UPSC with SAURABH KAUSHIK

Current Affairs Notes · 22 June 2026

The Hindu · Indian Express · PIB | 24 Topics | GS 1 · 2 · 3 + Prelims + Mapping

[TH] The Hindu | [IE] Indian Express | [PIB] Press Info Bureau

INDEX OF TOPICS

#	Topic	GS Syllabus	Src
1	Vance & Ghalibaf Lead Switzerland Talks — 'Can We Turn Over a New Leaf?'	*GS2 – IR; Iran-US*	[IE]
2	India–US Interim Trade Deal: 'Final Touches' — USTR Greer Arrives Delhi	*GS2–IR; GS3–Economy*	[TH]
3	Western Ghats ESA: Govt Prepares to Notify 3 States After 12-Year Deadlock	*GS3 – Environment*	[IE]
4	Maritime Sector a Major Growth Engine: PM Modi Commissions 3 Vessels	*GS3 – Economy; Defence*	[TH]
5	India–EU Trade Pact to Be Signed by December 2026: Piyush Goyal	*GS2–IR; GS3–Economy*	[TH]
6	Rakhigarhi Skeletons: DNA Tests and Facial Reconstruction	*GS1 – History; Science*	[IE]
7	DNA Profiling Act 2022: Over 1 Lakh Criminal DNA Profiles Generated	*GS2–Governance; GS3–S&T*	[TH]
8	Google Project Nimbus and Student Protests — AI Ethics	*GS3 – S&T; Ethics*	[TH]
9	NTPC: Global Nuclear Players Seek India for N-Tech Partnerships	*GS3 – Science; Energy*	[IE]
10	Guardrails in AI Growth to Protect Developing Nations	*GS3 – S&T; GS2–IR*	[IE]
11	Biochar: Turning India's Farm Smoke Into 'Black Gold'	*GS3 – Environment; Agriculture*	[TH]
12	Road to Energy Security Passes Through Our Farms	*GS3 – Economy/Environment*	[IE]
13	End the Free Rein of Junk Food Advertising in India	*GS2 – Governance; Health*	[TH]
14	Are Footpaths More Than Safe Spaces? Post-SC Ruling Analysis	*GS2 – Governance*	[TH]

15	Can Police Re-Open Probe Without Court Approval?	*GS2 – Governance; Criminal Justice*	[TH]
16	Britain After Brexit — Divided, Uncertain, Stagnant	*GS2 – IR; GS3– Economy*	[TH]
17	NSDC Crackdown: Ex-Staffers Notices for PMKVY Lapses	*GS2–Governance; GS3–Economy*	[IE]
18	Constitution's Promise of Fraternity Matters More Than Ever	*GS2 – Polity; Governance*	[IE]
19	Ease of Justice: Legal System Closer to People (BNS/BNSS Impact)	*GS2 – Governance*	[IE]
20	A 10 Per Cent Rule for Sustainable Development	*GS3 – Economy/Environment*	[IE]
21	India's Space Odyssey — PIB Backgrounder	*GS3 – Space*	[PIB]
22	Ashtalakshmi: Northeast at the Heart of India's Growth Story	*GS2–Governance; GS3–Economy*	[PIB]

PIB HIGHLIGHTS — 22 JUNE 2026

1. India's Space Odyssey — 12 Years of Space Achievement (2014–2026)

✓ Chandrayaan-3 (August 23, 2023): Vikram lander near lunar South Pole — India FIRST country to land near Moon's south pole; Pragyan rover confirmed sulphur in lunar soil.

✓ Aditya-L1 (2023): India's first solar mission; stationed at L1 Lagrange point; monitors solar wind, corona, CMEs.

✓ Gaganyaan: Two uncrewed orbital tests complete (2025); crewed mission targeted late 2026; Vyommitra (humanoid robot) + astronauts; India's first human spaceflight.

✓ NSIL Commercial: $800M+ in satellite launch contracts (OneWeb, Amazon Kuiper); LVM3 is India's heavy-lift commercial workhorse.

✓ IN-SPACe (Indian National Space Promotion & Authorisation Centre): 75+ Indian space startups; Skyroot Aerospace (Vikram-S, 2022 — first private Indian rocket); Agnikul Cosmos (Agnibaan sub-orbital).

✓ Space Economy: $8.4 billion (2023) → target $44 billion by 2033; India currently ~2% of global space economy; target 10% share.

✓ GS3 Angle: Space Technology; India's space programme milestones; IN-SPACe; private sector in space; Chandrayaan-3 significance (south polar water-ice exploration).

2. Ashtalakshmi — The North-East at the Heart of India's Growth Story

✓ Ashtalakshmi = 8 forms of Goddess Lakshmi; India's branding of the 8 NE states (Arunachal, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura) as 8 pillars of growth.

✓ Infrastructure: 2.5 lakh km roads in NE since 2014; Bogibeel Bridge (4.94 km, Assam — India's 2nd longest rail-road bridge); Dhola-Sadiya Bridge (9.15 km — India's longest); Zojila Tunnel breakthrough (June 2026).

✓ Energy: NE hydro potential 63,000 MW (India's largest); Dibang MPP (2,880 MW, Arunachal) approved; Subansiri Lower HEP (2,000 MW) nearing completion; NE grid connected to national grid.

✓ Connectivity: UDAN scheme — 40+ NE airports connected; India-Myanmar-Thailand Trilateral Highway; Agartala upgraded airport; Moreh-Myanmar trade gateway.

✓ Act East Policy: NE as India's gateway to ASEAN; land trade through Moreh (Manipur); Stilwell Road potential; Chittagong Port (Bangladesh) transit access discussions.

✓ Cultural: 28 GI tags from NE; Hornbill Festival (Nagaland), Sangai Festival (Manipur), Ziro Music Festival (Arunachal) as tourism assets.

✓ GS2/GS3 Angle: Special Category Status; 15th Finance Commission NE allocation; Article 371 special provisions; connectivity as strategic + economic priority; Act East Policy.

GS PAPER 2 — International Relations

1. 'Can We Turn Over a New Leaf?' — Vance, Ghalibaf Lead Switzerland Talks

[IE] Page 1

GS 2: International Relations: US-Iran Muscat Accord Phase 2; nuclear non-proliferation; West Asia geopolitics; India's energy security interests.

‣ June 21-22, 2026: US VP JD Vance + Iran's Parliament Speaker Mohammad Bagher Ghalibaf at Bürgenstock Resort, Lake Lucerne, Switzerland — first direct US-Iran technical talks under the Muscat Accord framework.

‣ Vance's question: 'Can we turn over a new leaf? Can we change Middle East relations permanently, or do we go back to the old way?'

‣ Iran's non-negotiable: President Pezeshkian — 'What is certain is that we will NEVER back down from the right to enrich uranium.'

‣ Complication: While Vance negotiated in Switzerland, Trump posted on Truth Social threatening to 'hit Iran very hard again' — creating a dissonance that Iranian media highlighted as undermining the talks.

Bürgenstock Talks: Structure and Delegations

- Venue: Bürgenstock Resort, Canton Nidwalden, Switzerland — same as the Ukraine Peace Summit (June 2024); Switzerland's permanent neutrality (since 1815) makes it the preferred venue for sensitive US adversary negotiations.
- US delegation: VP JD Vance (lead), Special Envoy Steve Witkoff, Jared Kushner (Trump's son-in-law, informal senior adviser).

- Iran delegation: FM Abbas Araghchi + Parliament Speaker Mohammad Bagher Ghalibaf (co-leads); Ghalibaf is a former IRGC commander — his participation signals the IRGC's conditional approval of the process.
- Mediators: Pakistan PM Shehbaz Sharif + Qatar PM Mohammed Al-Thani — same mediators as the Muscat Accord; both sides met mediators separately before any direct contact.
- IAEA's Rafael Grossi also present: If enrichment verification is agreed, IAEA will be the implementation mechanism.

Phase 2: What Must Be Agreed by August 13

- **Enrichment cap:** Iran to cap enrichment at 3.67% (JCPOA level); 440+ kg of 60%-enriched uranium to be downblended or shipped out; Iran calls enrichment an 'inalienable NPT right.'
- **IAEA Additional Protocol:** Full IAEA access including snap inspections at declared and undeclared sites; cameras removed from Iranian sites in 2021 must be restored.
- **Sanctions relief:** In exchange for nuclear compliance milestones: US to release staged tranches of frozen assets ($180 billion total over 3 years); OFAC general licences for oil, petrochemical exports.
- **Lebanon-Hezbollah:** Emergency agenda item: Iranian delegation demanded US pressure Israel to halt Lebanon strikes; talks recessed briefly while Qatari mediators shuttled between delegations.

The Trump-Vance Dissonance

- While Vance sought flexibility in Bürgenstock, Trump's Truth Social posts threatened renewed strikes — a 'two-level game' (Putnam, 1988): domestic political messaging vs. international negotiating reality. Iranian media used Trump's posts to justify 'pausing' and consulting hardliners in Tehran.
- Both sides ultimately continued talks — neither wants them to collapse. Iran needs sanctions relief; the US needs to show Phase 2 is on track before the August 13 deadline.

India's Stake

- If Phase 2 succeeds by August 13: Hormuz stays open; oil stabilises at $85-90/barrel; India's post-Accord economic recovery is locked in. If talks collapse: Iran resumes enrichment above 60%; US reimports blockade; oil spikes above $115; India faces renewed fuel crisis, fertiliser shortage, rupee pressure.
- India's MEA statement (June 22): 'India urges all parties to continue dialogue constructively and work toward a comprehensive and verifiable nuclear agreement.'

UPSC ANGLE

• 60-day window: Muscat Accord June 14 → technical talks began June 21 (1-week delay from Lebanon complications) → August 13 deadline = only ~53 days remaining; very tight for a nuclear deal.

• Ghalibaf's significance: As a former IRGC commander, his co-leadership signals the IRGC is conditionally on board — critical because IRGC hardliners are the most likely spoilers of any deal.

• Prelims: Bürgenstock = Switzerland; JD Vance = US Vice-President; Ghalibaf = Iran Parliament Speaker + ex-IRGC; IAEA Additional Protocol = snap inspection regime; August 13 = Phase 2 deadline.

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- 📌 **Additional Protocol (IAEA)** — A strengthened safeguards agreement allowing IAEA complementary access — snap inspections of declared and undeclared sites; Iran suspended compliance in 2021; restoration is key Phase 2 demand.
- 📌 **Two-Level Game (Putnam, 1988)** — Diplomatic theory: leaders simultaneously play domestic (winning political base) and international (reaching agreement with adversaries) games; Trump's Truth Social posts (domestic) vs. Vance's negotiating flexibility (international) illustrate this.

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2. India–US Interim Trade Deal: 'Final Touches' — USTR Greer Arrives in Delhi

[TH] Page 1

GS 2 / GS 3: IR: India–US Bilateral Trade Agreement; WTO; trade policy; GS 3: Economy — exports, tariffs, H-1B mobility, digital trade.

▸ USTR Jamieson Greer arrived New Delhi on the evening of June 22, 2026 for negotiations with Commerce Minister Piyush Goyal (June 23-24).
▸ Foreign Secretary Vikram Misri: 'We are in the final stages of concluding the interim trade agreement. Both leaders at G7 Évian gave instructions for the earliest possible conclusion.'
▸ Status: The February 7, 2026 Modi-Trump framework set a $500 billion trade target by 2030 and an 18% effective Indian tariff ceiling on US goods (from ~50%); now needs final touches on outstanding issues.
▸ Outstanding: H-1B mobility chapter; India's Equalisation Levy (2% digital services tax); agricultural tariffs (US wants India to lower wheat 40%, dairy 40%, soybeans 30%); GI protection for Indian products.

The Framework Agreement (February 7, 2026)

- Both leaders at their New Delhi bilateral set: $500 billion trade target by 2030; US withdrew additional 25% tariff on Indian steel/aluminium (Trump 1.0 tariff); India agreed to reduce tariffs on a basket of US goods to an effective 18% ceiling; both sides committed to negotiate the full BTA (Bilateral Trade Agreement) by end of 2026.
- Section 301 proceedings: The US had initiated Section 301 investigations against India over digital services tax and IPR practices; the interim deal framework includes a pause on Section 301 escalation while negotiations continue.

What the Deal Would Cover

- **Goods:** US: pharmaceuticals, textiles, engineering goods, IT services get lower US tariffs; India: high-end agricultural machinery, semiconductors, medical devices, LNG, aircraft components, whiskey get lower Indian tariffs.
- **Services:** IT professional mobility (H-1B chapter) — India wants treaty-level protection for skilled workers on temporary US assignments; codifying H-1B access as a trade commitment.
- **Digital trade:** India's 2% Equalisation Levy on digital companies without permanent establishment; US considers it discriminatory; India argues it's revenue protection; a compromise (phased reduction or WTO-aligned DST framework) is being negotiated.

- **Agriculture:** India's most politically sensitive; wheat (40%), dairy (40%), soybeans (30%); India insisting on 'sensitive sector exclusions' — standard FTA practice.
- **GI Protection:** India wants US to recognise Darjeeling Tea, Basmati Rice, Indian handicrafts; standard FTA provision.

UPSC ANGLE

• India's FTA momentum: India-UK CETA (effective July 15); India-EU FTA (December 2026 target); India-US BTA (end of 2026 target) — India is simultaneously concluding 3 of the world's most significant trade agreements in a single year.

• Section 301 (US Trade Act 1974): Allows US President to take action against trade practices deemed unfair, unreasonable, or discriminatory; India was under investigation for its equalisation levy; the BTA negotiations have paused escalation.

- **BTA (Bilateral Trade Agreement)** — Comprehensive US-India trade deal covering goods, services, investment, IP, digital trade; $500 billion by 2030 trade target; framework agreed February 2026; final touches June 2026.
- **Equalisation Levy** — India's 2% digital services tax on revenue of foreign e-commerce and digital advertising companies without permanent establishment in India; US considers it discriminatory under WTO/Section 301.

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3. India–EU Trade Pact to Be Signed by December 2026: Piyush Goyal

[TH] Page 12

GS 2 / GS 3: IR: India–EU FTA/CEPA; GS 3: Economy — trade policy, market access, services, FDI, GI tags.

▸ Commerce Minister Piyush Goyal confirmed India-EU CEPA (Comprehensive Economic Partnership Agreement) signing target: December 2026.

▸ History: Talks began 2007; stalled 2013-21; revived June 2022; legal scrubbing of text near completion.

▸ Significance: EU = 27 members, $17 trillion GDP; €120 billion/year India-EU bilateral trade; India's LARGEST trade deal ever.

▸ Modi at G7 met EU Commission President von der Leyen + EU Council President Charles Michel — December 2026 target reconfirmed.

- **Goods tariffs:** EU to offer near-zero tariffs on most Indian exports (pharma, textiles, engineering, auto components); India to reduce tariffs in 7-10 year phased schedule; exclusions: dairy, poultry, wheat.
- **Services:** 124 EU service sub-sectors opened to India; professional mobility for engineers, IT specialists, architects, accountants; India's IT sector's most significant EU market access gain.
- **GI Protection:** 250+ Indian GIs protected across EU-27: Darjeeling Tea, Basmati Rice, Alphonso Mango, Hyderabad Bidriware, Kancheepuram Silk.
- **CBAM transition:** India secured a 5+ year transition period before CBAM charges apply to Indian steel, aluminium, cement, fertiliser exporters.

- **Investment Court System:** India accepted EU's 'Investment Court System' (modified ISDS) — replacing the bilateral investment tribunal approach India had rejected.
- Post-Brexit architecture: India-UK CETA (effective July 15, 2026) + India-EU CEPA (December 2026) = India secures preferential access to the two largest developed economy markets in the same year — transformative.

UPSC ANGLE

• Why it took 20 years: EU-India trade talks stalled over: India's high tariffs on EU automobiles (100%), EU farm product restrictions, ISDS mechanism, data protection, government procurement — most of these have been resolved or found compromise in 2022-26 negotiations.
• RCEP context: India stayed out of RCEP (China-led FTA) in 2019; India-EU FTA is India's alternative path — preferential access to wealthy Western consumers rather than Chinese-dominated Asian value chains.

- **CEPA** — Comprehensive Economic Partnership Agreement — India's term for deep trade deals; India-EU CEPA covers goods, services, investment, IPR, digital trade.
- **CBAM (Carbon Border Adjustment Mechanism)** — EU's carbon tariff on imports of carbon-intensive goods from countries without equivalent carbon pricing; India secured transition period in EU FTA negotiations.

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4. Maritime Sector a Major Growth Engine: PM Modi Commissions 3 Naval Vessels at Kolkata Port

[TH] Page 1

GS 3: Economy: Maritime sector; Blue Economy; Defence — naval indigenisation; PM Gati Shakti; Sagarmala.

‣ June 20, 2026 (reported June 22): PM Modi commissioned INS Nilgiri (P17A stealth frigate), INS Surat (P15B destroyer), INS Vaghsheer (Kalvari submarine) — simultaneously, at Mazagon Dock, Mumbai.
‣ PM's statement at the commissioning: 'The maritime sector is a major engine of economic growth. India's seas are our future.' Made a broader pitch for Blue Economy including ports, shipbuilding, fisheries, coastal tourism.
‣ Sagarmala Programme: Rs 6+ lakh crore investment in port infrastructure (2016-2035); 189 projects completed; 293 under implementation; port capacity enhanced from 1,400 MTPA (2014) to 3,300 MTPA (2026).
‣ India's shipbuilding ambition: India aims to be a top-5 global shipbuilder by 2047 (currently ranked ~20th); MDL, GRSE, Cochin Shipyard, HSL expanded capacity.

- Blue Economy comprises: fisheries and aquaculture (~Rs 2.2 lakh crore/year); shipping and ports (EXIM trade ~95% by volume); offshore energy (ONGC's offshore oil, emerging offshore wind); coastal tourism; desalination; underwater mineral extraction. India's Blue Economy = ~4% of GDP; government target: 10% by 2030.
- Sagarmala + PM Gati Shakti: PM Gati Shakti (National Master Plan for Multi-Modal Connectivity, launched October 2021) has integrated Sagarmala's port-led development

with road (Bharatmala), rail (Dedicated Freight Corridors), and waterways (Jal Marg Vikas) in a single digital platform.

- Inland waterways: National Waterways Act 2016 declared 111 national waterways; NW-1 (Ganga, Varanasi-Haldia, 1,620 km) is the flagship; IWAI (Inland Waterways Authority of India) is developing river cargo infrastructure as a fuel-efficient alternative to road/rail.

UPSC ANGLE

• India's Blue Economy vision: PM Modi's speech connects the naval commissioning to the larger maritime economy — from warship manufacture (Rs 1.78 lakh crore defence production) to commercial shipping, ports, and fisheries. This is 'full-spectrum maritime power.'
• Sagarmala GS3 facts: 189 projects complete; 293 under implementation; port capacity: 1,400 → 3,300 MTPA; coastal employment: 10 lakh+ additional jobs targeted; fisheries export: $8.1 billion (FY26); National Waterways: 111 declared.

- **Sagarmala Programme** — Ministry of Ports' programme for port-led development; 2016-2035; Rs 6+ lakh crore investment; 482 projects; aims to reduce logistics cost (from 14% of GDP to 8%); develop coastal economic zones.
- **Blue Economy** — The sustainable use of ocean resources for economic growth, livelihoods, and ecosystem health; India's Blue Economy (~4% of GDP) includes fisheries, shipping, offshore energy, coastal tourism, and maritime trade.

5. Britain After Brexit — Divided, Uncertain, and Stagnant

[TH] Page 8

GS 2: International Relations: UK; Brexit; Geopolitics of Economic Integration; India-UK CETA implications.

‣ June 23, 2016: Brexit referendum (51.9% Leave) — 10 years ago. June 22, 2026 review: UK's economic and political condition a decade later.
‣ Economic: UK GDP growth averaged 0.8%/year (2021-26) vs. 2.3% pre-Brexit; OBR estimates Brexit reduced UK's long-run trade intensity by 15%.
‣ Three divides: England-Scotland (SNP dominates, IndyRef2 demand ongoing); North-South (levelling up promise largely unfulfilled); Remain-Leave (cultural polarisation persists, though less electorally salient).
‣ Immigration paradox: Brexit was partly anti-immigration; post-Brexit net migration INCREASED to record 906,000 (2023) — EU workers replaced by non-EU (India, Nigeria, Zimbabwe).

- UK's post-Brexit trade achievements: CPTPP (Comprehensive and Progressive Agreement for Trans-Pacific Partnership — joined July 2023); AUKUS security pact; India-UK CETA (July 15, 2026) — the latter is the UK's most significant bilateral trade deal post-Brexit, covering 99.1% of tariff lines.
- Northern Ireland's Windsor Framework (2023): Replaced the Northern Ireland Protocol; Northern Ireland remains in EU single market for goods while part of UK; creates de facto customs checks between Great Britain and Northern Ireland; politically contested but stabilised compared to 2021-22.

- Keir Starmer's EU reset: Labour PM (elected July 2024) seeks closer EU-UK relations ('reset') without rejoining Single Market or Customs Union; limited success — EU not willing to offer significant access without full membership obligations.
- India-UK CETA as Brexit dividend: India-UK CETA (3 years of negotiations, effective July 15, 2026) is arguably faster and more comprehensive than what India could have negotiated through EU — demonstrating UK's ability to move quickly as an independent trading nation.

UPSC ANGLE

• Brexit and India: India benefits from: (a) faster India-UK CETA (independent UK > EU bloc); (b) large Indian diaspora in UK (~1.8 million) lobby for strong India-UK ties; (c) Indian students — UK universities remain top destination (600,000+ Indian students in UK in 2025).
• UK's global Britain strategy: UK is pivoting to Indo-Pacific (AUKUS, CPTPP, India CETA) from EU-centric trade — this aligns with India's own Indo-Pacific positioning and creates convergent strategic interests.

- **Brexit** — UK's exit from the EU; referendum June 23, 2016 (51.9% Leave); formal exit January 31, 2020; full trade implementation January 1, 2021; UK left Single Market and Customs Union.
- **CPTPP** — Comprehensive and Progressive Agreement for Trans-Pacific Partnership; 12-member FTA covering Asia-Pacific; UK joined July 2023; no China; India is considering membership.

GS PAPER 2 — Governance · Polity

6. Can Police Re-Open a Probe Without Court Approval?

[TH] Page 10

GS 2: Governance: Criminal Justice; BNSS; Police Powers; Further Investigation; Judicial Oversight.

▸ The Hindu explainer: A political controversy about whether police/CBI can re-open a case that was previously closed without court permission.
▸ SC's consistent position: Police CAN conduct 'further investigation' even after filing a chargesheet — under Section 193(8) BNSS (formerly 173(8) CrPC); NO prior court permission required.
▸ 'Further investigation' (valid, no court permission) vs. 'Re-investigation' (starting fresh — requires court direction) — a key distinction.
▸ If matter is sub-judice: Police should inform the court before further investigation — courtesy, not mandatory permission.

- Section 193(8) BNSS: 'Nothing in this section shall be deemed to preclude further investigation in respect of an offence after a report under sub-section (2) has been forwarded to the Magistrate.' This statutory provision is the basis.
- Closure Report (Form 34 BNSS): When police find insufficient evidence, they file a closure report to the Magistrate; Magistrate can: accept (case closed) or protest (direct

further investigation). If Magistrate 'protests', it is a direction to investigate, NOT taking cognisance of the original report.

- Vinubhai Haribhai Malaviya v State of Gujarat (SC, 2019): Police power of further investigation does not cease after chargesheet; continues until trial concludes; any supplementary chargesheet goes to the court.
- Controversy context: The ruling party has used CBI/ED 'further investigation' to pursue opposition politicians; critics argue this is selective and politically motivated 'reopening of settled cases.' The SC's position is clear — further investigation is legally valid — but prosecutorial selectivity is a separate governance concern.

UPSC ANGLE

• UPSC relevance: Section 173 CrPC (now 193 BNSS) — further investigation; Closure Report mechanism; police powers in criminal procedure; judicial oversight of police.
• ED (Enforcement Directorate) and 'further investigation': ED has broad powers under PMLA (Prevention of Money Laundering Act) to investigate even after lower court acquittal; this is constitutionally valid but politically controversial.

- **Further Investigation (Section 193(8) BNSS)** — Statutory police power to continue investigation even after filing chargesheet; does not need prior court permission; ends with supplementary chargesheet to court.
- **Re-Investigation** — Starting a case investigation afresh; requires specific court direction (High Court or Magistrate); distinct from further investigation.

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7. End the Free Rein of Junk Food Advertising in India

[TH] Page 8

GS 2: Governance: Food Safety; Consumer Protection; Advertising Standards; FSSAI; Child Health; NCD Prevention.

‣ India's FSSAI has been drafting regulations for High Fat, Salt, Sugar (HFSS) food advertising since 2020 — implementation repeatedly delayed due to industry lobbying.
‣ India's NCD crisis: 77 million diabetics (highest globally); childhood obesity doubled in 10 years (2% → 4.7%); ultra-processed food consumption among children ↑45% since 2015.
‣ FSSAI's delayed Front-of-Pack (FoP) labelling regulation: 'HIGH in [Fat/Salt/Sugar]' red warning labels — still not mandatory due to industry resistance.
‣ Comparative: UK banned junk food ads pre-9pm watershed; Chile uses black octagon warning labels; WHO recommends no HFSS advertising to children under 16.

- FSSAI's draft restrictions: Prohibit HFSS advertising within 50m of schools; on children's TV channels; targeting children in online platforms; cartoon character promotions for HFSS products. Industry bodies (CII, ASCI) objecting, claiming restrictions are too broad.
- The information environment: Public health experts argue that children's food choices are shaped by the 'information environment' (advertising) just as lungs are shaped by the 'air environment' (pollution) — both require regulation.

- HFSS definition: Products exceeding threshold levels of fat (>20g/100g), saturated fat (>5g/100g), sugar (>15g/100g), or sodium (>600mg/100g); covers chips, biscuits, cola, instant noodles, most fast food.

UPSC ANGLE

• Article 47 (DPSP): State shall endeavour to prohibit consumption of intoxicating drinks and drugs injurious to health — by analogy, state has constitutional mandate to regulate foods injurious to health.
• COTPA parallel: Cigarettes and Other Tobacco Products Act 2003 strictly regulates tobacco advertising; similar legal framework for HFSS food advertising would align with global best practice.

- **HFSS (High in Fat, Salt, and Sugar)** — Classification of nutritionally poor ultra-processed foods; target of regulatory restriction; defined by threshold levels per 100g of fat, saturated fat, sugar, sodium.
- **FSSAI (Food Safety and Standards Authority of India)** — India's apex food regulator (FSSAI Act 2006); sets standards for food safety, labelling, advertising; pending HFSS advertising restrictions and mandatory FoP labelling.

8. NSDC Crackdown: Ex-Staffers Get Notices for PMKVY Lapses

[IE] Page 1

GS 2 / GS 3: Governance: NSDC; Skill Development; PMKVY accountability; CAG audit; fraud in government schemes.

‣ NSDC (National Skill Development Corporation) issued show-cause notices to current and former officials for PMKVY irregularities.
‣ Specific violations: Inflated trainee numbers; fictitious training; trainees 'certified' without assessment; funds diverted from training purposes.
‣ CAG audit findings: PMKVY placement rates only 15-20% (vs. claimed 70%+); certified trainees could not demonstrate stated skills.
‣ Scale: PMKVY has disbursed Rs 14,000+ crore since 2015; trained 1.5 crore (claimed); impact on actual employment questioned.

- Structural causes: (1) Training Partners (private institutions) had financial incentive to show high numbers without quality outcomes; (2) Recognition of Prior Learning (RPL) — intended to certify existing skills — became a vehicle for rapid numbers without training; (3) Assessment agencies often connected to Training Partners — conflict of interest; (4) NSDC oversight inadequate given PPP structure.
- Skill-employment mismatch: Even genuinely trained workers struggle to find employment — courses not aligned with industry demand. India needs a fundamental shift from 'certificate + number' targets to outcomes-based skill development with employer co-design.
- PMKVY 4.0 (2022-26): Attempted more demand-driven training; industry partnerships; improved monitoring; the NSDC crackdown on past irregularities is part of the institutional cleaning-up process.

UPSC ANGLE

• Germany comparison: Berufsausbildung (dual system) = classroom + workplace apprenticeship under employer sponsorship; outcomes-guaranteed by employer need. India's PMKVY = instructor-led classroom, no employer guarantee. The governance gap is structural.
• Skill India Mission reform need: India cannot afford skill training that produces unemployable certificate-holders; NSDC crackdown is necessary but not sufficient — the system design (PPP without robust verification) must change.

- **NSDC (National Skill Development Corporation)** — PPP under Ministry of Skill Development; implements PMKVY; disburses funds to Training Partners; facing accountability crisis; 16 member Board.
- **RPL (Recognition of Prior Learning)** — PMKVY component certifying existing skills without formal training; intended for informal sector workers; exploited to inflate trainee numbers.

9. Constitution's Promise of Fraternity Matters More Than Ever

[IE] Page 11

GS 2: Polity: Preamble; Fraternity; Constitutional Values; Article 51A(e); Social Cohesion; Communal Harmony.

‣ Indian Express opinion: In a time of growing institutional distrust — between communities, between citizens and state, and between humans and technology — the Preamble's promise of Fraternity is the most neglected constitutional value.
‣ Ambedkar (Constituent Assembly, November 25, 1949): 'Without fraternity, liberty and equality could not become a natural course of things.' Fraternity is the synthesis that makes liberty and equality meaningful.
‣ Distrust indicators (June 2026): AI-generated misinformation; Telegram-enabled criminal networks; communal tensions post-Operation Sindoor; economic anxiety from Hormuz crisis — all eroding inter-community trust.
‣ Preamble's unique formulation: 'Fraternity assuring the dignity of the INDIVIDUAL and the unity and integrity of the NATION' — it has both individual (dignity) and collective (national unity) dimensions.

- Article 51A(e) — Fundamental Duty: 'to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic, regional, or sectional diversities; to renounce practices derogatory to the dignity of women.' Inserted by 42nd Amendment (1976).
- Fraternity as institutional practice: Inclusive public spaces (SC's footpath ruling), shared civic culture, state ceremonies that include all communities — these are fraternity materialised, not just sentiment.
- Digital fraternity challenge: Social media algorithms reward tribal identity confirmation and outrage — they are structurally hostile to fraternity; India's DPDP Act 2023 and potential AI regulations are partly about protecting the 'information environment' that fraternity requires.

UPSC ANGLE

• Ambedkar's synthesis: He considered fraternity the most difficult and most important of the three constitutional values — because it requires not just laws but a change in social culture. His Annihilation of Caste (1936) argued caste was the fundamental obstacle to Indian fraternity.
• Fraternity + Article 21: The SC's footpath ruling (June 20) and the fraternity principle both point toward inclusive public spaces — shared civic infrastructure where all citizens, regardless of identity, have equal rights.

- **Fraternity (Preamble)** — Fourth value after Justice, Liberty, Equality; 'assuring dignity of the individual and unity of the Nation'; Ambedkar's synthesis; operationalised as Fundamental Duty in Article 51A(e).

10. Ease of Justice: BNS/BNSS/BSA — 2 Years of Criminal Law Reform

[IE] Page 11

GS 2: Governance: BNS; BNSS; BSA; Criminal Justice Reform; Access to Justice; Technology in Courts.

‣ 2 years after implementation (July 2024): Assessment of how the new criminal laws have changed India's justice system.
‣ New provisions working: Zero FIR (register anywhere, transfer to jurisdiction police station); eFIR (electronic filing); mandatory video conferencing for remand hearings; 90-day chargesheet timeline enforceable with digital case tracking.
‣ Victim-centric gains: Victims informed every 90 days on investigation progress (never required before); victim's right to be present at hearings; mandatory medical and legal aid for rape victims within 7 days.
‣ New punishments: Community service for minor offences (BNS Section 4) — first time in India's criminal law; restorative justice element.

- Technology provisions operationalised: Video conferencing for remand (reduced unnecessary physical transportation of accused); digital signatures on court documents; electronic service of summons; CCTNS (Crime and Criminal Tracking Network and Systems) integrated — all improving process efficiency.
- Section 152 BNS (sedition replacement): Replaces IPC Section 124A (sedition); covers 'acts endangering sovereignty, unity and integrity of India'; critics argue it is broader than sedition — SC constitutional challenge pending.
- Community service: Judges now have a third option beyond imprisonment and fine for minor offences (petty theft, public nuisance); 2-year data shows ~12,000 community service orders issued nationally — a positive start.

UPSC ANGLE

• The 'decolonisation' debate: Government's stated rationale for renaming the codes was replacing colonial-era British names; critics note the actual substantive changes are evolutionary not revolutionary, and the parliamentary process (passed with 146 MPs suspended) lacked adequate debate.

• Access to justice improvement: eFIR and Zero FIR are the most impactful access reforms — allowing any citizen to file a report electronically or at any police station removes historical barriers that privileged those with connections or mobility.

- 📌 **BNS (Bharatiya Nyaya Sanhita)** — Replaced IPC (effective July 2024); 358 sections; organised crime chapter; community service punishment; Section 152 replaces sedition.
- 📌 **BNSS (Bharatiya Nagarik Suraksha Sanhita)** — Replaced CrPC; 90-day chargesheet; Zero FIR; eFIR; video conferencing for remand; enhanced victim rights.

GS PAPER 3 — Environment · Science · Economy

11. Western Ghats ESA: Govt Prepares to Notify 3 States After 12-Year Deadlock

[IE] Page 1

GS 3: Environment: Western Ghats Biodiversity Hotspot; ESA; Gadgil and Kasturirangan Committees; Wayanad Landslides; GS2: Centre-State Relations.

‣ June 2026: After 12 years (first draft notification: March 2014), Centre finalising Ecologically Sensitive Area (ESA) for Western Ghats — starting with Gujarat, Goa, Maharashtra (agreement reached).
‣ ESA coverage: ~56,000 sq km (Kasturirangan's 37% recommendation) — not 1,64,000 sq km (Gadgil's 64% recommendation).
‣ Kerala and Karnataka still negotiating: Both have large populations within proposed ESA zones; demand 'softer' restrictions and livelihood protections.
‣ Trigger: Wayanad landslides, July 2024 — 230+ deaths; the disaster renewed urgency for ecological protection in the fragile Ghats.

The Western Ghats: Profile

- Location: 1,600 km mountain range parallel to India's west coast; 6 states (Gujarat, Goa, Maharashtra, Karnataka, Kerala, Tamil Nadu); UNESCO World Heritage Site (2012); one of 8 'hottest biodiversity hotspots.'
- Biodiversity: 5,000+ plant species (1,800 endemic); 139 mammal species (40+ endemic — Lion-tailed Macaque, Nilgiri Tahr, Malabar Giant Squirrel); 508 birds; 179 amphibian species (161 endemic).
- Water tower: Origin of 6 major peninsular rivers — Godavari, Krishna, Kaveri, Tapi, Narmada headwaters, Periyar; supports 400+ million people's water security.

Two Committees, Two Visions

- **Gadgil Committee (2011):** WGEEP (Western Ghats Ecology Expert Panel); recommended 100% of Western Ghats as ESA (3 tiers of regulation); Western Ghats Ecology Authority (statutory body); bottom-up Gram Sabha governance. Too strict — rejected by states.

- **Kasturirangan Committee (2013):** High Level Working Group; recommended 37% (60,000 sq km) as ESA; 2-tier regulation; balanced conservation and development; more pragmatic but still resisted by Kerala and Karnataka.

ESA Regulations

- PROHIBITED in ESA zones: Mining, quarrying, new large industries (above prescribed capacity), new townships, large construction projects.
- PERMITTED with regulation: Small-scale agriculture, existing settlements, tourism, minor construction.
- 6 successive draft notifications (2014-2026): Each inviting public comments and state feedback; current (6th) draft is the basis for finalisation.

UPSC ANGLE

• Wayanad 2024 context: Mundakkai landslide killed 230+ — attributed to deforestation in upper Ghats, slope encroachment, extreme rainfall intensified by climate change. This disaster is what finally broke the 12-year administrative deadlock.

• Federalism dimension: ESA is notified under Environment Protection Act 1986 (central power); but implementation requires state machinery; without state cooperation, the notification is on paper only — hence the staggered state-by-state approach.

• Prelims: Gadgil = 100% ESA + 3 tiers + WGEA; Kasturirangan = 37% + 2 tiers + balanced; UNESCO WHS 2012; 6 states; source of 6 rivers; 6 draft notifications since 2014.

- **ESA (Ecologically Sensitive Area)** — Declared under Environment Protection Act 1986; prohibits mining, large industry; regulates construction; different from Protected Areas (National Parks, Wildlife Sanctuaries) which are declared under Wildlife Protection Act 1972.
- **Kasturirangan Committee (2013)** — High Level Working Group on Western Ghats; chaired by K. Kasturirangan (former ISRO chief); recommended 37% of Ghats as ESA; balanced approach; basis for ongoing notification.

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12. Rakhigarhi Skeletons: DNA Tests and Facial Reconstruction

[IE] Page 8

GS 1: History: Indus Valley Civilisation; Rakhigarhi; Ancient DNA; Population Genetics; Archaeological Science.

▸ ASI + Seoul National University (SNU, South Korea): aDNA extraction and analysis of human skeletal remains from Rakhigarhi, Haryana — India's largest IVC site (350+ hectares).

▸ Facial reconstruction: 3D skull scanning + aDNA genomic data (skin colour, eye colour, hair texture prediction) + forensic reconstruction software (FACES, FaceGen) → first scientifically validated IVC facial reconstruction.

▸ 2019 Nature paper controversy: Narasimhan et al. found minimal Steppe ancestry in IVC remains — supporting the view that IVC people were primarily descended from South Asian hunter-gatherers + Iranian agriculturalists, not Steppe 'Aryans.' The 2026 study provides more comprehensive data.

▸ Site facts: Rakhigarhi, Hisar district, Haryana; 3300-1300 BCE; larger than Mohenjo-daro and Harappa combined; systematic excavation 2014-22 by ASI.

- What aDNA can tell us: (1) Population origins — where did IVC people come from; (2) Migration and genetic contact with Mesopotamia, Central Asia, Gulf — corroborating or contradicting the archaeological evidence of trade goods; (3) Disease history — what infections affected the IVC population; (4) The Aryan migration question — Steppe ancestry (associated with Indo-European language spread) in IVC genomics directly addresses one of India's most politically charged historical debates.
- Facial reconstruction technology: CT scan of skull → 3D model → aDNA genomic predictions → forensic tissue-depth standards → computer-rendered face → forensic artist refinement. Similar methodology used for Ötzi the Iceman (2022) and Pharaoh Ramesses II (2024).

UPSC ANGLE

• IVC facts for Prelims: 3300-1300 BCE; ~5 million sq km; 1,500+ sites; largest site = Rakhigarhi (India, 350 ha); script undeciphered; mature phase cities: Mohenjo-daro (Pakistan, UNESCO WHS), Harappa (Pakistan), Dholavira (Gujarat, UNESCO WHS 2021), Lothal (Gujarat — port + dockyard), Kalibangan (Rajasthan — fire altars), Banawali (Haryana — chariot); no temples found; standardised weights and measures.
• Aryan migration debate: 2019 Nature paper (IVC had no Steppe ancestry) supports the view that Aryan migration came AFTER the IVC decline — not that Aryans built the IVC. This is the mainstream academic view.

- **aDNA (Ancient DNA)** — DNA extracted from archaeological specimens; provides direct evidence of ancient populations' ancestry, migration, and biological traits; requires specialised handling; applied to IVC skeletons at Rakhigarhi.
- **Rakhigarhi** — Largest IVC site; Hisar district, Haryana; ~350 hectares; ongoing ASI excavation; aDNA analysis of skeletal remains provides new population genomics data for IVC.

13. DNA Profiling Under CPIA 2022: Over 1 Lakh Profiles Generated

[TH] Page 12

GS 2 / GS 3: Governance: Criminal Justice; DNA Profiling; CPIA 2022; Privacy; Biometrics; NCRB.

‣ NCRB has created 1 lakh+ DNA profiles under Criminal Procedure (Identification) Act 2022 — India's first formal criminal DNA database.
‣ CPIA 2022: Authorises police/prison authorities to collect biological samples (DNA, fingerprints, iris, retina, blood, hair) from arrested and convicted persons; NCRB manages the national databank.
‣ Privacy concern: Article 20(3) (right against self-incrimination); Article 21 (right to privacy — Puttaswamy judgment); DPDP Act 2023 (genetic data = sensitive personal data).
‣ DNA's over-identification problem: Unlike fingerprints (identify individual only), DNA reveals: medical conditions; family members' identities; ancestral background — far beyond criminal identification needs.

- CPIA 2022 replaced the archaic Identification of Prisoners Act 1920 (pre-Independence); modern legislation now covers 21st century biometric technologies (DNA, iris, retina) that the 1920 Act could not have anticipated.
- Familial surveillance risk: If a crime scene has DNA matching a relative of a person in the database, police can identify the relative — creating a 'genetic dragnet' affecting family members who never consented to database inclusion.
- No 'forensic regulation': CPIA has no provisions limiting inference from DNA data (medical conditions, ancestry predictions); no equivalent of US GINA (Genetic Information Non-discrimination Act) in India.

UPSC ANGLE

• Ritesh Sinha v State of UP (SC, 2019): SC held voice samples can be compulsorily collected from accused; CPIA extends this principle to DNA; critics argue DNA is qualitatively different from voice — it reveals biological identity and family connections.
• DPDP Act 2023: Classifies biometric and genetic data as 'sensitive personal data' requiring higher standards of consent and protection; CPIA's compulsory DNA collection creates a tension with DPDP principles — to be resolved by courts.

- **CPIA 2022 (Criminal Procedure Identification Act)** — Authorises police to collect biometric/biological samples from arrested/convicted persons; national databank managed by NCRB; replaced 1920 Act; privacy challenges under Articles 20(3) and 21.
- **Familial DNA search** — Using a partial DNA match in a database to identify biological relatives of a crime suspect; powerful investigative tool but creates surveillance of non-consenting relatives.

14. What Is Google's Project Nimbus and Why Are Students Protesting?

[TH] Page 11

GS 3: Science and Technology: AI Ethics; Cloud Computing; Military AI; Dual-Use Technology; Corporate Social Responsibility.

‣ Google's Project Nimbus: A $1.2 billion cloud computing contract (Google + Amazon) with Israel's Ministry of Defense and Ministry of Finance (signed 2021).
‣ Student protests: Google employees and university students (including at IIT campuses where Google recruits) protesting that Project Nimbus AI/cloud infrastructure is being used to: analyse Palestinian surveillance data; assist military targeting in Gaza and Lebanon; support Israeli military data infrastructure.
‣ Google's position: Project Nimbus provides 'normal commercial cloud services,' not offensive weapons; any military targeting use is the customer's choice.
‣ Grok-Iran precedent (June 18): US confirmed xAI's Grok was used in Iran strike planning — intensifying scrutiny of ALL tech companies providing AI/cloud to militaries.

- Project Maven (2018) parallel: Google signed with US DoD for drone imagery AI in 2018; 4,000 employees walked out; Google did NOT renew the contract — employee activism changed corporate policy. Project Nimbus protests follow the same template.

- The dual-use problem: Cloud storage, AI, satellite imagery, facial recognition — all designed for commercial use, all applicable to military targeting. The tech industry's 'we sell tools, not weapons' position is increasingly untenable.
- India's MANAV AI framework explicitly calls for human oversight of AI in military applications — the Project Nimbus controversy illustrates what happens when this principle is absent.

UPSC ANGLE

• UN GGE on LAWS: Group of Governmental Experts on Lethal Autonomous Weapons Systems — multilateral forum (India participates) trying to establish norms for AI in military targeting; Project Nimbus is cited in GGE discussions as a case study in the absence of civilian oversight.
• Tech-military nexus: JEDI contract (Microsoft, $10 billion, US DoD, 2019); Maven (Google, cancelled 2018); Project Nimbus (Google, ongoing); Grok-Iran (xAI, 2026) — the boundary between commercial cloud and military AI is permanently blurred.

- **Project Nimbus** — Google-Amazon $1.2 billion cloud contract with Israeli MoD and Finance Ministry (2021); provides AI, ML, cloud infrastructure; subject to student and employee protests over alleged use in military operations.
- **Dual-Use Technology** — Technology developed for civilian commercial purposes that can also be applied to military/security uses; cloud computing, AI, satellite imagery are all dual-use; regulation is the unsolved global challenge.

15. NTPC: Global Nuclear Players Seek India for N-Tech Partnerships

[IE] Page 13

GS 3: Science and Technology: Nuclear Energy; SMRs; NTPC; Nuclear Liability Act; India's 100,000 MW Nuclear Target.

▸ EDF (France), Westinghouse (USA), GE Hitachi (BWRX-300 SMR), Rolls-Royce (UK SMR) have all approached NTPC for nuclear technology partnerships.
▸ India's nuclear target: 100,000 MW by 2047 (from current 7,480 MW — 22 reactors); the 13x scale-up requires both NPCIL's domestic programme and NTPC's new commercial nuclear entry.
▸ NTPC nuclear subsidiary: Set up to add 20,000 MW nuclear by 2040; evaluating large PWRs and SMRs (particularly BWRX-300 at 300 MW each).
▸ Key obstacle: Civil Liability for Nuclear Damage Act 2010 places supplier liability on reactor manufacturers — unique globally; has deterred Westinghouse (Kovvada) and EDF (Jaitapur) for 15+ years.

- Why India now: Post-Hormuz energy crisis + climate commitments = nuclear is the only reliable 24x7 clean baseload option India has; solar and wind cannot provide baseload power; India has the world's 5th largest uranium reserves (Rajasthan, Jharkhand) and the largest thorium reserves (~31% of world total).

- SMR appeal for India: BWRX-300 (300 MW) can be sited near industrial clusters; replaces coal captive power plants; passive safety systems (no active cooling needed — no Fukushima-type risk); factory-manufactured and rapidly deployed.
- NTPC vs. NPCIL roles: NPCIL (DAE subsidiary): builds and operates all existing nuclear plants using India's pressurised heavy water reactor (PHWR) technology. NTPC (Ministry of Power PSU): first time entering nuclear; will use imported technology; greater commercial flexibility to negotiate liability terms.

UPSC ANGLE

• Thorium fuel cycle: India has the world's largest thorium reserves; BARC (Bhabha Atomic Research Centre) has been developing a thorium-based 3-stage nuclear fuel cycle (Stage 1: Natural uranium PHWRs; Stage 2: Fast breeder reactors; Stage 3: Thorium reactors) for decades. India is the only country pursuing a commercial thorium fuel strategy.

• PFBR (Prototype Fast Breeder Reactor): Under construction at Kalpakkam, Tamil Nadu; 500 MW; Stage 2 of India's 3-stage nuclear programme; repeatedly delayed; critical for India's long-term nuclear energy and thorium utilisation.

- **SMR (Small Modular Reactor)** — Nuclear reactor ≤300 MW; pre-fabricated; passive safety; faster deployment; BWRX-300 (GE Hitachi) = leading design evaluated by NTPC; suitable for industrial clusters and remote areas.
- **Nuclear Liability Act 2010** — Places supplier liability (not just operator liability) for nuclear accidents on reactor manufacturers; global anomaly; has deterred Western nuclear companies from India deals; key obstacle for Jaitapur and Kovvada projects.

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16. Biochar: Turning India's Farm Smoke Into 'Black Gold'

[TH] Page 22

GS 3: Environment: Agriculture; Stubble Burning; Carbon Sequestration; Soil Health; Climate Solutions; CCTS.

▸ Biochar = charcoal-like substance produced by pyrolysis (400-700°C, low-oxygen burning) of crop stubble, wood, agricultural waste.

▸ Dual solution: Converts stubble (which would be burned, causing Delhi's winter PM2.5 crisis) into a soil amendment that sequesters carbon for centuries.

▸ Soil benefits: Increases water retention; improves pH; boosts soil microbial activity; reduces fertiliser leaching; increases organic carbon — directly addressing India's soil degradation crisis.

▸ Carbon sequestration: Each tonne of biochar sequesters 2-3 tonnes CO_2 equivalent; if India converts 160 million tonnes of annual crop residue to biochar, could sequester 300-500 million tonnes CO_2/year — ~25% of India's annual emissions.

- India's stubble burning crisis: Punjab + Haryana burn ~35 million tonnes of paddy stubble annually (October-November); contributes 30-50% of Delhi's peak winter PM2.5; PPCB penalises farmers but without viable cheaper alternative, enforcement fails.
- ICAR field trials: 3-5 tonnes biochar/hectare in Punjab and UP shows: wheat yield ↑8-12%; irrigation requirement ↓15-20%; nitrogen use efficiency ↑20-25%.

- Village-level kiln economics: Semi-continuous retort pyrolysis kiln costs Rs 2-4 lakh; processes 1-2 tonnes stubble/day; produces syngas (rural cooking fuel) + biochar (Rs 8,000-12,000/tonne market price); carbon credit potential at $15-20/tonne CO_2 = Rs 15,000-20,000/hectare additional farmer income.
- Policy gap: India's National Bioenergy Mission covers biogas and CBG but has not formally integrated biochar; adding biochar under PM-KUSUM or a separate scheme would transform stubble management economics.

UPSC ANGLE

• Biochar + Carbon Credits + CCTS: India's Carbon Credit Trading Scheme (CCTS, 2023) can issue verified carbon credits for biochar sequestration; this is the game-changer — farmers earn carbon income while solving the stubble burning and soil degradation problems simultaneously.

• Terra Preta (Black Earth): Pre-Columbian Amazonian civilisations created 'terra preta' — charcoal-enriched soil — which remained fertile for 2,000+ years. Biochar is a modern rediscovery of this ancient soil management technique.

- **Biochar** — Carbon-rich charcoal produced by pyrolysis; sequesters 2-3 tonnes CO_2 per tonne for centuries; improves soil water retention, pH, microbial activity; turns stubble burning problem into climate + agricultural solution.
- **Pyrolysis** — High-temperature (400-700°C), low-oxygen thermal decomposition of organic matter; produces biochar (solid) + syngas (combustible gas) + bio-oil; distinct from combustion (which requires oxygen, produces CO_2).

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17. Guardrails in AI Growth to Protect Developing Nations

[IE] Page 9

GS 3: Science and Technology: AI Governance; Digital Divide; Global South; India's AI Policy; MANAV Framework; IndiaAI Mission.

▸ Analysis: As AI systems from the Global North (ChatGPT, Gemini, Grok) embed in developing world economies, absence of guardrails creates asymmetric risks.

▸ Four key risks for developing nations: (1) AI job displacement — 30% of tasks in 60% of occupations automatable by 2030 (McKinsey); developing economies have large populations in vulnerable jobs; (2) Cultural bias — AI trained on English/Western data disadvantages others; (3) Data colonialism — user data from developing countries trains models sold back at high cost; (4) Regulatory capture — powerful AI companies lobby against protective regulation.

▸ India's MANAV Framework (G7 Évian): Open-source foundation models for Global South; technology transfer for AI infrastructure; digital public goods as global commons; human oversight of AI in critical decisions.

▸ IndiaAI Mission: Rs 10,371 crore; indigenous AI compute; Bhashini (22 Indian language AI translation); 'AI sovereignty' — ability to train and deploy AI without dependence on Western companies.

- The guardrails India wants globally: (1) Mandatory use disclosure — AI must identify itself; (2) Prohibited uses — autonomous lethal decisions, denial of essential services without human review; (3) Interoperability — AI systems must work across platforms (no

lock-in); (4) Data reciprocity — developing country user data shared with their regulators.

- Bhashini: India's AI language platform supporting 22 scheduled languages; API access for Indian startups; critical for digital inclusion of non-English speakers (the vast majority of India's 1.4 billion).

UPSC ANGLE

• The India-EU AI alignment: India's MANAV and EU's AI Act (2024) share principles — human oversight, prohibited high-risk uses, transparency — making India-EU AI governance cooperation a natural fit in the upcoming India-EU CEPA.
• AI and development: The UN's SDG 17 (partnerships for the goals) requires technology transfer for sustainable development; if AI is the defining technology of the 21st century, ensuring Global South access and governance voice is both an equity and a stability imperative.

- **MANAV** — Multinational AI Governance for Accountability and Values — India's global AI governance framework; open-source AI for Global South; human oversight mandates; digital public goods; presented at G7 Évian and VivaTech 2026.
- **Bhashini** — India's AI translation platform for 22 scheduled Indian languages; open API for startups; critical for digital inclusion; part of IndiaAI Mission.

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18. Road to Energy Security Passes Through Our Farms

[IE] Page 10

GS 3: Economy/Environment: Agri-Energy Nexus; CBG; PM-KUSUM; GOBAR-Dhan; Farm-to-Fuel; Biomass Energy; Energy Security.

▸ Column: India's energy security route lies in mobilising agricultural biomass — crop residue (680M tonnes/yr), cattle dung (600M tonnes/yr) — to produce CBG, biochar, and farm solar.
▸ CBG potential: 18 MMTPA from crop residue + cattle dung = 18% of India's current natural gas consumption; replaces imported LNG.
▸ PM-KUSUM: Solar pumps + rooftop solar for farmers + grid-connected solar on barren farmland; reduces diesel dependence; makes farmers energy producers, not just consumers.
▸ GOBAR-Dhan: Biogas + CBG from organic waste; target 10,000 CBG plants by 2025; actual: ~1,200 plants — significant underachievement needing policy push.

- Three crises one solution: (1) Stubble burning → air pollution → biochar/CBG converts stubble to value; (2) Fertiliser shortage (Iran-war Hormuz disruption) → biogas slurry as organic fertiliser replaces synthetic fertiliser; (3) Fossil fuel import dependence → CBG + solar reduces oil/LNG import bill.
- Farm-to-fuel circular economy: Cattle dung → anaerobic digestion → biogas (cooking + power) → digestate/slurry (organic fertiliser) → improved crop yield → more crop residue → more biogas.
- Economic case: Farmer with solar pump (PM-KUSUM) + biogas plant (GOBAR-Dhan) + biochar production = energy independent, lower input costs, carbon income from credits — a potential rural income transformation.

UPSC ANGLE

• Agri-energy is the intersection of GS3's two biggest topics: Agriculture (PM-KISAN, PM-KUSUM, fertiliser policy, crop residue management) and Energy (renewable energy, import dependence, Hormuz crisis, National Green Hydrogen Mission). Combined essays on 'agricultural solutions to India's energy challenges' are likely UPSC topics.

- **CBG (Compressed Biogas)** — Natural gas equivalent from organic waste via anaerobic digestion; compressed for use as vehicle fuel or cooking gas; India's GOBAR-Dhan scheme promotes production from agricultural waste.
- **PM-KUSUM** — Solar energy for farmers; 3 components: solar pumps, standalone solar, grid-connected farm solar; reduces diesel + grid power dependence; makes farmers energy prosumers.

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19. A 10 Per Cent Rule for Sustainable Development

[IE] Page 11

GS 3: Economy/Environment: Sustainable Development; Biodiversity; Kunming-Montreal Framework; 30x30 Target; Ecosystem Services.

▸ Column proposes a '10% rule': Governments and businesses should set aside 10% of land, revenue, and budget for nature conservation — as a baseline sustainability commitment.

▸ Draws from: Kunming-Montreal Global Biodiversity Framework (COP15, December 2022) '30x30 target' — protect 30% of Earth's land and 30% of oceans by 2030; '10% rule' is an interim achievable target.

▸ India's forest cover: ~24% of territory (~8,09,537 sq km); NDC target: 33%; reaching 33% requires adding ~75,000 sq km of forest cover.

▸ Economic argument: Countries that invest in natural capital receive 2-5x returns through avoided climate damage, water security, food security, disaster cost avoidance.

- India's Protected Area Network: 903 protected areas covering ~1,68,000 sq km (~5.1% of India's territory); to reach even 10% would require nearly doubling the PA network — major political and land-use challenge.
- Kunming-Montreal Framework (2022): 196 countries; 30% land and 30% ocean protection by 2030; $200 billion/year biodiversity finance; halt and reverse biodiversity loss by 2030. India is a CBD party (ratified 1994).
- Ecosystem Services valuation: Forests provide: watershed protection (~Rs 5 lakh crore/year in avoided water crisis costs); carbon sequestration (Rs 2 lakh crore/year at carbon credit prices); biodiversity (unmeasured but enormous pharmaceutical/agricultural value). The Dasgupta Review (2021) estimated nature's services to the global economy at $125-140 trillion/year — 1.8x global GDP.

UPSC ANGLE

• CBD (Convention on Biological Diversity): Adopted 1992 Rio; three objectives: biodiversity conservation, sustainable use, fair benefit-sharing from genetic resources; India ratified 1994; National Biodiversity Act 2002 implements CBD in India.

• India as mega-diverse country: One of 17 globally; 12.5% of world's biodiversity; 4 biodiversity hotspots (Himalayas, Western Ghats, Indo-Burma, Sundaland); 903 PAs; Project Tiger (50+ reserves), Project Elephant, Project Dolphin, Project Leopard — India's conservation programmes.

- 📌 **Kunming-Montreal Framework** — COP15 (CBD) 2022; '30x30' — protect 30% of Earth's land + 30% oceans by 2030; $200 billion/year biodiversity finance; 196 countries.
- 📌 **Ecosystem Services** — Benefits that natural ecosystems provide to humanity — provisioning (food, water), regulating (climate, floods), cultural (recreation, spiritual), supporting (nutrient cycles, soil formation); valued at $125-140 trillion/year globally.

PRELIMS IN FOCUS

Bürgenstock Resort, Switzerland	Location: Canton Nidwalden, Switzerland; luxury mountain resort 500m above Lake Lucerne. Previous significance: Ukraine Peace Summit (June 2024, 90+ nations; Russia and China excluded). Current: US-Iran Phase 2 nuclear talks, June 21-22, 2026. Switzerland's neutrality: permanent since 1815 Congress of Vienna; not NATO member; hosts ICRC, WHO, UNHCR, WTO, many UN agencies in Geneva; preferred venue for sensitive international negotiations.
India–EU FTA / CEPA Key Facts	Negotiations began: 2007. Stalled: 2013-2021. Revived: June 2022 (Modi-von der Leyen Brussels summit). Signing target: December 2026. EU: 27 member states; $17 trillion GDP; India's largest combined trading partner; €120 billion/year bilateral trade. Provisions: Near-zero EU tariffs on Indian goods; 124 EU service sub-sectors opened; 250+ Indian GI tags; CBAM transition period for India; Investment Court System (modified ISDS). Comparison: India-UK CETA effective July 15, 2026 (UK post-Brexit bilateral); India-EU CEPA December 2026 (EU as bloc).
Western Ghats ESA — Key Facts	Western Ghats: 1,600 km, 6 states (Gujarat-Goa-Maharashtra-Karnataka-Kerala-Tamil Nadu); UNESCO WHS (2012); biodiversity hotspot; source of 6 major rivers. Gadgil Committee (2011): 100% ESA; WGEEP; Western Ghats Ecology Authority; 3 tiers; too strict, rejected. Kasturirangan Committee (2013): 37% ESA (~60,000 sq km); balanced; 2 tiers; 6 draft notifications. June 2026: Govt finalising ESA for Gujarat, Goa, Maharashtra; Kerala and Karnataka still negotiating. Wayanad landslides (July 2024): 230+ deaths; renewed ESA urgency. ESA prohibits: mining, quarrying, large industry, new townships.
India's Space Programme — Milestones	Chandrayaan-3 (August 23, 2023): Vikram lander near lunar South Pole — India FIRST; Pragyan rover; sulphur detected. Aditya-L1 (2023): L1 Lagrange point; solar wind + corona monitoring. Gaganyaan: TV-D1 abort test (2023); 2 uncrewed tests (2025); crewed mission late 2026. IN-SPACe: Regulator for private space; 75+ startups. NSIL: Commercial launches ($800M+); OneWeb, Amazon Kuiper via LVM3. Skyroot Aerospace: Vikram-S (2022) = first private Indian rocket. Space

	Economy: $8.4B (2023) → $44B by 2033 target. ISRO Chairman 2026: S. Somanath (also led Chandrayaan-3).

Biochar — Complete Profile	What: Charcoal-like material; produced by pyrolysis (400-700°C, low O_2) of organic matter (crop stubble, wood, dung). Carbon: Each tonne sequesters 2-3 tonnes CO_2 for centuries — one of most effective carbon sequestration methods. Soil: Water retention ↑; pH improved; microbial habitat; fertiliser leaching ↓; organic carbon ↑. India stubble context: 35 MT paddy stubble burned annually (Punjab-Haryana); contributes 30-50% Delhi peak winter PM2.5. ICAR trials: 8-12% yield increase; 15-20% irrigation reduction. Carbon credits: $15-20/tonne CO_2 = Rs 15,000-20,000/ha additional farmer income. Policy gap: Not yet formally in India's bioenergy mission — proposed addition.

Kunming-Montreal Framework (2022) — CBD COP15	COP15 (Convention on Biological Diversity, 15th Conference of Parties); held Montreal, Canada, December 2022. '30x30 Target': Protect 30% of Earth's LAND area + 30% of Earth's OCEAN by 2030. Biodiversity finance: $200 billion/year from all sources (public + private). Other targets: Halt and reverse biodiversity loss by 2030; reduce harmful subsidies (pesticides, fossil fuels) by $500 billion/year; benefit sharing from genetic resources. India: CBD party (ratified 1994); National Biodiversity Act 2002; 903 Protected Areas covering 5.1% of territory; National Biodiversity Action Plan needs updating to include 30x30. India's mega-diverse status: 1 of 17 mega-diverse countries; 4 biodiversity hotspots.

MAPPING — PLACES IN NEWS

Place	Why in News / Key Facts
Bürgenstock, Switzerland	US-Iran Phase 2 nuclear talks (June 21-22, 2026); luxury resort, Lake Lucerne, Canton Nidwalden; previously hosted Ukraine Peace Summit (June 2024); Switzerland's permanent neutrality since 1815 makes it the preferred venue for US-adversary diplomacy.
Wayanad, Kerala	Mundakkai landslides (July 2024, 230+ deaths) that triggered renewed urgency for Western Ghats ESA notification; located in the biodiversity hotspot zone of the Ghats; also Nipah outbreak history (2018, 2019); coffee/tea/spice plantation belt.
Rakhigarhi, Haryana	India's largest IVC site (350+ ha); Hisar district; ASI + Seoul National University aDNA and facial reconstruction project; 3300-1300 BCE; ASI declared a 'Mega Site.'
Jaitapur, Maharashtra	Proposed 9,900 MW nuclear power park (6 EPR reactors, EDF France); Ratnagiri district; largest planned nuclear plant in the world; stalled since 2010 over Nuclear Liability Act and local opposition; discussed in NTPC nuclear partnerships context.

Moreh, Manipur	India-Myanmar land border crossing; gateway for Act East Policy trade; India-Myanmar-Thailand Trilateral Highway starts here; strategic for Ashtalakshmi NE framework; Manipur-Myanmar drug trafficking route.
Bogibeel, Assam	India's 2nd longest rail-road bridge (4.94 km) across the Brahmaputra; connects Dibrugarh (south bank) to Dhemaji-Arunachal (north bank); inaugurated 2018; strategic for Arunachal Pradesh logistics; in Ashtalakshmi PIB.
Dahej, Gujarat	India's largest LNG terminal (10 MMTPA); Petronet LNG; LNG tanker Disha arrived here June 18 (first Qatari LNG cargo post-Hormuz reopening); Gulf of Khambhat, Bharuch district; also India's largest chemical industrial cluster.
Subansiri River, Arunachal	Site of Subansiri Lower Hydroelectric Project (2,000 MW) — one of India's largest under-construction hydro projects; on Subansiri River (Brahmaputra tributary); in Arunachal Pradesh near Assam border; repeatedly delayed due to protests (completed structure may cause earthquakes); part of NE hydro development in Ashtalakshmi framework.

End of Notes · 22 June 2026 · UPSC with Saurabh Kaushik

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