Today's Prelims Topics

Van (Sanrakshan Evam Samvardhan) Amendment Rules, 2025

Context

The Union Ministry of Environment, Forest and Climate Change has issued the **Van (Sanrakshan Evam Samvardhan) Amendment Rules, 2025**, also referred to as the **Forest Conservation Amendment Rules (FCA), 2025**.

Key Provision of the 2025 Rules

- **Working Permission for Linear Projects:** "Working permission" can now be granted **after Stage-I (in-principle) approval**.
  - It allows mobilization of resources and commencement of **preliminary works** (survey, site preparation, etc.) but excludes black-topping, road concretisation, laying of railway tracks, charging of transmission lines, etc., unless specified by the Centre.
  - The power to decide the scope of such works rests with the **Central Government**.
- **Clear Definitions of Approvals: Stage-I (In-Principle Approval):** Preliminary approval to use forest land, subject to specific conditions.
  - **Stage-II (Final Approval):** Granted after the **State Government submits a satisfactory compliance report** on Stage-I conditions, following which the Central Government gives final clearance.
- **Offline Applications in Special Cases:** Certain projects can submit applications **offline** rather than through the online PARIVESH portal.
  - This applies to projects related to defence, strategic & national importance, exceptional cases of public interest or emergency.
- **Special Provisions for Critical Minerals:** Mining of **Critical and Strategic Minerals** (as per MMDR Act, 1957) will get special relaxation.
  - Such projects can raise **compensatory afforestation over degraded forest land**, at least **double the diverted land area**.
- **Compensatory Afforestation (CA) Rules Changed:**
  - Earlier: CA land had to be notified as **Protected Forest** under Section 29 of the Indian Forest Act, 1927.
  - Now: This requirement is **optional**. Land can either be:
    - **Transferred and mutated as forest land in favour of the Forest Department**, or
    - **Notified as protected forest** under the Indian Forest Act, 1927 (or any other law).

Evolution of the Forest (Conservation) Act

- **Pre-1980**: Forests were under the **State List**, leading to widespread diversion of land for agriculture, mining, and industry.
- **42nd Constitutional Amendment (1976)**: Shifted forests to the **Concurrent List**, giving the Centre a larger role in conservation.
- **Forest (Conservation) Act, 1980**: Centralised approvals for diversion of forest land to **check deforestation**.
- **1988 Amendment**: Brought stricter rules, including **regulation on leasing forest land to private entities**.
- **Forest (Conservation) Amendment Act, 2023**: Focused on **balancing development with ecological protection**, aligned with **India's climate commitments**.

Source: New Indian Express

Regulatory Assets
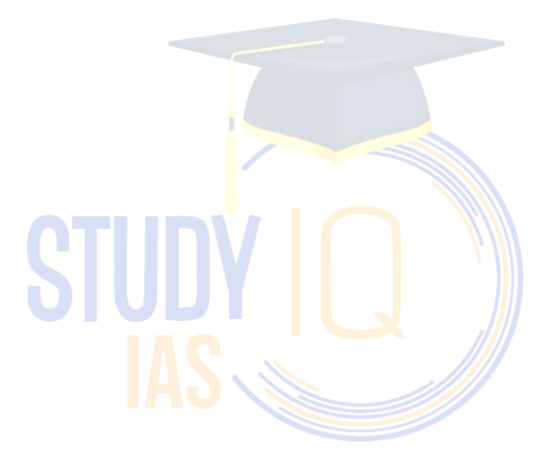
Context
The **Supreme Court of India (2025)** has directed **State Electricity Regulatory Commissions (SERCs)** and **DISCOMs** to clear all existing **regulatory assets** within **four years**, and any new ones within **three years**.

What are Regulatory Assets?
● Regulatory assets are **unrecovered revenue gaps** recorded by a **DISCOM** (Distribution Company).
● They arise when the **Average Cost of Supply (ACS)** (cost to deliver one unit of power) is **higher than the Annual Revenue Requirement (ARR)** (revenue collected via consumer tariffs + government subsidies).
● Instead of an immediate tariff hike, State Electricity Regulatory Commissions (SERCs) allow DISCOMs to defer the shortfall as a **regulatory asset**, recoverable in the future (with interest).
Source: The Hindu

WHO Data On Mental Health Conditions

Context

The **World Health Organization (WHO)** released two major reports – **World Mental Health Today** and the **Mental Health Atlas 2024**.

Key Highlights of the Report

- **Growing Prevalence:** In **2021**, **14% of the global population** was estimated to be living with a **mental disorder**.
- **Most Common Disorders: Anxiety and depressive disorders** account for **more than two-thirds** of all mental health cases.
- **Gender Disparities: Females disproportionately affected** by anxiety, depression, and eating disorders.
- **Youth Vulnerability:** Nearly **50% of mental disorders begin before age 18**, highlighting risks for children and adolescents.
- **Systemic Gaps:**
  - **Low investment:** Median government spending on mental health = **2% of total health budget**.
  - **Workforce shortage:** Severe lack of trained psychiatrists, psychologists, and community mental health workers.
  - **Treatment gap:** Poor service coverage and access in most countries, especially low- and middle-income regions.

India's Initiatives on Mental Health

- **Tele-MANAS:** Nationwide tele-counselling service to expand access to mental health support across states.
- **Manodarpan:** Initiative launched during COVID-19 to provide **psychosocial support to students**, continuing beyond the pandemic.
- **National Mental Health Programme (NMHP):** Aims to make **basic mental healthcare accessible and available to all**, especially in underserved areas.

Additionally,

- **SDG 3 (Good Health and Well-being)**, particularly **Target 3.4** is related to mental health and well-being.

Source: Indian Express

Immigration and Foreigners (Exemption) Order, 2025

Context
Immigration and Foreigners (Exemption) Order, 2025 recently notified by the Union Ministry of Home Affairs (MHA).

Key Highlights of the Order
Exemption from Passport/Visa Requirements
- **Indian Armed Forces personnel** → when on duty.
- **Citizens of India, Nepal, and Bhutan** → at specified border check-posts.
- **Tibetan nationals** → with valid registration certificates and special permits.
- **Religious minorities** (Hindus, Sikhs, Buddhists, Jains, Parsis, Christians) from **Afghanistan, Bangladesh, and Pakistan** → if they entered India **on or before December 31, 2024**, even if with **invalid/expired documents**.
- **Sri Lankan Tamil refugees** → who registered and took shelter in India **on or before January 9, 2015**.

Visa Exemptions
- **Foreigners with diplomatic/official passports** → if covered under bilateral agreements.
- **Foreigners eligible for visa-on-arrival** → as per existing provisions.
- **Foreign military personnel** → when visiting on **naval warships**.
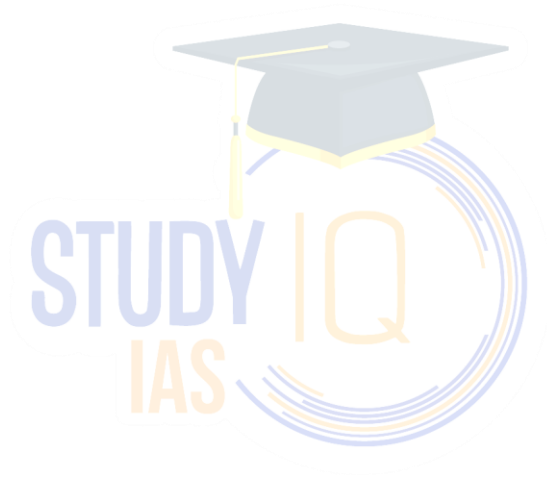
Source: Hindu Businessline

News In Short

PRATUSH (Probing ReionizATion of the Universe using Signal from Hydrogen)	**News?** PRATUSH is being developed by Raman Research Institute (RRI).
	What is it?
	● **Lunar-orbit radiometer.**
	● **Purpose:** To detect the faint **21-cm hydrogen signal** from the **Cosmic Dawn** (when the first stars formed).
	● To be placed on the **lunar far-side.**
	● **Technology:**
	  ○ Radiometer with **antenna + analog receiver + digital receiver + FPGA chip**.
	  ○ Uses a **single-board computer (SBC)** (e.g., Raspberry Pi) for control, calibration, and data processing.
	Related Information:
	→ **SARAS (Shaped Antenna measurement of the background RAdio Spectrum):** It is a **ground-based** radiometer experiment by Raman Research Institute to detect the faint **21-cm hydrogen signal from the early Universe's Cosmic Dawn and Epoch of Reionization.**
	Source: PIB

Niveshak Didi Initiative	**News?** The Investor Education and Protection Fund Authority (IEPFA) launched **Phase II of Niveshak Didi initiative**. **About the Initiative** ● It is a **financial literacy** initiative for training rural women as financial educators. ● Its first phase was launched in November 2022. ● **Launched by: Investor Education and Protection Fund Authority (IEPFA)**, in collaboration with **India Post Payments Bank (IPPB).** ● Under this initiative **Women postal workers** and **community leaders** are trained to become "*Niveshak Didis*", who act as **local financial educators**. **About IEPFA** ● It is a statutory body established under the **Union Ministry of Corporate Affairs,** as per the Companies Act 2013. ● It was established to **promote investor education** and **protect investors' interests**. **Source: PIB**

Senna Spectabilis	**News?** Kerala (Wayanad) conducted India's first science-based, community-driven **eradication program against *Senna spectabilis.***
	About it
	● **Type:** Invasive alien plant species.
	● **Native to:** Tropical regions of the Americas.
	● **Characteristics:**
	  ○ **Appearance:** Medium-sized tree (7–18 m tall) with a **dense spreading crown**; looks similar to **Cassia fistula** (Kerala's state flower, *Kanikkonna*).
	  ○ **Invasiveness:**
	    ■ Forms **dense, sterile thickets**.

	■ **Suppresses native vegetation** and alters soil chemistry. ■ **Reduces food availability** for herbivores. **What are Invasive Species?** They are **non-native (alien) plants** that, after being introduced to a new region (intentionally or accidentally), **spreads rapidly** and causes **ecological, economic, or social harm**. **Source: DTE**
MAITREE-XIV	**News?** MAITREE-XIV is being conducted in Umroi, Meghalaya. **About The Exercise** • **Type:** Bilateral **military exercise** between **India and Thailand**. • **Started:** First conducted in **2006** as part of the defence cooperation between the two nations. • **Nature:** Conducted annually & alternately in India and Thailand. • **Objective:** ○ Enhance **interoperability** and **mutual understanding**. ○ Conduct **joint training in counter-terrorism operations**, especially in **semi-urban and jungle terrain**. ○ Strengthen **military-to-military cooperation** under the broader India–Thailand defence partnership. **Source: The Hindu**
First made in India Semicon chip - VIKRAM 3201 	**News?** VIKRAM 3201 was unveiled at Semicon India 2025 and presented to Prime Minister Narendra Modi by Union IT Minister Ashwini Vaishnaw. **About it** • 1st **fully indigenous** 32-bit microprocessor ○ Advanced version of the earlier 16-bit VIKRAM1601 microprocessor. • **Designed by:** Vikram Sarabhai Space Centre (VSSC), ISRO • **Fabricated at:** ISRO's Semiconductor Laboratory (SCL), Chandigarh. • **Purpose:** To function under the harsh environmental conditions of launch vehicles. **Source: TOI**
Solar Energetic Electron (SEE)	**News?** The Solar Orbiter (SO) has recently traced the origin of Solar Energetic Electrons (SEE). **About SEE** • High-energy **electrons generated in the Sun** and ejected into space at **nearly the speed of light**. • **Two types:** ○ Linked to **solar flares** → explosions from smaller, intense patches of the Sun's surface. ○ Linked to **Coronal Mass Ejections (CMEs)** → massive eruptions of hot plasma from the solar atmosphere. **Related Fact** • THe Solar orbiter (SO) is a joint mission of **NASA** and the **European Space Agency (ESA).**

	Source: DTE

Places in News

Mauritania

News? A migrant boat sank off the coast of Mauritania caused the death of 49 persons.

About Mauritania
- **Location:** Northwest Africa.
- **Bordered by:** Atlantic Ocean (west), Western Sahara (northwest), Algeria (northeast), Mali (east and southeast), and Senegal (southwest).
- **Capital:** Nouakchott (also its largest city, located on the Atlantic coast).

India–Mauritania Relations
- Diplomatic relations established in the 1960s.
- Cooperation mainly through **Non-Aligned Movement, African Union partnerships, and ITEC (Indian Technical and Economic Cooperation) programmes**.
- India imports **iron ore and fisheries**; exports **pharmaceuticals, machinery, textiles**.

Source: TOI

Mains Topics

25th SCO Summit – Tianjin

Context

The recently concluded 25th SCO Summit in Tianjin adopted key reforms, condemned terrorism and expanded partnerships.

About Shanghai Cooperation Organisation (SCO)

- The **Shanghai Cooperation Organisation (SCO)** is a **regional intergovernmental organization** founded in **2001** in Shanghai (Successor to Shanghai Five group).
- **Founding Members:** Kazakhstan, China, Kyrgyzstan, Russia, Tajikistan, Uzbekistan
- **Current SCO Member Countries (10):** India, Iran, Kazakhstan, China, Kyrgyzstan, Pakistan, Russia, Tajikistan, Uzbekistan & Belarus.
  - India and Pakistan joined in 2017- Astana Summit, Iran (2023) & Belarus (2024).
  - **3 Observer states:** Afghanistan, Belarus, Mongolia.
  - **14 Dialogue Partners**: Azerbaijan, Armenia, Bahrain, Egypt, Cambodia, Qatar, Kuwait, Maldives, Myanmar, Nepal, United Arab Emirates, Saudi Arabia, Turkey, Sri Lanka.
- **Today, the SCO represents:** 40% of the world's population & Over 30% of global GDP.
- **Main objectives:**
  - Promoting regional security and stability.
  - Enhancing economic and cultural cooperation.
  - Coordinating positions on global and regional issues.
- **Permanent Bodies of the SCO:**
  - **SCO Secretariat (Beijing):** Coordinates activities, meetings, and communication among members.
  - **Regional Anti-Terrorist Structure (RATS) (Tashkent, Uzbekistan):** Dedicated to security and counter-terrorism cooperation.

SCO-RATS: Its Role and Functioning

- The **Regional Anti-Terrorist Structure (RATS)** is the **security pillar** of SCO.
- **Functions:**
  - Sharing **intelligence on terrorist networks, separatist groups, and extremists**.
  - Coordinating **joint counter-terror operations**.
  - Combating **drug trafficking, cybercrime, and transnational organized crime**.
- **Successes:** Creation of a **database of terror groups and individuals** & Conduct of joint military exercises like **"Peace Mission" drills**.
- **Limitations:** Members often disagree on defining terrorism (e.g., India views Pakistan-backed groups as terror outfits, while China shields Pakistan diplomatically).

Challenges in Functioning of SCO

- **Divergent Strategic Interests of Members:**
  - India-China border tensions (Doklam 2017, Galwan 2020) undermine trust.
  - India–Pakistan disputes often paralyze consensus on terrorism and connectivity.
  - Russia aims to retain primacy in Eurasia, while China pushes economic dominance via BRI.

- **Counter-Terrorism Contradictions:** The SCO-RATS is effective in intelligence sharing, but definitions differ. "Three Evils" of terrorism, separatism, and extremism are not uniformly interpreted.
  - **Eg:** India condemns Pakistan-backed terror outfits but China shields Pakistan diplomatically, blocking India's efforts at the UN (e.g., listing of Masood Azhar).
- **China's Economic Dominance:** Risk of SCO becoming a **China-centric platform**, eroding equality among members.
  - **Eg:** China's initiatives (BRI, SCO Bank proposal) overshadow smaller members.
- **Overexpansion and Dilution:** Consensus decision-making becomes harder with more diverse interests.
  - **Eg:** With Iran's entry and Turkey seeking membership, SCO risks becoming a **crowded, incoherent forum**.
- **Geopolitical Polarisation:** Perception of SCO as an **anti-Western bloc**, especially by U.S. and EU. India's balancing act between **QUAD/U.S. partnerships** and **SCO commitments** becomes tricky.
- **Institutional Weaknesses:** SCO lacks strong enforcement or binding mechanisms.
  - **Eg:** No permanent dispute resolution forum - limits effectiveness beyond declarations.

Way Forward
- **Strengthen RATS and Counter-Terrorism Consensus:** Develop **common definitions of terrorism** to avoid selective application.Expand RATS mandate to include cyber-terrorism, narco-terrorism, and radical financing.
- **Balance Economic and Security Agenda:** Avoid SCO being dominated by China's BRI vision. Encourage projects in digital economy, climate action, and health security for wider acceptance.
- **Institutional Reforms:** Move towards **binding resolutions** in areas like terrorism and connectivity. Strengthen Secretariat for better coordination.
- **Build Trust Through Dialogue:** Use SCO as a **confidence-building platform** between rivals (India-China, India-Pakistan). Encourage backchannel diplomacy on border and terrorism issues.
- **Controlled Expansion:** Ensure future enlargement (Turkey, Afghanistan, etc.) does not dilute SCO's focus. Adopt **criteria for membership** to keep cohesion.
- **Engage Beyond Anti-West Narrative:** SCO should avoid being seen purely as a counterweight to NATO or U.S. alliances. Promote **inclusive multilateralism** and collaboration with UN, WTO, WHO.

Significance of SCO for India
- **Counter-Terrorism Platform:** RATS database and intelligence sharing are crucial for tackling Pakistan-sponsored terror groups. Joint exercises enhance India's preparedness.
- **Access to Central Asia:** India's Connect Central Asia Policy finds a multilateral platform in SCO. Helps overcome geographical constraints (since India lacks direct land access, with Pakistan blocking routes).
- **Energy Security:** Central Asia (Kazakhstan, Turkmenistan, Uzbekistan) holds abundant oil, gas, and uranium. SCO gives India opportunities to pursue projects like **TAPI pipeline**.
- **Balancing China and Pakistan:** SCO provides India a forum to **directly raise concerns** with both countries.
- **Strategic Autonomy and Multipolarity:** India engages with Russia and China at SCO while also deepening ties with U.S., QUAD, and IPEF. It strengthens India's identity as a **balancer in global geopolitics**.
- **Voice of the Global South:** India uses SCO to highlight issues like climate change, digital inclusion, food security, and equitable globalisation. It enhances credibility among developing nations.

Key Takeaways from the Tianjin SCO Summit
Major Initiatives and Announcements
- **Strong Condemnation of Terrorism:** All 10 members unanimously condemned terrorism in all forms & called for ending cross-border movement of terrorists.
  - **Specific references**: Pahalgam attack & 2 other attacks in Pakistan.

Significance:
- First time the **Pahalgam attack** was explicitly mentioned in an SCO leaders' declaration, unlike in the **Defence Ministers' Qingdao meeting (June 2025)** where it was omitted.
- D**iplomatic gain for India,** though Pakistan was not directly named.

- **Global Governance Initiative (GGI)** - Proposed by Chinese President Xi Jinping, Vision for a **more just and equitable global order**, prioritising the **Global South**.
  - **Core pillars:**
    - **Sovereign Equality**: All countries, regardless of size or wealth, should have equal voice.
    - **Rule of Law**: Strict adherence to UN Charter; opposition to double standards.
    - **Multilateralism**: Strengthen UN's role, oppose unilateralism.
    - **Fairness & Justice**: Resist Cold War mentality, bullying, and promote multipolarity.
- **Artificial Intelligence Cooperation Roadmap:** Tianjin Declaration reaffirmed joint efforts in AI:
  - **Principles: Equal rights to develop and use AI**, minimize risks, enhance accountability.
  - **Initiatives:** Proposal for an **AI collaboration center** & Promotion of **open-source AI models**.
  - **Challenge:** Regulating **cross-border use of open-source AI**.
- **Proposal for an SCO Development Bank:**
  - **Aim:** Reduce reliance on U.S. dollar and create a financial alternative. Inspired by AIIB (2014).
  - **China pledged:**
    - 2 billion yuan ($280 million) in free aid for SCO members.
    - 10 billion yuan ($1.4 billion) in loans over the next three years.
- **Institutional Developments within SCO:**
  - Observer & Dialogue Partner status merged into a single category: Partner status.
  - Laos admitted as a new partner country, raising total to 27 states (10 members + 17 partners).
- **Unity and Solidarity:** President Xi called on members to "seek common ground while putting aside differences" and strengthen **SCO cohesiveness** amid global turbulence.

Key Engagements
- **India-China Engagement:** First Modi–Xi meeting on Chinese soil in 7 years. Both pledged to act as **"partners, not rivals."**
- **Xi-Putin-Modi Troika:**
  - **Symbolic gesture:** Three leaders holding hands, projecting unity of Asian powers.
  - **For Russia:** SCO provides a stage where Putin is not isolated despite Western sanctions.
  - **For India:** Opportunity to signal **strategic options** beyond the U.S.
- **India-Russia talks:** President Putin highlighted **trust and friendship with India**.

India's Strategic Messaging at Tianjin

● PM Narendra Modi presented India's vision for the region through **"S, C, O"** - symbolizing Security, Connectivity, and Opportunity.
   ○ **Security** → Terrorism, cybersecurity, border stability.
   ○ **Connectivity** → Central Asia links, digital economy, infrastructure.
   ○ **Opportunity** → Trade, investment, energy, technology.
● India's stand was **supportive but cautious**:
   ○ Backed AI cooperation and trade expansion.
   ○ Opposed any initiative undermining sovereignty (e.g., BRI projects - only SCO member to withhold support).
● India projected itself as a **responsible stakeholder** that upholds multilateralism while safeguarding national interests.
● India **joined** other SCO member states in condemning U.S. and Israeli strikes on Iran in the **Tianjin Declaration.**

The **Tianjin SCO Summit 2025** was less about immediate breakthroughs and more about **symbolism and long-term narratives**. China used it to push the **Global Governance Initiative**, Russia used it to showcase resilience against isolation, while India balanced carefully – highlighting terrorism, sovereignty, and ethical technology.
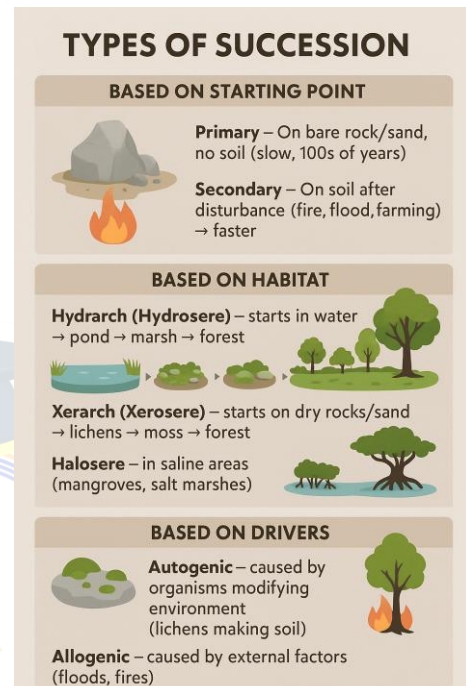
Ecological Succession in a Changing Climate

Context
Climate change is increasingly disrupting natural patterns of ecological succession in India's fragile ecosystems, demanding restoration strategies that build resilience against rising temperatures, altered rainfall, and invasive species.

What is Ecological Succession?
- Ecological succession is the **gradual and natural transformation of ecosystems** over time, through predictable changes in species composition and community structure.
- **Process:**
  ○ Begins with **pioneer species** (lichens, mosses) colonising barren areas.
  ○ Proceeds through **intermediate (seral) stages,** with increasing complexity.
  ○ Ends with a **climax community** — stable, self-sustaining ecosystems dominated by long-lived species.
- **Significance:** Provides resilience to ecosystems, enabling recovery after **natural disasters (floods, volcanic eruptions)** and **human disturbances (logging, deforestation).**
- **Stages of Succession:**
  ○ **Nudation** – Bare area formed (lava, flood, glacier).
  ○ **Pioneer Stage** – Hardy species (lichens, mosses, grasses) arrive first.
  ○ **Seral Stages** – Shrubs, small trees, larger trees gradually establish.
  ○ **Climax Community** – Stable, self-sustaining ecosystem (e.g., forest, mangrove).

TYPES OF SUCCESSION

BASED ON STARTING POINT
Primary – On bare rock/sand, no soil (slow, 100s of years)
Secondary – On soil after disturbance (fire, flood, farming) → faster

BASED ON HABITAT
Hydrarch (Hydrosere) – starts in water → pond → marsh → forest
Xerarch (Xerosere) – starts on dry rocks/sand → lichens → moss → forest
Halosere – in saline areas (mangroves, salt marshes)

BASED ON DRIVERS
Autogenic – caused by organisms modifying environment (lichens making soil)
Allogenic – caused by external factors (floods, fires)

How Climate Change is Disrupting Succession
- **Frequent Disturbances:** Repeated fires, floods, and storms "reset" succession, preventing ecosystems from reaching climax stages.
- **Phenological Shifts:** Flowering and pollination timings no longer align, weakening regeneration.
- **Soil and Water Stress:** Altered rainfall, salinity, and temperature hinder native species' survival.
- **Invasive Species:** Disturbed habitats are colonised by hardy invasives (*Lantana camara, Acacia spp., Pteridium aquilinum*), which block natural regeneration.
- **Impact:** Loss of biodiversity, carbon storage, and ecosystem resilience.

Impact on India's major Biogeographic Zones
Ecological Succession in the Himalayas
- **Treeline shifts:** Due to rising temperatures, the upper boundary where trees can grow (treeline) is moving higher up the mountains.
- **Decline of oaks:** Banj oak (*Quercus leucotrichophora*), a late-successional and stable forest species, is struggling to regenerate because of human pressures (grazing, logging) and frequent fires.
- **Pine expansion:** Instead of oaks, early-stage species like chir pine and grasses, which tolerate stress, are spreading.

- **Species migration:** High-altitude species like *Abies spectabilis* (East Himalayan fir), *Rhododendron campanulatum*, and *Betula utilis* (Himalayan birch) are shifting further upslope.
- **Impact:**
  - Hardwoods (oak, birch) that support rich biodiversity are declining.
  - Loss of habitat for many birds and mammals.
  - Changes in migration and feeding patterns of Himalayan fauna.

Ecological Succession in the Sundarbans
- **Salinity stress:** Sea-level rise and reduced rainfall are making soils more saline.
- **Normal succession:** Salt-tolerant pioneers (*Avicennia officinalis*) usually pave the way for less salt-tolerant climax mangroves like *Heritiera fomes* (sundari).
- **Disruption now:** High salinity favors pioneers, but sundari trees are declining.
- **Impact:**
  - Mangrove forests lose resilience against cyclones.
  - Biomass and carbon storage decrease.
  - Fish, prawns, and crabs that depend on diverse mangroves lose breeding grounds.

Ecological Succession in the Western Ghats
- **Fire frequency rising:** Fires used to maintain balance between grasslands and forests. But now, repeated fires prevent forests from maturing.
- **Blocked regeneration:** Seedlings of late-successional hardwood trees die in every fire, so climax forests cannot form.
- **Invasive takeover:** Disturbed landscapes are quickly colonised by invasive species like *Lantana camara*, *Acacia* (wattle), and *Pteridium aquilinum* (fern).
- **Impact:**
  - Native forests are replaced by invasive-dominated scrublands.
  - Less food for wild herbivores like elephants and gaur.
  - Soil fertility and water-holding capacity decline.
  - Long-term ecosystem degradation.

Way Forward: Tackling Climate-Driven Disruptions in Ecological Succession
- **Succession-Informed Restoration:** Restore ecosystems along natural successional pathways, not by planting fast-growing monocultures.
  - Use native, climate-tolerant species suited to local conditions and seral stages.
- **Promote Passive Recovery:** Allow ecosystems to regenerate naturally where possible. Use active restoration only in severely degraded or high-risk sites.
- **Manage Invasive Species and Disturbances:** Control invasives like *Lantana* and *Acacia* through fire and grazing management. Prevent repeated resets of ecosystems to early stages.
- **Climate-Resilient Planning:** Anticipate treeline shifts, salinity rise, and rainfall changes. Use assisted migration for vulnerable climax species (e.g., Himalayan oak, Sundarbans' sundari).
- **Phenology-Aligned Actions:** Time restoration with local flowering, pollination, and seed dispersal cycles to avoid mismatches.
- **Landscape and Watershed Approaches:** Restore forests, wetlands, rivers, and grasslands in an integrated way to maintain soil, water, and connectivity.
- **Monitoring and Early Warning:** Use satellites, drones, and AI to track succession stages, invasive spread, and treeline shifts for adaptive management.
- **Community-Based Conservation:** Empower local and tribal communities to manage fires, grazing, and invasives.
  - Link livelihoods with conservation (eco-tourism, mangrove fisheries, agroforestry).
- **Policy Reorientation:** Shift from carbon-focused afforestation to ecosystem-centric restoration. Integrate ecological succession into forest, coastal, and biodiversity policies.

Ecological succession is the **engine of ecosystem development and resilience**, yet climate change and human disturbances are **derailing natural pathways** in fragile regions. India's

conservation strategies must therefore **move beyond tree planting** to **ecologically informed restoration** that respects native species, natural stages of succession, and local contexts.

Source: Mongabay