on satellites in low-Earth orbit.
- Greater atmospheric drag can alter satellite trajectories and increase the need for orbital corrections.

Power and Critical Infrastructure:

- Coronal mass ejections that trigger geomagnetic storms can induce electrical currents in long conductors on Earth.
- Such **geomagnetically induced currents** can affect electrical power grids and, under severe conditions, damage critical infrastructure.
- Space-weather disturbances can also affect long pipelines and other infrastructure dependent on extensive conducting networks.

Human Space Exploration:

- High-energy solar particles pose a greater risk to astronauts operating beyond the substantial protection provided by Earth's atmosphere and magnetic environment.
- Improved forecasting of energetic solar events is therefore important for planning and protecting future human space missions.

Significance for India:***Scientific and Technological Importance:***

- Aditya-L1 strengthens India's indigenous capabilities in **solar physics, heliophysics and space-weather research**.
- The mission provides Indian researchers with continuous observational data for studying solar phenomena and their effects on near-Earth space.
- Its observations can complement international solar-monitoring efforts and improve global understanding of solar eruptive processes.

Strategic Relevance:

- Modern India increasingly depends on **satellite communication, navigation, weather forecasting, digital infrastructure and space-based services**, making space-weather monitoring strategically important.
- Improved understanding of solar disturbances can contribute to the protection of critical infrastructure and enhance preparedness against technology-related disruptions.
- Indigenous solar observation capabilities also support India's growing ambitions in **space exploration and human spaceflight**.

Challenges and Way Forward:***Improving Space-Weather Forecasting:***

- Scientific observations must be converted into reliable operational forecasting models capable of identifying potentially disruptive solar events.

- Continuous multi-wavelength monitoring should be combined with improved data analysis, modelling and international scientific cooperation.

Strengthening National Preparedness:

- India should integrate space-weather risk assessment into the protection of **satellite systems, communication networks, navigation services and electrical infrastructure**.
- Space agencies, scientific institutions and infrastructure regulators should strengthen coordination for early warning and response mechanisms.

Expanding Solar Research:

- Continued analysis of Aditya-L1 data can improve understanding of magnetic reconnection, coronal heating, solar-wind dynamics and solar eruptive events.
- India's future space-science programmes can build upon Aditya-L1's findings to develop stronger capabilities in **space situational awareness and space-weather services**.

Value Addition for UPSC:

Prelims Pointers:

- **Aditya-L1:** India's first dedicated space-based solar observatory mission.
- **Location:** Halo orbit around the Sun-Earth **Lagrange Point 1**, approximately **1.5 million kilometres** from Earth.
- **Number of payloads:** **Seven**, comprising four remote-sensing and three in-situ payloads.
- **Solar flare classes:** **A, B, C, M and X**, with X-class representing the most intense category.
- **Coronal mass ejection:** Large-scale expulsion of plasma and magnetic fields from the Sun that can trigger geomagnetic storms.

Potential UPSC Mains Question: *"Space-weather events pose an emerging risk to modern technological infrastructure. Examine the role of India's Aditya-L1 mission in improving scientific understanding and preparedness against solar disturbances."*

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India–Uzbekistan Comprehensive Strategic Partnership Deepens Central Asian Engagement Through Energy, Trade, Security and Connectivity Cooperation

Recent Developments:

- India and Uzbekistan have elevated their **Strategic Partnership to a Comprehensive Strategic Partnership**, marking a significant expansion of bilateral cooperation during the **15th anniversary of their Strategic Partnership**.
- During Prime Minister **Narendra Modi's State Visit to Tashkent**, India and Uzbekistan agreed to deepen cooperation across **civil nuclear energy, trade and investment, critical minerals, defence, security, infrastructure, digital public infrastructure, pharmaceuticals, agriculture, technology, education and culture**.

- The two countries have set an ambitious target of increasing annual bilateral trade to **USD 5 billion by 2030**, while agreeing to systematically address constraints related to **market access, connectivity, banking and payment systems**.
- India and Uzbekistan also agreed to establish a framework for the **long-term supply of uranium** from Uzbekistan to India, strengthening cooperation in civilian nuclear energy and India's broader energy-security strategy.

India–Uzbekistan Relations: Background and Evolution:

Historical and Strategic Foundations:

- India and Uzbekistan share historical and civilisational links shaped by centuries of interaction between the **Indian subcontinent and Central Asia** through trade routes, cultural exchanges and intellectual contacts.
- India and Uzbekistan established diplomatic relations after the dissolution of the Soviet Union, and their engagement subsequently expanded into cooperation in **security, defence, trade, connectivity, education and culture**.
- Uzbekistan occupies a geographically central position in **Central Asia**, making it an important partner for India's wider engagement with the region.
- The elevation to a Comprehensive Strategic Partnership indicates an attempt to transform bilateral relations from primarily diplomatic and security engagement into a broader **multidimensional strategic relationship**.

Institutional Deepening:

- To ensure implementation of the expanded partnership, the two countries have agreed to establish a **Foreign Ministers-led coordination mechanism**.
- The existing **Inter-Governmental Commission** is also being elevated to the **ministerial level**, providing greater political direction and institutional capacity for reviewing bilateral cooperation.
- Such institutional mechanisms are important because ambitious strategic partnerships require regular monitoring, sectoral coordination and mechanisms to convert political commitments into measurable outcomes.

Civil Nuclear Cooperation and Uranium Supply:

Long-Term Uranium Partnership:

- India and Uzbekistan have agreed to work towards a framework for the **long-term supply of uranium**, opening an important new dimension in their civilian nuclear-energy cooperation.
- India requires reliable uranium supplies to support the expansion of its civilian nuclear-energy programme and to strengthen long-term energy security.
- Access to uranium from Uzbekistan can help India **diversify its sources of supply**, reducing excessive dependence on a limited number of external suppliers.
- Diversified sourcing is strategically important because nuclear power provides relatively reliable **low-carbon baseload electricity**, which can complement India's renewable-energy expansion.

Strategic Importance for India:

- Uranium cooperation can strengthen India's **energy security** by expanding access to a strategically important nuclear fuel.
- A diversified supply network can reduce vulnerabilities arising from geopolitical disruptions, supply constraints and overdependence on individual exporting countries.

- The arrangement also reflects the increasing linkage between India's foreign policy and its requirements for **energy, strategic resources and resilient supply chains**.

Trade and Economic Partnership:

USD 5 Billion Trade Target:

- India and Uzbekistan have set a target of increasing annual bilateral trade from more than **USD 1 billion to USD 5 billion by 2030**.
- Priority sectors include **trade and investment, agriculture, pharmaceuticals and healthcare, energy, critical minerals, mining, jewellery, infrastructure, information technology and digital public infrastructure**.
- The countries intend to address structural constraints involving **market access, logistics and connectivity, banking arrangements and payment mechanisms**.
- A stronger economic partnership could help India expand its commercial presence in the resource-rich Central Asian region.

Pharmaceutical and Healthcare Cooperation:

- India and Uzbekistan have recognised significant potential for cooperation in the **pharmaceutical sector**, including investment, technology transfer, manufacturing and skill development.
- Uzbekistan's **Tashkent Pharma Park Innovative Scientific and Industrial Pharmaceutical Cluster** can provide opportunities for joint projects involving Indian pharmaceutical companies.
- The partnership also envisages cooperation in medical centres, laboratories, biomedical research, medical innovation and joint pharmaceutical manufacturing.
- Such cooperation can strengthen India's role as a major supplier of affordable medicines while supporting Uzbekistan's healthcare and manufacturing capabilities.

Defence and Counter-Terrorism Cooperation:

Towards Defence-Industrial Collaboration:

- Defence cooperation is expanding beyond traditional military exchanges towards greater **defence-industrial collaboration**.
- Both countries intend to promote direct linkages between their defence industries and explore opportunities for **co-development and co-production of military equipment**.
- The **Joint Working Group on Military Cooperation** is exploring new avenues for strengthening defence-industrial engagement.
- The **Dustlik joint military exercise** continues to enhance interoperability, operational understanding and professional exchanges between the armed forces.

Zero Tolerance Towards Terrorism:

- India and Uzbekistan have unequivocally condemned **terrorism, including cross-border terrorism**, and rejected attempts to justify terrorist activities on any grounds.
- Their cooperation includes **intelligence sharing, law-enforcement coordination, countering violent extremism, combating terrorist financing, addressing terrorist safe havens and infrastructure, fighting organised crime, preventing illicit drug trafficking and countering cyber threats**.
- This cooperation assumes particular importance because instability in **Afghanistan** can create security challenges for Central Asia through terrorism, radicalisation, transnational crime and narcotics trafficking.

- India–Uzbekistan security cooperation therefore complements India's broader objective of promoting a stable and secure **Central Asian and Eurasian neighbourhood**.

Critical Minerals and Strategic Resources:

Building Resilient Supply Chains:

- Critical minerals and mining have emerged as important pillars of the expanded bilateral partnership.
- Uzbekistan possesses significant mineral resources, while India is seeking to diversify access to minerals required for **clean-energy technologies, electronics, advanced manufacturing and strategic sectors**.
- Cooperation can support India's broader objective of reducing supply-chain concentration and building **resilient and diversified global supply chains**.
- Critical-mineral partnerships have acquired increasing geopolitical importance because several strategically important minerals are geographically concentrated in a limited number of countries.

Strategic Relevance:

- Greater access to diversified mineral resources can support India's **energy transition and manufacturing ambitions**.
- It can also strengthen India's capacity in strategic technologies and reduce vulnerabilities associated with external supply disruptions.
- The partnership demonstrates the growing role of **economic security and resource diplomacy** in India's foreign policy.

Connectivity and Digital Partnership:

The Connectivity Challenge:

- Connectivity remains one of the principal constraints in India–Central Asia relations because India does not possess direct overland access to the region.
- This limitation increases the importance of developing **alternative transport, trade and connectivity corridors**.
- India's engagement with Uzbekistan therefore complements the broader objectives of its **Connect Central Asia Policy** and wider efforts to improve Eurasian connectivity.

Digital Payment Integration:

- A commercial agreement between **National Payments Corporation of India International Payments Limited** and Uzbekistan's **National Interbank Processing Centre** will enable Indian **Unified Payments Interface applications** to scan the national **यूज़ेडक्वूआर** system for merchant payments in Uzbekistan.
- Digital-payment connectivity can facilitate tourism, business travel and commercial transactions while demonstrating India's capabilities in **Digital Public Infrastructure**.
- Such cooperation can create opportunities for the internationalisation of India's indigenous digital-payment ecosystem.

People-to-People Connectivity:

- Uzbekistan's decision to remove visa requirements for Indian citizens for stays of up to **30 days** can facilitate tourism, business exchanges and people-to-people interaction.

- Cooperation in education, culture, tourism and youth exchanges can strengthen the social foundations of the bilateral relationship.
- Improved societal connectivity is particularly important for sustaining long-term strategic partnerships beyond government-level engagement.

Culture, Education and Civilisational Heritage:

Buddhist Heritage Cooperation:

- India and Uzbekistan have concluded a **Letter of Intent** for the restoration and conservation of the Buddhist sites of **Fayaz Tepa and Kara Tepa**.
- These initiatives highlight the historical links between Central Asia and the Indian subcontinent and provide an important cultural dimension to contemporary diplomacy.
- Conservation of shared heritage can strengthen India's **cultural diplomacy and soft power** in Central Asia.

Educational and Cultural Initiatives:

- India announced **100 Lal Bahadur Shastri Scholarships for Hindi language** for Uzbek students.
- An **Indian Council for Cultural Relations Sanskrit Chair** will be established at the **Tashkent State University of Oriental Studies**.
- More than **2,700 Uzbek nationals** have participated in India's **Indian Technical and Economic Cooperation Programme**, while more than **400 Uzbek students** have been selected under Indian Council for Cultural Relations scholarships, including scholarships related to traditional medicine.
- These initiatives can deepen human-resource development, academic engagement and long-term cultural familiarity between the two societies.

Environmental Cooperation and the Aral Sea:

Afforestation and Ecological Rehabilitation:

- India has announced a **USD 1 million grant** for afforestation and ecological rehabilitation in the **Aral Sea region**.
- The initiative reflects cooperation between Uzbekistan's **Yashil Makon** green initiative and India's **Ek Ped Maa Ke Naam** campaign.
- India's participation links bilateral diplomacy with environmental restoration and demonstrates the growing role of **climate and ecological cooperation** in India's international engagement.
- The Aral Sea crisis is globally significant as an example of severe environmental degradation resulting from unsustainable diversion and management of river waters.

Strategic Significance for India:

Central Asia and the Extended Neighbourhood:

- Uzbekistan occupies a pivotal position in Central Asia, a region influenced by the strategic interests of **Russia, China, Türkiye, Iran and other regional powers**.
- Stronger ties with Uzbekistan can expand India's economic and strategic footprint within its **Extended Neighbourhood**.
- Deeper engagement can also provide India with greater access to Central Asian markets, energy resources and strategic mineral supplies.

Balancing Regional Geopolitics:

- Central Asia has witnessed increasing economic and strategic engagement by China, particularly through connectivity and infrastructure initiatives.
- Greater Indian engagement can provide Central Asian countries with **additional economic and strategic partnerships**, supporting a more diversified regional order.
- India's approach is based on expanding cooperation through trade, connectivity, technology, security and people-to-people engagement rather than viewing the region solely through geopolitical competition.

Afghanistan and Regional Security:

- Uzbekistan's geographical proximity and engagement with Afghanistan make it an important partner for understanding evolving regional security developments.
- India–Uzbekistan cooperation can contribute to counter-terrorism coordination and wider efforts to prevent instability from affecting Central Asia.
- A stable Central Asian region is important for India's connectivity ambitions, economic interests and broader security environment.

Challenges and the Way Forward:***Implementation and Connectivity Constraints:***

- The success of the Comprehensive Strategic Partnership will depend on translating political commitments into **time-bound and measurable implementation**.
- Limited direct connectivity remains a structural challenge and requires sustained investment in viable transport and logistics corridors.
- Banking and payment mechanisms, market-access barriers and regulatory differences must also be addressed to achieve the **USD 5 billion trade target**.

Recommended Approach:

- India and Uzbekistan should establish clear sector-specific implementation mechanisms under the proposed high-level coordination architecture.
- Greater participation by private companies is necessary to convert government agreements into sustained **trade, investment and industrial cooperation**.
- Defence-industrial and critical-mineral cooperation should focus on long-term institutional partnerships rather than isolated transactions.
- Connectivity initiatives should be integrated with India's wider Central Asian and Eurasian economic strategy.

Value Addition for UPSC:***Prelims Pointers:***

- **Uzbekistan:** A landlocked country located in Central Asia.
- **Capital:** Tashkent.
- **Aral Sea:** A major transboundary water body associated with one of the world's most serious ecological degradation crises.
- **Fayaz Tepa and Kara Tepa:** Important Buddhist heritage sites located in Uzbekistan.
- **Dustlik:** A joint military exercise associated with India and Uzbekistan.

- **India–Uzbekistan trade target:** USD 5 billion by 2030.
- **Recent partnership upgrade:** From **Strategic Partnership** to **Comprehensive Strategic Partnership**.
- **New energy cooperation:** Framework for the **long-term supply of uranium** from Uzbekistan to India.

Potential UPSC Mains Question: “Central Asia has emerged as an important component of India's Extended Neighbourhood Policy. Examine how the India–Uzbekistan Comprehensive Strategic Partnership can advance India's economic, security and connectivity interests.”

India Considers Qualified MFN in Revised Investment Treaty Framework to Balance Investor Protection with Regulatory Autonomy

Recent Developments:

- India is reviewing its **Bilateral Investment Treaty (BIT) framework** to make it more attractive to foreign investors while retaining adequate **regulatory policy space** for the State.
- As part of the proposed overhaul, India is reportedly considering a **limited or Qualified Most-Favoured Nation (MFN) provision** instead of restoring an unrestricted MFN clause.
- The review follows concerns that India's existing investment-treaty framework may be relatively restrictive for foreign investors, particularly regarding access to **international arbitration**.
- The Government is also examining the requirement under the existing framework that investors pursue domestic remedies before initiating international arbitration, with the present **five-year period** reportedly under review.
- The reform has wider significance because India is simultaneously seeking greater **foreign direct investment**, negotiating investment treaties and expanding opportunities for Indian companies investing abroad.

Bilateral Investment Treaties:

Meaning and Purpose:

- A **Bilateral Investment Treaty** is an agreement between two countries that establishes rules for the protection and treatment of investments made by investors of one country in the territory of the other.
- BITs generally seek to reduce investment-related uncertainty by establishing standards concerning **non-discrimination, fair and equitable treatment, expropriation, transfer of funds, protection and security, and dispute settlement**.
- Many BITs provide an **Investor-State Dispute Settlement mechanism**, under which an eligible foreign investor may bring certain claims against the host State before an international arbitral tribunal.
- BITs are therefore intended to create a more **predictable and rules-based investment environment** while balancing the interests of investors and host States.

India's Model BIT Approach:

- India adopted its **Model BIT in 2016**, following concerns arising from investment disputes and international arbitration involving the country.
- The Model BIT adopted a relatively cautious approach towards investor protection and sought to preserve greater **policy and regulatory autonomy** for India.

- The framework did not retain a broad, open-ended **MFN clause**, reflecting concerns about investors importing favourable provisions from India's treaties with third countries.
- The current review therefore represents an attempt to recalibrate the framework rather than simply return to the earlier unrestricted approach.

Most-Favoured Nation Principle in Investment Treaties:

Meaning of MFN:

- In an investment treaty, the **MFN principle** generally requires a State to provide investors from one treaty partner treatment that is **no less favourable** than the treatment provided to investors from another treaty partner.
- For example, if India grants investors from Country A a particular investment protection under a later treaty, an applicable MFN clause could potentially allow investors from Country B to seek similar treatment under India's treaty with Country B.
- The underlying objective is to prevent **discriminatory treatment among foreign investors** from different treaty partners.

Why MFN Became Controversial for India:

- An unrestricted MFN clause can potentially allow an investor to rely on provisions negotiated by the host State with a **third country**, even when those provisions were not included in the investor's own treaty.
- This can create uncertainty regarding the actual obligations that a State accepted during the original treaty negotiations.
- Investment tribunals have differed in their interpretation of the scope and application of MFN clauses, particularly concerning whether MFN provisions can be used to import **substantive protections or procedural rights**.
- India therefore moved away from a broad MFN approach in its revised investment-treaty policy.

Qualified MFN:

Concept:

- A **Qualified MFN provision** would preserve the principle of non-discrimination while imposing clearly defined limitations on its operation.
- Instead of allowing investors to automatically claim every favourable provision available in another treaty, the clause could specify **which provisions may be imported, which treaties may be considered and under what circumstances MFN treatment may apply**.
- The approach could also clarify whether MFN treatment applies **retrospectively**, whether previously settled disputes can be reopened and which categories of investment protection are covered.

Why India May Prefer Qualified MFN:

- Qualified MFN can provide greater **investor confidence** without creating an unlimited mechanism for importing provisions from unrelated treaties.
- It can reduce interpretational uncertainty and help India maintain greater **regulatory autonomy**.
- It can also become a negotiating instrument because India could seek comparable treatment for its own investors in major overseas markets.
- A carefully drafted MFN clause can therefore attempt to balance **investment protection, treaty certainty and sovereign policy space**.

MFN under Investment Treaties versus WTO:

Key Difference:

- The **MFN principle in investment treaties** concerns the treatment of foreign investors and investments under bilateral or regional investment agreements.
- The **WTO MFN principle** is a core principle of the multilateral trading system and generally requires a WTO member to extend trade advantages granted to one member to other WTO members on a non-discriminatory basis.
- Under the **General Agreement on Tariffs and Trade**, MFN is contained in **Article I**, while the **General Agreement on Trade in Services** contains MFN treatment in **Article II**, and the **TRIPS Agreement** contains it in **Article 4**.
- Therefore, the two applications share the broader idea of **non-discrimination**, but operate within different legal frameworks and cover different subject matter.

UPSC Distinction:

- **Investment-Treaty MFN:** Protects investors from discriminatory treatment vis-à-vis investors of third countries, subject to the wording of the particular treaty.
- **WTO MFN:** Promotes non-discrimination among WTO trading partners in the treatment of goods, services and intellectual-property-related trade obligations.
- **Important:** MFN does not mean giving a country a uniquely preferential status; within the WTO system, it principally means extending comparable trade treatment to members without discrimination.

Investment Dispute Settlement and India's Approach:

Investor-State Dispute Settlement:

- **Investor-State Dispute Settlement** allows qualifying foreign investors to challenge certain State measures through international arbitration under the applicable investment treaty.
- India has historically become more cautious about ISDS because investment disputes can involve substantial financial claims and questions concerning the balance between **investor protection and sovereign regulatory powers**.
- India's Model BIT therefore sought to strengthen the requirement for investors to first use **domestic judicial remedies** before accessing international arbitration.
- The current review reportedly considers shortening the existing domestic-remedy period, reflecting concerns that prolonged pre-arbitration requirements can reduce India's attractiveness to foreign investors.

Why India Is Reconsidering the BIT Framework:

Need to Attract Foreign Investment:

- India seeks to make its investment regime more **predictable, competitive and investor-friendly** while retaining safeguards against excessive treaty claims.
- India's net FDI inflows reportedly declined to approximately **USD 7.7 billion in FY 2025–26**, significantly below the levels seen in some competing Asian economies.
- A more predictable investment-treaty framework could strengthen investor confidence, particularly among investors from developed economies.

Protection of Indian Investors Abroad:

- The reform is not only about attracting foreign capital into India.
- A carefully designed MFN provision could strengthen India's bargaining position when negotiating investment treaties with major economies such as the **United States and European Union**.
- Indian companies investing abroad could potentially benefit from **non-discriminatory treatment** and comparable investment protections in partner countries.
- MFN could therefore operate as both an **investor-protection mechanism** and a **diplomatic negotiating instrument**.

Advantages of Qualified MFN for India:

Balancing Competing Objectives:

- **Investor Protection:** Qualified MFN can provide foreign investors with greater certainty regarding non-discriminatory treatment.
- **Regulatory Autonomy:** Explicit limitations can prevent investors from automatically importing every favourable provision from unrelated treaties.
- **Treaty Predictability:** Clear drafting can reduce disputes over the scope and interpretation of MFN provisions.
- **Negotiating Leverage:** MFN can strengthen India's position while seeking reciprocal protections for Indian investors abroad.
- **Investment Climate:** A balanced framework can improve India's attractiveness without substantially weakening the State's ability to regulate in the public interest.

Potential Challenges:

Drafting and Interpretation:

- The effectiveness of Qualified MFN will depend heavily on **precise treaty drafting**.
- Ambiguous language could recreate the very interpretational disputes that India sought to avoid through its restrictive Model BIT approach.
- India will need to clearly define the **scope, exceptions, temporal application and procedural consequences** of MFN treatment.

Balancing State and Investor Interests:

- Excessively restrictive provisions may discourage foreign investment by reducing the practical value of treaty protection.
- Excessively broad provisions may expose India to extensive claims and reduce regulatory flexibility.
- The central policy challenge is therefore to establish an appropriate balance between **investor confidence and sovereign regulatory space**.

Broader Significance for India's Economic Diplomacy:

Investment Treaty Network:

- India's BIT policy is increasingly important because the country is negotiating and updating investment agreements with multiple economic partners.

- Recent developments, including India's willingness to advance **BIT negotiations with Canada**, demonstrate the continuing importance of investment treaties in India's external economic strategy.
- The revised framework could therefore become a common negotiating template for India's future investment agreements.

Integration with FDI Policy:

- BIT reform should complement India's domestic efforts to improve the **ease of doing business, investment facilitation and regulatory predictability**.
- The Government has also recently revised aspects of its FDI framework, with the revised regime facilitating certain investments involving **non-controlling beneficial ownership from land-bordering countries**.
- A coherent combination of domestic investment reforms and modern BITs can strengthen India's position in global investment flows.

Way Forward:

Policy Priorities:

- India should adopt a **clearly defined Qualified MFN clause** that identifies the provisions capable of being imported from third-country treaties.
- The framework should specify the treatment of **retrospective claims, settled disputes, procedural provisions and treaty exceptions**.
- Domestic dispute-resolution institutions should be strengthened so that investors have access to **efficient, credible and time-bound remedies**.
- India should pursue greater **reciprocity** so that stronger protection for foreign investors in India is accompanied by meaningful protection for Indian investors overseas.
- BIT reform should remain consistent with India's wider objectives of **FDI attraction, economic security, regulatory autonomy and global economic integration**.

Value Addition for UPSC:

Prelims Pointers:

- **MFN in investment treaties:** A non-discrimination principle concerning investors from different treaty partners.
- **WTO MFN:** A core multilateral trade principle reflected in **GATT Article I, GATS Article II and TRIPS Article 4**.
- **India's Model BIT:** Published by the **Department of Economic Affairs in 2016**.
- **Qualified MFN:** A restricted MFN mechanism subject to specifically negotiated conditions and safeguards.
- **ISDS:** A mechanism through which eligible foreign investors may pursue treaty-based claims against host States through international arbitration.

Potential UPSC Mains Question: *"India's reconsideration of a Qualified Most-Favoured Nation provision reflects an attempt to reconcile foreign-investor protection with regulatory autonomy. Examine the opportunities and challenges associated with this approach."*

India Mandates Indian Standard Time as Common National Reference to Strengthen Digital Infrastructure, Precision Synchronisation and Time Sovereignty

Recent Developments:

- The **Department of Consumer Affairs** has notified the **Legal Metrology (Indian Standard Time) Rules, 2026**, establishing **Indian Standard Time (IST)** as the common time reference for legal, administrative, commercial and other official purposes across India.
- The Rules were notified on **27 August 2026** and will come into force **180 days from their publication in the Official Gazette**, giving government departments, businesses and institutions time to upgrade their systems.
- The Rules have been framed under **Section 52 of the Legal Metrology Act, 2009**, which empowers the Central Government to make rules for carrying out the provisions of the Act.
- The move is part of the broader **One Nation, One Time** initiative aimed at establishing a secure, accurate and traceable national timing ecosystem.
- The initiative has gained importance because **banking, digital payments, telecommunications, railways, power systems, computer networks and government records** increasingly depend on accurate and consistent time-stamping.

Legal Metrology (Indian Standard Time) Rules, 2026:

Core Provisions:

- The Rules establish **IST as the official time scale for civil, commercial and legal purposes** in India and provide a framework for its generation, maintenance, dissemination, synchronisation and traceability.
- The framework seeks to ensure **uniformity, accuracy, reliability, traceability, operational efficiency, resilience and security** in the use of national time.
- Government departments, commercial entities, institutions and other organisations will receive a **180-day transition period** before the Rules become operational.
- The framework provides for **authorised timing sources**, which may disseminate traceable IST or coordinated universal time realised through the national laboratory, subject to specified technical, operational and security requirements.

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Why a Common Time Reference Matters:

- Different or poorly synchronised time sources can create discrepancies in the recording and coordination of **financial transactions, digital communications, transport operations and legal records**.
- Standardised time-stamping can improve the reliability of transactions where the exact sequence and timing of events are legally or operationally significant.
- The significance of precise time increases further with the expansion of **high-frequency digital transactions, automated systems, smart grids and networked critical infrastructure**.

Indian Standard Time:

Geographical and Scientific Basis:

- **Indian Standard Time** is based on India's **Standard Meridian at 82°30' E longitude**, which passes through **Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Odisha and Andhra Pradesh**.

- IST is **5 hours and 30 minutes ahead of Coordinated Universal Time**, commonly represented as **UTC+5:30**.
- India follows a **single national time zone**, unlike some geographically large countries that operate multiple standard time zones.

National Time Authority:

- The **Council of Scientific and Industrial Research–National Physical Laboratory** is responsible for the realisation, maintenance and dissemination of India's national time standard.
- The national time scale is maintained using highly precise **Cesium atomic clocks and Hydrogen masers**, with traceability to the international time standard maintained through the **International Bureau of Weights and Measures**.
- The national time scale maintained by the laboratory is traceable to coordinated universal time at the level of **a few nanoseconds**, demonstrating the high precision required for modern technological applications.

One Nation, One Time Initiative:

Objectives:

- The **One Nation, One Time** initiative seeks to create a unified and highly accurate national timing ecosystem based on Indian institutions and indigenous technological capabilities.
- It aims to reduce excessive dependence on foreign timing sources and strengthen India's **technological sovereignty and critical-infrastructure resilience**.
- Accurate national timing is particularly important for systems in which even extremely small timing differences can affect **synchronisation, sequencing, authentication and operational safety**.

White Rabbit Technology:

- India has developed a **White Rabbit Technology-based Indian Standard Time Dissemination Demonstration Network** for secure and highly precise dissemination of national time.
- The demonstration network was commissioned at the **Regional Reference Standards Laboratory, Bengaluru**, in July 2026.
- The network was developed jointly by the **Department of Consumer Affairs, CSIR–National Physical Laboratory and Indian Space Research Organisation**.
- White Rabbit is a precision time-synchronisation technology based on **Precision Time Protocol**, capable of achieving extremely high synchronisation accuracy over networks.
- The technology can support time-sensitive institutions and infrastructure requiring highly precise and traceable timing.

Role of NavIC and Indigenous Timing Infrastructure:

Strategic Indigenisation:

- The new framework provides for the use of **NavIC** and other approved Indian timing sources for reliable and secure dissemination of national time.
- **NavIC**, developed by the **Indian Space Research Organisation**, can provide an indigenous satellite-navigation and timing capability.
- Greater reliance on Indian timing infrastructure can reduce vulnerabilities associated with excessive dependence on foreign satellite-navigation systems.
- Indigenous timing capability is therefore relevant not only to **scientific precision** but also to **national security, critical infrastructure and strategic autonomy**.

Applications Across Critical Sectors:

Financial and Digital Systems:

- Standardised time can improve the accuracy of **banking transactions, digital payments, electronic records and transaction reconciliation**.
- Precise time-stamping can assist in establishing the chronological sequence of digital events and detecting inconsistencies or anomalous transactions.

Transport and Emergency Services:

- Accurate and synchronised time can improve coordination across **railways, airports, emergency-response systems and other transport networks**.
- Precise timing is particularly important for automated signalling, network coordination and safety-critical operations.

Telecommunications and Power Infrastructure:

- Modern **telecommunication networks, computer networks and smart power grids** require highly accurate synchronisation for coordinated operation.
- National timing infrastructure can strengthen the reliability and resilience of such systems.

Legal and Administrative Systems:

- Uniform time-stamping can improve the consistency of **government records, legal documents, administrative logs and official filings**.
- A common authoritative time reference can reduce ambiguity where the exact timing of an event has legal or administrative significance.

Strategic Significance for India:

Technological Sovereignty:

- A domestically controlled timing ecosystem strengthens India's **strategic autonomy** in an infrastructure layer that supports financial, communication, energy and defence-related systems.
- Dependence on external timing sources can create potential vulnerabilities during geopolitical tensions, technological disruptions or system failures.

Critical Infrastructure Security:

- Synchronised national time can strengthen the resilience of **critical information infrastructure** by providing a trusted and traceable reference.
- It can also support secure operation of increasingly interconnected digital systems.

Digital Economy:

- India's rapidly expanding **digital public infrastructure** requires reliable and scalable timing systems.
- Uniform timing can complement India's broader digitalisation efforts by improving the integrity and interoperability of networked systems.

Challenges and Way Forward:

Implementation Challenges:

- Successful implementation will require government agencies, private enterprises and institutions to upgrade **software, hardware, network clocks and time-synchronisation systems**.
- Legacy systems may require significant investment and technical modification to comply with the new national timing framework.
- Effective implementation will also require clear standards for **authorised timing sources, traceability, cybersecurity and system auditing**.

Way Forward:

- India should ensure seamless integration of **CSIR–NPL, ISRO, Legal Metrology laboratories and authorised timing networks**.
- The Government should develop robust cybersecurity safeguards because national timing infrastructure can become a critical target for malicious disruption.
- Wider adoption of **White Rabbit Technology and indigenous satellite-based timing** can strengthen precision and technological self-reliance.
- The transition should remain interoperable with international time standards while ensuring that India's national time scale remains **accurate, traceable and independently disseminated**.

Value Addition for UPSC:

Prelims Pointers:

- **Legal Metrology (Indian Standard Time) Rules, 2026:** Notified on **27 August 2026**.
- **Effective date:** 180 days after publication in the Official Gazette.
- **Legal basis:** Section 52 of the Legal Metrology Act, 2009.
- **National time authority:** CSIR–National Physical Laboratory.
- **IST:** UTC+5:30.
- **Standard Meridian:** 82°30' E.
- **Precision timing initiative:** White Rabbit Technology.
- **Indigenous satellite-navigation system:** NavIC.
- **Broader initiative:** One Nation, One Time.

Potential UPSC Mains Question: “The Legal Metrology (Indian Standard Time) Rules, 2026 represent more than a standardisation of clocks. Examine their significance for India’s digital economy, critical infrastructure and technological sovereignty.”

QUESTIONS

1. Regarding the evolution of India's international investment treaty framework, consider the following statements:

Statement 1: India's 2015 Model Bilateral Investment Treaty (BIT) excluded unrestricted Most Favoured Nation (MFN) provisions and broadened conditions for accessing Investor-State Dispute Settlement (ISDS).

Statement 2: The 2015 Model BIT aimed to safeguard sovereign policy space and curb expansive interpretations by international arbitral tribunals following adverse treaty claims.

Which one of the following is correct in respect of the above statements?

- (A) Both Statement 1 and Statement 2 are correct and Statement 2 is the correct explanation for Statement 1
- (B) Both Statement 1 and Statement 2 are correct but Statement 2 is NOT the correct explanation for Statement 1
- (C) Statement 1 is correct but Statement 2 is incorrect
- (D) Statement 1 is incorrect but Statement 2 is correct

2. With reference to solar phenomena and space weather dynamics, consider the following statements:

(1) Solar flares are sudden, intense eruptions of electromagnetic radiation resulting from the reconfiguration of solar magnetic fields.

(2) Every solar flare event is accompanied by a Coronal Mass Ejection (CME) directed toward the Earth.

(3) Coronal Mass Ejections involve the large-scale expulsion of plasma and magnetic fields from the Sun into interplanetary space.

(4) Near-Ultraviolet (NUV) radiation from solar eruptive events penetrates Earth's atmosphere completely, allowing ground-based optical telescopes to monitor pre-flare signatures.

Which of the statements given above are correct?

- (A) 2 and 4 only
- (B) 1, 2 and 3 only
- (C) 1 and 3 only
- (D) 1, 3 and 4 only

3. With reference to the geographical, geopolitical, and economic profile of Central Asia and India's bilateral relations with Uzbekistan, consider the following statements:

(1) Uzbekistan is one of only two doubly landlocked countries in the world, surrounding itself entirely with other landlocked nations.

(2) The Aral Sea basin, situated between Uzbekistan and Kazakhstan, suffered catastrophic shrinking primarily due to natural climatic cycles in the 20th century.

(3) The Fayaz Tepa and Kara Tepa archaeological sites in Uzbekistan reflect the historic spread of Mahayana Buddhism along Silk Road trade corridors.

(4) India and Uzbekistan share a direct overland land border through the Wakhan Corridor in northern Afghanistan.

Which of the statements given above are correct?

- (A) 1, 2 and 3 only
- (B) 2 and 4 only
- (C) 1, 3 and 4 only
- (D) 1 and 3 only

4. Consider the following provisions, doctrines, and mechanisms commonly found in international investment and trade law agreements:

- (1) Investor-State Dispute Settlement (ISDS)
- (2) Most-Favoured-Nation (MFN) Clause
- (3) Exhaustion of Local Remedies (ELR)
- (4) Fair and Equitable Treatment (FET)
- (5) Protection against Indirect Expropriation

How many of the above provisions or mechanisms are typically incorporated into international Bilateral Investment Treaties (BITs) to govern foreign investor protection and host-State obligations?

- (A) Only two
- (B) Only three
- (C) Only four
- (D) All five

5. Consider the following two statements regarding national timing ecosystems:

Statement 1: The Legal Metrology (Indian Standard Time) Rules, 2026 mandate Indian Standard Time (IST) as the sole legal and official time scale across civil, commercial, and administrative domains in India.

Statement 2: All sovereign nations are required under International Telecommunication Union (ITU) statutes to operate at least two distinct time zones if their longitudinal span exceeds 20 degrees.

Which one of the following is correct in respect of the above statements?

- (A) Both Statement 1 and Statement 2 are correct and Statement 2 is the correct explanation for Statement 1
- (B) Both Statement 1 and Statement 2 are correct but Statement 2 is NOT the correct explanation for Statement 1
- (C) Statement 1 is correct but Statement 2 is incorrect
- (D) Both Statement 1 and Statement 2 are incorrect

ANSWER KEY

1 – Answer (A), 2 – Answer (C), 3 – Answer (D), 4 – Answer (D), 5 – Answer (C)



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