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QUARTERLY

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SECTION 1

Climate, Weather & Monsoon

01 Super El Niño and India's Monsoon

Super El Niño impact: Will India see a weak monsoon? [Down To Earth](#)

PRELIMS POINTERS

- **El Niño:** A periodic warming of the **central and eastern equatorial Pacific**. The **easterly trade winds weaken**, warm surface water moves east, and the upwelling of cold, nutrient-rich water off South America is reduced. A **Super El Niño** is an exceptionally strong event of this kind.
- **Impact on India:** It alters the **Walker circulation** and is generally linked to a **weaker southwest monsoon**, although the **Indian Ocean Dipole (IOD)** can offset or amplify the effect.

Feature	Normal Pacific	El Niño
Trade winds	Stronger, east to west	Weaken
Warm water	Western Pacific	Moves eastward
Eastern Pacific SST	Relatively cool	Warmer
Upwelling near Peru	Strong	Weak
Thermocline	Deeper in west, shallower in east	Flattens
Atmospheric pressure	Higher east, lower west	Difference weakens

MAINS POINTERS

Impacts

- 1 **Weaker monsoon:** Lower southwest monsoon rainfall and higher drought risk.
- 2 **Agriculture:** Lower yields, especially of rice and other rain-fed crops.
- 3 **Heatwaves:** Greater chance of extreme temperatures and heat stress.
- 4 **Water scarcity:** Lower reservoir storage and groundwater recharge.
- 5 **Food inflation:** Lower output pushes up food prices.
- 6 **Marine ecosystems:** Weaker upwelling off Peru reduces fish stocks.
- 7 **Global temperatures:** Adds to a rise in global average temperature.

02 Centre Issues Heatwave Advisory

Ministry of Labour & Employment issues nationwide heatwave advisory to protect workers and labourers [PIB](#)

PRELIMS POINTERS

- **In the news:** The **Ministry of Labour & Employment** issued a nationwide advisory to protect workers and labourers from heat stress.
- **Threshold:** IMD generally considers **40°C or more in the plains** and **30°C or more in hilly areas**, together with departure-from-normal criteria.
- **Criteria:** A departure of **4.5-6.4°C** above normal is a heatwave, and **6.5°C or more** a severe heatwave. An actual maximum of **45°C or more** also qualifies as a heatwave, and **47°C or more** as severe.

- **Coastal areas:** A heatwave may be declared at **37°C or more** with a departure above 4.5°C.
- **Warm night:** A minimum temperature **4.5-6.4°C above normal**; more than 6.4°C is a severe warm night.
- **Colour alerts:** **Green, Yellow, Orange and Red**, indicating rising risk and the need for preparedness.

MAINS POINTERS

Impacts of heatwaves

- 1 **Human health:** Heat exhaustion, heatstroke, dehydration and higher mortality.
- 2 **Agriculture:** Lower yields, livestock stress and higher irrigation demand.
- 3 **Water scarcity:** Faster evaporation and depletion of surface and groundwater.
- 4 **Power demand:** Higher electricity use for cooling and power shortages.
- 5 **Labour productivity:** Less outdoor work capacity and more occupational heat stress.
- 6 **Ecosystems:** Forest fires, biodiversity loss and habitat degradation.
- 7 **Economic losses:** Damage to infrastructure, disrupted livelihoods and higher healthcare costs.

03 Nautapa

Nautapa returns: India braces for "nine burning days" amid Super El Niño heat [The Economic Times](#)

PRELIMS POINTERS

- **Nautapa** is a traditional name for a **nine-day spell of intense summer heat** that begins when the **Sun enters Rohini nakshatra**, around **25 May**.
- It is especially discussed in **North and Central India**, where it coincides with the peak of pre-monsoon heat.

04 Heat Dome and Omega Block

Extreme heatwave in Europe: Seven dead in France, temperature shatters record in UK [The Indian Express](#) · [The Indian Express](#)

PRELIMS POINTERS

Heat dome

- A **persistent high-pressure system traps hot air near the surface**, keeping temperatures unusually high for days or weeks. Sinking air **warms by compression** and suppresses clouds and rain, creating a self-reinforcing spell of heat.
- **Impacts:** Prolonged heatwaves, drought, wildfires, water stress and higher electricity demand, made worse in cities by the **urban heat island** effect.

Omega block

- A blocking pattern in which a **high-pressure system sits between two low-pressure systems**, so the jet stream takes the shape of the Greek letter **Ω**. It stalls the normal west-to-east movement of weather systems.
- **Heatwave link:** The central high brings **subsidence, clear skies and continuous solar heating**, while warm-air advection from lower latitudes can intensify the heat.
- **2026 example:** An omega block over **Western Europe in June 2026** pushed temperatures above **40°C in parts of France**.

05 Wet-Bulb Temperature

What is wet-bulb temperature, and why is it being discussed during heatwaves? [The Indian Express](#)

PRELIMS POINTERS

- **Meaning:** The lowest temperature to which air can be cooled by **evaporation of water into it**. It combines **air temperature and humidity**, making it a key indicator of heat stress.
- **Why it matters:** In humid air, sweat evaporates poorly, so the body cannot cool itself; even moderate air temperatures can then be dangerous.
- **Wet-Bulb Globe Temperature (WBGT):** A related index that also includes **wind and radiant heat**; widely used for occupational heat exposure.
- **Human limit:** A wet-bulb temperature of about **35°C** is often cited as the theoretical upper limit of survivability, but harmful heat stress occurs **well below 35°C**, depending on exposure, health and activity.

06 Dust Storm

Churu dust storm: the Aravallis protect the Gangetic plains, but the shield is weakening [The Indian Express](#)

PRELIMS POINTERS

- **Meaning:** Strong winds lift loose, dry soil and dust and carry it through the atmosphere; common in **arid and semi-arid** regions.
- **Conditions:** Dry, loose soil, strong surface winds and sparse vegetation; often triggered by thunderstorms, pressure gradients or cold fronts.
- **India:** Most common in the **pre-monsoon season (April-June)** over **Rajasthan, Punjab, Haryana, Uttar Pradesh** and parts of Madhya Pradesh, where they are locally called **Andhi**. (The **Nor'westers** or **Kalbaisakhi** are a separate pre-monsoon storm of eastern India.)
- **Aravalli shield:** The Aravallis act as a barrier against dust moving from the Thar towards the Gangetic plains; mining and degradation have opened **gaps** that weaken this shield.

MAINS POINTERS

Impacts of dust storms

- **Health:** Respiratory disease, allergies, eye irritation and cardiovascular stress.
- **Visibility:** Disruption of road, rail and air transport.
- **Agriculture and soil:** Crop damage, reduced photosynthesis and loss of fertile topsoil, accelerating **desertification**.
- **Infrastructure and economy:** Damage to machinery, solar panels and buildings, with wider economic losses.
- **Ecosystems:** Habitat degradation and altered nutrient cycles on land and at sea.

07 Glacial Lake Outburst Floods (GLOFs)

Kashmir's melting glaciers are feeding lakes that villagers know well, but have not been warned about [Down To Earth](#)

PRELIMS POINTERS

- **GLOF:** A sudden release of water from a **glacial lake**, causing a destructive flood downstream. Such lakes form from **glacial retreat** and meltwater held behind natural dams.

- **Triggers:** Ice or rock avalanches, landslides, earthquakes, intense rainfall, rapid melting, or failure of the **moraine or ice dam**.
- **Moraine-dammed lakes:** Many hazardous lakes are held back by **loose moraine deposits**, far weaker than engineered dams, so failure can release huge volumes quickly.

MAINS POINTERS

Causes

- 1 **Glacial retreat:** Warming speeds up melting and the growth of glacial lakes.
- 2 **Weak moraine dams** can collapse suddenly.
- 3 **Avalanches and landslides** falling into a lake displace water.
- 4 **Earthquakes** destabilise dams and slopes.
- 5 **Rapid lake expansion** raises pressure until the dam is overtopped or breached.

Impacts

- 1 **Loss of life** in downstream settlements.
- 2 **Infrastructure damage:** Roads, bridges, hydropower projects and communications.
- 3 **Agricultural losses** from erosion of fertile land.
- 4 **Sedimentation** clogs and shifts river channels.
- 5 **Cascading hazards:** Landslides, debris flows and secondary floods.
- 6 **Economic disruption** to tourism, hydropower and livelihoods; Himalayan GLOFs can also cross international borders.

Mitigation

- 1 **Early-warning systems:** Real-time sensors, sirens and automated alerts.
- 2 **Lake-level reduction** through controlled channels or siphoning.
- 3 **Hazard mapping** of risky lakes and exposed settlements using remote sensing and GIS.
- 4 **Moraine stabilisation** where feasible.
- 5 **Continuous monitoring** with satellites, drones and ground instruments.
- 6 **Preparedness:** Evacuation routes, mock drills and community response.

08 2026 Pacific Super Typhoons: Sinlaku and Bavi

Super Typhoon Sinlaku strikes the Northern Mariana Islands; Bavi becomes 2026's third Category-5 storm [The Times of India](#) · [Mint](#)

PRELIMS POINTERS

Super Typhoon Sinlaku

- Formed over the **Northwestern Pacific** near Micronesia and **rapidly intensified** to Category-5-equivalent strength (per the **Joint Typhoon Warning Center**), striking **Saipan and Tinian** in the Northern Mariana Islands.
- Notable for its strength **very early in the typhoon season**; NASA described it as only the **second Category 5 cyclone of 2026** at the time.

Super Typhoon Bavi

- Became the **third Category-5 cyclone of 2026** in early July, with peak winds of about **250 km/h (155 mph)**.

- Hit **Guam and the Northern Mariana Islands** (Rota, Saipan, Tinian), then moved west-northwest across the **Philippine Sea** towards East Asia, later affecting China.
- Its rapid intensification was fed by **high sea-surface temperatures, high Tropical Cyclone Heat Potential, weak wind shear and good upper-level outflow**.

MAINS POINTERS

Conditions for cyclone formation

- 1 **Warm ocean water:** Sea-surface temperatures above about **26.5°C**; the Bay of Bengal is highly favourable.
- 2 **High moisture** in the lower and middle troposphere drives deep convection and latent-heat release.
- 3 **Low vertical wind shear** keeps the storm's structure intact.
- 4 **Coriolis force** supplies the spin, so cyclones rarely form **very close to the Equator**.
- 5 A **pre-existing disturbance** or low-pressure area provides the initial circulation.
- 6 **Upper-level outflow** removes air aloft and supports intensification.

Impacts of cyclones

- **Loss of life** from wind, storm surge and floods.
- **Infrastructure damage** to houses, roads, power lines, ports and communications.
- **Agriculture:** Crop and livestock losses and **salinisation** of farmland.
- **Flooding and storm surge** inundate coasts.
- **Economy:** Disruption to industry, trade, fisheries and tourism.
- **Ecosystems:** Damage to mangroves and coral reefs, although mangroves also buffer cyclones.
- **Public health:** Water-borne disease and shortages of essential supplies.

09 Rip Currents

ISRO and Andhra University to study rip currents along Visakhapatnam beach [The Hindu](#)

PRELIMS POINTERS

- **Meaning:** Powerful, **narrow currents flowing away from the shore** through the surf zone, formed when water piled up by waves returns to sea through a concentrated path.
- **Formation:** Often found at **gaps between sandbars**, breaks in reefs, or near piers; strength varies with **tides, wave direction and beach shape**.
- **Characteristics:** Flow perpendicular or at an angle away from the coast, and are **narrow and localised**, not broad longshore currents.
- **Hazard:** A leading cause of **beach drownings**; they carry swimmers offshore but **do not pull them underwater**.

10 Doppler Weather Radar

India expands Doppler Weather Radar network by over 250% since 2014 [News On AIR](#)

PRELIMS POINTERS

- **Doppler Weather Radar (DWR)** monitors **precipitation, thunderstorms, cyclones and severe weather** using the **Doppler effect**.

- **Working:** Emitted waves bounce off raindrops and hail; the **frequency shift** gives their **radial velocity**, and the signal strength shows rainfall intensity.
- **Outputs:** Rainfall intensity, wind velocity, direction of movement and storm structure, which make it valuable for **nowcasting** and early warning.
- **Types:** **S-band** radars have longer range, while **X-band** radars give higher resolution over shorter distances; **C-band** lies in between.
- **India:** The **IMD** uses DWRs to track cyclones, thunderstorms, heavy rain and hailstorms, improving short-range forecasts and disaster preparedness.

11 SkyCast System

India's first SkyCast system inaugurated at IGI Airport, New Delhi, for fog-free, weather-smart aviation [PIB](#)

PRELIMS POINTERS

- **What it is:** An integrated aviation weather system giving real-time data on **fog, turbulence, wind, moisture, aerosols and visibility**; developed under **Mission Mausam**.
- **Instruments:** **Radar Wind Profiler, SODAR, Microwave Radiometer, Ground-based Fog Aerosol Spectrometer (GFAS)** and a **Lidar-based Ceilometer**.
- **Radar Wind Profiler:** Measures wind speed and direction, turbulence, vertical velocity and boundary-layer dynamics, which are critical during take-off and landing.
- **Fog monitoring:** GFAS tracks fog droplets and aerosol-fog interactions; the Ceilometer tracks the vertical structure of fog and visibility.
- **Coverage:** Monitors the atmosphere up to about **3 km**, targeting **low-level aviation hazards**.

12 Ancient Indian Rainfall Measurement

What a raingauge tells us about Indian science history [The Indian Express](#)

PRELIMS POINTERS

- **Arthashastra:** Kautilya's text, traditionally dated to the Mauryan period, refers to **systematic rainfall measurement**.
- **Rain gauge:** It describes a **wide-mouthed vessel** placed in front of the state granary to measure rainfall, associated with the term **Varshamana**.
- **Unit:** Rainfall was measured in **Drona**, showing standardised measurement in ancient administration.
- **Purpose:** Rainfall data informed **agriculture, taxation, irrigation and state administration**.

SECTION 2

Physical Geography & Geomorphology

01 Dukono Volcano

Dukono volcano erupts in Indonesia, sends ash 5,000 m into sky [News On AIR](#)

PRELIMS POINTERS

- **Location:** An active volcano on **Halmahera Island, North Maluku, Indonesia**.
- **Tectonic setting:** Part of the **Pacific Ring of Fire**, in a **subduction-zone** setting.
- **Type:** A **complex volcano** with multiple summit peaks and overlapping craters; rocks include andesite, basaltic andesite and basalt.
- **Recent activity:** Activity intensified from **30 March 2026**, with **199 explosive events** in the initial phase and ash plumes up to 5,000 m.

MAINS POINTERS

Positive impacts of volcanic eruptions

- 1 **Fertile soils** enriched with minerals from ash.
- 2 **Geothermal energy** potential.
- 3 **Mineral deposits** such as sulphur, copper and gold.
- 4 **New land** and islands formed by lava.
- 5 **Geotourism** around volcanoes and hot springs.

Negative impacts

- 1 **Loss of life** from lava, pyroclastic flows and lahars.
- 2 **Air pollution:** Ash and gases such as SO₂ harm health.
- 3 **Agricultural losses** from ash, lava and toxic gases.
- 4 **Infrastructure damage** to roads, buildings and power lines.
- 5 **Aviation disruption:** Ash clouds damage aircraft engines.
- 6 **Climate effects:** Large eruptions inject SO₂ into the stratosphere, forming aerosols that temporarily cool the climate.
- 7 **Secondary hazards:** Lahars, landslides, tsunamis and earthquakes.

02 Volcán de Fuego

Tourists scramble to safety as Guatemala's Volcán de Fuego erupts [The Indian Express](#)

PRELIMS POINTERS

- An active volcano in **Guatemala, Central America**; the name means "**Volcano of Fire**", and it is one of the country's most active volcanoes.
- Its volcanism results from the **subduction of the Cocos Plate beneath the Caribbean Plate** along the Middle America Trench.

03 Seismic Doublet Strikes Venezuela

Tens of thousands feared dead in Venezuela: why doublet earthquakes were so destructive [The Indian Express](#)

PRELIMS POINTERS

- **The event:** Two powerful earthquakes of about **Mw 7.2** and **Mw 7.5** struck northern Venezuela roughly **39 seconds** apart.
- **Seismic doublet:** Two earthquakes of similar magnitude, very close in space and time, whose ruptures are distinct but causally related. Unlike a mainshock followed by smaller aftershocks, a doublet delivers two comparable shocks, greatly raising the hazard.
- **Tectonic setting:** The boundary between the **Caribbean and South American Plates**, where the Caribbean Plate moves east at about **2 cm/year**.
- **Mechanism:** **Shallow strike-slip faulting** along the **San Sebastián fault system** on Venezuela's northern coast.

MAINS POINTERS

Causes of earthquakes

- 1 **Tectonic movement** along faults is the primary cause.
- 2 **Plate convergence and subduction** build intense stress.
- 3 **Fault rupture** suddenly releases accumulated strain.
- 4 **Volcanic activity** from moving magma.
- 5 **Human activities:** Reservoir-induced seismicity, mining, drilling and fluid injection.

Impacts

- 1 **Loss of life** from shaking and building collapse.
- 2 **Infrastructure damage** to roads, bridges, dams and networks.
- 3 **Secondary hazards:** Tsunamis, landslides, liquefaction and fires.
- 4 **Economic losses** and disrupted livelihoods.
- 5 **Psychological trauma** and prolonged displacement.
- 6 **Cascading disasters** from damaged dams, pipelines and industrial sites.

Mitigation

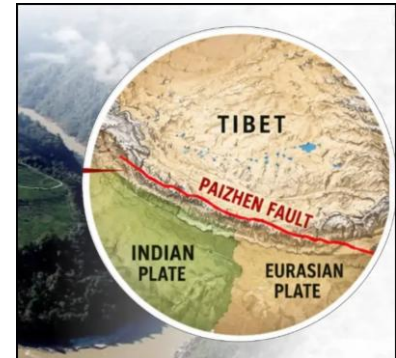
- 1 **Earthquake-resistant construction:** Enforce seismic codes and retrofit weak buildings.
- 2 **Hazard mapping** and zoning of high-risk areas.
- 3 **Early-warning systems** that give seconds of warning.
- 4 **Preparedness:** Drills, evacuation plans and awareness.
- 5 **Protect critical infrastructure** such as hospitals, dams and power networks.
- 6 **Land-use planning:** Restrict building on fault zones, unstable slopes and liquefaction-prone ground.

04 Paizhen Fault

Chinese dam near India border a ticking geological bomb, finds Beijing-backed study [India Today](#)

PRELIMS POINTERS

- The **Paizhen Fault** is an **active tectonic fault in southeastern Tibet**, in the **eastern Himalayan** tectonic region.
- It drew attention in 2026 for its proximity to the reservoir zone of China's **Medog (Yarlung Tsangpo) hydropower project**, upstream of the Brahmaputra.
- Its activity is driven by the ongoing collision of the **Indian and Eurasian Plates**.



05 Seafloor Spreading

Scientists witness first-ever seafloor-spreading event as 160 million cubic metres of lava create new ocean floor [The Times of India](#)

PRELIMS POINTERS

- **Meaning:** New oceanic crust forms at **mid-oceanic ridges** as magma rises, cools and solidifies, pushing older crust away. The idea was proposed by **Harry Hess** in the early 1960s.
- **Where:** At **divergent plate boundaries**, for example the **Mid-Atlantic Ridge**; decompression melting produces **basaltic magma**.
- **Age pattern:** Rocks are **youngest at the ridge** and progressively older away from it.
- **Magnetic stripes:** Cooling basalt records the magnetic field; **geomagnetic reversals** leave symmetrical stripes on both sides of the ridge, strong evidence for spreading.
- **Recycling:** Old crust returns to the mantle at **subduction zones**.
- **Significance:** Strong evidence for **Wegener's continental drift** and the theory of plate tectonics.

MAINS POINTERS

Significance of seafloor spreading

- 1 **Supports plate tectonics** by showing that lithospheric plates move.
- 2 **Creates new oceanic crust** at ridges.
- 3 **Mantle-ocean exchange** of heat and materials.
- 4 **Mineral resources:** Hydrothermal vents form deposits rich in copper and zinc.
- 5 **Unique ecosystems** at vents based on **chemosynthesis**.
- 6 **Ocean chemistry:** Hydrothermal circulation shapes biogeochemical cycles.
- 7 **Explains seafloor features** such as ridges and magnetic striping.

06 Blue Micromoon

Blue Micromoon: what it is and why it occurs [The Indian Express](#)

PRELIMS POINTERS

- A **Blue Micromoon** occurs when a **Blue Moon** coincides with a **Micromoon**.

- **Blue Moon:** Popularly, the **second Full Moon in a calendar month**; the Moon does **not** actually look blue.
- **Micromoon:** A Full Moon near **apogee**, the farthest point of the Moon's elliptical orbit, so it looks slightly smaller and dimmer.
- **Supermoon vs Micromoon:** A **Supermoon** is a Full Moon near **perigee** (closest approach); a Micromoon is near **apogee**.

07 Bolide

What is a bolide? Meteor triggers explosion-like boom over Boston and Rhode Island [Hindustan Times](#)

PRELIMS POINTERS

- **Bolide:** An exceptionally **bright meteor**, often visible over a wide area and sometimes brighter than Venus.
- **Formation:** A **meteoroid** enters the atmosphere at high speed, heats up and produces a luminous trail; many **fragment explosively** under intense pressure and heat, sometimes with an audible boom.
- **Key terms:** **Meteoroid** is the object in space; **meteor** is the streak of light during entry; **meteorite** is a fragment that **survives and reaches the ground**.

SECTION 3

Energy & Resources Geography

01 Coal Gasification in India

Historic first: coal mine development agreements with Underground Coal Gasification provisions signed [PIB](#)

PRELIMS POINTERS

- **In the news:** India signed its **first coal mine development agreements with Underground Coal Gasification (UCG) provisions**.
- **Coal gasification** converts coal into **synthesis gas (syngas)** by reacting it with **oxygen, air and/or steam** at high temperature with limited oxygen.
- **Syngas** is mainly **carbon monoxide and hydrogen**, with some CO₂ and methane. Unlike **combustion**, which burns coal fully for heat, gasification turns it into fuels and chemical feedstock.
- **Products:** **Methanol, ammonia, hydrogen, synthetic natural gas** and, through further processing, **liquid fuels (coal-to-liquid)**.
- **Underground Coal Gasification** gasifies coal **in situ** within the seam, without conventional mining.
- **Target:** The **National Coal Gasification Mission** aims to gasify **100 million tonnes of coal by 2030**.

MAINS POINTERS

Benefits

- 1 **Energy security:** Turns abundant coal into value-added fuels and cuts oil and gas imports.
- 2 **Import substitution** in methanol, ammonia, fertilisers and chemicals.
- 3 **Hydrogen** production from syngas.
- 4 **Value addition** and diversification of the coal economy.
- 5 **Industrial growth** in chemicals, fertilisers, steel and synthetic fuels.
- 6 **Use of high-ash Indian coal** that is hard to use directly.
- 7 **Jobs** in coal-producing regions.

Challenges

- 1 **High carbon emissions** that can undercut decarbonisation.
- 2 **High capital cost** and complex technology.
- 3 **Water-intensive** processing.
- 4 **Ash management** with high-ash coal.
- 5 **Technology dependence** in gasification, carbon capture and hydrogen.
- 6 **Costly CCUS** needing infrastructure and storage sites.
- 7 **Local environmental risks** from mining, water use and pollutants.

Government measures

- 1 **National Coal Gasification Mission** to promote conversion of coal into syngas, methanol and chemicals.
- 2 **Financial incentive scheme** approved by the Union Government for coal and lignite gasification projects.
- 3 **PSU projects:** Coal India, GAIL and others are pursuing coal-to-chemicals and coal-to-methanol plants.
- 4 **Linkage with the National Green Hydrogen Mission** for cleaner hydrogen.

Way forward

- 1 **Clean gasification** integrated with **CCUS**.
- 2 **Blend with green hydrogen** to cut the carbon footprint.
- 3 **Water efficiency** through zero-liquid discharge, recycling and dry cooling.
- 4 **Indigenous R&D** suited to high-ash coal.
- 5 **Circular economy**: Use gasification ash in cement and construction.
- 6 **Economic viability** through targeted incentives.
- 7 **Just transition** for coal-dependent regions alongside renewables.

SECTION 4

Passes, Islands, Ports & Infrastructure

01 Lipulekh Pass

Nepal objects to Mansarovar Yatra via Lipulekh; India says unjustified [The Indian Express](#)

PRELIMS POINTERS

- **Location:** In **Uttarakhand's Kumaon Himalayas** at about **5,300 m**, linking India with the Tibetan plateau.
- **Tri-junction:** Close to the **India-Nepal-China** frontier, which makes it strategically and diplomatically sensitive. Nepal's 2020 map claimed Lipulekh, Kalapani and Limpiyadhura; India rejects the claim as unjustified.
- **Kailash Mansarovar Yatra:** One of India's traditional routes: **Dharchula, Gunji, Kalapani, Navidhang, Lipulekh, Taklakot** (Tibet).
- **Strategic value:** Border connectivity, surveillance and defence logistics in the high Himalaya.
- **River link:** The route follows the **Kali (Kali Ganga)** river system, via Kalapani and Gunji.

02 Majuli Island

4,000 years of climate history from the world's largest inhabited river island offer adaptation insights [PIB](#)

PRELIMS POINTERS

- **Majuli** is a river island in the **Brahmaputra, Assam**, widely described as the **world's largest inhabited river island**; it became **India's first island district** in 2016.
- **In the news:** A study of **4,000 years of climate history** from Majuli offers insights for climate adaptation.
- **Landscape:** Shaped by **river deposition, channel migration, floods and erosion**. The Brahmaputra lies to its south, and the **Subansiri** and the **Kherkutia Xuti** channel to its north.
- **Culture:** A major centre of **Assamese Neo-Vaishnavism**, famous for its **Satras** linked to **Srimanta Sankardeva and Madhavdeva**.
- **Communities:** **Mising, Deori and Sonowal Kachari**.



03 Salaya Port

Iran war and the monsoon: why Salaya port is critical to Gujarat's dhow trade [The Indian Express](#)

PRELIMS POINTERS

- **Location:** **Devbhumi Dwarka district, Gujarat**, on the **Gulf of Kutch** along the Saurashtra coast of the Arabian Sea.
- **Dhow trade:** A traditional hub of Gujarat's **dhow** (wooden sailing vessel) trade with the **Gulf, Iran, Yemen and East Africa**. Sailing pauses in the **monsoon**, and the West Asia conflict has disrupted the trade.
- **Energy link:** The area handles **petroleum and energy cargo**, supporting Gujarat's refining and petrochemical cluster.

- **Port network:** Part of Gujarat's maritime system, which includes the major **Deendayal Port (Kandla)** and many non-major and private ports, close to routes to the **Middle East**.

04 Zojila Tunnel

Strategic, all-weather Zojila Tunnel between Kashmir and Kargil sees final breakthrough [The Hindu](#)

PRELIMS POINTERS

- **Breakthrough:** On **9 June 2026**, the tunnel achieved its final breakthrough near the east portal at **Minamarg (Drass, Ladakh)**; it is expected to open around **February 2028**.
- **Route:** Links **Baltal (Ganderbal, J&K)** with **Minamarg** under the **Zojila Pass**, on the Srinagar-Kargil-Leh highway (NH-1).
- **Size:** A **13.153 km**, two-lane, **single-tube, bi-directional** tunnel, described as the world's longest of its kind, with about **18 km** of approach roads.
- **Altitude:** About **11,578 ft (3,528 m)**.
- **Significance:** Zojila Pass closes for months in winter due to snow and avalanches; the tunnel will give **year-round movement** of civilians, goods and security forces between Kashmir and Ladakh, cutting crossing time to about 15 minutes.
- **Engineering:** Built through fragile Himalayan geology using the **New Austrian Tunnelling Method**, with ventilation, fire detection and CCTV systems.

SECTION 5

Tribes & Indigenous Communities

01 Lodha Tribe

Odisha official lands in trouble for allegedly referring to members of a PVTG as criminals [The Hindu](#)

PRELIMS POINTERS

- **Lodhas** (called **Kheria** in some areas) are a **Particularly Vulnerable Tribal Group (PVTG)**, found mainly in **West Bengal** (Jhargram and Paschim Medinipur) and in **Odisha**.
- **Stigma:** They were notified as a "criminal tribe" under the colonial **Criminal Tribes Act, 1871**, and later denotified; the label still causes discrimination, which is why the official's remark drew action.
- **Livelihood:** Traditionally dependent on **forests, hunting, gathering and minor forest produce**; agriculture and wage labour are now important.
- **Language:** **Bengali and Odia** are widely used alongside their traditional speech.

02 Tana Bhagats

Who are the Tana Bhagats of Jharkhand and why are they opposing a highway project? [The Indian Express](#)

PRELIMS POINTERS

- A socio-religious reform movement among the **Oraon (Kurukh)** tribe of Chotanagpur, begun by **Jatra Bhagat in 1914**.
- **Beliefs:** Purity, abstinence from alcohol and meat, vegetarianism and simple living.
- **Freedom struggle:** Many joined **Gandhi and the Congress** during the **Non-Cooperation Movement**, adopting **khadi and the tricolour**, and opposed British rule, taxes and exploitation by landlords and moneylenders.
- **In the news:** Tana Bhagat communities in **Jharkhand** are opposing a **highway project** on their land.

03 Rung Community

The Himalayas as a battleground of belief [The Hindu](#)

PRELIMS POINTERS

- A **Scheduled Tribe** of **Uttarakhand**, mainly in the high border valleys of **Pithoragarh district**, Kumaon.
- **Groups:** Linked to the **Byans, Chaudans and Darma** valleys (Byansis, Chaudansis and Darmis).
- **Livelihood:** Historically engaged in **trans-Himalayan trade with Tibet**, pastoralism and agriculture.
- **Language and culture:** Speak **Rung (Rang) Tibeto-Burman** languages and follow a distinctive Himalayan tradition.

SECTION 6

Water Resources, Rivers & Oceanography

01 India's Water Crisis: A Governance Challenge

How India is governing its water resources [The Hindu](#)

MAINS POINTERS

India's water crisis is not just physical scarcity but also **uneven distribution, over-extraction, pollution and weak governance**. The CGWB estimates groundwater extraction at **245.64 BCM in 2024**, with **agriculture accounting for 87%**.

Causes

- 1 **Groundwater over-extraction** through borewells for irrigation and drinking water, faster than natural recharge.
- 2 **Water-intensive cropping**: Paddy and sugarcane in water-stressed regions, encouraged by MSP, procurement and subsidised power.
- 3 **Monsoon dependence**: About **80% of rainfall** falls in a few months and varies widely across regions.
- 4 **Climate change**: Erratic monsoons, dry spells and intense rain events affect recharge and storage.
- 5 **Urbanisation** raises demand while concrete reduces infiltration.
- 6 **Pollution** from sewage, effluents and farm runoff shrinks usable water.
- 7 **Loss of traditional systems** such as ponds, tanks and wetlands.

Challenges arising

- 1 **Food security**: Irrigation uncertainty and crop failure, especially for **rainfed farmers**.
- 2 **Drinking-water insecurity** and tanker dependence, hitting poorer households hardest.
- 3 **Urban water stress** from demand-supply gaps and poor wastewater treatment.
- 4 **Inter-state disputes**, e.g. **Cauvery, Krishna and Ravi-Beas**.
- 5 **Industry and energy** compete with farms and homes (the **water-energy-growth nexus**).
- 6 **Ecological damage** to wetlands, aquatic life and environmental flows.
- 7 **Inequality and health**: More time and money spent on water, and more water-borne disease.

Why it is a governance challenge

- 1 **Fragmented institutions**: Centre, States, local bodies and many departments with overlapping roles.
- 2 **Water is mainly a State subject**, so basin-level management needs Centre-State and inter-State cooperation.
- 3 **Weak groundwater regulation**: Groundwater is tied to land ownership rather than treated as a **common-pool resource**.
- 4 **Poor data** on aquifers, extraction, flows and quality.
- 5 **Supply bias**: Focus on dams and canals over pricing, metering, reuse and efficiency.
- 6 **Weak urban local bodies**: Scarcity alongside sewage and flooding.
- 7 **Implementation gap** in last-mile delivery, participation and maintenance.

Way forward

- **River-basin approach:** Integrated River Basin Management (IRBM).
- **Aquifer-based, participatory groundwater management.**
- **Crop-water alignment:** "Right crop in the right region", micro-irrigation and diversification.
- **Water accounting:** Meter and publish extraction and use data.
- **Circular water economy:** Treat and reuse urban wastewater.
- **Stronger ULBs** with finances, capacity and accountability.

02 Kallakkadal

INCOIS expands coastal flood monitoring to tackle Kallakkadal surges [The Hindu](#)

PRELIMS POINTERS

- **Meaning:** Sudden **coastal flooding caused by long-period swells** from distant storms, particularly in the **Southern Ocean**, with no major local weather. Kerala fishermen use the term, meaning the sea arrives "like a thief".
- **Origin and path:** Swells from intense Southern Ocean storms travel thousands of kilometres north to the **south-west coast of India**, especially **Kerala**, and also South Tamil Nadu and Lakshadweep.
- **No local storm needed:** Unlike a **storm surge**, it occurs **without a cyclone or strong local winds**, so it is hard to anticipate.
- **Mechanism:** In shallow water, **wave setup and infragravity waves** raise coastal water levels and flood low-lying areas.
- **Forecasting:** INCOIS issues warnings through its **Swell Surge Forecast System**.

03 Gepang Gath Glacial Lake

How big a threat is the expanding Ghepan Lake above Sissu village in Himachal Pradesh? [Down To Earth](#)

PRELIMS POINTERS

- **Location:** Lahaul-Spiti, Himachal Pradesh, in the upper **Chandra sub-basin** of the Indus basin, at about 4,068 m.
- **Type:** A **moraine-dammed proglacial lake** at the snout of the Gepang Gath glacier.
- **Drainage:** Flows via **Sissu Nala** into the **Chandra**, which meets the Bhaga at **Tandi** to form the **Chenab**.
- **Rapid growth:** ISRO data show it expanded from **36.49 ha (1989) to 101.30 ha (2022)**, about **178%**, due to glacier retreat.
- **GLOF risk:** NRSC has carried out risk assessment and downstream hazard modelling for the lake.

04 Manasbal Lake

J&K's Manasbal Lake starts hosting migratory birds again [The Hindu](#)

PRELIMS POINTERS

- A freshwater lake in **Ganderbal district, J&K**, about **30 km north of Srinagar**.
- Known as the **deepest natural lake in Kashmir** (about 13 m); it drains into the **Jhelum**.

- Famous for **lotus** blooms in July-August and as an important **bird habitat**, now hosting migratory birds again.

05 Antarctica's Blood Falls

The 100-year glacier mystery: scientists crack the secret behind Antarctica's Blood Falls [The Indian Express](#)

PRELIMS POINTERS

- **Blood Falls** lies at the terminus of **Taylor Glacier** in the **McMurdo Dry Valleys**, **East Antarctica**, near **Lake Bonney**.
- Its red colour comes from **iron-rich brine** that oxidises on contact with air.



GALLANT IAS ACADEMY

TRIVANDRUM

