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[Nirdesh] Current Affairs 23rd September 2025

1.Apple Production in India

Introduction

- Apples are a key temperate fruit crop in India, especially in the Himalayan region.
- Crucial for livelihoods & regional economy, particularly in Jammu & Kashmir (J&K), Himachal Pradesh, Uttarakhand.

Cropping Pattern for Apples in India

Argo-Climatic Conditions & Geography

- Temperature: Requires a summer temperature of around 21-24°C during active growth and significant winter chilling (1,000-1,500 hours at or below 7°C) for proper dormancy and fruit set.
- Altitude: Apple trees are best grown at altitudes between 1,500 and 2,700 meters above sea level.
- Sunshine: Abundant sunshine is crucial for good fruit color development.
- Rainfall: A well-distributed annual rainfall of 1,000-1,250 mm throughout the growing season is ideal for optimum growth and fruit production.
- Wind: Apple cultivation is not suitable in areas prone to high-velocity winds.
- Major apple belts: Kashmir Valley (J&K), Shimla, Kinnaur, Kullu, Mandi, Solan in Himachal Pradesh; parts of Uttarakhand.

Varieties & Planting Pattern

- Common varieties: *Red Delicious, Golden Delicious, Fuji, Gala*, etc.
- Orchards are perennial; once established, productive for many years (20-30+), subject to pruning, re-juvenation.

Crop Cycle / Harvest Season

- Blooming in spring; fruit growth through summer; harvesting season is broadly **September-November** in Kashmir & Himachal.
- Off-season gap exists after harvest until imports fill demand.

Land Use & Cropping Shifts

- Over time, states have shown **crop diversification**: shifting from cereals/food crops in hill zones to fruits (apples), vegetables to raise incomes.
- Infrastructure (cold storages, packing) and transport increasingly integral.

Production Status

Volume and Trends

- India's apple production in Marketing Year (MY) 2022/23: about **2.35 million metric tonnes**.

- Jammu & Kashmir contributes major share (variously reported ~70-80%) of India's apple output.
- Himachal Pradesh is the second largest state producer. Uttarakhand also contributes.

Productivity & Challenges

- Many orchards are old; declining productivity. Need for upgrading varieties & orchard management.
- Climatic risks: untimely rains, frost, hail, inconsistent rainfall in monsoon, erratic weather due to climate change.
- Infrastructure gaps: cold chain, transport to mandis, post-harvest losses.

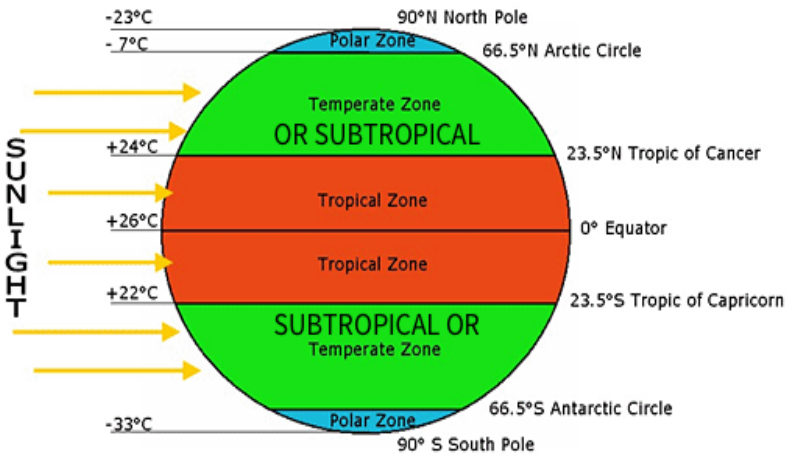
Import and Export Status

Imports

- India imports a significant quantity of fresh apples to meet domestic demand especially in off-season. In MY 2022/23, imports estimated around **430,000 MT**.
- Major supplying countries: Turkey, Iran, Italy, Chile among others
- Policies affecting imports: customs duties (basic customs duty ~50%), phytosanitary / non GM certification requirements.

Exports

- Indian apple exports are modest , were in the range **30,000-45,000 MT per year**
- Major destination countries: Nepal, Bangladesh, Bhutan.
- Quality, grading, storage, & competition with imports remain constraints.



Kashmir as Major Producer & Recent Disruptions:

Role of Kashmir

- The Kashmir Valley supplies about **75-80%** of India's apple output.
- Large number of households dependent on apple orchards; major source of employment & income in rural Kashmir.

Recent Crisis: Highway Closure & Floods

- In 2025 season, repeated highway closures—particularly the **Jammu-Srinagar National Highway (NH44)**—due to landslides/floods have stranded thousands of trucks loaded with apples.
- Losses estimated at **Rs 600-700 crore** (approx. US$ 68-80 million).
- Apples rotting on the road; price collapses. Per box price falling ~40% in some reports.

- The government has started a parcel train service from Budgam to Delhi to help move apples during the crisis. However, capacity is small relative to need.

Government Initiatives & Policy Measures

- **Apple Cluster Development**: e.g. in Shopian district, under govt-cluster development programme. Focus on pre-production, post-harvest, value addition & branding.
- Market intervention schemes and procurement by state agencies (e.g Himachal Pradesh). Universal packaging cartons to ensure better pricing.
- Cold chain improvements, better storage, better transport connectivity being emphasized.

Policy Challenges & Recommendations

1. **Infrastructure Resilience**: Strengthen all-weather road connectivity; early warning systems; design roads to withstand monsoon and landslides.
2. **Post-harvest Management**: Expand cold storage, packhouses, grading, packaging; reduce losses during transportation.

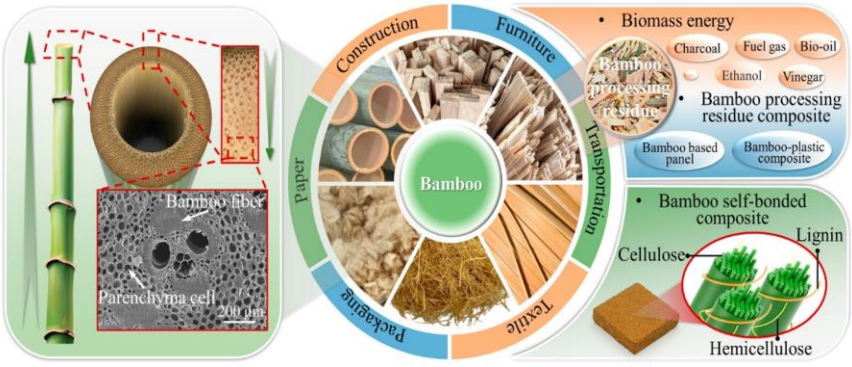
Quality & Varietal Upgradation: Promote high-yielding, disease-resistant varieties; rejuvenate old orchards; improve management practices

2.Bamboo in India: Production, Legal Status & Emerging Role in Energy

Introduction

Bamboo, often called the "green gold," is both an ecological resource and an economic commodity. Globally, **China is the largest producer**, while India, with over **136 species across 23 genera**, holds the **second position in diversity and growing stock**. Its uses span handicrafts, housing, paper, furniture, and, more recently, bio-energy.

Production and Distribution



- **Area**: ~13–15 million hectares under bamboo.
- **Annual production**: ~3–5 million tonnes.
- **Major states**: Assam, Arunachal Pradesh, Tripura, Mizoram, Madhya Pradesh, Maharashtra, West Bengal.
- **North-East India**: Accounts for nearly **two-thirds of bamboo growing stock** in the country.
- **Economic significance**: Source of livelihood for tribal and rural communities, particularly artisans and small enterprises.

Legal and Policy Status

1. Under Indian Forest Act (IFA), 1927

- Bamboo was historically treated as a **"tree"**, requiring permits for felling and transit, even if grown on private land.
- The **2017 amendment** reclassified bamboo grown on **non-forest land** as **not a tree**, thereby exempting it from felling and transit restrictions.
- On **forest land**, however, bamboo continues to be regulated as a tree species.

2. Under Forest Rights Act (FRA), 2006

- Bamboo is explicitly recognised as **Minor Forest Produce (MFP)**.
- FRA grants **ownership and usage rights to forest dwellers** for collection, transportation, and disposal of MFP, including bamboo.
- This has empowered tribal communities by legally securing their access.

3. Forest Conservation Act (FCA), 1980

- FCA primarily governs diversion of forest land.
- Thus, if bamboo is on forest land, diversion requires FCA clearance, but bamboo itself is not restricted on non-forest lands.

Bamboo and Bio-energy: Assam Ethanol Plant

- India's **first bamboo-based ethanol plant** was inaugurated in **Golaghat, Assam** (2025).
- Joint venture by **Numaligarh Refinery Ltd.** and international partners.
- **Capacity**: ~48,900 MT of 2G ethanol annually.
- **Feedstock**: ~5 lakh tonnes of green bamboo from Assam and NE states.
- **By-products**: acetic acid, furfural, food-grade CO_2.
- **Features**: Zero-waste, non-food biomass based (2G ethanol).
- **Significance**:
  - Aligns with India's **20% ethanol blending target**.
  - Provides stable market for bamboo growers, especially in NE India.
  - Generates rural employment and adds value to the resource.

Challenges

1. **Supply sustainability**: Over-harvesting and monoculture risks.
2. **Regulatory overlaps**: Different interpretations under IFA, FRA, FCA create confusion.
3. **Value chain gaps**: Lack of storage, processing units, and market linkages.
4. **Tribal rights**: Risk of displacement or exploitation if industrial demand sidelines forest dwellers.
5. **Awareness & skill gaps**: Artisans face limited training, poor access to finance and technology.

Conclusion

Bamboo exemplifies the convergence of **ecology, economy, and energy**. Policy changes removing bamboo from the "tree" definition under IFA, coupled with its recognition as **Minor Forest Produce under FRA**, have unlocked growth opportunities. The Assam bamboo ethanol plant represents a new era of **green industrialisation**. Going forward, balancing industrial utilisation with **community rights and ecological sustainability** will be key to positioning India as a global bamboo leader.

UPSC PYQ - 2019

1.Consider the following statements:

1. As per recent amendment to the Indian Forest Act, 1927, forest dwellers have the right to fell the bamboos grown on forest areas.
2. As per the Scheduled Tribes and Other Traditional Forest Dwellers Recognition of Forest Rights) Act, 2006, bamboo is a minor forest produce.
3. The Scheduled Tribes and Other Traditional Forest Dwellers Recognition of Forests Rights) Act, 2006 allows ownership of minor forest produce to forest dwellers.

Which of the statements given above is/ are correct?

(a) 1 and 2 only (b) 2 and 3 only (c) 3 only (d) 1, 2 and 3

Correct answer: 2 and 3

Explanation:

- FRA 2006 recognises both **habitation and use rights** of tribal and traditional forest dwellers.
- Bamboo is explicitly included as a **minor forest produce**.
- Ownership, collection, usage, and sale rights are vested with the **forest dwellers**, subject to community management and state regulations.

3.World's top 10 happiest cities in 2025:

Why in News?

- The 2025 Happy City Index ranks the world's happiest cities using 82 indicators across six themes.
- The report gained attention post-COP29, with Copenhagen topping for environment and citizen engagement.
- A new "Health" category was added, reflecting COVID-19 impacts on public health priorities.
- No Indian cities ranked, sparking debates on urban governance and pollution challenges versus Asian peers like Singapore.

What Makes a City Happy?

- Cities evaluated on six themes: Citizens, Governance, Environment, Economy, Health, and Mobility.
- Factors include infrastructure, work-life balance, and eco-friendly initiatives promoting well-being.
- Rankings split into Gold (top 31), Silver (32-100), and Bronze (101-200) tiers.
- Nordic cities excel due to balanced policies and strong social safety nets.

Top 10 Happiest Cities in 2025

Rank	City, Country	Score	Key Strengths
1	Copenhagen, Denmark	1039	Environment, Citizens
2	Zurich, Switzerland	993	Citizens, Governance
3	Singapore	979	Citizens, Health
4	Aarhus, Denmark	958	Citizens, Governance
5	Antwerp, Belgium	956	Citizens, Governance
6	Seoul, South Korea	942	Citizens, Governance
7	Stockholm, Sweden	941	Citizens, Environment
8	Taipei, Taiwan	936	Governance, Environment
9	Munich, Germany	931	Citizens, Health
10	Rotterdam, Netherlands	920	Environment, Health

European Dominance and Asian Presence

- Europe claims 7 top 10 spots, including Copenhagen and Aarhus from Denmark.
- Asian cities: Singapore (#3), Seoul (#6), and Taipei (#8), known for governance and health.
- US, UK, and China cities absent in top 10; highest ranks: New York (#17), London (#31), Beijing (#54).

India's Position

- No Indian city in top 200 due to governance, pollution, and health service issues.
- Challenges include air pollution, inequality, and infrastructure deficits in cities like Mumbai and Delhi.
- Opportunity for sustainable urban development aligned with India's Smart Cities Mission.

Key Takeaways

- The index stresses holistic well-being beyond just economic growth.
- Gold-tier cities balance all well-being factors effectively.
- Calls for policies fostering inclusive happiness and sustainable urban planning globally.

4.Global Innovation Index (GII):

Source: PIB

Why in the News?

The World Intellectual Property Organization (WIPO) has released the Global Innovation Index (GII) 2025.

About the Global Innovation Index (GII):

- Annual ranking of 139 economies based on their innovation capacity and success.
- Published jointly by Cornell University, INSEAD, and WIPO.
- First published in 2007.
- Evaluates innovation using 80+ metrics across 7 pillars.

Structure of GII:

- Innovation Input Sub-Index: Includes institutions, human capital and research, infrastructure, market sophistication, business sophistication.
- Innovation Output Sub-Index: Covers knowledge and technology outputs, creative outputs.

Purpose:

- Helps governments assess how effectively R&D, education, and infrastructure translate into innovation outcomes.

Key Highlights of GII 2025:

- Global R&D growth slowed to 2.9% in 2024 and projected at 2.3% in 2025, the lowest since 2010 financial crisis.
- Top ranking countries: Switzerland (1st), Sweden (2nd), United States (3rd), followed by South Korea, Singapore, UK, Finland, Netherlands, Denmark, and China (10th).
- China leads in knowledge and technology outputs, patent filings, and ranks 2nd in R&D expenditure.
- Europe dominates with 15 of the top 25 economies; Southeast, East Asia, and Oceania region has 6 in the top 25.

India's Performance:

- Ranked 38th globally with an approximate score of 40.5.
- Top among lower-middle-income countries and in the Central & Southern Asia region.
- Strengths: Knowledge and technology outputs (22nd), market sophistication, human capital, and research.
- Weaknesses: Business sophistication, infrastructure, and institutions lag behind.

5. Upcoming FTA talks with the EAEU

CONTEXT: The upcoming FTA talks with the EAEU form part of India's broader strategy to deepen trade ties with regional economic blocs.

- This development follows recent diplomatic engagements and is set against global trade uncertainties including US tariff threats.
- The meetings between Indian Commerce Minister Piyush Goyal and EAEU's Trade Minister Andrey Slepnev signal growing momentum towards formal trade agreements.

'Objectives of India-EAEU FTA

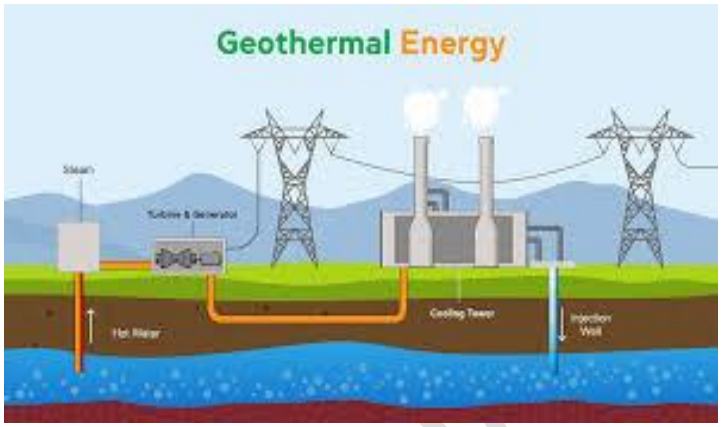
- Enhance trade and investment between India and the EAEU member states: Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia.
- Provide Indian exporters access to a market with a combined GDP of around $6.5 trillion.
- Boost diversification of Indian exports and reduce dependence on traditional markets.

Comparison with European Union (EU)

Aspect	Eurasian Economic Union (EAEU)	European Union (EU)
Member Nations	Armenia, Belarus, Kazakhstan, Kyrgyzstan, Russia	27 European countries
Established	2015	1993 (Maastricht Treaty)
Combined GDP	~$6.5 trillion	Over $17 trillion
Governance Body	Eurasian Economic Commission (Moscow)	European Commission (Brussels)
Economic Integration	Goods, services, capital, and labor mobility	Goods, services, capital, and labor mobility
Market Nature	Mixed economies with varying levels of market reforms	Primarily market economies
Trade Challenges	Sanctions and geopolitical tensions	Regulatory complexity but high standards

6.Geothermal energy

Geothermal energy is thermal energy that comes from natural hot springs. In India, the Geological Survey of India (GSI) has identified 350 geothermal energy locations. The most promising of these is in the Puga Valley of Ladakh.



Why in News?

- The Ministry of New and Renewable Energy (MNRE) launched India's first National Policy on Geothermal Energy in September 2025.
- This is part of India's bigger goal to achieve Net Zero emissions by 2070 and boost renewable energy sources.

What is Geothermal Energy?

- It is heat stored beneath the Earth's surface.
- The energy can be used for electricity, heating, cooling, agriculture, aquaculture, and spa tourism.
- Offers continuous, reliable power unlike intermittent solar or wind.

Key Highlights of the Policy

- Scope: Applies to power generation and direct use like heating, agriculture, and cooling.
- Implementation: MNRE leads with other ministries, states, companies, and academia involved.
- Financial Support: Includes tax benefits, grants, concessional loans, and Viability Gap Funding (₹36 crore per MW).
- Regulatory Support: Open access waivers, must-run status, and parity with other renewable energy sources.
- Repurposing Wells: Focus on reusing abandoned oil and gas wells for geothermal projects in collaboration with ONGC, Vedanta, Reliance.
- Global Collaboration: Partnerships with countries like Iceland, Norway, USA, and Indonesia for research and development.
- Pilot Projects: Five approved projects for resource assessment and demonstration across India.

Geothermal Energy Scenario in India

- Potential: Estimated capacity is 10.6 GW (10,600 MW) by the Geological Survey of India (GSI).
- Hot Springs: Over 381 hot springs mapped, temperatures between 35°C to 89°C.
- Global Context: India, US, and China hold 75% of global potential for next-generation geothermal energy.

- Ongoing Projects: Pilot projects at Puga and Chhumathang (Ladakh), Cambay (Gujarat), Barmer (Rajasthan), and a 20-kW pilot plant in Telangana.

Major Geothermal Sites in India

Region/State	Site/Key Features
Ladakh	Puga, Chhumathang—high-temperature springs, pilots underway
Himachal Pradesh	Manikaran, Satluj, Beas, Spiti Valleys—good potential for power and tourism
Uttarakhand	Tapoban, Alaknanda Valley—pilot and research areas
Gujarat	Cambay Graben—oil wells repurposing projects
Chhattisgarh	Tattapani field—direct heat use suitability
Jharkhand/West Bengal	Damodar Valley, Surajkund springs—high temperature zones
Andaman & Nicobar	Volcanic geothermal fields—high promise, reduce island power costs
Telangana	Manuguru—20 kW pilot binary-cycle plant
Other States	Madhya Pradesh, Odisha, Maharashtra, Meghalaya—small clusters

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Future Roadmap

- 10 GW geothermal capacity targeted by 2030.
- Around 100 GW potential expected by 2045.
- Vision for hybrid solar-geothermal projects and heating for cold regions like Ladakh, Northeast, and Andamans by 2047.

Geothermal energy, though currently underutilized, has significant potential in India.

Significance

1. **Potential and Resources:**
   - India has identified 350 geothermal energy locations, with the most promising sites in the Puga Valley of Ladakh, Manikaran in Himachal Pradesh, Bakreshwar in West Bengal, and other regions.
2. **Renewable and Reliable:**
   - Geothermal energy is a renewable and reliable source of power, providing consistent energy output regardless of weather conditions, unlike solar or wind energy.
3. **Environmental Benefits:**
   - Geothermal energy produces minimal greenhouse gas emissions compared to fossil fuels. It is a sustainable option that can significantly reduce India's carbon footprint.
4. **Energy Independence:**
   - Utilizing geothermal energy can reduce India's dependence on imported fuels, enhancing national energy security and contributing to a diversified energy mix.

5. **Direct Use Applications:**
   - Beyond electricity generation, geothermal energy can be used directly for heating, agriculture (greenhouses), aquaculture, and industrial processes, offering versatile applications.

Challenges in Geothermal Energy

1. **Resource and Location:**
   - Geothermal resources are location-specific, making it difficult to find and exploit suitable sites.
2. **Infrastructure:**
   - The development of infrastructure for geothermal energy is capital-intensive and requires significant investment.
3. **High Cost:**
   - The initial cost for geothermal energy projects is high compared to other renewable energy sources.
4. **Renewable Does Not Mean Unlimited:**
   - Geothermal energy, while renewable, is not unlimited and requires careful management to avoid depletion.
5. **Location Restricted:**
   - Suitable geothermal sites are often located in remote areas, complicating access and development.
6. **Transmission Barrier:**
   - Transmitting geothermal energy from remote locations to urban centers poses significant logistical and technical challenges.
7. **Environmental Side Effects:**
   - Geothermal energy projects can have environmental impacts, such as land subsidence and the release of greenhouse gases like carbon dioxide and hydrogen sulfide.
8. **Earthquakes:**
   - Geothermal drilling and extraction can induce seismic activity, posing risks to nearby communities.

7.the Chabahar port in Iran

Context: On September 18, 2025, the U.S. State Department announced revocation of India's waiver on sanctions regarding the Chabahar port in Iran, effective September 29, 2025.

- This decision represents an escalation of U.S. sanctions pressure on Iran, disrupting India's strategic regional connectivity plans.
- It follows recent talks signaling U.S.-India trade rapprochement but highlights tensions in other bilateral and regional issues.

What is Chabahar Port?

- Chabahar is a strategic port in southeastern Iran, developed jointly by India and Iran to enhance trade connectivity.
- It serves as an alternative trade route for India, bypassing Pakistan, to access Afghanistan and Central Asia.
- The port is crucial for fostering regional economic integration and reducing reliance on contentious routes.

Background of the US Waiver

- In 2018, the U.S. had provided India a special waiver exempting its activities in Chabahar from sanctions imposed on Iran.
- The waiver was intended to support India's efforts in regional connectivity and counterbalance China-Pakistan influence.
- It allowed India to develop the Shahid Beheshti terminal and operate despite broader US sanctions on Iran.

What Happened Now in 2025

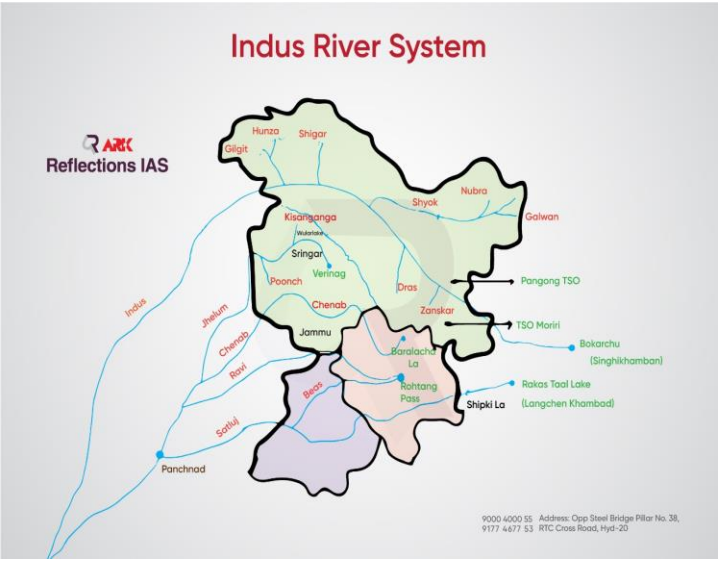
- President Trump's executive order on February 5, 2025, mandated a review of all Iran sanctions waivers.
- The State Department revoked the Chabahar waiver, effective September 29, citing changed circumstances like Taliban's control in Afghanistan and port revenues funding Iran's proxies.
- Indian firms involved risk sanctions including asset freezes and transaction bans.

8.INDUS RIVER SYSTEM

INDUS RIVER SYSTEM –

1. Introduction

- One of the **three major Himalayan River basins** (others: Ganga, Brahmaputra).
- Flows through **western Indian subcontinent**, carving deep gorges and sustaining ecosystems.
- Total length: **>3,000 km**; longest river in **Pakistan**, one of the longest in **Asia**.
- Only flows through India in **Leh district of Ladakh**.
- Supports agriculture, hydroelectricity, livelihoods, and **Indus Valley Civilization** historically.
- **Unique fauna:** Blind Indus River Dolphin – exclusive to Indus.



2. Origin

- Glacier near **Bokhar Chu**, Tibetan region, **Kailash Range**, near **Mansarovar Lake**.
- Flows northwest; enters India at **Demchok, Ladakh**.
- Passes between **Karakoram and Ladakh ranges**.
- Local names: Tibet – "Singi Khamban" (Lion's Mouth).

3. Course

1. Joined by **Zaskar River** at Leh.
2. Joined by **Shyok River** in Ladakh.
3. Receives waters of **five eastern tributaries** (Jhelum, Chenab, Ravi, Beas, Sutlej) at **Panchnad** near **Mithankot**.
4. Forms **Indus Delta** in Sindh before draining into **Arabian Sea** near Karachi.

4. Tributaries

A. Left Bank Tributaries

1. **Zanskar River** – sparse human settlements.
2. **Suru River** – Ladakh.
3. **Soan River** – Pakistan.
4. **Jhelum River** – Kashmir; main tributary: **Kishanganga (Neelum) River**.
5. **Chenab River** – originates Bara Lacha Pass; confluence of **Chandra & Bhaga** at Tandi; called **Chandrabhaga** upstream.
6. **Ravi River** – Dhauladhar Range, Himachal; **Ranjit Sagar Dam**; Chamba on right bank.
7. **Beas River** – originates Rohtang Pass, Himachal; joins Sutlej at **Hari-Ke-Pattan**, Punjab.
8. **Satluj River** – antecedent river; originates Rakas Lake, Tibet; enters India at **Shipki La**; major projects: **Bhakra Nangal, Kol Dam, Nathpa Jhakri**.
9. **Panjnad River** – formed by Chenab, Ravi, Beas, Sutlej; joins Indus at Mithankot.

B. Right Bank Tributaries

1. **Shyok River** – Karakoram Range; joined by **Nubra River** (from Nubra Glacier).
2. **Gilgit River** – Gilgit region, Pakistan.
3. **Hunza River** – Pakistan.
4. **Swat River** – Pakistan.
5. **Kunar, Kurram, Gomal, Tochi, Kabul Rivers** – Afghanistan/Pakistan.

5. Key Features

- **Snow-fed rivers** in upper catchment; some monsoon-fed (Ghaggar/Saraswati).
- Forms **deep gorges** in Ladakh/Karakoram.
- **Sediment-rich**, forming fertile plains in Sindh and Punjab.
- Supports **hydroelectric & irrigation projects** (Bhakra Nangal, Ranjit Sagar, Mangla, Uri).

6. Ecological and Cultural Importance

- **Indus Delta:** supports mangroves, estuarine biodiversity.
- Cradle of **Indus Valley Civilization**.
- Provides **water for agriculture, electricity, and fisheries**.

7. Indus Water Treaty (1960)

- Brokered by **World Bank** between **India and Pakistan**.
- Allocation:
  - **Eastern rivers (Ravi, Beas, Sutlej)** → India
  - **Western rivers (Indus, Jhelum, Chenab)** → Pakistan
- India allowed **non-consumptive uses** and **hydropower projects** on western rivers.
- Treaty ensures **peaceful water sharing**, even amid geopolitical tensions.

8. Summary Table of Tributaries

Bank	Tributaries	Key Notes / Projects
Left	Zanskar, Suru, Soan, Jhelum, Chenab, Ravi, Beas, Satluj, Panjnad	Ranjit Sagar Dam (Ravi), Bhakra Nangal (Sutlej), Nathpa Jhakri (Sutlej)
Right	Shyok, Nubra, Gilgit, Hunza, Swat, Kunar, Kurram, Gomal, Tochi, Kabul	Shyok & Nubra – Ladakh; Kabul – Afghanistan; supports Pakistan's irrigation

9.Comptroller and Auditor General (CAG) of India:

The office of the **Comptroller and Auditor General (CAG)** of India, inspired by the **British Constitution**, is a pivotal constitutional authority established under **Article 148** of the Indian Constitution. The CAG is responsible for auditing the accounts of the Union and State governments, public sector organizations, and autonomous bodies, ensuring transparency, accountability, and financial propriety in governance.

Constitutional Provisions Related to the CAG

The Indian Constitution outlines the framework for the CAG's role and responsibilities under the following articles:

- **Article 148**: Governs the **appointment, tenure, and conditions of service** of the CAG.
- **Article 149**: Defines the **duties and powers** of the CAG.
- **Article 150**: Mandates that the accounts of the Union and States be maintained in the form prescribed by the **President** on the advice of the CAG.
- **Article 151**:

- The CAG submits **annual reports** of the Union government to the **President**, who lays them before both Houses of Parliament.
- For State governments, the CAG submits reports to the **Governor**, who presents them to the State Legislature.

Appointment, Tenure, and Removal

- **Appointment**: The CAG is appointed by the **President of India**.
- **Tenure**: The CAG serves for a term of **6 years** or until reaching the age of **65**, whichever is earlier.
- **Removal**: The CAG can only be removed through a process akin to that of a **Supreme Court Judge**, requiring a resolution passed by both Houses of Parliament with a **special majority (Type-2)** on grounds of **proved misbehavior or incapacity**. Thus, he does not hold his office till the pleasure of the president, though he is appointed by him.
- **Note**: The term **impeachment** applies only to the removal of the **President of India**. For other constitutional functionaries like the CAG or Supreme Court Judges, the process is referred to as **removal**.
- **Post-Retirement Restrictions**: The CAG is ineligible to hold any office under the **Central or State Government** after retirement.
- **Role with Public Accounts Committee (PAC)**: The CAG acts as a **guide, friend, and philosopher** to the PAC, assisting in scrutinizing government expenditure.

The Three Major Audit Reports

These reports are submitted annually to the President (for Union Government reports) or to the Parliament and State Legislatures.

1. **Audit Report on Appropriation Accounts:**

This report details the expenditure of the government against the funds allocated by Parliament or Legislature.

2. **Audit Report on Finance Accounts:**

This report provides an analytical review of the financial performance and finances of the government.

3. **Audit Report on Public Undertakings:**

This report examines the functioning and financial performance of government-owned enterprises.

Report is submitted to President and President lays it in parliament and then its discussed by Public Accounts Committee

The Three Main Types of CAG Audits

1. **Financial Audit:**

This audit focuses on examining the accuracy of financial statements and records of government departments, public sector undertakings, and other bodies receiving government funds.

2. **Compliance Audit:**

This type of audit verifies whether an entity has followed the established laws, regulations, and rules governing its operations and transactions.

3. Performance Audit:

This audit assesses the economy, efficiency, and effectiveness of a government program or activity. It provides insights and analysis on whether resources are used optimally to achieve the program's objectives

In addition to legal and regulatory audits, the **CAG can conduct propriety audits,** that is, he can assess the **wisdom, faithfulness, and economy of government expenditure**, and comment on **wastefulness and extravagance.** Unlike legal and regulatory audits, which are obligatory, propriety audits are discretionary.

Comparison: CAG in India vs. Britain

The roles and powers of the CAG in India differ significantly from those in Britain, as outlined below:

Aspect	India	Britain
Role	Primarily an **Auditor General**, with "Comptroller" in name only. Performs **ex-post facto audits** (post-expenditure).	Acts as both **Comptroller and Auditor**. No funds can be withdrawn from the public exchequer without CAG approval.
Audit Timing	Audits conducted **after expenditure** is incurred.	Requires **prior approval** for withdrawals from the public exchequer.
Parliamentary Membership	Not a member of Parliament.	A member of the **House of Commons**.

Primary Functions of the CAG

The CAG plays a critical role in ensuring financial accountability and transparency through the following functions:

1. **Audit of Government Accounts**:
   - Audits accounts of the **Union and State governments**, including government departments, public sector enterprises (PSEs), and autonomous bodies.
   - Covers expenditure from the **Consolidated Fund of India**, **Consolidated Fund of States**, and **Consolidated Fund of Union Territories** with Legislative Assemblies.
2. **Audit of Receipts and Expenditure**:
   - Ensures compliance with laws and regulations for all receipts (tax and non-tax revenues) and expenditures (schemes and projects).
3. **Audit of Public Sector Enterprises (PSEs)**:
   - Examines financial propriety and operational efficiency of PSEs and government companies.
   - Conducts **performance audits** to evaluate effectiveness and efficiency in achieving objectives.

4. **Audit of Autonomous Bodies**:
   - Audits accounts of autonomous bodies and authorities substantially funded by the Central or State governments, such as educational institutions and research organizations.
5. **Certification of Accounts**:
   - Certifies the **Appropriation Accounts** and **Finance Accounts** of the Union and State governments to ensure they reflect a true and fair financial position.
6. No minister or the government can represent the CAG in Parliament (both Houses) and no minister can be called upon to take any responsibility for any actions done by him.
7. CAG can audit the accounts of local bodies and other authority when requested by the President or Governor.
8. **Advisory Role**:
   - Advises on financial matters, including accounting policies and financial reforms.
   - Provides inputs for the preparation of Union and State budgets.

Issues and Challenges

Despite its critical role, the CAG faces several challenges that impact its effectiveness:

1. **Independence and Autonomy**:
   - Concerns about functional independence due to the executive's role in the appointment process.
   - Need for greater transparency and safeguards to prevent executive influence.
2. **Resource Constraints**:
   - Inadequate staffing and budgetary allocations limit comprehensive audit coverage.
   - The CAG struggles to audit all areas of government expenditure and revenue effectively.
3. **Access to Information**:
   - Delays and lack of cooperation from government departments and PSEs hinder the audit process.
   - Difficulty in accessing records affects the quality and timeliness of audit reports.
4. **Implementation of Recommendations**:
   - Lack of prompt follow-up on audit findings reduces their impact.
   - Corrective actions are often delayed or not implemented.
5. **Reduction of number of reports**:

The total number of CAG reports relating to central government ministries and departments decreased from 55 in 2015 to just 14 in 2020, a fall of nearly 75 percent, as per a recent reply to a Right to Information (RTI) application

6. **Technological Advancements**:
   - Rapid technological changes and complex government operations require advanced audit tools and techniques.
   - Continuous upgradation is needed to ensure effective audits.

7. **Public Awareness and Engagement**:
   - Limited public awareness of CAG reports reduces their impact on accountability.
   - Greater dissemination and public participation could enhance transparency.
8. **Executive Discretion in Appointment**:
   - The appointment of the CAG is at the **complete discretion of the executive**, limiting its ability to hold the executive accountable.

Suggestions for Improving the CAG's Functioning

To enhance the effectiveness of the CAG, the following reforms are suggested:

1. **Appointment Process**:
   - **Broad-Based Committee**: Establish a committee comprising the **Prime Minister**, **Leader of Opposition in Lok Sabha**, and **Chief Justice of India** for transparent and impartial appointments, similar to other statutory bodies like NHRC, CVC, and Information Commissioner.
   - **Career Auditors**: Appoint CAGs from the **Indian Audit and Accounts Service (IAAS)** to leverage expertise and reduce conflicts of interest. Historically, only the first three CAGs were IAAS officers; most subsequent appointees were retired IAS officers.

2. **Independence and Accountability**:
   - **Legislative Membership**: Consider making the CAG part of the legislative branch, as in the USA and UK, to ensure greater parliamentary engagement with audit reports.
   - **Post-Retirement Restrictions**: Enforce stricter rules to prevent conflicts of interest, e.g., the appointment of former CAG Vinod Rai as Chairman of the Banks Boards Bureau was seen as violating **Article 148(4)**.

3. **Enhancing Audit Capacity**:
   - **Increase Staffing**: Address understaffing in the IAAS. Currently, only ~60,000 of ~250,000 auditable entities are audited annually due to limited resources.
   - **Training and Development**: Invest in continuous training for IAAS officers to keep pace with modern auditing techniques and technologies.

4. **Scope and Methodology of Audits**:
   - **Propriety Audits**: Strengthen audits to assess the **wisdom, faithfulness, and economy** of government spending.
   - **Performance Audits**: Increase focus on evaluating the effectiveness and efficiency of government programs.

5. **Transparency and Public Engagement**:
   - **Public Disclosure**: Make CAG reports more accessible to the public to enhance awareness and accountability.

- **Stakeholder Consultations**: Engage civil society organizations for feedback to improve the audit process.

6. **Technological Integration**:
- **Digital Audits**: Adopt advanced technologies like **data analytics, AI, and blockchain** to improve audit accuracy and efficiency.
- **E-Governance Collaboration**: Streamline data collection and analysis through e-governance initiatives for faster audits.

Role of CAG in Ensuring Legality and Propriety of Expenditure

Ensuring Legality of Expenditure:

1. Constitutional Mandate: CAG audits expenditures from the Consolidated Fund of India, ensuring legal compliance under Article 266.
2. Audit Reports: CAG publishes annual reports on financial and operational integrity.
3. Compliance with Laws: Ensures government transactions adhere to legal requirements (e.g., GST compliance audit).
4. Financial Oversight: CAG detects mismanagement, like in the Commonwealth Games (2010) procurement irregularities.
5. Public Accountability: Findings are reviewed by the Public Accounts Committee (e.g., 2G spectrum case).

Ensuring Propriety of Expenditure:

1. Value for Money Audits: Ensures government programs deliver value (e.g., Clean Ganga Mission audit).
2. Transparency in Spending: CAG promotes transparency by publishing audit results (e.g., Delhi Metro Rail audit).
3. Advisory Role: Provides policy advice (e.g., Railway Board fare pricing recommendations).
4. Safeguarding Public Interest: Ensures PSUs are managed efficiently (e.g., Air India audit).
5. International Standards: Adheres to global audit practices.

CAG-LLM: AI-Powered Auditing Tool

- **What is it?**: A **Large Language Model (LLM)** developed by CAG to assist auditors.
- **Purpose**:
  - Access decades of **past audit reports** and institutional knowledge.
  - Analyze large datasets to identify **patterns and risks**.
  - Generate consistent **inspection reports** with greater accuracy.
- **Launch Timeline**: First version ready by **November 2025**.
- **Benefits**: Speeds up audits, improves report quality, and reduces manual effort.

Connect Portal

- **What is it?**: A digital platform for ~**10 lakh auditee entities** (government agencies/departments).
- **Features**:
  - BY CAG
  - Allows direct responses to **audit queries** and **reports**.
  - Tracks audit observations in real-time for transparency.
- **Launch**: Expected on **September 19, 2025**, during the **Annual Conference of State Finance Secretaries**.
- **Benefits**: Streamlines communication, cuts paperwork, and speeds up audit resolution.

UPSC PYQ

In India, other than ensuring that public funds are used efficiently and for intended purpose, what is the importance of the office of the Comptroller and Auditor General (CAG)? (2012)

1. CAG exercises exchequer control on behalf of the Parliament when the President of India declares national emergency/financial emergency
2. CAG reports on the execution of projects or programmes by the ministries are discussed by the Public Accounts Committee.
3. Information from CAG reports can be used by investigating agencies to press charges against those who have violated the law while managing public finances.
4. While dealing with the audit and accounting of government companies, CAG has certain judicial powers for prosecuting those who violate the law.

Which of the statements given above is/are correct?

(a) 1, 3 and 4 only
(b) 2 only
(c) 2 and 3 only
(d) 1, 2, 3 and 4

Q1: "The Comptroller and Auditor General (CAG) has a very vital role to play." Explain how this is reflected in the method and terms of his appointment as well as the range of powers he can exercise. **(2018)**
Q2: Exercise of CAG's powers in relation to the accounts of the Union and the States is derived from Article 149 of the Indian Constitution. Discuss whether audit of the Government's policy implementation could amount to overstepping its own (CAG) jurisdiction. **(2016)**

10.International North-South Transport Corridor (INSTC)

Why in News

- Recently, the **U.S. revoked the sanctions waiver on Iran's Chabahar Port**, effective September 29, 2025.
- Chabahar Port is a **key node of INSTC**, developed by India to access Afghanistan and Central Asia while bypassing Pakistan.
- This development has **strategic and economic implications** for India's trade and connectivity in the region.

Overview

- INSTC is a **7,200 km multi-modal transport corridor** established in 2000 by India, Iran, and Russia.
- It connects the **Indian Ocean to Russia and Europe** via Iran and the Caspian Sea.
- Provides a **shorter, faster, and cost-effective alternative** to the Suez Canal route.
- Currently, there are 13 Members of INSTC (India, Iran, Russia, Azerbaijan, Armenia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkey, Ukraine, Belarus, Oman and Syria)
- Bulgaria has joined as an Observer State.

Key Routes

1. Western Route (via Azerbaijan – Baku to Astrakhan)

- **Path:** Mumbai → Bandar Abbas (Iran) → Astara (Iran-Azerbaijan border) → Baku (Azerbaijan) → Astrakhan (Russia) → Moscow → Europe
- **Significance:**
  - Seamless rail connectivity **Baku → Astrakhan** for cargo to Russia.
  - Critical for India-Iran-Russia trade.
  - Rasht-Astara railway is a key segment.

2. Caspian Sea Route

- **Path:** Mumbai → Bandar Abbas → Caspian Sea ports (Bandar Anzali, Amirabad) → Astrakhan → Moscow → Europe
- **Significance:**
  - Uses the Caspian Sea for cargo transit.
  - Provides flexibility and bypasses Azerbaijan if needed.

Strategic Importance for India

- **Trade Diversification:** Reduces dependency on the Suez Canal and Pakistan routes.
- **Regional Connectivity:** Links India with Russia, Central Asia, and Europe.
- **Economic Benefits:** Faster trade, lower costs (~30%), and improved access to Russian energy.
- **Geopolitical Leverage:** Counters China's Belt and Road Initiative and enhances India's Eurasian influence.

Recent Development: U.S. Sanctions on Chabahar

- **Waiver Revocation:** U.S. ended the sanctions waiver granted to Chabahar Port, impacting India's operations.
- **Impact:**
  - Operational uncertainty for India's terminal at Chabahar.
  - Risk to trade flows via INSTC and regional influence.
- **Strategic Response:**
  - Diplomatic engagement with the U.S.
  - Investment in alternative routes and port infrastructure.

11.Trump Issues Ultimatum to Afghanistan over Bagram Airbase

Why in News

- US President **Donald Trump** demanded the **return of Bagram Airbase** to US control.

Bagram Airbase: Key Details

- Bagram Airbase was the **largest U.S. military base in Afghanistan**, situated adjacent to the historic city of Bagram.
- According to U.S. officials, it served as the **central hub for operations against militants for nearly 20 years**.
- Geographically, Bagram is located at the **junction of the Ghorband and Panjshir Valleys**, close to the present-day city of **Charikar** in Afghanistan.
- **US Withdrawal:**
  - July 2021, as part of the **Trump-mediated peace deal** facilitating Taliban return.
  - Taliban now controls the base.

Strategic Importance

1. **Regional Influence:** Control over Bagram enhances operational reach across Afghanistan and Central Asia.

2. **Geopolitical Leverage:** Its location is critical vis-à-vis **China, Pakistan, and regional security**.
3. **Security Considerations:** Any US attempt to retake Bagram would likely **heighten tensions with China**.

Responses

- **Afghanistan / Taliban:**
  - Foreign Minister **Amir Khan Muttaqi**: No foreign military presence permitted.
  - Afghan officials open to political/economic engagement, but **reject re-establishing US troops**.
- **China:**
  - Condemned Trump's call, stating it **stokes regional instability** and violates Afghan sovereignty.

12.China's Strategic Maritime Investments in the Indian Ocean Region (IOR)

Context

- **In News:** Prime Minister Narendra Modi, as President of the United Nations Security Council, chaired a high-level debate on strengthening maritime security through cooperation.
- **Focus:** Emphasized sustainable maritime connectivity, highlighting the need for projects to consider the physical sustainability and absorption capacity of host countries.

Strategic Importance of the Indian Ocean Region

- **Energy Imports:** The IOR accounts for 80% of China's energy imports.
- **Trade Routes:** Crucial for China's trade activities, making the region strategically and economically significant.
- **Infrastructure Investments:** Over the past three decades, Chinese investment and construction activity in the IOR have increased, particularly in port development.

Chinese Involvement in IOR Ports

China has been involved in 17 port projects across the IOR, ranging from major deep-water ports to smaller terminals. This involvement includes direct construction, financial investments, and strategic partnerships.

Chinese Ports in the Indian Ocean Region

Port	Country
Lamu Port	Kenya
Mombasa Port	Kenya
Bagamoyo Port	Tanzania
Dar es Salaam Port	Tanzania
Doraleh Multipurpose Port	Djibouti
Sudan Port	Sudan
CSP Terminal, Khalifa Port	U.A.E.
Sokhna Port	Egypt
Gwadar Deepwater Port	Pakistan
Karachi Deepwater Terminal	Pakistan
Hambantota Port	Sri Lanka
CICT Terminal Colombo	Sri Lanka
Chittagong Port	Bangladesh
Payra Port	Bangladesh
Kyaukpyu Port	Myanmar
Malacca Port	Malaysia
Darwin Port	Australia

13.India's Exploration Licence

- India signed a contract with **International Seabed Authority (ISA)** (Jamaica-based UN body) for **exploring polymetallic sulphides** in **Carlsberg Ridge (NW Indian Ocean, Arabian Sea)**.
- First licence of its kind granted globally.
- Contract covers **3,00,000 sq km stretch** forming boundary between **Indian & Arabian tectonic plates**.

Background

- **ISA Role:** Regulates mineral-related activities in the "**Area**" (international seabed beyond national jurisdiction) under **UNCLOS (1982)**.
- Countries must obtain ISA permission for exploration in **high seas**.
- **India's applications:**

1. Carlsberg Ridge (approved – 2025).
2. **Afanasy–Nikitin Seamount (ANS)** (pending – also claimed by Sri Lanka).

- Earlier rights:

1. **2002:** Polymetallic nodules, Central Indian Ocean Basin (till 2027).
2. **2016:** Polymetallic sulphides, Indian Ocean Ridge (till 2031).

PYQ-2021

Consider the following statements:

1. The Global Ocean Commission grants licences for seabed exploration and mining in international waters.
2. India has received licences for seabed mineral exploration in international waters.
3. "Rare earth minerals' are present on seafloor in international waters.

Which of the statements given above are correct?

(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Answer: B

14.Critical Minerals

IEEFA's report examines five critical minerals (and their compounds) — cobalt, copper, graphite, lithium and nickel — from the perspectives of import dependency, trade dynamics, domestic availability, and global price fluctuations. The findings show that India remains largely import-dependent for these minerals and their compounds, with 100% import reliance for minerals like lithium, cobalt, and nickel.

India has committed to achieving 500 gigawatts (GW) of non-fossil fuel-based electricity installed capacity by 2030. Currently, the country's renewable energy installed capacity stands at 201 GW, with solar energy accounting for 91 GW

Minerals for a clean and green future

The data for the charts were sourced from Our World in Data. The data shows the reserves as a share of the global total as of 2023