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The visit of India's Ambassador and Permanent Representative to UNESCO, Mr. Vishal V. Sharma, to the Rudreswara (Ramappa) Temple in Telangana highlights India's sustained engagement with UNESCO-led heritage governance. As a UNESCO World Heritage Site since 2021, the Ramappa Temple represents not only India's rich cultural legacy but also the country's growing leadership role in global heritage conservation and cultural diplomacy.

India's UNESCO Ambassador reviews conservation works at Ramappa Temple

The Hindu Bureau
HYDERABAD

Ambassador and Permanent Representative of India to UNESCO-Paris Vishal V. Sharma visited the Rudreswara (Ramappa) Temple, a UNESCO World Heritage Site, in Palampet village of Mulugu district in Telangana on Sunday to review the preservation and conservation efforts undertaken by the Archaeological Survey of India (ASI) and the State government.

Mr. Sharma, who was in Hyderabad for a programme at the Indian National Centre for Ocean Information Services (INCOIS), also toured the district to assess the ongoing conservation work.

India's UNESCO envoy Vishal V. Sharma at Ramappa Temple in Mulugu district of Telangana on Sunday. SPECIAL ARRANGEMENT

He was accompanied by ASI officials H.R. Desai, Krishna Chaitanya and Rohini Pandey-Ambedkar, along with INCOIS senior executive Nagoji Rao.

Mr. Sharma has served as Chair of UNESCO's prestigious World Heritage Committee during its 46th session, becoming the first Indian to hold the position.

He recently chaired the 20th session of the Intergovernmental Committee for Safeguarding the Intangible Cultural Heritage at the Red Fort in Delhi, during which 'Deepavali' was inscribed on UNESCO's Intangible Cultural Heritage list. It was under his leadership that the Ramappa Temple was inscribed on the World Heritage List in 2021, a press release said.

Key Analysis

1. Significance of Ramappa Temple

The Ramappa Temple (13th century), built during the Kakatiya dynasty, is renowned for:

- Advanced engineering techniques, including "floating bricks"
- Distinctive Kakatiya architectural style
- Integration of temple architecture with landscape and water bodies

Its inscription in 2021 marked India's 39th World Heritage Site, strengthening India's cultural footprint globally.

2. Conservation and Governance

The visit reviewed preservation efforts by:

- Archaeological Survey of India (ASI) – technical conservation and site management
- State Government of Telangana – local infrastructure, tourism management, and community linkage

This reflects a multi-level governance model combining central expertise and state-level implementation, aligned with UNESCO's Operational Guidelines.

3. India's Rising Role in UNESCO

Mr. Sharma's leadership milestones:

First Indian Chair of the 46th UNESCO World Heritage Committee

Chair of the 20th Intergovernmental Committee for Safeguarding Intangible Cultural Heritage

Under his chairmanship:

Deepavali was inscribed on UNESCO's Intangible Cultural Heritage List

This demonstrates India's shift from being a heritage claimant to a norm-setter and agenda-shaper in global cultural institutions.

4. Link with Soft Power and Cultural Diplomacy

Heritage conservation enhances:

India's soft power

Cultural tourism and local livelihoods

International credibility in multilateral forums

Hosting UNESCO sessions (e.g., Red Fort, Delhi) reflects India's capacity in heritage diplomacy and global cultural leadership.

UNESCO World Heritage Sites in India Recent Updates

In 2025, six significant sites from India were added to UNESCO's Tentative List, an essential step before any site can be nominated for the prestigious World Heritage status. This inclusion brings the total number of sites on India's tentative list to 62. The newly added sites are:

Kanger Valley National Park (Chhattisgarh): A biodiversity hotspot known for its dense forests and limestone caves, home to rare species like the Bastar Hill Myna.

Mudumal Megalithic Menhirs (Telangana): Ancient standing stone structures dating back to the Iron Age, believed to be burial markers or commemorative monuments.

Ashokan Edict Sites along the Mauryan Routes: Inscriptions by Emperor Ashoka carved on pillars and rocks to propagate Buddhist teachings and ethical governance.

Chausath Yogini Temples (Multiple States): A series of 64 temples dedicated to the goddess Durga, showcasing unique architectural styles across various locations.

Gupta Temples in North India: Ancient temples from the Gupta period, reflecting the golden age of Indian architecture and sculpture.

Palace-Fortresses of the Bundelas (Madhya Pradesh and Uttar Pradesh): Majestic structures blending Rajput and Mughal architectural styles, illustrating the grandeur of the Bundela dynasty.

Conclusion

The visit of India's UNESCO Ambassador to Ramappa Temple underscores the evolving paradigm of heritage conservation in India—where preservation, diplomacy, and sustainable development converge. It reflects India's growing confidence and credibility in global cultural governance, while reaffirming the importance of safeguarding tangible and intangible heritage as a shared legacy of humanity. Going forward, effective conservation coupled with community participation will be crucial to ensure that World Heritage Sites remain living symbols of cultural continuity rather than static monuments.

UPSC Prelims Practice Question

Ques: With reference to the Rudreswara (Ramappa) Temple, consider the following statements:

1. It was built during the Kakatiya dynasty in the 13th century.

2. It is known for the use of lightweight "floating bricks" in its construction.

3. It was India's first UNESCO World Heritage Site from Telangana.

Which of the statements given above are correct?

(a) 1 and 2 only

(b) 1 and 3 only

(c) 2 and 3 only

(d) 1, 2 and 3

Ans: (b)

Page 07 : GS 3 : Science & Technology/ Prelims

The sharp rise in publication retractions from India since 2022, as highlighted by Achal Agrawal of India Research Watch and reported in Nature and The Hindu, brings into focus a systemic crisis of research integrity in Indian academia. With India now ranking among the top countries for retracted papers, the issue raises serious concerns about academic ethics, governance of higher education, and the unintended consequences of performance-driven evaluation frameworks.

'Publication retractions from India have skyrocketed since 2022'

The biggest concern is the use of gen AI to manufacture fake data, papers and reviews; before AI software became available, paraphrasing applications were employed to avoid detection. consequently, these papers contain ludicrous artefacts; many were submitted, reviewed by software and accepted without anyone reading them at all

Divya Gandhi

Achal Agrawal founded the India Research Watch (IRW) after observing grave academic misconduct in India. Dr. Agrawal, now a freelance data scientist in Raipur, told scientific journal *Nature* how shocked he was when a student spoke casually of using software to publish his work. This amounts to plagiarism, Dr. Agrawal said, but the student insisted his work had passed the university's plagiarism checks. Now a part of *Nature*'s 10 - a list of people "who shaped science in 2025" compiled by the journal - Dr. Agrawal spoke to *The Hindu* about why he decided to quit his university job and devote his time to driving the discourse on research misconduct in India.

India ranks third, after China and the U.S., for publication retraction numbers. Is academic misconduct, such as plagiarism, not taken seriously in Indian academia?

India actually ranks second since 2022. The number of retractions from India has skyrocketed since 2022. Even the percentage of articles getting retracted has seen a sharp increase. It's true that even the discovered cases of misconduct are not taken seriously. We know of cases with more than 30 retractions due to manipulation being felicitated and awarded in a premier Indian Institute.

University Grants Commission (UGC) guidelines stipulate very minimal penalty even if someone is found having plagiarised 60% of the content. Other forms of misconduct like data manipulation, are not even mentioned in the UGC guidelines. Also, most countries have central 'Research Integrity Offices' that investigate and follow up on cases of misconduct. In India, such an office does not exist, and the investigations are left to the institutes, which have a vested interest in letting their researchers continue to use shortcuts.

In what ways is software used unethically to assist published work?

The biggest concern right now is the use of gen AI to generate fake data, papers and reviews. Before gen AI, a lot of people also used paraphrasing software to avoid getting caught for plagiarism. They would take existing papers, pass it through software, and then check if the plagiarism percentage was lower than the threshold. A lot of papers like that were then submitted, reviewed and accepted without anyone reading them at all. They contain hilarious artefacts of paraphrasing: "big data" becomes "colossal information" and "artificial intelligence becomes counterfeit consciousness", for instance. A lot of image manipulation also happens using popular image editing software, but there are increasingly sophisticated tools to detect image manipulation.

Achal Agrawal, founder of India Research Watch. SPECIAL ARRANGEMENT

Why did you feel it was necessary to quit your university job to catalyse this discourse?

It is difficult to do this work while working at a university, as it creates tonnes of conflicts of interest as well as pressures from the university itself. But I did not quit the university solely to do this work. I was also volunteering at a government school in Uttarakhand.

However, not being in the university system gave me the freedom to do this work without any conflict of interest or institutional pressures. I was lucky to be able to do a few freelancing projects too, as a data scientist, to help me with finances.

> NIRF has to be more transparent. For example, we don't know which college was given how much penalty this year, making it imperceptible, and thus ineffective
>
> ACHAL AGARWAL
> INDIA RESEARCH WATCH

How easy is it to prove misconduct?

Most of the cases being caught right now are the really lazy researchers who do a shabby job at hiding the unethical artefacts in their work. The clever ones are way more difficult to prove, especially since it needs cooperation and coordination of several bodies in some cases.

On average, a retraction happens two years after publishing, showing how rigorous the process for a retraction is. A lot of problematic papers that are flagged by sleuths are still not retracted even after clear proof of issues with the paper. Plagiarism detection software, as well as gen AI detection software are not reliable and can't be considered proof. Also, a lot of paraphrasing escapes detection.

India's National Institutional Ranking Framework (NIRF) now pulls up institutions if several papers published by their researchers have been retracted. What more needs to be done?

Penalty for retractions is a necessary step to control this problem urgently. However, it is only treating the symptoms and ignoring the root cause, which in this case are the flawed metrics in NIRF itself, which have given rise to excessive focus on publication statistics. There is an urgent need to review NIRF to make it much more robust and transparent.

For example, we don't know which college was given how much penalty this year, making the penalty imperceptible, and thus ineffective. Also, because of the excessive focus on research, education has really taken a backseat in higher education. Many professors cut corners while teaching to devote more time to research, as it is what is measured and rewarded.

Tell us more about the portal you have created where whistleblowers can report breaches anonymously.

A lot of people are only willing to talk about issues anonymously as they, legitimately, fear retribution for whistle-blowing. So we provide this feature on our portal where one is anonymous by design. The person has the option of providing an anonymous email in case they wish to follow up. We receive about 10 tips a day, but many of them are quite generic in nature asking to look at a certain profile, or are clearly driven by vendetta based on the language of complaint. Certain complaints are genuine, which we follow up and sometimes post about through our handle. However, a 'Research Integrity Office' will be much better placed in dealing with these complaints as they will have the authority to actually pursue and do something about it.

You now face a lawsuit by a private university...

Yes, a civil defamation case has been filed against IRW and is pending. Interim applications were disposed of on December 8 and a copy of the order is now awaited.

THE GIST

The UGC has stipulated only minimal penalties even for 60% plagiarised content. India also has no 'Research Integrity Office' to follow up on cases of misconduct. Investigations are left to the institutes, which have an interest in letting researchers continue to use shortcuts

Most cases that come to light are by researchers who did a shabby job of hiding unethical artefacts. Many problematic papers are not retracted even after proof is furnished. Plagiarism and AI detection software are not reliable and cannot be considered proof

Penalties for retractions are a necessary step. However, the root cause is the flawed metrics by NIRF itself, which led to an excessive focus on publication statistics. Because of this skewed focus, education has taken a backseat

Key Issues and Analysis

1. Scale and Nature of the Problem

India ranks second globally in publication retractions since 2022, with both absolute numbers and percentages increasing sharply.

Misconduct includes:

Plagiarism and paraphrasing to evade detection

Fabrication and manipulation of data and images

Use of generative AI to create fake papers, datasets, and even peer reviews

Many such papers passed through plagiarism software and peer review without substantive human scrutiny, indicating weaknesses in editorial and institutional oversight.

2. Role of Technology: Double-Edged Sword

Generative AI has amplified the scale and sophistication of misconduct by:

Enabling rapid creation of text, data, and images

Lowering entry barriers for unethical publishing

Detection tools (plagiarism or AI-detection software) are:

Inherently unreliable

Insufficient as legal or academic proof: This exposes the limits of techno-solutionism in safeguarding academic integrity.

3. Regulatory and Institutional Gaps

UGC plagiarism regulations prescribe minimal penalties, even for high levels of plagiarism, and do not adequately address:

Data falsification

Image manipulation

Paper mills and AI-generated fraud

Unlike many countries, India lacks a central Research Integrity Office, leaving investigations to individual institutions that often face conflicts of interest.

Instances of researchers with multiple retractions being rewarded indicate normalisation of misconduct rather than deterrence.

4. Incentive Structures and NIRF

Excessive emphasis on publication metrics under NIRF has:

Encouraged quantity over quality

Created pressure to "publish at any cost"

Penalties linked to retractions are opaque and weak, reducing their deterrent effect.

Teaching quality and student learning outcomes have been sidelined as research output dominates evaluation.

5. Whistleblowing and Academic Freedom

The emergence of platforms like India Research Watch reflects:

- Lack of formal grievance redressal mechanisms
- Fear of retaliation among whistleblowers

Ongoing defamation cases against watchdogs raise concerns about:

- Chilling effects on academic scrutiny
- Balance between reputation and public interest

Broader Implications

Credibility of Indian research in global academia is at stake.

Misconduct undermines:

- Evidence-based policymaking
- Innovation ecosystems
- India's aspiration to become a global knowledge hub

Ethically compromised research also poses risks in sensitive domains such as health, environment, and technology governance.

Way Forward

Establish an independent National Research Integrity Office

Revise UGC regulations to cover all forms of misconduct with proportionate penalties

Reform NIRF to balance research quality, teaching outcomes, and ethical compliance

Strengthen peer review through accountability and human oversight

Protect whistleblowers through legal and institutional safeguards

Promote ethics training and responsible AI use in higher education

Conclusion

The surge in publication retractions from India since 2022 is not merely a problem of individual misconduct but a reflection of deeper structural distortions in academic governance and incentive systems. Addressing it requires moving beyond punitive measures to comprehensive institutional reform—one that prioritises integrity, transparency, and quality over numerical metrics. Only then can Indian academia restore credibility and align with global standards of ethical scholarship.

UPSC Prelims Practice Question

Ques : Which of the following best explains the term *"paper mills"*, often discussed in the context of academic misconduct?

(a) Journals that publish papers without peer review

(b) Software tools used to detect plagiarism

(c) Commercial entities producing fraudulent research papers for authors

(d) University presses involved in mass publication

Ans : (c)

UPSC Mains Practice Question

Ques : India has witnessed a sharp rise in academic publication retractions in recent years. Examine the institutional and regulatory factors responsible for this trend. What reforms are required to strengthen research integrity in India?

Page 08 : GS 2 : Indian Polity / Prelims

The recent observations of the Supreme Court in Ranveer Allahbadia vs Union of India (2025), suggesting the creation of autonomous regulatory bodies for online content, have triggered a significant constitutional debate on the role of courts in safeguarding freedom of speech. As argued by Supreme Court lawyer Kaleeswaram Raj, the concern is not merely about online regulation, but about the risk of judicial overreach in an area where constitutional limits, legislative competence, and democratic freedoms intersect.

Courts must protect, not regulate free speech

Kaleeswaram Raj
is a lawyer at the Supreme Court of India

Thulasi K. Raj
is a lawyer at the Supreme Court of India

Freedom of speech is vital for any democracy. The suspect for any attack on the right to free speech is usually the executive or the legislature. However, the proceedings of the Supreme Court of India, in *Ranveer Allahbadia vs Union of India* and other cases have raised the worry that the potential risks of endangering speech could emerge from the Court itself. On November 27, 2025, the Court said that self-styled bodies are insufficient for regulation of online content and suggested the creation of neutral, autonomous bodies. It also suggested that the Government publish the draft regulatory guidelines and invite comments.

Existing laws and regulation

In India, the existing laws already regulate various aspects of speech. Section 67 of the Information Technology Act and Sections 294, 295 and 296 of the Bharatiya Nyaya Sanhita (BNS) penalise obscenity. On online regulation in particular, Sections 66 of the Information Technology Act prohibits computer-related offences such as hacking and 66E of the Act prohibits publishing personal images of others. Section 66F of the same Act penalises cyber terrorism. The Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules were also promulgated in 2021 though they are criticised for their overreaching interference and penal provisions.

Under these rules, there is already an oversight mechanism by the Centre. These rules also impose prior restraint. To illustrate, as per clause II (c) under the appendix of the Rules, a publisher should take " due caution and discretion" while dealing with "activities, beliefs, practices or views of any racial or religious group". Despite the existence of these and other provisions, any attempt at further regulating the right to freedom of speech and expression must be subject to critical analysis, especially when it comes from the Court.

The first concern is about the nature of the case under consideration. The Bench was dealing with a plea challenging the First Information Reports at the instance of persons who are accused of improper or obscene content. The question of online content regulation was not originally the subject matter of such a case.

However, in the earlier proceedings on March 3, 2025, the Court said that it would "extend the scope" of the case to examine the question of what regulatory measures are required to prevent broadcasting which are "offensive to well-known moral standards of our society". This expansion is problematic at the outset. Identifying the problems of content and regulation is something that falls in the legislative domain. In Common Cause vs Union of India (2008), the Court cautioned itself: "Apart from the doctrine of separation of powers, courts must realize that there are many problems before the country which courts cannot solve, however much they may like to." When the Court takes on this task, it is limited by inherent institutional barriers, including that of technical expertise in the field of online media regulation. The Court's obstinacy for regulations in the field also would be vitiated by the same limitations.

> Any attempt at further regulating the right to freedom of speech and expression must be scrutinised, especially when it comes from the top court

The second is about the thin line between regulation and unlawful restraint. A five judge Bench of the Court in *Sahara India Real Estate Corp. Ltd.& Ors. vs Securities & Exch. Board Of India & Anr.,* (2012) had considered in detail the question whether regulation of media content is desirable. Being conscious of the dangers of blanket prohibition, the Court held that pre-censorship of the media must be avoided at all costs. In the context of court reporting, it was held that the postponement orders directed at the media must be done only as a last resort and must satisfy a high threshold of reasonableness.

An outline in the Constitution

Also, the grounds based on which the right to free speech can be restricted are laid down by the Constitution in Article 19(2). This consists of interests of sovereignty, security of the state, public order, defamation and others expressly enumerated. The Court itself, speaking through a five judge Bench in *Kaushal Kishor* (2023) held that additional restrictions beyond what is expressly laid down in Article 19(2) could not be imposed. It was categorically held: "The grounds lined up in Article 19(2) for restricting the right to free speech are exhaustive. Under the guise of invoking other fundamental rights or under the guise of two fundamental rights staking a competing claim against each other, additional restrictions not found in Article 19(2) cannot be imposed on the exercise of the right conferred by Article 19(1)(a) upon any individual."

It is interesting to note that on previous occasions, the Court has effectively restrained itself from venturing into blanket prohibitory measures. In *Adarsh Co-operative Housing Society Ltd. vs Union of India and Others* (2018), when a suggestion was made by a counsel urging the court to direct the film-makers to add a disclaimer before the movie, the Court repelled it.

It said that it is for the Censor Board and not for the Court to decide it, and even the Censor Board could decide it only after hearing the producer or the director of the movie.

Validity of the laws are to be determined by the Court as the constitutional umpire. During the Constituent Assembly debates, Pandit Thakur Dass Bhargava said that "the Supreme Court should ultimately be the arbiter and should have the final say" in situations of challenging the restrictions on freedom, by saying whether "the restrictions put are reasonable" (Constituent Assembly Debates. December 1, 1948). This is the scheme of Article 19 of the Constitution as well. Therefore, constitutional propriety demands that the Court abstains not only from the process of law making but also from the deliberation on the requirement for a law touching the citizen's freedom.

The case abroad

The Court's persuasive demand for further stringent laws in a tricky area could instigate prior censorship or statutory gag. Almost all the major democracies across the world focus on removal of offensive content and penalisation in case of breaching the order for removal of content. The Digital Services Act, 2022 promulgated by the European Union prescribes content removal protocols. The Network Enforcement Act, 2017 in Germany ensures prompt action on harmful content, without adversely impacting free speech. The Online Safety Act, 2023 of the United Kingdom focuses on removal of harmful content and imposing a fine in case of breach. The Online Safety Act, 2021 in Australia imposes a fine on non-compliance with regulation. Unlike these practices in democracies, countries such as China and Russia are invoking draconian laws to restrict online content. Surveillance and pre-censorship also dominate the online content regulation in these jurisdictions. Sadly, even some of the democracies which transform into autocracies also follow suit. David Landau and Rosalind Dixon, in a research paper, demonstrated that "would- be authoritarians at times seek to capture courts and deploy them in abusive ways as part of a broader project of democratic erosion...." (Abusive Judicial Review: Courts Against Democracy, 53 UC Davis Law Review 1313 (2020).

When the Court repeatedly asks for stringent laws to regulate Internet content and when the Centre readily agrees, it is a serious concern in terms of a citizen's freedom. Author Salman Rushdie, when censored, has put it succinctly – "Free Speech is the whole thing, the whole ball game. Free speech is life itself ."

Core Issues and Analysis

1. Constitutional Position on Free Speech

Freedom of speech and expression is guaranteed under Article 19(1)(a).

Restrictions are permissible only on grounds explicitly listed under Article 19(2), such as public order, decency, morality, sovereignty, and defamation.

In Kaushal Kishor v. State of Uttar Pradesh (2023), a Constitution Bench categorically held that the grounds under Article 19(2) are exhaustive, and no additional restrictions can be imposed, even by judicial interpretation.

2. Judicial Role: Protector vs Regulator

Traditionally, courts act as constitutional umpires, adjudicating the validity of laws rather than initiating regulatory frameworks.

In Common Cause v. Union of India (2008), the Supreme Court cautioned against courts stepping into domains they are institutionally ill-equipped to manage, particularly policy and regulation.

Expanding the scope of a case dealing with FIRs on obscenity into a broader exercise on content regulation raises concerns of judicial legislation, undermining the doctrine of separation of powers.

3. Regulation vs Prior Restraint

Existing legal framework already regulates speech:

- IT Act provisions (Sections 66, 66E, 66F, 67)
- Bharatiya Nyaya Sanhita provisions on obscenity
- IT Rules, 2021, which already provide an executive oversight mechanism

In Sahara India Real Estate Corp. v. SEBI (2012), the Court emphasised that pre-censorship must be avoided, and any restraint must meet a very high threshold of necessity and proportionality.

Judicial endorsement of additional regulatory bodies risks legitimising prior restraint, which is constitutionally suspect.

4. Institutional Competence and Democratic Risk

Regulation of online speech involves complex technical, social, and technological considerations, better suited for the legislature after public consultation.

Courts lack:

- Technical expertise in digital governance
- Democratic accountability

Comparative experience shows that even in advanced democracies (EU, UK, Germany, Australia), the focus is on post-publication content removal and penalties, not blanket pre-censorship.

Scholarship on abusive judicial review warns that courts, if captured or over-extended, can become instruments of democratic erosion rather than its safeguard.

5. Judicial Self-Restraint: Past Practice

In Adarsh Cooperative Housing Society v. Union of India (2018), the Supreme Court refused to mandate disclaimers in films, reaffirming that such decisions lie with statutory authorities, not courts.

Constituent Assembly debates also envisaged the Supreme Court as the final arbiter on reasonableness, not as a law-maker or policy initiator.

Implications for Indian Democracy

Judicial encouragement of stricter speech laws may embolden executive overreach.

It risks normalising surveillance, chilling effects, and self-censorship.

Free speech, once curtailed through "reasonable regulation", may gradually slide into constitutional authoritarianism, even within democratic structures.

Conclusion

The constitutional design of India entrusts courts with the duty to protect freedom, not to redesign its regulatory contours. While harmful online content is a genuine concern, addressing it through judicially driven regulatory advocacy risks blurring the line between adjudication and governance. Constitutional propriety, democratic legitimacy, and comparative global practice all suggest that courts must exercise judicial restraint, confining themselves to testing the reasonableness of laws rather than initiating them. In a democracy, as the article underscores, free speech is not merely one right among many—it is the foundation upon which all other freedoms stand.

UPSC Prelims Practice Question

Ques: Consider the following statements regarding Freedom of Speech in India:

1. The grounds for restricting freedom of speech under Article 19(2) are exhaustive in nature.

2. Courts can impose additional restrictions on free speech by balancing it against other Fundamental Rights.

3. Prior restraint on media content is constitutionally permissible only in exceptional circumstances.

Which of the statements given above is/are correct?

A. 1 only

B. 1 and 3 only

C. 2 and 3 only

D. 1, 2 and 3

Ans : b)

UPSC Mains Practice Question

Ques: Discuss the constitutional limits on regulating freedom of speech in India. Can courts legitimately suggest new regulatory frameworks for online content? Substantiate your answer with judicial precedents.

Page 09 : GS 3 : Environment / Prelims

Methane, a greenhouse gas nearly 84 times more potent than carbon dioxide over a 20-year period, has emerged as a critical but under-addressed challenge in India's climate action framework. Recent satellite-based observations suggest that methane emissions from Indian landfills may be significantly underreported, in some cases up to 10 times higher than official estimates. This revelation raises serious concerns about data accuracy, urban waste governance, and India's ability to meet its climate commitments under global frameworks such as the Paris Agreement and the Global Methane Pledge.

Are methane emissions in India being missed?

Satellites show that emissions at key sites can be up to 10 times higher than estimates

DATA POINT

Suyash Nandgaonkar

What fuels landfill fires and is 84 times more potent than carbon dioxide over a 20-year period? The answer is methane. While it is an excellent fuel for kitchen stoves, CNG vehicles, and power plants, it is also busy burning the planet. Methane is generated naturally by decomposing organic matter. The same prehistoric processes that created natural gas reserves are now at work within landfills. Managing methane means not just cleaner cities but also a significant step toward our climate ambitions.

Around 15% of India's methane emissions are from the waste sector. Unlike the agriculture or energy sectors, which require complex, long-term reforms, waste management offers immediate gains through targeted action. Crucially, the policy frameworks and incentives are already in place through national programmes such as the Swachh Bharat Mission.

Targeted action is only possible if we know exactly where the hotspots are, but tracking an invisible gas is difficult. Historically, we have relied on models that estimate emissions by tracking incoming waste volumes and applying baseline assumptions. However, this approach depends on accurate, recurring data, which is often scarce in developing countries. Because such data are aggregated at the regional or national levels and updated infrequently, it makes pinpointing individual sources nearly impossible.

The alternative is physical monitoring, which is even more challenging in the Indian context. Ground-level detection requires expensive equipment, regular maintenance, and constant oversight, making it logistically and technically difficult to scale.

As technology advances, satellites are stepping into this gap. This data broadly fall into two categories: regional measurements that monitor methane over a few kilometers (frequent and useful for national trends), and fine-resolution detection that can pinpoint hotspots down to a few square meters (critical for targeted action).

Satellite data

India has already taken the first steps toward this opportunity. Last year, a paper published by scientists from ISRO quantified anthropogenic methane emissions across the country using satellite data that was acquired in 2023. Based on these measurements, the study identified major dumpsites in Pirana (Ahmedabad), Deonar and Kanjurmarg (Mumbai), and a sewage outlet as significant emitters. The National Green Tribunal took these findings further, establishing a committee to conduct ground investigations at the flagged sites.

Over the past few years, multiple new satellite missions have emerged, such as CarbonMapper's Tanager and the Space Research Organisation Netherlands (SRON) projects. These satellites provide public data covering major landfills across the country, including Ghazipur and Okhla in Delhi, Jawaharnagar in Hyderabad, and Dhapa in Kolkata. Platforms such as ClimateTRACE and WasteMap collate this global monitoring data, combining it with baseline statistics for advanced modeling. These newer models refine traditional calculations by integrating real-time satellite observations and updating landfill-specific estimates to reflect reality.

Globally, satellite surveys estimate that actual landfill emissions can exceed model-based predictions by around 1.8 times. In India, city-level comparisons are difficult due to a lack of granular data on waste characteristics. Consequently, we must rely on State-level estimates from 2018 for sector-wise breakdowns, as newer public data have not yet been compiled. This

The landfill at Bhalswa in northwest Delhi FILE PHOTO: SUSHIL KUMAR VERMA

discrepancy between advanced satellite observations and older State models highlights a critical information gap: we currently cannot agree on the true scale of the numbers or the location of the hotspots.

Differing data

Take Delhi as an example: its 2018 emissions inventory estimates 1.07 million tons of CO_2 equivalent annually from the entire solid waste sector. Recent satellite observations, however, estimate emissions from just Ghazipur and Bhalswa alone to be between 0.85 and 0.96 million tons – almost as much as the sector's entire theoretical footprint. In Mumbai, the data offer a different perspective. While calculations suggest that the Kanjurmarg landfill accounts for 11% of the city's waste emissions, an expected number given its engineered design. However, satellite data show it to be emitting 1.05 million tons. This is almost 10 times the model's estimate and approximately half of the entire State's solid waste emissions. A similar discrepancy emerges in Ahmedabad: while Gujarat estimates 0.73 million tons for the entire sector, satellite observations show the Pirana landfill alone emitting between 0.60 and 0.81 million tons.

These are not just numbers. They indicate potential leakages, accelerated methane generation, or opportunities to refine our engineered systems.. Critically, these are hazards we never tackled

By making data the backbone of our waste policy, we can turn one of our biggest environmental challenges into our smartest climate solution

simply because we did not know they existed. Now, we can not only gauge the magnitude of the problem but, in the case of large landfills, also pinpoint the exact source of the leaks, allowing for precise, targeted solutions.

Of course, these observations come with limitations. Cloud interference and complex weather dynamics mean that satellite data cannot fulfil its potential in isolation. Urban local bodies must complement these findings with ground-level insights, a step that is especially critical for the massive, unwieldy landfills of our metro cities. The real breakthrough lies in linking satellite detection with ground-level action.

Feedback loop

When satellites detect a methane hotspot, ground teams can immediately investigate the cause – whether it is poor waste coverage, a gas collection failure, or illegal dumping. This creates a powerful feedback loop: space-based detection guides targeted ground interventions, while ground data validate and improve satellite accuracy. Integrating other data sources beyond just methane monitoring can further enhance the efficiency of this loop.

At open dumpsites such as Ghazipur, recording dumping and reclamation patterns provides critical insight into how human activity drives methane generation. Meanwhile, at engineered landfills such as Jawaharnagar and Kanjurmarg, infrastructure data on existing gas collection systems can help pinpoint leaks and identify hidden hotspots. Cities such as Bengaluru, with their advanced waste management systems, are well-positioned to integrate these datasets to increase transparency.

To address this, we need coordinated action on three critical fronts: expanding satellite monitoring to cover all major waste sites, establishing on-ground validation systems in metro cities, and creating standardised data-sharing protocols between urban local bodies and oversight agencies.

Currently, urban local bodies operate in silos, separate from the State Pollution Control Boards that oversee them. This disconnect hinders coordinated action on methane reduction. However, the revised municipal waste guidelines already envision a centralised data portal for bulk waste management, handling the wet waste that is the primary source of untreated methane. This portal could be expanded to connect with a standardised nationwide dataset for tracking emissions. Regional bodies such as the Commission for Air Quality Management (CAQM) in the NCR can oversee this monitoring, while the Swachh Bharat Mission can integrate methane targets, aligning them with other central schemes.

This integrated approach delivers multiple co-benefits that make the investment worthwhile. Methane's potential as a fuel is already recognised in policy. Just recently, Indore has utilised the Gobardhan scheme to set up a Bio-CNG plant from its waste.

This strategy creates a powerful ecosystem: satellites detect hotspots, ground teams investigate and fix leaks, and standardised data sharing ensures insights reach decision-makers instantly. What is needed now is coordinated implementation across these three fronts. By making data the backbone of our waste policy, we can turn one of our biggest environmental challenges into our smartest climate solution.

Suyash Nandgaonkar is a Senior Research and Policy Associate at the Energy Policy Institute at the University of Chicago (EPIC India)

Key Issues and Analysis

1. Importance of Methane in India's Emissions Profile

About 15% of India's methane emissions originate from the waste sector, particularly municipal solid waste landfills.

Unlike agriculture and energy, waste-sector methane mitigation offers low-cost, short-term climate gains.

Methane is also a local hazard, contributing to landfill fires, air pollution, and public health risks in urban areas.

2. Limitations of Existing Estimation Methods

India primarily relies on model-based estimates, using waste volume data and standard emission factors.

These models suffer from:

- Infrequent updates
- Aggregated State-level data
- Poor granularity at city or site level

Physical ground-based monitoring is expensive, technically demanding, and difficult to scale across Indian cities.

3. Role of Satellite-Based Monitoring

Advances in satellite technology (ISRO studies, CarbonMapper, SRON missions) now allow:

- Regional monitoring of methane concentrations
- High-resolution detection of site-specific "super-emitters"

Platforms like ClimateTRACE and WasteMap integrate satellite data with existing models, improving accuracy.

4. Evidence of Data Gaps and Underestimation

Case studies reveal stark discrepancies:

- Delhi: Emissions from Ghazipur and Bhalswa landfills alone nearly equal the city's entire estimated waste-sector emissions.
- Mumbai: Kanjurmarg landfill emissions appear nearly 10 times higher than model estimates.
- Ahmedabad: Pirana landfill emissions rival the State's total estimated waste-sector emissions.

These gaps indicate unaccounted leakages, inefficient gas capture, or accelerated methane generation.

5. Governance and Institutional Challenges

Urban Local Bodies (ULBs) and State Pollution Control Boards often operate in silos.

Absence of:

- Real-time, standardised emissions data
- Integrated monitoring and response mechanisms

Existing frameworks like the Swachh Bharat Mission and revised municipal waste rules provide an institutional base but lack explicit methane-focused integration.

6. Towards an Integrated Monitoring–Action Framework

A three-pronged approach is suggested:

Expand satellite coverage of major landfills nationwide.

Establish ground-level validation systems in metro cities.

Create standardised, centralised data-sharing platforms linking ULBs, SPCBs, and national bodies.

Regional regulators such as the CAQM (NCR) and schemes like GOBARdhan can play a catalytic role.

Co-benefits include:

Cleaner cities

Reduced fire and health risks

Energy generation through Bio-CNG (e.g., Indore model)

Conclusion

The emerging satellite evidence suggests that India may be underestimating one of its most critical climate challenges—methane emissions from urban waste. This is not merely a data problem but a governance opportunity. By integrating satellite intelligence with ground-level action and institutional coordination, India can convert invisible emissions into actionable insights. Addressing landfill methane through a data-driven, cooperative, and technology-enabled approach can deliver rapid climate benefits while advancing urban sustainability—making methane mitigation one of India's smartest and most achievable climate solutions.

UPSC Prelims Practice Question

Ques : Which of the following best explains why landfill methane mitigation is considered a "low-hanging fruit" for climate action in India?

(a) It requires no technological intervention

(b) It delivers quick emission reductions compared to agriculture and energy

(c) It does not require coordination with State governments

(d) It is not covered under any national scheme

Ans : b)

UPSC Mains Practice Question

Ques : Methane mitigation in the waste sector offers India an opportunity for rapid climate gains. Critically analyse this statement in the context of urban governance, technology, and existing policy frameworks.

Page 13 : GS 3 : Indian Economy / Prelims

Recent developments across India's maritime sector—from the rapid rise of cruise tourism at Visakhapatnam, to the emergence of GIFT City as a ship-leasing hub, and steady cargo growth at ports—signal a structural transformation in India's port-led development strategy. Together, these trends reflect the convergence of infrastructure creation, financial innovation, and regulatory reform, aligning with national initiatives such as Sagarmala, Cruise Bharat Mission, and Make in India.

Ship leasing in full sail at GIFT City

Today, bulk carriers account for 43% of the ships leased or purchased from GIFT IFSC, with the value of assets leased rising to $1.47 billion, according to data shared by International Financial Services Authority (IFSCA), the unified regulatory in GIFT City

NEWS ANALYSIS

Avinash Nair

Launch pad:

In just two years since ship leasing took off at GIFT City in Gujarat, the numbers are already turning heads. As of October this year, 27 registered ship-leasing entities are operating from the International Financial Services Centre (IFSC) at India's first global finance enclave, and the number of vessels leased or purchased has more than doubled to 30 in the past year (16 ships purchased and 14 ships leased).

The shift is significant. Until recently, India had no dedicated platform for leasing ocean-going vessels. After Ripley Shipping India IFSC Pvt. Ltd. became the first entity to lease a bulk carrier in June 2023, GIFT IFSC is fast emerging as one of the few financial centres globally to host a comprehensive, regulator monitored ship-leasing regime. The services covered include financial leases, operating leases, hybrid structures and sale-and-leaseback transactions.

Today, bulk carriers account for 43% of the ships leased or purchased from GIFT IFSC, with the value of assets leased rising to $1.47 billion, according to data shared by International Financial Services Authority (IFSCA) – the unified regulatory in GIFT City.

In all, 13 bulk carriers, ranging from 75,500 DWT to 106,00 been lease to date. Th vessel lease is a 150,00(crude oil c month leas presents size of tank sit the Suez ly loaded. I the fleet GIFT inclu gas carrier ships, one product ta tankers, ar tanker.

Relocatio Of the 30 purchased. flagged ves flags inclu lands (six v (one), Port Singapore

the facility to create Indian-domiciled lessors operating under a globally aligned framework.

This helps reduce reliance on offshore leasing centres while enabling competitive financing. The clarity and depth of the IFSCA framework are an added attraction. With prescribed capital ing Services, concurs. "The key challenges are in streamlining the import process of Indian flag ships in IFSC. Rule 29b of SEZ Act requires ships to file bill of entry and shipping bill every time a ship is leased in or out of IFSC. This rule is fine for aircraft as that is a different business with long-term char-

Vizag's cruise traffic: 10,000 and counting

Key strength: The terminal has been able to attract all stakeholders in view of its strategic location . K.R DEEPAK

G. Naga Sridhar

Ports gear up to haul more cargo after a good year

Prashant Vasisht

The Indian port sector maintained a stable performance in FY2025, with cargo volume growing about 3.3% year-on-year (YoY). Petroleum, oil, and lubricants (POL) – including crude oil, LNG, and LPG – accounted for the largest share at around 28%, followed by coal at 24% and containers at 21.5%.

The remaining 27% comprised iron ore, fertilisers, and other cargo. The growth was primarily driven by an 11 % increase in container volumes and a 3 % rise in POL, even as coal and iron ore volumes moderated. Container volumes increased due to the rising containerisation of cargo in the country.

During the first seven months of FY2026, cargo volumes at major and non-major ports cumulatively grew by 4.1% compared to the same period in FY2025. Going forward, overall cargo volumes are expected to grow by 3-5% in FY2026, supported by strong performance in the container and fertiliser segments. POL volumes are likely to follow their long-term growth trend of 2-4%, while iron ore shipments may decline further, due to increased domestic coal production.

Lion's share: Petroleum, oil, and lubricants, including crude oil, LNG, and LPG, accounted for the largest share at 28%. REUTERS

In FY2025, container volume grew by 11% to 351 million tonnes (MT) from 317 MT in FY2024, and subsequently improved to 214 MT in 7M FY2026, with a 6% YoY growth.

In FY2025, the port sector saw significant policy reforms aimed at modernising and streamlining maritime operations. The Parliament passed five landmark Bills – Bills of Lading; Carriage of Goods by Sea Bill; Coastal Shipping Bill; Merchant Shipping Bill; and Indian Ports Bill – which collectively replaced legacy maritime laws. The reforms are aimed at boosting operational efficiency, simplifying documentation, enhancing regulatory clarity, and promoting sustainable coastal shipping. Further, the government is working towards allowing pre-November 2021 terminals the freedom to set market-based tariffs, as also creating a level playing field for all terminals.

India's strategic location gives it a competitive advantage over several other countries as a natural transshipment hub for cargo moving between Europe, Africa, and Asia. Additionally, India's growing domestic market ensures sustained demand for ports and shipping services. India also benefits from a cost advantage in terms of lower port handling charges compared to other countries. Further, there has been significant policy support in recent years to strengthen India's position in the global trade and shipping landscape.

Union Budget 2026-27 is expected to prioritise support for the shipbuilding and repair industry through measures such as expanding the Maritime Development Fund (MDF) corpus, and increasing shipbuilding financial assistance to strengthen domestic yards and enhance their global competitiveness. Additionally, significant emphasis is likely on port modernisation and connectivity, with continued allocations to the Sagarmala project.

Bigger investments in the Inland Waterways Authority of India (IWAI) are anticipated, alongside a long-term focus on improving both inland and port connectivity. This includes efforts to decongest railway networks to facilitate port traffic and reduce overall logistics costs.

(The writer is Senior VP and Co-Group Head, Corporate Ratings, ICRA Ltd.)

2025, Jurgen Bailom, President and CEO of Waterways Leisure Tourism and Cordelia Cruises, had said that VPA was set to become the next home port on the eastern coast for premier cruise services.

VICT is projected to double its passenger throughput to 20,000 by 2029, aligning with the targets outlined in the Cruise Bharat Mission.

(The writer is with The Hindu businessline)

Key Dimensions of Analysis

1. Cruise Tourism as a New Growth Driver

The Visakhapatnam International Cruise Terminal (VICT), inaugurated in 2023, has already handled nearly 10,000 cruise passengers, exceeding initial expectations.

Strategic advantages include:

- Location in the Outer Harbour
- Proximity to tourist circuits
- ISPS-compliant, world-class infrastructure

With cruise liners like MV The World and MV Empress, Vizag is emerging as a home port on the east coast, complementing western ports such as Mumbai and Kochi.

Aligned with the Cruise Bharat Mission, VICT's projected doubling of traffic to 20,000 by 2029 highlights cruise tourism's potential for:

- Employment generation
- Coastal urban development
- Soft power and people-to-people connectivity

2. GIFT City and the Financialisation of Maritime Assets

Ship leasing at GIFT IFSC marks a paradigm shift:

- 27 registered entities
- 30 ships leased or purchased within two years
- Asset value of $1.47 billion

India, traditionally dependent on foreign leasing hubs (Singapore, Europe), is now internalising maritime finance under IFSCA's unified regulatory framework.

Benefits include:

- Reduced foreign exchange outflow
- Greater regulatory oversight
- Strengthening India's maritime sovereignty

However, challenges persist:

Closed ship registry norms

Procedural hurdles under SEZ rules

Need for recognition of shipping as an infrastructure sub-sector

3. Port Cargo Growth and Policy Reforms

Indian ports recorded 3.3% cargo growth in FY2025, with strong performance in:

Containers (11% growth)

POL cargo (28% share)

Rising containerisation reflects India's deeper integration into global value chains.

Parliament's passage of five landmark maritime Bills modernised outdated laws, improving:

Regulatory clarity

Ease of doing business

Coastal shipping efficiency

Continued investments under Sagarmala, focus on inland waterways (IWAI), and port-rail-road connectivity aim to reduce logistics costs and boost competitiveness.

4. Strategic and Economic Significance

India's geographic position gives it a natural edge as a transshipment hub between Europe, Africa, and Asia.

Lower port handling charges and a growing domestic market provide sustained demand.

The expected push in Union Budget 2026–27 for shipbuilding, repair, and port modernisation indicates long-term strategic intent.

Conclusion

India's maritime sector is entering a phase of consolidation and expansion, driven by port modernisation, cruise tourism, and innovative financial ecosystems like GIFT City. While infrastructure and policy momentum are evident, addressing regulatory bottlenecks, easing procedural rigidities, and enhancing multimodal connectivity will be critical. If effectively implemented, this integrated maritime push can position India as a regional maritime hub, reduce logistics costs, and significantly contribute to sustainable economic growth—making ports not just gateways for trade, but engines of national development.

UPSC Prelims Practice Question

Ques : Consider the following pairs:

Initiative	Primary Objective
1. Sagarmala Programme	Port-led infrastructure development
2. Cruise Bharat Mission	Promotion of coastal and cruise tourism
3. GOBARdhan Scheme	Bio-energy from organic waste

Which of the pairs given above are correctly matched?

(a) 1 and 2 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

Ans : d)

UPSC Mains Practice Question

Ques : India's port sector has shown resilience despite global trade uncertainties. Examine the recent performance of Indian ports and highlight the role of policy reforms in improving their competitiveness.

Page : 08 : Editorial Analysis

The right moment to boost India-Ethiopia ties

Ethiopia, with a population of around 109 million (2024) and as one of Africa's fastest-growing economies, is of growing strategic and economic interest to major partners, including India. Its substantial manufacturing base, large domestic market, and geographic position in the Horn of Africa make it one of the continent's pivotal states.

Despite internal challenges, Ethiopia continues to be viewed as a regional anchor of stability with an effective military, and a central role in the evolving politics of a subregion marked by conflict. It is also the headquarters of the African Union and a potential renewable-energy powerhouse, especially in hydropower, positioning it to become an important regional energy exporter.

Although landlocked, Ethiopia has traditionally relied on Djibouti for access to the Red Sea. Recent efforts to diversify access through Somaliland and Eritrea underline its desire to secure strategic autonomy in trade and logistics. Politically, the country is emerging from the traumas of civil conflict and is attempting to build a new national consensus. This regeneration provides an important window for enhancing India-Ethiopia engagement across multiple domains.

Deep ties with India

India's relationship with Ethiopia has deep and long-standing roots. For more than a century, Indian teachers and university professors have formed the backbone of Ethiopia's education system, shaping generations of students and earning enormous respect. Although the number of Indian teachers has declined, Ethiopia's interest in educational collaboration remains high. Ethiopia was the pilot country for the Pan-African e-Network project in 2007 and has maintained long-term cooperation with IIT Delhi for tele-education, demonstrating strong receptivity to modern educational technologies.

Today, Ethiopia sends one of the highest numbers of African students to India, often through government-funded programmes. Remarkably, it has the largest number of PhD students from Africa studying in India. Ethiopia also successfully used graduates from the Pan-African e-Network's Master's programmes to help staff newly opened universities and academic departments.

Expanding this education partnership – through digital learning, vocational training, university linkages and new scholarship frameworks – remains one of the most promising avenues for bilateral cooperation.

Gurjit Singh

is an author and a former Ambassador to Ethiopia and the African Union

With Ethiopia attempting to build a new national consensus, its engagement with India can be developed across multiple domains

Investment and defence cooperation

Indian investment in Ethiopia is another pillar of the partnership. Indian businesses first ventured into Ethiopia in the 1950s, but the real surge came after India extended major lines of credit beginning in 2006. These catalysed a wave of private investment that surpassed $4 billion. Ethiopian leaders continue to acknowledge the positive developmental impact of Indian investors, particularly at a time when International Monetary Fund (IMF) conditionalities require the country to mobilise new capital. While earlier investments focused heavily on agriculture, many investors withdrew due to taxation and operational issues.

Today, the most promising opportunities lie in mining – especially gold, critical minerals, and rare earth elements – which is an area where Ethiopia has vast but underexplored potential. The Indian Embassy's recent comprehensive mining survey identifies key opportunities while noting regulatory, infrastructural, and logistics constraints that must be addressed. If India can work with Ethiopia to commission and operate selected mines, this could help secure supplies for India's fast-growing renewable energy, battery, and semiconductor sectors. Mining cooperation could become a core element of a strategic economic partnership.

Defence cooperation is another promising frontier. Ethiopia was one of the first foreign countries to receive Indian military assistance, beginning with the establishment of the Harar Military Academy in 1956. Since 2009, Indian defence teams have supported the training of Ethiopian forces. After years of demanding internal deployments and operations in Somalia, the Ethiopian military requires fresh training and modern equipment to replace aging Soviet-era systems. India, with its competitively priced and battle-tested platforms, is well placed to become a key supplier.

A new MoU on defence cooperation and the first meeting of the Joint Defence Cooperation Committee held this year provide an institutional framework for expanding training, capacity building, and defence exports. Ethiopia, which has responsibly repaid earlier Indian lines of credit under the Indian Development and Economic Assistance Scheme (IDEAS) programme, could be considered for new defence-related lines of credit within IMF guidelines.

Potential for a new phase

As both countries enter new phases of development, and with Ethiopia now a member of BRICS, the moment is ripe to redefine the partnership. Ethiopian officials repeatedly express strong interest in attracting Indian investment, especially in pharmaceuticals, agro-processing, light manufacturing and mining.

India could help by updating bilateral agreements such as the Double Taxation Avoidance Agreement (DTAA) and the Bilateral Investment Treaty to support private-sector engagement. Ethiopia, in turn, needs to address long-standing investor concerns related to foreign exchange availability, taxation, approvals, and consistency of regulations. The 2,500-strong and influential Indian diaspora, represented through the India Business Forum, continues to highlight foreign exchange accessibility as a key bottleneck.

At the multilateral level, expanding cooperation through BRICS, G-20 platforms, and South-South frameworks strengthens political convergence. Demonstrating success stories of Indian investment within Ethiopia and across Africa could help both countries build wider regional partnerships. Under the African Continental Free Trade Area (AfCFTA), Ethiopian-based Indian companies can now access East African and continental markets more easily, making Ethiopia an attractive hub for Indian enterprises. In a rapidly changing global economy – marked by tightening regulations in the United States and European Union and uncertainty around arrangements such as African Growth and Opportunity Act – India's duty-free tariff preference scheme for Ethiopian exports remains important. Ethiopia can leverage this preferential access by welcoming more Indian investors, including in export-oriented manufacturing with buy-back arrangements.

Overall, the prospects for India-Ethiopia relations are bright. With renewed political will, targeted reforms, and strategic alignment, the partnership can evolve into one of the most dynamic and mutually beneficial relationships between India and Africa in the coming decade.

The meeting between Prime Minister Narendra Modi and Ethiopian Prime Minister Abiy Ahmed Ali at Johannesburg during the G-20 summit has catalysed the relationship again.

GS Paper 2 : International Relations

UPSC Mains Practice Question : Ethiopia's membership of BRICS and its role in the Horn of Africa enhance its importance for India. Analyse how India can leverage this partnership to advance its interests in Africa and the Global South. (150 words)

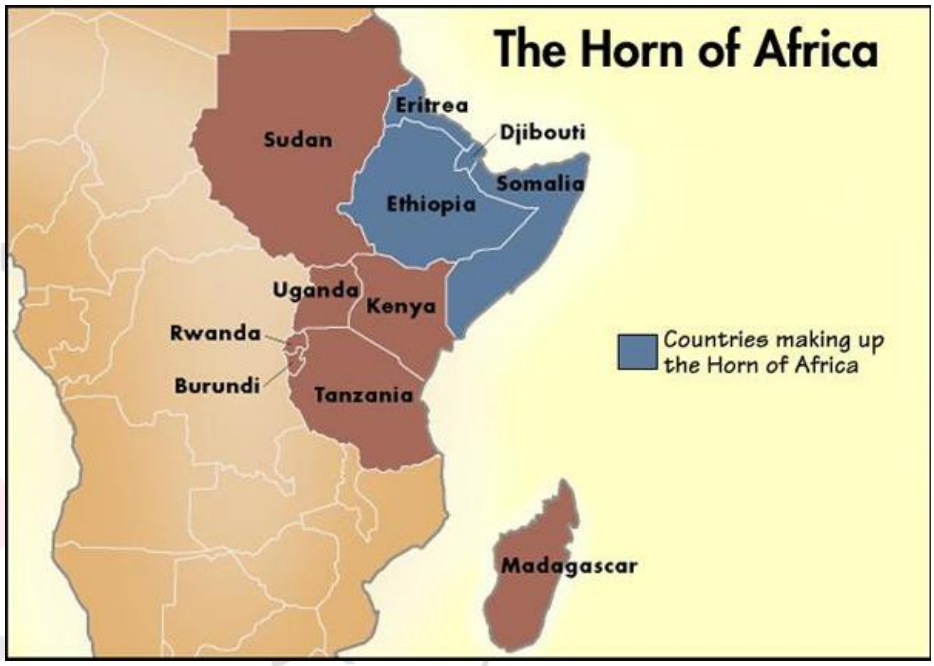
Context :

Ethiopia, one of Africa's most populous nations and fastest-growing economies, is emerging as a key strategic partner for India in the Horn of Africa. With its large domestic market, manufacturing base, renewable energy potential, and status as the headquarters of the African Union, Ethiopia occupies a pivotal position in Africa's political and economic landscape. The recent engagement between Prime Minister Narendra Modi and Ethiopian Prime Minister Abiy Ahmed Ali at the G-20 summit signals renewed momentum in bilateral relations, making this a timely opportunity to deepen India–Ethiopia cooperation.

Where is Ethiopia?

It is a landlocked country located in the Horn of Africa, officially known as the Federal Democratic Republic of Ethiopia.

- The country lies completely within the tropical latitudes and is relatively compact, with similar north-south and east-west dimensions.
- The capital is Addis Ababa.
- Ethiopia is one of the world's oldest countries, its territorial extent having varied over the millennia of its existence.
- It is the tenth-largest country in Africa in terms of area.
- Ethiopia is located from Sudan in the southeast, Eritrea to the south, Djibouti and Somalia to the west, Kenya to the north, and South Sudan to the east.
- It is the most populous landlocked country in the world.



Key Dimensions of India–Ethiopia Relations

1. Strategic and Geopolitical Importance

Ethiopia acts as a regional anchor in the conflict-prone Horn of Africa.

Its effective military and diplomatic centrality through the African Union enhance its strategic relevance.

Efforts to diversify Red Sea access beyond Djibouti reflect Ethiopia's pursuit of strategic autonomy, an area where India's experience in maritime logistics and diplomacy can be leveraged.

2. Historical and Educational Linkages

India has enjoyed deep people-to-people ties, particularly through education.

Indian teachers historically shaped Ethiopia's higher education system.

Ethiopia remains one of the largest African sources of students in India, including the highest number of African PhD scholars.

Initiatives such as the Pan-African e-Network demonstrate India's soft power and technological diplomacy.

Expanding digital education, vocational training, and research collaboration offers high returns with low political risk.

3. Economic Engagement and Investment

Indian investment in Ethiopia exceeds $4 billion, supported by Lines of Credit since 2006.

While earlier investments in agriculture faced constraints, new opportunities lie in:

- Mining (gold, rare earths, critical minerals)
- Pharmaceuticals and agro-processing
- Light manufacturing

Mining cooperation aligns with India's needs for renewable energy, battery storage, and semiconductor supply chains.

Ethiopia's membership in BRICS and participation in AfCFTA enhance its role as a regional hub for Indian companies.

4. Defence and Security Cooperation

Defence ties date back to the 1950s, including the establishment of the Harar Military Academy.

India has been involved in training Ethiopian forces since 2009.

Ethiopia's need to modernise aging military equipment creates scope for:

- Indian defence exports
- Training and capacity-building programmes

A new MoU on defence cooperation and the Joint Defence Cooperation Committee provide an institutional framework for expansion.

5. Institutional and Multilateral Cooperation

Platforms such as BRICS, G-20, and South–South cooperation frameworks strengthen political alignment.

India's Duty-Free Tariff Preference (DFTP) scheme offers Ethiopia an edge amid global trade uncertainties.

Updating bilateral instruments like the DTAA and Bilateral Investment Treaty can unlock private-sector confidence.

Challenges

Foreign exchange shortages and regulatory inconsistencies in Ethiopia.

Taxation and approval delays affecting Indian investors.

Need for policy predictability to sustain long-term engagement.

Conclusion

India–Ethiopia relations stand at a critical inflection point. Ethiopia's economic regeneration, BRICS membership, and strategic importance in Africa coincide with India's expanding global footprint and quest for diversified partnerships. By leveraging historical goodwill, expanding education and defence cooperation, and aligning economic engagement with Ethiopia's reform priorities, India can elevate this partnership into a model of mutually beneficial South–South cooperation. With sustained political will and targeted reforms, India–Ethiopia ties have the potential to become one of India's most dynamic engagements in Africa in the coming decade.