AXIA IAS ACADEMY

DAILY NEWS ANALYSIS

JULY 2

CONSISTENT COMPREHENSIVE AND CREDIBLE

UNIQUE AND BEST IN QUALITY

GST revenues up 14% in June amid dependence on imports

T.C.A. Sharad Raghavan
NEW DELHI

The government's Goods and Services Tax (GST) revenue grew 13.9% to ₹1.95 lakh crore in June compared with the corresponding period in 2025, the highest year-on-year growth rate in 13 months. However, the bulk of this growth came from imports, with the tax collected from domestic transactions growing far slower.

The data shows that GST revenue from domestic transactions grew 6.5% to about ₹1.35 lakh crore in June 2026. This made up 69% of the total GST revenue earned that month, down from the 74% share it held in June last year.

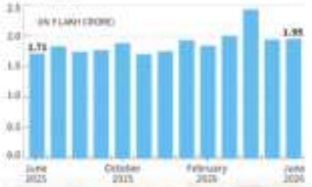
Revenue from imports, on the other hand, grew nearly 35% in June 2026 to ₹6 lakh crore.

This marks the 10th consecutive month in which GST revenues from imports have grown in double digits, and the 10th straight month in which their growth has exceeded the growth in revenues from domestic transactions.

Tax experts are divided on the cause for this sharp rise in revenues from imports, but they agree that it is something the government must keep an eye on.

Consistent progress

The 13.9% growth in June 2026 is the highest y-o-y rise in 13 months. The graph shows GST revenue in the last 1-year period



Nine years of GST

Further, as GST marked nine years of implementation on Wednesday, tax experts point to several aspects – such as input tax credits, dispute resolution, multiple registrations, and the inverted duty structure – as issues that still need to be addressed. However, they do acknowledge that the system has been steadily improving over the years.

According to Saurabh Agarwal, tax partner at EY India, a possible reason could be that India is importing what it should be manufacturing.

"The rising share of collections from imports warrants closer structural analysis," Mr. Agarwal said. He pointed out that one way to mitigate this reliance is to redeploy unutilised outlays from the production linked incentive schemes to strategically attract and scale high-value manufacturing within India.

Mahesh Jaising, partner and indirect tax leader at Deloitte India, largely echoed these views, saying that the growth in import revenues suggest an increase in the import of raw materials and intermediate goods, which reflects sustained manufacturing activity.

However, another possible reason, as voiced by Pratik Jain, partner at Price Waterhouse & Co is that revenues from imports are growing because the prices of imported goods have also increased across many commodities.

Structural changes

Looking ahead at what remains to be done in GST after nine years in operation, the tax experts pointed to a number of structural and legislative issues that need to be addressed.

"At a structural level, you have real estate, petroleum products, liquor, agriculture and education either outside of GST or exempt," Mr. Jain said. "I think now that GST has stabilised, it's the right time for us to start a debate as to how some of these can be included."

"I don't think it will happen immediately and I don't see passenger fuels coming in soon, but things like aviation turbine fuel and natural gas are low hanging fruit because the revenue implications are not significant," he added.

The other area he said that needed work was resolving the inverted duty structure that has become more of a problem since the GST rates were rationalised in September last year. An inverted duty structure arises when a final product is taxed lower than the rates applied on its inputs. This means companies end up paying higher tax on their inputs than they collect when they sell a product. Not all of this gets refunded.

Apart from these, Karthik Mani, partner with the tax and regulatory practice of BDO India pointed out that the "wish list" of industry and taxpayers is clear. This includes, he said, a single pan-India GST registration to end the compliance burden of state-wise registrations for pan-India businesses, and a "genuine" amnesty for routine reconciliation mismatches so that taxpayers are not pulled into litigation over minor, non-fraudulent notices.

- **Key Terms and Explanations**
- **Goods and Services Tax (GST)**
- GST is a comprehensive, multi-stage, destination-based indirect tax levied on the manufacture, sale, and consumption of goods and services across India. It subsumed several central and state indirect taxes (like excise duty, VAT, and service tax) to create a unified domestic market.
- **Example:** If a smartphone manufactured in Tamil Nadu is sold to a consumer in Assam, the tax revenue from the final consumption accrues to Assam, showcasing its destination-based architecture.
- **Integrated GST (IGST) on Imports**
- Under the GST framework, import transactions are treated as inter-state supplies. Therefore, they attract Integrated Goods and Services Tax (IGST) along with basic customs duties. This ensures that imported goods are taxed at par with similar products manufactured domestically.
- **Example:** A company importing industrial machinery from Germany pays IGST at the port of entry, which can later be claimed as an input tax credit if the machinery is used for business operations.
- **Inverted Duty Structure**
- An inverted duty structure occurs when the tax rate on raw materials or intermediate inputs is higher than the tax rate on the finished, final product. This creates a distortion where domestic manufacturers accumulate unutilized tax credits, locking up their working capital and making domestic manufacturing less competitive than direct imports of finished goods.
- **Example:** If fabric (an input) is taxed at 12% but the final readymade garment (the output) is taxed at 5%, the manufacturer pays more tax on purchases than they collect on sales, leading to a structural imbalance.
- **Input Tax Credit (ITC)**
- ITC is the mechanism that allows taxpayers to reduce the tax they have to pay on outputs by the amount of tax they have already paid on inputs. It is the cornerstone of the GST regime designed to eliminate the cascading effect of taxation (tax-on-tax).
- **Example:** A baker pays ₹10 tax on flour (input) and calculates ₹15 tax on the final cake (output). Using ITC, the baker only pays the difference of ₹5 to the government.
- **Production Linked Incentive (PLI) Scheme**
- A flagship industrial policy initiative by the government designed to boost domestic manufacturing by offering financial incentives to companies based on incremental sales of products manufactured in domestic units. It aims to reduce import dependence in high-value sectors like electronics, pharmaceuticals, and advanced chemistry cells.

- **Main Arguments and Substantive Parts**
- The current fiscal trajectory of India's indirect tax regime presents a classic macroeconomic paradox: while overall collections are expanding robustly—flirting with the landmark milestone of ₹2 lakh crore monthly—the underlying engine of this growth is structurally skewed.
- **The Divergence between Import and Domestic Collections**
- The core structural trend is the aggressive outperformance of import-led GST revenues against domestic transactions. Import revenues are expanding at nearly 35%, marking over a year of consecutive double-digit growth. Conversely, domestic transaction tax growth has moderated to a modest 6.5%. Consequently, the share of domestic transactions in the total GST pool has compressed from 74% to 69% within a twelve-month cycle.
- **The Dual Interpretation of Import Dependence**
- Economists and policy analysts are divided on what this structural shift signals for the broader economy:
- **The Optimistic View (Sustained Economic Activity):** One school of thought suggests that surging import collections reflect a vibrant domestic manufacturing base. The imports are primarily composed of raw materials, capital goods, and intermediate components, signaling robust industrial capital expenditure (CapEx) and domestic value addition.
- **The Structural Concern (Sub-optimal Local Substitution):** The counter-argument warns that India may be importing goods that it should fundamentally be manufacturing locally. This indicates that domestic capacity creation in intermediate segments is lagging, forcing a structural reliance on foreign supply chains.
- **The Commodity Inflation Factor:** A third complicating variable is global commodity pricing. Elevated global prices for essential imported inputs automatically inflate the ad-valorem tax base at customs ports, driving up IGST collections without necessarily translating to an equivalent increase in the physical volume of imports.
- **Unresolved Friction Points after Nine Years of Implementation**
- As the GST regime marks nearly a decade of operational existence, significant structural and administrative bottlenecks continue to restrict its ultimate efficiency:
- **Persistent Inverted Duty Structures:** Despite sporadic rate rationalizations, the tax architecture continues to penalize domestic value addition in several key sectors by taxing inputs higher than outputs.
- **Compliance Fragmentation:** Businesses operating across state borders face substantial compliance burdens due to the mandatory requirement for individual state-wise registrations rather than a single, unified pan-India registration.
- **Adversarial Litigation Environment:** The system continues to generate extensive litigation over minor, non-fraudulent clerical and reconciliation errors, highlighting the need for a pragmatic amnesty mechanism to distinguish routine compliance mistakes from systemic tax evasion.

- **Historical Evolution of the Issue**
- **The Pre-2017 Fragmented Landscape**
- Before the introduction of the unified tax, India's indirect tax architecture was heavily fragmented. The central government levied Central Excise Duty and Service Tax, while state governments levied independent Value Added Taxes (VAT), Entry Taxes, Luxury Taxes, and Octroi. This created a severe cascading effect where taxes were levied on top of taxes as goods crossed state boundaries. Internal check posts slowed logistics, and the nation was functionally divided into separate economic zones.
- **2017: The Structural Reset**
- The passage of the 101st Constitutional Amendment Act paved the way for the rollout of the Goods and Services Tax on July 1, 2017. This marked the single largest tax reform in independent India's history, replacing a multi-layered system with a dual-GST framework (CGST and SGST/IGST). The early phase was characterized by severe technological disruptions within the GST Network (GSTN), complex multiple rate slabs (5%, 12%, 18%, 28%), and transitional friction regarding input tax credit verification.
- **2018–2023: Tech Stabilization and Inter-State Consolidation**
- This middle period saw the introduction of systemic checks like the electronic way bill (E-Way Bill) and mandatory E-Invoicing for businesses, which drastically reduced tax evasion and improved compliance. The period was also defined by intense political debates within the GST Council regarding the "Compensation Cess"—a mechanism designed to protect states from revenue shortfalls during the first five years of transition. The economic shock of the COVID-19 pandemic tested this federal arrangement, forcing the Center to borrow on behalf of states to fulfill revenue guarantees.
- **2024–2026: The Maturation and the Import Challenge**
- By 2026, the GST ecosystem has stabilized into a reliable revenue generator, with baseline monthly collections consistently exceeding ₹1.7 to ₹1.9 lakh crore. However, the current period has shifted focus from basic tax evasion to deeper structural questions. The narrative is no longer just about raising revenue, but addressing why import-derived tax collections are outpacing domestic growth, how to resolve persistent inverted duties, and when to bring excluded sectors like petroleum, natural gas, and real estate into the tax fold.

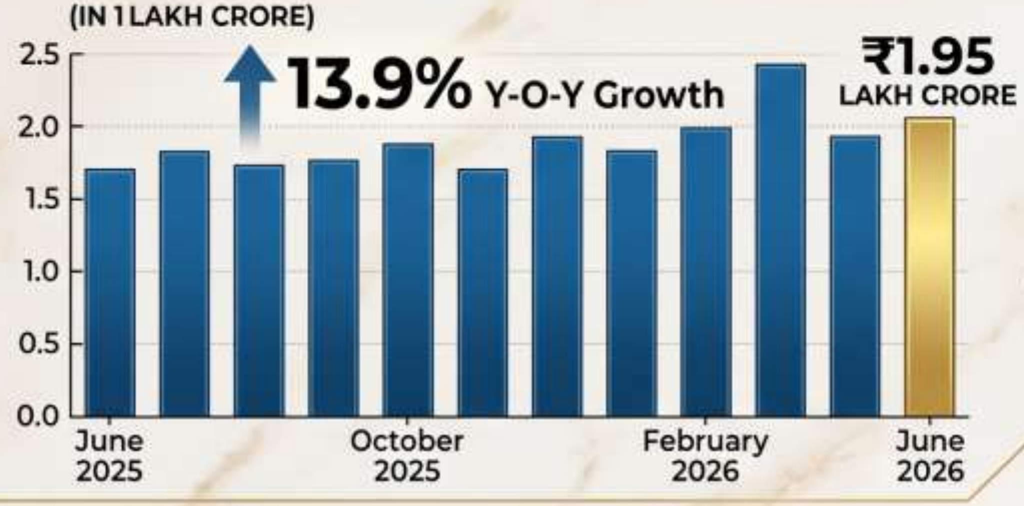
- **Way Forward**
- **Targeted Calibration of the Industrial Incentive Framework**
- To address the structural reliance on imported intermediate goods, unutilized outlays from existing Production Linked Incentive (PLI) schemes should be strategically redirected. This capital can be redeployed to attract and scale high-value manufacturing in foundational areas where India currently lacks deep supply chains.
- **Comprehensive Correction of Inverted Duty Structures**
- The GST Council needs to accelerate its review of split-rate structures across industrial sectors. Rationalizing tariff lines to ensure that raw materials and intermediate inputs are not taxed at higher rates than finished goods will unlock trapped working capital and improve the competitiveness of domestic production.

COMPREHENSIVE GST REVENUE ANALYSIS: PERFORMANCE, CHALLENGES & THE ROAD AHEAD

AXIA IAS ACADEMY

RISE ABOVE THE REST

PERFORMANCE OVERVIEW: HIGHEST YOY RISE IN 13 MONTHS



Y-O-Y Growth

THE GROWTH PARADOX: IMPORTS VS. DOMESTIC

DOMESTIC TRANSACTIONS (₹1.35 Lakh Cr)

Grew 6.5%

Share Down to 69% (from 74%)

Domestic workshop

IMPORT REVENUES (₹0.6 Lakh Cr)

Grew ~35%

16th consecutive double-digit growth month

IMPORT DRIVER

EXPERT DIVERGENCE: THE "WHY" QUESTION

- IMPORTS INDICATE VIBRANT manufacturing (more raw/intermediate goods)
- REVENUE GROWTH due to higher COMMODITY prices
- Idle
- INDIA IS IMPORTING what it *should* be manufacturing
- PRICE

9 YEARS OF GST: PERSISTENT ISSUES & WISHLIST

KEY ISSUES TO ADDRESS

- ☑ Input Tax Credits
- ☑ Dispute Resolution
- ☑ Multiple Registrations
- ☑ Inverted Duty Structure

INDUSTRY WISHLIST

- ☑ Single pan-India GST Registration
- ☑ "Genuine" Amnesty for mismatches

PATH AHEAD: STRUCTURAL REFORMS

Sectors outside GST/exempt

- Real estate
- Petroleum (ATF, Natural Gas)
- Liquor
- Agriculture
- Education

LOW-HANGING FRUIT

Near-Term Reform: ATF & Natural Gas (Minimal Revenue Impact)

Centre fixes minimum wage of ₹300 per day under VB-G RAM G scheme

The Hindu Bureau
NEW DELHI

The Centre has fixed a floor wage of ₹300 per day under the Viksit Bharat-Guarantee for Rozgar and Ajeevika Mission (Gramin) (VB-G RAM G) Act, 2025, which came into effect on Tuesday replacing the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), 2005.

The 21 States and Union Territories which paid less than ₹300 per day under the MGNREGA have had their wage rates increased to this level, while States already paying above ₹300 saw more minimal hikes.

Four major Hindi-belt States saw significant wage increases – ₹48 in Uttar Pradesh, ₹45 in Bihar, ₹39 in Madhya Pradesh, and ₹19 in Rajasthan – compared with the last MGNREGA rates set in 2025-26. Barring the U.T. of Dadra and Nagar Haveli and Daman and Diu, where wages remain unchanged from the MGNREGA levels, Telangana recorded the lowest increase of just ₹1, with wages rising 0.33% from ₹307 to ₹308.

Other southern States which were already above the ₹300 level also saw minimal hikes, including Andhra Pradesh (1.6%), Tamil Nadu (2.7%), and Karnataka (3.2%).

Excluding the special rate of ₹450 applicable to certain gram panchayats in Sikkim, Haryana continues to have the highest wage rate at ₹409, but recorded one of the lowest increases of just 2.25%. Haryana (₹409), Goa (₹406) and Kerala (₹401) are the only States with wage rates above ₹400.

'Hike above 15%'

Northern and northeastern States which saw wage hikes above 15% to reach the ₹300 level include Arunachal Pradesh, Nagaland, Himachal Pradesh, Uttarakhand, Jharkhand, Assam, Tripura, Sikkim, and West Bengal.

Small boost: Several States which paid less than ₹300 per day under MGNREGA have had their wage rates jacked up. ARUN KULKARNI

Congress general secretary Jairam Ramesh criticised the notification, saying the wages remain "unjustifiably low". He reiterated the Congress's demand, made during the 2024 Lok Sabha campaign, for a national daily minimum wage of ₹400 for all workers in India.

"The Expert Committee headed by Dr. Anoop Satpathy, set up by the Modi government, had also recommended a national minimum wage floor of ₹375 per day in 2019," he said.

Mr. Ramesh noted that the Parliamentary Standing Committee on Rural Development, chaired by Congress MP Saptagiri Ulaka, had also consistently recommended higher wages for MGNREGA workers.

Given the "widespread minimum wage protests in industrial hubs like Noida, and at a time when the stagnation of rural wages is widely recognised as a key constraint on our economic growth", the notification was both a "snub to India's workers and an unwise economic policy," he said.

"A just minimum wage for India's workers would adopt Dr. Satpathy's recommendation and accommodate the increase in prices since then," he added.

Burden on States

Mr. Ulaka said his party had opposed the VB-G RAM G Act "from the streets to Parliament" and would continue to do so. "We appeal to the government that the VB-G RAM G be repealed and a strengthened MGNREGA be brought back," he said at a press conference here. He criticised the shift from the rights-based, demand-driven MGNREGA to what he described as a supply-driven, government-driven VB-G RAM G.

Mr. Ulaka said a key concern was the new cost-sharing arrangement. Under MGNREGA, the Centre bore almost the entire labour cost, while material costs were shared in a 60:40 ratio. Under VB-G RAM G, however, the combined labour and material expenditure is now subject to the 60:40 ratio, he said. "If additional work needs to be provided beyond this, the financial burden will fall on the State government," he added.

DATA POINT
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- **Key Terms and Explanations**
- **Viksit Bharat Guarantee for Rozgar and Ajeevika Mission (Gramin) (VB-G RAM G) Act, 2025:** This is the newly enacted legislative framework governing rural public works in India, completely replacing the two-decade-old Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), 2005. Its primary mandate is to streamline rural livelihood guarantees while aligning asset creation with national development goals.
- **National Floor Wage for Public Works:** The legally mandated baseline daily remuneration below which no state or union territory can pay workers engaged in government-backed rural employment schemes. For instance, setting the floor wage at ₹300 per day means that even if a state's previous baseline was lower, it must legally elevate its payments to meet this threshold.
- **Demand-Driven vs. Supply-Driven Welfare Models:**
    - *Demand-Driven Model:* A rights-based approach where the government is legally obligated to provide employment whenever a citizen demands it. Under the old MGNREGA framework, if the government failed to provide work within 15 days of a demand, it was legally bound to pay an unemployment allowance.
    - *Supply-Driven Model:* A programmatic framework where the volume, timing, and allocation of employment are dictated by the government's budgetary ceilings, pre-determined asset targets, and structural capacities rather than the spontaneous demands of laborers.
- **Combined Labour-Material Fiscal Ratio:** The statutory cost-sharing formula between the Central Government and State Governments for executing public works. Historically, the center bore nearly 100% of the unskilled labor cost. Under a combined 60:40 ratio, the aggregate expenditure—pooling both labor wages and material costs together—is split, requiring states to chip in 40% across the board.
- **Real Wage Stagnation:** An economic condition where nominal wage increases fail to keep pace with inflation, resulting in stagnant or declining actual purchasing power for the worker.

- **Main Arguments and Substantive Parts**
- The transition to the VB-G RAM G framework brings to the forefront a fundamental debate regarding the direction of India's social safety nets, regional equity, and fiscal federalism.
- **The Central Thesis**
- The evolution from a demand-driven, rights-based rural employment guarantee to a structured, supply-driven infrastructure and livelihood mission represents a strategic shift. The objective is to achieve fiscal rationalization and standardized national wage floors, but this comes at the cost of altering the financial equation between the Center and States, while transforming a statutory citizen entitlement into an administrative program.
- **Core Arguments and Supporting Evidence**
- **Standardization of the Rural Wage Floor:** Proponents argue that setting a national floor wage of ₹300 per day provides a much-needed correction for historically underpaid regions. Major Hindi-belt states and Northeastern regions have seen substantial double-digit percentage hikes (e.g., an increase of ₹48 in Uttar Pradesh and ₹45 in Bihar) to bring them up to this new baseline.
- **Persistence of Regional Disparities:** Despite the new floor, the framework maintains higher historical baselines for economically advanced or high-cost states. Consequently, states like Haryana (₹409), Goa (₹406), and Kerala (₹401) operate significantly above the floor, reflecting stark variations in the regional cost of living and rural economic dynamics.
- **The Fiscal Burden Shift:** A critical structural component of the new model is the unified 60:40 labor and material cost-sharing ratio. By moving away from the model where the Center absorbed the entire labor wage bill, the new architecture introduces a significant financial obligation for state budgets, particularly if local demand exceeds planned central supplies.

- **Historical Evolution of the Issue**
- **Pre-Independence to Early Post-Independence Era:** Public works were primarily reactive, deployed as ad-hoc scarcity relief measures during severe famines. The philosophical grounding evolved with the drafting of the Constitution, particularly Article 41 of the Directive Principles, which urged the State to secure the "Right to Work" within its economic capacity.
- **The 1972 Maharashtra Employment Guarantee Scheme (EGS):** Triggered by a devastating drought, Maharashtra pioneered the EGS. This was the first structural blueprint in Asia to recognize employment as a seasonal entitlement, establishing the conceptual foundation that rural citizens could claim manual work from the state as a matter of right.
- **The Era of Centrally Sponsored Schemes (1980s–1990s):** The Central government launched programs like the Jawahar Rozgar Yojana (JRY) in 1989 and the Employment Assurance Scheme (EAS). While these expanded the geographic reach of public works, they remained highly bureaucratic, supply-driven, and plagued by top-down leakages.
- **The MGNREGA Revolution (2005):** A watershed moment in Indian social policy. The passing of the Mahatma Gandhi National Rural Employment Guarantee Act transformed welfare from a charity-based model to a legally enforceable statutory right, guaranteeing 100 days of manual work per rural household. The Center took on the entire liability for unskilled labor to ensure states were not fiscally constrained from providing work.
- **The Present Transition (2025–2026):** The repeal of MGNREGA and the rollout of the VB-G RAM G Act marks the beginning of a new chapter. This phase attempts to balance the asset-creation needs of a modernizing economy ('Viksit Bharat') with stricter fiscal controls, shifting the financial co-responsibility onto state governments.

- **Way Forward**
- **Dynamic Inflation Indexation:** The ₹300 national wage floor should not remain static. It needs to be dynamically linked to the Consumer Price Index for Agricultural Labourers (CPI-AL) and updated annually to prevent rural purchasing power from eroding against inflation.
- **Asymmetric Fiscal Federalism:** A rigid, one-size-fits-all 60:40 cost-sharing ratio across all states can widen regional inequities. The Center should consider a tiered funding model, maintaining a 90:10 or 80:20 ratio for fiscally strained, low-income states (like Bihar and Jharkhand) and special category states in the Northeast, while applying the 60:40 split to fiscally stronger states.
- **Convergence for Asset Quality:** Since the new mission emphasizes supply-driven development, local governments should focus on combining these funds with other schemes like the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) or Rashtriya Krishi Vikas Yojana (RKVY). This will help ensure that manual labor is channeled into building high-value assets like cold storage linkages, check dams, and micro-irrigation systems.
- **Strengthening Decentralized Accountability:** To offset the potential downsides of a supply-driven model, the institutional role of the Gram Sabha must be protected. Social audits should be mandate-driven and independently funded to ensure that the work targets set by the government match the actual, on-the-ground needs of rural communities.

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THE TRANSITION IN RURAL EMPLOYMENT: FROM MGNREGA TO VB-GRAMG ACT, 2025 - A COMPREHENSIVE ANALYSIS FOR UPSC & PSC ASPIRANTS

SECTION 1
STRUCTURAL SHIFT & COMPARISON

OLD: MGNREGA, 2005 (Rights-Based)	NEW: VB-G RAMG ACT, 2025 (Programmatic)
MODEL:	
Demand-Driven Statutory Guarantee	Supply-Driven Program
LEGAL STATUS:	
Statutory Citizen Entitlement	Administrative Livelihood Mission
PRIMARY MANDATE:	
Guarantee of Livelihood	Asset Creation for Viksit Bharat
FISCAL RATIO (CENTRE:STATE):	
100:0 (Unskilled Wage)	60:40 (Combined Labour-Material)

SECTION 2
NATIONAL WAGE FLOOR & REGIONAL IMPACTS

Expert panels like Dr. Satpathy Com. recommended higher floor wage

₹300 NATIONAL FLOOR WAGE

UP
Bihar
Goa

HIKES IN LOW-WAGE STATES
e.g., Uttar Pradesh: +₹48, Bihar: +₹45

e.g., Uttar Pradesh: +₹48, Bihar: +₹45

Expert panels like Dr. Satpathy Com. recommended higher floor wage

PERSISTENT DISPARITIES
e.g., Haryana ₹409
Goa ₹406
Kerala ₹401

SECTION 3
MULTIDIMENSIONAL ANALYSIS

(Ripple Effects)

ECONOMY: Distressed Migration (Reduces), Fiscal Stress on Sub-National Budgets (Increases), Agrarian Labor Distortions

SOCIAL: Gender Empowerment Mechanics, Internal Migration reduction

LEGAL: Dilution of Statutory Recourse, Cap on Work Availability

POLITICAL: Regional Electoral Narratives, Central Welfare Ideology Shift

ETHICAL: Human Dignity vs. Fiscal Realism, Inter-Generational Equity

INTERNATIONAL: SDG Commitments (SDG 1: No Poverty, SDG 5: Gender Equality, SDG 8: Decent Work)

SECTION 4
HISTORICAL EVOLUTION & WAY FORWARD

100S DAYS WORK

- **Pre-1970s:** Ad-hoc Relief
- **1972:** Mah. EGS
- **1989:** JRY
- **2005-2025:** MGNREGA (Rights-Based)
- **2025+:** VB-G RAMG (Present Transition)

Way Forward

BALANCED ADJUSTMENTS:

CPI

- **Dynamic Inflation Indexation** Linked to CPI-AL
- **Asymmetric Fiscal Federalism** Tiered funding for strained states (e.g., 90:10)
- **Convergence for Asset Quality** Leverage PMKSY, RKVY funds
- **Decentralized Accountability** Protect role of Gram Sabha, social audits

Centre's demography panel to send questionnaire to States

The High-Level Committee on Demographic Changes will seek details of population changes and increase in settlements since the 2011 Census; it will also ask the EC for data on SIR deletions

Vijaita Singh
NEW DELHI

The High-Level Committee on Demographic Changes (HLCDC) led by a retired Supreme Court judge is all set to send questionnaires to Chief Secretaries of all States seeking details of population changes and increase in settlements since the last Census was conducted in 2011, a government source told *The Hindu*.

"We will compare the 2011 Census data with the present scenario to understand the scale of change and will also visit those areas. The questions pertain to changes post 2011 Census," said the source.

The final data for the next Census after 2011, the Population Census 2027, which is being done after a gap of 16 years, are yet to be known.

The first phase of Population Census 2027 – the House Listing and Housing Operations (HLO) – is presently being conducted in phases in several parts of the country and the final phase, the Population Enumeration, will be completed on March 1, 2027. The HLO can give a fair idea of the settlements and tentative population in enumeration blocks and is set to conclude on September 30 this year.

Taking stock: The High-Level Committee on Demographic Changes with Union Home Minister Amit Shah in New Delhi. PIB

The panel will also issue an e-mail address to which people can send suggestions or feedback regarding the exercise.

SIR exclusions

The panel will also ask the Election Commission of India (EC) to furnish the names of those excluded from voter rolls during the Special Intensive Revision (SIR) exercise and also the reasons behind the exclusions. The details of exclusions would help the panel estimate the number of "illegal migrants" in the country, the source said. The SIR has been completed in 13 States and Union Territories so far.

A document-based process of revising voter lists, the SIR has been criticised for placing the burden of proof on electors, with 6.5 crore names (around 11%) deleted from the electoral rolls across the States where the combined electorate had stood at 58.88 crore before the SIR began.

On June 25, the panel met Home Minister Amit Shah and informed him about its decision to visit States and interact with various Union Ministries to get first-hand ground-level details and feedback on subjects related to demographic changes, a statement by the Ministry of Home Affairs on July 1 said.

The Minister, while appreciating the strategy formed by the panel, directed Union Home Secretary Govind Mohan to provide all possible assistance to the committee in its day-to-day work and also during its visits. Mr. Shah suggested that the panel provide its recommendation at the earliest.

Prime Minister Narendra Modi had announced the "High-powered Demography Mission" in his Independence Day address on August 15, 2025. On May 26, the Ministry constituted the committee to study the demographic changes arising from illegal immigration and other abnormal reasons, and to suggest measures to deal with these demographic changes.

The panel is headed by former Supreme Court judge Justice Prakash Prabhakar Navlekar (retd).

- **Key Terms and Explanations**
- **Demographic Changes and Abnormality**
- Demographic changes refer to shifts in the structure, size, distribution, and characteristics of a population over time, typically measured by parameters like birth rates, death rates, and migration. An "abnormal" demographic change denotes population growth or structural shifts that cannot be accounted for by natural increase (births minus deaths) or routine domestic migration.
- **High-Level Committee on Demographic Changes (HLCDC)**
- This is an administrative task force constituted by the Union Government, typically headed by a retired judicial expert (such as a retired Supreme Court Judge), tasked with conducting spatial and statistical audits of population shifts. Its objective is to gather empirical evidence on unauthorized settlements and unusual population growth, bridge data gaps resulting from delayed census cycles, and provide policy recommendations to safeguard internal security and resource equity.
- **Special Intensive Revision (SIR)**
- A targeted administrative exercise conducted by the Election Commission of India (ECI) to clean, update, and verify electoral rolls in specific geographic regions, particularly those prone to high population fluidity or suspected illegal migration. Unlike summary revisions, SIR involves rigorous door-to-door verification and document validation.
- **House Listing and Housing Operations (HLO)**
- The foundational phase of the official Population Census. Before individuals are counted, every structural unit—whether residential, commercial, or mixed—is identified, numbered, and mapped. HLO provides the spatial framework and an initial tentative estimate of settlements, serving as the baseline for the subsequent population enumeration phase.
- **Burden of Proof**
- A legal and procedural principle determining which party is responsible for providing the evidence to establish a fact. In standard civil matters, the state or the accuser carries this burden. However, in citizenship verification or intensive electoral revisions, the burden of proof is often shifted onto the individual elector, who must proactively present documentary evidence to prove they are a legitimate resident or citizen.

- **Main Arguments and Substantive Parts**
- **Core Thesis**
- The primary administrative argument posits that robust, updated spatial and demographic data is a prerequisite for sovereign security, targeted welfare distribution, and resource planning. In the absence of contemporary census baselines, integrating specialized electoral roll data with localized administrative surveys is essential to identify abnormal population spikes, counter unauthorized migration, and protect regional socio-political balances.
- **Key Supporting Points**
- **Bridging the Statistical Vacuum:** With the official Census cycle experiencing a prolonged extension (the 16-year gap between 2011 and the projected completion of the 2027 Census), the state lacks contemporary data. Utilizing interim questionnaires sent to State Chief Secretaries acts as a stop-gap mechanism to capture real-time settlement expansions.
- **Data Integration for Border Security:** By cross-referencing House Listing Operations (HLO) data with the Election Commission's Special Intensive Revision (SIR) metrics, the administration seeks to mathematically isolate patterns of illegal migration, particularly in sensitive border states and union territories.
- **Federal Cooperation:** The reliance on State Chief Secretaries acknowledges that land, local law and order, and primary civil registration are heavily dependent on state-level machinery, requiring a coordinated federal response to demographic shifts.
- **Counterarguments and Criticisms**
- **The Threat of Disenfranchisement:** The scale of deletions during the SIR exercise—where approximately 6.5 crore names (nearly 11% of the combined electorate across 13 states/UTs) were removed—raises significant concerns regarding institutional overreach. Critics argue that a rigid document-based verification system disproportionately penalizes poor, migratory, or illiterate populations who lack flawless documentation.
- **Procedural Disproportion:** Shifting the absolute burden of proof onto individual voters can compromise the democratic ideal of universal adult suffrage. If the state machinery errs or maintains rigid bureaucratic benchmarks, genuine citizens risk facing systemic exclusion from both electoral rolls and social safety nets.

- **Historical Evolution of the Issue**
- **Colonial Era (Late 19th Century to 1947)**
- The institutionalized mapping of Indian demography began with the first synchronous Census in 1881 under British rule. The colonial administration heavily utilized demographic data not just for resource planning, but for communal and caste-based categorization to execute policies of political balancing. Population shifts across provincial borders (such as the movement of farm labor from Bengal into the valleys of Assam) laid the early structural foundations for regional demographic frictions.
- **Post-Independence and the Geopolitical Shocks (1947–1970s)**
- The partition of 1947 caused massive, sudden population exchanges, compelling the newly independent state to pass emergency legislations like the Immigrants (Expulsion from Assam) Act, 1950. The geopolitical crisis of 1971 and the Bangladesh Liberation War led to an unprecedented influx of millions of refugees into India's eastern and north-eastern frontiers, permanently altering local land-holding patterns and regional demographics.
- **The Era of Agitations and Legislative Alterations (1980s–2000s)**
- Unchecked demographic anxieties culminated in the historic Assam Movement (1979–1985), which concluded with the signing of the Assam Accord in 1985. This period introduced Section 6A into the Citizenship Act of 1955, establishing a customized framework for citizenship based on specific cutoff dates. Later, the Citizenship (Amendment) Act of 2003 formally codified the concept of an "illegal migrant" and introduced statutory provisions for constructing a National Register of Citizens (NRC).
- **The Modern Paradigm (2010s–Present Day)**
- The successful completion of the 2011 Census was followed by the localized, supreme court-monitored update of the NRC in Assam (concluding in 2019), which highlighted the immense administrative, logistical, and humanitarian challenges of document-based citizenship verification. The postponement of the 2021 Census due to global health crises disrupted the traditional decadal statistical baseline. This vacuum led to the conceptualization of the High-powered Demography Mission in 2025 and the subsequent formation of the High-Level Committee on Demographic Changes in 2026, aimed at utilizing multi-agency data (like ECI's SIR) to address abnormal population expansions.

- **Way Forward**
- **Technological Integration with Civil Registrations**
- Instead of relying on periodic, high-pressure document reviews like the SIR, India should focus on strengthening and digitizing its real-time civil registration infrastructure. Ensuring the comprehensive registration of births, deaths, and domestic migrations via the Civil Registration System (CRS) can provide a continuous, reliable demographic baseline, reducing the need for ad-hoc, document-heavy verification panels.
- **Establishing Institutional Safeguards**
- When intensive voter roll updates or demographic audits are conducted, the Election Commission and state administrations must provide clear procedural safeguards. The burden of proof should be balanced by active state assistance, ensuring that marginalized, illiterate, or displaced individuals are given adequate time, legal counseling, and accessible avenues to clarify their status before any deletion is finalized.
- **Strengthening Coordinated Federalism**
- Demographic data collection must be a collaborative exercise between the Center and the States rather than a top-down mandate. Utilizing the platform of the Inter-State Council or specialized regional committees can ensure that the questionnaires deployed by panels yield objective, verified data that avoids partisan or political polarization.

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COMPREHENSIVE ANALYSIS - DEMOGRAPHIC CHANGES, SECURITY & ADMINISTRATIVE CHALLENGES

DEMOGRAPHIC VERIFICATION AUDIT

CORE THESIS

Robust data prerequisite for Sovereign Security, Targeted Welfare & Resource Planning

SUPPORTING POINTS

Statistical Vacuum (Interim questionnaires as stop-gap)

Data Integration for Security (Cross-referencing HLO & SIR metrics)

Federal Cooperation (Land, Law & Order are state matters)

SOCIAL

SOCIAL COHESION vs. FEAR

Anxieties regarding culture dilution vs. widespread anxiety among marginalized/illiterate

Note: SIR deletions affected 11% (approx. 6.5 crore names)

POLITICAL

POLITICAL REPRESENTATION & FEDERALISM

Changes in demography impact delimitation and legislative seat allocation.

Dynamic between Central and State priorities

LEGAL

LEGAL BURDEN OF PROOF

Legal conflict between state power for regulation and protection against arbitrary disenfranchisement. Special Intensive Revision (SIR) shifting burden onto individual voters

ECONOMIC

ECONOMIC RESOURCE SCARCITY

Strain on public goods vs. economic dependence on informal migrant labor (e.g., construction, agriculture)

ETHICAL DILEMMA

Balancing institutional efficiency and statutory enforcement with empathy and administrative

INTERNATIONAL DIMENSION

Border management and regional diplomacy (e.g., Bangladesh, Myanmar), non-refoulement principles

CRITICISMS & CONCERNS

Risk of Disenfranchisement (Penalizes poor, migratory, illiterate)

Procedural Disproportion (Shifted burden compromises democratic ideal)

1881: COLONIAL ERA

Colonial Census, Communal Balancing policies, provincial migration (e.g., Bengal to Assam)

1947: POST-INDEPENDENCE

Massive population exchanges (Partition 1947), 1971 refugee flow (eastern frontier)

1985 ACCORD & 2003 CAA: ERA OF AGITATIONS

Section 6A (Citizenship Act 1955), customized frameworks, 2003 CAA defines "illegal migrant"

MODERN PARADIGM (NRC, CENSUS DELAY)

Updated localized NRC in Assam (2019), Census postponement (16-year gap), HLCDC formed 2026

WAY FORWARD

TECHNOLOGICAL INTEGRATION
Digitize and Strengthen Civil Registration System (CRS) for real-time demographic baseline

INSTITUTIONAL SAFEGUARDS
Provide State assistance for document validation, adequate time, and legal counseling

STRENGTHENING FEDERALISM
Collaborative data collection via Inter-State Council/regional committees

BORDER MANAGEMENT & DIPLOMACY
Balanced border enforcement (tech surveillance) paired with regional diplomacy (repatriation agreements)

Army chief unveils road map 'VIJAY' for a future-ready, tech-savvy force

Saurabh Trivedi
NEW DELHI

Stepping forth: General Dhiraj Seth inspects the Guard of Honour, at the South Block Lawns, in New Delhi on Wednesday. SUSHIL KUMAR VERMA

Chief of the Army Staff General Dhiraj Seth on Wednesday unveiled a road map titled "VIJAY", outlining his vision for transforming the Indian Army into a technology-enabled, future-ready force capable of operating across multiple domains. The road map, inspired by the Defence Minister's vision for the Decade of Transformation, was unveiled a day after he assumed charge as the 31st Chief of the Army Staff.

Calling it a moment of "great pride and humility" to lead the Indian Army, General Seth reaffirmed his commitment to the principles of "Duty, Honour and Nation First" and thanked the Prime Minister and the Defence Minister for reposing their faith in him.

Describing the Indian Army as a combat-ready and battle-hardened force, the Army Chief said it remains fully prepared to meet emerging security challenges.

Explaining the road map, General Seth said "V" represents Vigilance, with emphasis on maintaining operational readiness and constant alertness along the borders. "I" stands for Innovation and Transformation, focusing on modern doctrine, cutting-edge technologies and capability development to keep pace with the changing character of warfare. The letter "J" signifies Jointness and Integration, highlighting deeper synergy among the Army, Navy and Air Force, alongside greater military-civil fusion through a Whole-of-Nation approach to strengthen national security and contribute to the vision of Viksit Bharat 2047. For "A", he emphasised Atmanirbharta, reiterating the Army's commitment to indigenous technologies. "Y" stands for Yodha First, reflecting the Army's focus on every soldier as its greatest strength. He said improving training standards, technological skills, welfare and empowerment of veterans and Veer Naris would be key priorities.

- **Key Terms and Explanations**
- **Multi-Domain Operations (MDO):** Traditional warfare was confined to land, sea, and air. MDO expands this battlefield to include two modern domains: **space** and **cyber/electronic** warfare. A multi-domain force seamlessly orchestrates actions across all five realms simultaneously to overwhelm an adversary.
- **Military-Civil Fusion (MCF):** This refers to the deliberate integration of civilian scientific and technological innovations with defense capabilities. For instance, adapting civilian Artificial Intelligence (AI), quantum computing, or commercial drone technologies directly into military hardware and strategy.
- **Jointness and Integration:** This goes beyond simple cooperation among the Army, Navy, and Air Force. It implies structural fusion—such as integrated theatre commands—where resources are pooled under a single operational commander to prevent duplicated effort and maximize strike efficiency.
- **Whole-of-Nation Approach:** National security is no longer just the responsibility of the armed forces. This approach synchronizes diplomatic, economic, informational, technological, and academic resources to safeguard national sovereignty and achieve strategic objectives like *Viksit Bharat 2047*.
- **Atmanirbharta (Defence Indigenisation):** The process of substituting imported military hardware with indigenously designed, developed, and manufactured systems. A classic example is the shift from relying on foreign missile systems to deploying domestic alternatives like the Akash or Pinaka rocket systems.

- **Main Arguments and Substantive Parts**
- The conceptual core of the **'VIJAY'** roadmap focuses on transitioning the Indian Army from a legacy, manpower-heavy force to a lean, technology-driven powerhouse.
- **The Core Pillars of the Transformation**
- **Vigilance (Active Deterrence):** Maintaining persistent surveillance and instantaneous operational readiness along active borders (the Line of Actual Control and Line of Control) using modern tech like satellite imagery, sensors, and loitering munitions.
- **Innovation and Transformation:** Rewriting military doctrines to institutionalize cutting-edge technologies. This means incorporating automation, robotic process automation, and data analytics into combat decisions.
- **Jointness:** Moving away from standard service silos to build deep synergy among the three branches of the armed forces, ensuring they operate as a single, cohesive fist.
- **Atmanirbharta:** Ensuring strategic autonomy. True sovereignty cannot exist if a nation depends on foreign supply chains for critical components during a conflict.
- **Yodha First (Human Capital Optimization):** Acknowledging that tech is only as good as the soldier operating it. This prioritizes rigorous training upskilling, soldier welfare, and institutional support for veterans and *Veer Naris* (war widows).
- **Structural Challenges & Counterarguments**
- While the vision is robust, critics and strategic experts point out significant operational friction points:
- **The Capital-Revenue Imbalance:** High-tech modernization requires massive capital expenditure. However, a major chunk of the defense budget is historically consumed by revenue expenditure (salaries and pensions), leaving limited fiscal space for cutting-edge procurement.
- **Technology vs. Terrain:** Advanced electronic and AI systems face severe degradation in high-altitude, extreme-weather terrains like Siachen or Eastern Ladakh, meaning traditional boots-on-the-ground capability cannot be entirely replaced.

- **Historical Evolution of the Issue**
- **The Post-Independence Era (1947–1962):** India inherited a British-style, infantry-heavy military structure. The 1962 Sino-Indian conflict starkly exposed vulnerabilities in logistical infrastructure, high-altitude equipment, and intelligence gathering, forcing a shift toward modernization.
- **The Kargil Catalyst (1999):** The Kargil conflict was a watershed moment. The *Kargil Review Committee (KRC)* explicitly highlighted a lack of structural jointness between the Army and the Air Force. It strongly recommended creating the post of Chief of Defence Staff (CDS) to enforce inter-service integration.
- **The Shekatkar Committee Reforms (2016):** This committee focused on optimizing the **Teeth-to-Tail ratio** (the ratio of combat soldiers to support staff). It recommended redeploying redundant administrative wings into active combat roles and embracing technological force multipliers.
- **The Current Transformation Era:** The formal appointment of the first CDS in 2019, followed by systemic human resource overhauls like the Agnipath scheme, paved the way for the current paradigm. The 'VIJAY' roadmap represents the modern synthesis of these decades of reform, focusing explicitly on technology and indigenization.

- **Way Forward**
- **Accelerate Theaterisation:** The political and military leadership must expedite the creation of Integrated Theater Commands. Overcoming inter-service bureaucratic resistance is critical to achieving true 'Jointness'.
- **Dedicated R&D Funding:** To sustain *Atmanirbharta*, India must increase its defense R&D spending. Mechanisms like the *Innovations for Defence Excellence (iDEX)* should be expanded to aggressively integrate deep-tech startups into the defense pipeline.
- **Streamlining Procurement:** Defense acquisition processes must be simplified. Radical tech upgrades become obsolete within a few years; therefore, the bureaucratic cycle from testing to induction must be rapidly compressed.
- **Civil-Military Intellectual Fusion:** Create structured pipelines where civilian tech experts, data scientists, and AI engineers can work laterally within military research wings, breaking down rigid institutional walls.

PRECISE UPSC-ORIENTED ANALYSIS: THE 'VIJAY' STRATEGIC TRANSFORMATION ROADMAP

'VIJAY' STRATEGIC ROADMAP FOR FUTURE-READY MILITARY

VIGILANCE
active deterrence

INNOVATION
tech-savvy military
AI
Quantum bit

JOINTNESS
synergy & efficiency
ITC Integrated Theatre Command

ARMY
synergy & efficiency

YODHA FIRST
human capital optimization

ATMANIRBHARTA
defence indigenisation
MADE IN INDIA

Multi-domain operations
DODIS
MDO: SEA, AIR, LAND, SPACE, CYBER, CYBER

Military-Civil Fusioach
Civilian tech
MCF
Military needs needs

Whole-of-Nation approach
Economic, Diplomatic, Academic, Diplomatic, Technological

Timeline
- **PRE-1962: LEGACY FORCE** (Infantry-sn, British-era structure)
- **1999: KARGIL WATERSHED** (KRC, lack of jointness)
- **2016: SHEKATKAR REFORMS** (teeth-to-tail ratio, modern systems)
- **PRESENT: 'VIJAY' PARADIGM** (MDO, indigenisation, tech-savvy solders)

CHALLENGES
- **Capital-Revenue Imbalance** — low fiscal space for tech
- **Technology vs. Terrain** — Degraded sensor signal; Boots-on-Ground necessary

MULTIDIMENSIONAL ANALYSIS
- **Social**: tech-adept profile, welfare for Veer Naris
- **Political**: Viksit Bharat goal, civilian oversight
- **Legal**: Statutory Harmonisation, unified commands
- **Ethical**: AI Human-in-the-Loop, humanitarian law
- **International**: Net Security Provider, Indo-Pacific balance
- **Economic**: Multiplier effect, jobs, R&D ecosystem

NCERT Linkages
Class XII Tiereover:
- Contemp. World Politics - Security
- Class Pol. India - External Relations
- Constitution - Executive

Class XI Constitution → UPSC Syllabus Mapping

UPSC Syllabus Mapping
- GS Paper 3: Security & Border Mgmt, Indigenisation
- GS Paper 4: Ethics, Duty, Honour, Welfare
- GS Paper 2: Governance, Ministries, Command
- Essay & Optionals: Strategic Autonomy

PAST UPSC QUESTION EXAMPLES:
(GS 3, 2023: Character of warfare → emerging technologies – cyber, space, AI
GS 3, 2022: Organizational changes for Jointness; - effective jointness → defence indigenisation
GS 3, 2018: Private sector participation/fusion) → civil-military technological fusion

WAY FORWARD
- **ACCELERATE THEATERISATION** (integrated commands)
- **INCREASE R&D FUNDING** (iDEX, deep-tech startups)
- **STREAMLINE PROCUREMENT** (simplified process, compressed cycle)
- **CIVIL-MILITARY INTEL FUSION** (breaking institutional walls)

World Bank may scrap funding target for climate projects

Jacob Koshy
NEW DELHI

Following disapproval from the U.S. administration, the World Bank Group (WBG) has indicated that it would do away with its funding target for climate-centric projects.

"We will complete our shift from inputs to outcomes to maximise development impact. We will retire the 45% climate co-benefits target and the 35% target in the Climate Change Action Plan [CCAP]. We have done significant work in answering client demand and needs," the World Bank said in its June 29 statement on its CCAP.

Possible impact

Launched in 2020 and over a five-year period ending 2026, the CCAP mandated the WBG to allocate 35% of its total financing

change. The goal was increased to 45% in 2023.

The latest announcement by the World Bank may impact projects in developing countries.

In India, the World Bank's climate-focused projects include electrified freight rail and inland waterways to cut transport emissions; forest restoration and biodiversity conservation in Madhya Pradesh and Meghalaya; climate-resilient agriculture for smallholders; rehabilitation of ageing large dams; community-led groundwater management under Atal Bhujal Yojana; mangrove restoration along both coasts; flood forecasting and embankment strengthening in Bihar's Kosi basin; solar parks and rooftop solar systems; green hydrogen for hard-to-abate industries; battery storage paired with renewables in

Policy shift: World Bank's climate-focused projects in India include those aimed at cutting transport emissions. SUSHIL KUMAR VERMA

Health" livestock disease programme guarding against zoonotic spillover.

The Hindu has reached out to the World Bank spokesperson, asking whether the latest development would impact India-based projects. The spokesperson has not responded so far.

countries in their national plans and meeting their Nationally Determined Contributions. While the CCAP would continue, an independent evaluation group would appraise it.

"We will continue to track and report on our two scorecard indicators on (i) net greenhouse gas emissions and (ii) benefici-

the Board on progress, including on climate co-benefits," the statement added.

U.S. criticism

In April, the U.S. – the WBG's largest shareholder – expressed its strong disapproval at the CCAP funding target. "The World Bank must maintain focus on its core mission of reducing poverty and increasing economic growth... It also means jettisoning the Group's 45% climate finance target that breeds inefficiency, distorts economic decision-making, and moves the Bank away from its core mission. At the same time, we expect greater efficiency, discipline, and accountability so that every dollar delivers more impact," said U.S. Treasury Secretary Scott Bessent.

U.S. President Donald Trump, who has labelled

the 2015 pledge that binds countries to reduce greenhouse gas emissions in a way that it leads to global temperature not exceeding two degrees Celsius over the pre-Industrial Age temperature, by 2100.

Much of the subsequent climate action and the global thrust to shield against ongoing damage from climate change - including the World Bank's - draws from this principle. Despite the global move towards renewable energy sources, developing countries say they have yet to receive adequate financial support from developed countries - despite commitments - to accelerate the transition.

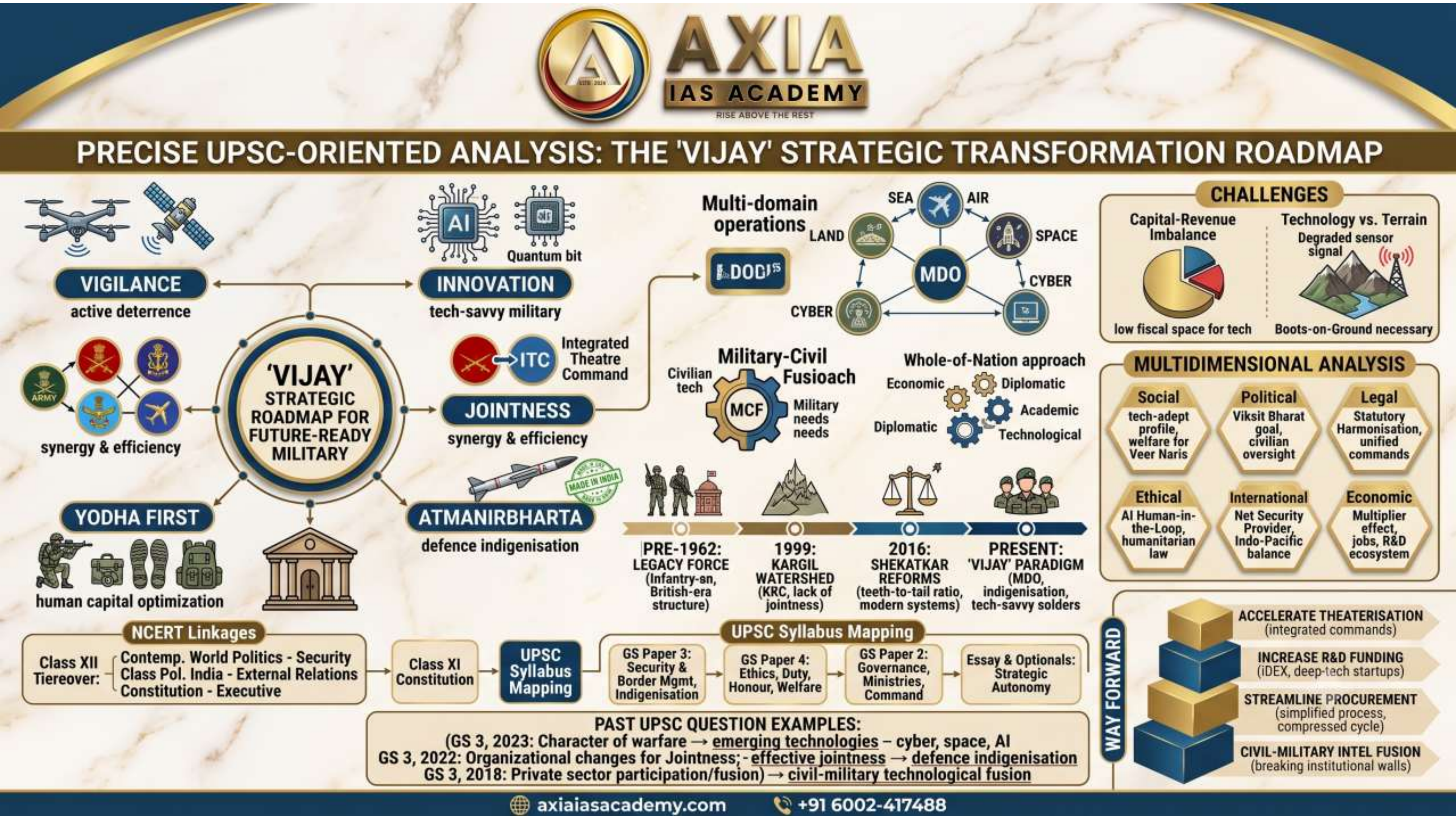
"The promise to mobilise $300 billion a year for developing countries depends on strong multilateral development banks. If the World Bank steps back, that promise becomes

- **Key Terms and Explanations**
- **Climate Co-benefits:** This refers to the financial investments made by development institutions that simultaneously address development objectives and climate change mitigation or adaptation.
- **Climate Finance:** Local, national, or transnational financing—drawn from public, private, and alternative sources of financing—that seeks to support mitigation and adaptation actions that will address climate change.
- **Climate Change Action Plan (CCAP):** A strategic institutional framework adopted by the World Bank Group (WBG) to systematically integrate climate change considerations into all its analytical work, country diagnostics, and lending operations.
- **Input-based vs. Outcome-based Financing:** Input-based financing fixes a rigid percentage of total capital that *must* be spent on specific sectors (e.g., mandating that 45% of all loans go to green projects). Outcome-based financing shifts the focus away from how much money is spent, measuring instead the actual real-world impact achieved (e.g., net metric tons of greenhouse gases abated or the number of people made resilient to floods).
- **Nationally Determined Contributions (NDCs):** Non-binding national plans highlighting climate actions, including climate change mitigation and adaptation targets, that policies commit to under the Paris Agreement framework.

- **Main Arguments and Substantive Parts**
- The core debate centers around a fundamental pivot in the operational philosophy of the World Bank Group (WBG). The institution is transitioning away from rigid, input-driven climate targets toward outcome-centric metrics, a move heavily influenced by its largest shareholder, the United States.
- **The Paradigm Shift (Inputs to Outcomes):** The central thesis relies on the decision to retire the 45% climate co-benefits target and the 35% target under the Climate Change Action Plan (CCAP). The argument put forth by the bank is that removing arbitrary spending quotas allows the institution to maximize actual development impacts, shifting focus toward tracking net greenhouse gas emissions and the total number of resilience beneficiaries.
- **The Critique of "Mission Creep":** Major shareholders, particularly the U.S. administration, argue that mandatory climate funding percentages divert the bank from its original, core mandate: poverty reduction and broad-based economic growth. The critique posits that rigid climate targets breed structural inefficiencies, distort domestic economic decision-making in borrowing nations, and compromise fiscal discipline.
- **The Developing World's Vulnerability:** Conversely, the counterargument from civil society and developing nations emphasizes that removing these institutional targets directly jeopardizes the global pledge to mobilize $300 billion annually for climate action. Without mandatory earmarks within Multilateral Development Banks (MDBs), critical adaptation and mitigation initiatives face severe funding deficits.
- **Direct Implications for India's Green Transition:** This policy reorientation hits home across several vital sectors in India. Major cross-sectoral initiatives funded through these channels—ranging from electrified freight rails and inland waterways to community-led groundwater management under the *Atal Bhujal Yojana*, solar parks, green hydrogen ecosystems, and flood forecasting networks in the Kosi basin—now face uncertain funding continuities.

- **Historical Evolution of the Issue**
- **The Post-WWII Reconstruction Era (1944 – 1970s):** At their inception, the World Bank and IMF focused entirely on post-war reconstruction and basic infrastructure development (dams, roads, grids). Environmental consequences were largely treated as externalities, and poverty alleviation was viewed through a pure growth-centric lens.
- **The Environmental Awakening and Structural Adjustment (1980s – 1990s):** Following intense global criticism over ecologically devastating projects (such as large-scale dam displacements), the bank introduced environmental assessments. However, this era was simultaneously dominated by Structural Adjustment Programs (SAPs), which often forced developing nations to prioritize immediate fiscal austerity over long-term environmental protection.
- **The Post-Paris Agreement Integration (2015 – 2023):** The signing of the Paris Agreement in 2015 forced a structural convergence. MDBs realized that poverty alleviation is impossible without tackling climate vulnerabilities. This culminated in the launch of the Climate Change Action Plan (CCAP) in 2020, with a initial 35% climate funding mandate that was aggressively scaled up to 45% in 2023.
- **The Geopolitical Pushback and Pragmatic Pivot (Present Day):** The current landscape reflects a sharp ideological friction point. Political transitions in major shareholder nations have triggered a retreat from multilateral green quotas. The focus is shifting toward economic nationalism and outcome-based accountability, threatening the steady flow of concessionary capital to the Global South.

- **Way Forward**
- **Democratizing MDB Governance:** There is an urgent need to reform the voting rights and governance architecture of the World Bank and IMF. Expanding the voting share of emerging economies ensures that the developmental priorities of the Global South cannot be easily sidelined by political changes in any single Western capital.
- **Optimizing the MDB Capital Adequacy Framework (CAF):** Instead of backing away from climate targets, the World Bank should implement the recommendations of the G20 Independent Review of MDBs' Capital Adequacy Frameworks. By prudently relaxing leverage ratios and utilizing hybrid capital instruments, the bank can unlock hundreds of billions of dollars in lending capacity without needing immediate capital injections from skeptical shareholders.
- **Transitioning to a Standardized Blended Finance Framework:** To address concerns regarding outcome efficiency, the bank should implement a robust blended finance model. Here, public concessionary capital is used strictly to "de-risk" green projects, thereby crowding in trillions of dollars of private commercial capital for high-impact clean energy and adaptation ventures.
- **Strengthening Alternative South-South Financial Pipelines:** Developing countries must diversify their financial dependencies. Expanding the capital base and operational reach of institutions like the New Development Bank (NDB) and the Asian Infrastructure Investment Bank (AIIB) can create alternative, reliable pathways for climate finance that remain insulated from Western domestic political shifts.
- **Focusing on Outcome-Based Verification Ecosystems:** If the pivot toward outcome-based financing is inevitable, international accounting protocols must be robustly standardized. Developing nations should proactively build transparent, third-party verified monitoring systems to clearly prove their net emissions reductions and resilience metrics, ensuring that funding flows remain continuous based on measurable performance.



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RISE ABOVE THE REST
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CIVIL-MILITARY INTEL FUSION (breaking institutional walls)
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• HEALTH AND POLICY

Why eggs matter for schoolkids

Different foods serve distinct nutritional purposes. But from the lens of nutrition science, the egg remains one of the most complete and easy-to-prepare foods

EXPERT EXPLAINS

Dr Seema Gulati

[illegible]

The 'brain nutrient' factor

[illegible]

Each food has its own strength

[illegible]

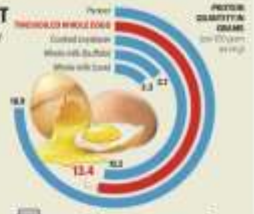
Carbohydrates and fats

[illegible]

Protein: Quantity vs quality

[illegible]

• EGGS vs THE REST



Nutrient	Whole milk (Buffalo)	Whole milk (cow)	Paneer (cottage cheese)	Cooked soya chunks	Two boiled whole eggs
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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A lesson from Tamil Nadu, pioneer in midday meals

Anagha Jayakumar

[illegible]

Getting children into school...

[illegible]

How school lunch came to other states

[illegible]

...and keeping them there

[illegible]

Eggs in the basket

[illegible]

- **Key Terms and Explanations**
- **Amino Acids (Essential vs. Non-Essential):** Amino acids are the organic compounds that combine to form proteins, often referred to as the building blocks of life. The human body requires 20 amino acids to function.
  - *Non-Essential Amino Acids:* The body can synthesize 11 of these internally.
  - *Essential Amino Acids:* The remaining 9 cannot be manufactured by the body and must be acquired entirely through dietary intake.
- **Complete Protein:** A food source that contains all nine essential amino acids in adequate proportions relative to human requirements. Animal-derived proteins (such as eggs and dairy) are naturally complete, whereas most plant-based foods lack one or more essential amino acids.
- **Bioavailability:** This refers to the rate and extent to which a nutrient is absorbed by the digestive system and successfully utilized by the body for metabolic functions. Even if two foods have identical raw nutrient weights, the one with higher bioavailability delivers more actual nourishment to bodily tissues.
- **Protein Complementation:** The dietary practice of combining two or more incomplete plant protein sources (such as cereals and pulses) within the same meal. Because different plant foods have different limiting amino acids, combining them ensures that the deficiency of one is balanced by the abundance of the other (e.g., *khichdi* or *dal-rice*).
- **Choline:** A vital micronutrient critical for structural cellular integrity, neurotransmitter synthesis (specifically acetylcholine for memory and cognitive development), and liver function. It is particularly crucial during early childhood brain development.
- **PM POSHAN (Pradhan Mantri Poshan Shakti Nirman):** Formally known as the Mid-Day Meal Scheme, this is a Centrally Sponsored Scheme under the Ministry of Education. It provides one hot cooked meal per day to eligible school children, targeting nutrition security, school retention, and social socialization across caste lines.

- **Main Arguments and Substantive Parts**
- The core discourse balances the scientific imperative of child nutrition against the administrative and cultural complexities of public policy delivery.
- **The Scientific Case for Egg-Inclusive Menus**
- **The Gold Standard Reference:** In nutritional biochemistry, egg protein is treated as a premium reference protein due to its near-perfect amino acid profile and high digestibility. A single standard egg provides approximately 6 gto 7 gof highly bioavailable protein.
- **The Micronutrient Advantage:** Eggs contain concentrated amounts of critical micronutrients like biotin, zinc, iron, and notably choline (offering nearly 290 mgto 300 mgper 100 g, which is significantly higher than dairy or soy alternatives). This dense package offers an efficient response to childhood stunting and wasting.
- **Operational Ease and Safety:** Boiled eggs are compact, tamper-evident, easy to portion, and resistant to adulteration. In institutional settings with variable kitchen infrastructure, they present fewer food safety and contamination risks compared to perishable dairy products like paneer or liquid milk.
- **The Rationale for Vegetarian Reforms and Institutional Partnerships**
- **Cultural and Religious Neutrality:** Proponents of strictly vegetarian menus argue that public institutions should remain culturally inclusive. By partnering with socio-religious organizations like the International Society for Krishna Consciousness (ISKCON), governments aim to offer standardized, high-quality vegetarian food that aligns with local sensibilities.
- **Hygiene and Centralized Logistics:** Mega-kitchen models operated by centralized non-governmental partners leverage advanced technology to maintain high hygiene standards, reduce operational leakages, and ensure consistent caloric delivery at scale.
- **Equivalence via Smart Combinations:** The counter-argument to animal-source proteins relies on intelligent plant protein complementation. By pairing legumes with cereals and incorporating fortified elements or dairy, a fully vegetarian menu can theoretically match the amino acid profile required for child development, provided it is executed with meticulous planning.

- **Historical Evolution of the Issue**
- **1920 (The Colonial Experiment):** The first publicly funded school meal initiative began under the Madras Presidency, championed by Justice Party leader P. Theagaraya Chetty. Introduced at the Cochrane Basin Corporation School in Madras city, it served as an economic incentive to encourage impoverished families to send their children to school rather than into the workforce.
- **1926–1930 (From Attendance to Cognition):** Early expansion was strongly supported by progressive leaders like Singaravelu Chetty. When budget cuts caused a temporary suspension in 1927, school attendance dropped sharply by 50%. By 1930, the administrative philosophy shifted from basic school enrollment to cognitive development, giving rise to the foundational policy principle: *"If you cannot feed the body of a child, you cannot feed the brain."*
- **1956 (Post-Independence Universalization):** Chief Minister K. Kamaraj scaled up the program across Madras State, integrating it into a broader strategy for universal elementary education and poverty alleviation.
- **1982 (The Nutritious Meal Transition):** Under Chief Minister M.G. Ramachandran, the initiative was overhauled into the *Nutritious Meal Programme*, placing a explicit focus on child public health alongside educational metrics.
- **1989 (The Introduction of Eggs):** Chief Minister M. Karunanidhi introduced boiled eggs into the Tamil Nadu school menu, establishing a precedent of state-funded animal-protein distribution to directly counter malnutrition.
- **1995 (The National Scale-up):** Recognizing the success of southern models, the Central Government launched the *National Programme of Nutritional Support to Primary Education*, initially providing dry food grains across selected blocks.
- **2001 (The Landmark Judicial Mandate):** In the *PUCL vs. Union of India* case, the Supreme Court issued a historic directive transforming dry rations into a legal entitlement of a hot, cooked mid-day meal for every child in government and government-aided primary schools.
- **2013–2021 (Diversification and Modernization):** Menu diversification schemes (such as the variety meals introduced by J. Jayalalithaa in 2013) added fortified elements and diverse ingredients. In 2021, the entire framework was rebranded under the holistic national umbrella of **PM POSHAN**.

- Way Forward
- **Insulating Policy from Ideological Shifts:** Nutritional guidelines should be governed by a panel of independent pediatricians, public health specialists, and biochemical nutritionists. Changes to institutional menus should be driven by local health indicators—such as stunting, wasting, and anemia data—rather than shifting political priorities.
- **Empowering Local Economies through Self-Help Groups (SHGs):** Rather than relying entirely on large, centralized mega-kitchens, states should consider decentralizing procurement by partnering with local women's Self-Help Groups and poultry farmers. This approach keeps resources within the local economy, ensures fresh, warm meals tailored to regional tastes, and builds community oversight into the program.
- **Scaling Up Safe Micronutrient Fortification:** To address widespread micronutrient deficiencies, governments can introduce fortified staples into the PM POSHAN supply chain, such as fortified rice and double-fortified salt (enriched with iron and iodine). This provides a reliable baseline of micronutrients regardless of the broader protein source selected.

ESTD 2024

ESTD : 2024

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RISE ABOVE THE REST

COMPREHENSIVE ANALYSIS: SCHOOL NUTRITION PROGRAMS & PUBLIC POLICY

Key Nutritional Science Concepts

Complete Protein vs. Protein Complementation

Complete Protein
Example wth all 9 essential amino acid

VS

Legume + Grain
Matchtor-egrain pair
'Khichdi'

Bioavailability & Brain Function Flow

→ Highly bioavailable amino acids →

Logical & Philosophical Bases

Get Children into School → Respect Diverse Food Practices → Enable Concentrated Learning

Historical Evolution of the Programme

1920	P. Theagaraya Chetty	Colonial Madras Presidency experiment icons Higher attendance
1930	No people people	"Feed the body to feed the brain"
1956		Kamaraj expansion, universal ed
1982		Nutritious Meal Programme, Focus on nutrition
1999	Specific Government order	M Karunanidhi eggs every 2 weeks
2001	*cooked* mid-day meals	Centre steps in, *cooked* meals
2021	PM POSHAN	PM POSHAN
Current	Variety Meals	Variety Meals, eggs 5 days

Multidimensional Analysis

Social
- Economic gap, Dalit focus conceptuals

Political
- Ideology
- Vegetarianism vs. nutrition reform
- ISKON partnership

Legal
- Right to Education,
- SC mandate concepts

Economic
- Funding, budget, conceptual
- Offsetting children's earnings conceptuals

Ethical
- Child rights.
- Diverse cultures, concepts

International
- Global human rights concepts

UPSC Syllabus & NCERT Linkages

UPSC

- **GS1** Colonial History concepts conceptal
- **GS2** Welfare Schemes, Social Sector conceptual
- **GS3** Human Capital, Food Security conceptual
- **GS4** Ethics, Public Admin conceptual

NCERT

- Poverty, human capital, concepts, racenoarism, nureliity, human capitad
- food security

- Human capital, protectory concepts
- Human capital, welfarms human concetants
- Food security, lseerature economc security concepts
- Food security, food concepts

Way Forward

1. **SCIENCE-BASED Decisions** — Evidence not perception →
2. **Focus on COMPLETE PROTEIN** — Essential amino acids →
3. **BALANCED, DIVERSIFIED Diets** — Evidence-guided menu

Govt. asks WhatsApp to put username feature on hold

Ministry expresses concern that it may lead to increase in spam and impersonation cases; it seeks detailed explanation within three days; Meta says the update will come with safety measures

The Hindu Bureau
NEW DELHI

WhatsApp's new username feature – which will allow users to interact without exposing their phone numbers – is drawing scepticism from the Union government, with a senior official saying on Wednesday that the government is worried about the potential for spam and impersonation. The government has sent a notice to WhatsApp, asking it to put the feature on hold for the time being.

The Centre told the firm "to furnish a detailed explanation on the 'usernames' feature within three days," and to avoid proceeding until "detailed consultations" were held, the official said.

"It is felt that the feature may materially increase the incidence of online fraud, phishing, digital arrest scams and impersonation attacks, by enabling bad actors to solicit and message victims," the Ministry of Electronics and Information Technology said in the notice addressed to WhatsApp's chief compliance officer in India, a copy of which *The Hindu* reviewed.

> It is felt that the feature may materially increase the incidence of online fraud, phishing, digital arrest scams and impersonation attacks, by enabling bad actors to solicit and message victims
> CENTRE

> To help control who can reach you on WhatsApp with your username, we've built an optional username key that others will need to know to message you
> META

The feature is similar to the ones available on other apps such as Telegram and Signal, where users can chat without sharing their phone numbers. "When someone new walks into your life – a classmate, a neighbour, someone you meet at an event – sharing a phone number can feel like a big step," Meta, which owns WhatsApp, said in an announcement earlier this week. "That's because a phone number is personal and it's tied to so many parts of your life. Sometimes you just want to chat without handing over your digits."

"The ability to use a username is not yet live and will roll out slowly later this year," a WhatsApp spokesperson said. "To protect against impersonation, we've held the highest-profile names – think public figures, government entities, celebrities, verified Meta accounts – so they can only ever be claimed by their legitimate owners and lookalike derivatives of known names are held as well." Users can choose whether or not to reply to unknown accounts, and their origin country will be displayed, the firm added. The feature would come with in-built spam detection features, such as disclosing to message recipients what country a phone number is from, Meta said in its announcement. "To help control who can reach you on WhatsApp with your username, we've built an optional username key that others will need to know to message you," it had said.

WhatsApp has increasingly come under the Centre's scrutiny. Last year, the Department of Telecommunications directed Meta to ensure users cannot access the app without the registered SIM being active on the device and to log out WhatsApp Web users every six hours. While the latter mandate was rolled back, the former remains. While the firm has resisted compromises on its end-to-end encryption for messages – by challenging a part of the IT Rules before the Delhi High Court – Meta has signaled a more cooperative attitude in more recent years, such as by moving to comply with the SIM binding directions.

- **Key Terms and Explanations**
- **Identity Abstraction (Username-Based Communication):** A system architecture where users interact using custom alphanumeric handles (e.g., @SecureUser) rather than direct, verifiable personal identifiers like phone numbers. While it enhances consumer privacy by shielding contact details, it detaches the digital persona from real-world identification.
- **Digital Arrest Scams:** A sophisticated form of cyber-fraud where criminals impersonate law enforcement, customs, or regulatory officials via audio-visual platforms. Victims are falsely informed they are implicated in illegal activities and are coerced into staying online under "digital custody" until they transfer large sums of money.
- **Phishing and Social Engineering:** Psychological manipulation tactics used by bad actors to trick individuals into revealing sensitive data or transferring funds. Impersonation features amplify these vectors by allowing scammers to masquerade as trusted entities, such as government offices or corporate bodies.
- **SIM Binding:** A security protocol that links a digital application account directly to the physical and active SIM card inside a specific hardware device. This mechanism prevents remote account takeovers, unauthorized cloning, and account mirroring across secondary devices.
- **Intermediary Liability and Traceability:** The legal obligation of digital platforms (intermediaries) to track and identify the first originator of malicious or unlawful information within their network, a concept central to maintaining public order under India's information technology framework.

- **Main Arguments and Substantive Parts**
- The structural core of this debate centers on a fundamental policy conflict: individual digital autonomy versus collective societal security.
- **The Regulatory Position**
- The core concern of state authorities, as illustrated in **image.png**, rests on the proactive mitigation of cybercrime. The government argues that allowing users to obscure their phone numbers behind custom user handles strips away a vital layer of deterrence. By enabling anonymous, unverified contact, platforms inadvertently lower the entry barrier for financial fraudsters, impersonators, and perpetrators of digital arrest scams. Consequently, the state has called for a temporary freeze on such rollouts, demanding exhaustive consultations to evaluate how these architectural changes impact law enforcement capabilities.
- **The Platform Position**
- Conversely, communications providers approach the feature from a data minimization and user-safety perspective. A phone number is no longer just a communication tool; it is a structural key tied to an individual's banking, healthcare, and social identity. Exposing it during casual interactions introduces distinct privacy hazards. To counter the government’s security concerns, platforms propose built-in defensive guardrails, such as:
- Implementing optional verification keys required to initiate contact.
- Reserving high-profile usernames (celebrities, state entities, public officials) to prevent identity theft.
- Displaying geographic data, such as the phone number's country of origin, alongside automated spam-detection algorithms.

- **Historical Evolution of the Issue**
- **The Telecom Era (Pre-2010s):** Communication was tethered exclusively to cellular and landline architectures governed by the Indian Telegraph Act, 1885. Absolute physical verification via Know Your Customer (KYC) compliance ensured that every communication endpoint was traceable to a legal identity.
- **The Over-The-Top (OTT) Revolution (Mid-2010s):** The mass adoption of internet-based messaging bypassed traditional telecom carriers. The global rollout of End-to-End Encryption (E2EE) around 2016 created a structural shift where platform providers themselves could no longer view message content, moving accountability from the message content to the metadata and user account identifiers.
- **The Dawn of the IT Rules (2021):** The introduction of the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021, mandated that significant social media intermediaries enable the identification of the "first originator" of information. This triggered prolonged legal challenges regarding whether such mandates structurally undermine encryption architectures.
- **The Era of Advanced Cyber-Fraud (Present Day):** The contemporary landscape is defined by cross-border digital arrest scams and highly organized phishing networks. This has driven regulatory interventions like SIM binding directives alongside current administrative pauses on anonymity features to preserve digital traceability.

- **Way Forward**
- **Co-Regulation and Technological Guardrails**
- Instead of halting feature rollouts indefinitely, regulatory bodies and tech intermediaries should co-create localized compliance frameworks. If username features are introduced, they should be paired with strong, mandatory safety defaults for the domestic market. For example, accounts using handles rather than phone numbers could be flag-marked with verified origin details, giving recipients clear context before they engage.
- **Strict Risk-Based Verification**
- Platforms can implement a tiered approach to account security. While casual users could use usernames to protect their privacy, accounts that send bulk messages or interact with large public audiences should go through stricter verification. High-profile, institutional, and corporate handles must feature mandatory cryptographic verification badges to eliminate spoofing and impersonation risks.
- **Enhancing Law Enforcement Capabilities**
- Security strategies should focus on upgrading cyber-forensic capabilities rather than requesting structural backdoors that weaken platform encryption. By focusing on advanced metadata analysis, faster cross-border intelligence sharing, and building faster channels to freeze fraudulent bank accounts, law enforcement can disrupt financial scam networks without undermining consumer privacy features.
- **Designing for Consumer Awareness**
- The ultimate defense against social engineering scams is a digitally literate public. The state and communication platforms should run coordinated campaigns to educate citizens on the tactics used in cybercrimes, such as digital arrest scams. Building user skepticism around unsolicited communications is just as vital as implementing technical patches.

ANALYSIS: DIGITAL IDENTITY VS. STATE CYBERSECURITY: THE WHATSAPP USERNAME DEBATE.

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KEY TERMS (GLOSSARY)

IDENTITY ABSTRACTION: Decoupling account details from direct person. Shields user data but can reduce direct accountability. E.g., @User123 vs. phone number.

DIGITAL ARREST SCAMS
Cons involve impersonating law enforcement to extract money. Concerns regarding fake accounts impersonating officials are high.

SIM BINDING
A security measure to link an app to a physical SIM card, preventing remote hijacking and unauthorized use. Restricts one number per active device.

INTERMEDIARY TRACEABILITY
Balancing encryption with detection is key.

CORE POLICY CONFLICT: PRIVACY VS. SECURITY

USER PRIVACY (Identity Abstraction, Account Control)

STATE SECURITY (Traceability, Fraud Mitigation)

USER IDENTITY
↓
ANONYMOUS USERNAME HANDLE
↓
GOVT. ACTION (PAUSE & REVIEW)
↓
THE GOAL: Secure & Accountable Digital India

HISTORICAL EVOLUTION (TIMELINE)

- **Pre-2010s** — KYC: Telecom Era (KYC, feature phones)
- **Mid-2010s** — OTT Revolution (encryption)
- **2021** — IT Rules Mandate (law book, law, traceability and usernamie)
- **Present** — Advanced Scams & Feature Pause (on username username)

THE ARGUMENTS (COMPETING VIEWS)

GOVT. POSITION

Prevent Fraud / Scams (Hides phone numbers from bad actors) → REDUCES VECTORS FOR FRAUD.

Ensure Accountability → ENSURES FRAUDSTERS CAN BE IDENTIFIED & TRACED.

Protect Citizens → REDUCES VULNERABILITY TO IMPERSONATION SCAMS.

VS

PLATFORM POSITION

Data Minimization → USERS SHARE LESS PERSONAL DATA.

Enhance User Safety (Verified key requirement) → INCREASES CONSENT & CONTROL OVER WHO CAN REACH YOU.

Foster Innovation (New features with safety built-in) → PROVIDES PRIVACY-VIRST INNOVATIONS FOR USERS.

- **Pre-2010s:** Telecom Era (KYC, feature phones)
- **Mid-2010s:** OTT Revolution visual (encryption)
- **2021:** IT Rules Mandate (traceability)
- **Present:** Advanced Scams & Feature Pause (on username)

MULTIDIMENSIONAL ANALYSIS

DIGITAL GOVERNANCE

SOCIAL
- Impact on interpersonal trust, protection of vulnerable groups, new community interactions.

ECONOMIC
- Affects trust in digital commerse, cost of fraud reduction, platform business models, global data market.

Political
- Puttaswamy Judgment
- IT Act compliance

Legal
- Puttaswamy Judgment
- IT Act compliance

CO-REGULATION (handshake, platform & govt.)

ETHICAL International cəmficient Judgment)

USER EDUCATION (digital literacy training)

LOCALIZED SAFETY DEFAULTS (verification badges, & geo-filters)

SYLLABUS & NCERT CONNECTIONS

NCERT Links	
Class 11 Pol. Sc.	Rights, Liberty
Class 12 Sociology	Mass Media

UPSC Syllabus Links
GS2: Rights, Governance
GS3: Cybersec, Tech, Tech, Internal Security
GS4: Ethics

CRACKING PYQs (PRACTICE)

1. Balance privacy & security in encrypted communication. (GS3)
2. Digital governance's impact on individual rights in India. (GS2)
3. Compare telecom & OTT in internal security management. (GS3)

Why has the govt. notified a new set of telecom rules?

How do the rules change the telecom regulatory framework? What powers does the Act give the govt.?

Aroon Deep

The story so far:

The Telecommunications Act, 2023, saw a clutch of rules being notified this month, namely the Telecommunications (Authorisation for Provision of Principal Telecommunication Services) Rules, 2026; the Telecommunications (Authorisation for Captive Telecommunication Services) Rules, 2026; and the Telecommunications (Authorisation for Provision of Miscellaneous Telecommunication Services) Rules, 2026.

What changes for telecom operators and users?

There are not many operational changes in India's telecom ecosystem due to the parent act or the rules being notified, as the major objective of the legislation is to simplify the oft-amended Indian Telegraph Act, 1885, which it replaces (along with other accompanying laws, like the Wireless Telegraphy Act, 1933.

Along the way, the Union government got some greater powers in the text of the parent statute, such as a definition of "telecommunication" that can be used to regulate messaging apps. (While the government initially denied this, last year the Department of Telecommunications (DoT) tried to force WhatsApp to log out users every six hours from web instances of the service, and to "bind" every user to a SIM, as an anti-spam measure.)

Which provisions of the Act have already been brought into force?

This is, of course, not the beginning of the notification of the Act. As early as 2024, the government notified parts of the law, such as one that renamed the Universal Service Obligation Fund (where telcos are required to pay into a corpus to fund financially unfeasible telecom infrastructure in remote and isolated areas) to the Digital Bharat Nidhi. Another part of the law that was notified was one that allowed the government to seize telecom infrastructure on national security or war grounds.

More parts of the law that have already been notified in previous months include a replacement for the interception orders, where in spite of an industry and civil society push, the government retained senior officials' powers to issue phone and internet tapping orders.

The specific rules notified this month replace the bulk of the licensing framework for telecom operators. This has been replaced with the term "authorisation," accompanied by language that simplifies and modifies some of the paperwork that telcos and Internet Service Providers (ISPs) have to do. It also adds anti-spam enforcement as an obligation under the Parent Act.

Why are some aspects of the new regime still uncertain?

The new telecom act also recognises satellite internet, but this has been taken away, even as Starlink, the largest satellite internet provider in the world, awaits approvals to launch. "The final Rules have removed explicit references to Global Mobile Personal Communications by Satellite (GMPCS), as contained in the Draft Rules," the law firm Khaitan & Co wrote in a brief. Separately, news reports (and the delay) indicate that the government is yet to give up on concerns of whether it can truly shut off Starlink, seeing how it is used in countries like Iran in defiance of the local government.

At any rate, telcos and ISPs can choose to migrate to this authorisation regime now, or wait until their licenses expire and then apply afresh. As Khaitan & Co pointed out, "a significant volume of operational detail is still awaited ... implementation detail awaits further clarity and remains dependent on further specifications, including the 'sound' track-record criterion, exemption thresholds and technical directions."

THE GIST

- The newly notified rules largely replace the old telecom licensing framework with an authorisation regime, simplify compliance for telecom operators and ISPs, and add anti-spam obligations, while leaving day-to-day operations largely unchanged.

- Although several provisions of the Telecommunications Act have already been brought into force, implementation is still incomplete, with satellite internet rules, Starlink approvals, and key operational details yet to be clarified.

- **Key Terms and Explanations**
- **Licensing Regime vs. Authorisation Regime:** Historically, operating a telecom network required a rigid "license"—a formal, often cumbersome contract with the sovereign state involving heavy compliance burdens. The modern "authorisation" framework replaces this with a streamlined, permissions-based system. It simplifies administrative paperwork and reduces market entry barriers, transforming the regulatory relationship from a restrictive permit system to a facilitative oversight model.
- **Digital Bharat Nidhi:** This is the modernized avatar of the erstwhile **Universal Service Obligation Fund (USOF)**. Funded via a non-lapsable levy on telecom operators' revenue, its core mandate is to subsidize telecom infrastructure deployment in geographically remote, economically unviable, and rural pockets of India.
- **Captive Telecommunication Services:** These are private, localized communication networks established by an enterprise or institution for its own internal use, entirely independent of public networks. For instance, a major metro rail corporation or a massive automated seaport sets up its own secure, high-speed internal communication grid to manage operations safely without relying on commercial telecom providers.
- **Global Mobile Personal Communications by Satellite (GMPCS):** A technology network that delivers voice, data, and internet services directly to handheld or compact terminals via a constellation of low-earth orbit (LEO) or geostationary satellites. Unlike traditional satellite dishes, this enables seamless global communication even in extreme terrains where laying fiber-optic cables is physically or economically impossible.
- **Interception Orders:** Legally sanctioned directives issued by authorized state executives to monitor, record, or decrypt data transmission and phone conversations. Under updated governance rules, the state retains the centralized authority to issue these orders through senior administrative officials during emergencies, balancing personal liberty with collective public safety.

- **Main Arguments and Substantive Parts**
- The contemporary discourse on telecommunications governance centers around a core thesis: India must completely dismantle its colonial-era statutory architecture to build a highly responsive, digitally aligned regulatory framework that balances national security with market innovation.
- **The Shift Toward Ease of Business and Authorisation**
- The structural transition from an archaic licensing model to an agile authorisation framework stands as the most critical reform. By cutting through bureaucratic red tape and simplifying operational paperwork for Telecom Service Providers (TSPs) and Internet Service Providers (ISPs), the framework aims to attract global capital and accelerate infrastructure rollout. It shifts the regulatory focus from micro-managing operations to macro-level compliance and robust consumer protection against menaces like rampant spam.
- **The Expansion of State Oversight and National Security**
- A significant and debated pillar of modern telecom governance is the explicitly broadened definition of "telecommunication." This expansion gives the state potential jurisdiction over modern internet-based communication services and Over-The-Top (OTT) messaging platforms. The core argument for this expansion rests on national security: in an era of hybridized threats, the state requires clear statutory powers to intercept communications, prevent spam through measures like SIM-binding, and seize critical infrastructure during times of war or public emergency.
- **The Satellite Internet Impasse and Regulatory Ambiguity**
- While the broader statutory framework explicitly recognizes the potential of satellite-based broadband, the final administrative rules introduce deliberate caution. By omitting explicit, streamlined tracks for Global Mobile Personal Communications by Satellite (GMPCS), regulatory ambiguity remains for global satellite giants. The underlying concern stems from geopolitical sovereignty: observing how unauthorized satellite internet constellations function independently of local government blockades in global conflict zones, the state remains highly cautious about its ability to enforce compliance or implement targeted shutdowns over space-based data streams.

- **Historical Evolution of the Issue**
- **The Colonial Bedrock (1885–1947):** The journey began with the **Indian Telegraph Act of 1885** and the **Indian Wireless Telegraphy Act of 1933**. These statutes were originally designed by the British Raj to maintain a strict state monopoly over information flow, primarily to suppress nationalist movements and preserve imperial security rather than empower citizens.
- **The Era of State Monopoly (1947–1994):** Post-independence, the Government of India retained this centralized, departmentally run monopoly. Telephones were treated as a luxury commodity rather than a public utility, resulting in severe infrastructure deficits, decade-long waiting lists for basic connections, and a lack of technological innovation.
- **Liberalization and Market Evolution (1994–1999):** The **National Telecom Policy of 1994 (NTP-94)** cracked open the sector to private enterprise, though it was initially marred by unviable bidding and litigation. This led to the landmark **New Telecom Policy of 1999 (NTP-99)**, which transitioned the industry from rigid, upfront license fees to a sustainable revenue-sharing model. Concurrently, the **Telecom Regulatory Authority of India (TRAI) Act of 1997** established an independent regulator to ensure a level playing field.
- **The Digital Boom and Convergence Era (2000–2018):** This phase witnessed the mobile revolution, plunging tariff rates, and the transition from voice-centric networks to massive data-centric ecosystems. The **National Digital Communications Policy of 2018** reoriented the sector toward emerging frontiers like 5G, the Internet of Things (IoT), and universal broadband access, highlighting that the century-old statutory framework was no longer fit for purpose.
- **The Modern Paradigm Shift (2023–Present):** The enactment of the **Telecommunications Act of 2023** systematically repealed the archaic 1885 and 1933 laws. The phased notification of the **2026 Rules** marks the operationalization of this new era, establishing the authorization regime, creating the Digital Bharat Nidhi, and introducing updated rules for satellite communication and national security.

- **Way Forward**
- **Institutionalizing Judicial Safeguards for Interception:** To balance national security and individual privacy, intercepting communications or blocking internet access should ideally require independent judicial or non-executive oversight. Moving away from a purely bureaucratic approval system would help ensure these powers are used proportionately, aligned with the supreme court's legal principles.
- **Delineating Jurisdictional Boundaries for Digital Services:** The government should clearly distinguish between physical network infrastructure (governed by the Department of Telecommunications) and data-driven internet applications or OTT platforms (governed by the Ministry of Electronics and Information Technology). Avoiding overlapping regulations gives digital startups and global platforms the regulatory certainty they need to invest.
- **Clarifying Satellite Broadband Norms:** The administrative rules for space-based internet services should establish transparent, non-discriminatory spectrum allocation methodologies. Resolving the ambiguities around Global Mobile Personal Communications by Satellite (GMPCS) will help India attract global investment and quickly connect its most isolated regions.
- **Strengthening Consumer Protection and Data Rights:** Anti-spam rules like SIM-binding should be carefully implemented to safeguard user convenience and protect personal data. Security measures must build on the protections of the Digital Personal Data Protection (DPDP) Act, ensuring user data is handled transparently and responsibly.

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COMPREHENSIVE UPSC ANALYSIS: THE NEW INDIAN TELECOM REGIME & RULES

COMPARATIVE ANALYSIS: ARCHAIC vs. MODERN GOVERNANCE

OLD LICENSING REGIME (Ex-1885/1933 Acts)	NEW AUTHORISATION REGIME (Telecommunications Act 2023 & Rules 2026)
Departmental Monopoly	• Simplified Authorisation
Rigid Contracts	• Reduced Paperwork
High Compliance Burden	• Market-Led Growth
Colonial-era logic	• Streamlined Compliance

5G

FUNDING THE FUTURE: THE DIGITAL BHARAT NIDHI (EX-USOF)

TSPs/ISPs (Revenue-Sharing Levy) → **MODERN CENTRAL DIGITAL HUB FUND** →

- **SUBSIDIZING RURAL & REMOTE INFRASTRUCTURE**
- **FOSTERING INNOVATION & INDIGENOUS TELECOM TECH** (e.g., 5G/6G)
- **DISASTER MANAGEMENT NETWORKS**
- **UNIVERSAL BROADBAND ACCESS**

CRITICAL STATE POWERS: NATIONAL SECURITY & PUBLIC EMERGENCY

BROADENED DEFINITION OF TELECOMMUNICATION
(Including Modern Internet/OTT Messaging Services)

CENTRALIZED INTERCEPTION POWERS
(Powers of senior officials to issue phone & internet tapping orders)

INFRASTRUCTURE SEIZURE
(Government powers to seize critical telecom grid on national security/war grounds)

STATE AUTHORITY — INDIVIDUAL LIBERTY

UPSC CSE RELEVANCE

- **GS-2: Governance & Policies**
- **GS-3: Infrastructure, Science & Tech, Internal Security**
- **GS-4: Ethics (Security vs. Privacy)**

MODERN THEMES & KEY UNCERTAINTIES

SATELLITE INTERNET (GMPCS) - DELIBERATE OMISSION:
Delay in Starlink and global LEO approvals; concerns over independent operation & compliance.

OVER-THE-TOP (OTT) & MESSAGING APPS - JURISDICTION CONFLICT:
Potential overlapping regulation between DoT and MeitY; data rights and SIM-binding issues.

• GEOPOLITICS

US-Iran talks: 'MoU is a breakthrough for Iran, but overreach would be folly'

EXPERT EXPLAINS

AJAY SINGH

TOKYO-BASED ENERGY & SHIPPING EXECUTIVE

AFTER TRADING strikes over the past week, the US and Iran appear to be finally inching back towards the negotiating table. These strikes had threatened to unravel a fragile truce between both countries that remains in place despite occasional flare-ups and Israeli aggression in southern Lebanon.

Last month, a 14-point Memorandum of Understanding (MoU) was signed as part of a framework agreement to end the war in West Asia that began in February. **Ajay Singh**, a management advisor and a former oil and gas industry executive with considerable experience of the Middle East, spoke to **Anil Sasi** about how the situation could have unfolded differently in the absence of an MoU or had the Strait remained closed for much longer.

Prospects for US-Iran talks

Flare-ups may continue as the MoU has left crucial details unaddressed, such as arrangements for monitoring and enforcing the ceasefire in Lebanon, protocols for shipping in the Strait, and whether or not the International Atomic Energy Agency's inspectors may access sites in Iran.

Some people on both sides may prefer that full-blown fighting resumes, and cause disruptions in Lebanon or the Strait as elections in Israel and the US draw closer. But the US and Iran will likely get on with negotiations because both realise that further conflict is not in their interests, at least for now.

Mutual mistrust and the complexity of the nuclear issue make it highly unlikely that a result will be forthcoming within 60 days — if at all — and extensions will be required. The best outcome would be something like the Joint Comprehensive Plan of Action (JCPOA) of 2015, whereby Iran may pursue a peaceful nuclear programme under safeguards and secure a lasting end to sanctions, in return for the highly enriched uranium being rendered harmless.

Perhaps the US — although not Israel — may be amenable to such a deal, so long as it can be presented as an improvement over the JCPOA.

This is an opportunity for Iran to make peace with dignity, secure the rightful future prosperity of its people, and end its decades-long ostracisation. The unknown is the internal dynamic within the Iranian regime at this time. It may well decide that the country's only guarantee of security lies in continued conflict, or insist on a complete withdrawal of US forces from the Middle East. That would be an overreach.

The situation after the US mid-term elections may not be quite as favourable for Iran; the military advantage that it has secured through the use of drones and missiles will eventually be countered; and in a no-holds-barred conflict, superior American economic and technological strength will prevail.

Significance of the MoU

One may say that Iran has pulled off something of a breakthrough. After decades of enduring tough sanctions, it has restored its primary source of national income through oil export in addition to securing access to hitherto frozen funds, besides another $300 billion of funding. It retains the military capabilities to continue menacing adversaries and choke off the Strait of Hormuz. Extraordinarily, the US has recognised Iran's claims over the Strait, without regard to the rest of the world.

The war stands as a rare instance — the first since the 1956 Suez war — in which a Middle Eastern nation has directly faced off with one of the world's foremost military powers, stood its ground, and compelled the adversary to negotiate on balanced terms. That boosts Iran's position in the Islamic world and strengthens the hands of the Islamic Revolutionary Guard Corps.

Outlook for oil and gas markets

While price forecasts are logical determinations based on supply and demand projections, market prices are based on sentiments of traders whose job is to match demand with supply, and make money. During the last four months, market prices have remained consistently below forecasts, indicating optimism which may, fortunately, be borne out. But optimism and pessimism are no substitutes for planning.

Oil prices could have easily gone in the opposite direction had there been no MoU and had the Strait remained closed for much longer. The world's economy has had a close shave in terms of energy security. And we are by no means out of the woods yet. Oil prices have fallen back but do not represent a return to the pre-war situation.

Disruptions to negotiations and outbursts of fighting may cause volatility in the coming months. The power balance in the Persian Gulf stands fundamentally altered, reducing its reliability as an energy supplier. Changes in the energy policies of consuming nations will be needed.

Meanwhile, it would be wise to top off oil, liquefied petroleum gas, liquefied natural gas, and fertiliser stocks and expand reserves, taking advantage of reduced prices. Reserves cost money but insure against much worse economic damage and social unrest from physical scarcity.

FULL REPORT ON
WWW.INDIANEXPRESS.COM

- **Key Terms and Explanations**
- **Strait of Hormuz:** A narrow, strategically vital waterway connecting the Persian Gulf with the Gulf of Oman and the Arabian Sea. It serves as the world's most critical energy chokepoint.
- *Example:* If a nation threatens to block the Strait, global oil prices instantly spike because nearly a fifth of the world's petroleum consumption passes through this narrow passage.
- **Joint Comprehensive Plan of Action (JCPOA):** Popularly known as the 2015 Iran Nuclear Deal, this was a landmark agreement between Iran and the P5+1 (US, UK, France, China, Russia, and Germany). Iran agreed to eliminate its stockpile of medium-enriched uranium and cut its low-enriched uranium stockpile in exchange for the lifting of economic sanctions.
- **Enriched Uranium:** Natural uranium is processed to increase the proportion of the isotope U-235. Low-enriched uranium (3-5% purity) is used for commercial nuclear power plants, while highly enriched uranium (90% or more) is weapon-grade material used to build nuclear warheads.
- **International Atomic Energy Agency (IAEA):** Operating as the world's nuclear watchdog, this autonomous international organization reports to both the United Nations General Assembly and the Security Council. It verifies that states are using nuclear materials exclusively for peaceful purposes.
- **Strategic Overreach:** A geopolitical phenomenon where a state expands its military commitments, territorial ambitions, or diplomatic demands beyond its actual economic, technological, or military capacity to sustain them.

- **Main Arguments and Substantive Parts**
- The geopolitical theater in West Asia is witnessing a critical recalibration. The core thesis centers on a fragile 14-point Memorandum of Understanding (MoU) that has brought major opposing powers back to the negotiating table, offering a profound breakthrough for one side while warning against the dangers of diplomatic overreach.
- **The Gaps within the Breakthrough**
- While the signing of the MoU marks a significant pause in open hostilities, it remains fundamentally incomplete. The agreement leaves several critical operational details unaddressed, creating a volatile environment where the truce could easily unravel.
- **Ambiguity in Ceasefire Enforcement:** There are no concrete mechanisms or clear international protocols outlined to monitor and enforce the ceasefire in highly contested zones like southern Lebanon.
- **Maritime Vulnerability:** The protocol for safe commercial shipping through the critical Strait of Hormuz remains ambiguous, maintaining a lingering threat over global trade.
- **Nuclear Inspection Impasse:** The framework does not clearly specify whether or under what conditions international inspectors (IAEA) will gain access to sensitive verification sites within sovereign territory.
- **The Strategic Windfall for a Regional Power**
- For a nation that has endured decades of international ostracization and crippling economic sanctions, this diplomatic development represents an unprecedented structural victory.
- **Economic Resuscitation:** The agreement restores the nation's primary revenue stream by reopening global channels for oil exports and unlocking access to massive frozen foreign asset reserves, estimated near $300 billion.
- **Psychological and Geopolitical Elevation:** This standoff marks a historic milestone—the first time since the 1956 Suez War that a West Asian power directly faced a global military superpower, held its ground, and forced balanced negotiations. This significantly elevates its status across the Islamic world and strengthens internal elite military units like the Islamic Revolutionary Guard Corps (IRGC).
- **The Peril of Overreach and Market Realities**
- Despite these gains, the situation remains highly precarious. The temptation to push for excessive concessions carries catastrophic risks.
- **The Illusion of Permanence:** Demanding an absolute, immediate withdrawal of foreign superpower forces from the Middle East constitutes a classic strategic overreach. In an unrestricted, long-term conflict, the superior economic and technological depth of a global superpower will inevitably prevail.
- **The Energy Security "Close Shave":** Although global energy markets have temporarily stabilized and prices have fallen below initial forecasts due to market optimism, the world economy narrowly avoided a major supply disaster. The fundamental power balance in the Persian Gulf has shifted, permanently lowering its perceived reliability as an energy hub.

- **Historical Evolution of the Issue**
- **The Pre-1979 Era (The Alliance Period):** Prior to 1979, the West Asian region was anchored by a close strategic alliance between Western superpowers and the ruling secular monarchy. During this time, early civilian nuclear frameworks were actually encouraged and supported by external Western programs under initiatives like "Atoms for Peace."
- **The 1979 Turning Point (The Islamic Revolution):** The overthrow of the monarchy and the rise of a structural theocracy completely upended regional dynamics. The subsequent hostage crises and ideological shifts transformed a vital regional ally into a primary strategic adversary, prompting the first wave of severe international isolation.
- **The 1980s (The Asymmetric Conflict and Tanker War):** During the protracted regional conflicts of this decade, the strategic value of maritime chokepoints became apparent. Direct attacks on commercial shipping lines in the Persian Gulf established the precedent that regional actors could project asymmetric leverage by threatening global energy supply lines.
- **The 2000s to 2015 (The Nuclear Standoff to the JCPOA):** The discovery of undeclared nuclear enrichment facilities led to a series of stringent UN Security Council sanctions. Years of economic isolation eventually culminated in the 2015 Joint Comprehensive Plan of Action (JCPOA), which offered temporary economic normalization in exchange for strict caps on nuclear enrichment.
- **The 2018 Collapse to Present Day:** The unilateral withdrawal of a major superpower from the JCPOA in 2018 ushered in a "maximum pressure" campaign of renewed sanctions. This triggered a dangerous cycle of proxy conflicts, direct military exchanges, and maritime disruptions, eventually forcing both sides to seek the current fragile 14-point MoU to prevent a catastrophic, all-out regional war.

- **Way Forward**
- **Formalizing and Broadening the Legal Framework**
- Relying on a loose, 14-point MoU is inherently risky. Diplomatic efforts must focus on turning this temporary framework into a comprehensive, legally binding treaty ratified by legislative bodies on both sides. This upgraded agreement should clearly define operational rules for snap IAEA inspections, outline concrete enforcement mechanisms for the Lebanon ceasefire, and remove ambiguities regarding maritime transit through the Strait of Hormuz to prevent sudden miscalculations.
- **Practicing Strategic Restraint and Avoiding Overreach**
- The regional power must resist the urge to view this breakthrough as an opportunity to push for excessive concessions, such as demanding an immediate, total exit of superpower forces from the entire zone. Tehran must prioritize long-term domestic economic recovery, smooth reintegration into global markets, and the steady welfare of its citizens over ideological expansion, recognizing that strategic overreach will inevitably invite devastating economic and military pushback.

COMPREHENSIVE GEOPOLITICAL ANALYSIS: US-IRAN RELATIONS FOR UPSC CSE

HISTORICAL EVOLUTION TIMELINE

1979 → 1980s → 2015 → 2018 →

- **1979** Iran Revolution
- **1980s** Tanker War
- **2015** JCPOA Framework
- **US** Maximum Pressure Campaign
- **Current** fragile 14-point MoU

CORE ARGUMENT: FRAIL MoU AS A BREAKTHROUGH FOR IRAN, BUT GAPS CREATE INSTABILITY.

- **Economic Breakthrough for Iran:** Sanctions Relief, Access to Frozen Funds ($300bn+)
- **Strategic Windfall:** Historic direct confrontation with a superpower, holding ground
- **Critical Gaps in MoU:** Ambiguous Ceasefire Monitoring, Lack of Shipping Protocols, Nuclear Inspection Access Impasse.

KEY TERMS & CONCEPTS

- **Strait of Hormuz** Chokepoint example
- **JCPOA** Nuclear Deal Simple example
- **IAEA** Nuclear Watchdog
- **Enriched Uranium** Atom a examples
- **Strategic Overreach** Stretching figure
- UNCLOS, Treaty Enforcement
- Humanitarian cost vs. security
- **International** Regional power shift
- Oil prices, GDP, Global Markets

MULTIDIMENSIONAL ANALYSIS

- **Social** People's welfare vs. unrest
- **Political** Domestic balancing
- **Legal** UNCLOS, Enforcement
- Humanitarian cost vs. security

Balance of Realpolitik

LOGICAL & PHILOSOPHICAL

- Balance of Realpolitik
- Asymmetric Deterrence
- Economic Oil prices, GDP, Global Markets

UPSC SYLLABUS LINKAGES & PYQs

- **GS Paper 2** International Relations
- **GS Paper 3** Security, Energy
- **Essay** US-iran confrontcation

Previous year Questions

- E.g. 2020 Mains GS 2 (US-Iran confrontation)
  2017 Prelims (IAEA)

WAY FORWARD & POLICY RECOMMENDATIONS

- **Formal Treaty** (Legally binding)
- **Strategic Restraint** (Restrained behavior)
- **Energy Security for Consuming Nations** (Diversification)
- **Multilateral Maritime Protocols** (UN-led)

Scientists build from scratch cells that can grow, feed & reproduce

Marking a breakthrough in biological engineering, researchers claim to have created the world's first synthetic cells that can feed, grow and replicate like a natural cell, taking a big step towards the holy grail of making a living organism out of non-living components.

Developed by University of Minnesota scientists under a project called SpudCell, the work could in time lead to made-to-order living machines.

"We've replicated in chemistry what only used to be possible in biology: the complete set of behaviours of a cell. It proves that fundamental functions of life, like growth and replication, don't need a mysterious magical spark," said Kate Adamala, who led the effort, in a note released by the varsity.

The SpudCell isn't quite 'alive'. It can't survive without deliveries of food and ribosomes, the molecular machines needed to make proteins. It also has no defences or a good waste removal system. TNN

WHAT IS SPUDCELL?

- It's a **pared down version of living cell** that has its own mechanism of cell division
- Cells demonstrate **traits of selection and competition,** have a **tiny genome** split across 7 DNA plasmids
- Experts say SpudCell most compelling demonstration yet that it is **possible to generate life from non-life**

▶ OTHER BK, INSIDE JACKET

- **Key Terms and Explanations**
- **Synthetic Cell (Artificial Cell):** An engineered micro-structure designed to mimic one or more functions of a natural biological cell. Unlike a genetically modified organism (GMO)—which alters an existing natural organism—a synthetic cell is built from the bottom up using chemical and synthetic components.
- **Cytoskeleton:** A complex, dynamic network of interlinking protein filaments (such as actin and microtubules) present in the cytoplasm of all natural cells. It provides structural shape, facilitates internal transport, and generates the mechanical force necessary for a cell to pinch and divide during reproduction.
- **DNA Plasmids:** Small, circular, double-stranded DNA molecules that are distinct from a cell's main chromosomal DNA. In natural systems, they often carry non-essential but beneficial genes (like antibiotic resistance in bacteria). In synthetic engineering, they are used as modular "software packages" to program specific cellular functions independently.
- **Kilobase Pairs (kbp):** A unit of measurement for the length of DNA fragments, equal to 1,000 base pairs of nucleotides. For scale, the human genome is massive at approximately 3 million kbp, whereas a minimal synthetic genome can operate on less than 100 kbp.
- **Ribosomes:** The universal molecular machines found within all living cells that perform biological protein synthesis (translation). They read messenger RNA (mRNA) sequences and assemble amino acids into functional proteins.
- **Fusion Proteins:** Chimeric proteins created by joining two or more genes that originally coded for separate proteins. When translated, this hybrid molecule exhibits properties of both original proteins, used in bioengineering to induce specific mechanical movements or structural changes.
- **Directed Evolution:** A method used in protein engineering that mimics the process of natural selection to evolve proteins or cells toward a user-defined goal. By introducing targeted mutations and applying selective pressure, researchers force faster-growing or more resilient variants to outcompete ancestral strains.

- **Main Arguments and Substantive Parts**
- The central paradigm shift in this domain is the demonstration that the fundamental characteristics of life—feeding, growing, and replicating—can be achieved strictly through chemical engineering without relying on classical biological evolutionary pathways.
- **The Mechanics of Bypassing Evolution**
- Natural cells rely on millions of years of evolutionary refinement to build a cytoskeleton for cell division. The core technical breakthrough here involves bypassing this structural requirement entirely. By engineering specific fusion proteins that crowd together on the inner surface of the cell's synthetic membrane, researchers generate physical, mechanical stress. Once this surface pressure reaches a critical threshold, the membrane naturally undergoes fission, splitting into two daughter cells. This substitutes complex biological machinery with basic soft-matter physics.
- **The Genetic Architecture of Modular Control**
- To make synthetic life programmable, the genetic layout is decoupled from a single, large chromosome. By splitting a minimal genome of just 90 kbp across seven distinct DNA plasmids, each functional pathway behaves like an independent code module.
- This structural independence allows bioengineers to optimize, alter, or mute specific cellular behaviors—such as acceleration of growth or response to nutrients—without destabilizing the entire entity's genetic integrity.
- **The Boundary of Life: The Dependency Paradox**
- While these entities exhibit life-like behaviors, they occupy a grey area between living organisms and chemical machines. They are bound by severe systemic limitations:
- **External Assembly Reliance:** They cannot synthesize their own ribosomes, meaning they remain fundamentally dependent on external deliveries of these molecular machines to sustain protein production.
- **Lack of Homeostatic Resilience:** They lack internal defense mechanisms against viral or chemical threats and possess no active metabolic waste removal systems.
- Consequently, they demonstrate that while replication and growth can be automated via chemistry, true ecological autonomy remains a separate evolutionary hurdle.

- **Historical Evolution of the Issue**
- **Pre-1950s: The Conceptual Foundations**
- The intellectual origin lies in the Oparin-Haldane "primordial soup" hypothesis, which theorized that life arose gradually from inorganic molecules through a process of chemical evolution. This shifted the scientific perspective of life away from supernatural origins toward physical chemistry.
- **1953–1970s: Cracking the Code and the Birth of Biotech**
- The discovery of the DNA double helix by James Watson and Francis Crick in 1953 recontextualized life as digital information written in nucleic acids. By the 1970s, the development of recombinant DNA technology (the Cohen-Boyer genetic engineering experiments) allowed scientists to cut and paste genes between organisms, birthing the modern biotechnology industry.
- **2000–2010: The Sequencing to Synthesis Transition**
- The completion of the Human Genome Project in 2003 provided the full reading blueprint of complex life. Scientists immediately pivoted from *reading* DNA to *writing* it. In 2010, the J. Craig Venter Institute created *Syn 1.0*, the world's first synthetic genome inserted into a bacterial shell, proving that a chemically synthesized chromosome could boot up and dictate life functions.
- **2016–Present Day: Minimalism and Non-Natural Mechanics**
- In 2016, researchers stripped away all non-essential genes to create *Syn 3.0*, a minimal organism with only 473 genes required to sustain life. The current generation of research expands on this by moving beyond minimal natural systems into entirely non-natural mechanics—designing cells that bypass core natural structures like the cytoskeleton, showing that synthetic life can use entirely different operational rules than classic biology.

- **Way Forward**
- **1. Instituting a "Safe-by-Design" Containment Architecture**
- Synthetic cells should be engineered with absolute biological dependencies, such as an inability to synthesize core molecular machinery like ribosomes or survive without rare, non-natural chemical feeds. This establishes an unbreachable biological firewall, ensuring that if these entities ever escape a controlled laboratory setting, they degrade instantly rather than undergoing uncontrolled directed evolution in the wild.
- **2. Updating National and Global Biosafety Protocols**
- Governments must modernize existing biotechnology guidelines to create distinct regulatory pathways specifically for bottom-up synthetic life, moving beyond old rules built only for top-down GMOs. Internationally, a unified oversight body—modeled after the International Atomic Energy Agency (IAEA) but dedicated to advanced biosecurity—should be established to monitor dual-use plasmid designs and prevent rogue synthesis of dangerous pathogens.
- **3. Establishing an Open-Access "Global Biocommons"**
- To prevent intellectual property monopolies that could choke scientific progress, fundamental synthetic architectures (like basic membrane-splitting mechanisms) should be maintained under an open-source registry. Patents should be restricted to highly specific, downstream commercial applications, such as a particular drug-delivery cell design, ensuring that foundational tools remain accessible to developing countries to build their own bio-economies.

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SPUDCELL: WORLD'S FIRST SYNTHETIC CELL
A QUANTUM LEAP IN BIOLOGICAL ENGINEERING

WHAT IS SPUDCELL? - THE CORE CONCEPT

NATURAL CELL | SPUDCELL
Minimal and Pared-Down

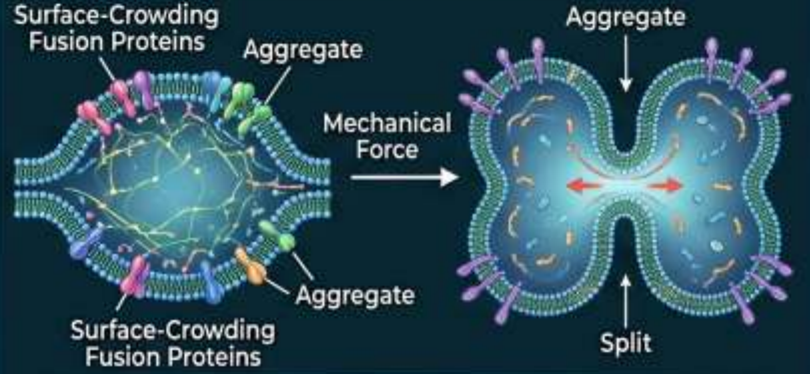
NATURAL CELL
Pared-Down System
- Bypasses Cytoskeleton
- Dependency on external ribosomes & food

SPUDCELL
Bypasses Cytoskeleton
- No defersey on system
- No defenses or good waste removal

Feeds → Grows → Replicates

FUNCTIONAL MECHANICS & PROGRAMMABLE GENOME

Cytoskeleton-Free Division

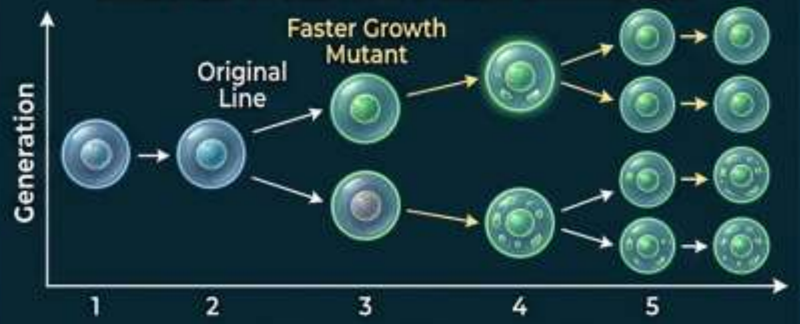


MODULAR GENOME
7 separate DNA plasmids for independent programming

DNA	DNA	DNA	DNA	DNA	DNA	DNA
Metabolism	Growth Protein	Growth Protein	Fission Control	Nutrients Intals	Growth Control	Nutrients Intake

COMPETITIVE EVOLUTION & MULTIDIMENSIONAL ANALYSIS

DIRECTED EVOLUTION & COMPETITIVENESS



MULTIDIMENSIONAL ANALYSIS

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HISTORICAL EVOLUTION

- Major Milestone in the Inatural SPUDCELL
- May 2023 - 17Ui Natural bajor milestone
- Major Milestone in Historical Evolution
- SpudCell: Synthetic Synthetic Seundrmic Cell
- Completes SpudCelic programming and biological Milestones
- Commrcial evolution and Biological Milestone
- First Milestone Sciences in sasons
- Programent to SpudCell: Synthetic Synthetic Cell
- Mays 20th to AXIas RHS

UPSC CSE RELEVANCE

- **GS Papers 1-4** — Linkages to GS Pappers 1-4, ended ing reradied and slinees in key themes
- **Essay** — Linkages to sns paperts to linkage i growth outroanidanies and other ethics
- **Ethics** — Ethiopes to ethics, ethics, comomatics and optionals
- **optionals** — Key themes to tronists, opoutiom and slats conditions to be connst of compliats and optionals

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