

Today's Prelims Topics

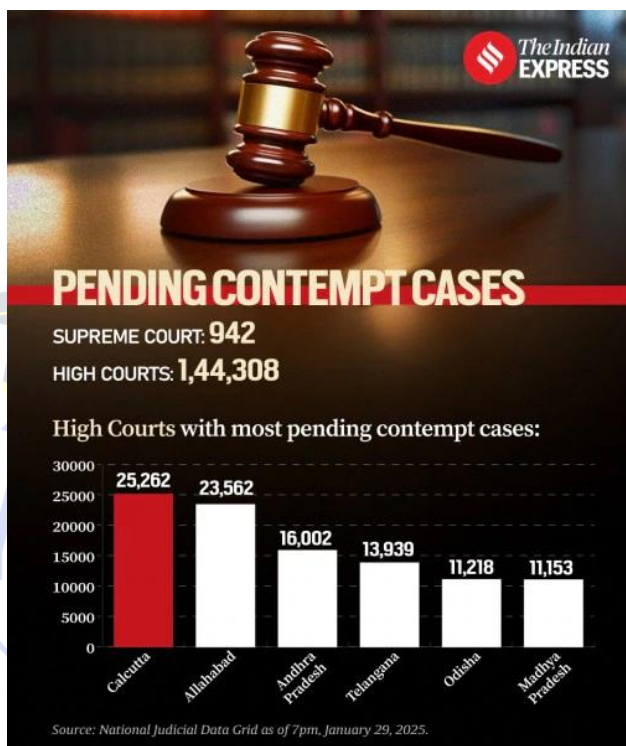
1.45 Lakh pending Contempt cases

Context

The Union Law and Justice Ministry has asked all Ministries to improve the compliance of judicial orders to reduce the number of such cases pending against the government.

About Contempt Of Court

- Contempt of court is a **legal provision to safeguard judicial institutions from undue attacks and preserve their authority.**
- The Constitution of India **does not define** Civil Contempt and/or Criminal Contempt.
- **Constitutional and Statutory Provisions:**
 - The Constitution restricts freedom of speech under Article 19(2) to include contempt of court.
 - **Articles 129 and 215** grant the Supreme Court and the High Courts the **power to punish contempts** of themselves.
 - The **Contempt of Courts Act, 1971**, provides a **statutory basis** for contempt proceedings. It was passed on recommendations made by the **H N Sanyal Committee.**
- **Types of Contempt of Court**
 - **Civil Contempt:** Defined as the intentional disregard of court orders or breaching a commitment made to the court.
 - **Criminal Contempt:** Constitutes actions or publications that denigrate the authority of the courts, interfere with judicial proceedings, or obstruct justice.
- **Exceptions**
 - Fair and objective reporting on judicial proceedings does not constitute contempt.
 - Constructive criticism of judicial orders, post-adjudication, is allowed.
- **Punishment for Contempt**
 - **Penalties Under the Act of 1971:** Contempt can lead to a maximum of six months imprisonment, a fine of Rs 2,000, or both.
- **2006 Amendment:**
 - "Truth and good faith" was introduced as a valid defense in contempt cases.
 - Punishment is applicable only if the contemptuous act significantly disrupts the course of justice.



UPSC PYQ

Q. Consider the following statements: **(2022)**

1. Pursuant to the report of H.N. Sanyal Committee, the Contempt of Courts Act, 1971 was passed.
2. The Constitution of India empowers the Supreme Court and the High Courts to punish for contempt of themselves.
3. The Constitution of India defines Civil Contempt and Criminal Contempt.
4. In India, the Parliament is vested with the powers to make laws on Contempt of Court.

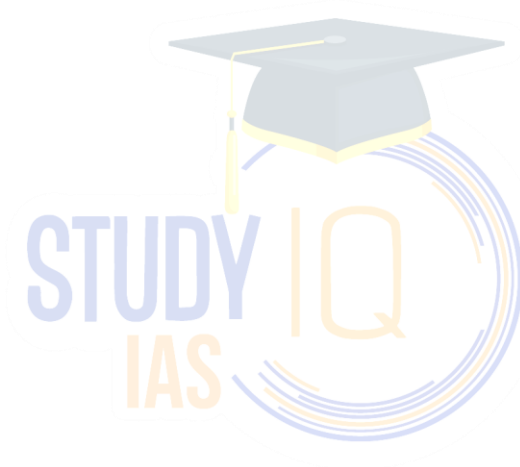
Which of the statements given above is/are correct?

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

Ans: B

Source:

- [Indian Express - Pending contempt cases](#)



Axiom - 4 Mission

Context

Indian astronaut Group Captain Shubhanshu Shukla will be the pilot of the upcoming Axiom-4 mission to the International Space Station (ISS).

About Axiom 4 Mission

- It is the 4th **private astronaut** mission to the **International Space Station**.
- **Duration** of the mission: **14 days**.
- **Launch Site**: Kennedy Space Center in Florida
- **Launch Vehicle**: **SpaceX's Falcon 9 rocket**.
- This mission is organised in collaboration with **NASA**.

Mission Objectives

- **Scientific Research**: Conduct microgravity experiments in various fields, including medicine, materials science and technology development.
- **Commercial Development**: Axiom Space is testing technology and procedures for its future commercial space station.
- **International Collaboration**: It includes international astronauts, sponsored by their home countries or private institutions. This will boost International collaboration.
- **Space Tourism & Training**: To provide training and flight opportunities for private individuals interested in space travel.

About International Space Station

- The ISS is the **largest man-made structure in space**, launched on **November 20, 1998**, and has served as a continuous habitat for astronauts since 2011.
- It is a joint project involving multiple international space agencies including:
 - **NASA**: National Aeronautics and Space Administration
 - **Roscosmos**: Russian Federal Space Agency
 - **ESA**: European Space Agency
 - **JAXA**: Japan Aerospace Exploration Agency
 - **CSA**: Canadian Space Agency
- The ISS orbits Earth at an Altitude of 400 kilometres.
- It travels at a speed of around 28,000 kilometres per hour, completing an orbit around Earth approximately every 90 minutes.
- The primary objectives of the ISS are to enhance our understanding of space and microgravity conditions, facilitate scientific research, and exemplify international collaboration in space exploration.

Source:

- [The Hindu - NASA's AXIOM 4 Mission](#)

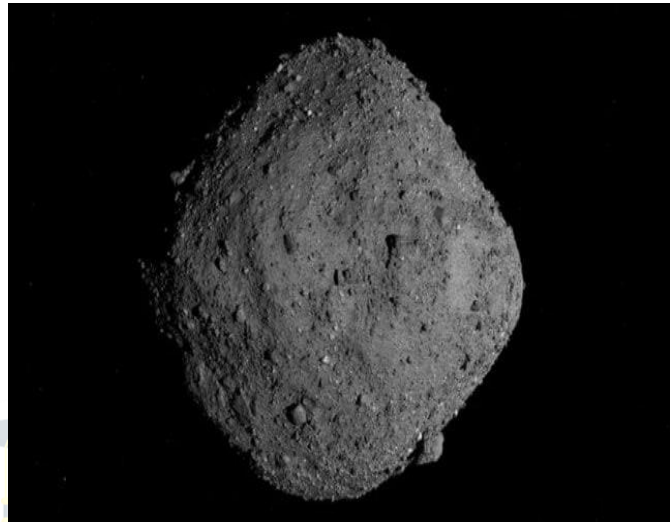
NASA's Benu Asteroid Sample: Evidence of Life's Building Blocks

Context

A recent study on rock and dust samples retrieved from the asteroid **Benu** provides **strong evidence** that space rocks may have played a crucial role in **seeding early Earth** with the fundamental **chemical ingredients for life**.

About Benu

- **Benu** is a near-Earth asteroid that **formed 4.5 billion years ago** from remnants of a larger celestial body.
- It is a "**rubble pile**" asteroid, meaning it is a loosely bound collection of rocky debris rather than a solid object.
- **Benu's parent body** was an **icy celestial object**, estimated to be **100 km (60 miles) in diameter**, which was destroyed **1-2 billion years ago**.



About NASA's OSIRIS-REx Mission

- It was launched in 2016 to study Benu and collect samples.
- In **2020**, **OSIRIS-REx** **successfully collected rock and dust from Benu's surface**.
- The **samples were brought back to Earth in September 2023**, landing in the **Utah desert** via a **parachute-equipped capsule**.
- These samples are the **first pristine asteroid samples collected directly from space**, eliminating concerns about **Earthly contamination**, unlike meteorite samples.

Key Findings from Benu Samples

- **Building Blocks of Life Found:** Scientists discovered **14 amino acids** (used to make proteins) and **all 5 nucleobases** (genetic material in DNA & RNA).
 - These are essential for life but **not actual life**—just ingredients that could help life form.
- **Water and Salty Minerals Present:** Benu's parent body had **water** in the past.
 - Brine (salty water) evaporated, leaving behind minerals—suggesting a **wet environment** suitable for chemical reactions.
- **Supports the "Life from Space" Theory:** Asteroids like Benu may have **brought essential molecules to early Earth**, helping life start.
 - Similar processes **might have happened on other planets** too.
- **No Earth Contamination:** Unlike meteorites, Benu's samples were collected **directly from space** and remained untouched by Earth's environment.
 - This confirms that the organic materials truly came from **space**.

Source:

- [Indian Express - Asteroid Benu](#)

Kurdistan Region

Context

Recently, India has sent humanitarian assistance to support residents of the Kurdistan region in Iraq.

About Kurdistan Region

- **Kurdistan region** is a geo-cultural area spanning across parts of **Iraq, Iran, Turkey and Syria**, where the **Kurdish people** live.
- Kurds are one of the **world's largest stateless ethnic groups**.
- This region is rich in oil and natural gas, particularly in **Iraqi Kurdistan**, making it geopolitically significant. Post World War I, under the **Treaty of Sevres (1920)**, Western powers promised the Kurds their own homeland.
- However, under **Treaty of Lausanne (1924)**, which divided the Kurds among the newly formed nations of the Middle East, their hopes were dashed.



Key Cities in the Kurdistan Region

- **Erbil (Hewlêr)**: Capital of the **Kurdistan Regional Government (KRG)** in Iraq.
- Sulaymaniyah (Slemani), Dohuk, Mahadabad, Diyarbakır (Largest Kurdish-majority city in Turkey).

UPSC PYQ

Q. Community sometimes mentioned in the news In the affairs of? (2016)

1. Kurd : Bangladesh
2. Madhesi : Nepal
3. Rohingya : Myanmar

Which of the pairs given above is/are correctly matched?

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

Answer: C

Source:

- [DD News - Kurdistan](#)

Leprosy in India

Context

The **Union Health Ministry** is shifting towards a **targeted approach** to controlling **leprosy** in India after achieving the **elimination status** as a public health problem at the national level in **2005**.

About Leprosy

- **Affected Areas:** Leprosy impacts the skin, peripheral nerves, mucosa of the upper respiratory tract, and eyes.
- **Transmission:** Spread through droplets from the nose and mouth, typically via close contact with untreated individuals.
- **Treatment:** Leprosy is curable with multidrug therapy (MDT).
- **Types of Leprosy:**
 - **Pauci-Bacillary (PB):** Fewer bacteria are visible, and no advanced disease signs are observed in biopsies.
 - **Multibacillary (MB):** Bacteria are visible, and biopsies may show signs of advanced disease.

Leprosy cases in India

- **India achieved leprosy elimination as a public health problem in 2005**, as per **WHO criteria** (less than **1 case per 10,000 people**).
- However, some states and districts **still report high prevalence rates**, requiring **focused interventions**.
- **High-Prevalence States:** Bihar, Chattisgarh, Jharkhand, Maharashtra & Odisha.

Recent Initiatives:

- **National Strategic Plan (NSP) & Roadmap for Leprosy (2023-27):** Aims to achieve zero transmission by 2027.
- **National Leprosy Eradication Programme (NLEP):** A centrally sponsored scheme under the National Health Mission.
- **Nikusth 2.0 Portal:** An integrated platform for managing leprosy cases.

Source:

- [The Hindu - Leprosy](#)

High Ammonia levels in Yamuna

Context

The ongoing **Yamuna water crisis** has escalated into a political dispute between the **Delhi & Haryana government**.

What is Ammonia?

- **Ammonia (NH₃)** is a **colorless, water-soluble gas** with a **pungent smell**.
- It is **naturally present** in the environment but can reach **toxic levels** due to **human activities**.
- **Major sources of ammonia pollution:**
 - **Runoff from agricultural lands** (fertilizers and animal waste).
 - **Industrial discharge** (dye units, distilleries, chemical plants).
 - **Untreated sewage** from human settlements.
 - **Natural decomposition** of **organic matter** like blue-green algae.
- **Health Impact of Ammonia:**
 - **Highly corrosive** and can damage **internal organs** with prolonged exposure.
 - **Affects water quality**, making it **unsafe for human consumption**.
 - **Long-term exposure** can cause **respiratory and digestive issues**.

Why is Ammonia Pollution in the Yamuna a Concern for Delhi?

- **Sources of Ammonia in Yamuna (Haryana Region):**
 - Industrial discharge from **dye units and distilleries** in **Panipat and Sonapat districts**.
 - **Untreated sewage** from **residential colonies**.
 - **Low water flow in winters** worsens pollution as **freshwater is scarce**.
- **Impact on Delhi's Water Supply:**
 - Ammonia reduces the **dissolved oxygen (DO) levels** in water, making it **unsuitable for consumption**.
 - **Water Treatment Plants (WTPs)** in Delhi **cannot process water with ammonia levels above 1 ppm**.
 - When ammonia levels spike, **Delhi faces water shortages** due to treatment inefficiencies.
 - The situation worsens in **winters**, as ammonia levels **increase significantly** due to **reduced river flow**.

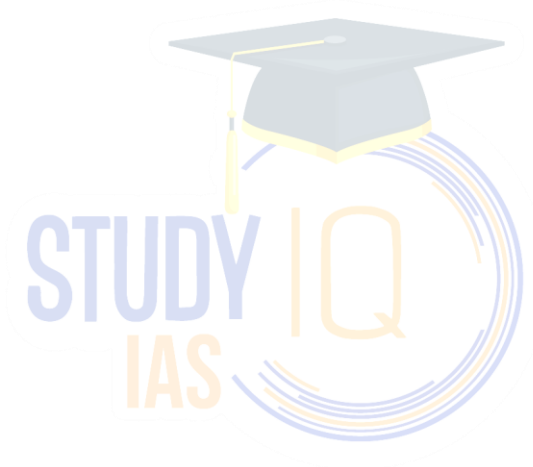
Methods for Treating Ammonia-Laden Water

- **Chlorination (Chemical Treatment):**
 - **How it works:** Ammonia is neutralized using **chlorine gas (Cl₂)** or **sodium hypochlorite (NaOCl)**.
 - **Limitation:** Excess chlorine can lead to **harmful disinfection byproducts (DBPs)**.
- **Biological Nitrification & Denitrification:**
 - **How it works:** Bacteria convert ammonia into **nitrites (NO₂⁻)** and then **nitrates (NO₃⁻)**, which are removed through further biological processes.
 - **Bacteria involved:**
 - **Nitrosomonas** bacteria convert **ammonia to nitrite**.
 - **Nitrobacter** bacteria convert **nitrite to nitrate**.
 - **Limitation:** Requires **specific bacterial cultures and controlled conditions**.
- **Reverse Osmosis (RO) & Ion Exchange (Membrane-Based Treatment)**
 - **How it works:** **RO membranes filter ammonia molecules**, removing them from water. This method is used in **Singapore's NEWater project** for wastewater recycling.
 - **Limitation:** Expensive and requires **high energy input**.
- **Constructing Wetlands (Nature-Based Solution)**

- **How it works:** Wetland plants **absorb ammonia** from water. Microbial activity in **root zones** promotes **natural nitrification**.
- **Limitation:** Requires **large areas** and **long-term monitoring**.
- **Ammonia Stripping (Physical Process)**
 - **How it works:** Water is aerated at **high pH (~10.5-11)** to **convert ammonium ions (NH_4^+) into gaseous ammonia (NH_3)**, which escapes into the air.
 - **Limitation:** Requires pH adjustment and **high energy consumption**.

Source:

- [Indian Express - Yamuna in Delhi](#)



Polar Bear Fur and Its Potential to Replace PFAs

Context

A recent study published in *Science Advances* has revealed that **polar bear fur contains an oily substance** that helps keep them dry in extreme icy conditions.

The Unique Properties of Polar Bear Fur

- Researchers found that **polar bear fur contains an oily substance** (sebum) that **prevents ice from sticking** to it.
- This oily substance functions similarly to **fluorinated ski skins**, which help skis glide on ice.
- This property allows polar bears to stay dry even after **sliding on ice or diving into water** while hunting.
- **Composition of Polar Bear Sebum:**
 - **Polar bear fur sebum lacks squalene**, a compound that is **predominant in human sebum**.
 - Instead, **polar bear sebum contains cholesterol and other fatty acids**.
 - Since very few studies have examined animal sebum, it is **uncertain whether this composition is unique to polar bears**.
- Findings of the study suggest that naturally sourced coatings, modeled after polar bear fur's sebum, could **replace harmful PFAs in various products**.

PFAs / Forever Chemicals

- Polyfluoroalkyl substances (PFAs) are human-made chemicals widely used for their water, oil, and heat resistance.
- They are known as "**forever chemicals**" because they do not break down in the environment, leading to their accumulation in ecosystems, drinking water and the human body.
- **Common Uses of PFAs:** Non-stick cookware (Teflon), Waterproof clothing, Grease-resistant food packaging, Fluorinated ski skins (used in skiing) etc.
- **Environmental and Health Hazards of PFAs:**
 - PFAs **do not break down** in the environment, leading to long-term contamination.
 - **Health risks linked to PFA exposure:** High Exposure can lead to Liver damage, lower birth weights and testicular cancer.

Source:

- [Indian Express - Polar Bear Fur](#)

Places in News

INSV Tarini crosses most remote part of earth - Point Nemo

- As part of the ongoing mission to circumnavigate the globe under the **Navika Sagar Parikrama-II**, two Indian Navy officers passed through **Point Nemo**.

About Sagar Parikrama

- **Mission Goals:** To promote seamanship, maritime heritage and gender equality through a challenging circumnavigation of the globe
- **Participants:** Two Indian Navy women officers – Lt Cdr Roopa A and Lt Cdr Dilna K.
- **Mentorship:** Guided by Golden Globe Race hero, Cdr Abhilash Tomy (Retd.).
- **Vehicle:** Indian Naval Sailing Vessel (INSV) Tarini.
 - It is a 55-foot sailboat that was inducted into the Indian Navy in February 2017.
 - It is named after the **Tara-Tarini temple in Odisha**, which is a patron deity for sailors and merchants



- **Point Nemo** is the **Oceanic Pole of Inaccessibility**, i.e. most isolated point on the planet.
- It is located in the **South Pacific Ocean**, approximately **2,688 kilometers from the nearest landmass**.
- Due to its remoteness, it is also known as the **spacecraft graveyard**, where space agencies direct **decommissioned satellites and space stations** for safe re-entry into Earth's atmosphere

Source:

- [The Hindu - INSV Tarini](#)

Guantanamo Bay

- U.S. President **Donald Trump** has announced plans to **detain thousands of criminal immigrants at Guantánamo Bay, Cuba**.
- Guantánamo Bay is a **U.S. naval base in Cuba**, known for housing detainees linked to the **war on terror**.
- It also contains a separate migrant detention center for individuals caught attempting to enter the U.S. illegally by sea.
- It was constructed during **George W. Bush's presidency** as part of the **"war on terror."**



- **Location:** Southeastern Cuba
- **Controlled by the U.S. Since:** 1903 (under a lease agreement with Cuba)
- **Cuba has long demanded the return of Guantánamo Bay**, calling it **illegally occupied territory**.
- **The U.S. refuses to vacate the base**, citing security and strategic interests.

Source:

- [Indian Express - Guantanamo](#)

News in Shorts

Middle Income Trap

- It is a situation **where a country struggles to transition from middle-income to high-income status.**
- It's characterized by slow growth, stagnant wages, and a growing informal economy.
- The **World Bank's 2024 World Development Report says that over 100 countries** are stuck in the middle-income trap.
- The term "middle-income trap" was coined by the **World Bank** in its report titled 'An East Asian Renaissance: Ideas for Economic Growth' (2007).

What causes the middle-income trap?

- Countries get stuck in the middle-income trap if they can't compete internationally in labor-intensive goods or higher value-added activities.
- When countries don't pursue sound policies to maintain economic growth.

Source:

- [The Hindu - Middle income](#)

Philippines to remove U.S. missile system (Typhoon) if China stops 'sea aggression'

- Philippines has offered to remove the **Typhoon mid-range missile system**, if China ceases its aggressive actions in the South China Sea.
- U.S. Army deployed the **Typhoon system** in the **northern Philippines** in **April 2024** for joint readiness exercises.

About Typhoon mid-range missile system

- It is also known as US army's Strategic Mid-Range Fires (SMRF) System.
- **Missiles:** It can launch both SM-6 missiles and Tomahawk cruise missiles
- **Launchers:** The Typhoon system consists of **launchers** capable of firing **16 missiles** (four launchers, each carrying four missiles).
- **Range:**
 - Tomahawk missiles have a range of **1,600 km** , capable of reaching parts of **mainland China**.
 - SM-6 missiles have a range of over **200 km** and can engage air and maritime threats.



Source:

- [The Hindu - Philippines to remove U.S. missile system](#)

Editorial Summary

India-Sri Lanka Relations and the 13th Amendment

Context

India has named the **Jaffna Cultural Centre** after Tamil poet-philosopher **Thiruvalluvar**, signifying India's enduring cultural and historical ties with Sri Lanka.

More in News

- Originally, Sri Lankan Tamils expressed concern over the omission of 'Jaffna' from the name, prompting swift action from Indian authorities to rename it the **Jaffna Thiruvalluvar Cultural Centre**.
- This centre, built by India, serves as a cultural landmark and reinforces the deep-rooted connection between the two nations.

Historical Context of India-Sri Lanka Political Relations

Since the anti-Tamil riots in 1983, India has played various roles in Sri Lankan politics, including mediating during civil conflicts and supporting constitutional reforms like the Indo-Lanka Accord of 1987, which led to the establishment of Provincial Councils under the 13th Amendment.

13th Amendment to the Sri Lankan Constitution

- The **13th Amendment (13A)** to the **Constitution of Sri Lanka** was introduced in **1987** as part of the **Indo-Lanka Accord** between **India and Sri Lanka**.
- It aimed to address the long-standing ethnic conflict by providing **devolution of power** to the provinces, particularly benefiting the **Tamil-majority Northern and Eastern Provinces**.

Key Features of the 13th Amendment

- **Creation of Provincial Councils:** Established **9 Provincial Councils**, each with limited **legislative and executive powers**.
 - Marked the first attempt at **decentralized governance** in Sri Lanka.
- **Powers of the Provincial Councils:** Devolved powers on subjects like **education, health, agriculture, land, and police**.
 - Certain subjects remained under **Central Government control**, including **national security and finance**.
- **Official Status for Tamil Language:** Recognized **Tamil as an official language**, alongside **Sinhala**, and an administrative language at the provincial level.
- **Merger of Northern and Eastern Provinces** (Later Annulled)
 - Allowed the **temporary merger** of the **Northern and Eastern provinces** into a single Tamil-majority unit.
 - In **2006**, the **Sri Lankan Supreme Court annulled the merger**, restoring them as separate provinces.

Significance of 13A

- Seen as a **compromise solution** to Sri Lanka's ethnic conflict.
- Represents the **only constitutional provision** offering **devolution of power** to Tamil-majority regions.
- Continues to be a **point of contention** in Sri Lankan politics, with **Tamil groups demanding its full implementation** and **Sinhala nationalist parties advocating its repeal**.

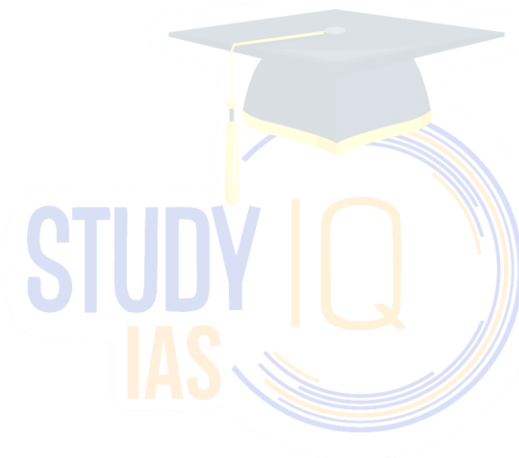
Challenges and Status

- Despite being part of the **Sri Lankan Constitution for over 35 years, 13A has never been fully implemented.**
- **Provinces lack control over police and land administration**, despite constitutional provisions.
- **Successive Sri Lankan governments have resisted its full implementation**, fearing it would lead to separatism.
- The **JVP and nationalist parties** have opposed 13A, viewing it as an **imposition by India**.
- **India has consistently urged Sri Lanka** to implement the amendment **fully** as a means to address Tamil grievances.

Current Situation

- While **Provincial Councils functioned from 1988 to 2019**, their powers remain weak.
- No **Provincial Council elections** have been held since **2019**, delaying the democratic process.
- The **new JVP-led government** has not clarified its stance on **full implementation or repeal** of 13A.
- **Prime Minister Modi's silence on 13A in December 2024** has raised speculation about India's evolving stance.

Source: [The Hindu: An opportunity to settle Sri Lanka's ethnic problem](#)



India's Position in AI Race

Context

The emergence of DeepSeek as a cost-effective, high-performing **open-source AI model** has significant implications for **India's AI ecosystem**, spanning **AI application development, research, infrastructure, and policy**.

Global Implications of DeepSeek

- **Disrupting US AI Dominance:** DeepSeek R1 challenges the **US-led AI ecosystem**, which relies on **expensive data centers and high-end semiconductor chips**.
 - It demonstrates that **high-performance AI models** can be built with **lower infrastructure costs**, threatening the **business models of US AI giants** like OpenAI, Google, and Anthropic.
- **Intensifying US-China AI Rivalry:** AI is now a **geopolitical battleground**, and DeepSeek is **China's response** to the US's lead in AI research.
 - China aims to **achieve self-reliance** in AI and semiconductors, reducing **dependence on Western technology**.
 - The **US may impose stricter sanctions** on AI chips and AI model exports to China, further intensifying the tech cold war.
- **Impact on Global AI Accessibility:**
 - **Democratization of AI:** DeepSeek's **open-source approach** makes **powerful AI more accessible** to startups, researchers, and smaller nations.
 - **New AI Hubs:** Countries that lack AI infrastructure can **use and adapt DeepSeek models** instead of relying on **costly, closed-source models from the US**.
 - **AI Technological Colonialism Risk:** If AI development remains concentrated in a few nations (US and China), smaller nations could become **dependent on foreign AI infrastructure**.
- **AI Cost Reduction and Efficiency Gains:** DeepSeek's success shows that **innovative AI techniques** (e.g., reinforcement learning, mixture-of-experts) can **cut costs and boost efficiency**.
 - This could **lower the barriers** for other countries to **develop their own AI models**.

Challenges in India's AI Development

- **Dependence on Foreign AI Models:** India lacks **homegrown foundational AI models** and relies heavily on **foreign LLMs** (like OpenAI's GPT and Google's Gemini).
 - This limits **customization for Indian languages and applications** and raises **data privacy concerns**.
- **Limited AI Infrastructure (GPUs & Data Centers):** India's AI ecosystem lacks **high-performance computing resources** like GPUs and TPUs.
 - The **plan to acquire 10,000 GPUs** has been **slow-moving**, delaying AI research and development.
- **Insufficient AI Research & Funding:** India has **strong AI talent** but **low investment** in fundamental AI research.
 - Most AI research is focused on **applications**, not **core AI development (LLMs, reinforcement learning, etc.)**.
- **Language and Data Challenges:** AI models must cater to **22 official Indian languages and hundreds of dialects**.
 - There is **limited high-quality training data** in regional languages, affecting **LLM accuracy and usability**.
- **AI Policy and Ethical Concerns** India lacks **clear regulations** for AI safety, bias mitigation, and data protection.

- The absence of **AI governance frameworks** could **slow adoption** and **raise legal risks** for businesses.

Solutions for India's AI Growth

- **Develop Indigenous AI Models:** India should **fund and accelerate the development** of Indian LLMs, much like China did with DeepSeek.
 - Government, private companies, and academia must **collaborate on mission-mode AI projects**.
- **Invest in AI Infrastructure:** Expand **high-performance computing clusters** and **cloud AI infrastructure** through the **IndiaAI Mission**.
 - Encourage **public-private partnerships** for building **data centers** and acquiring **advanced GPUs**.
- **Increase AI Research & Development Funding:** Set up **dedicated AI research institutes** focusing on LLMs, reinforcement learning, and multi-modal AI.
 - Provide **grants and incentives** for **AI startups working on foundational models**.
- **Build AI Models for Indian Languages:** Create **high-quality datasets** in **regional languages** for training **Indian-specific LLMs**.
 - Use **DeepSeek or Meta's Llama** to fine-tune models for **local applications**.
- **Strengthen AI Policy & Regulation:** Establish an **AI regulatory framework** ensuring **ethical AI use, privacy protection, and bias reduction**.
 - Promote **open-source AI adoption** to **avoid dependence on foreign models**.
- **Foster AI Innovation and Entrepreneurship:** Organize **AI hackathons, incubators, and startup accelerators** to nurture AI talent.
 - Encourage **industry-academia collaboration** for **AI research and commercialization**.

Conclusion: India Must Act Now

- DeepSeek proves that **cost-effective AI models can challenge the dominance of US AI giants**.
- India **has the talent and potential**, but lacks **foundational AI models and high-performance computing infrastructure**.
- **Urgent investment in AI R&D, infrastructure, and policy reforms** is required for India to become a **global AI leader**.

Source: [Indian Express: The Launch of Deepseek's Model has set off global AI Race. Where does India Stand?](#)

Union Budget 2025: Economic Challenges, Taxation Debate & Policy Solutions

Context

On **February 1, 2025**, Finance Minister **Nirmala Sitharaman** will present the **Union Budget for FY 2025-26**.

Current Economic Challenges

- **Sluggish GDP Growth:** India's GDP growth is **slowing down**, returning to the **pre-COVID levels of below 4% (2019-20)**.
 - **Post-COVID CAGR (Compound Annual Growth Rate):** Less than **5% per year**, lower than expected.
 - Policymakers aim for a **7%-8% annual growth rate**, but **current trends suggest 5%-6%**.
- **Declining Consumer Spending & Weak Private Investment:** Consumers are **not spending enough**, leading to low demand for goods and services.
 - **Private firms are hesitant to invest** in expanding their businesses due to low consumer demand.
 - **Exports** used to be a growth driver, but with **Donald Trump's return as US President**, uncertainty around **tariffs and global trade** poses new risks.
- **Government's Financial Constraints:** The **government has been the main driver of economic growth** through public spending.
 - However, its **finances are stretched** due to **high borrowings and rising debt levels**.
 - **Fiscal deficit pressures** limit how much more the government can spend to stimulate growth.

Proposed Solution: Boosting Consumer Spending Through Tax Cuts

Many economists argue that **cutting taxes** will put **more money in people's pockets**, encouraging them to **spend more**. This could create a **virtuous cycle**:

- **Higher consumer spending** → Boosts demand for goods/services.
- **Firms invest more** to meet demand → Creates **new jobs** and increases wages.
- **More income leads to more spending**, driving long-term growth.

Why Taxpayers Demand a Tax Cut

- Many Indians **feel overtaxed**, believing the government is **taking too much** from their earnings.
- However, data **presents a more complex picture**, showing that **India is actually under-taxed** compared to global standards.

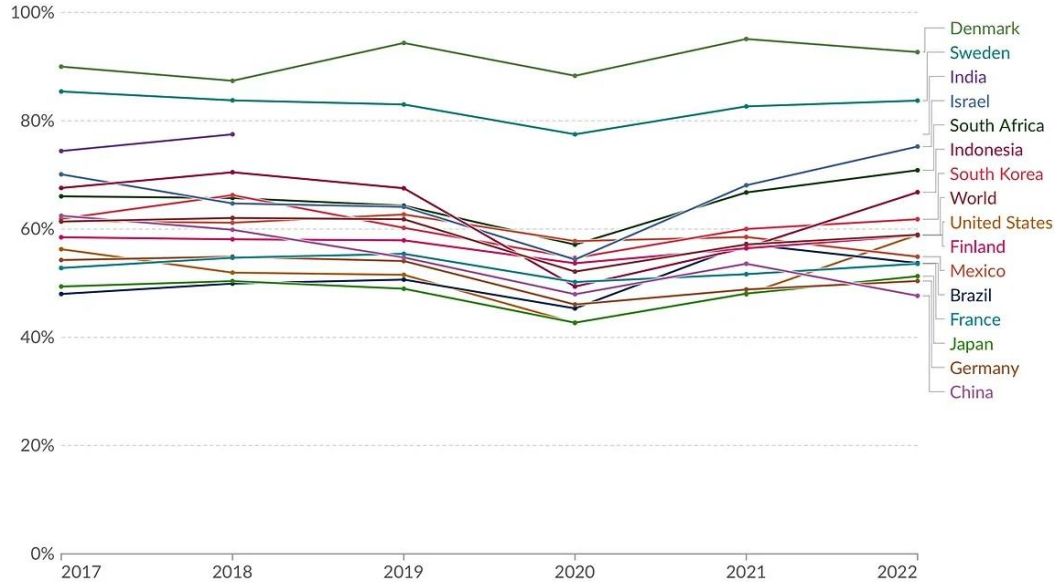
Understanding India's Taxation

India's Government is Highly Dependent on Tax Revenue

Share of central government expenditures funded by taxes, 2017 to 2022



Fines, penalties, and most social security contributions are excluded.



Data source: International Monetary Fund

OurWorldinData.org/taxation | CC BY

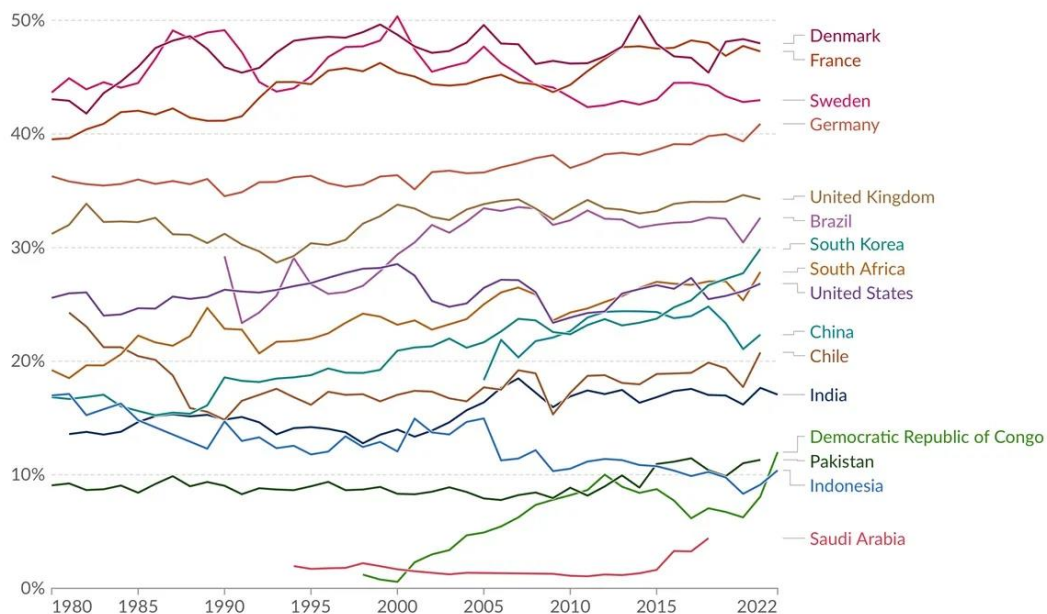
- **Nearly 80% of India's central government expenditures are funded by taxes.**
- **Brazil, Mexico, and China** rely less on tax revenue and more on other income sources.
- **Implication:** Cutting taxes without alternative revenue sources will **force India to borrow more**, which could **increase interest rates** for businesses and consumers.

India's Tax-to-GDP Ratio is Low

Tax revenues as a share of GDP



Direct and indirect taxes as well as social contributions included.



Data source: UNU-WIDER Government Revenue Dataset (2023)

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- India's total **tax revenue is below 20% of GDP**, much lower than **European nations**.
- Developed countries raise **more tax revenue as a % of GDP**, meaning they are **more efficient in taxation**.

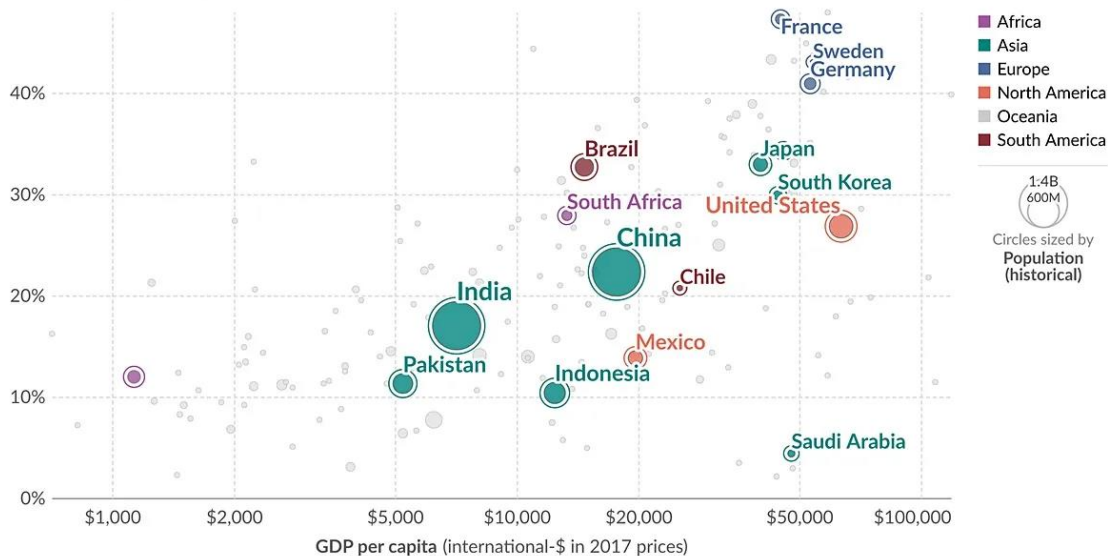
Tax Collection vs. GDP per Capita

Tax revenues as a share of GDP vs. GDP per capita, 2022



Taxes include direct and indirect taxes as well as social contributions. GDP per capita is adjusted for inflation and differences in the cost of living between countries.

Tax revenues (% of GDP)



Data source: UNU-WIDER Government Revenue Dataset (2023); World Bank (2023)

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Note: Tax revenue includes social contributions. GDP per capita is expressed in international-\$¹ at 2017 prices.

1. **International dollars:** International dollars are a hypothetical currency that is used to make meaningful comparisons of monetary indicators of living standards. Figures expressed in international dollars are adjusted for inflation within countries over time, and for differences in the cost of living between countries. The goal of such adjustments is to provide a unit whose purchasing power is held fixed over time and across countries, such that one international dollar can buy the same quantity and quality of goods and services no matter where or when it is spent. Read more in our article: [What are Purchasing Power Parity adjustments and why do we need them?](#)

- **Wealthier nations collect more tax revenue as a % of GDP.**
- **India collects more tax revenue than Indonesia & Mexico but less than China & the US.**
- **Implication:** As India's per capita income rises, tax collections will also naturally increase.

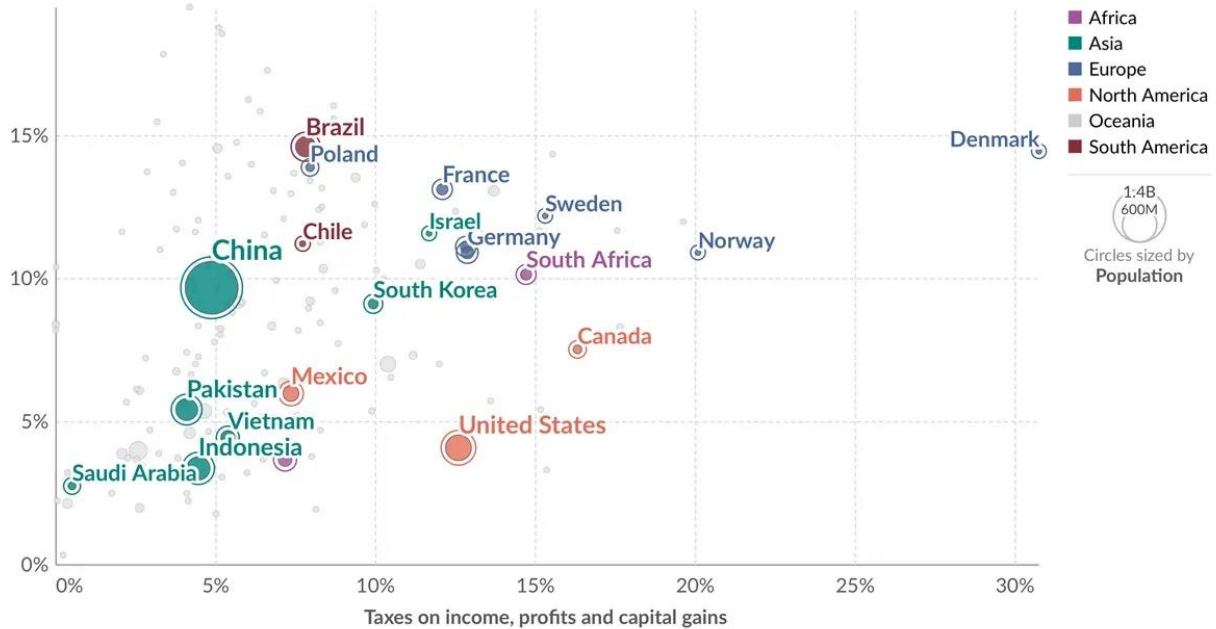
India's Tax Structure: Direct vs. Indirect Taxes

Taxes on income vs. taxes on goods and services, 2022

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Total taxes on income (individual and corporate) vs. total taxes on goods and services (including VAT and sales taxes), as a share of GDP.

Taxes on goods and services (% of GDP)



Data source: UNU-WIDER Government Revenue Dataset (2023)

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- **Direct taxes (income tax) are fairer**, as the rich pay more.
- **Indirect taxes (GST) are regressive**, affecting both rich and poor equally.
- In India, **both direct and indirect taxes contribute around 7% of GDP each**.
- **Implication:** India should focus on increasing **direct tax collection from high-income earners** to reduce dependence on **regressive indirect taxes like GST**.

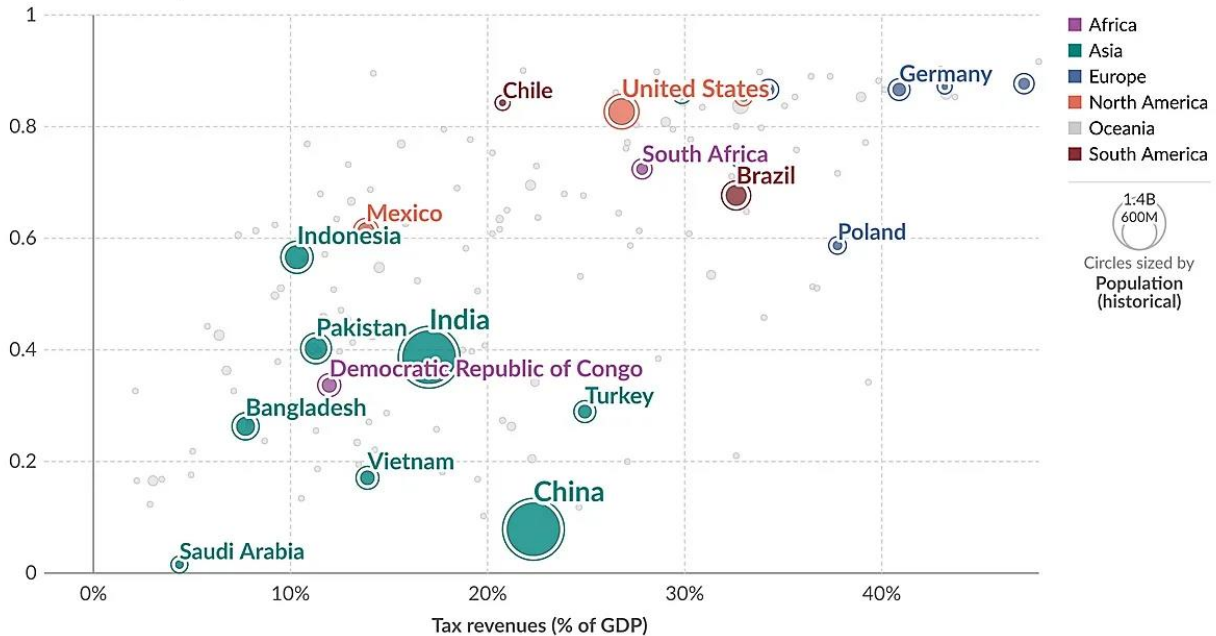
Democracies Collect More Taxes

Tax revenues vs. electoral democracy index, 2022

Our World in Data

Taxes include direct and indirect taxes as well as social contributions. Electoral democracy based on the expert estimates and index by V-Dem¹, ranging from 0 to 1 (most democratic).

Electoral democracy index



Data source: V-Dem (2024); UNU-WIDER Government Revenue Dataset (2023)

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1. V-Dem: The Varieties of Democracy (V-Dem) project publishes data and research on democracy and human rights. It relies on evaluations by around 3,500 country experts and supplementary work by its own researchers to assess political institutions and the protection of rights. The project is managed by the V-Dem Institute, based at the University of Gothenburg in Sweden. Learn more: Democracy data: how do researchers measure democracy? The 'Varieties of Democracy' data: how do researchers measure democracy? The 'Varieties of Democracy' data: how do researchers measure human rights?

- Countries with **higher democracy rankings** tend to **collect more tax revenue**.
- India does **better than Bangladesh** but **lags behind Brazil, the US, and Germany** in tax collection efficiency.
- **Implication:** As India's **democracy matures**, **higher tax collection is expected**.

Is India Over-Taxed or Under-Taxed?

- India's tax revenues (as a % of GDP) are **low** compared to **developed nations**, suggesting **potential for higher tax collection**.
- The **government heavily relies on tax revenue (80%)** to fund its spending, making **tax cuts risky** without alternate revenue sources.
- **As India becomes richer**, **tax collection will naturally increase**, reducing the need for drastic tax hikes or cuts.

Possible Budget Strategies

- **Balanced tax reforms:** Reduce **personal income tax burden** for middle-class earners **without hurting government revenues**.
- **Widen tax base:** Bring more people into the **direct tax net**, reducing reliance on GST.
- **Boost tax efficiency:** Improve tax collection systems to **reduce evasion and increase compliance**.

Source: [Indian Express: Taxes and the Citizens](#)