BAJIRAO IAS ACADEMY

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E-WASTE

E-WASTE MANAGEMENT

THE EDUCATIONAL LANDSCAPE IN INDIA

The educational landscape, its disconcerting shift

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Education has historically been regarded as the cornerstone of societal advancement – a realm where critical thinking, free inquiry, and the pursuit of knowledge could flourish. At its best, higher education had always cultivated intellectual independence, nurtured dissent, and inspired progress across disciplines and societies. The boundaries of human understanding were continually pushed through unfettered dialogue and academic exploration.

Yet, in recent decades, the educational landscape, especially within universities, has undergone a profound and disconcerting shift. Institutions once celebrated for fostering independent thought now appear increasingly constrained by bureaucratic controls, external mandates, and ideological gatekeeping. Rather than serving as laboratories of innovation and resistance, the Canadian thinker, H.A. Giroux, sees universities becoming engines of conformity, prioritising managerial efficiency and market alignment over academic freedom and intellectual integrity. Indoctrination, intimidation and intolerance become the central ingredients of education.

From independence to centralisation

A particularly disquieting development in this decline is the unyielding centralisation of academic curricula. In the past, universities enjoyed considerable autonomy to craft syllabi tailored to their students' needs, faculty expertise, and the shifting contours of intellectual inquiry. Today, however, this independence is steadily eroding. Centralised agencies – be they governmental bodies such as the University Grants Commission (UGC) or frameworks such as the National Education Policy (NEP) – increasingly dictate the structure and content of academic programmes. These prescriptions are often influenced not by academic merit or pedagogical philosophy, but by economic agendas or partisan leanings.

The UGC, originally intended to coordinate academic standards, has mutated into an instrument of control. It dictates appointments, interferes in administration, and shapes curricula, often with scant regard for academic judgement, thereby becoming the long arm of a state increasingly intolerant of independent or critical thinking. Let us be clear: this is not about standards – it is about submission. Under the guise of regulation, the UGC has eroded the autonomy of Indian universities to the point of extinction. The promise of self-governance has been replaced with bureaucratic tutelage. An institution that is stripped of autonomy in faculty selection, research direction, and protection of dissent ceases to be a university in any meaningful sense.

The consequences of this centralisation are far-reaching. It undercuts not only academic autonomy but also produces compliant drones, regiments intellectual discourse, and marginalises alternative perspectives. When syllabi are standardised across regions and institutions, the intellectual ecosystem becomes monolithic – devoid of diversity, nuance, or radical innovation. This intellectual flattening not only stifles creativity but also discourages the interrogation of dominant narratives and received assumptions.

Institutions once celebrated for fostering independent thought, now face bureaucratic controls, external mandates and ideological gatekeeping

Pressures on the academic climate

Historically, campuses have played a vital role in catalysing social change – whether in anti-colonial movements, civil rights struggles, or pro-democracy uprisings. By exerting control over what is taught and how it is taught, policymakers and administrators ensure that universities remain compliant rather than confrontational. Suppressing critical perspectives ensures that higher education does not produce citizens who question authority or imagine alternatives to the status quo. Take, for instance, a research scholar who gives a reference to Noam Chomsky's views on the decline of democracy or talks about nationalism and human rights. There is every chance that the student and his supervisor will be reprimanded by the state, a preposterous intervention indeed.

Take, for instance, the resurgence of reactionary politics that has led to increasing interference in academic affairs. Scholars whose work critiques systemic injustice, discriminatory politics, corporate exploitation, or nationalist rhetoric often find themselves marginalised, defunded, or even expelled or deported. Entire disciplines, especially in the social sciences and humanities, are being defunded or dismissed as politically awkward.

Such pressures have had an unsettling effect on academic life. Teachers, wary of professional reprisals, begin to engage in self-censorship. Controversial research topics are sidestepped not out of disinterest, but out of fear. Students, too, internalise this climate of caution, refraining from engaging critically with contentious issues, apprehensive about academic penalties, peer backlash, or threats to their future careers. The outcome is a smothering intellectual climate where fear of dissent trumps inquiry, and conformity is mistaken for collective wisdom, resulting in the decline of public intellectuals.

This erosion of academic freedom is compounded by the increasing corporatisation of higher education. Universities are no longer viewed as public institutions dedicated to knowledge and social advancement. Instead, they are treated as businesses, expected to generate profit, attract investment, and enhance their brand image. The logic of the market now governs the priorities of educational institutions, reshaping both what is taught and why it is taught. The corporate corruption of higher education and the wrecking of the university is indeed apparent.

Consequently, disciplines that promise immediate financial returns – such as technology, business, and engineering – receive substantial funding and institutional support. Meanwhile, fields that emphasise critical thought, ethical reflection and historical understanding – such as philosophy, literature, and the arts – are sidelined as unproductive or irrelevant. The value of education is thus reduced to its marketability, and knowledge becomes a commodity to be consumed rather than a pursuit to be cherished.

It is often seen that faculty members are not immune to these pressures. Academic faculty are increasingly subject to performative pressures, evaluated through metrics such as publication counts and student satisfaction ratings. The proliferation of global university rankings exacerbates this issue, prioritising conformity to western norms and standardised metrics over indigenous intellectual traditions and context-specific inquiry. This regime incentivises strategic branding and replication of external models, rather than genuine academic innovation.

Academic governance as a concern

This shift has also altered the structure and the ethos of academic governance. University leadership, it is now proposed, can comprise administrators drawn from corporate backgrounds rather than only academic. These individuals will, understandably, bring with them a managerial mindset that privileges efficiency, quantifiable outputs, and brand visibility over scholarly rigour and pedagogical richness. Furthermore, the appointment of Vice Chancellors from non-academic fields compromises the collegial culture of universities, disconnecting decision-making from teaching and research realities.

Visibly, the prevailing trend of appointing academics lacking intellectual engagement with literature and social issues raises concerns about ideological biases influencing leadership selections. To address this, universities should prioritise appointments grounded in the intellectual ethos of liberal arts and sciences, ensuring that selection procedures are rigorous and objective.

The crisis of education has, therefore, at its core, a crisis of imagination. The university must at all costs be preserved as a sanctuary of intellectual freedom, where merit is not the casualty. Failure to do so imperils not only education but also the very idea of democracy. By reclaiming the university's essence, we restore the transformative potential of knowledge, rather than reducing it to mere transaction.

Context

- The **increasing centralisation by regulatory bodies** like the UGC, ideological interference, and the **corporatisation of university spaces** is leading to growing threats to academic freedom and institutional autonomy in Indian higher education.

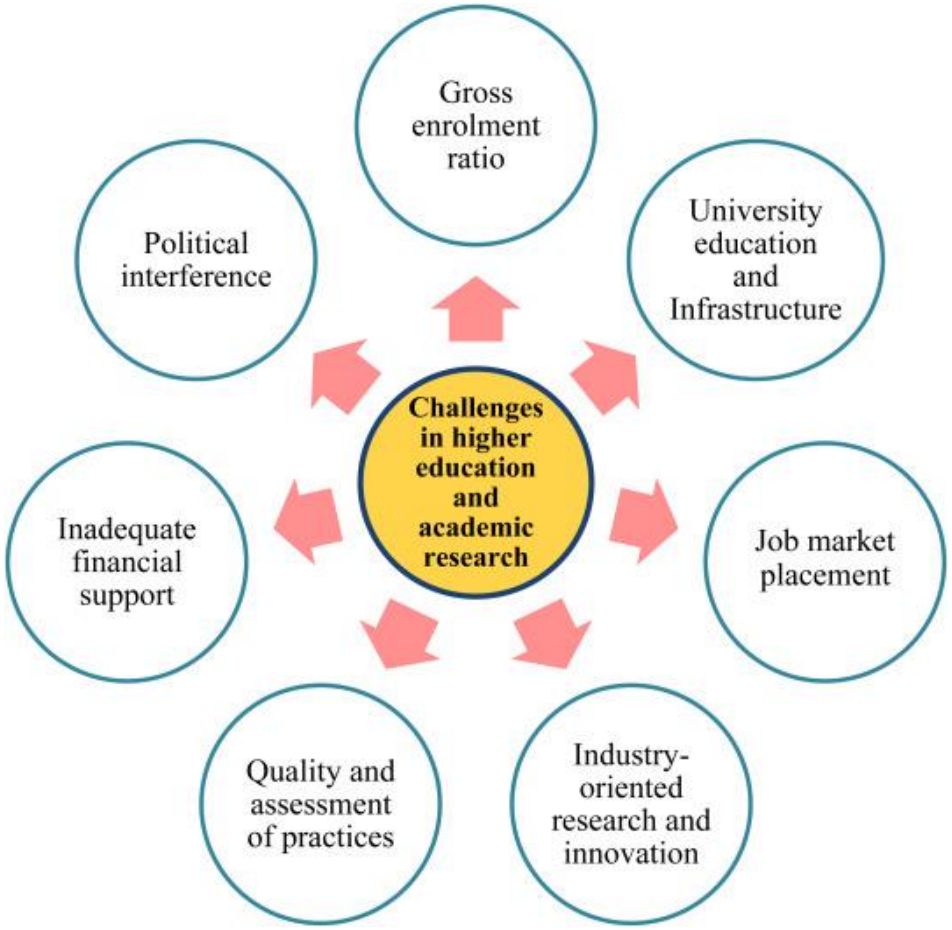
- It reflects a broader crisis in higher education governance and the **shrinking space for dissent and critical thinking**

Centralisation and Bureaucratic Control over Academia

- Centralised bodies like the **University Grants Commission (UGC)** and policies like the **National Education Policy (NEP)** now heavily influence syllabus design, appointments, and research direction, undermining academic judgment and institutional independence.

- Uniformity in syllabus across institutions **eliminates regional, disciplinary and ideological diversity,** leading to intellectual stagnation and discouraging radical or alternative approaches to knowledge.

- Universities are increasingly turned into i**nstruments of state control,** where referencing critical thinkers (e.g., Noam Chomsky) or critiquing nationalism may attract penalties, surveillance, or administrative backlash, curbing democratic expression.

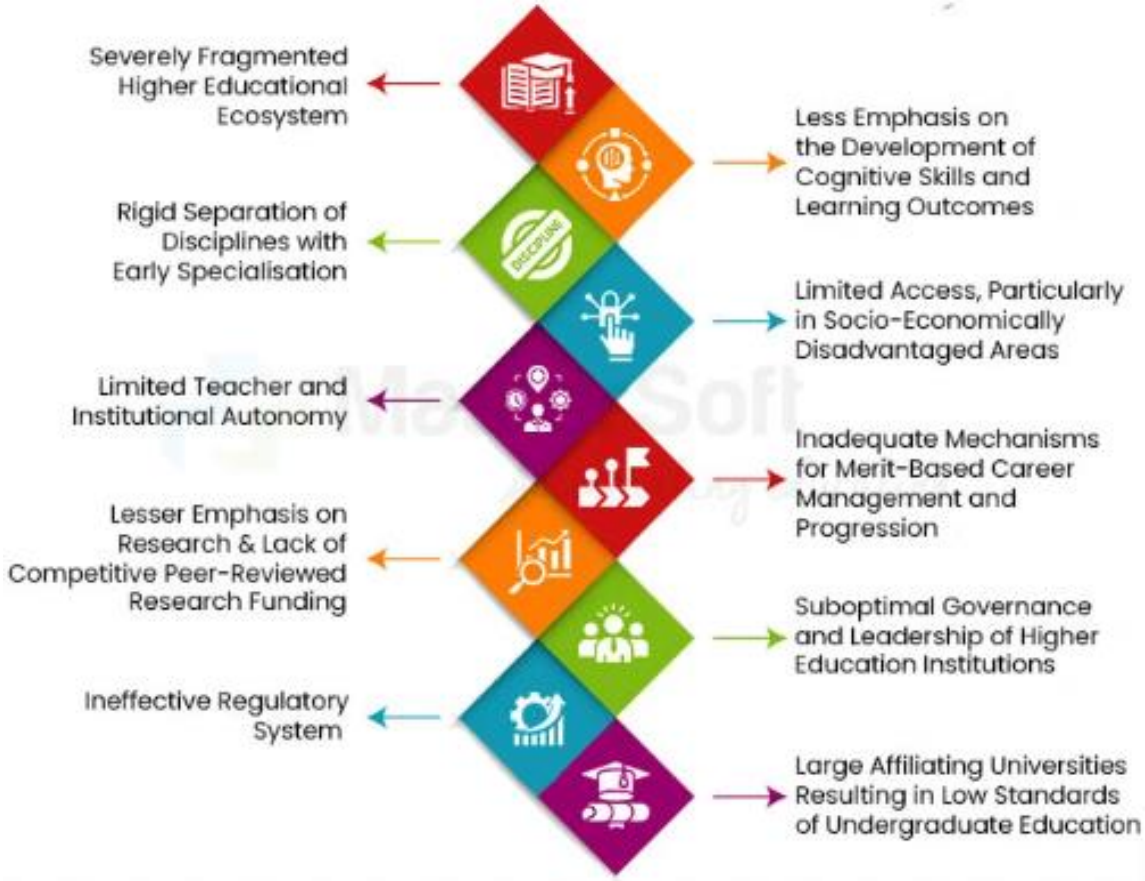


Corporatisation and Market-Driven Academic Priorities

- Universities are being **restructured on corporate models,** where the focus shifts from public service to profit-generation, rankings, and brand visibility, thereby **eroding the educational ethos.**

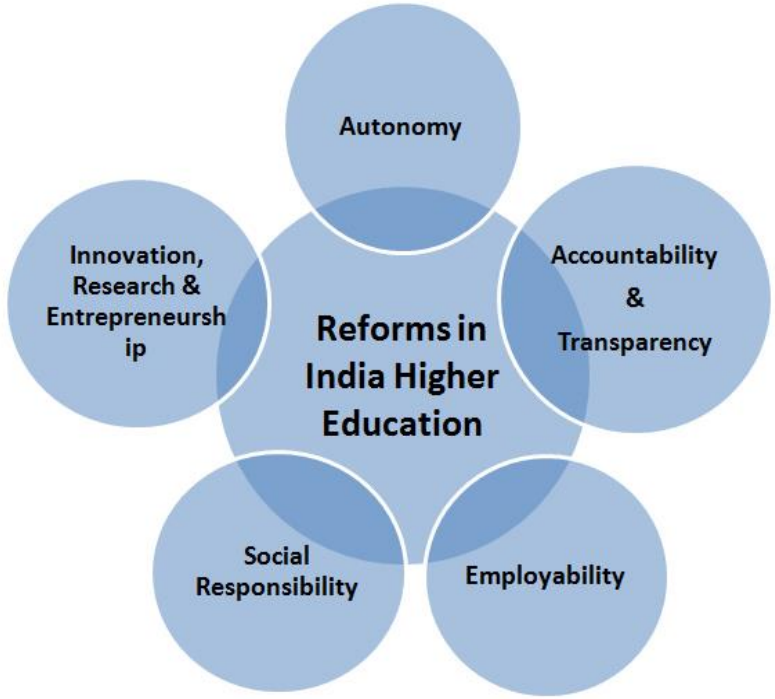
- Disciplines like philosophy, literature, and political science are **deprioritised as financially unproductive,** while business, technology, and engineering dominate funding and institutional priorities.

- Academics are now **assessed based on publication counts, student ratings, and global rankings**, often rewarding performativity and western benchmarks over indigenous or contextual relevance.



Governance Crisis and Ideological Interference

- Vice Chancellors are increasingly drawn from non-academic or corporate backgrounds, **promoting efficiency and branding over pedagogical** or scholarly engagement.
- Academic leadership often **reflects partisan or ideological leanings**, with appointments favouring individuals disconnected from liberal intellectual traditions or critical scholarship.
- Fear of political reprisal fosters **self-censorship among faculty and students,** discouraging bold research or critical classroom debates, thus shrinking the space for public reasoning and academic dissent.



INDIA'S RISING e- WASTE

India's rising e-waste, the need to recast its management

India's journey toward Viksit Bharat is being powered by a rapid digital transformation, with an increasing reliance on electronic devices. From smartphones and laptops to advanced industrial and medical equipment, technology has become the backbone of economic growth, connectivity and innovation. However, this growing dependence on electronic devices has a by-product – electronic waste (e-waste) – which must be managed effectively to ensure sustainable progress. Ranking among the world's top e-waste generators (China, the United States, Japan, and Germany) India confronts a formidable challenge of managing e-waste. India's e-waste volumes soared by 151.03% in six years, from 7,08,445 metric tonnes in 2017-18 to 17,78,400 metric tonnes in 2023-24, with an annual increase of 1,69,283 metric tonnes.

Extended Producer Responsibility (EPR) mandates producers, importers and brand owners to manage waste from their products' end-of-life. It holds them accountable for environmental impacts throughout the product lifecycle, promotes sustainable design, integrates environmental costs into pricing, and supports efficient waste management, reducing the burden on municipalities.

Impact of improper e-waste management

The consequences of improper e-waste management extend beyond environmental degradation. India loses more than $10 billion annually due to water pollution from the disposal of cyanide and sulphuric acid solutions, air pollution caused by lead fumes, open coal burning, and plastic incineration, and soil pollution. Beyond the environmental impact, improper e-waste recycling causes a social loss of over $20 billion annually, as most of the hazardous processing is conducted by informal, illegal recyclers (women and children comprise the majority workforce). Tragically, their average lifespan is less than 27 years due to prolonged exposure to toxic substances. Additionally, India forfeits over ₹80,000 crore annually in lost critical metal value due to rudimentary extraction methods in informal recycling. In addition, at least $20 billion in annual tax revenue is lost as informal recycling is largely cash-based and unaccounted for.

Dhanendra Kumar

was India's Executive Director at the World Bank, Secretary to the Government of India and the first Chairman of the Competition Commission of India (CCI). He is currently Chairman, Competition Advisory Services India LLP (COMPAD)

A focus on floor price will help transform e-waste recycling and its management in India

Importance of stable pricing

The E-waste (Management) Rules, 2022 introduced a floor price for EPR certificates, a game-changer for India's e-waste management. This provision ensures fair returns for registered recyclers, curbing informal, hazardous recycling (practices that dominate 95% of the sector). Without a strong floor price, India may miss the chance to lead in sustainable waste management. Stable pricing incentivises formal recyclers to adopt safe, advanced technologies, unlocking e-waste's valuable materials such as gold and copper. It prevents chaos seen in sectors such as plastic waste and drives investment in infrastructure, turning e-waste into a resource and supporting a circular economy.

This economic pivot carries profound environmental benefits. Fair compensation motivates recyclers to prioritise material recovery over disposal, shrinking landfill burdens and halting the seepage of toxins such as lead and mercury into soil and waterways. It recasts e-waste as an asset rather than as a liability, redefining India's waste narrative toward sustainability. Globally, EPR fees paid by original equipment manufacturers are significantly higher than the floor EPR prices fixed by the Government of India, in alignment with global best practices. The minor impact of floor EPR prices on product costs is outweighed by the significant environmental and social benefits of formal recycling and sustainable practices.

An effective floor price levels the playing field by offsetting the informal sector's cost advantage. It makes formal recycling viable, reduces waste leakage, and ensures more responsible processing. This not only corrects market imbalances but also drives compliance, helping producers meet EPR targets through certified recyclers. When recyclers are adequately paid, they can expand operations, deliver verifiable outcomes, and reduce producers' incentives to bypass obligations. In a country where only 10% of e-waste reaches formal recycling, this stability is a game-changer. Without it, certificate prices could collapse, starving recyclers of funds and exposing producers to unpredictable costs, destabilising EPR markets. A predictable pricing framework fosters trust, ensuring the system doesn't erode into a free-for-all.

Critics argue that a floor price hikes producer costs, potentially raising consumer prices. This concern, while valid, misses the broader calculus. The cost of inaction – environmental ruin, health crises and lost resources – dwarfs the modest burden of fair pricing. Producers can offset expenses by innovating durable, recyclable designs, which is a core EPR goal. The plastic industry's misstep with low prices, which spawned sham recyclers and eroded trust, underscores the peril of under-pricing. Far from stifling progress, a floor price could surge innovation, rewarding efficiency and technological breakthroughs. India's e-waste crisis demands audacious solutions, aligning with economic and ecological imperatives.

Need for a recycling vision

The stakes of EPR floor pricing transcend financial concerns. Inadequate pricing imperils more than profits. It endangers rivers with pollution, soils and agriculture produce with harmful ingredients, damages communities with toxic exposure, and squanders valuable potential. By valuing recycling efforts, India can formalise its e-waste sector, spur advanced infrastructure, and champion resource efficiency, ensuring responsible practices.

As India vies for sustainability leadership, this floor price is the bedrock of its recycling vision – a bold move to transform e-waste into opportunity, setting a global standard. The numbers demand action: a 73% e-waste surge in five years is a clarion call. With an adequate floor price, economic vitality and environmental care can coexist, securing the future with sustainability.

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Need for a Floor Price in EPR Certificate System

- The **E-waste (Management) Rules, 2022** introduced a **floor price for EPR certificates**.
- A **floor price ensures minimum guaranteed returns** for certified recyclers, providing economic security and encouraging safe practices.

It serves as a tool to:

- **Discourage the informal sector** by making formal recycling economically viable.
- Boost investment in **recycling infrastructure.**
- **Make the formal system competitive** enough to challenge the cost advantages of the informal sector.
- **Unlock the value of critical metals like** copper and gold through advanced technology.

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E-Waste Management Rules, 2022

Why in News?

Recently, the government notified E-waste (management) Rules, 2022 which will come into force from 1 April ,2023 and apply to every manufacturer, producer , refurbisher, dismantler and recycler of e-waste.

Key Provisions

- Increased the number of items to 106 (Earlier 21) that come under e-waste category.
- Compulsory registration under the Extended Producer Responsibility Framework.
  - Can store the e-waste for a period not exceeding 180 days.
  - Shall maintain a record of e-wastes.
- Manufacturers make end product recyclable.
  - Products by different manufacturers need to be compatible with each other.
- Reduce the use of hazardous substances like lead, mercury, cadmium among others in the manufacturing.
- 'Environmental compensation' to be provided by the companies that don't meet their target.
- Central Pollution Control Board shall monitor and verify the compliance of reduction of hazardous substance.

About E-waste

- Electronic-Waste is a term used to describe old, end-of-life or discarded electronic appliances.
  - E-waste is generated from components, consumables, parts and spares as well as manufacturing, refurbishment and repair processes.
- India is third-largest producer of e-waste after China and United States.
- 95% of e-waste in India is recycled by the informal sector.
- India's first e-waste clinic has been set up in Bhopal, MP.

Challenges

- Inadequate regulation , enforcement and penal laws.
- Poor Infrastructure for e- waste management.
- Lack of awareness among various stakeholders.
- Currently Recycling practices are environmentally unsustainable and dominated by informal sector.
- No tracking and mismanagement of end of life products.

SHIPPING INDUSTRY TACKLING EMISSIONS

How is shipping industry tackling emissions?

What was decided at the 83rd session of the International Maritime Organization's Marine Environment Protection Committee? Was the U.S. a participant in the discussions? How have oil-exporting nations and traditional maritime powerhouses responded to the decision? How has India positioned itself?

EXPLAINER

THE GIST

Context

- The **83rd session of the International Maritime Organisation** 's Marine Environment Protection Committee (MEPC-83) discussed introducing a **Market-Based Measure (MBM) to curb shipping emissions** through a global levy, marking a potential first in mandatory sector-wide carbon pricing.

Key-highlights of the Session

- The **MEPC-83 session** marked a critical step by agreeing in principle to introduce a **Market-Based Measure (MBM) to reduce greenhouse gas (GHG) emissions** from international shipping.

- **Global Emissions Levy**: The committee supported moving towards an emissions pricing mechanism, where shipping companies would pay a set fee per tonne of CO2 emitted.

- This would make **international shipping the first global sector with a universal carbon pricing** structure, if adopted.

- The MBM framework is intended to help meet the goals of the **IMO's Revised GHG Strategy**, which aims to achieve **Net-zero GHG emissions from international shipping by or around 2050.**

- 20-30% reduction by 2030 and 70-80% by 2040, compared to 2008 levels. The committee agreed to finalise the MBM design and adopt a legally binding measure by 2025.

What Does This Mean for India?

- ❑ India is expected to benefit in multiple ways from the new emissions framework

- ❑ According to UNCTAD estimates, India's **shipping logistics costs may increase by only 5–8% by 2030** and up to 33–35% by 2050.

- ❑ However, the actual trade volumes are unlikely to be significantly affected.

- ❑ India operates **236 large ships, but only 135 are involved in international voyages,** which are subject to the MBM. Domestic fleets are not covered by this framework.

- ❑ India currently spends about **$400 million per year on ship fuel.** This may rise by approximately $108 million by 2030—a manageable increase in the context of India's growing economy.

- ❑ **Green Hydrogen Opportunity: India's National Hydrogen Mission** aims to make the country a global exporter of green fuels.

- ❑ Indian ports such as those in Gujarat and Andhra Pradesh are preparing to offer green hydrogen bunkering services, placing India at the forefront of future maritime energy hubs.

India engaged with China on germanium export restrictions, says embassy

The Indian embassy in Beijing listed germanium as the only element mentioned in grievances from Indian industry players regarding China's export restrictions of rare earth elements

Aroon Deep
NEW DELHI

India is engaging with the Chinese government to navigate export restrictions on germanium, a critical mineral that is used for manufacturing semiconductors, fibre optic cables, and solar panels. The export restrictions for the element – over half of its annual output comes from China – may have caused some friction in electronics manufacturing and other industries that require the element.

In response to a Right to Information application from *The Hindu*, the Indian Embassy in Beijing listed germanium as the only element mentioned in grievances from Indian industry players regarding China's export restrictions of rare earth elements (REEs). Germanium is not listed as an REE, a category that includes 17 heavy metals that China has a practical monopoly in refining.

The exports of germanium and gallium to the United States were largely banned last November. REUTERS

Germanium and gallium's exports to the United States were largely banned last November, and a year before, were placed under "export licensing" for other countries.

Fully reliant on imports

India makes no germanium, and is completely reliant on imports for the element. According to a financial daily's report in 2024, India is relying on imports of germanium through suppliers in the United Arab Emirates, a process that has inflated costs for Indian importers.

The embassy in Beijing declined to disclose specific representations and meetings with Chinese officials on the issue. "The matter has been taken up with Ministries/Departments concerned on the Chinese side through formal communications as well as during meetings," the embassy said in its response to *The Hindu*.

Germanium oxide is used in the "core of the preform" for fibre optic cables, an industry expert said. "Preforms are solid cylinders of glass which are used to draw optical fibres in specialised furnaces."

While relations with China have cooled down in recent months, the country is reportedly thwarting certain projects with export curbs and even travel restrictions. For instance, Apple, Inc.'s contract manufacturer for iPhones, Foxconn, was reportedly prevented from allowing personnel to travel from China to India, and more recently, moving heavy machinery needed to make the phones. "I guess these are matters which pertain to Foxconn and several other Indian private entities so they would be looking into it," External Affairs Ministry spokesperson Randhir Jaiswal said in response to a query on these curbs in January.

Context

- India's embassy in Beijing confirmed that the Indian government has formally taken up the issue of **export restrictions on germanium** with Chinese authorities.
- This follows grievances raised by Indian industry players affected by **China's tightening control over exports of certain critical minerals**, particularly germanium, which is essential for electronics, semiconductors, fiber optics, and solar panels.

- **Germanium(Ge)** is a metallic element with high conductivity and thermal conductivity, which makes it an important component in the **semiconductor industry.**

- **Germanium wafers are thin, circular slices** of pure germanium that serve as the foundation for many electronic devices.

- **Germanium is a metalloid** that possesses metal and non-metal properties.

- While germanium is not classified as a rare earth element, it plays a crucial role in high-technology industries.

Ge is a metallic element used in:

- Fiber optic cables (as germanium dioxide in preform cores)
- Infrared optics Solar photovoltaic cells (especially for satellites and space applications)

- It is critical for high-tech industries, and its **supply is concentrated in China**, which accounts for over 50% of global production.

- India is highly dependent on imports for most critical minerals, including **germanium and gallium.**

1	Antimony	11	Indium	21	Selenium
2	Beryllium	12	Lithium	22	Silicon
3	Bismuth	13	Molybdenum	23	Strontium
4	Cadmium	14	Niobium	24	Tantalum
5	Cobalt	15	Nickel	25	Tellurium
6	Copper	16	PGE*	26	Tin
7	Gallium	17	Phosphorous	27	Titanium
8	Germanium	18	Potash	28	Tungsten
9	Graphite	19	REE*	29	Vanadium
10	Hafnium	20	Rhenium	30	Zirconium

Thank you

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