
Prelims Exam Topics

SPOON-TAILED DUSKHAWKER

Context

Researchers have recorded the first **verifiable photographic evidence** of the rare **Spoon-tailed Duskhawker** in **Namdapha National Park and Tiger Reserve, Arunachal Pradesh**.

About Spoon-tailed Duskhawker

- **Classification:** A large predatory dragonfly belonging to the **Aeshnidae** family under the insect order **Odonata**.
- **Distribution:** Originally described from the **Philippines** and found in parts of **Southeast Asia**.
- **Habitat:** Prefers **dense evergreen and semi-evergreen forests**, especially humid, shaded areas near streams, temporary pools and wetlands.
- **Activity:** **Crepuscular**, meaning it is most active during **dawn and dusk**.

LAKE ONTARIO

Context

Lake Ontario is in focus after the United States directed federal agencies to refer to it as “**Lake America**”, amid tensions between the US and Canada.

About Lake Ontario

- **Nature:** The **smallest by surface area** and the **easternmost** of the five **Great Lakes of North America**.
- **Location:** Lies along the **international boundary between the United States and Canada**.
- **Lake Type:** A **glacial lake** formed by Pleistocene continental glaciation.
- **Inflow:** The **Niagara River** is the principal inflow, connecting Lake Ontario with **Lake Erie**.
- **Other Tributaries:** Include the **Genesee, Oswego, Black and Trent** rivers.
- **Outflow:** Drains through the **St. Lawrence River** towards the **Atlantic Ocean**.

ORIENTAL DARTER

Context

Oriental Darters are being affected by **garbage dumping in lakes of Bengaluru**.

About Oriental Darter

- **Nature:** A **tropical water bird** with a long, slender neck and sharp, pointed bill.
- **Distribution:** Found across **tropical South Asia and Southeast Asia**.
- **Habitat:** Mainly inhabits **freshwater lakes, wetlands and streams**.
- **Diet:** Described as an **omnivorous** species.
- **Other Names:** Also called the **Snakebird** or **Indian Darter**.
- **IUCN Red List:** **Near Threatened**.

DUNG BEETLES

Context

A recent study found that **dung beetles may prefer dog dung over cow dung**, but their offspring can have **lower survival rates** in dog dung.

About Dung Beetles

- **Classification:** Dung beetles belong to the **Scarabaeidae family** of the order **Coleoptera**.
- **Distribution:** Found on **all continents except Antarctica**, in habitats ranging from **deserts to forests**.
- **Diet:** Feed mainly on the **faeces of mammals**, which also provide food for their developing young.
- **Body Features:** Have a **hard exoskeleton and strong legs** adapted for digging, handling and rolling dung.
- **Ecosystem Services:** Dung beetles contribute to **nutrient cycling, soil aeration, seed dispersal and suppression of parasites and flies**. Some species also use **celestial cues**, including the Milky Way, for navigation.

LARAK ISLAND

Context

Larak Island, near the **Strait of Hormuz**, is in focus amid heightened military tensions involving **Iran** and the **United States**.

About Larak Island

- **Location:** A small **Iranian island in the Strait of Hormuz**, south of **Hormuz Island**.
- **Proximity:** Located about **45 km southeast of Bandar Abbas** and around **18 km southeast of Qeshm Island**.
- **Strategic Importance:** Its location near the **Strait of Hormuz**, a major global maritime chokepoint, gives it significant strategic value.

HANGING GLACIERS

Context

A recent **Nature** study identified **219 hanging glaciers in the Alaknanda basin of the Garhwal Himalayas**, highlighting their growing hazard under a warming climate.

About Hanging Glaciers

- **Nature:** Ice masses perched on **steep mountain slopes** that can detach and generate large avalanches.
- **Formation:** They develop when a major **valley glacier retreats and thins**, leaving tributary glaciers high above the reduced main-glacier surface.
- **Hanging Valley:** When the main glacier disappears completely, the elevated tributary valleys left behind are known as **hanging valleys**.

Why Are They a Risk?

- **Glacier Break-Off:** Unstable hanging ice can suddenly detach, producing **large ice and debris avalanches**.
- **Cascading Hazards:** Such break-offs can trigger **Glacial Lake Outburst Floods (GLOFs)** and other downstream hazards.
- **Climate Sensitivity:** High-altitude glaciers respond strongly to **warming and climate variability**.
- **Himalayan Vulnerability:** Warming in the Himalayas has contributed to **accelerated glacier retreat**, increasing instability in some glacier systems.

MAGNETARS

Context

A magnetar called **1E 1547.0–5408** has provided strong evidence that an extremely powerful magnetic field can alter how **light travels through empty space**.

About Magnetars

- **Nature:** Magnetars are **neutron stars** with extraordinarily strong magnetic fields.
- **Formation:** Form when massive stars undergo **core collapse during a supernova explosion**.
- **High-Energy Emission:** Their intense electromagnetic radiation is mainly powered by the **decay of their magnetic fields**.
- **Slow Rotation:** Magnetars generally rotate relatively slowly compared with many other neutron stars but undergo rapid **spin-down**.
- **Bursts & Outbursts:** They can produce sudden, intense **X-ray and gamma-ray bursts**, ranging from short flares to prolonged outbursts.

MALARIA

Context

India recorded an **around 80% decline in malaria cases and deaths between 2015 and 2025**, while the number of **high-burden districts fell from 155 to 33**, according to the Union Health Ministry.

About Malaria

- **Nature:** A **life-threatening febrile disease** caused by *Plasmodium* parasites.
- **Transmission:** Mainly spread through the bite of an infected **female Anopheles mosquito**.
- **Other Transmission:** Though **not directly contagious**, it can spread through **infected blood and contaminated needles**.

SOLAR FLARES

Context

A study using **Aditya-L1 observations** has identified small, short-lived brightenings that appear **hours before major solar flares**, offering clues for improved flare forecasting.

About Solar Flares

- **Nature:** Solar flares are sudden, intense releases of **magnetic energy** in the Sun's atmosphere.
- **Origin:** They occur mainly in **active regions** where strong and complex magnetic fields develop.
- **Emission:** Flares release intense **X-rays and ultraviolet radiation** and can disturb space weather.

Effects of Solar Flares on Earth

- **Communication Disruption:** Strong solar radiation can **disturb radio signals and satellite communications**.
- **Astronaut Risk:** Increased radiation can pose **health risks to astronauts** in space.
- **Geomagnetic Storms:** Solar activity can trigger **geomagnetic storms**, affecting satellite operations and power grids.
- **Auroras:** Geomagnetic disturbances can produce **auroras at unusually low latitudes**, including both Northern and Southern Lights.



Mains Exam Topics

INDIA-UZBEKISTAN RELATIONS

Context

India and Uzbekistan elevated their **Strategic Partnership to a Comprehensive Strategic Partnership (CSP)** during Prime Minister Narendra Modi's State Visit to Uzbekistan.

Why is Uzbekistan strategically important for India's engagement with Central Asia?

- **Central Asian Strategic Hub:** Uzbekistan's location at the centre of Central Asia gives India a partner through which it can pursue wider regional economic, political and security interests.
 - **E.g.,** Uzbekistan shares borders with **all four other Central Asian republics and Afghanistan**, making engagement with Tashkent valuable for India's broader Central Asia strategy rather than merely for bilateral relations.
- **Eurasian Connectivity Node:** Uzbekistan can become an important destination and logistics node for India's alternative routes into Central Asia, helping mitigate India's lack of direct overland access.
 - **E.g.,** India's development of **Chabahar Port and the International North-South Transport Corridor (INSTC)** creates alternative access towards Central Asia, with Uzbekistan providing an important downstream market and regional connectivity partner.
- **Regional Market Platform:** Uzbekistan's central location and economic weight make it a potential base from which Indian firms can serve the wider Central Asian market.
 - **E.g.,** Indian investment in **pharmaceuticals, engineering, healthcare and advanced manufacturing** can establish production and distribution networks in Uzbekistan with access to neighbouring Central Asian markets.
- **Critical Mineral Security:** Uzbekistan can help India diversify access to strategic minerals required for clean technologies, electronics and advanced manufacturing.
 - **E.g.,** The 2026 Joint Statement provides for cooperation in **geology, mining, mineral processing, value-added production and recycling**, while encouraging Indian participation in the development of prospective Uzbek mineral deposits.
- **Nuclear Fuel Diversification:** Uranium cooperation can improve the resilience of India's nuclear fuel supply chain by widening its supplier base.

- **E.g.,** During the 2026 visit, both sides welcomed progress towards a **long-term arrangement for uranium supplies from Uzbekistan** and reaffirmed cooperation in peaceful uses of nuclear energy.
- **Central Asian Security Convergence:** Uzbekistan's proximity to Afghanistan and shared concerns over terrorism, extremism and narcotics create scope for sustained security cooperation.
 - **E.g.,** India and Uzbekistan continue cooperation through the **Joint Working Group on Counter-Terrorism, Joint Working Group on Military Cooperation and Exercise Dustlik**, whose seventh edition was held in Namangan in April 2026.
- **Diplomatic Convergence:** Political alignment with Uzbekistan strengthens India's wider influence in Central Asia and multilateral forums.

Why has India–Uzbekistan economic potential remained under-realised?

- **Multi-country Transit Costs:** India–Uzbekistan trade remains costly because Indian goods travel through multiple transit jurisdictions and depend on multimodal routes.
 - **E.g.,** Access through **Iran, the Caspian region and onward Central Asian networks** requires coordination across multiple borders and transport modes, increasing transit time, handling costs and supply-chain uncertainty.
- **Fragmented Multimodal Connectivity:** The existence of individual transport links has not yet translated into a seamless India–Central Asia logistics chain.
 - **E.g.,** Greater economic integration requires coordinated rail, road, port, customs and logistics systems linking **Chabahar and INSTC routes with onward Central Asian networks**, rather than isolated infrastructure projects.
- **Narrow Trade Basket:** Bilateral trade remains relatively small and insufficiently diversified, limiting the number of sectors that can generate sustained two-way commerce.
 - **E.g.,** Although bilateral trade has now **crossed \$1 billion**, the gap with the **\$5 billion target for 2030** indicates the need to bring substantially more products, firms and sectors into bilateral commerce.
- **Financial Connectivity Gaps:** Limited banking and settlement links can raise transaction costs for businesses and constrain smaller firms from participating in bilateral trade.
- **Implementation Deficit:** Political agreements generate limited economic outcomes when projects face weak monitoring, regulatory delays or inadequate business participation.

- **E.g.,** The 2026 CSP established a **Foreign Ministers-led mechanism** and raised the Inter-Governmental Commission to the **ministerial level** to provide greater momentum and oversight to bilateral commitments.

Way Forward

- **Build an Integrated Eurasian Connectivity Chain:** Reduce the logistics penalty created by distance, landlockedness and fragmented transit arrangements.
- **Reduce the Market-Access Penalty:** Make regulatory harmonisation as important as tariff reduction in expanding bilateral commerce.
 - **E.g.,** Take **time-bound steps on the India–Uzbekistan PTA**, while pursuing mutual recognition of standards, digital customs and simplified trade procedures.
- **Diversify the Trade Basket:** Build the \$5 billion trade target around sectors with greater scope for sustained two-way commerce.
 - **E.g.,** Prioritise **pharmaceuticals, engineering goods, automobiles, agriculture, digital services, healthcare and advanced manufacturing** through sector-specific export and investment strategies.
- **Build Joint Value Chains:** Shift from finished-product trade towards local manufacturing, technology transfer and regional production networks.
 - **E.g.,** Expand Indian participation in the **Tashkent Pharma Park** and develop joint ventures in pharmaceuticals, engineering and advanced manufacturing that can serve Uzbekistan and neighbouring Central Asian markets.
- **Secure Strategic Supply Chains:** Convert critical-mineral and uranium cooperation into long-term industrial partnerships.
- **Deepen Digital and Financial Integration:** Lower transaction costs and make bilateral commerce easier for firms, tourists, students and smaller businesses.
 - **E.g.,** Build on **UPI–UZQR interoperability** while expanding banking connectivity, digital trade platforms and cross-border payment mechanisms.
- **Strengthen Business-to-Business Linkages:** Ensure that bilateral economic integration is driven by private investment alongside government agreements.
- **Institutionalise Implementation:** Make the CSP an execution framework with measurable outcomes rather than simply an upgraded diplomatic designation.

- **E.g.,** Use the **Foreign Ministers-led mechanism and ministerial-level Inter-Governmental Commission** to monitor trade, investment, connectivity, mineral and defence initiatives through periodic targets and reviews.
- **Leverage Civilisational Linkages:** Complement strategic and economic cooperation with cultural and educational partnerships that deepen societal familiarity.
 - **E.g.,** Conserve the ancient Buddhist sites of **Fayaz Tepa and Kara Tepa in Termez**, while implementing the wider 2026–30 cultural and educational cooperation agenda.

