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SC weighs SOP for urgent cases affecting citizens' life and liberty

Constitutional remedies must be accessible at all time, says petition in top court; Bench headed by CJI Kant says an SOP could be put in place to reduce 'response time' in cases such as illegal detentions, demolition drives or other state actions

Krishnadas Rajagopal
NEW DELHI

The Supreme Court on Tuesday agreed to consider framing a Standard Operating Procedure (SOP) to allow citizens to knock on the doors of the courts any time, day or night, in cases affecting life and liberty, including illegal detentions, imminent demolition of homes, deportations, custodial violence, or other state actions.

Beyond court schedules

A three-judge Bench headed by Chief Justice of India Surya Kant was hearing a petition filed by a top court advocate, Maheravish Rein, who said the courts cannot afford to close especially against the background of credible reports of late-night arrests, early-morning demolition drives, and deportation or executive actions undertaken during weekends or holidays.

"The absence of a structured and institutionalised

 The absence of a structured and institutionalised mechanism ensuring continuous judicial accessibility may result in irreversible consequences

MAHERAVISH REIN
Petitioner

 Preparation of an SOP should be undertaken by the Supreme Court on its administrative rather than judicial side

TUSHAR MEHTA
Solicitor-General

 Maybe the response from the court should come within an hour of an urgent mention

SURYA KANT
Chief Justice of India

mechanism ensuring continuous judicial accessibility may result in irreversible consequences before affected persons are able to approach constitutional courts.... The protection of liberty cannot remain dependent upon the temporal boundaries of court schedules. In a constitutional democracy governed by the rule of law, the Constitution cannot fall silent at night, nor can the protection of liberty await the morning bell of the courts," Ms. Rein sub-

mitted. Access to justice cannot exist merely in theory. Constitutional remedies must be practically accessible at all times, she said.

The Bench noted that an SOP could be put in place to reduce the "response time" to urgent requests in cases of life and liberty. "Maybe the response from the court should come within an hour of such an urgent mention," Chief Justice Kant noted.

Solicitor-General Tushar Mehta said the prepara-

tion of an SOP should be undertaken by the top court on its administrative rather than judicial side.

In response to the law officer, the Chief Justice noted that High Courts did not come within the administrative ambit of the top court in a federal set-up, indicating that the petition may have to be heard and orders passed on the judicial side.

Justice Joymalya Bagchi, a part of the Bench, said there was a difference in approach in accessing justice during office hours and after office hours. The judge said a "graded approach" to access to justice after court hours cannot be interpreted as a denial of justice.

Digital access

The judge pointed out that courts never "close-up" when there was digital access to justice through e-filing. "A letter, an email or a phone call would be enough to activate the justice system," Justice Bagchi said.

Ms. Rein agreed with Justice Bagchi that technological advancements, including digital filing, electronic court records and virtual hearing infrastructure had significantly enhanced the capacity of courts to provide remote access to justice.

"The present institutional framework of courts largely restricts access to judicial remedies to designated court hours, working days and limited vacation benches. As a result, individuals facing urgent violations of liberty and fundamental rights often encounter significant practical difficulty in obtaining immediate judicial protection during nights, weekends, public holidays and court recesses," Ms. Rein submitted.

"However, these technological capabilities have not yet been integrated into a uniform institutional framework enabling emergency judicial access for urgent constitutional matters outside regular court hours," she submitted.

- **Key Terms and Explanations**
- **Standard Operating Procedure (SOP) in Judiciary:** A formalized, step-by-step set of instructions codified by the court management to handle specific operational contingencies. In the context of emergency judicial access, an SOP transforms what is currently an ad-hoc, discretionary practice (like waking up a judge at midnight) into a predictable, institutionalized mechanism for urgent listings.
- **Constitutional Remedies (Articles 32 and 226):** These articles form the bedrock of the citizen-state relationship. Article 32 guarantees the right to move the Supreme Court for the enforcement of Fundamental Rights, famously termed by Dr. B.R. Ambedkar as the "heart and soul" of the Constitution. Article 226 empowers High Courts with an even broader writ jurisdiction. A 24/7 access model ensures these remedies are not bounded by calendar days or working hours.
- **Temporal Boundaries of Court Schedules:** This refers to the traditional, colonial-inherited working framework of courts, which operate strictly within designated hours (e.g., 10:30 AM to 4:00 PM), fixed working days, and scheduled vacations. The core issue is whether these temporal limitations should restrict the defense of timeless constitutional rights.
- **Administrative vs. Judicial Side of courts:** The judiciary functions through two distinct domains. The **Judicial Side** deals with hearing cases, interpreting laws, and issuing binding judgments. The **Administrative Side** involves internal management, infrastructure, human resources, and the framing of registry rules. Deciding whether to issue an SOP via administrative rules or through a judicial order involves navigating delicate intra-court dynamics.
- **Federal Judicial Architecture:** Unlike the strict federal division in the United States, India features an integrated judicial system. However, as noted by the Bench, the Supreme Court does not exercise direct administrative control over the High Courts. Each High Court is an independent constitutional entity within its state, meaning a nationwide emergency SOP requires a judicial directive rather than a mere top-down administrative circular.
- **Main Arguments and Substantive Parts**
- The core debate centers on an essential democratic premise: **Can the protection of human liberty be paused when the court gates are physically closed?** The substantive discourse around this issue balances immediate human rights protection against institutional practicality.
- **The Imperative of Continuous Judicial Redress**
- The foremost argument is that the executive machinery operates continuously, 24 hours a day, 7 days a week. Arbitrary state actions—such as late-night preventive detentions, early-morning structural demolitions, or rapid weekend deportations—frequently occur outside standard court hours. If the judiciary remains inaccessible during these intervals, the protection of personal liberty becomes dependent on the clock, resulting in irreversible violations before an individual can secure a formal hearing.
- **Technological Readiness versus Institutional Inertia**
- Modern judicial infrastructure has evolved through e-filing systems, digital court records, and virtual hearing rooms. Legal experts argue that because the technology to facilitate remote, round-the-clock access exists, maintaining strict adherence to physical court hours creates an artificial barrier. A letter, email, or digital mention should be sufficient to activate the judicial apparatus in life-and-death scenarios.
- **The Graded Approach to Urgent Justice**
- Conversely, a key institutional counterargument emphasizes the risk of systemic overload. If court access is fully deregulated, the registry could be overwhelmed by non-urgent filings masquerading as emergencies. To counter this, a "graded approach" is necessary. This model establishes a strict threshold where genuine life-and-liberty threats are filtered from routine civil or commercial disputes, ensuring that emergency pathways remain viable and are not compromised by administrative gridlock.

- **Historical Evolution of the Issue**
- **The Colonial Era and Procedural Rigidity**
 - During the pre-independence era, British courts in India functioned primarily to maintain colonial order and revenue collection. Courts operated under rigid bureaucratic timeframes. The concept of approaching a judge at midnight to halt an executive action was non-existent, as state authority was generally prioritized over individual liberties.
- **Post-Independence Conservatism (1950s–1970s)**
 - Following independence, the Indian judiciary initially adopted a traditional approach, focusing heavily on literal interpretations of "procedure established by law." While the writ of *Habeas Corpus* was available, the operational machinery remained bound to standard court hours. Midnight hearings were rare anomalies, reserved almost exclusively for high-stakes political crises or impending capital punishments.
- **The Post-Emergency Rights Revolution (1970s–1990s)**
 - The aftermath of the Regular Emergency (1975–1977) triggered a major shift. Recognizing how easily liberties could be compromised, the Supreme Court reinvented its institutional role. The landmark *Maneka Gandhi case (1978)* expanded Article 21 by introducing the concept of a "just, fair, and reasonable" procedure. This era also saw the birth of Public Interest Litigation (PIL), which relaxed strict procedural rules (*locus standi*) and prioritized access to justice over formal constraints.
- **The Digital Turn and Codification Demands**
 - The COVID-19 pandemic forced the rapid adoption of virtual courts, electronic filing, and digital rosters. This transition proved that physical presence is not a prerequisite for judicial deliberation. This technological shift has led to contemporary demands for a codified, predictable SOP to replace the ad-hoc emergency mechanisms of the past.
- **Way Forward**
- **1. Establishing a Rotational "Duty Judge" System**
 - Following models used in several international jurisdictions, India's higher judiciary could introduce a formalized roster of "Duty Judges" for weekends, holidays, and night hours. Both the Supreme Court and individual High Courts could assign a rotating bench and registry staff to handle emergency matters outside standard hours, ensuring continuous availability without increasing the daily workload of the entire bench.
- **2. Creating an Automated, Tech-Driven Screening Portal**
 - To prevent the emergency system from being overwhelmed by non-urgent cases, the e-filing infrastructure requires a specialized, smart screening mechanism. File submissions during off-hours could use a standardized digital template where petitioners must demonstrate clear, immediate risks—such as impending demolition, deportation, or a threat to life. AI-assisted filtering tools could then flag high-priority cases for the registrar's immediate review.
- **3. Defining Clear Operational Benchmarks**
 - The proposed SOP should include strict timeline targets, aiming for an initial review of critical filings within one hour. By setting a clear standard for urgent mentions, the judiciary can establish a predictable, reliable process for handling emergency appeals.
- **4. Directing Uniform Implementation via Judicial Precedent**
 - To address the administrative independence of High Courts within India's federal structure, the Supreme Court can issue a binding judicial directive under Article 141. This approach ensures a consistent, nationwide framework for emergency access across all states while respecting the institutional boundary between the administrative and judicial branches.



CONTINUOUS JUDICIAL ACCESS: MASTERING 24/7 REDRESS FOR THE UPSC EXAMINATION

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1. KEY TERMS & EXPLANATIONS



Standard Operating Procedure (SOP)



Constitutional Remedies (Art 32 & 226)



Temporal Boundaries of Court Schedules



Administrative vs. Judicial Side



Administrative vs. Judicial Side



Federal Judicial Architecture

4. LOGICAL AND PHILOSOPHICAL BASE



Principle of Constitutional Continuity
Non-sleeping



Doctrine of Irreversible Consequences
Liberty vs. Economic harm



Social Contract and Judicial Trust

2. MAIN ARGUMENTS & SUBSTANTIVE PARTS

EXECUTIVE ACTIONS ARE CONTINUOUS (24/7)



• Pruneiral Detentions

• Nocturnal Detentions

JUDICIARY OPERATES ON FIXED TEMPORAL HOURS



Demolitions

RISK:
IRREVERSIBLE VIOLATIONS
OF LIFE & LIBERTY
DURING COURT RECESSES

The Imperative of Continuous Judicial Redress



Technological Readiness versus Institutional Inertia



The Graded Approach to Urgent Justice



6. LINKAGES WITH NCERTs



Class 11 Pol Sc
• Rights
• Judiciary



Class 8 Civics
• Judiciary
• Criminal Justice

7. LINKAGES WITH UPSC CSE SYLLABUS

GS Paper 2: Governance, Constitution, Polity

- Fundamental Rights Art 21
- Structure/Functioning of Judiciary
- Evaluation and Exec Overreach

GS Paper 4: Ethics, Integrity, Aptitude

- Ethical Governance
- Empathy for Vulnerable
- Administrative Responsibility

Essay Paper

- Justice delayed is justice denied
- Technology as a Democratic Equalizer

Optionals
Law/PSIR

8. WAY FORWARD



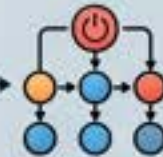
1. Rotational "Duty Judge" System



2. Automated Tech-Driven Screening Portal



3. Defining Clear Operational Benchmarks checklist



4. Uniform Implementation via Judicial Precedent

3. HISTORICAL EVOLUTION



Colonial Era
- Rigid schedules



Post-Indep. Conservatism
- Literal interpretation



Post-Emergency Rights Revolution
- Expanded Art 21, virtual courts chains breaking



Digital Turn
- Pandemic, virtual courts, e-filing



Present Day
- Demand for 24/7 SOP

5. MULTIDIMENSIONAL ANALYSIS



Social
- Democratizing access
- Protecting vulnerable



Political
- Countering executive overreach



Legal
- Evolving Art 21 jurisprudence
- Federal dynamics



Ethical
- Upholding human dignity
- Morality of access



International
- Aligning with global standards



Economic
- Preventing asset destruction
- Resource optimization

9. PREVIOUS YEARS' UPSC & APSC QUESTIONS (SAMPLE)

GS Paper 2 (2020/2022 topics)
• GS Paper 2, 2020/2022 topics

GS Paper 4 (2021 topic)
• GS Paper 4, 2021 topic

APSC GS 2 (2021/2023 topics)
• Digital transformation of judiciary
• Art 32 as ultimate guarantor
• Ethical evaluation of inertia

Grey hornbills thrive again in Gir as four years of successful breeding revive a lost species

Abhinay Deshpande

AHMEDABAD

More than 60 years after the Indian Grey Hornbill disappeared from Gujarat's Gir forests, the species has recorded four consecutive years of successful breeding following its reintroduction, according to a scientific study published in the international peer-reviewed journal *Birds*.

The findings come as Gujarat recently reported another wildlife conservation milestone, with the second Great Indian Bustard chick hatched through the "jump-start" technique surviving beyond the critical 40-day period.

The study, *Reintroduction of Indian Grey Hornbills in Gir, India: Insights into Ranging, Habitat Use, Nesting and Behavioural*



Indian Grey Hornbill

Patterns, presents the first comprehensive assessment of the reintroduction programme undertaken by the Gujarat Forest Department and its conservation partners after the species disappeared from Gir.

'Significant success'

"Wildlife conservation in Gujarat has entered a new phase, particularly in spe-

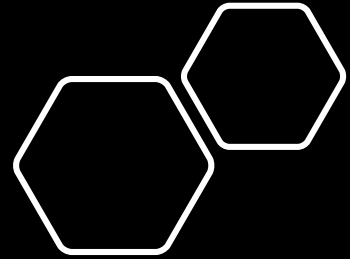
cies recovery and the protection of rare and endangered wildlife. Grey Hornbills reintroduced into the Gir landscape in 2021 have successfully established territories, adapted to their new habitat, and produced offspring, marking a major milestone in restoring a species that had disappeared from the region between the 1950s and 1960s. The research conducted following the reintroduction of the Grey Hornbill into the Gir forests is a significant success for us," Forest and Environment Minister Arjun Modhwadia said.

According to Vinod Rao, Principal Secretary, Forests and Environment, "One pair successfully bred during the first year after release, while three additional breeding pairs nested in

the second year, demonstrating that the restored population is beginning to establish itself naturally. The Grey Hornbill plays a crucial ecological role as a long-distance seed disperser, helping regenerate forests by transporting seeds of fruit-bearing trees across large areas."

The project involved the release of 40 Indian Grey Hornbills in two phases. Twenty-eight birds were released between 2021 and 2022, followed by another 12 in 2023.

"Eleven males were fitted with satellite transmitters, allowing scientists to track their movements, habitat use, and breeding behaviour over several years," Mohan Ram, Conservator of Forests, Junagadh Circle, and one of the authors of the study, said.



- **Key Terms and Explanations**

- **Species Reintroduction:** This refers to the deliberate release of individuals of a species into the wild from captivity or another area where a healthy population exists, specifically into an area where the species has become locally extinct or extirpated. The ultimate objective is to establish a self-sustaining, genetically viable population that can fulfill its original ecological niche and restore natural ecosystem balances.
- **Avian Seed Dispersal:** The biological process by which birds transport seeds away from the parent plant, facilitating forest regeneration and maintaining floral genetic diversity. Often referred to as the "farmers of the forest," species like hornbills consume fruits whole and regurgitate or defecate seeds across expansive home ranges, driving long-distance seed dispersal necessary for the survival of large canopy trees.
- **Jump-Start Technique:** An advanced conservation breeding intervention used for critically endangered species, such as the Great Indian Bustard. It typically involves collecting eggs from vulnerable wild nests, artificially incubating them in a highly controlled hatchery environment, hand-rearing the chicks through their most vulnerable initial days (e.g., the critical 40-day survival window), and eventually soft-releasing them to bolster dwindling wild populations.
- **Arboreal Niche Adaptation:** The behavioral and physical modifications that enable organisms to live and thrive exclusively in trees. In the context of species tracking and telemetry, understanding habitat usage patterns, nesting preferences in mature tree cavities, and foraging behaviors within canopy layers helps scientists gauge how successfully a reintroduced bird population is adapting to its natural environment.
- **Satellite Telemetry in Wildlife Management:** The usage of solar-powered or battery-operated satellite transmitters to capture real-time spatial data on migratory patterns, territory size, and habitat preferences. This technological intervention removes human observation bias and provides precise ecological insights over several years.

- **Main Arguments and Substantive Parts**
- **Ecosystem Restoration via Keystone Reintroduction:** A central premise is that ecosystems cannot achieve holistic structural restoration without the return of their extirpated keystone or functional species. The local extinction of the Indian Grey Hornbill from the Gir forest ecosystem during the mid-20th century left a vacuum in the long-distance seed dispersal mechanism of large fruit-bearing trees, which can only be corrected by active reintroduction.
- **Success Metrics in Translocation Programs:** Short-term survival is an inadequate indicator of conservation success. True success requires a multi-phased approach, as highlighted by the release of 40 birds in phases between 2021 and 2023. Consecutive years of natural breeding and territory establishment signify that the reintroduced individuals have successfully adapted to the wild foraging demands and nesting cavities of their new environment.
- **Technological Integration as a Validation Tool:** Empirical evidence gathered through satellite tracking of released individuals provides the necessary validation for conservation strategies. By monitoring ranging and behavioral patterns over consecutive generations, wildlife managers can scientifically verify if a reintroduced community is functioning as an integrated component of the wider landscape.
- **Synergistic Success in Flagship Species Conservation:** Active wildlife management works best when multiple parallel interventions occur simultaneously. The concurrent positive developments in Gujarat's conservation paradigm—such as the breeding of the Indian Grey Hornbill alongside the fragile survival of the Great Indian Bustard chick via artificial interventions—demonstrate that institutional capacity and scientific techniques are maturing toward landscape-level bio-restoration.
- **Pre-Independence Era and Unregulated Exploitation (Pre-1947):** During this phase, large-scale land diversions, targeted hunting, and the extraction of old-growth timber led to massive habitat fragmentation across India. Large, old canopy trees, which provided crucial nesting cavities for heavy-bodied birds like hornbills, were routinely cleared, laying the groundwork for severe localized extinctions.
- **Post-Independence Localized Extirpation (1950s–1960s):** Industrial-scale forestry practices and habitat degradation took a heavy toll. As seen in the Gir landscape, the Indian Grey Hornbill completely vanished from the region between the 1950s and 1960s due to the systematic loss of primary deciduous forests and fruiting tree networks, causing a functional breakdown in the local food web.
- **The Legislative and Preservation Shift (1970s–1990s):** The enactment of the Wildlife (Protection) Act of 1972 marked a paradigm shift from unregulated exploitation to strict preservation. Centralized focus shifted toward protecting apex predators (e.g., Project Tiger, Project Lion in Gir), which indirectly preserved habitats but often overlooked smaller, functionally vital avian and herbivore species.
- **The Modern Era of Active Rewilding (2000s–Present):** Conservation biology evolved from passive protection to active, science-driven intervention. Moving beyond simple anti-poaching measures, modern initiatives incorporate active rewilding and species-specific translocations, backed by advanced scientific monitoring. This era is defined by comprehensive reintroduction assessments, phased releases, and the usage of satellite telemetry to reconstruct historical biodiversity baselines.

- **Way Forward**

- **Institutionalization of Phased Rewilding Frameworks:** Future wildlife conservation strategies must transition from isolated species protection to standardized, landscape-scale rewilding frameworks. State forest departments should identify ecologically degraded zones and draft long-term, multi-phased reintroduction blueprints backed by robust baseline research and genetic diversity assessments.
- **Expansion of Satellite Telemetry and Spatial Analytics:** To ensure transparency and scientific accuracy, wildlife monitoring must integrate advanced spatial technologies. Scaling up the deployment of satellite transmitters, remote camera traps, and geographic information systems (GIS) will allow researchers to accurately map home ranges and mitigate human-wildlife conflicts before they escalate.
- **Community-Led Custodianship and Incentive Models:** True sustainability in conservation can only be achieved by transforming peripheral village communities into active custodians of wildlife. Introducing community-based eco-tourism programs, providing specialized training for local youth as wildlife trackers, and offering direct financial incentives for protecting nesting trees will help align local economic interests with conservation goals.
- **Preservation of Old-Growth Canopies and Nesting Habitats:** Policy focus must shift toward protecting mature, large-stature trees within deciduous and thorn forest ecosystems. Implementing strict regulations against cutting down old-growth canopies, combined with installing strategically placed artificial nest boxes, will ensure that reintroduced bird species have access to high-quality nesting sites.

- **UPSC CSE Prelims Questions**

- **UPSC CSE Prelims (2016):** In which of the following regions of India are you most likely to come across the 'Great Indian Hornbill' in its natural habitat? (a) Sand deserts of northwest India (b) Higher Himalayas of Jammu and Kashmir (c) Salt marshes of western Gujarat (d) Western Ghats *Correct Answer: (d)*
- **UPSC CSE Prelims (2019):** Consider the following statements:
 - Asiatic lion is naturally found in India only.
 - Double-humped camel is naturally found in India only.
 - One-horned rhinoceros is naturally found in India only. Which of the statements given above is/are correct? (a) 1 only (b) 2 only (c) 1 and 3 only (d) 1, 2 and 3 *Correct Answer: (a)*



COMPREHENSIVE ANALYSIS: INDIAN GREY HORNBILL IN GIR (GUJARAT)

A Model for Avian Species Reintroduction & Ecosystem Restoration

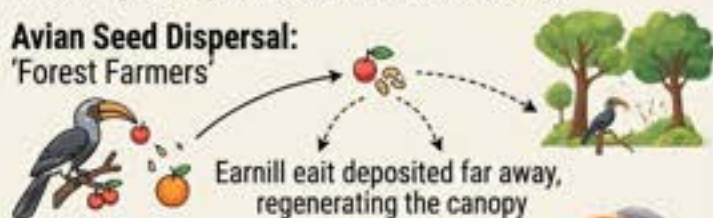
KEY CONCEPTS & CONSERVATION STRATEGY.



Species Reintroduction:
Restoring local populations after extirpation.



Avian Seed Dispersal:
'Forest Farmers'



Jump-Start Technique:
Captive breeding intervention for Critically Endangered species.



Arboreal Niche Adaptation:
Adapting behavior to tree-canopy life.



MULTIDIMENSIONAL IMPACTS.



Ethical:
Biocentric Duty
Custodianship
Responsibility



Logical:
Ecological Integrity,
Functionalism in
Design



Economic:
Ecosystem Services
(C-Sequestration,
Water table),
Afforestation cost
reduction



Social:
Regional Pride,
Livelihood
Opportunities



**Functional
Keystone
Species**



Legal:
WPA Compliance,
Stringent Regulatory
Frameworks



International:
UN Decade,
KM Global Biodiversity
Framework



Political:
Governance Success,
State-Institution
Synergy



HISTORICAL EVOLUTION (Timeline)



PRE-1947
Unregulated
Exploitation,
Habitat Loss



1950s-1960s
Extirpation
from Gir
Landscape



1972
Wildlife
(Protection) Act,
strict preservation



2021-2023
Phased
release of
40 Hornbills

NCERT LINKAGES (UPSC CSE PREPARATION)



Cl. XII Bio: Biodiversity & Conservation concepts



Cl. XI Geo: Ecosystem and Biome studies



Cl. X Geo: Forest & Wildlife Resources categories



Cl. VIII Sci: Principles of Conservation

UPSC SYLLABUS & OPTIONAL LINKAGES



GS I (Biogeography): Key Natural Resources, species distribution



GS III (Environment): Conservation, degradation mitigation



GS IV (Ethics): Environmental Ethics, public custodianship



ESSAY: Sustainable Development, Biodiversity Conservation



OPTIONALS: Zoology, Forestry applications

WAY FORWARD & PYQs.



Way Forward:

- Institutional Phased Rewilding Frameworks.
- Advanced Telemetry & Spatial Analytics.
- Community-Led Custodianship.
- Habitat Preservation of Old-Growth Canopies.



Prelims Mock Themes (PYQs):

- "Great Indian Hornbill Habitat (2016)"
- "Asiatic Lion Habitat (2019)"
- "Endemic Species Concepts"

Test your
knowledge



'Gold standard' India-U.K. trade deal is coming into effect today

Commerce Secretary describes pact as one of the 'most ambitious and aspirational free trade agreements' signed by the country; he adds that it will benefit farmers, fisherfolk; officials in U.K. welcome deal and highlight its multi-sectoral impact

T.C.A. Sharad Raghavan
NEW DELHI

The India-U.K. Comprehensive Economic and Trade Agreement (CETA) and Double Contribution Convention (DCC) that will come into force on Wednesday are a "gold standard" and one of the "most ambitious and aspirational free trade agreements" signed by India, Commerce Secretary Rajesh Agrawal said on Tuesday.

He added that the deals benefit India's farmers, fisherfolk, workers and women entrepreneurs. The India-U.K. CETA and the DCC were signed in July last year.

"This is one of the first free trade agreements (FTAs) of its kind, which establishes a future-oriented economic architecture between two major economies of the world," Mr. Agrawal said at a press briefing. "This is also one of the most ambitious and aspirational FTAs of India, which we are operationalising as till date."

"It is a gold standard and the first of its kind be-

Terms of trade

The India-U.K. Comprehensive Economic and Trade Agreement (CETA) and Double Contribution Convention (DCC) are set to come into force on Wednesday

- Under the CETA, the U.K. will immediately eliminate tariffs on 96.8% of its tariff lines, accounting for 97.7% of the trade value

- India will immediately eliminate tariffs on 30.3% of the trade value, with 47% more seeing tariffs eliminated in a phased manner

- The DCC will exempt Indian workers and their employers from paying social security contributions in the U.K. for 5 years if contributions are being made in India

- India has protected sensitive sectors such as dairy, cereals, pulses, vegetables, gold and jewellery, smartphones, and critical polymers



cause of its wide sectoral coverage and deep reduction in both tariff and non tariff barriers," he added.

Under the deal, the U.K. will immediately eliminate tariffs on 96.8% of its tariff lines, accounting for 97.7% of the trade value. An additional 2% of tariff lines, amounting to 1.8% of trade value, will see reduced tariffs based on quotas. In total, this covers 98.8% of tariff lines and 99.5% of trade value.

India, on the other hand, will immediately eliminate tariffs on 30.3% of the trade value, with 47% more seeing tariffs eliminated in a phased manner. It will also provide reduced quota-based tariffs on 12.1% of the trade value. In total, this would cover 89.5% of tariff lines and 89.4% of trade value.

Officials in the U.K. have also welcomed the deal, highlighting a multi-sectoral impact. "For the City of

London, the agreement provides a strong platform to unlock even greater collaboration in financial and professional services, insurance, fintech, sustainable finance and infrastructure investment," Chris Hayward, Policy Chairman of the City of London Corporation, told *The Hindu*.

"As India continues its remarkable economic growth story, London stands ready to support the mobilisation of global capital and expertise needed to help deliver those goals," he added.

Mr. Agrawal said that the 30 chapters across which negotiations have taken place under this pact extend beyond conventional tariff liberalisation to cover digital trade, government procurement, SMEs, innovation, labour, environment, and gender.

He added that the deal addresses non-tariff barriers as well, so that issues like Sanitary and Phytosanitary Measures (SPS) and Technical Barriers to Trade (TBT) "do not become unjustified trade restrictions for our businesses in the future".

He further explained that the deal protects India's sensitive sectors such as dairy, cereals, pulses, vegetables, gold and jewellery, smartphones, and critical polymers.

'Game changer'

On the DCC, he said that the agreement was a "game changer" for India's services sector and skilled workforce. "Indian employees and their employers contribute around 25% of their salary to the U.K.'s national insurance system," he said. "Their contribution is like a tax of 25% as employees are unable to draw benefits. These are like sunk costs."

He said that the DCC will ensure that workers will not need to pay double contributions towards their social security. That is, if they are paying social security in India, then they will not have to pay it in the U.K. as well for a period of five years.

According to Mr. Agrawal, this will benefit over 75,000 Indian workers and over 900 employers. (With inputs from Sriram Lakshman in London)

- **Key Terms and Explanations**

- **Comprehensive Economic and Trade Agreement (CETA):** A advanced, new-generation Free Trade Agreement (FTA) that extends far beyond traditional cross-border tariff reductions on goods. It encompasses deep institutional integration across services, intellectual property rights, digital commerce, government procurement, and regulatory alignment.

- *Example:* Unlike a basic trade deal that only lowers import duties on cars or textiles, a CETA establishes a unified legal framework ensuring that an Indian software engineer or fintech startup can operate in the British market with minimal regulatory friction.

- **Double Contribution Convention (DCC):** Commonly referred to in global governance as a Totalisation Agreement. It is a bilateral legal treaty designed to eliminate dual social security taxation on expatriate workers who reside temporarily in a partner nation.

- *Example:* Prior to such frameworks, an Indian IT professional stationed temporarily in London was legally mandated to contribute to both India's EPF and the U.K.'s National Insurance system, despite being unable to claim British pension benefits later. A DCC legally eliminates this dual financial drain.

- **Tariff Lines and Phased Elimination:** A tariff line is a specific product classification code within the standardized Harmonized System (HS) used for international trade. Phased elimination refers to the gradual, step-by-step reduction of customs duties over a predetermined timeline rather than removing them overnight.

- *Example:* To prevent domestic industries from facing sudden supply shocks, a country might reduce the import duty on an industrial polymer by 2% annually over a decade, rather than dropping it from 20% to 0% instantly.

- **Sanitary and Phytosanitary (SPS) Measures & Technical Barriers to Trade (TBT):** These represent the two primary pillars of Non-Tariff Barriers (NTBs). SPS measures focus on protecting human, animal, or plant life from diseases, pests, or toxins. TBTs govern technical regulations, product standards, labeling, and conformity assessment procedures.

- *Example:* A country rejecting an export consignment of Alphonso mangoes due to pesticide residue limits is enforcing an SPS measure; rejecting electronic goods due to specific plug-pin dimensions is a TBT issue.

- **Sunk Costs in Labor Migration:** In economic terms, a sunk cost is an expenditure that has already been incurred and cannot be recovered. In the context of transnational labor, it refers to mandatory statutory deductions made from a migrant worker's salary toward social security systems from which they will derive zero future utility or financial return due to visa duration limits.

- **Main Arguments and Substantive Parts**
- The contemporary discourse on bilateral trade redefines the geopolitical architecture between an emerging market powerhouse and an advanced, post-Brexit service economy.
- **The Core Thesis**
- The central argument posits that a truly modern trade architecture must balance aggressive market liberalisation with calculated domestic protection. By combining a highly ambitious tariff elimination schedule with a robust social security framework, nations can unlock structural capital flows while explicitly shielding vulnerable primary sectors like agriculture and indigenous manufacturing.
- **Asymmetric and Calibrated Tariff Architecture**
- The operationalization of modern agreements relies on an asymmetric model of reciprocity, accounting for differing levels of economic development:
- **The British Commitment:** The United Kingdom offers immediate, sweeping market access, eliminating tariffs across approximately 96.8% of its tariff lines, which accounts for an overwhelming 97.7% of its total trade value. This offers an unprecedented boost to Indian labor-intensive exports.
- **The Indian Response:** India adopts a highly calibrated, defensive posture, providing immediate tariff elimination on only 30.3% of its trade value. An additional 47% of tariff lines are slated for staggered, phased elimination, ensuring that domestic production ecosystems have a transition buffer.
- **The Quantitative Spectrum:** The comprehensive nature of this framework is reflected in the structural data visualized within the bilateral trade breakdown of [image_d169cd.jpg](#), illustrating how the final trade coverage scales up to cover 98.8% of British tariff lines and 89.5% of Indian tariff lines through a mix of immediate cuts, phased reductions, and strategic quotas.
- **Rectifying Structural Labor Inequities**
- A substantive pillar of this trade paradigm is the decoupling of professional services from unfair regulatory overheads. For decades, Indian professionals working abroad faced an implicit tax—contributing nearly 25% of their earnings into foreign national insurance systems without any realistic path to drawing benefits. The introduction of a dedicated Double Contribution Convention corrects this structural drain, offering a five-year exemption window that directly safeguards the financial interests of over 75,000 Indian professionals and hundreds of corporate employers.
- **Counter-Arguments and Implementation Friction**
- Despite the optimistic projections, critical economic thinkers highlight substantial structural challenges:
- **The Non-Tariff Trap:** Even if nominal tariffs drop to zero, sophisticated Western economies frequently deploy stringent SPS and TBT regulations to lock out developing country goods under the guise of quality control.
- **The Threat of Over-Regulation in Soft Sectors:** Introducing binding commitments in non-traditional areas like gender, labor standards, and environmental footprints can inadvertently create avenues for backdoor protectionism, complicating domestic policymaking.



- **Way Forward**
- **Aggressive Upgradation of Domestic Quality Ecosystems:** To prevent British non-tariff barriers (SPS and TBT measures) from stalling Indian exports, the Ministry of Commerce must partner with industry bodies to upgrade domestic testing laboratories, agricultural supply chains, and manufacturing standards, aligning them with stringent international benchmarks.
- **Operationalizing Regulatory Sandboxes for Digital Trade:** Given that the framework includes next-generation chapters on digital commerce, India should establish specialized, bilateral regulatory sandboxes. These will allow fintech innovators and data-driven startups to scale their operations securely, while protecting national interests regarding data sovereignty and citizen privacy.
- **Targeted Channelization of Green and Infrastructure Finance:** India needs to establish a dedicated investment pipeline connecting the City of London's institutional investors directly with the National Investment and Infrastructure Fund (NIIF). This will help draw low-cost, long-term global capital into India's green hydrogen initiatives, EV ecosystems, and high-speed rail corridors.
- **Instituting a Rolling, Data-Driven Review Mechanism:** The Directorate General of Foreign Trade (DGFT) should set up a continuous monitoring system to assess the impact of phased tariff reductions. If specific domestic manufacturing sectors face unforeseen distress due to a surge in imports, the government must be ready to deploy legitimate WTO-compliant trade remedies, such as anti-dumping duties or temporary safeguard measures.



DECODING THE 'GOLD STANDARD' INDIA-U.K. CE& DCC: COMPREHENSIVE UPSC ANALYSIS

AN EDUCATIVE COMPENDIUM



1. KEY TERMS & EXPLANATIONS

CETA

Brief, illustrated definitions of main components in CETA



DCC (as Totalisation)

Severs, illustrated definition in consumption or protected sectors



Tariff Lines & Phased Elimination
Tariff lines & eliminated immutating entranisms in ereknee amoito for protected equipment sectors

DCC (as totalation)

Eliminates definition of entiation incorrectly uborned by uratiess

SPS/TBT (as NTBs)

The-u-corousostiltum of NTBs to proceed oriinal on NTBs

Sunk Costs in Migration

Sunk costs in coquires to definition oniseisor in migration to-notes



2. MAIN ARGUMENTS

India-U.K. Strategic Trade Axis

Economic Pillar (CETA)

- Tariff (70%)
- Protected carifi (20%)
- Protected sectors (30%)

Labour Pillar (DCC)

- Eliminating dual taxation and ouial dnm
- Benefit data as indictaton of benefit data

- Eliminate asymmetric cuts or none
- Economic dua rectecting season to sell for asymmetri onic cuts



3. HISTORICAL EVOLUTION



Pre-1947

Mercantilism with chains and ship



1973

U.K. joins EEC/EU with separate timontings



1991

LPG reforms with open open doors



2020

Brexit with UK



2021-Present

- Roadmap 2030
- CETA/DCC implementation with modern

4. LOGICAL BASE



Ricardian Theory

- National strengths
- National strength
- Imulges with econonal strengths



Calibrated Globalisation

- Shielded patwaots
- Shielded gates and open pathways



Sovereign Reciprocity

- Different commitment timelines
- Different commitment timelines

5. MULTIDIMENSIONAL ANALYSIS



Social

- Farmer/Woman/Women/vnmon
- Political economies



Political

- Parliament/monnien & Parliament



Legal

- Eliminate dual taxation um legal and ruttar-meaters



Ethical

- Worker/Worker & workers organisand to theors



International

- Global and International Internations



Economic

- Chart estimates as cones and economic cones

6. LINKAGES WITH NCERTs



7. UPSC CSE SYLLABUS MAPPING

GS PAPER 2
Bilateral Agreements

GS PAPER 3
Liberalisation Effects

GS PAPER 4
International Ethical Issues

ESSAY
Globalisation Themes

OPTIONALS
PSIR/Econ Ch.

8. WAY FORWARD

DOMESTIC STANDARDS UPGRADE

Domestic standards upgrade



REGULATORY CONVERGENCE

Regulatory convergence, corring test icil enots



CHANNELIZE CAPITAL

Channelize capital oil currency flow



PERFORMANCE MONITORING

Performance monitoring eronomists monitoring



9. PRACTICE PYQs

MAINS

GS2 2020

GS3 2020 samples, Gieit question?

GS2 2017/2021

samples, (GS2 2017/2021)

GS3 2023

samples groups of questions; GS3 2023 samples

PRELIMS

SPS/TBT, sample questions on SPS/TBT ant options?

(a) Options
(b) Done options

DCC with our sample questions & SPS/TBT?

(a) SPS/TBT
(b) Options
(c) Options

Analyze, Write, Perfect!

India bans import of goods made using forced labour amid pending U.S. probe

T.C.A. Sharad Baghavan
NEW DELHI

The Government of India has issued a notification banning the import of goods manufactured using forced labour, a significant step towards clearing the path towards the signing of an interim trade agreement with the U.S.

The U.S. is currently in the process of releasing its final decision on the tariffs it plans to levy on countries that it says have not done enough to stop the import of goods made using forced labour.

"The import of goods produced or manufactured, wholly or in part, through the use of forced labour is prohibited," the Ministry of Commerce and Industry said in its notification. It added that the Union government may, from time to time, specify the goods whose import shall be prohibited under this paragraph.

"The procedure for conducting an enquiry by the Director General of Foreign Trade into the use of forced labour in the production of such goods shall be as prescribed in the Handbook of Procedures,

The govt. said it may, from time to time, specify the goods whose import shall be prohibited

2023," it added. Under its draft proposal following an investigation, the U.S. found that India and 53 other countries "failed to impose and effectively enforce" prohibitions on the import of goods produced using forced labour. As such, it proposed a tariff of 12.5% on imports from these countries.

Commerce Secretary Rajesh Agrawal confirmed on Monday that India had made its submissions to the U.S. on the matter and protested the tariffs.

This pending decision has led to significant uncertainty surrounding the India-U.S. trade deal, with Commerce Minister Piyush Goyal and Mr. Agrawal separately saying India would sign a deal only once it is established that it will receive a comparative advantage over its competitors.

One key factor in establishing this comparative advantage is to see what tariffs the U.S. plans to levy

under its various investigations. The second investigation is into whether the U.S.'s trade partners are using excess capacity to export to the U.S. to the detriment of the American economy.

According to the notification by the Commerce Ministry, "forced labour" means "all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily, as defined under the ILO Forced Labour Convention, 1930 (No. 29)".

According to Manoj Mishra, Partner and Tax Controversy Management Leader, Grant Thornton Bharat, the introduction of a prohibition on imports of goods produced through forced labour marks a significant policy shift in India's trade framework. "While India has so far relied largely on labour and criminal laws to address forced labour domestically, the Foreign Trade Policy now incorporates a dedicated trade measure aligned with international standards under the ILO Forced Labour Convention," Mr. Mishra said.

- **Key Terms and Explanations**
- **Forced Labour (ILO Convention No. 29)**
 - **Conceptual Definition:** As established by the International Labour Organization (ILO) under Convention No. 29, forced or compulsory labour refers to any work or service extracted from an individual under the threat of penalty, where the person has not offered themselves voluntarily. It represents a severe violation of basic human rights and a restriction of human agency.
- **Foreign Trade Policy (FTP) & Non-Tariff Barriers (NTBs)**
 - **Conceptual Definition:** The Foreign Trade Policy is a regulatory framework governing a nation's exports and imports. Increasingly, nations utilize Non-Tariff Barriers—administrative, qualitative, or ethical stipulations rather than direct taxes—to regulate trade.
- **Director General of Foreign Trade (DGFT)**
 - **Conceptual Definition:** The DGFT is an attached office of the Ministry of Commerce and Industry. It is tasked with formulating and implementing the Foreign Trade Policy, issuing licenses, and monitoring compliance with import-export regulations.
- **Countervailing Tariffs & Comparative Advantage**
 - **Conceptual Definition:** Countervailing actions or retaliatory tariffs are trade penalties levied by an importing country to offset unfair competitive advantages gained by trading partners due to subsidies or lower ethical/environmental standards. Comparative advantage is the ability of an economy to produce goods at a lower opportunity cost than its competitors.
- **Main Arguments and Substantive Parts**
- **The Structural Shift in Trade Calculus**
 - **The Intersection of Trade and Human Rights:** Historically, trade policies were strictly economic instruments focused on tariffs, quotas, and market access. There is an unmistakable paradigm shift where international trade is being re-engineered to absorb global ethical standards, transforming labor rights from a purely domestic socio-legal issue into a core trade determinant.
 - **Moving Beyond Domestic Criminal Law:** For decades, addressing exploitative labor practices relied exclusively on domestic criminal codes and local labor inspectorates. The integration of restrictive measures directly into the Foreign Trade Policy signifies that local enforcement is no longer viewed in isolation; it must now align with international trade compliance framework to prevent global economic isolation.
- **Strategic Reciprocity and Market Preservation**
 - **Proactive Compliance as a Shield:** The decision to systematically bar products tied to exploitative labor is fundamentally a defensive economic maneuver. Facing potential punitive tariffs from major Western trading partners, proactive domestic alignment serves as a strategic shield to safeguard broader market access and clear the path for critical bilateral trade pacts.
 - **The Doctrine of Comparative Advantage:** Economic diplomacy requires that any concession made on international standards must translate into tangible market gains. Policymakers are maintaining a firm stance that regulatory alignment will only be formalized when it guarantees that domestic exporters retain a distinct, competitive edge over global rivals in premium markets.

- **Historical Evolution of the Issue**
- **Pre-Independence and Colonial Exploitation (Pre-1947)**
- **Systemic Institutionalization:** The colonial economy thrived on highly exploitative labor frameworks, including indentured labor systems and forced cultivation patterns (such as the Indigo system). Regulatory frameworks during this era were designed to maximize resource extraction rather than protect human capital, creating deep-seated structural vulnerabilities in the rural economy.
- **Post-Independence Constitutional Foundation (1950s–1970s)**
- **Rights-Based Assertions:** The founding fathers recognized the systemic nature of labor exploitation, leading to the explicit inclusion of Article 23 in the Indian Constitution, which strictly prohibits trafficking and forced labor. This foundational constitutional guarantee was later reinforced by the landmark enactment of the Bonded Labour System (Abolition) Act in 1976, aiming to dismantle agrarian debt-bondage.
- **The WTO Era and Resisting the "Social Clause" (1990s–2010s)**
- **The Global Trade Divide:** With the creation of the World Trade Organization (WTO) in 1995, developed nations consistently attempted to introduce a "Social Clause" linking trade access to labor standards. India, alongside other developing economies, vehemently resisted these moves for decades, arguing that such clauses were thinly veiled protectionist tools designed to neutralize the labor cost advantages of developing nations.
- **The Modern Era of Supply Chain Due Diligence (Present Day)**
- **The Transnational Enforcement Regime:** The contemporary landscape, shows a shift from multilateral WTO debates to unilateral and bilateral regulatory pressures. Global supply chain due diligence laws, Environmental, Social, and Governance (ESG) mandates, and targeted import bans by major economies have forced a transition from diplomatic resistance to active domestic policy integration via the Foreign Trade Policy.
- **Way Forward**
- **Establishing Robust Digital Traceability**
- **Blockchain-Enabled Supply Chains:** To effectively implement import restrictions on forced labor, the Ministry of Commerce, in coordination with the DGFT, should deploy blockchain-based supply chain mapping. This technology provides an unalterable ledger tracking raw materials from their source to the finished product, making it difficult for suppliers to obscure exploitative practices.
- **Institutional Capacity Building for the DGFT**
- **Specialized Investigative Cells:** The DGFT's mandate must be expanded beyond purely administrative and fiscal monitoring. Establishing specialized labor compliance cells, trained in collaboration with the ILO and Ministry of Labour, will give the directorate the technical expertise needed to conduct cross-border supply chain audits.



DEEP ANALYSIS OF GLOBAL GOVERNANCE & MULTI-POLARITY: INDIA'S STRATEGIC & ETHICAL CHALLENGES.

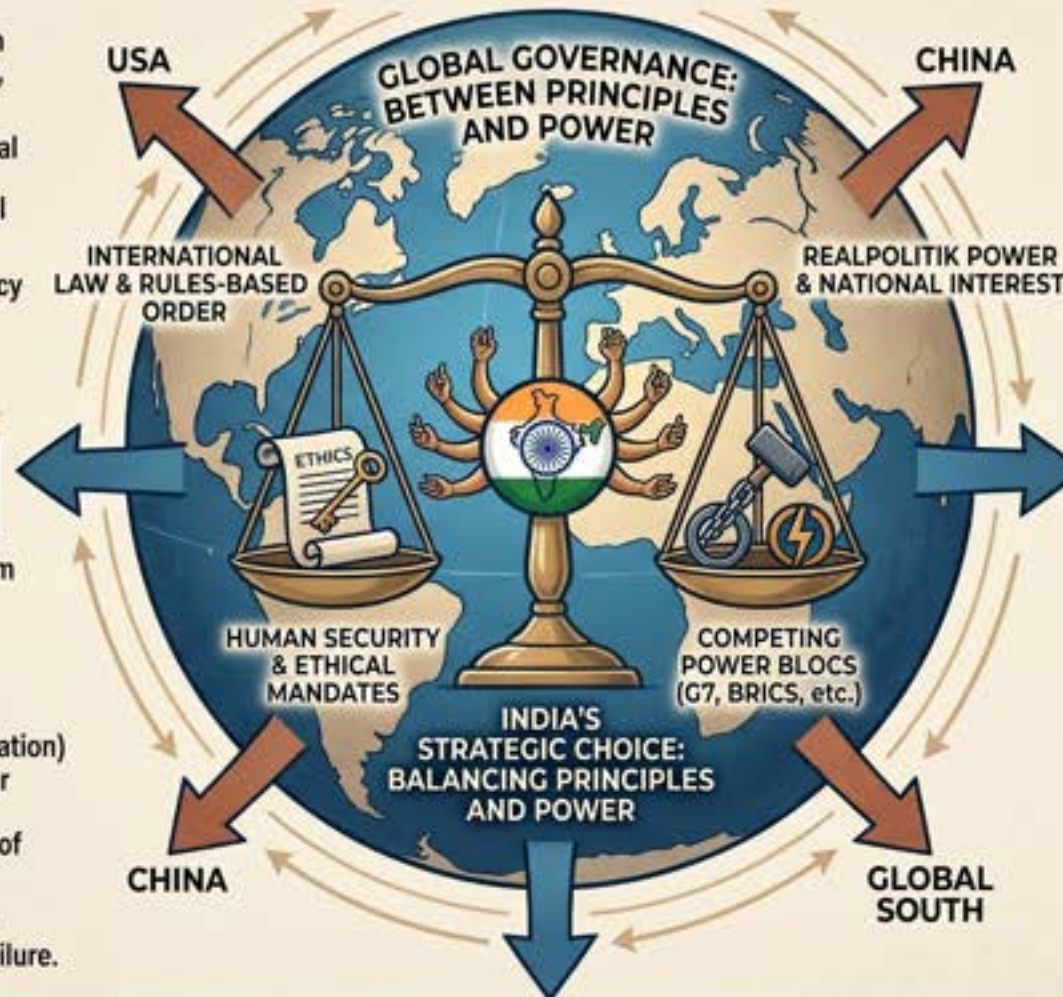
1. CORE CONCEPTS & ARGUMENTS (THE SHIFTING PARADIGM)

- **TERM: RULES-BASED INTERNATIONAL ORDER (RBIO):** Not just a framework of global rules, but often seen as reflecting the power and norms of its creators, leading to challenges of legitimacy and inclusion.
- **TERM: HUMAN SECURITY:** Transition from traditional state-centric security to a direct focus on individual well-being—freedom from fear (human rights, physical violence) and freedom from want (poverty, disease).
- **KEY THESIS:** Global institutions are facing a legitimacy crisis. Rise of multiple power centers prevents global consensus on critical issues, creating a volatile multi-polar world.

3. LOGICAL, PHILOSOPHICAL & HISTORICAL FOUNDATIONS

- **PHILOSOPHY:** Conflict between Realpolitik (zero-sum power calculations) and Cosmopolitanism (universal cooperation and solidarity). Tension between state sovereignty and global ethical responsibilities.
- **HISTORICAL EVOLUTION:**
 - Timeline from Pre-Independence (Colonial Exploitation)
 - 1945-1990 (Post-WWII Multilateral Order, Cold War Bipolarity)
 - 1990s-Present (Post-Cold War Globalisation, Rise of Multi-Polarity)
- **LOGIC:** Why current reforms are required to manage diverse power centers and prevent global systemic failure.

AXIA IAS ACADEMY RISE ABOVE THE REST



2. MULTIDIMENSIONAL IMPACT (UPSC CSE FOCUS)

- **INTERNATIONAL:** Paralysis of UNSC reform, fragmentation of multilateralism into transaction-based agreements, G20 as a key but stressed platform for global dialogue.
- **ECONOMIC:** Widespread debt distress in the Global South, global food and energy insecurity, and a shift towards protectionism like friend-shoring and resource nationalism.
- **SOCIAL:** Erosion of international consensus on human rights norms, significant setbacks to Sustainable Development Goals (SDGs), and increased vulnerability for marginalized populations.

4. THE WAY FORWARD & UPSC/APSC LINKAGES (REFORMS)

- **UPSC LINKAGES (GS PAPERS):**
 - GS Paper 2 (Global Institutions, India's Role)
 - GS Paper 3 (Economic Development, Security)
 - GS Paper 4 (Ethics in International Relations), Essay
 - APSC relevance for Paper 3 (International Issues).
- **BALANCED SOLUTIONS:**
 - **REVIVED MULTILATERALISM 2.0:** Reform global institutions like the UNSC for greater inclusivity.
 - **PRIORITIZE HUMAN SECURITY:** Shift focus to collaborative solutions for poverty, climate change, and global health.
 - **INDIA'S LEADERSHIP:** Champion the Global South (e.g., via the 'Voice of Global South' initiative) while maintaining strategic autonomy.
 - **COLLABORATION, REFORMS, & CONSENSUS**



Can't English be considered an Indian language, asks top court

Court questions the use of the colonially loaded term 'native' in CBSE circular, says push for three-language scheme may be in the spirit of constitutional goal to use Indian languages for official purposes; petitioners point to human resource crunch

Krishnadas Rajagopal
NEW DELHI

The Supreme Court on Tuesday questioned the categorising of English as a "non-native language" by the Central Board of Secondary Education (CBSE) in the three-language scheme, teaming the tongue spoken in India for over 300 years and used for official communication in at least five States with those such as German, Spanish, Arabic, and French.

"Can India consider English as an indigenous Indian language," Justice Joydip Bagchi, part of a three-judge Bench headed by Chief Justice of India Surya Kant, asked.

The latest circular issued by the CBSE on July 10 differentiates between "Bharatiya Bhashas" such as Hindi, Sanskrit, Tamil, Telugu, Punjabi, and so on from the "non-native" languages. The three-language scheme, which is under dispute, requires Class 9 students to study at least two languages "native to India".

Justice Bagchi said the term "native" used by the



The CBSE circular differentiates between 'Bharatiya Bhashas' such as Hindi and Tamil and 'non-native' languages.

CBSE was loaded with colonial meaning. "What does this word 'native' mean? Can it be understood as indigenous Indian language," Justice Bagchi asked.

The judge pointed out that neither the Constitution nor the statute books used the term "native". It was either "mother tongue", "regional language", or "Indian language".

Justice Bagchi, however, said the push for the three-language scheme may be in the spirit of the constitutional goal to use Indian languages for official purposes throughout the country.

Senior advocate Gopal Sankaranarayanan, appearing for parents and

students, said neither books nor teachers were available in schools. Out of the 22 Scheduled languages, books were available only for three though the three-language scheme came into force from July 1.

The senior counsel said teaching 22 languages in CBSE schools would mean 22 teachers more, with one for each language.

"This is true as all 22 languages should be made available to students... This creates a complete impossibility of human resources for schools in the country," Mr. Sankaranarayanan said.

The court issued notice in his petition highlighting the impact of the three-language scheme on children

in Classes 5 and 6, and listed the next hearing on July 22.

Senior advocate Mukul Rohatgi, appearing for parents and students of Class 9, said it was far too much to expect students to take up a new language, be proficient and appear for exams. He focused on the human resource crunch staring at schools. "Which teacher can teach 22 languages," Mr. Rohatgi asked.

Senior advocate Shyam Divan, also for Class 9 students, said the scheme was originally meant for 2030, but was advanced to 2026-27.

Retired teachers: CBSE

In an affidavit filed on July 13, the CBSE has acknowledged the possibility of a resource crunch in the implementation of the three-language scheme, but said retired teachers and "suitably qualified postgraduates" could pitch in.

The CBSE considered this a "very practical and enabling approach" to address the availability of teachers and learning resources for implementation of the language policy.

"Recognising that schools may require time

to build full teaching capacity in different Bharatiya Bhashas, the Board has permitted flexible staffing arrangements as an interim measure... It has been suggested that schools may, as an interim measure, engage 25-26 existing teachers with functional proficiency, retired teachers and suitably qualified post-graduates, and may use Sahodaya clusters and virtual/hybrid teaching," it said.

The Board reasoned that out of the 28,848 schools sponsoring Class 9 candidates, 47.3% already offer two or more native Indian languages and were fully compliant without the need for any additional teachers.

The CBSE said that 99.9% of schools already had at least one Indian language teacher.

In a separate affidavit, the National Council of Educational Research and Training (NCERT) said it had already undertaken the preparation, review, vetting, finalisation and dissemination of textbooks in 22 Scheduled languages as part of the implementation of the three-language formula.

- **Key Terms and Explanations**
 - **Three-Language Formula:** This is an educational policy framework designed to promote multilingualism and national integration. Originally conceptualized in 1968 and re-emphasized in recent national education policies, it mandates that students study three languages. In Hindi-speaking states, this typically includes Hindi, English, and a modern Indian language (preferably from the South). In non-Hindi-speaking states, it encompasses the regional language, English, and Hindi.
 - **Eighth Schedule of the Constitution:** A constitutional list containing 22 officially recognized Indian languages (such as Hindi, Tamil, Sanskrit, and Punjabi). While it confers administrative and promotional status on these languages, English is notably absent from this schedule despite its widespread use.
 - **Subsidiary Official Language:** Under the Official Languages Act of 1963, English is designated as the authoritative associate language for official purposes of the Union. This status ensures that English remains the functional medium for the higher judiciary, inter-state communication, and central administration alongside Hindi.
 - **Indigenous vs. Non-Native Dichotomy:** A contested socio-legal classification. Administrative circulars often differentiate between "Bharatiya Bhashas" (indigenous tongues) and "non-native" languages (traditionally lumping English with foreign languages like German, French, or Arabic). The legal challenge questions whether a language spoken in India for over three centuries can be structurally isolated as entirely foreign.
 - **Sahodaya School Clusters:** A collaborative institutional concept introduced by educational boards where a neighborhood network of schools shares resources, pedagogical best practices, and teaching staff to optimize educational delivery and mitigate infrastructural deficits.
- **Main Arguments and Substantive Parts**
 - The core debate centers on the tension between revitalizing indigenous languages and the pragmatic, logistical realities of India's schooling system.
 - **The Judicial Contention on Linguistic Identity**
 - A primary argument questions the administrative classification of English as a purely "non-native" tongue. The apex judiciary notes that English has been woven into the country's social and administrative fabric for over 300 years. It serves as the primary language of official communication in at least five Indian states. Labeling it "non-native" lacks explicit constitutional or statutory backing, as the Constitution refers primarily to "mother tongues," "regional languages," or "official languages."
 - **The Logistical and Human Resource Crunch**
 - Implementing an expanded language curriculum creates immediate operational friction. Forcing schools to offer a vast array of Scheduled languages demands an unprecedented expansion of teaching personnel—potentially requiring dozens of additional specialized teachers per school. When policies are advanced abruptly—such as shifting implementation targets from 2030 to the 2026–27 academic cycle—schools face severe deficits. At the onset of these mandates, complete learning materials and trained educators are often available for only a fraction of the mandated languages.
 - **The Institutional Defense and Transitional Fixes**
 - Educational authorities argue that the underlying intent of these policies is deeply aligned with the constitutional directive to promote indigenous languages. To counter immediate shortages, institutions rely on flexible staffing arrangements. These include hiring retired teachers, leveraging qualified postgraduates, utilizing virtual or hybrid teaching modules, and sharing educators across Sahodaya school clusters. Data indicates that nearly half of the affiliated schools already offer multiple regional languages without needing extra staff, and almost all possess at least one regional language teacher, suggesting that the baseline infrastructure is partially receptive to the transition.

- **Historical Evolution of the Issue**
- **The Colonial Footprint (1835):** Lord Macaulay's Minute on Indian Education deliberately institutionalized English to create a class of anglicized citizens. This historical inflection point embedded English into the administrative, legal, and educational structures of subcontinent governance.
- **The Constituent Assembly Dilemma (1947–1949):** The "Language Question" was among the most fiercely debated topics. The resulting Munshi-Ayyangar Formula designated Hindi in the Devanagari script as the official language of the Union but permitted the continued use of English for an initial period of 15 years to prevent administrative disruption.
- **The 1963 Flashpoint:** As the 15-year deadline neared, widespread anti-Hindi agitations, particularly in Southern India, threatened national cohesion. In response, the Official Languages Act of 1963 was enacted, ensuring that English would continue to be used indefinitely as an associate official language.
- **The Formulation of the Three-Language Strategy (1968):** Based on the recommendations of the Kothari Commission (1964–66), the Three-Language Formula was introduced in the first National Policy on Education. It sought to bridge the linguistic divide between the North and South while maintaining a global connection via English.
- **The Modern Push for Decolonization (2020–Present):** Recent educational reforms have renewed focus on Indian languages ("Bharatiya Bhashas"). This shift has prompted administrative bodies to fast-track curriculum overhauls, bringing long-standing debates over linguistic identity back to the forefront of judicial and public discourse.

- **Way Forward**
- **Calibrating the Implementation Timeline**
- Rather than rushing strict linguistic mandates, educational boards should adopt a phased, flexible timeline. Reverting closer to the original long-term targets allows schools, teachers, and students the necessary runway to adapt organically without compromising academic performance or inducing learning stress.
- **Adopting Inclusive and Standardized Legal Terminology**
- Administrative circulars should avoid polarized or legally ambiguous terms like "native" and "non-native." Utilizing precise, legally grounded terminology such as "Languages under the Eighth Schedule" or "Constitutional Languages" respects the unique, historical position of English as an institutional link language in India.
- **Leveraging Technology and Shared Institutional Networks**
- To address the immediate shortage of language teachers, schools can expand the use of hub-and-spoke models like Sahodaya clusters. Combining this with high-quality digital learning platforms and hybrid classrooms allows a single qualified language educator to reach students across multiple campuses, maximizing scarce human resources.
- **Ensuring Comprehensive Curricular Readiness**
- No language should be made mandatory for examination until high-quality textbooks, standardized learning materials, and vetted evaluation metrics are fully prepared and distributed. The state must focus on building capacity through specialized teacher-training programs before enforcing strict compliance measures in schools.

COMPREHENSIVE ANALYSIS: ENGLISH AS AN 'INDIAN LANGUAGE' & THREE-LANGUAGE SCHEME



JUDICIAL & LEGAL VIEW



- SC questions 'non-native' term for English.
- Used in India for 300+ years.
- Official language in multiple states.
- Associate official language under statute.



LOGISTICAL CHALLENGES



- Human resource crunch cited.
- Offer 22 Scheduled Languages.
- Requires significant additional teachers.
- Implementation fast-tracked to 2026-27.



INSTITUTIONAL ROLES



- CBSE and NCERT involved.
- CBSE allows flexible staffing.
- Retired teachers, postgraduates, clusters.
- NCERT creating textbooks for 22 languages.

MULTIDIMENSIONAL IMPACTS



- Social: Class stratification vs. opportunity.
- Political: Federal structure & linguistic identity.
- Legal: Eighth Schedule vs. Associate status.
- Ethical: Student burden & fairness.



WAY FORWARD



- Phased implementation timeline.
- Precise legal terminology.
- Strategic resource use (clusters, tech).
- Curricular & textbook readiness.

UPSC CSE RELEVANCE: GS Papers I, II, IV & ESSAY

Draft health research policy proposes overhaul of India's research ecosystem

Bindu Shajan Perappadan
NEW DELHI

The Centre has released the draft National Health Research Policy, 2026, that seeks to align the country's scientific research more closely with its disease burden and public health priorities, proposing a wide-ranging restructuring of India's health research ecosystem with a sharper focus on indigenous innovation, evidence-based policymaking, and measurable outcomes.

Prepared by the Department of Health Research, the draft is the first attempt at a unified national framework spanning biomedical science, clinical medicine, public health, epidemiology, digital health, health systems, behavioural sciences, and emerging technologies.

The Ministry has invited stakeholder feedback be-



Among the key proposals is a system for identifying priority research areas.

fore the policy is finalised. It aims to address long-standing problems, including fragmented research efforts, wide regional disparities in research capacity, and the slow translation of scientific findings into actual healthcare delivery and policy.

While India has built considerable scientific capability through institutions such as the Indian Council of Medical Research

(ICMR), universities, medical colleges and other research bodies, the policy points out that this capability remains concentrated in a handful of institutions and States.

Research priorities, it notes, do not always track the country's real disease burden, health-system gaps, equity concerns or its preparedness for future public health emergencies. Administrative and regulatory delays, it adds, continue to slow down research even when funding is not the constraint.

Among the key proposals is a system for periodically identifying priority research areas, based on disease burden, scientific opportunity, equity, pandemic preparedness and strategic national interest – an agenda to be drawn up in consultation with States, Union Territories, researchers, health profes-

sionals, patients and community representatives.

Three-tier structure

The draft also lays out a three-tier governance structure: a National Health Research Stewardship Committee for overall strategic coordination, the Department of Health Research as the nodal implementing agency, and the ICMR as the scientific and technical lead. States, in turn, will be expected to weave research more tightly into local health programmes and service delivery.

Ethics, research integrity, data governance, cybersecurity and community participation have been placed at the core of this framework. Long-term national targets have also been proposed for research investment, medical science Ph.D., publications, and patents.

- **Key Terms and Explanations**
 - **Disease Burden:** This is a critical epidemiological metric used to quantify the overall impact of health problems within a specific population, accounting for both financial costs and mortality/morbidity indicators. It is frequently measured using Disability-Adjusted Life Years (*DALYs*), which combine the years of life lost due to premature mortality and years lived with a disability. For instance, while a central research laboratory might focus heavily on rare genetic anomalies, the actual country-wide disease burden might be heavily skewed toward non-communicable lifestyle diseases or neglected tropical infections, necessitating a realignment of research funding.
 - **Evidence-Based Policymaking:** This process ensures that public health decisions, regulatory approvals, and fiscal allocations are grounded in rigorously verified empirical data rather than political expediency or intuition. A practical example is altering a state-wide nutritional program only after peer-reviewed clinical data demonstrates a specific micronutrient deficiency in that geographic terrain.
 - **Three-Tier Governance Structure:** A unified administrative architecture designed to eliminate operational overlaps. It segments governance into strategic coordination (led by a Stewardship Committee), implementation oversight (managed by a central nodal department), and technical/scientific execution (driven by premier statutory research bodies).
 - **Translational Research:** The iterative process of turning fundamental laboratory discoveries and clinical trial findings into tangible, real-world medical interventions—such as diagnostics, therapeutics, or behavioral guidelines—that actively improve community health. It bridges the gap between the laboratory bench and the patient's bedside.
 - **Data Governance and Cybersecurity in Health:** A specialized regulatory framework that dictates how clinical data, genomic sequences, and patient electronic records are collected, stored, anonymized, and protected. It ensures that while data remains accessible for public health research, it is safeguarded against cyber threats and unauthorized commercial exploitation.
- **Main Arguments and Substantive Parts**
 - The structural overhaul of the healthcare research architecture centers on a foundational premise: a nation's scientific research must mirror its socio-epidemiological realities. The core thesis argues that despite substantial scientific advancements, the current ecosystem remains structurally fragmented, hyper-centralized, and disconnected from the everyday medical needs of the populace.
 - **The Paradox of Institutional Concentration:** There is a distinct regional and institutional asymmetry in research capabilities. While elite central bodies like the Indian Council of Medical Research (ICMR) and select metropolitan universities showcase state-of-the-art infrastructure, the vast majority of provincial medical colleges and state universities remain research deserts, creating a severe knowledge imbalance.
 - **Misalignment with Epidemiological Realities:** Active medical investigations often occur in academic silos, detached from localized disease burdens, systemic health gaps, and equity concerns. Research investments frequently favor high-tech medical innovations over critical, ground-level public health challenges and pandemic preparedness.
 - **Administrative and Regulatory Bottlenecks:** Bureaucratic friction and protracted approval pathways often delay critical scientific inquiries. These procedural delays slow down clinical translation even when fiscal capital and research funding are not the primary constraints.
 - **The Architecture of a Unified Framework:** To rectify these vulnerabilities, the proposed 2026 policy framework advocates for a streamlined, three-tier governance model. Under this layout, a National Health Research Stewardship Committee handles overarching strategic coordination, the Department of Health Research (DHR) acts as the nodal implementation vehicle, and the ICMR provides scientific leadership. This setup seeks to firmly weave research metrics into local state-level healthcare programs.

- **Historical Evolution of the Issue**

- The trajectory of public health research in India highlights a gradual transition from colonial-era disease containment to a modern focus on technological sovereignty and comprehensive, evidence-based healthcare.

- **The Pre-Independence Inception (1911–1947):** The roots of institutional research trace back to the establishment of the Indian Research Fund Association (IRFA) in 1911. Its primary mandate was limited to addressing tropical outbreaks and conserving the health of the colonial workforce and military apparatus, leaving systemic public health research largely neglected.

- **Post-Independence Consolidation (1949–1980s):** Following independence, the IRFA was re-designated as the Indian Council of Medical Research (ICMR) in 1949 with an expanded mandate. The subsequent establishment of elite institutions like the All India Institute of Medical Sciences (AIIMS) in 1956 sought to merge high-quality tertiary clinical care with native medical research, though these resources remained highly concentrated.

- **The Era of Bureaucratic Specialization (2007):** Recognizing that medical research required dedicated administrative focus, the government established the Department of Health Research (DHR) under the Ministry of Health and Family Welfare in 2007. This move separated clinical service delivery from the broader mandate of building scientific capacity and supervising ethical clinical protocols.

- **The Post-Pandemic Realignment (2020–2026):** The vulnerabilities exposed during recent global health emergencies highlighted deep gaps in local trial ecosystems, genomic surveillance networks, and state-level research capabilities. This reality directly catalyzed the formulation of the Draft National Health Research Policy, 2026, shifting focus away from siloed laboratory work toward an integrated, decentralized, and security-conscious national framework.

- **Way Forward**

- **Establishing Regional Competence Hubs:** To address institutional concentration, the government should systematically fund and upgrade research infrastructure in Tier-2 and Tier-3 provincial medical colleges. Creating regional research hubs allows institutions to document, analyze, and address localized disease variations effectively.

- **Implementing a Single-Window Regulatory Dashboard:** Administrative and regulatory delays can be minimized by deploying a unified, time-bound digital clearinghouse. Co-managed by the Department of Health Research and regulatory bodies like the CDSCO, this system would accelerate approvals for ethical clinical trials without compromising safety protocols.

- **Fostering Public-Private Translational Partnerships:** The state should incentivize private biomedical and pharmaceutical firms to collaborate with public academic institutions through tax exemptions, joint research grants, and shared intellectual property frameworks. This approach can help turn institutional lab discoveries into affordable, mass-market medical diagnostics and therapies.

- **Creating Interdisciplinary Research Pathways:** Achieving long-term national targets requires training a new generation of medical researchers. Introducing specialized medical science programs that combine clinical training with data analytics, artificial intelligence, epidemiology, and health economics will help build a future-ready scientific workforce.



AXIA
IAS ACADEMY



DISEASE BURDEN (DALYs)

ANALYSIS: DRAFT NATIONAL HEALTH RESEARCH POLICY, 2026 - OVERHAUL OF INDIA'S RESEARCH ECOSYSTEM

KEY TERMS & CONCEPTS



THREE-TIER GOVERNANCE STRUCTURE



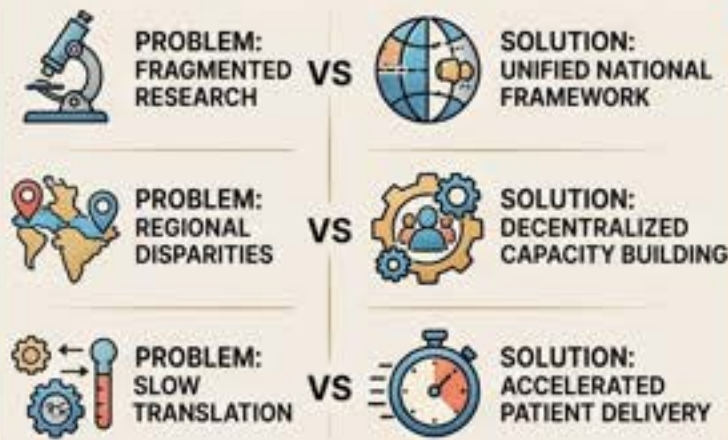
HISTORICAL EVOLUTION TIMELINE



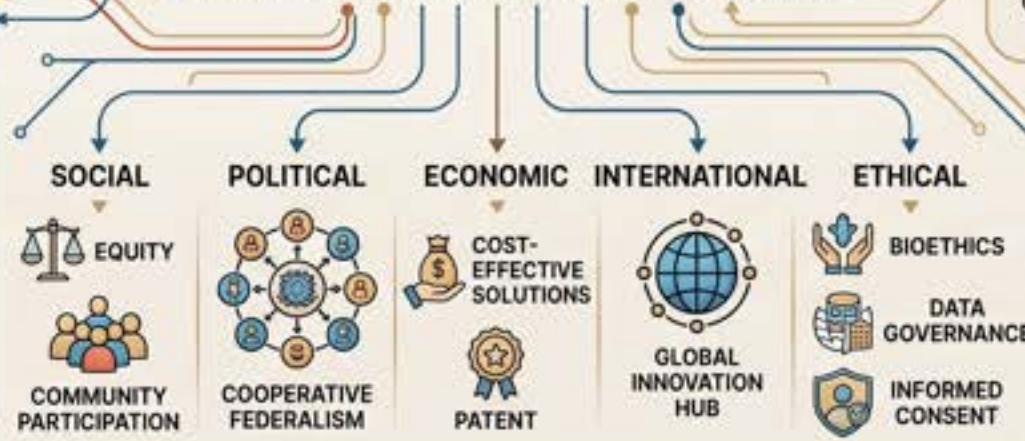
WAY FORWARD & KEY TARGETS



MAIN ARGUMENTS & CHALLENGES vs SOLUTIONS



MULTIDIMENSIONAL IMPACT ANALYSIS



RELEVANT UPSC CSE PYQs (PRELIMS & MAINS)

- HEALTH GOVERNANCE (GS II)
- INDIGENIZATION OF TECHNOLOGY (GS III)
- ETHICS IN MEDICAL RESEARCH (GS IV)
- ESSAY TOPICS ON SOCIAL EQUITIES & TECHNOLOGY

Acid ingestion included in amended Act: Centre to SC

The Hindu Bureau
NEW DELHI

The Union government informed the Supreme Court on Tuesday of amending the Rights of Persons with Disabilities Act (RPwD) of 2016 to extend the definition of “acid attack victim” to mean persons who have internal injuries caused by the ingestion of acid or any other similar corrosive substances.

Appearing before a three-judge Bench headed by Chief Justice of India Surya Kant, Solicitor-General Tushar Mehta, for the Centre, said a notification was issued on May 22 by which the Act’s schedule was amended to define an “acid attack victim” as anyone “disfigured externally or internally due to violent assault, self-infliction, accident by throwing, administering, or spilling

Earlier, the law only recognised victims of acid-throwing, and not forcible acid ingestion

of acid or similar corrosive substance”.

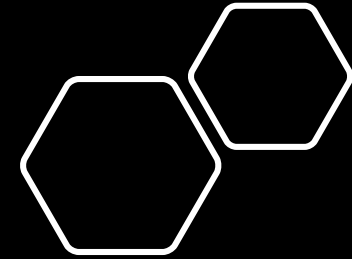
The amendment would have a retrospective effect, which would allow victims with internal injuries that occurred prior to May 22, 2026 to also claim benefits under the 2016 Act.

The 2016 law had previously recognised only victims of acid-throwing, and not forcible acid ingestion. The Act had remained unchanged although the Bharatiya Nyaya Sanhita (BNS), which replaced the Indian Penal Code, accepted both the act of acid-throwing and administration of acid as offences punishable from

10 years’ imprisonment to a life sentence under Section 124 (voluntarily causing grievous hurt).

In May, the top court had flexed its plenary powers to include survivors of forcible administration of acid in the category of ‘acid attack victims’ under the 2016 Act. The court took the extraordinary step in May to judicially intervene under Article 142 of the Constitution after senior advocate Mukul Rohatgi, appearing for the petitioners, successfully urged the Bench that “those who suffered the extreme agony of having to forcibly ingest acid” must not be left out.

In previous hearings, the court had even gone to the extent of indicating to the Centre to change the penal and bail laws to punish the perpetrators of this “most ruthless, most heinous” of crimes.



- **Key Terms and Explanations**
- **Rights of Persons with Disabilities (RPwD) Act, 2016:** This landmark legislation replaced the older 1995 Act, expanding the recognized categories of disabilities from 7 to 21. It moved India's legislative framework from a medical model of disability to a rights-based model, guaranteeing reservations in higher education and government jobs, alongside dedicated healthcare and rehabilitation.
- **Internal Acid Ingestion vs. External Acid Throwing:** Traditionally, legal definitions focused heavily on external disfigurement (visible scarring of skin or loss of sight). Internal ingestion involves the forced or accidental consumption of corrosive substances, leading to catastrophic, often invisible destruction of the esophagus, internal organs, and respiratory tract.
- **Article 142 of the Indian Constitution:** This constitutional provision equips the Supreme Court with unique, plenary powers to pass any decree or order necessary for doing "complete justice" in any cause or matter pending before it. It acts as an equitable safety valve when statutory laws fall short or feature legislative gaps.
- **Section 124 of the Bharatiya Nyaya Sanhita (BNS):** Replacing the older provisions of the Indian Penal Code (IPC), this section penalizes voluntarily causing grievous hurt by use of acid or similar corrosive substances. Crucially, it recognizes both the act of throwing and the act of administering (ingestion), prescribing punishments ranging from 10 years to life imprisonment.
- **Retrospective Effect:** This legal principle allows an amendment or law to apply to actions, events, or crimes that occurred before the law was formally modified. In welfare legislation, it acts as a remedial tool to extend benefits to past survivors who were previously excluded due to narrow legal definitions.
- **Main Arguments and Substantive Parts**
- The central core of this legal discourse revolves around correcting a long-standing asymmetric gap between criminal prosecution and social rehabilitation. While the penal framework has historically evolved to punish perpetrators of both external and internal acid violence, welfare and disability benefits remained rigidly restricted to visible, external trauma.
- **The Asymmetry of Harm Recognition:** For years, a survivor who suffered extreme internal organ failure due to forced acid ingestion could see their attacker jailed under criminal law, yet remain entirely ineligible for state-sponsored disability support, medical concessions, or employment quotas. The core argument here is that trauma must not be rationed based on visual visibility.
- **Judicial Intervention as a Catalyst:** The systemic vacuum was bridged by the highest judiciary, which recognized that waiting for slow legislative overhauls extends the agony of survivors. By using its extraordinary powers to mandate a broader reading of the law, the judiciary pushed the executive to formalize an all-encompassing definition.
- **The Remedial Scope of Retrospectivity:** Unlike criminal law, where the Constitution strictly prohibits retrospective punishment (ex-post facto laws), welfare laws face no such barrier. The administrative decision to give this change a retrospective effect ensures that individuals who survived internal acid trauma prior to May 2026 are not left out of the national safety net.
- **Harmonization of Legal Definitions:** A fragmented legal system creates administrative chaos. The substantive shift achieved here harmonizes the protective definitions of the RPwD Act with the punitive definitions of the Bharatiya Nyaya Sanhita, ensuring the state speaks with one cohesive, protective voice.

- **Historical Evolution of the Issue**

- **The Pre-2013 Blindspot:** Before structural changes were introduced, acid attacks were handled under standard provisions of "grievous hurt" within the Indian Penal Code. The law failed to acknowledge the gendered, weaponized nature of acid, and internal ingestion was frequently miscategorized as standard poisoning.
- **The 2013 Criminal Law Watershed:** Triggered by civil society movements and the landmark *Laxmi v. Union of India* case, the Criminal Law (Amendment) Act of 2013 introduced dedicated penal provisions. This criminalized acid throwing and attempts to throw, though the primary visualization of the crime remained external.
- **The 2016 Socio-Economic Inclusion:** Realizing that penalizing the attacker does not automatically rebuild the survivor's life, the state included acid attack survivors in the RPwD Act of 2016. This transformed survivors from mere witnesses in a criminal trial into rights-bearing citizens entitled to state care.
- **The Modern Synthesis:** The recent administrative change marks the ultimate convergence of penal reality and welfare policy, ensuring that internal trauma receives the exact same socioeconomic dignity as external disfigurement.

- **Way Forward**

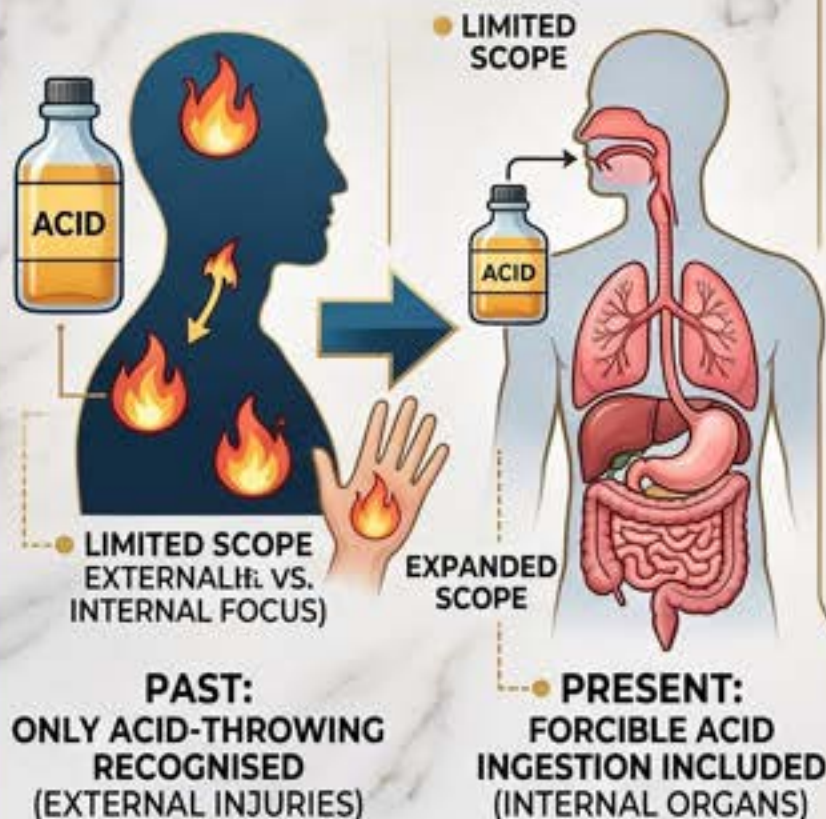
- **Enforcing Strict Retail Control:** Expanding welfare definitions addresses the consequences, but preventing the crime requires stopping the source. State governments must enforce rigorous tracking, mandatory licensing, and verified logbooks for the over-the-counter sale of all corrosive chemicals and industrial acids.
- **Standardizing Medical Evaluation Protocols:** Because internal chemical injuries are complex and hidden, specialized medical boards must establish clear, non-bureaucratic diagnostics to evaluate internal damage quickly. This ensures survivors can secure their disability certificates without facing administrative harassment.
- **Implementing Single-Window Rehabilitation:** Survivors should not have to navigate multiple government departments for medical care, financial ex-gratia, and educational quotas. A streamlined, single-window clearance model handled by district collectors can ensure immediate access to all entitlements under the RPwD Act.
- **Sustained Sensitivity & Skilling Campaigns:** Public and private entities need structured sensitization programs regarding the expanded definition of disability. Furthermore, the state must design targeted, flexible skill-development programs tailored to the specific physical capabilities of internal trauma survivors, securing their long-term financial independence.

COMPREHENSIVE ANALYSIS: COMPASSION & JUSTICE FOR ACID ATTACK SURVIVORS - BRIDGING THE GAP

PENAL & WELFARE LAW CONVERGENCE

For APSC / UPSC Prep

DEFINITIONAL EVOLUTION (EXTERNAL vs. INTERNAL FOCUS)



LEGAL FRAMEWORK CONVERGENCE



LEGAL HARMONIZATION
Punishment for For Acid Administration & Throwing Scops Yrs to Life)

MULTIDIMENSIONAL IMPACT



WAY FORWARD & SOLUTIONS



What is meant by 'trial in absentia'?

Who can be tried in absentia under BNSS? What changed under the new criminal law? How does the law protect the accused's right to fair trial? What happens if the accused later appears before the court? Why was trial in absentia introduced?

EXPLAINER

Rizmi Liaqat

The story so far:

A Special NIA Court in Jammu has issued a non-bailable warrant against Hafiz Saeed, the Pakistan-based chief of the proscribed terror outfit Lashkar-e-Taiba (LeT), in connection with the investigation into the Pahalgam terror attack. The warrant was issued at the request of the National Investigation Agency (NIA). The order was passed by the Special Judge of the NIA Court on July 8, two days after a supplementary chargesheet was filed against Saeed in the Pahalgam terror attack case.

Since Saeed is unlikely to appear before an Indian court, the agency is expected to seek a trial in absentia under Section 356 of the Bharatiya Nagarik Suraksha Sanhita (BNSS), which replaced the Code of Criminal Procedure (CrPC). In its supplementary chargesheet, the NIA has charged Hafiz Saeed both in his individual capacity and as the chief of the banned Lashkar-e-Taiba (LeT) and its proxy outfit, The Resistance Front (TRF).

"The accused has been charged under various provisions of the Bharatiya Nyaya Sanhita (BNS), 2023, and the Unlawful Activities (Prevention) Act, 1967. The NIA has also invoked provisions relating to waging war against India and hatching a conspiracy from across the border," the agency said.

What is trial in absentia?

A trial in absentia refers to a criminal trial conducted in the absence of the accused.

Section 356 of the BNSS provides that if a person declared a proclaimed offender has absconded to evade trial and there is no immediate prospect of arrest, the court may treat the accused's absence as a



The law does not permit courts to try every accused person in their absence. It applies only to a "proclaimed offender", as defined under Section 84 of the BNSS. GETTY IMAGES

waiver of the right to be present during the proceedings. After recording its reasons in writing, the court may proceed with the inquiry, trial and pronouncement of judgment as if the accused were present.

Under the Code of Criminal Procedure, 1973 (CrPC), the predecessor of BNSS, Section 82(4) of CrPC allows proclamation and attachment of the property of an absconding accused, and Section 317 of CrPC allows the Judge or Magistrate to conduct trial of an accused in his absence in certain specific cases. Section 299 CrPC allows the Judge or Magistrate to record the evidence in absence of absconded accused if there is no prospect of arresting him soon.

Those provisions provide a discretion to a presiding officer to conduct an in-absentia trial only when it feels that, firstly, the personal attendance of the

accused before the court is not necessary in the interests of justice, and secondly, the accused persistently disturbs the proceedings in court. But none of those provisions allowed full fledged trials in absentia. As a result, trials often remained pending for years until the accused was apprehended.

Whom does it apply to?

The law does not permit courts to try every accused person in their absence. It applies only to a "proclaimed offender", as defined under Section 84 of the BNSS.

Under Section 84(4), where a proclamation has been issued against a person accused of an offence punishable with imprisonment of 10 years or more, life imprisonment, or death under the Bharatiya Nyaya Sanhita, 2023, or any other law, and the person fails to appear at the specified place and time, the court

may, after making such inquiry as it considers necessary, declare the person a proclaimed offender.

Thus, trial in absentia is available only in cases involving serious offences punishable with imprisonment of at least 10 years, life imprisonment, or death, where the accused has been declared a proclaimed offender.

What are the procedural safeguards under Section 356?

Section 356 lays down several procedural safeguards before a trial can commence in the absence of the accused. These include the issuance of two consecutive warrants of arrest within an interval of at least 30 days. A notice must also be published in a local or national newspaper, giving the accused 30 days to appear before the court. In addition, the notice must be displayed at the accused's last known place of residence, and a relative or friend of the accused must be informed about the trial.

The trial cannot commence until 90 days have elapsed from the date of framing of charges, giving the accused sufficient opportunity to appear before the court. If the absconding accused does not have legal representation, the court must appoint a defence lawyer at the State's expense to safeguard the accused's right to a fair trial.

Statements of prosecution witnesses recorded before the commencement of the trial may be used as evidence against the absconding accused. However, if the accused later appears or is apprehended, the court may permit cross-examination of witnesses in the interest of justice.

The deposition and examination of witnesses may, as far as practicable, be recorded through audiovisual electronic means. Such recordings must be preserved to ensure transparency, accuracy and the integrity of the trial process, and to facilitate review if the accused is subsequently apprehended.

THE GIST

Section 356 of the BNSS provides that if a person declared a proclaimed offender has absconded to evade trial and there is no immediate prospect of arrest, the court may treat the accused's absence as a waiver of the right to be present during the proceedings.

If the accused later appears or is apprehended, the court may allow cross-examination of witnesses in the interest of justice. Witness testimony can also be recorded through audiovisual means and preserved for future review.

- **Key Terms and Explanations**

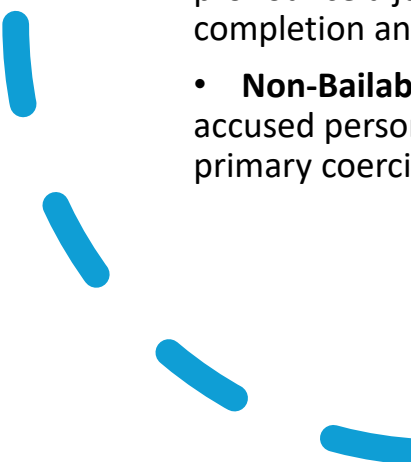
- **Trial in Absentia:** This refers to a formal criminal trial conducted by a court of law entirely in the physical absence of the accused person. Traditionally, criminal jurisprudence mandates that the accused must hear the evidence against them to defend themselves. Under specific exceptional laws, if an individual willfully evades the law, the state can proceed with the trial to its logical conclusion—including conviction and sentencing—without their presence.

- **Proclaimed Offender:** Under criminal law, specifically aligning with Section 84(4) of the Bharatiya Nagarik Suraksha Sanhita (BNSS), a court designates a person as a proclaimed offender if a warrant has been issued against them, and the court has reason to believe that the individual has absconded or is concealing themselves to evade arrest. For a trial in absentia to apply, this designation is restricted to individuals accused of severe offenses punishable by death, life imprisonment, or rigorous imprisonment extending to 10 years or more.

- **Waiver of Right to Presence:** This is a legal doctrine where a court presumes that an individual has voluntarily surrendered a protected procedural right. In this context, when an accused deliberately absconds despite knowing that legal actions are pending against them, the law treats this flight as a constructive waiver of their right to be physically present during the trial.

- **Section 356 of the BNSS vs. Section 299 of the CrPC:** Under the old Code of Criminal Procedure (CrPC), 1973, Section 299 merely allowed a magistrate or judge to record the statements of prosecution witnesses in the absence of an absconding accused so that the evidence would not perish over time. However, it did not permit the court to conduct a full-fledged trial, evaluate the evidence, and pronounce a judgment of conviction or acquittal. Section 356 of the BNSS radically changes this by enabling the court to run the trial to completion and issue a final verdict.

- **Non-Bailable Warrant (NBW):** This is a stringent judicial order issued by a court directing law enforcement agencies to arrest an accused person and bring them before the court without the option of releasing them on bail at the police station level. It serves as the primary coercive step before declaring an individual a fugitive or a proclaimed offender.



- **Main Arguments and Substantive Parts**
 - The structural pivot from freezing a trial to completing it in the absence of a fugitive rests on balancing state sovereignty and victim justice against the constitutional right to a fair trial.
- **The Core Thesis**
 - The central argument for enabling full-fledged trials in absentia is that the Indian criminal justice delivery system cannot be held hostage by perpetrators who utilize geographical borders, political safe havens, or deep-seated evasion tactics to stall the rule of law. By completing the trial process, the state secures judicial finality, preserves volatile evidence, provides closure to victims of heinous crimes, and creates formal legal records necessary for international diplomatic and extradition measures.
- **Key Justifications and Functional Benefits**
 - **Prevention of Systemic Stagnation:** In long-standing criminal cases, especially those involving cross-border terrorism or organized syndicates, trials have historically remained stuck at the stage of framing charges for decades. This law allows the state to bypass this artificial gridlock.
 - **Preservation of Evidence Integrity:** Witnesses often turn hostile, lose memory, or pass away during prolonged delays. Recording testimonies under a formal trial structure ensures that evidence is judicially locked and evaluated while fresh.
 - **International Legal Leverage:** A formal conviction by a sovereign court carries far greater weight in international law, interpol channels, and bilateral extradition negotiations than a mere pending investigation or an open arrest warrant.
- **Counterarguments and Procedural Risks**
 - **Dilution of *Audi Alteram Partem*:** The bedrock of natural justice dictates that "no man shall be condemned unheard." Critics argue that a trial without the physical presence of the accused risks turning into a unilateral presentation by the prosecution, potentially leading to a miscarriage of justice.
 - **Burden on State-Appointed Defense:** While the law mandates providing a defense counsel at state expense, an attorney operating without direct inputs, instructions, or clarifications from their client faces an uphill battle in effectively cross-examining witnesses and building a robust defense.
- **Statutory Safeguards Implemented**
 - To offset these severe risks, specific procedural filters have been integrated into the legal framework before a trial can commence:
 - **The Dual-Warrant Buffer:** The court must issue two consecutive warrants of arrest with an interval of at least 30 days between them to ensure exhaustive efforts were made to apprehend the individual.
 - **Multi-Platform Public Notification:** A notice must be published in prominent local or national newspapers giving the individual a clear 30-day window to appear, coupled with physical notices affixed to their last known residence and formal notification sent to known relatives or friends.
 - **The 90-Day Post-Charge Window:** The trial cannot actively commence until a minimum of 90 days have fully elapsed from the date when the formal charges were framed by the court.
 - **Post-Apprehension Remedial Rights:** If the accused is captured or surfaces later, the law permits the court to allow the cross-examination of prosecution witnesses in the interest of justice, ensuring that the verdict can be revisited under fair trial standards.

- **Historical Evolution of the Issue**
- **Colonial Era and the CrPC of 1898**
 - During the British Raj, the formulation of criminal procedure strictly tied judicial progress to the physical body of the accused. This was designed partly to prevent colonial authorities from conducting secret, arbitrary trials of political dissidents without their knowledge. The presence of the accused was treated as an absolute requirement, and if an individual fled, the entire judicial machinery ground to a halt, leaving the case files open indefinitely.
- **The Post-Independence Era and the CrPC of 1973**
 - When India updated its criminal procedure code in 1973, it recognized that absolute rigidity could cause evidence to rot. Under Section 299 of the 1973 Code, lawmakers introduced a compromise: if an accused absconded and there was no immediate prospect of arresting them, the court could record the depositions of witnesses in their absence. This ensured that if a witness died or became untraceable before the accused was caught, their recorded statement could be admitted as evidence. However, the law stopped short of allowing a verdict; the trial itself remained frozen at the pre-judgment stage.
- **The Rise of Transnational Crime and Mass Terror (1990s–2020s)**
 - With the advent of cross-border terrorism, organized global syndicates, and large-scale financial fraud, masterminds began exploiting this legal limitation. Fugitives operating from hostile foreign territories or safe havens knew that by simply avoiding physical stepping foot on Indian soil, they could prevent Indian courts from ever handing down a formal conviction. This created structural impunity, leaving victims of major attacks without legal closure and limiting India's diplomatic capacity to present conclusive judicial verdicts to international bodies like the United Nations Security Council or the Financial Action Task Force (FATF).
- **The Modern Paradigm Shift: BNSS, 2023**
 - The enactment of the Bharatiya Nagarik Suraksha Sanhita marks a fundamental break from colonial procedural constraints. Moving away from the passive stance of the 1973 Code, Section 356 establishes that state justice cannot be indefinitely delayed by voluntary flight. It shifts the focus toward procedural finality, enabling a complete transition from the mere preservation of evidence to the active pronouncement of judgments in absentia, provided a strict chain of notifications and safeguards is preserved.
- **Way Forward**
- **Establishing Strict Judicial Thresholds:** The high courts should issue clear practice notes ensuring that Section 356 of the BNSS is reserved for exceptional cases involving serious security threats, organized crime, or significant financial fraud. It should not be used routinely for standard criminal trials where apprehension remains possible through traditional law enforcement methods.
- **Strengthening the Legal Aid Framework (NALSA):** Since defense counsels in these trials operate without direct instructions from the accused, the National Legal Services Authority (NALSA) must assign experienced legal minds to these cases. These state-appointed lawyers should have access to independent investigative resources to properly review the prosecution's evidence, preventing the trial from becoming unbalanced.
- **Upgrading Digital Infrastructure:** The mandatory audiovisual recording of witness testimonies must be supported by secure, tamper-proof digital infrastructure. Courts should implement certified cloud repositories and advanced encryption protocols to safeguard these recordings, ensuring they remain reliable for future appellate reviews if the accused returns.
- **Aligning Domestic Verdicts with Diplomatic Action:** The Ministry of External Affairs should collaborate with the Ministry of Home Affairs to create a streamlined process that translates domestic convictions in absentia into immediate international legal actions. This includes fast-tracking requests for Interpol Blue and Red Notices, utilizing mutual legal assistance treaties (MLATs), and presenting detailed case files to international counter-terrorism bodies.



INTRODUCTION & KEY TERMS

- **'Trial in Absentia'**: trial without the accused (for serious sc: >10 yrs/life/death)
- **Proclaimed Offender**: Sec 84 BNSS, fugitive for and presse for serious offences.
- Context: Hafiz Saeed special NIA court Jammu case

BNSS 356 vs CrPC 299



CrPC 299:
Mere Evidence
Recording
(Frozen Trial)

VS



BNSS 356:
COMPLETE TRIAL
& VERDICT

PROCEDURAL FLOW & SAFEGUARDS FOR TRIAL IN ABSENTIA



MULTIDIMENSIONAL ANALYSIS

LEGAL & CONSTITUTIONAL



Art 21
Justice
Procedural Efficiency.
waiver of right.

SOCIAL & DETERRENCE



Societal Deterrence;
Victim Closure.

POLITICAL & STATE POWER



State Sovereignty
Assertion of power.

ETHICAL DILEMMAS



Individual rights vs.
Collective trauma.

ECONOMIC EFFICIENCY



Optimization of resources;
complementary to asset

INTERNATIONAL RELATIONS



Interpol leverage.

WAY FORWARD

Summary inspire rascements from norbarnsat disnse, and nasother-in sapora,
complementary to resources; complementary to asset recovery

UPSC CSE RELEVANCE

GS 2, GS 3, GS 4, Essay, Law Optional

NCERT LINKS

Class 11 Pol Sci, Class 8 SPL

How the Gaganyaan crew module is built to survive

What happens to the crew and service modules during descent?

Unnikrishnan Nair S.

The story so far:

Gaganyaan is India's maiden crewed space mission, designed to carry Indian astronauts to space and safely return them back to earth. Here, the rocket – Human-rated Launch Vehicle Mark (HLVM) 3 – will inject the orbital module (OM) into the desired orbit. The Gaganyaan astronauts will be onboard the OM.

What does the OM contain?

The OM consists of two sections, the crew module and the service module, connected by a joint. The crew module serves as the crew habitat while the service module provides on-orbit support to the OM.

After the orbital phase, the propulsion system in the service module will fire its thrusters to de-orbit the OM, then the service module will separate from the crew module by severing the joint with a redundant mechanism.

While both modules descend to the

earth, the crew module – which is designed to survive the intense thermo-structural loads of re-entry – will decelerate by aero-braking and safely splash down in sea. Meanwhile, the service module will burn up.

Some crewed spacecraft, such as Russia's Soyuz and China's Shenzhou, use a three-module configuration. The third module provides extra living and working space for the crew while in orbit. It also houses the docking mechanism, cargo, and basic life-support facilities, including the toilet. Like the service module, this third module will also separate during descent and will be destroyed during re-entry.

Which configuration is best for re-entry?

The crew module design must balance several critical objectives, including maximise the internal volume, manage the aerodynamic lift and drag generated during atmospheric flight, be as easy as possible to fabricate, maintain aerodynamic and hydrodynamic stability, and stabilise the module dynamically at

low speeds.

Because no single configuration can satisfy all these requirements simultaneously, the final shape of the crew module will depend on which design attributes are prioritised. To minimise launch and re-entry mass, engineers strip the crew module down to essential landing systems, directly reducing the required size and mass of both the heatshield and the parachutes.

A spherical configuration offers the highest possible internal volume with the lowest structural mass. This is because a sphere has minimum surface area required to enclose a given volume. The design closest to a sphere was the Soviet Union's Vostok module, in which Yuri Gagarin made the historic first trip to space.

However, because a perfect sphere creates no aerodynamic lift, it falls straight down through the atmosphere, like a dropped stone. This subjects the crew to painfully high g-forces.

Consequently, a sphere-cone combination is the preferred configuration for a re-entering body. Its

blunt base generates a detached shockwave that pushes intense frictional heat away from the spacecraft, while its conical body provides the aerodynamic stability and lift necessary for a controlled, survivable descent.

The Gaganyaan crew module has a sphere-cone configuration.

Why aren't all re-entry modules mono-stable?

Aerodynamic and hydrodynamic mono-stabilities are highly preferred features for a re-entering body.

A module is aerodynamically monostable if it maintains only one stable attitude while flying through the atmosphere – like a shuttlecock. Similarly, hydrodynamic mono-stability ensures the module will self-right itself and float in a single, stable orientation after splashdown.

Mono-stability is controlled by the module's aerodynamic shape and the location of its centre of gravity. As the centre of gravity is dictated by the packaging of internal subsystems, system engineers often lack the flexibility to achieve the required location of the centre of gravity.

As a result, in practice, modules frequently have more than one stable orientation. The Gaganyaan crew module, for instance, has two distinct stable aerodynamic positions as well as two stable hydrodynamic positions.

The undesired attitude is managed by firing control thrusters during flight through the atmosphere and by deploying a gas-based up-righting system upon

splashdown in sea.

What is dynamic instability during re-entry?

Dynamic instability is a critical condition experienced by a re-entry module, resulting in rapidly growing and uncontrolled oscillations as it decelerates through the atmosphere. Just like a traditional kite without a tail wobbles and spins wildly out of control because it lacks stability, the crew module can experience dangerous, self-growing swings that make it tumble if it is not controlled.

How smoothly the crew module falls through the atmosphere depends strongly on its shape, mass, and the way air flows around it. The module shakes and wobbles the most as it approaches the speed of sound, where bouncing shockwaves and swirling air violently whip it around. To stop the module from spinning dangerously out of control, it must either use small control thrusters to steady itself or deploy parachutes before this instability grows too large.

Ultimately, balancing all of these competing traits, from its blunt aerodynamic shape and mass to its fight against dynamic instability, is what transforms the module design into a masterfully engineered lifeboat capable of bringing astronauts safely back to the earth.

Unnikrishnan Nair S. is Former Director, VSSC and IIST; Founding Director, HSFC; and an expert in launch vehicle systems, orbital re-entry and human spaceflight technologies. Currently Dr Sarabhai Professor at VSSC.

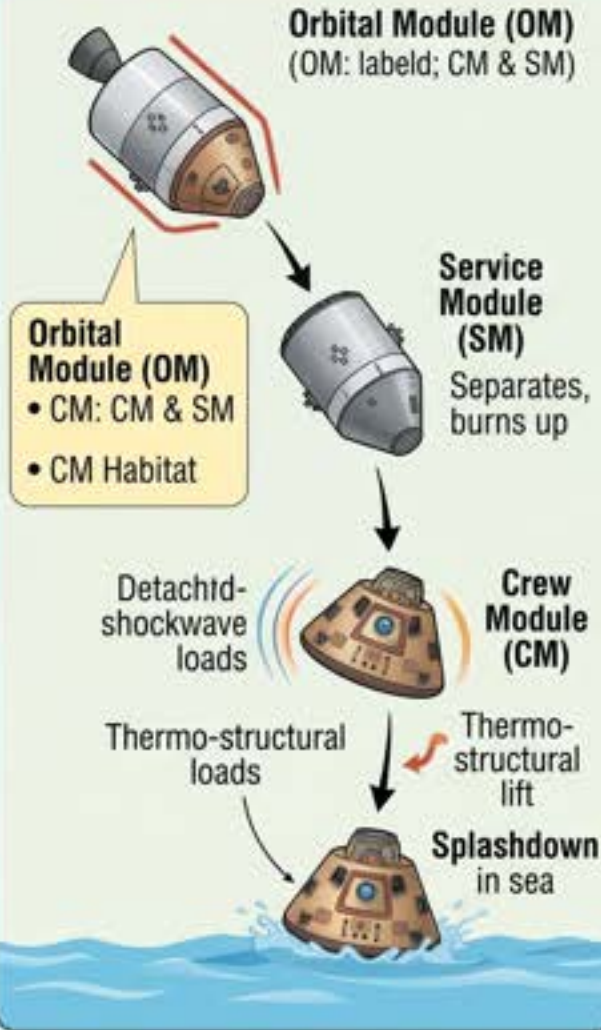
- **Key Terms and Explanations**
- **Orbital Module (OM):** The primary spacecraft assembly that circles the Earth during a mission. It is structurally split into two components: the **Crew Module (CM)**, which acts as the pressurized, life-supporting habitat for astronauts, and the **Service Module (SM)**, which houses the propulsion systems, fuel, and power generation equipment.
- **Aero-braking and Thermo-structural Loads:** Aero-braking is the process of using a planet's atmospheric friction to slow down a spacecraft, converting massive kinetic energy into heat. The resulting thermo-structural loads are the intense forces and extreme thermal stresses (reaching thousands of degrees Celsius) that the spacecraft's outer shield must withstand without deforming or failing.
- **Sphere-Cone Configuration:** A spacecraft design geometry featuring a blunt, rounded base transitioning into a conical upper body, as seen in advanced human-rated capsule designs. *Example:* Unlike a pointed rocket nose, this shape creates a detached shockwave that pushes extreme frictional heat away from the hull while providing sufficient aerodynamic lift for a guided descent.
- **Aerodynamic and Hydrodynamic Mono-stability:** **Aerodynamic mono-stability** refers to a spacecraft shape designed to naturally maintain only *one* stable orientation while flying through the air (similar to how a badminton shuttlecock always self-corrects to fly cork-first). **Hydrodynamic mono-stability** ensures that once the module splashes down in the ocean, it naturally self-rights into a single upright position to keep the crew safe and communications active.
- **Dynamic Instability:** A hazardous condition during atmospheric re-entry where a spacecraft experiences rapidly amplifying, uncontrolled wobbling and oscillations. *Example:* It behaves like a kite that has lost its tail, spinning and tumbling dangerously due to erratic airflows and shockwaves near the speed of sound.
- **Human-Rated Launch Vehicle:** A rocket engineered with extreme safety margins, component redundancies, and an automated emergency escape system, certifying it safe enough to carry human lives rather than just satellite cargo.
- **Main Arguments and Substantive Parts**
- The core engineering challenge of human spaceflight is not just launching humans into space, but returning them safely through Earth's punishing atmosphere. The technical parameters and design choices that dictate spacecraft survival involve several critical considerations:
- **The Physics of Re-entry Geometry**
- The geometric profile of a crew module determines its survival. While a perfectly **spherical configuration** offers the maximum internal volume with the lowest possible structural weight, it suffers from a fatal flaw: it generates zero aerodynamic lift. It plummets through the atmosphere like a dropped stone, subjecting astronauts to dangerously high, painful *g*-forces. Consequently, modern space engineering favors a **sphere-cone combination**. The blunt bottom creates a detached shockwave that acts as a thermal shield, deflecting the worst of the frictional heat away from the spacecraft body.
- **The Conflict Between Stability and Packaging**
- In an ideal world, a crew module would possess perfect aerodynamic and hydrodynamic mono-stability. However, real-world engineering requires a compromise. The module's center of gravity is dictated by the heavy internal packing of life support systems, computers, and survival gear. Because engineers lack the flexibility to place this equipment arbitrarily, modules frequently end up with **multiple stable orientations** (e.g., two aerodynamic and two hydrodynamic stable states). To prevent the module from trapping itself in an inverted or unsafe position, active mitigation systems—such as automated control thrusters during flight and gas-based up-righting flotation bags upon sea splashdown—must be integrated.
- **Managing Transonic Turbulence**
- The transition from supersonic speeds to subsonic speeds represents a highly volatile phase of descent. As the module approaches the speed of sound, bouncing shockwaves and swirling aircurrents create severe dynamic instability. If left unmanaged, these self-growing swings can cause the module to tumble violently. This risk is managed through a combination of autonomous firing of small attitude-control thrusters and the precise deployment of specialized stabilization parachutes before the oscillations grow unmanageable.

- **Historical Evolution of the Issue**
- **The Dawn of Crewed Spaceflight (1960s)**
 - The earliest human space missions relied on simple geometric shapes due to computational and manufacturing limitations. Yuri Gagarin's historic flight in the **Vostok 1 (1961)** utilized a purely spherical capsule. While easy to manufacture and stable in terms of volume, it followed a rigid ballistic trajectory. The lack of lift meant that astronauts had to endure brutal gravitational deceleration forces, frequently requiring them to eject from the capsule before it hit the ground.
- **The Shift to Multi-Module and Conical Designs (1970s–Present)**
 - As missions grew longer, space agencies realized that a single module could not efficiently handle living space, propulsion, and re-entry physics simultaneously. This led to the multi-module architectures seen in Russia's **Soyuz** and China's **Shenzhou** programs. By splitting the spacecraft into three distinct compartments—an orbital module for living/working, a service module for instruments, and a specialized conical crew module for re-entry—agencies optimized mass. Only the heavily armored crew module needs to survive re-entry; the other modules separate and burn up, reducing the fuel and parachute size required for recovery.
- **India's Incremental Technical Journey (2000s–Present)**
 - India's path to mastering human spaceflight has been deliberately incremental, building on decades of satellite and launch vehicle success. Key milestones include:
 - **2007 (Space Capsule Recovery Experiment - SRE-1):** India successfully launched and recovered a 550 kg uncrewed capsule, validating early reusable thermal protection materials and sea-recovery operations.
 - **2014 (Crew Module Atmospheric Re-entry Experiment - CARE):** A prototype of the actual crew module was launched on an experimental GSLV Mk III flight. It underwent sub-orbital re-entry, testing the aero-braking shields and parachute deployment sequences in real atmospheric conditions.
 - **Present Day:** The human-rating of the **Launch Vehicle Mark 3 (LVM3)** into the **HLVM3**, alongside the finalization of the dual aerodynamic/hydrodynamic stability systems of the indigenous crew module, marks the culmination of this evolutionary timeline.
- **Way Forward**
- **Institutionalizing Zero-Failure Testing Regimes**
 - Before embarking on crewed missions, a series of uncrewed test flights utilizing advanced humanoid robotics (such as the *Vyommitra* project) must be executed. These flights should deliberately simulate worst-case re-entry trajectories, extreme dynamic instability, and off-target sea splashdowns to validate the autonomous performance of the control thrusters and the gas-based up-righting systems under real pressure.
- **Deepening Private Sector Aerospace Integration**
 - The state space agency should shift its role from a primary manufacturer to a chief architect and regulator. By transferring mature technologies—such as thermal shield fabrication and specialized parachute weaving—to domestic private aerospace companies through platforms like IN-SPACe, the nation can build a commercial supply chain. This reduces costs and accelerates the production of future modules.
- **Constructing a Comprehensive Legal and Safety Architecture**
 - Parliament must pass a dedicated, updated Space Act that clearly defines the legal liability framework for human spaceflight, establishes international insurance protocols, and creates an independent aerospace safety board. This board would hold the authority to audit and sign off on the human-rated status of launch vehicles and crew survival habitats, independent of political timelines.
- **Outlining a Long-Term Vision for Space Infrastructure**
 - A single human spaceflight mission should not be an end in itself, but a stepping stone. The technologies perfected for the crew module must be systematically upgraded to support the construction of a permanent domestic low-Earth orbit space station (such as the planned *Bharatiya Antariksha Station*) and, eventually, deep-space crewed lunar exploration. This ensures continuous utilization of the specialized industrial base now being built.

ANALYSIS: HOW THE GAGANYAAN CREW MODULE IS BUILT TO SURVIVE RE-ENTRY.

Credentials of behalf Unnikrishnan Nair S.
Credentials of Former Director, VSSC & IIST, etc.

OVERVIEW: THE DESCENT PROCESS



MODULE CONFIGURATION COMPARISON

THE SPHERE (e.g., Soviet Vostok)

Max Internal Volume, Lowest Structural Mass



e.g., Yuri Gagarin's historic trip

THE SPHERE-CONE (Gaganyaan Design)



UNDERSTANDING STABILITY PRINCIPLES

MONO-STABILITY

Like a shuttlecock, naturally self-correcting

Aero-mono-stability



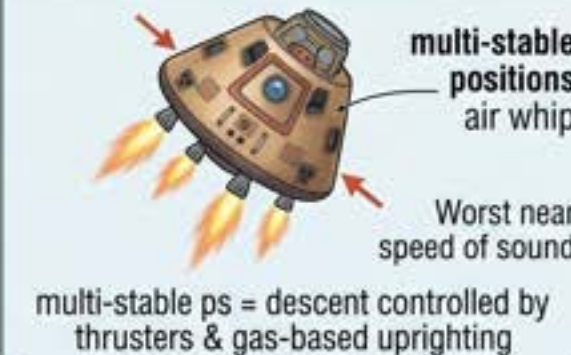
Hydro-mono-stability

Ensures upright floating after splashdown in scures



Packaging of internal subsystems & C.o.G. limitations

THE GAGANYAAN REALITY: Active Control



DYNAMIC INSTABILITY: THE CRITICAL CONDITION

Rapidly growing, uncontrolled oscillations



CONTROL MEASURES: Two Approaches



SUMMARY: A MASTERFULLY ENGINEERED LIFEBOAT



How protein biosensors can shrink the timeline of medical emergencies

Proteins are important diagnostic targets because they are involved in almost every biological process; over the last two decades, scientists have developed aptamers for hundreds of disease-relevant proteins and have become the recognition element of choice in advanced biosensor designs

Manjiv Goweranram

A patient arrives at a hospital showing signs of sepsis, a deadly condition where the immune system attacks its own body after an infection. Sepsis kills 11 million people every year. Doctors must treat it within hours to save lives, but standard blood tests take up to 48 hours for results.

Last year, researchers reported a sensor platform capable of detecting multiple immune proteins linked to sepsis from a blood sample in real time. It was also compact enough for bedside use. The device was a protein biosensor – and it was based on six decades of research and technological development to read the body's molecular signals at a speed compatible with acute medical needs.

Early-warning system

Proteins are important diagnostic targets because they are involved in almost every biological process. At any given moment, thousands of them are circulating in the blood: they regulate inflammation, carry oxygen, signal between cells, and fight infection.

When something goes wrong, proteins often change first. Troponin levels in the blood rise within hours of a heart attack. Procalcitonin levels increase during bacterial infections. Certain cancer-associated proteins appear in blood long before a tumour is visible on any scan. If these protein levels are measured accurately and quickly, clinicians can gain time to optimise treatment before the disease becomes too severe.

Scientists conceived of protein biosensors when they were studying ways to monitor glucose. In 1962, the American biochemist Leland C. Clark, Jr. and microbiologist Champ Lyons described the first functional biosensor in the form

of an electrode coated with an enzyme that reacted with glucose to produce a measurable electrical current.

Modern biosensor researchers continue to use this basic design, pairing a biological recognition element with a signal-converting transducer. However, glucose is a comparatively simpler target than proteins. Blood contains thousands of structurally diverse proteins at the same time. Identifying a single target requires a way to recognise molecules with extraordinary precision.

Antibodies provided the first viable solution to detect proteins in a targeted way. Since they are produced naturally by the immune system, they can be attached to sensor surfaces to capture and identify specific proteins. The flip side was that antibodies are expensive to produce and even small amounts of heat, movement or improper storage can render them useless. This pushed researchers towards aptamers – short, synthetic strands of DNA or RNA that bind to target proteins with high selectivity. They are also cheaper, more stable, and, unlike antibodies, can be produced entirely within a laboratory, sidestepping the biological systems that make antibody manufacturing difficult.

Over the last two decades, scientists have developed aptamers for hundreds of disease-relevant proteins and have become the recognition element of choice in advanced biosensor designs.

Current landscape

Today, protein biosensing lies at the intersection of chemistry, materials science, and electronics.

Nanotechnology significantly enhanced the sensitivity of biosensors by incorporating gold nanoparticles, carbon nanotubes, graphene, and materials called MXenes to build sensor surfaces. The high surface area of these nanomaterials gives more protein binding

sites while their electrical properties generate stronger signals. Thus biosensors have become able to detect proteins even at low concentrations, when a disease is just setting in.

This nanotechnology infrastructure has more recently converged with biotechnological tools like Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR). Although best known for gene-editing, when CRISPR enzymes are coupled with aptamers on a sensor's surface, a target protein's binding can be made to trigger a large and distinct signal. This approach has already been demonstrated to detect malaria, SARS-CoV-2, and many biomarkers of cancer. Finally, the COVID-19 pandemic allowed these technologies' developers to accelerate scaling, as the pandemic presented a strong demand for rapid, portable diagnostics.

The sepsis platform mentioned earlier paired a gold-silver alloy nanostructure with a machine learning system trained to analyse complex signals. This setup could confirm an infection and also distinguish between disease stages to guide treatment decisions.

Healthcare workers are also applying multi-marker detection to pancreatic cancer, a disease with high mortality because it is currently usually detected only when it has become advanced. In a June 2025 review, University of Science and Technology Beijing researchers said several protein markers can now be simultaneously detected using a single platform, offering the best chance of improving early diagnosis.

Researchers are also exploring wearable monitoring. For example, in December 2025, a (separate) team from China reported an aptamer-coated microneedle array that could sample proteins through the skin of animals. It was tested with. Their goal was to make a patch that could stick on the skin and

monitor inflammatory or cardiac issues continuously and send data to a phone.

Scientists and engineers are also adapting this technology for environmental and industrial uses in the form of cell-free biosensors. Here, using isolated biological machinery like enzymes and regulatory molecules without maintaining live cells, these platforms can detect heavy metal contamination in water, trace antibiotic residues, identify foodborne pathogens in supply chains, and screen for biological threat agents.

Different future

The next step involves closed-loop systems – devices that can use artificial intelligence to interpret multi-protein sensor outputs and feed that information directly to automated therapeutic responses. This model could, in principle, trigger a drug delivery mechanism or adjust an ongoing infusion in response to real-time protein data. To this end, in November 2025, Turkish researchers published a proof-of-concept implantable sensor that used genetically engineered bacteria to detect target molecules in surrounding tissue and transmit data wirelessly from inside the body.

Several logistical hurdles remain before widespread clinical implementation. Biological recognition elements degrade over time, particularly due to heat. Baseline protein levels vary between individuals, complicating universal calibration. Many performant sensors are only laboratory prototypes, with no indications as to their scalability. Regulatory approval also requires extensive clinical validation, demanding substantial investments.

However, the field seems set to address them over time.

Manjiv Goweranram has a PhD in RNA biochemistry and works as a freelance science writer.

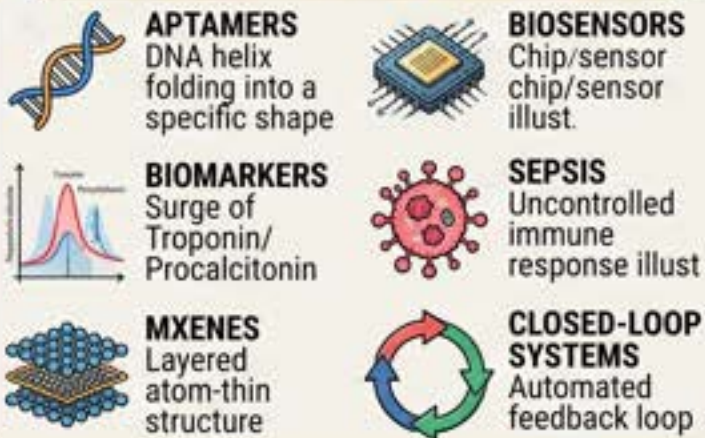
- **Key Terms and Explanations**
 - **Biosensors:** Integrated devices capable of providing specific quantitative or semi-quantitative analytical information using a biological recognition element. A classic example is the ubiquitous home glucometer, which uses glucose oxidase enzymes to track blood sugar levels.
 - **Aptamers:** Engineered, short, single-stranded DNA or RNA sequences designed to fold into unique three-dimensional architectures. These structures bind with high affinity and specificity to target molecules, functioning essentially as synthetic chemical antibodies.
 - **Biomarkers:** Measurable biological indicators that signal a physiological change, pathogenic process, or pharmacological response. For instance, a sudden surge of *Troponin* in the bloodstream serves as a specific biomarker for myocardial infarction (heart attack).
 - **Sepsis:** A medical emergency characterized by a life-threatening organ dysfunction caused by a dysregulated host response to infection. It requires rapid diagnostics because the body's immune response ends up damaging its own tissues.
 - **MXenes and Nanomaterials:** Two-dimensional inorganic compounds consisting of atom-thin layers of transition metal carbides, nitrides, or carbonitrides. Their exceptionally high surface-to-volume ratio makes them optimal substrates for enhancing biosensor electrical signals.
 - **Closed-Loop Systems:** Medical systems where a diagnostic sensor and a therapeutic delivery mechanism operate in a continuous, automated feedback loop. An example is an automated insulin pump that calculates and delivers insulin doses based on real-time continuous glucose monitor readings.
- **Main Arguments and Substantive Parts**
 - The structural narrative of modern medical diagnostics centers on compressing the critical timeline between the onset of pathology and clinical intervention.
- **The Core Thesis**
 - Traditional pathology relies heavily on waiting for visible structural or systemic symptoms to manifest, followed by lab-bound testing that can take up to 48 hours. The paradigm shift highlighted in contemporary research argues that since proteins alter their expression at the molecular level hours before physical symptoms materialize, real-time protein biosensing can fundamentally rewrite the survival rates of acute emergencies like sepsis and cardiac arrest.
- **Key Supporting Points**
 - **Proteins as First Responders:** Biological shifts occur in protein concentrations (e.g., *Procalcitonin* during bacterial invasions) long before imaging or macroscopic symptoms reveal an illness.
 - **The Aptamer Advantage:** Unlike natural antibodies, which are prone to thermal degradation and high manufacturing costs, synthetic aptamers are highly stable, cost-effective, and can be synthesized entirely in laboratory settings without animal models.
 - **Nanotech and AI Amalgamation:** Incorporating gold nanoparticles, graphene, and machine-learning models allows modern sensors to process complex multi-marker datasets, filtering out biochemical "noise" from blood samples to deliver high-precision results at the bedside.
- **Counterarguments and Real-World Constraints**
 - **The Baseline Dilemma:** Human biological baselines are not uniform. Normal protein concentrations vary wildly across age, gender, and ethnicity, making universal calibration incredibly complex.
 - **Scalability Gaps:** While proof-of-concept laboratory prototypes show massive success, transitioning these sensitive bio-nanostructures into mass-manufactured, shelf-stable commercial medical devices remains a significant hurdle.

Historical Evolution of the Issue		
Epoch / Year	Milestone	Core Impact on Healthcare
1962	The Clark-Lyons Enzyme Electrode	Conceived by Leland C. Clark Jr., this marked the birth of the first functional biosensor, utilizing glucose oxidase on an electrode to revolutionize diabetes monitoring.
Late 20th Century	The Monoclonal Antibody Boom	The integration of lab-grown antibodies allowed diagnostics to target specific proteins, forming the backbone of modern laboratory immunoassays (like ELISA).
Early 2000s	Evolution of Synthetic Aptamers	Over the last two decades, researchers shifted toward synthetic DNA/RNA strands, overcoming the thermal fragility and high production costs associated with antibodies.
2020–2025	Pandemic Catalyst & Nano-Convergence	The urgency of COVID-19 accelerated portable diagnostic platforms. By mid-2025, researchers successfully merged CRISPR and MXenes to detect multi-marker signals simultaneously.
Late 2025–Present	Closed-Loop & Cell-Free Innovations	Recent milestones include microneedle arrays for wireless telemetry and cell-free environmental biosensors that track pathogens or heavy metals without live biological agents.

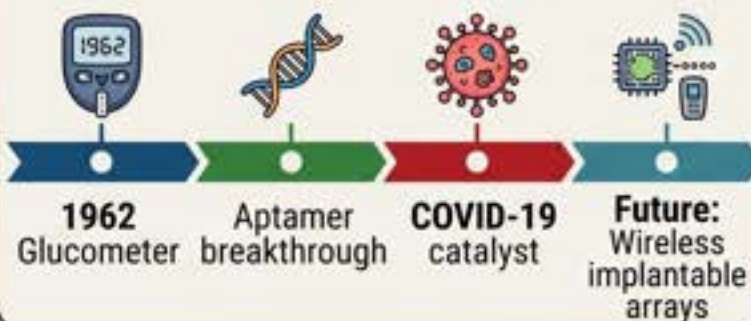


COMPREHENSIVE ANALYSIS: ADVANCED BIOSENSORS & THE REVOLUTION IN MEDICAL EMERGENCIES.

KEY TERMS & CONCEPTS



HISTORICAL EVOLUTION



MULTIDIMENSIONAL ANALYSIS



UPSC & NCERT LINKAGES

UPSC SYLLABUS MAPPING

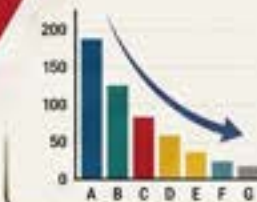
-  **GS Paper II**
Health Policy
-  **GS Paper III**
Biotech, Nanotech
-  **GS Paper IV**
Bioethics

NCERT LINKAGES

-  **Biology Class XII**
Biotech, applications
-  **Chemistry Class XII**
Biomolecules
-  **Physics Class XI**
Surface area

WAY FORWARD

- ☒ **LOCALLY CALIBRATED DATABASES**
Diverse demographic baselines 
- ☒ **DYNAMIC REGULATIONS**
CDSCO, adaptive pathways 
- ☒ **TARGETED PPPs**
Scaling lab prototypes 
- ☒ **FRONTLINE CARE INTEGRATION**
Ayushman Arogya Mandirs 



Inaugural Index of Services Production shows 14 sectors grew in double digits in April

T.C.A. Sharad Raghavan
NEW DELHI

As many as 14 of the 19 sub-sectors in the trial and inaugural release of the government's new Index of Services Production (ISP) witnessed double-digit growth in April 2026, with the best-performing sectors including accommodation and food, retail trade, administrative and support services, and real estate.

The 19 sub-sectors measured account for about 60% of India's services sector.

The ISP is meant to be the services sector counterpart to the Index of Industrial Production (IIP). While the IIP is released on the 28th of every month unless it is a weekend or holiday, the ISP will be re-



Accommodation and food was among best performing sectors.

leased on the 29th henceforth.

"The ISP represents an important milestone in strengthening India's statistical system and improving the measurement of the services sector, which accounts for more than half of the country's economic activity," the Ministry of Statistics and Pro-

gramme Implementation said in a release.

While the inaugural release does not provide a composite growth rate for the entire index, this growth rate can be calculated using the sector-wise growth rates and weightages, said D.K. Srivastava, chief policy advisor at EY India.

"Considering the year-on-year growth in April 2026 over that in April 2025, the 19-services sector growth is at 20.8%," Mr. Srivastava said.

The base year of the trial ISPs has been set as 2024-25, and the index sources its data from several areas, including administrative data, Goods and Services Tax data, and the Annual Survey of Incorporated Services Sector Enterprises (ASISSE) data.

- **Key Terms and Explanations**
 - **Index of Services Production (ISP):** This is a high-frequency macro indicator designed to measure short-term volume changes in the output of the services sector over a specified period. Just as we track industrial physical output, the ISP quantifies the real-term operational expansion of services, stripping out the direct distortions of price inflation. *Example:* If retail trade or real estate transactions increase by volume over a month, the ISP captures this movement directly, offering a real-time health check of the tertiary sector.
 - **Index of Industrial Production (IIP):** A long-standing statistical composite that measures the short-term volume changes in a basket of industrial products across mining, manufacturing, and electricity. It serves as the traditional industrial counterpart to the newly developed services index.
 - **Base Year (e.g., 2024-25):** The benchmark year against which economic indices compare current performance to establish growth rates. Setting a stable, recent base year ensures that structural changes, new market dynamics, and technological evolutions are accurately represented without being skewed by outdated historical prices.
 - **Annual Survey of Incorporated Services Sector Enterprises (ASISSE):** A comprehensive statistical exercise aimed at gathering operational and financial data from registered corporate and formal service providers. It serves as a vital database to fill historical data gaps and refine overall Gross Domestic Product (GDP) calculations.
 - **High-Frequency Indicators (HFIs):** Economic metrics released at short, regular intervals (such as monthly or weekly) that give immediate insight into economic momentum before formal quarterly GDP numbers arrive.
- **Main Arguments and Substantive Parts**
 - The institutionalization of a monthly tracking mechanism for the services domain represents a critical upgrade in macroeconomic monitoring. Historically, India's statistical ecosystem faced a structural asymmetry: while the secondary sector was meticulously tracked monthly via the IIP, the services sector—despite contributing more than half of the national economic activity—lacked a unified high-frequency volume index.
 - **Addressing the Statistical Vacuum:** The primary assertion is that measuring 19 sub-sectors covering approximately 60% of India's services ecosystem significantly strengthens the national statistical framework. By tracking components like accommodation, food services, retail trade, and real estate, policy instruments move from speculative proxy-based tracking to direct, evidence-based quantification.
 - **Evidence of Strong Sectoral Momentum:** Data from April 2026 demonstrates that 14 of the 19 monitored sub-sectors achieved robust double-digit growth. When weighted and aggregated by expert analysis, this points to a striking year-on-year expansion of 20.8% for the covered segments over April 2025, highlighting a resilient and surging domestic demand.
 - **Multi-Source Data Synergy:** The architecture of modern economic tracking relies heavily on data convergence. Instead of relying on isolated survey samples, contemporary methodology integrates administrative data registries, real-time GST filings, and structured enterprise surveys like the ASISSE. This minimizes sampling errors and reduces reliance on outdated proxies.
 - **Methodological Limitations and Challenges:** While this is a major analytical advance, certain structural caveats remain. The initial framework does not yet provide an official, state-sanctioned composite growth rate, requiring independent expert calculation. Furthermore, nearly 40% of the services sector remains unmonitored by this index, leaving a significant portion of highly informal or unorganized activities unaccounted for.

- **Historical Evolution of the Issue**
- **The Post-Independence Industrial Bias (1950s–1980s):** Following independence, India's statistical focus was naturally aligned with physical assets—agriculture and heavy industrial manufacturing. This led to the early establishment of the IIP. Services were viewed as residual or secondary, resulting in minimal tracking infrastructure.
- **The 1991 Structural Shift and the Data Lag:** The historic LPG (Liberalization, Privatization, Globalization) reforms completely altered India's growth trajectory, causing the services sector to leapfrog manufacturing as the primary engine of GDP. However, high-frequency tracking did not keep pace. For decades, economists had to rely on fragmented proxies like railway freight, bank credit growth, or tourist arrivals to estimate service sector health.
- **The Rangarajan Commission Recommendations (2001):** The National Statistical Commission, chaired by Dr. C. Rangarajan, formally recognized these severe data deficiencies. It emphasized that a services-driven economy cannot be managed effectively using an industrial-era statistical dashboard, sparking institutional discussions on the need for a dedicated services index.
- **The Formalization and Digitalization Catalyst (2010s–Present):** The introduction of the MCA-21 corporate registry, followed by the rollout of the Goods and Services Tax (GST), transformed the data landscape. These platforms generated extensive digital footprints, creating the administrative data streams necessary to power a reliable, monthly services index. This evolution culminated in the launch of the ISP with a modern 2024-25 base year.
- **Way Forward**
- **Expanding Sectoral Coverage:** Moving forward, institutional efforts should focus on closing the remaining 40% tracking gap. By integrating digital payment footprints, digital commerce logs, and localized urban body registries, the framework can capture informal services that currently slip through formal nets.
- **Institutionalizing an Official Composite Index:** While presenting individual sub-sector growth is valuable, MoSPI should work toward launching an official, seasonally adjusted composite ISP score each month, similar to the IIP. This would provide an immediate, single-number health check of the overall services sector.
- **Leveraging Advanced Data Analytics:** The statistical architecture should incorporate advanced big data pipelines and machine learning algorithms to process large volumes of GST and corporate filings more quickly. This would speed up processing times, reduce subsequent data revisions, and minimize reporting lags.
- **Strengthening Cooperative Federalism in Statistics:** State Directorates of Economics and Statistics should be actively integrated into this framework. Syncing central and state data collection will help capture regional variations in service delivery, from tourism-heavy states to financial hubs, making sub-national planning more precise.



INDIA'S INAUGURAL INDEX OF SERVICES PRODUCTION (ISP): A STRATEGIC OVERVIEW

SECTION 1: WHAT IS THE INDEX OF SERVICES PRODUCTION (ISP)?



Services Counterpart to the IIP (Index of Industrial Production).



High-Frequency Indicator (HFI) measuring short-term volume changes in service output.



Measured 19 key sub-sectors, covering ~60% of India's services economy (value-added)



Released on the 29th of every month (IIP is on the 28th)



Base Year (Trial): 2024-25

SECTION 2: CORE PERFORMANCE SNAPSHOT (APRIL 2026 DATA)

20.8%
YEAR-ON-YEAR GROWTH

14 14 OF 19 SUB-SECTORS GREW IN DOUBLE DIGITS

BEST PERFORMING SUB-SECTORS



Accommodation & Food



Retail Trade



Administrative & Support Services



Real Estate

SECTION 3: METHODOLOGY AND DATA SOURCES



ADMINISTRATIVE DATA (Data registries)



GST (Goods and Services Tax) DATA



ASISSE (Annual Survey of Incorporated Services Sector Enterprises) DATA

TRIANGULATING DATA FOR MORE ACCURATE MEASUREMENT AND STRENGTHENED STATISTICAL SYSTEM

SECTION 4: MULTI-DIMENSIONAL IMPORTANCE (UPSC/APSC CONTEXT)



SOCIAL
Barometer of urban employment trends



POLITICAL
Objective data for policy assessment



LEGAL/REGULATORY
Link between compliance (GST) and statistical power



ETHICAL
Commitment to data integrity and transparency



INTERNATIONAL
Improves India's global economic standing and credit rating



ECONOMIC
Informs business decisions and resource allocation





AXIA
IAS ACADEMY
RISE ABOVE THE REST



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