IAS WITH DR RAVI
AIM. PREPARE. ACHIEVE

DAY 21 | COMPLETE PICTOGRAPHS

Topics 201–210 | Student edition

10 topics | 96 teaching pages | 4 teaching-page indexes

Concept diagrams and worked examples; no standalone MCQs.

Concept diagrams and worked examples for daily revision.

201 Tripartite struggle for Kanauj

Pages 6–14

202 Dutch, Danes and French companies

Pages 15–23

203 United Nations: principal organs

Pages 24–33

204 Central Vigilance Commission and CBI

Pages 34–43

205 Nominal GDP, real GDP and the deflator

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206 Andhra Pradesh: crops and agriculture

Pages 55–63

207 NAPCC: eight missions and dated NDC targets

Pages 64–73

208 Communication and listening

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209 Exponents and powers

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210 Padma Awards 2026

Pages 93–101

How to use this set

Use the concept diagrams and worked examples to build understanding.
Page IDs identify each visual; original numbered sections appear within teaching panels.
Keep historical records, dated updates, targets and achievements distinct.
Concept art is schematic, not a verified map, portrait or historical reconstruction.

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2.1 – 2.2 Why three powers wanted Kanauj

1. After Harsha

Harsha died about 647 without an heir. His empire fragmented, but Kanauj in the Ganga valley remained a prized centre.



2. Three rivals, one prize

Their long rivalry for Kanauj is the tripartite struggle.

Gurjara-Pratiharas
Gujarat and Rajasthan

Palas
Bengal

Kanauj

Rashtrakutas
Western Deccan

- Political prestige (imperial capital)
- Fertile agriculture (rich Ganga valley)
- Control of trade routes (link to north Indian commerce)

3. Why Kanauj mattered

Holding Kanauj symbolised sovereignty over north India and control of the agriculturally rich upper Gangetic valley.

Political prestige: Satish Chandra.

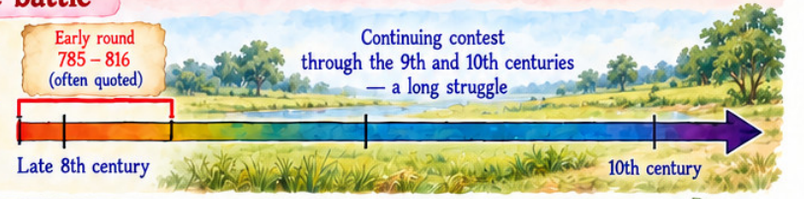
4. How new powers arose

Samantas (subordinates) → Powerful chiefs → Independent dynasties

Some claimed titles such as maha-samanta and maha-mandaleshvara. The Rashtrakutas were one example.

5. A long contest, not one battle

Late 8th century into the 10th century. NCERT describes a contest lasting centuries; NIOS gives about 150 years. The often-quoted 785–816 span covers only an early round.



Battle victories and lasting control are not the same.

Concept illustrations; buildings and symbols are schematic.

The Palas: from disorder to regional power

1. Bengal and Bihar

The Pala dynasty ruled in eastern India from the 8th to the 12th century. Britannica identifies Mudgagiri (Munger) as its main capital.



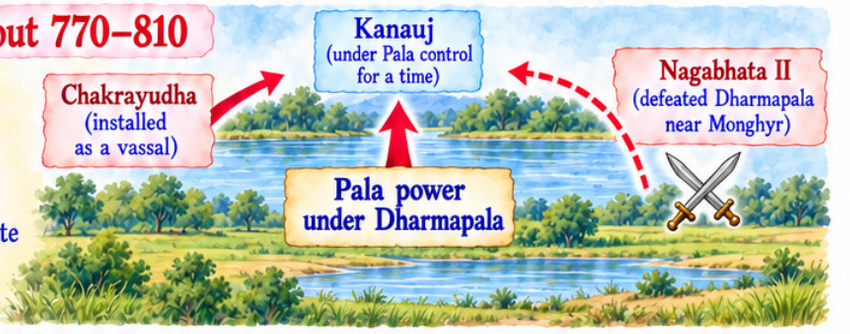
2. Gopala: mid-8th century

Gopala rose during anarchy, described as *matsyanyaya* or 'fish justice'. Satish Chandra says notable men chose him to end disorder. The Khalimpur copper plate uses prakriti; this does not establish a modern popular vote.



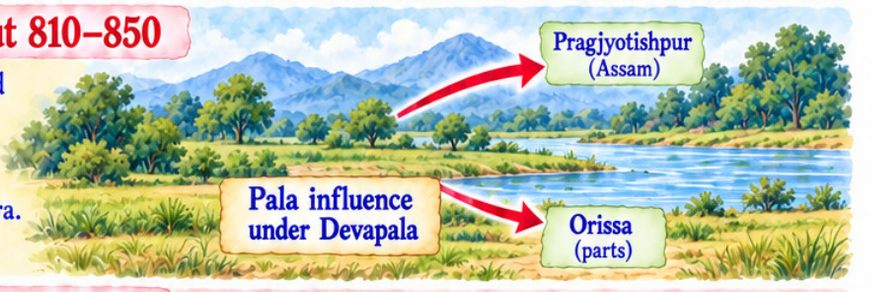
3. Dharmapala: about 770–810

Gopala's son expanded Pala power and for a time controlled Kanauj. He installed Chakrayudha as a vassal and held a grand darbar attended by subordinate rulers, Nagabhata II later defeated him near Monghyr.



4. Devapala: about 810–850

Dharmapala's son extended Pala influence toward Pragjyotishpur (Assam) and parts of Orissa, according to Satish Chandra.



5. A later revival, then decline

Mahipala I, about 988–1038, restored Pala strength. In the 12th century, the Senas eclipsed the Palas. The dynasty endured far longer than its brief control of Kanauj.

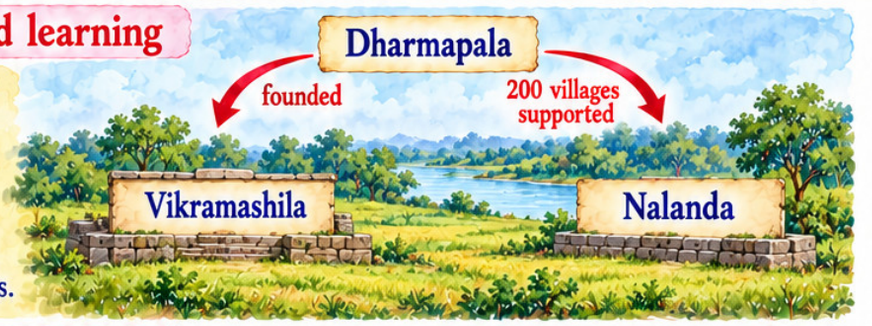


Concept illustrations; buildings and symbols are schematic.

Pala patronage: learning, Buddhism and trade

1. Dharmapala and learning

Dharmapala founded Vikramashila near Bhagalpur in Bihar. Satish Chandra and NIOS also describe his revival of Nalanda, supported by 200 villages.



2. Vikramashila and Tibet

The Palas supported Buddhism. Vikramashila attracted students from Tibet; Atisha Dipankara is a prominent name associated with it. Buddhist connections linked eastern India and Tibet.



3. Trade with Southeast Asia

Trade enriched Bengal. Shailendra rulers sent embassies to the Pala court and obtained permission to build a monastery at Nalanda.



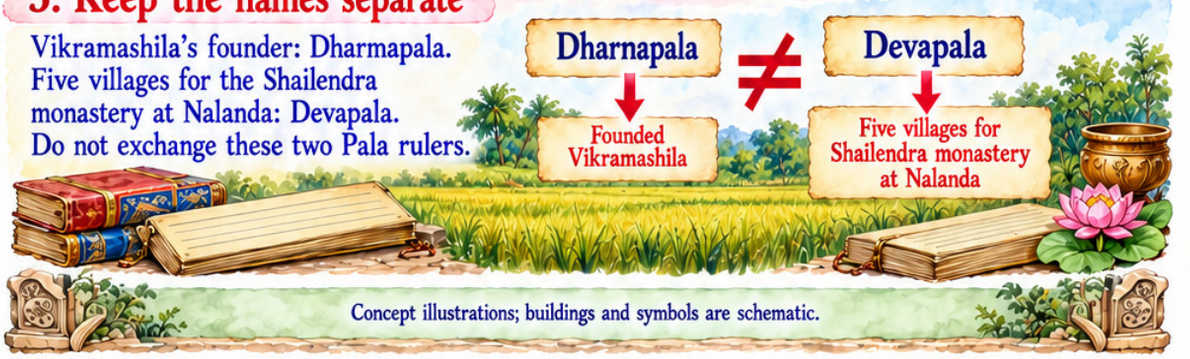
4. Devapala's patronage

Devapala endowed five villages for that Nalanda monastery. The Shailendra ruler is identified as Balaputradeva in the supplied source record.



5. Keep the names separate

Vikramashila's founder: Dharmapala.
Five villages for the Shailendra monastery at Nalanda: Devapala.
Do not exchange these two Pala rulers.



Concept illustrations; buildings and symbols are schematic.

Gurjara-Pratiharas: the rulers exam questions mix up

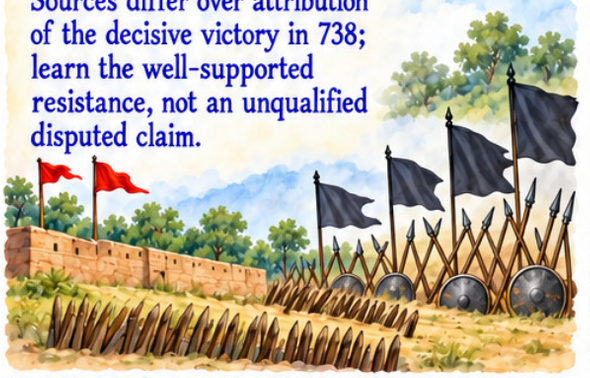
Different lines, different 'founders'

NCERT names Harichandra in Rajasthan; NIOS names Nagabhata I in Malwa, Britannica distinguishes the Harichandra line at Mandor from the imperial Nagabhata line, first at Ujjain and later Kanauj, Satish Chandra calls Mihira Bhoja the 'real founder' of the empire.



Nagabhata I

Resisted Arab expansion from Sind in the 8th century. Sources differ over attribution of the decisive victory in 738; learn the well-supported resistance, not an unqualified disputed claim.



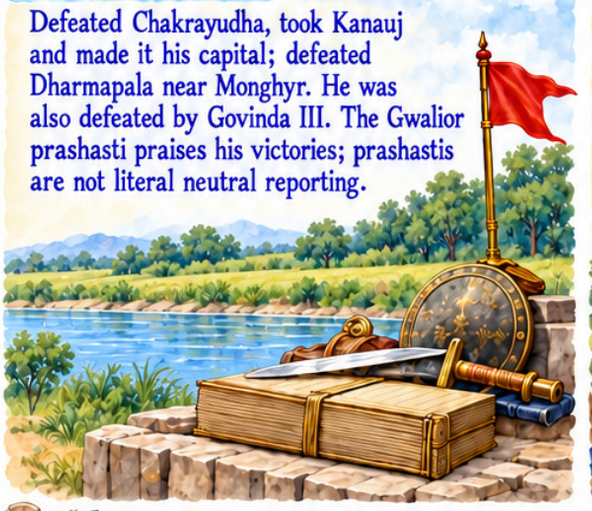
Vatsaraja

Defeated Dharmapala, then lost to the Rashtrakuta Dhruva and took refuge in the deserts of Rajasthan.



Nagabhata II

Defeated Chakrayudha, took Kanauj and made it his capital; defeated Dharmapala near Monghyr. He was also defeated by Govinda III. The Gwalior prashasti praises his victories; prashastis are not literal neutral reporting.



Mihira Bhoja and Mahendrapala I

After Ramabhadra's brief reign, his son Bhoja rebuilt the empire and recovered Kanauj by about 836. A Vishnu devotee, Bhoja used Adivaraha; he died about 885. Mahendrapala I succeeded him and ruled until about 908–09.





Concept illustrations; buildings and symbols are schematic.

Rashtrakutas: rise and northern interventions

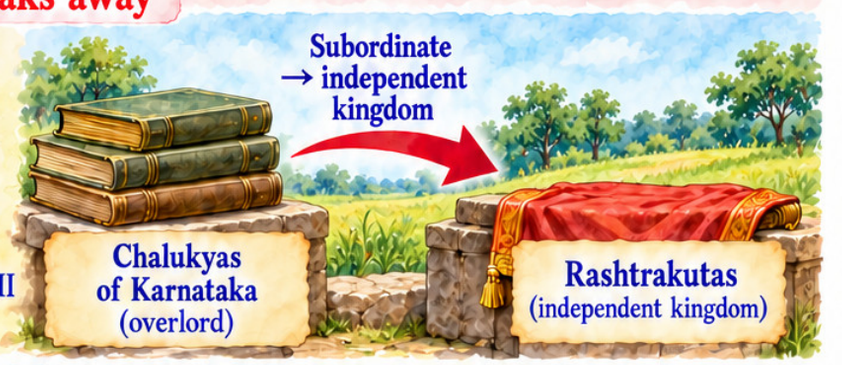
1. Western Deccan base

The royal family came from Lattalur (Latur). Manyakhet (Malkhed) was the capital. Britannica dates the dynasty to about 755–975.



2. Dantidurga breaks away

The Rashtrakutas began as subordinates of the Chalukyas of Karnataka. In the mid-8th century, Dantidurga overthrew his overlord. His Samangadh plate of 753 records victory over Kirtivarman II of Badami.



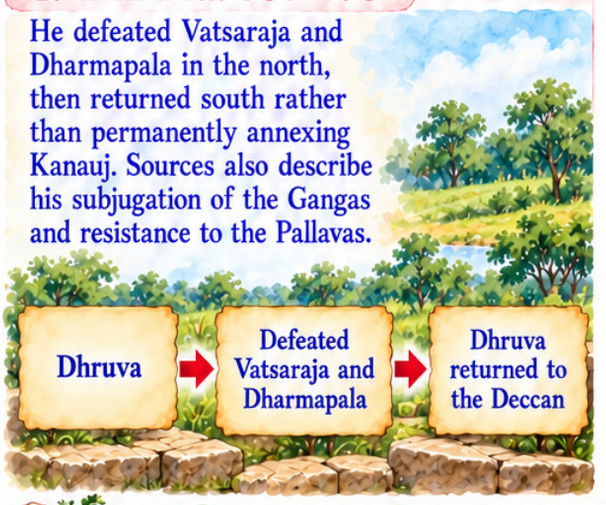
3. Hiranya-garbha

NCERT explains the 'golden womb' ritual: performed with Brahmanas, it was believed to bring rebirth as a Kshatriya, even if the performer was not one by birth. This is a historical belief, not a biological claim.



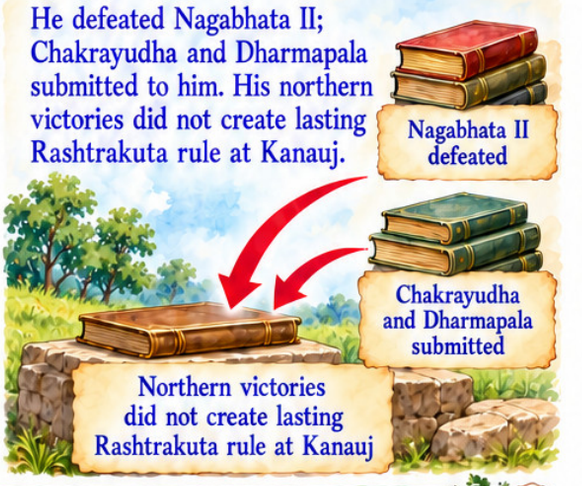
4. Dhruva: 780–793

He defeated Vatsaraja and Dharmapala in the north, then returned south rather than permanently annexing Kanauj. Sources also describe his subjugation of the Gangas and resistance to the Pallavas.



5. Govinda III: 793–814

He defeated Nagabhata II; Chakrayudha and Dharmapala submitted to him. His northern victories did not create lasting Rashtrakuta rule at Kanauj.



Concept illustrations; buildings and symbols are schematic.

Rashtrakuta culture, later campaigns and decline

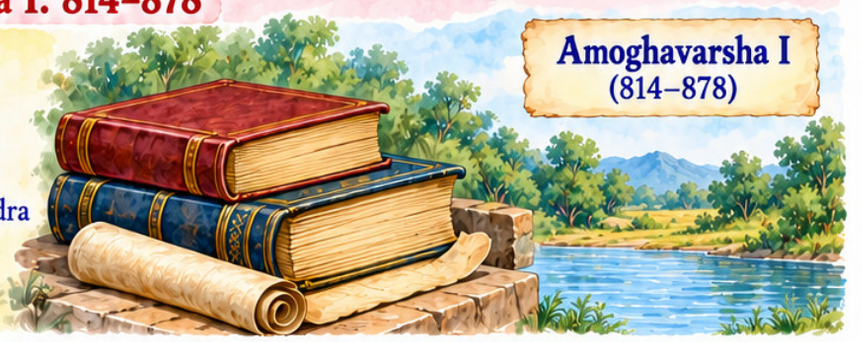
1. Krishna I and Kailasa

Krishna I, about 756–773, is credited with the rock-cut Kailasa temple at Ellora. These reign dates place it in the 8th century; the supplied Satish Chandra passage gives a conflicting 9th-century description.



2. Amoghavarsha I: 814–878

His 64-year reign is associated with religion and literature. He is credited with part of the Kannada Kavirajamarga, described by Satish Chandra as a work on poetics. He is said to have followed Jainism.



3. Indra III

He came to the throne in 914 and captured Kanauj. Satish Chandra places its devastation between 915 and 918; another source gives 916. Keep the date range rather than invent a single uncontested year.



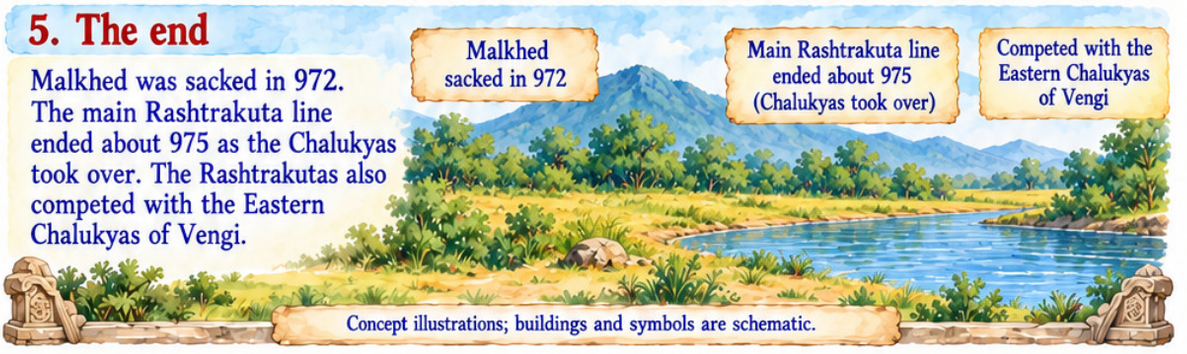
4. Krishna III

Northern campaigns are recorded around 940. Satish Chandra dates his defeat of the Pratihara ruler to about 963.



5. The end

Malkhed was sacked in 972. The main Rashtrakuta line ended about 975 as the Chalukyas took over. The Rashtrakutas also competed with the Eastern Chalukyas of Vengi.



Concept illustrations; buildings and symbols are schematic.

Arab travellers: evidence, not a census.

1. Sulaiman on regional powers

The Arab writer Sulaiman praised the Gurjara ruler's cavalry. NIOS notes his praise for security from robbers under Mihira Bhoja.



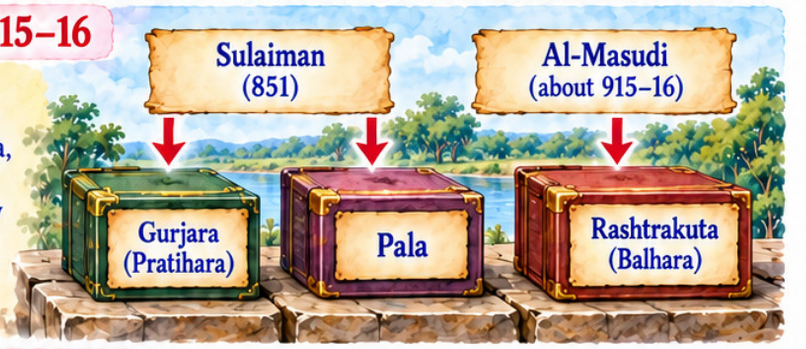
2. Reports about Pala strength

Sulaiman (851) reported 50,000 elephants accompanying the Pala king. He also ranked the Balhara—the Rashtrakuta ruler—among four great kings, alongside the Caliph and the rulers of Byzantium and China. Treat the elephant count as a traveller's report, not a verified census.



3. Al-Masudi: about 915–16

Al-Masudi visited Gujarat. He called the Rashtrakuta ruler Balhara, from Vallabharaja, and described him as India's greatest king, whose supremacy many rulers accepted. He called the Pratihara kingdom al-Juzr, a form of Gurjara.



4. Keep political meaning clear

Prestige in a traveller's account, victory in a campaign and permanent territorial control are different claims. None alone proves uninterrupted rule over Kanauj.



5. How to read historical evidence

Identify the writer, the dynasty and the nature of the statement. Royal praise inscriptions and travellers' descriptions must be interpreted, not automatically read as literal statistics.

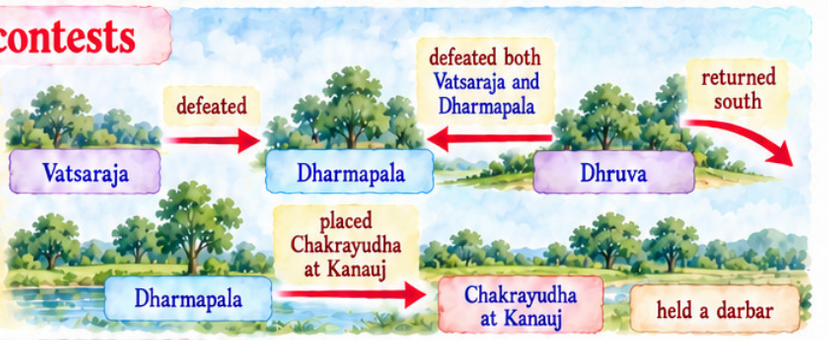


Concept illustrations; buildings and symbols are schematic.

Rounds of struggle: victories and changing control

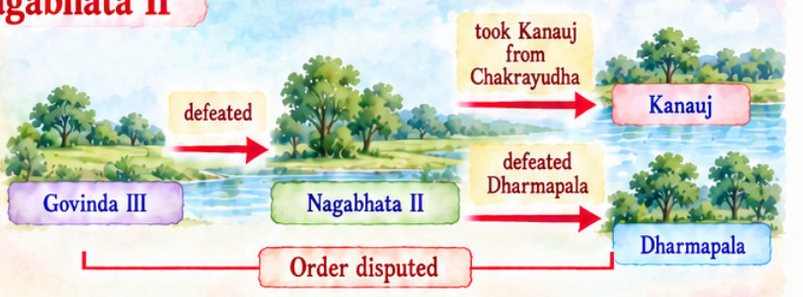
1. First northern contests

Vatsaraja defeated Dharmapala; Dhruva defeated both and returned south. Dharmapala then placed Chakrayudha at Kanauj and held a darbar.



2. Govinda III and Nagabhata II

Govinda III defeated Nagabhata II. Nagabhata II took Kanauj from Chakrayudha and defeated Dharmapala. Sources disagree on the exact order and date of these events; do not force them into one certain sequence.



3. Pratihara consolidation

By about 836, Mihira Bhoja had recovered Kanauj. It remained the Pratihara capital for almost a century. The Pratiharas became dominant in northern India from the early 9th to the middle of the 10th century.



By about 836, Mihira Bhoja had recovered Kanauj.
↓
It remained the Pratihara capital for almost a century.
↓
The Pratiharas became dominant in northern India from the early 9th to the middle of the 10th century.

4. Later Rashtrakuta blows

Indra III devastated Kanauj between 915 and 918 in Satish Chandra's account. Krishna III defeated the Pratihara ruler around 963.



5. After the contest

The Pratihara empire fragmented. Mahmud of Ghazni captured Kanauj in 1018. Pala rule continued in Bengal and Bihar beyond the main struggle.



Broad sequence—not to scale

Early contests (order disputed) → Bhoja recovers Kanauj c. 836 → Indra III: 915–918 → Krishna III: c. 963 → Mahmud: 1018

Concept illustrations; buildings and symbols are schematic.

Outcome and three examination traps

1. Who held Kanauj longest?

The Gurjara-Pratiharas. Rashtrakuta rulers repeatedly won northern campaigns or sacked the city, then returned to the Deccan; victory did not mean long-term possession.



2. What the struggle changed

After Krishna III's blow about 963, the Pratihara empire broke up. By the end of the 10th century it held little more than the Doab. Mahmud captured Kanauj in 1018 and Rajyapala fled. NIOS highlights the rise of the Rajputs in this age.



3. Three examination traps

Trap 1: capture means permanent rule

False. Indra III's capture of Kanauj does not prove long Rashtrakuta occupation. Distinguish winning a battle, sacking a city and ruling from it.

✗ **Wrong idea**
A capture = permanent rule



✓ **Correct view**
A capture can be a brief campaign or sack, not long-term rule



Trap 2: Gopala won a popular election

The evidence points to notable men or leading chiefs choosing him to end disorder. Prakriti does not prove universal adult voting; Taranatha's much later story is not contemporary evidence.

✗ **Wrong idea**
Gopala won a popular election



✓ **Correct view**
Notable men or leading chiefs chose him to end disorder



Trap 3: one war, 785–816

Those years describe only an early phase. NCERT says centuries; NIOS gives about 150 years. Bhoja's recovery around 836 and Indra III's later sack belong to subsequent rounds.

✗ **Wrong idea**
The struggle ended in 785–816

✓ **Correct view**
The struggle continued well beyond 816 for about 150 years

785–816

Continued into the 9th and 10th centuries (about 150 years)



Concept illustrations; buildings and symbols are schematic.

2.1 Companies competing for the same trade

Company foundation is not the date of its first factory.

English

charter 31 December 1600



Masulipatnam factory, 1611

Dutch VOC

founded 1602



Masulipatnam, 1605

Danish

chartered 1616



Tranquebar, 1620

French

founded 1664



Surat, 1668

A factory means a trading post, not a modern manufacturing plant.

Why competition became conflict

The companies wanted the same Indian goods.



Competition raised purchase prices.



Ships were attacked and routes blockaded.



Trading posts were fortified.



Trade and armed force grew together; this was not simply peaceful buying and selling.

Recall

Portuguese arrival, 1498 (Topic 171).

English–French rivalry and the three Carnatic Wars (Topic 61).



Exam traps

- The English company was older than the VOC, even though the Dutch company began with much more capital.
- Masulipatnam had several companies' factories: Dutch 1605 ≠ English 1611 ≠ French 1669. Always identify the company.



Concept illustrations; buildings and symbols are schematic.

2.2 VOC: Indian textiles and Asian spices

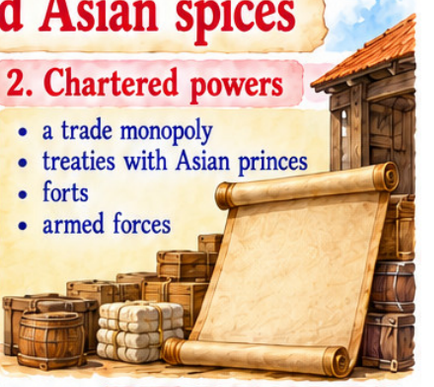
1. VOC: Vereenigde Oost-Indische Compagnie

Vereenigde Oost-Indische Compagnie — United East India Company; founded in the Dutch Republic in **1602**.



2. Chartered powers

- a trade monopoly
- treaties with Asian princes
- forts
- armed forces



3. Commercial connection



4. Dutch interests

The main Dutch interest lay in the East Indies (Indonesia), not in building a large Indian territorial empire.



5. Key events in Indonesia

1619: Jacatra renamed Batavia (now Jakarta), a base for expansion in Java.



1623: Amboina massacre of English traders marked the intensity of Anglo-Dutch rivalry in Indonesia.



6. Indian settlements and goods

Masulipatnam 1605
earliest Dutch factory on the Coromandel coast in the supplied settlement account.



Pulicat
capital of Dutch Coromandel from **1610**.
Fort permission **1608**; Fort Geldria **1613** in the Dutch Coromandel/Pulicat accounts.



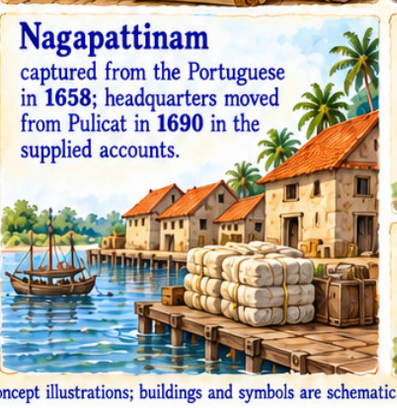
Surat 1616
west-coast factory.



Dutch Bengal 1627
factory at Hugli-Chuchura; saltpetre and opium.
Do not equate the regional date with the factory's foundation: Britannica gives Chinsura factory **1656**.



Nagapattinam
captured from the Portuguese in **1658**; headquarters moved from Pulicat in **1690** in the supplied accounts.



Cochin 1663
taken from the Portuguese; Malabar pepper trade.



Other acquisitions
Ceylon **1656**;
Pondicherry held by the Dutch, **1693–1699**.



Concept illustrations; buildings and symbols are schematic.

2.3 Dutch posts on the Andhra coast

1. Masulipatnam

Set up 1605 → Given up 1756

2. Nizampatnam

Set up 1606 → Given up 1668

3. Palakollu

Set up 1613 → Temporarily given up 1730

4. Draksharama

Set up 1633 → Given up 1730, for Jagannathapuram.

5. Bimlipatnam (Bheemunipatnam)

Set up 1652 → Fortified 1758 → Held until 1825

A post's events are different

Read each post as a separate life cycle, not as one common date of departure.

A post's foundation, its fortification and its closure are different events.

Example: Bimlipatnam 1652 is the post; 1758 is the fort; 1825 is the end of Dutch possession.

Location trap

Pulicat town is in Tiruvallur district, Tamil Nadu. It belongs in the Dutch Coromandel story, but not in this Andhra-posts table.

Further programme link

Andhra coastal settlements are developed in Topic 471.

Concept illustrations; buildings and symbols are schematic.

2.4 Dutch decline: defeat is not final departure

1. 1741 — Colachel

Travancore under Marthanda Varma defeated the Dutch. Commander Eustachius De Lannoy was captured; later he served Travancore and trained its army.

The old NCERT describes this as ending Dutch political power in Kerala.

Accounts differ on the exact battle/surrender day; retain the secure year 1741.



2. 1753 — Treaty of Mavelikkara

The Dutch agreed not to obstruct Travancore's expansion.



3. 1759 — Bedara / Biderra

Near Chinsura, between Chinsura and Chandernagore.

Mir Jafar invited Dutch help against the British.

24 November: naval fight.
25 November: land battle.

Francis Forde led the English, with Clive directing from Calcutta.

The Dutch attempt to expand in Bengal failed.

Britain and the Dutch Republic were not formally at war.



4. Company and possessions: separate timelines

Dutch company (VOC)

1799 VOC charter revoked → Dutch government takes over debts and possessions after decline, corruption and debt.

≠

Dutch settlements / possessions

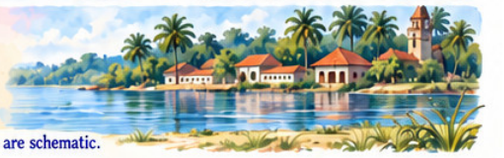
1781 British capture Nagapattinam. → **1814 treaty** → posts handed back on 31 March 1818. → **1824** Anglo-Dutch Treaty → remaining posts ceded in 1825.

Accounts differ on the precise cession date; do not force one day for all posts.



5. A key historical trap

Bedara was English versus Dutch, NOT English versus French merely because Chandernagore is nearby.



Concept illustrations; buildings and symbols are schematic.

2.5 Danish settlements: charter, ports and sale

1. Charter and early expeditions

1616: Christian IV of Denmark-Norway chartered the Danish East India Company, with a 12-year Asian trade monopoly. Accounts differ between 17 March and 16 October; use 1616.

1618: first expedition sailed under Ove Gjedde.



2. Tranquebar: grant and fort

1620: Raghunatha Nayak of Tanjore granted Tranquebar, permitting a stone house and taxation. Treaty records differ between 19 and 20 November.

Fort Dansborg was built in 1620; Tamil Nadu declared it a protected monument in 1977.



3. Serampore: founding

1732: the Asiatic Company received its charter on 12 April.

1755: the Danes founded Frederiksnagore — Serampore — in Bengal, in October.



4. Temporary occupations vs final sale

Temporary occupation ≠ permanent sale

British occupations: 1801–1802 and 1808–1815.

↓

1845: sale of Tranquebar, Serampore and the other mainland settlements to the British.

↓

1868: sale of Danish rights in the Nicobar Islands.

Remember the distinction: mainland settlements, 1845; Nicobar rights, 1868.

5. Danish and Dutch settlements

Dansborg (Tranquebar)



Dansborg → Tranquebar (Danish)

Geldria (Pulicat)



Geldria → Pulicat (Dutch)

Company charter ≠ first settlement ≠ temporary occupation ≠ final sale.



Concept illustrations; buildings and symbols are schematic.

2.5 Missionaries and Serampore College

Tranquebar

The Danish king sent Ziegenbalg and Plütschau in 1706.

Ziegenbalg's arrival is given as 1706; one account gives 1707.



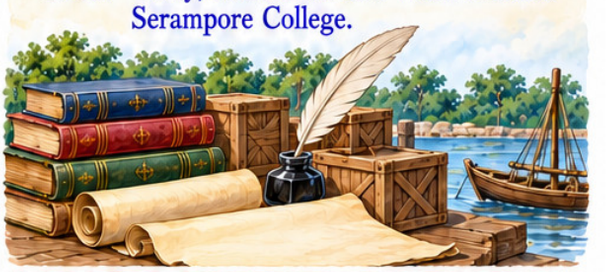
Serampore

1793: William Carey reached Bengal.

1799: Joshua Marshman and William Ward arrived, according to the supplied Serampore trio account.

1800: Carey moved to the Danish settlement of Frederiksnagar (Serampore), as Britannica records.

1818: Carey, Marshman and Ward founded Serampore College.



Why a Danish settlement?

Missionaries were barred from the English Company's territory → the Danish settlement offered a base for their work.

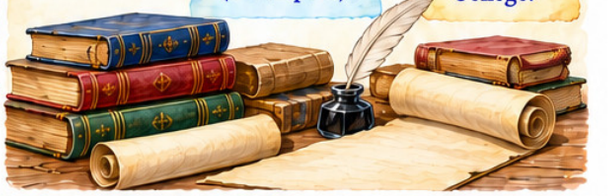


Keep events separate

Arrival in Bengal ≠ move to Serampore ≠ foundation of the college.

Carey: 1793 → 1800 → college with Marshman and Ward, 1818.

1793 Carey reached Bengal. → **1800** Carey moved to the Danish settlement of Frederiksnagar (Serampore). → **1818** Carey, Marshman and Ward founded Serampore College.



Keep the centres distinct

Serampore: Danish settlement, 1755 + three Baptist missionaries' college, 1818.

Tranquebar: Nayak of Tanjore's grant, 1620 + Fort Dansborg.



Concept illustrations; buildings and symbols are schematic.

2.6 The French Company: rise and limits

1664: Jean-Baptiste Colbert launched the company with Louis XIV's support. By 1668 the king was its biggest investor.



1. Company names

1664 – 1719: Compagnie Française des Indes Orientales. → 1719 – 1720: Compagnie des Indes. → 1720 – 1789: Compagnie Française des Indes.



2. First factories

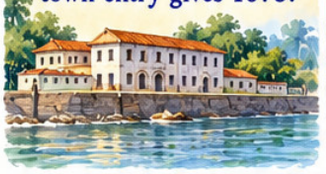
François Caron's expedition: Surat, 1668 → Masulipatnam, 1669.



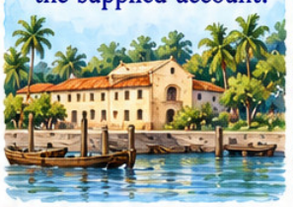
Pondicherry: acquired in 1673 in the supplied French India account; François Martin developed the town from 1674. Britannica gives acquisition as 1674. It became French India's capital.

Other settlements — dates need qualification

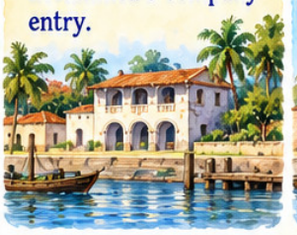
Chandernagore: 1692 in the supplied account; Britannica's India history gives 1690–1692, while its town entry gives 1673.



Yanam: post in 1723; abandoned 1727; retaken 1731 in the supplied account.



Mahe: 1725 in the India history; 1724 in Britannica's company entry.

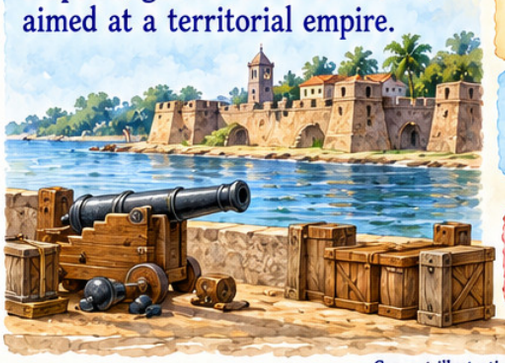


Karaikal: 1739.



3. Political ambition and decline

Dupleix, governor 1742 – 1754, aimed at a territorial empire.



Wandiwash, 22 January 1760 → Pondicherry surrendered, January 1761 → returned in 1765.

1769: company loses its trade monopoly.

1789: company disappears in the French Revolution.

Company end in 1789 did NOT end French possession of the settlements.



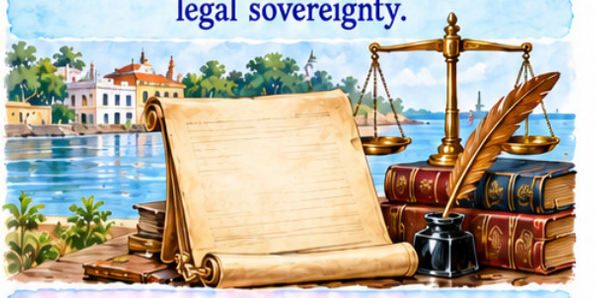
Concept illustrations; buildings and symbols are schematic.

2.7 Two different French-transfer timelines

De facto = transfer in fact:
who administers the territory.



De jure = transfer in law:
legal sovereignty.



CHANDERNAGORE

- **19 June 1949:** referendum chooses India.
- **2 May 1950:** de facto transfer.
- **2 February 1951:** treaty of cession.
- **9 June 1952:** de jure transfer.
- **2 October 1954:** merger with West Bengal under the Chandernagore (Merger) Act, 1954.



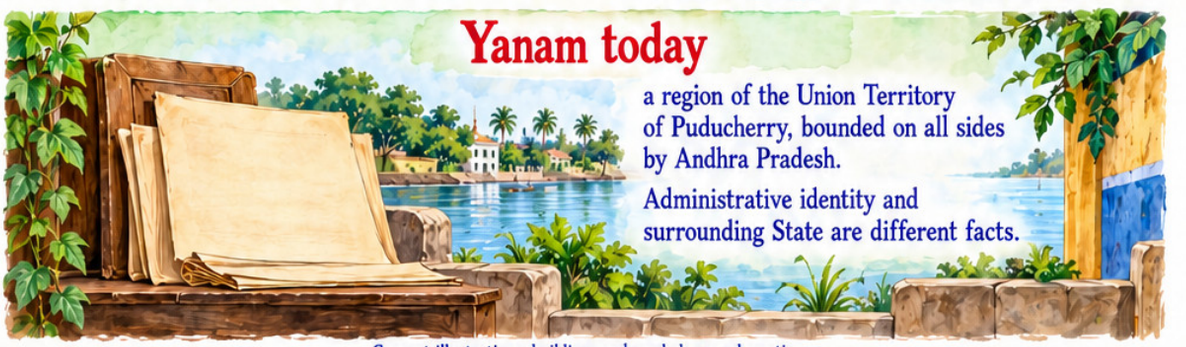
PONDICHERRY • KARAIKAL • MAHE • YANAM

- **18 October 1954:** Kizhur vote; 170 of 178 elected representatives choose India.
- **1 November 1954:** de facto transfer.
- **28 May 1956:** treaty of cession signed.
- **16 August 1962:** de jure transfer, when instruments of ratification were exchanged.

The Fourteenth Amendment made Pondicherry a Union Territory with effect from 16 August 1962.



Yanam today



a region of the Union Territory of Puducherry, bounded on all sides by Andhra Pradesh.

Administrative identity and surrounding State are different facts.

Concept illustrations; buildings and symbols are schematic.

2.8 Compare the companies without mixing dates

Company	Founded	Early factory	End to distinguish
English	1600 charter	Masulipatnam 1611	See Topic 52.
Dutch	1602	Masulipatnam 1605	VOC ended 1799; posts ceded 1825.
Danish	1616	Tranquebar 1620	Mainland settlements sold 1845.
French	1664	Surat 1668	Company ended 1789; de facto transfers 1950 and 1954; four settlements' de jure transfer 1962.

Why the English prevailed

Britannica links English profitability against the Dutch to a smaller trading area and fewer costs of enforcing a monopoly.

Against the French, command of the sea and Bengal's resources were decisive (Topic 61). French trade was valuable, but not large enough to rival English trade.



A five-question chronology check

1.	Is the date a charter or a factory?	English 1600 ≠ Masulipatnam 1611.
2.	Is it a post or a fort?	Bimlipatnam 1652 ≠ fort 1758.
3.	Is it a defeat or final cession?	Colachel 1741 ≠ Dutch departure 1825.
4.	Is it a company or a settlement?	French company 1789 ≠ transfer to India.
5.	Is it in fact or in law?	Four French settlements: 1954 ≠ 1962.



Concept illustrations; buildings and symbols are schematic.

United Nations • the founding

1 2.1 • From signature to entry into force

25 April–26 June 1945: 50 countries met at San Francisco.



26 June 1945: the UN Charter was signed.



24 October 1945: the Charter entered into force; the UN came into existence.

Ratification was required from China, France, the Soviet Union, the UK, the USA and a majority of the other signatories.

24 October is United Nations Day.

2 India's two dates

26 June 1945: Sir Arcot Ramaswamy Mudaliar led India's delegation at the signing on 26 June 1945.



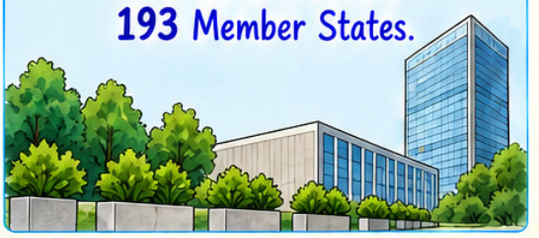
30 October 1945: The UN membership list records India's admission on 30 October 1945.



India is a founding member.

3 Membership snapshot • 24 October 2026

24 October 2026: **193** Member States.



South Sudan, admitted **14 July 2011**, is the latest member.



4 Exam distinction

Charter signed ≠ Charter in force ≠ India's listed admission date.

Buildings are schematic.

Purposes and principles

2.2 Articles 1 and 2

1 ARTICLE 1 • What the UN seeks

1. Maintain international peace and security.



2. Develop friendly relations based on equal rights and self-determination of peoples.



3. Cooperate on economic, social, cultural and humanitarian problems.



4. Harmonize the actions of nations toward these ends.



2 ARTICLE 2 • Rules for acting together

Sovereign equality of all Members.



fulfil Charter obligations in good faith.



settle disputes peacefully.



refrain from the threat or use of force in international relations.



Article 2(7): no UN intervention in matters essentially within a state's domestic jurisdiction.



Buildings are schematic.

BUT this does not prevent Chapter VII enforcement measures. → Chapter VII enforcement measures.



Apply the distinction: peaceful settlement is a general principle; the domestic-jurisdiction rule is not an absolute shield against Chapter VII enforcement.

Memory link: purposes = ends; principles = rules of conduct.

Six principal organs • one Charter

2.3 • Article 7



1 GENERAL ASSEMBLY

all 193 Member States: discussion and recommendations, budget, elections; appoints the Secretary-General on the Security Council's recommendation.



2 SECURITY COUNCIL

15 states: primary responsibility for international peace and security; Chapters VI and VII; Members must carry out its decisions.



3 ECOSOC

54 states: economic, social, cultural, educational, health and human-rights studies, reports and recommendations.



4 TRUSTEESHIP COUNCIL

now the P5: supervised 11 Trust Territories; operations suspended on 1 November 1994, NOT abolished.



5 ICJ

15 judges: settles legal disputes submitted by States and gives advisory opinions.



6 SECRETARIAT

Secretary-General and staff: day-to-day UN work; the SG is chief administrative officer.





Seat test: five organs are in New York; only the ICJ is at the Peace Palace, The Hague, Netherlands.

7 2.10 • WHO and ILO are specialised agencies linked to the UN, NOT Article 7 principal organs.



Subsidiary organs may be established under Article 7(2).
Recall Topic 333: specialised agencies.

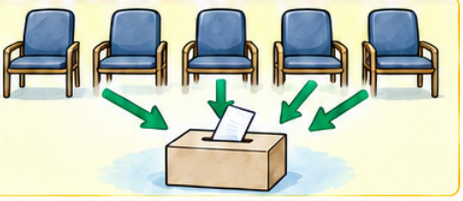
Concept illustrations are schematic.

General Assembly • representation and votes

2.4 • Articles 9–22

1 Article 9: every UN Member belongs to the Assembly.

Each may send up to **FIVE** representatives, but has only **ONE** vote.

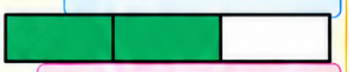


2 Article 18: important questions require TWO-THIRDS of members present and voting.

Other questions require a majority of members present and voting.

Worked denominator: if **150** members cast yes/no votes, **100** yes votes meet two-thirds.

$\frac{100}{150}$ = two-thirds



Abstentions are **not** counted as votes cast.

3 Article 19: arrears equal to or exceeding contributions due for the preceding TWO full years cause loss of the Assembly vote.



→ Loss of the Assembly vote.

Exception: the Assembly may permit voting if non-payment arises from conditions beyond the Member's control.

4 Article 12: while the Security Council exercises its Charter functions on a dispute or situation, the Assembly shall not recommend on it unless the Council requests.



→ The Assembly **shall not recommend** on it → **unless** the Council requests.

5 Uniting for Peace: resolution 377, 3 November 1950, provides for Assembly recommendations on collective measures when a permanent-member veto blocks Council action.

Security Council blocked by P5 veto → General Assembly recommendations on collective measures → Recommendations (**not** binding enforcement).

6 Dated office-holder • 24 October 2026



Khalilur Rahman of Bangladesh, elected **2 June 2026**, President of the 81st session.

Do not confuse representation, voting strength and voting threshold.

Concept illustrations are schematic.

Security Council • how a decision passes

1 2.5 • Article 27

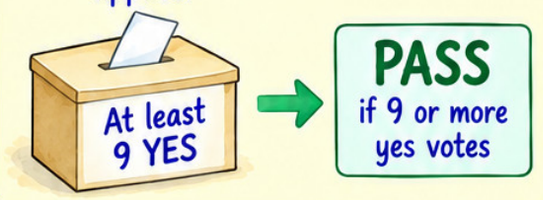
15 MEMBERS = 5 permanent + 10 elected.
Each member has ONE vote.



2 Voting rules under Article 27

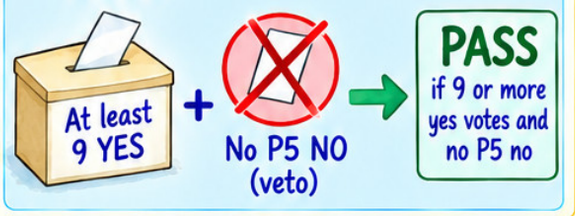
PROCEDURAL MATTER

→ at least 9 affirmative votes. No permanent-member veto applies.



OTHER / SUBSTANTIVE MATTER

→ at least 9 affirmative votes **AND** no negative vote from a permanent member.



3 P5 abstention

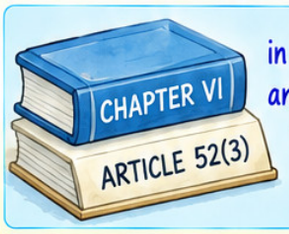
A P5 abstention is **NOT** a veto. The resolution can pass if it still receives nine favourable votes.



4 Worked tests (15 votes in each row):

Procedural:	9 YES + 6 NO →	PASS	even if a P5 member votes no.
Substantive:	9 YES + 1 P5 NO + 5 ABSTAIN →	FAIL	veto.
Substantive:	9 YES + 6 ABSTAIN →	PASS	no veto, including a P5 abstention.
Substantive:	8 YES + 7 ABSTAIN →	FAIL	fewer than nine yes votes.

5 Charter qualification



in decisions under Chapter VI and Article 52(3), a party to the dispute shall abstain.

6 P5 today

China • France • Russian Federation • United Kingdom • United States.

The Charter's original names include Republic of China and Union of Soviet Socialist Republics. Distinguish historical wording from today's membership.

Concept illustrations are schematic.

Security Council • seats rotate, not all at once

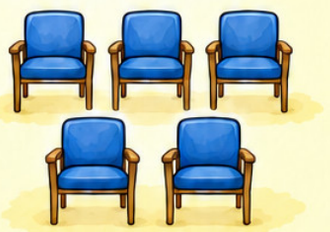
2.5 | Article 23 | dated snapshot: 24 October 2026

The General Assembly elects TEN non-permanent members for TWO-year terms. A retiring member is NOT eligible for immediate re-election.

1 Current elected members and their term end dates

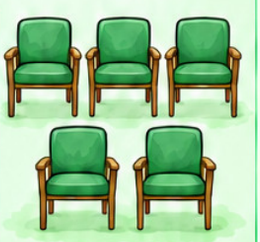
2026 elected members whose terms end in 2026:

- Denmark
- Greece
- Pakistan
- Panama
- Somalia



2026 elected members whose terms end in 2027:

- Bahrain
- Colombia
- Democratic Republic of the Congo
- Latvia
- Liberia



2 Next rotation: new elected members for 2027–2028

NEXT ROTATION • elected on 3 June 2026 for 1 January 2027–31 December 2028:

- Austria
- Kyrgyzstan
- Portugal
- Trinidad and Tobago
- Zimbabwe



These five replace the members whose terms end in 2026. They do NOT replace the five whose terms end in 2027.

Replaces the FIVE seats ending in 2026.

3 Seat arithmetic for 2027

Five permanent  + Five continuing elected (terms end in 2027)  + Five incoming elected (2027–2028)  = **fifteen (15)**

4 Recall contrast



ECOSOC allows immediate re-election.



The Security Council's retiring elected members do not.

Concept illustrations are schematic.

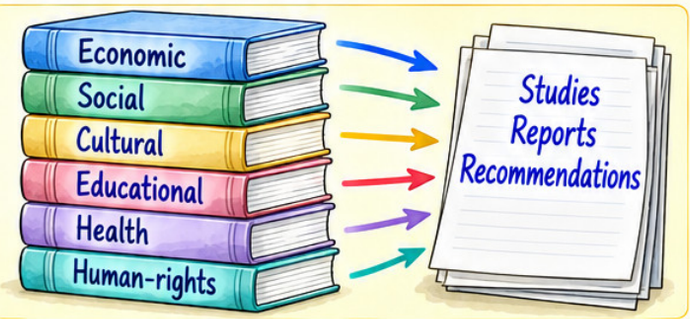
ECOSOC and Trusteeship • different mandates

2.6 • Two councils, two kinds of work

1 ECOSOC | Articles 61–72

54 members, elected by the General Assembly; 18 elected each year for THREE-year terms. A retiring member IS eligible for immediate re-election.
Each member has one representative and one vote.
Decisions: majority of members present and voting.

Mandate:
studies, reports and recommendations on economic, social, cultural, educational, health and human-rights matters.



Rotation check:
18 + 18 + 18 = 54 overlapping seats, not 54 newly elected each year.



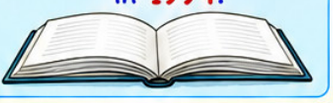
2 TRUSTEESHIP COUNCIL | Articles 86–91

Supervised 11 Trust Territories.
Each member designates ONE specially qualified representative.
Decisions: majority of members present and voting.

11 Trust Territories



Palau, the final trust territory, became independent in 1994.



Operations were suspended on 1 November 1994, a month later.



Today: the five permanent Security Council members; meets as occasion requires.



Exam trap:
SUSPENDED operations ≠ ABOLISHED organ.
It remains an Article 7 principal organ.

Concept illustrations are schematic.

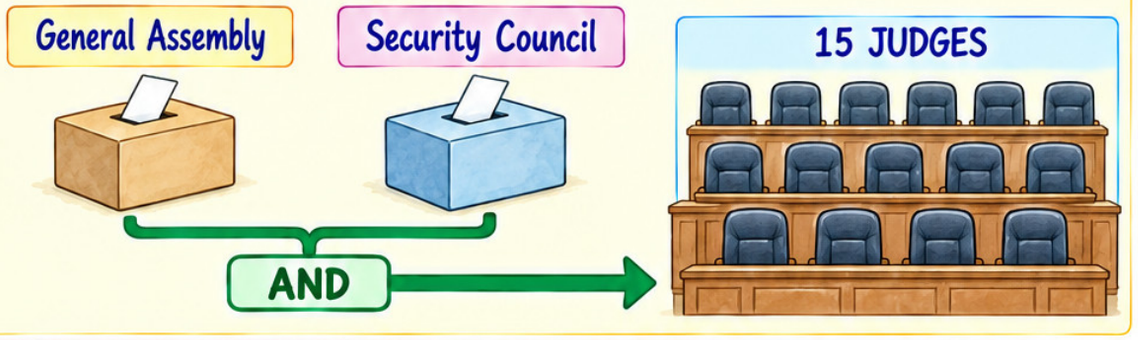
International Court of Justice • judges, not state seats

1 2.7 • The principal judicial organ

15 JUDGES • NINE-year terms • one third elected every THREE years • re-election allowed. Terms begin on 6 February.

2 Election: General Assembly votes separately from Security Council.

A candidate needs an ABSOLUTE MAJORITY in BOTH bodies; success in one alone is insufficient.



3 The Court elects its President and Vice-President by secret ballot for THREE years.

4 Two functions:

Contentious cases



legal disputes submitted by STATES.

Advisory opinions



Article 96 lets the General Assembly or Security Council request an opinion on ANY legal question.

5 Seat: Peace Palace, The Hague, Netherlands.



Buildings are schematic.

It is the ONLY principal UN organ outside New York.

6 Dated heads • 24 October 2026:

President
Yuji Iwasawa (Japan), from 3 March 2025.

Vice-President
Julia Sebutinde (Uganda), from 6 February 2024.

7 Number trap:

Security Council has 15 MEMBER STATES; ICJ has 15 JUDGES. Their composition and voting rules are not interchangeable.

Concept illustrations are schematic.

Secretary-General • recommendation is not appointment

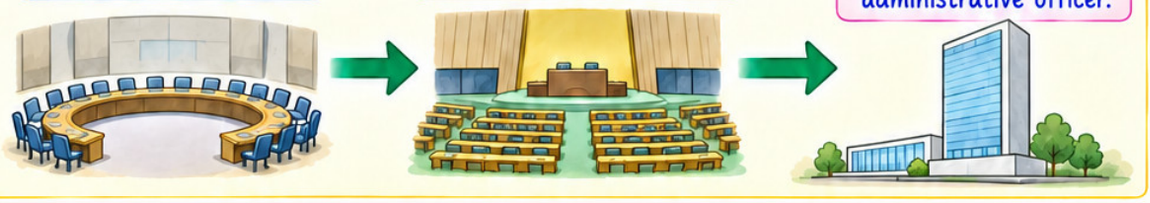
2.8 Secretariat: Secretary-General + staff

1 ARTICLE 97 • selection chain

Security Council
RECOMMENDS

General Assembly
APPOINTS

Secretary-General
serves as chief administrative officer.



2 ARTICLE 99 • independent agenda power



The SG may bring to the Council's attention a matter which, in the SG's opinion, may threaten international peace and security.



3 TERM: the Charter fixes NO term.



A five-year renewable term is the established practice, not a Charter requirement.

4 Dated incumbent • 24 October 2026:



António Guterres (Portugal), ninth Secretary-General; first took office on 1 January 2017.



8 June 2021:
Security Council recommendation for a second term.



18 June 2021:
General Assembly appointment.



Second term: January 2022–December 2026.

5 Successor process:



the official 2026 selection record consulted for this review had not announced a Council recommendation.
Next term begins 1 January 2027.
Candidate counts and straw polls are not appointments.

6 Exam trap:



The Security Council alone does **NOT** appoint the SG.

Concept illustrations are schematic.

India and the UN • trace the institutions

1 2.9 • Eight elected Security Council terms

1950–51 → 1967–68 → 1972–73 → 1977–78 → 1984–85 → 1991–92 → 2011–12 → 2021–22

For 2021–22, India received 184 of 192 votes polled (MEA, 18 June 2020). This was its EIGHTH term, not permanent membership.

India has declared candidature for 2028–29; candidature is not election.

2 G4 for Security Council reform



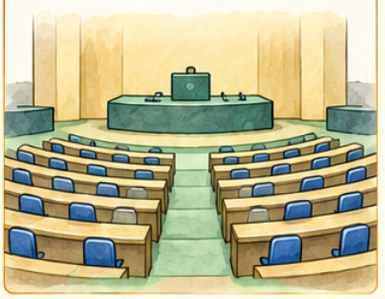
G4 for Security Council reform: Brazil • Germany • India • Japan.

The G4 is NOT the P5.

3 Three key UN institutions and India

GENERAL ASSEMBLY

Vijaya Lakshmi Pandit became its first woman President in 1953.



ICJ

Nagendra Singh was President from 1985 to 1988. Dalveer Bhandari joined on 27 April 2012 and was re-elected from 6 February 2018. A nine-year term from that date runs to February 2027; this does not by itself state a later election result.



SECURITY COUNCIL

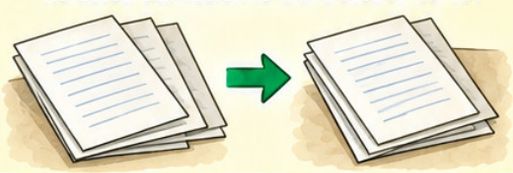
India has had eight elected terms:
1950–51 → 1967–68 → 1972–73 → 1977–78 → 1984–85 → 1991–92 → 2011–12 → 2021–22.



4 Founding link and a comparison

FOUNDING LINK

India signed the Charter on 26 June 1945; its listed admission is 30 October 1945.



Institution test

GA presidency, ICJ judgeship and an elected Security Council seat are three different offices.



Buildings are schematic.

Concept illustrations are schematic.

CVC and CBI • origins are not the same as powers

1 2.1 and 2.4 • Two executive beginnings

CBI

1941
Special Police Establishment investigated bribery and corruption in War and Supply Department dealings.



1946
DSPE Act, 1946.



1 April 1963
CBI established by MHA resolution on 1 April 1963.



CVC

11 February 1964
Government resolution, following the Santhanam Committee.



18 December 1997
Vineet Narain judgment, directed statutory status.



25 August 1998
Ordinance, further Ordinances.



2003
CVC Act, 2003 (Act 45 of 2003).



2 Legal distinction:

CVC



CVC = statutory body under its own 2003 Act.

CBI



CBI = established by the 1963 resolution; investigative powers come from the DSPE Act, 1946, which names the Delhi Special Police Establishment, not the CBI.

3 The CBI is older than the CVC, but neither began as a constitutional body.



4



The 2013 Gauhati High Court ruling against the CBI's legal status was stayed by the Supreme Court.
Do not present that High Court ruling as an operative abolition of the CBI.

Concept illustrations are schematic.

CVC • composition and appointment

2.2 | CVC Act, 2003

1 Section 3: composition



ONE
Central Vigilance Commissioner
(Chairperson)

+



NOT MORE THAN TWO
Vigilance Commissioners
(Members).

2 Section 4: recommending committee and appointment

Recommending committee =



Prime Minister (Chairperson) + Home Minister + Leader of the Opposition in the Lok Sabha.

Committee recommends →



President appoints by warrant under hand and seal.



3 Section 5: tenure and reappointment



FOUR years

OR



age SIXTY-FIVE

whichever comes first.

A Central Vigilance Commissioner cannot be reappointed in the Commission.

A Vigilance Commissioner may become CVC, but the combined tenure cannot exceed FOUR years.

Example: a VC who has served three years cannot gain a fresh four years merely by becoming CVC; the aggregate ceiling still applies.

4 Section 6(1): removal

Proved misbehaviour or incapacity →



Supreme Court inquiry. →



President orders removal

This is the specified inquiry route, not a claim that every statutory ground uses the same route.

5 Section 10(1): acting arrangement

if the CVC post is vacant, →



the President may authorise →



a Vigilance Commissioner to perform its functions.

6 Do not put the Chief Justice of India on the CVC selection committee.

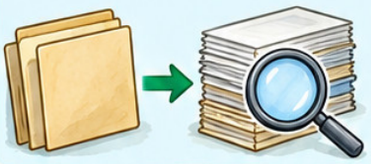
Buildings are schematic.

CVC • powers with a boundary

1 2.3 • What oversight permits

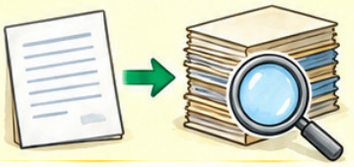
Section 8(1)(a)

superintendence over DSPE functioning in relation to investigations under the Prevention of Corruption Act, 1988.



Section 8(1)(c)

on a Central Government reference, inquire into or cause investigation of allegations against Central Government employees within the provision.



Section 11

while inquiring, powers of a civil court trying a suit under the Code of Civil Procedure, 1908— for example, summoning witnesses and requiring documents.



2 LIMIT: the CVC cannot require the DSPE to investigate or dispose of a case in a particular manner.



Oversight is **NOT** permission to dictate a particular case outcome.

3 Section 14 • annual accountability chain:

Close of year



within **SIX** months, CVC submits annual report to PRESIDENT



President causes it to be laid before **EACH HOUSE** of Parliament.



Exam contrast: the annual report is not submitted directly to the Supreme Court, nor only to one House.

Use the section ladder: **8** = functions → **11** = inquiry powers → **14** = annual report

Concept illustrations are schematic.

CBI • legal powers and State consent

1 2.4 • DSPE Act, 1946

The CBI was established by resolution on 1 April 1963. Its police powers are derived from the DSPE Act, not a separate "CBI Act".



2 Section 6: State consent and exceptions

Section 6: DSPE powers cannot be exercised in a State without that State Government's consent, with the statutory exception for Union territories or railway areas.



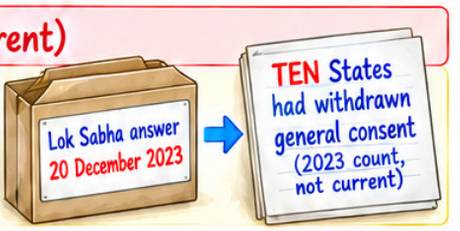
3 GENERAL CONSENT is not permanent

GENERAL CONSENT is not a permanent, unchanging list. States may withdraw or restore it.



4 Dated evidence: 2023 count (not current)

A Lok Sabha answer of 20 December 2023 listed TEN States that had withdrawn general consent. That is a 2023 count, NOT a claim about today's count.



5 Historical examples • individual dates from press reports

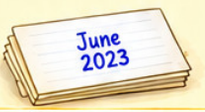
West Bengal withdrew in November 2018.



Kerala, Jharkhand and Punjab in November 2020.



Tamil Nadu in June 2023.



Andhra Pradesh restored general consent in 2019.



6 Do not confuse three questions

1. Which law supplies investigative powers?



DSPE Act.

2. Where may those powers be exercised?



Territorial and consent rules.

3. Who supervises the agency?



A separate statutory allocation.

These individual dates are from the supplied press-sourced account; the current State list can change.

Concept illustrations are schematic.

CBI Director • the committee changed

2.5 and 2.7 | Keep three stages separate

1 1997 • VINEET NARAIN directions:

Central Vigilance Commissioner (Chairperson) + Home Secretary + Secretary (Personnel)

These were interim judicial directions pending legislation.

2 2003 • ORIGINAL statutory section 4A:

CVC (Chairperson) + Vigilance Commissioners + Home Secretary + Secretary (Coordination and Public Grievances), Cabinet Secretariat.

3 CURRENT • section 4A after the Lokpal Act:

Prime Minister (Chairperson) + Leader of the Opposition in the Lok Sabha + Chief Justice of India, or a Supreme Court judge nominated by the CJI.

If there is no recognised Leader of the Opposition, the leader of the single largest opposition party in the Lok Sabha fills that place.

Committee recommends → → CENTRAL GOVERNMENT appoints CBI Director.

4 Comparison trap:

CVC committee includes HOME MINISTER;
CBI Director committee includes CJI / nominated SC JUDGE.

Both are chaired by the Prime Minister today, but the 1997 Vineet Narain committee was CVC-led.

5 Section 4BA:



Directorate of Prosecution, headed by an officer not below Joint Secretary rank, works under the CBI Director's supervision.

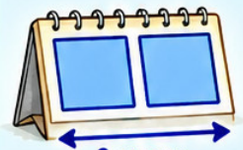
Concept illustrations are schematic.

CBI Director • minimum is not maximum

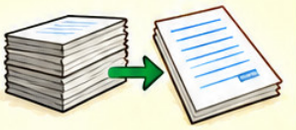
2.5 Section 4B of the DSPE Act

1 Minimum tenure and possible extensions

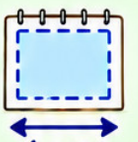
MINIMUM: not less than TWO years from taking charge.



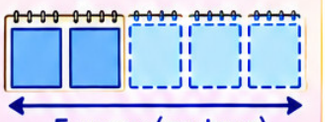
2021 amendment: extensions may be granted in the public interest, on the selection committee's recommendation, with reasons recorded in writing.



Each extension: up to ONE year at a time.



TOTAL CEILING: FIVE years, including the initial tenure. There is no automatic five-year appointment.



2 Effective date of the 2021 amendment

The 2021 amendment (Act 45 of 2021) is deemed effective from **14 November 2021**.



3 Transfer requires previous consent

Transfer: section 4B(2) requires the committee's PREVIOUS consent.



4 Dated illustration – Praveen Sood

Took charge 25 May 2023 for two years. → One-year extension in May 2025. → One-year extension in May 2026. → Tenure through 24 May 2027, four years in all.

This example shows permitted extensions, not an entitlement to the maximum.

5 Vineet Narain (1997)



Vineet Narain (1997): minimum two-year tenure regardless of superannuation date; subsequent legislation supplies the current rules.

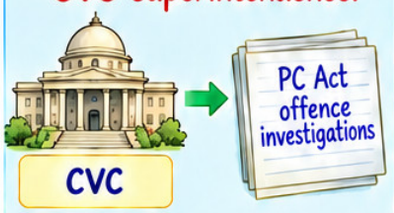
Concept illustrations are schematic.

Who supervises the CBI?

2.6 Do not merge supervision with administration

1 DSPE ACT, SECTION 4

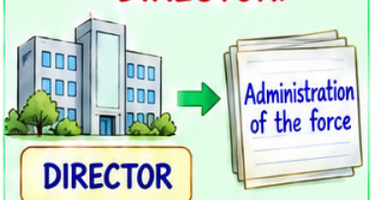
PC Act offence investigations → CVC superintendence.



All other matters → CENTRAL GOVERNMENT superintendence.



Administration of the force → DIRECTOR.



2 LOKPAL ACT, SECTION 25



Matters referred by Lokpal for preliminary inquiry or investigation → LOKPAL superintendence and directions.

The Lokpal lane is specifically tied to matters it has referred; it is not a replacement for the whole section 4 allocation.

3 BOUNDARY applying to CVC / Lokpal powers:

They may not require the DSPE to investigate or dispose of a particular case in a particular manner.



4 Functional test:

"Who administers the force?"	Director.
"Who has PC Act investigative superintendence?"	CVC.
"Who supervises a matter referred by Lokpal?"	Lokpal, under section 25.
"Who supervises other matters?"	Central Government.



Oversight aoes not permit orders requiring guilt, closure or a predetermined investigation result.

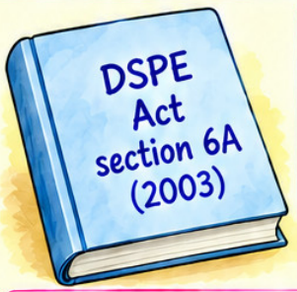
Buildings are schematic.

Concept illustrations are schematic.

Prior approval • section 6A is not section 17A

2.6 Different statutes and different tests

1 OLD: DSPE Act, section 6A (inserted 2003).

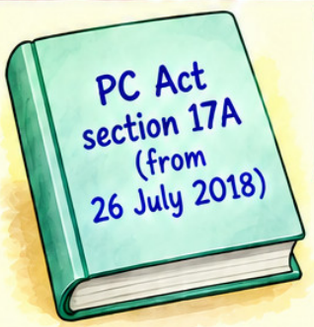


Previous Central Government approval protected Joint Secretary-level and higher officers, and certain Central public-body officers, against PC Act inquiries/investigations; spot bribery arrests were excepted.

6 May 2014: a five-judge Constitution Bench in Dr. Subramanian Swamy v. Director, CBI held section 6A invalid and unconstitutional.



2 NEWER, DISTINCT: PC Act, section 17A (from 26 July 2018).



Prior approval concerns an alleged offence relatable to an official recommendation made or decision taken by a public servant in discharge of official functions or duties.



Alleged offence relatable to an official recommendation made or decision taken



in discharge of official functions or duties.

Approving authority:
Union Government, State Government or authority competent to remove the public servant, as applicable.



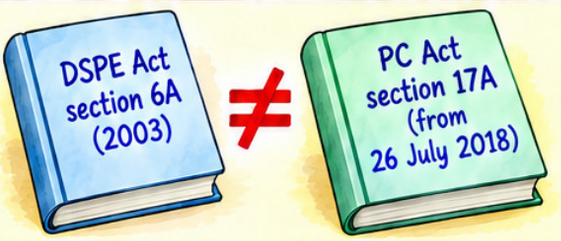
Union Government | State Government | authority competent to remove the public servant

Buildings are schematic.

Exception: no approval for arrest on the spot on a charge of accepting or attempting to accept an undue advantage.



3 Exam trap: section 17A is not section 6A.



Section 17A is in the PREVENTION OF CORRUPTION ACT, not the DSPE Act. It is not simply section 6A renamed.

Section 17A's constitutional litigation is addressed on the next page; do not label it finally struck down.

Concept illustrations are schematic.

Courts and accountability • read the outcome precisely

2.7 and 2.6 Three judicial milestones

1 Three judicial milestones

18 DECEMBER 1997
Vineet Narain



Buildings are schematic.

A three-judge Bench led by Chief Justice J. S. Verma directed statutory status for the CVC; efficient CBI functioning and reporting to the CVC; a CVC-led Director-selection committee; minimum two-year tenure.

The Single Directive's clause 4.7(3) was struck down.

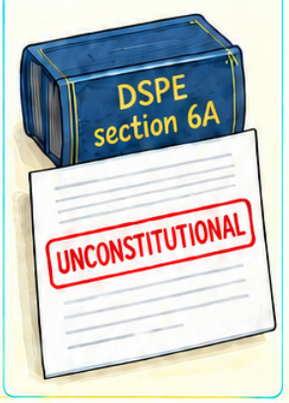
Interim directions operated until legislation replaced them.

6 MAY 2014
Subramanian Swamy



Buildings are schematic.

A five-judge Constitution Bench held DSPE section 6A unconstitutional.



13 JANUARY 2026
Centre for Public Interest Litigation, 2026 INSC 55

Section 17A produced a SPLIT verdict:

- Justice B. V. Nagarathna → unconstitutional.
- Justice K. V. Viswanathan → upheld subject to approval following a Lokpal / Lokayukta recommendation.

The final order placed the matter before the Chief Justice of India for an appropriate Bench's fresh consideration.

Therefore: a split is NOT a final majority invalidation of section 17A.

2 Accountability principle

Superintendence does not authorise dictating how a particular case must be investigated or disposed of.

Investigation manner — DICTATE A PARTICULAR CASE — Disposal manner

CVC Act, section 8(1)(b) proviso

CVC • CBI • Lokpal: compare the legal design

2.8 Three different bodies

CVC



CVC Act, 2003; statutory.



Chairperson + up to two Vigilance Commissioners.



President appoints.



Term: four years or age 65, whichever earlier.



PC Act investigation superintendence over DSPE.

CBI



Buildings are schematic.

1 April 1963 resolution; powers under DSPE Act, 1946.



Director appointed by Central Government.



Minimum two years; conditional annual extensions, maximum five total.



Investigates; Director administers the force.

LOKPAL



Buildings are schematic.

Lokpal and Lokayuktas Act, 2013 (Act 1 of 2014), effective 16 January 2014.



Chairperson + up to eight Members; fifty per cent of Members judicial.



President appoints.



Term: five years or age 70, whichever earlier.

Lokpal selection committee:

Prime Minister + Lok Sabha Speaker + Lok Sabha Leader of Opposition + CJI / nominated SC judge + eminent jurist.



Lokpal supervises DSPE matters it refers for preliminary inquiry or investigation.

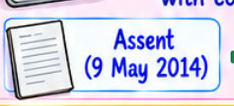
2 Chronology links



PIDPI Resolution, April 2004, designated CVC to receive informers' complaints.



Whistle Blowers Protection Act received assent on 9 May 2014; assent alone must not be confused with commencement.



3 Keep heads separate from institutions



An acting CVC under section 10(1) is not the same as a fresh regular appointment.

Concept illustrations are schematic.

Nominal and real GDP: the bread economy

Nominal GDP values output at current-year prices. Real GDP uses a constant set of base-year prices, separating output change from price change.

NCERT illustration: an economy makes only bread; base year 2000.

Year	Quantity of bread (units)		Price per unit (Rs)		Nominal GDP (current-year prices) (Rs)
2000	100	x	10	=	1,000
2001	110	x	15	=	1,650

Real GDP: 2001 at 2000 prices

Quantity of bread (units)		Price per unit (2000 prices) (Rs)		Real GDP (2000 prices) (Rs)
110	x	10 (base year price held constant)	=	1,100

Nominal growth = 65%; real output growth = 10%. Higher nominal GDP does not by itself establish higher physical output.

India's National Statistics Office, within MoSPI, compiles national accounts. The 2022-23 base series replaced 2011-12 on 27 February 2026.

Remember: the bread numbers illustrate a concept; they are not India's GDP.

Concept illustrations are schematic.

The GDP deflator: an implicit price index

$$\text{GDP deflator} = \frac{\text{nominal GDP}}{\text{real GDP}} \times 100.$$

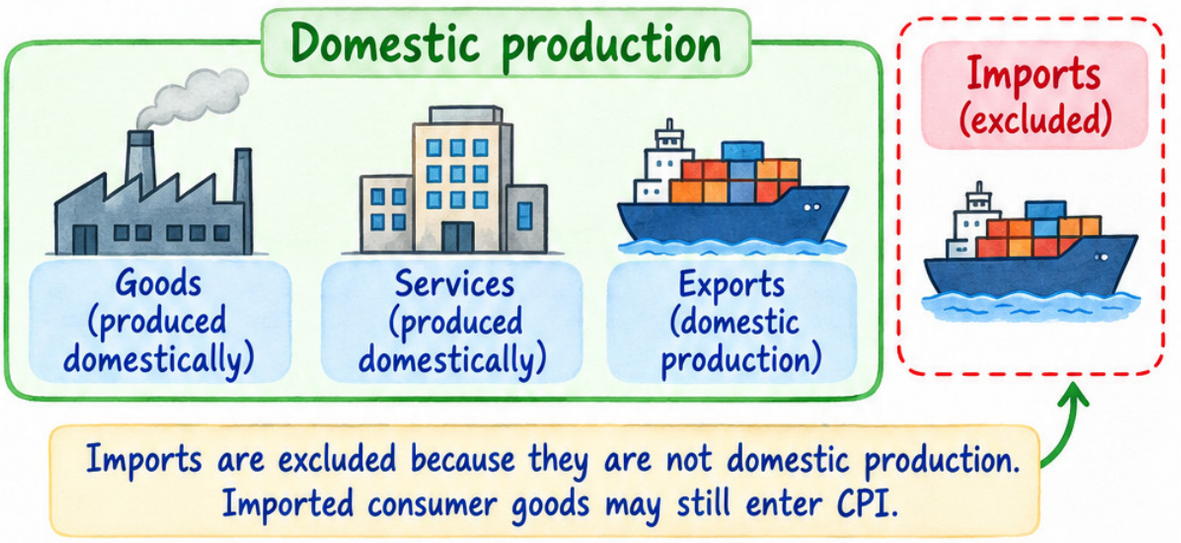
current-price GDP

constant-price GDP

Bread example: 1,650 ÷ 1,100 × 100 = 150.

Index 150 means prices are 1.5 times the base-year level: 50% above it. It does NOT mean 150% inflation.

Coverage: goods and services produced domestically, including investment goods, exports and government services.



Imports are excluded because they are not domestic production. Imported consumer goods may still enter CPI.

The deflator is implicit: it is derived from current-price and constant-price GDP rather than by directly pricing a separate fixed basket.

In the base year, nominal GDP = real GDP, so the deflator = 100.

The deflator's weights reflect the changing composition of production.

Concept illustrations are schematic.

Deflator, CPI and WPI: compare the coverage

GDP deflator



All domestic final output, including goods and services, investment and government services.

- Imports excluded; production weights change.

CPI



A representative household's consumption basket of goods and services.

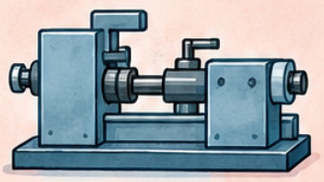
- Includes imported goods if households buy them;
- uses fixed basket weights.

WPI



Wholesale-price measure for goods traded in bulk;

- services are excluded from this goods-based index.



Investment machinery belongs in GDP's output coverage but not in a household consumption basket.

→ **Do not assume the three measures show identical inflation: coverage, weights and price concepts differ.**

Dated-method note



The supplied comparison explains traditional CPI/WPI concepts.

MoSPI's 31 August 2026 GDP update incorporated new PPI, IIP and Banking Services Price Index series released in June 2026.

WPI must not be presented as the unchanged current input everywhere.

Concept illustrations are schematic.

Growth rates: exact division versus shortcut

1. Relationship between nominal GDP, real GDP and the deflator

Nominal GDP = real GDP × deflator ÷ 100.

2. Growth rate identity (multiplicative)

Therefore (1 + nominal growth) = (1 + real growth) × (1 + deflator growth), with rates written as decimals.

1 + nominal growth	=	1 + real growth	×	1 + deflator growth
Nominal growth factor		Real growth factor		Deflator growth factor

3. Exact calculation of real growth

Exact real growth = (1 + nominal growth) ÷ (1 + deflator growth) − 1.

4. Example

Nominal growth 12%, deflator growth 5%.

Real growth = 1.12 ÷ 1.05 − 1 ≈ 6.67% (rounded).

5. Shortcut

Shortcut: 12 − 5 = 7%; useful approximation, not the exact answer.

6. Index points are not percentage growth

A deflator rising from 200 to 210 gains 10 index points, but its growth is 10 ÷ 200 × 100 = 5%.



7. Important reminder

Always divide the change by the earlier index.
Do not divide by 100 unless the earlier index actually is 100.

Concept illustrations are schematic.

India's GDP: one source, three estimate vintages

MoSPI, National Accounts Statistics 2026, released 31 August 2026.
Base 2022–23.

2023–24 FINAL

Current-price GDP (Rs crore)	Constant-price GDP (Rs crore)
Rs 2,90,73,287 crore	Rs 2,80,94,358 crore
Nominal growth (per cent)	**Real growth (per cent)**
11.1%	7.3%

2024–25 FIRST REVISED

Current-price GDP (Rs crore)	Constant-price GDP (Rs crore)
Rs 3,17,98,524 crore	Rs 3,01,15,428 crore
Nominal growth (per cent)	**Real growth (per cent)**
9.4%	7.2%

2025–26 PROVISIONAL

Current-price GDP (Rs crore)	Constant-price GDP (Rs crore)
Rs 3,45,36,796 crore	Rs 3,24,70,100 crore
Nominal growth (per cent)	**Real growth (per cent)**
8.6%	7.8%

Note 1: Do not mix these August estimates with earlier advance-estimate releases or with the 2011–12 base series.

Note 2: The new price/volume indicators incorporated in August can revise earlier GDP estimates; a revision is not automatically evidence that previous estimates were erroneous.

India's implied deflator: calculated, not quoted

Derived from the preceding MoSPI GDP figures; these rounded deflator columns are calculations, not figures directly quoted from MoSPI.

2023-24	2024-25	2025-26
103.48	105.59	106.36
Deflator growth about 3.5%.	Deflator growth about 2.0%.	Deflator growth about 0.7%.

2025-26 calculation:

$$\frac{3,45,36,796}{3,24,70,100} \times 100 \approx 106.36$$



Compare with 2024-25:

$$\frac{3,17,98,524}{3,01,15,428} \times 100 \approx 105.59$$



Growth in the deflator:

$$(106.36 \div 105.59 - 1) \times 100 \approx 0.7\%$$

The shortcut 8.6 – 7.8 = 0.8% differs slightly.
Exact calculation uses unrounded values before reporting the rounded result.

A small positive deflator increase can coexist with faster real output growth.
It need not match CPI inflation.



Concept illustrations are schematic.

The base year: benchmark and structural revision

A base year supplies the price set used to value real output throughout a constant-price series.

In 2022–23, both current-price and constant-price GDP equal Rs 2,61,77,001 crore in NAS 2026. Therefore its deflator is 100.

Current-price GDP (nominal)
Rs 2,61,77,001 crore (2022–23)

=

Constant-price GDP (real, base year)
Rs 2,61,77,001 crore (2022–23)

→

GDP deflator

$$= \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

$$= \frac{2,61,77,001}{2,61,77,001} \times 100$$

$$= 100$$

Why revise?

- Capture structural changes.
- Incorporate newer data sources.
- Improve methods and widen coverage.

A base revision is more than changing prices:



Annual revision vs base revision

Annual revision	Base revision
Updates available data without changing the underlying conceptual framework in the same way.	Can change sectoral weights, coverage, methods and historical GDP levels, in addition to prices.

MoSPI described 2022–23 as a recent normal year after COVID, with robust data availability.

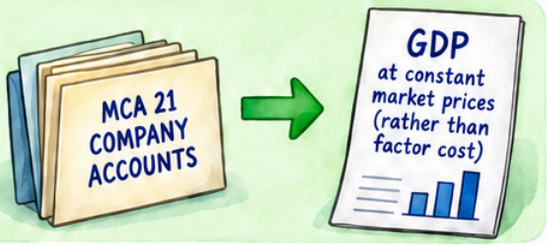
Do not assume rebasing leaves all past growth rates unchanged.

India's base years: keep base and release year apart

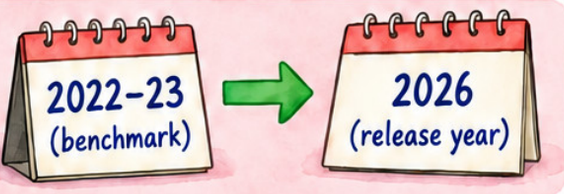
BASE YEAR	RELEASE CONTEXT
1948-49	first official national-income estimates prepared by CSO in 1956.
1960-61	revised series published 1967.
1970-71	January 1978.
1980-81	February 1988.
1993-94	February 1999.
1999-2000	2006 revision.
2004-05	January 2010.
2011-12	30 January 2015.
2022-23	27 February 2026.



The 2015 series used MCA 21 company accounts and shifted headline growth to GDP at constant market prices rather than factor cost.



A base year and the calendar date of release are different facts. 2022-23 is the benchmark; 2026 is the release year.



Concept illustrations are schematic.

The 2022-23 framework: new data and methods

February 2026 framework:

GST data: extensive quarterly use and allocation of private-corporate estimates across States.



MCA 21: company filings; separate activities of multi-activity enterprises.



PLFS and ASUSE: annual surveys improve household/ unincorporated-sector estimates.

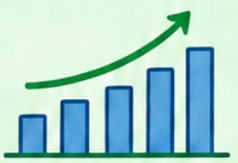


Supply and Use Tables: improve consistency between production and expenditure estimates.



National accounts (2022-23 framework)

Proportional Denton benchmarking replaces the pro-rata quarterly method.



Private consumption: COICOP 2018 classification, Household Consumption Expenditure Survey and administrative data such as e-Vahan.



Double deflation: agriculture and manufacturing.

Volume/single extrapolation: other sectors.



June/August 2026 update:

new 2022-23 base PPI, IIP and Banking Services Price Index became available and were incorporated in August estimates.

New 2022-23 base PPI



New 2022-23 base IIP



New Banking Services Price Index



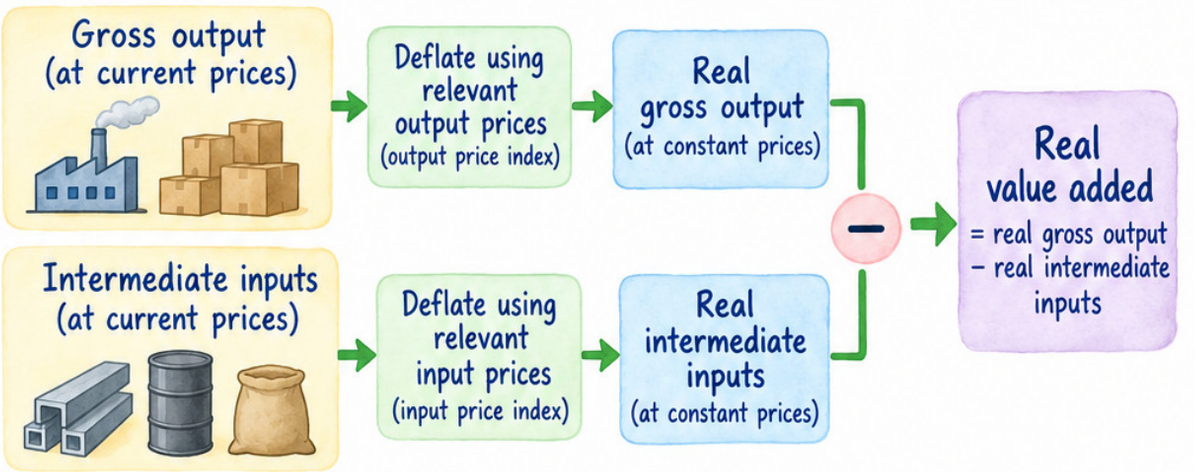
Incorporated in August estimates

Keep methodological descriptions dated; do not silently combine release versions.

Concept illustrations are schematic.

DOUBLE DEFLATION

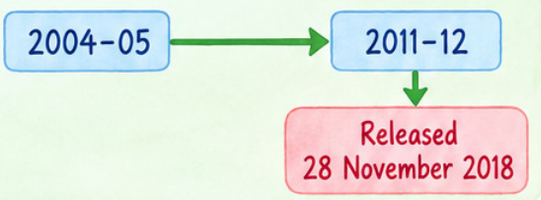
- Deflate gross output using the relevant output prices.
- Separately deflate intermediate inputs using relevant input prices.
- Real value added = real gross output − real intermediate inputs.
- This differs from deflating value added by a single price index.



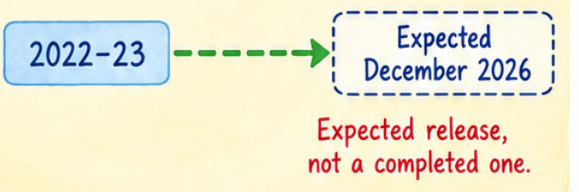
BACK SERIES

Re-estimate earlier years on the new framework so comparisons do not splice incompatible levels blindly.

The 2011–12 base back series from 2004–05 was released 28 November 2018.

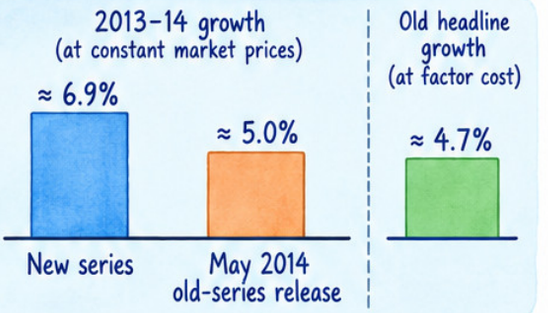


For the 2022–23 base, official guidance expected the back series by December 2026; that is an expected release, not a completed one.



The 2015 debate:

- 2013–14 growth was 6.9% in the new series versus 5.0% in the May 2014 old-series release, both at constant market prices.
- Old headline factor-cost growth was 4.7%; do not mix valuation bases.



Concept illustrations are schematic.

Worked example: wheat and machines

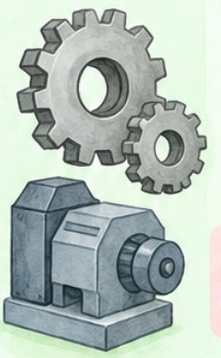
ILLUSTRATIVE ECONOMY; Year 1 is the base.

Wheat



	Year 1 (base)	Year 2
Quantity	100 quintals	110 quintals
Price	Rs 20	Rs 22
Value	Rs 2,000	
Nominal value		Rs 2,420
At base prices (real value)		Rs 2,200

Machines



	Year 1 (base)	Year 2
Quantity	10	12
Price	Rs 200	Rs 210
Value	Rs 2,000	
Nominal value		Rs 2,520
At base prices (real value)		Rs 2,400

GDP calculations

Item	Year 1 (base)	Year 2 nominal	Year 2 real (at base prices)
Wheat	Rs 2,000	Rs 2,420	Rs 2,200
Machines	Rs 2,000	Rs 2,520	Rs 2,400
Total GDP	Rs 4,000	Rs 4,940	Rs 4,600

GDP deflator

$$\text{Deflator} = 4{,}940 \div 4{,}600 \times 100 \approx 107.39 \text{ (rounded)}.$$

Growth rates

$$\text{Nominal growth} = \frac{4{,}940 - 4{,}000}{4{,}000} \times 100 = 23.5\%.$$

$$\text{Real growth} = \frac{4{,}600 - 4{,}000}{4{,}000} \times 100 = 15.0\%.$$

Deflator growth

Deflator growth ≈ 7.39%, from 1.235 ÷ 1.150 − 1.

The shortcut 23.5 − 15.0 = 8.5% is less close when rates are large.

CPI versus GDP coverage

A household CPI basket here prices wheat, not investment machines. Imported phones bought by households could enter CPI but not domestic-output GDP.

Concept illustrations are schematic.

Read the crop, season and measurement

1 2.1–2.2 Foundations

Coastal paddy: Godavari and Krishna deltas and the north coast.



Drier south-west: pulses and groundnut. Chillies, turmeric and fruits are also important.



Kharif: sowing with monsoon onset.



Rabi: winter sowing.



Paddy, groundnut and chillies: BOTH seasons.



Red gram: mainly kharif.



Bengal gram: rabi.



Recall: delta alluvial soils; red and black soils cover much of the rest of the State. Godavari and Krishna canals irrigate the deltas.



2 Key measurements

Net irrigated area: 2,936 thousand ha (2020–21).



SES 2024–25: land cultivated 49.55 lakh ha = 30.40% of State land.



June–December 2024 rainfall:

Actual	Normal	
960.3 mm	860.0 mm	+11.7%

3 Foodgrains, 2024–25 Second Advance Estimates

Area 37.51 lakh ha, up 12.85% from 33.24 (2023–24).



Output 161.86 lakh tonnes, up 12.94% from 143.31.



Paddy 2024–25: area +9.16%; output +12.95% to 127.15 lakh tonnes.



4 District vintage and key terms

District vintage: 13 districts before 4 April 2022; 26 after; 28 from 1 January 2026. Read each table in its own district boundaries.

Area = land used.
Yield = output per hectare.
Production = total output.

Concept illustrations are schematic.

2.3 Agro-climatic zones

IMD Agromet Bulletin 52/2025 • 1 July 2025 • PRE-2022 district names

1. **North Coastal Andhra**
   Srikakulam, Vizianagaram, Visakhapatnam



2. **Godavari**
   East Godavari, West Godavari



3. **Krishna**
   Guntur, Krishna, Prakasam



4. **South Andhra**
   Nellore, Chittoor, Kadapa



5. **Scarce Rainfall**
   Anantapur, Kurnool



6. **High Altitude**
   Srikakulam, Vizianagaram, Visakhapatnam, East Godavari



{ High Altitude OVERLAPS other zones: a district may occur in two zones.
These are not six mutually exclusive district groups.

ANGRAU uses North Coastal, Godavari, Krishna, Southern and Scarce Rainfall zone names, with a hill research station at Chintapalle.

3 Zone-to-crop links: compare dates, not boundaries blindly

North coast:



- Srikakulam third in paddy area, 2022-23.

Godavari:



- West Godavari first in paddy area/output, 2022-23.

Krishna zone:



- Krishna second in paddy area, 2022-23.
- Guntur and Prakasam lead chillies, 2020-21.

South Andhra:



- Nellore second in paddy output, 2022-23.
- Chittoor fifth in groundnut area, 2022-23.
- YSR Kadapa third in Bengal gram output, 2020-21.

Scarce Rainfall:



- Ananrhapuramu leads red gram area, 2025-26, and groundnut output, 2022-23.
- Kurnool leads Bengal gram, 2020-21.

No crop table here is specific to the High Altitude zone.
A new district with an old name may cover only part of the old district.

Concept illustrations are schematic.

Paddy: yield is not total output

2.4 Paddy • Andhra Pradesh • 2022-23

Total: 21.29 lakh hectares → 126.30 lakh tonnes.

Season	Area (lakh ha)	Output (lakh tonnes)	Yield (tonnes/ha, calculated)
Kharif	14.52	78.05	about 5.4
Rabi	6.77	48.25	about 7.1



Kharif

Area: 14.52 lakh ha

Output: 78.05 lakh tonnes

Yield: about 5.4 tonnes/ha



Rabi

Area: 6.77 lakh ha

Output: 48.25 lakh tonnes

Yield: about 7.1 tonnes/ha

Output = area × yield

Rabi has the HIGHER yield, but the SMALLER area. Its area is less than half the kharif area.

Rabi share of annual output = 48.25 ÷ 126.30 × 100 ≈ 38%, NOT more than half.

District comparison • 26-district list, 2022-23

Area leaders (thousand ha)

1	West Godavari	176
2	Krishna	168
3	Srikakulam	160
4	Kakinada	155

The first four hold about 31% of area.

Output leaders (thousand tonnes)

1	West Godavari	1,201
2	Nellore	1,007

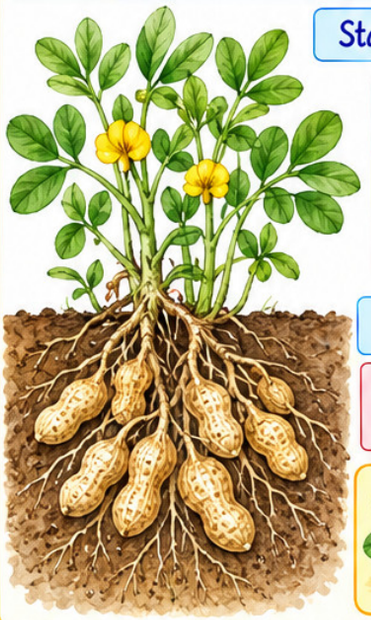
Nellore: fifth in area (151 thousand ha), but SECOND in output (1,007 thousand tonnes). East Godavari: sixth by area.

Read the measure before ranking: area ≠ yield ≠ production.

Concept illustrations are schematic.

Groundnut: two different district leaders

2.4 Groundnut • kharif and rabi



State data, 2022–23: 594 thousand ha; 600 thousand tonnes.

Season	Area (thousand ha)	Output (thousand tonnes)
Kharif	497	328
Rabi	97	272

26-district list, 2022–23: area leaders (thousand ha)

Sri Sathya Sai	Ananthapuramu	Kurnool	Annamayya	Chittoor
204	197	59	40	38



Largest AREA: Sri Sathya Sai.

Largest OUTPUT: Ananthapuramu, 133 thousand tonnes.



2.8 Yield contrast, same 2022–23 table



Sri Sathya Sai: about 473 kg/ha.

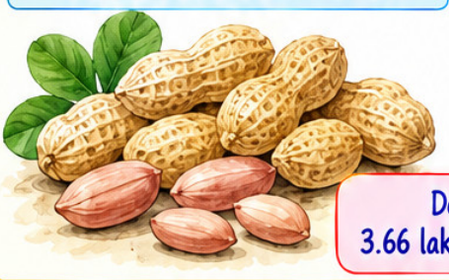


Annamayya: about 1,755 kg/ha.

More area does not guarantee more total production or higher yield.

2.5 National comparison • 2023–24 Third Advance Estimates

AP area: 3.66 of India's 48.80 lakh ha ≈ 7.5%.



Gujarat leads: area 16.35 lakh ha; output 36.74 of India's 102.89 lakh tonnes.



AP is NOT among the top five by production.

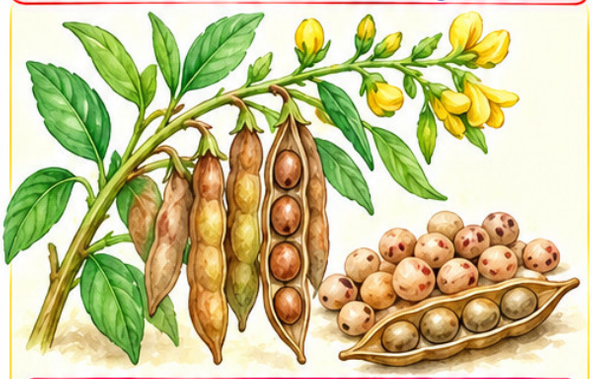
Do not treat AP's 5.94 lakh ha (State data, 2022–23) and 3.66 lakh ha (national estimate, 2023–24) as rival estimates for one year.

Always specify the measure, year, source and district list.

Concept illustrations are schematic.

Two pulses: red gram and Bengal gram

RED GRAM • mainly kharif



2025–26 national Third Advance Estimates: AP 0.43 million ha and 0.28 million tonnes; 31.26% of the State's pulse area.

India: 4.46 million ha, 3.59 million tonnes. AP has about a tenth of area and about 8% of output.

Karnataka: most national area (34%). **Maharashtra:** most output (33%).

AP district area, 2025–26, 26-district list (thousand ha):

District	Area (thousand ha)
Ananthapuramu	101.64
Prakasam	52.39
Kurnool	44.40
Nandyal	42.51
Palnadu	36.01
Sri Sathya Sai	24.38

Yield: AP 6.47 quintals/ha; India 8.05. AP is 19.6% below national average.

BENGAL GRAM • rabi



AP 2021–22: area 4.45 lakh ha; output 4.92 lakh tonnes.

India output 137.50 lakh tonnes: AP share 3.58%. Madhya Pradesh leads, 36.96 lakh tonnes.

DISTRICTS use 2020–21, 13-district list:

Kurnool first in area (156 thousand ha) and output (176 thousand tonnes).

District	Output (thousand tonnes)
Prakasam	138
YSR Kadapa	122
Ananthapuramu	38

Ananthapuramu SECOND by area: 92 thousand ha.

Do not merge 2021–22 State totals with 2020–21 district totals.

Concept illustrations are schematic.

Chillies, turmeric and commercial crops

2.4 – 2.5 Chillies • kharif AND rabi



2023–24 Spices Board Second Advance Estimates:

	Area	Output
AP	2.47 lakh ha	14.44 lakh tonnes
India	8.09 lakh ha	29.13 lakh tonnes

AP FIRST in chilli production:
14.44 ÷ 29.13 x 100 = 49.57%.

Separate State data, 2022–23:
258 thousand ha; 1,459 thousand tonnes.

District comparison: 2020–21, 13-district list

District	Area	Output
Guntur first	78 thousand ha	456 thousand tonnes
Prakasam second	51 thousand ha	132 thousand tonnes

Kurnool and Krishna follow.



TURMERIC: sources differ—do not silently combine ranks.



SES 2024–25:
AP SECOND.

ANGRAU outlook, using Indiastat 2023–24 advance estimates:
AP EIGHTH; 38.03 of India's 1,054.17 thousand tonnes.

Other crops: cotton, tobacco and sugarcane.

FCV tobacco soil zones (Tobacco Board):



Southern Light Soils + Southern Black Soils → Prakasam and Nellore.



Northern Light Soils → East and West Godavari.



The Tobacco Board at Guntur registers Virginia tobacco processors and manufacturers.

Recall sugarcane:
West Godavari and Krishna. These are source district names, not a new boundary map.



Concept illustrations are schematic.

Horticulture: productivity is not a production rank

2.6 Horticulture • SES 2024–25

SES 2024–25 reports 18.23 lakh hectares under horticulture. Total output: 365.92 lakh tonnes (2023–24 final estimates, Table 5.7).

The Survey calls AP the largest fruit producer, and ranks it second in mango and sweet orange. Its turmeric rank conflicts with ANGRAU's dated estimate.

The Survey says AP excels in **PRODUCTIVITY** of oil palm, papaya, lime, cocoa, tomato and chillies.

Productivity = output per hectare, not total production rank.



oil palm | papaya | lime | cocoa | tomato | chillies

MANGO • national Ministry of Agriculture table

2017–18 PROVISIONAL production (lakh tonnes):

Uttar Pradesh	45.49
Andhra Pradesh	44.89
India	207.14



AP SECOND; the same table places it second in each year 2014–15 to 2017–18.

This is a historical 2017–18 comparison, not a freshly verified 2026 ranking.

FISH AND SHRIMP • SES 2024–25



Fish ACTUAL: **41.38** lakh tonnes.



Fish TARGET: **56.62** lakh tonnes.



AP has **31%** of India's shrimp exports.



India's fish output: **197** lakh tonnes in 2023–24 (Union minister's reply).

The national and AP fish figures refer to **DIFFERENT YEARS**: do not draw a same-year national-share chart.

Horticulture, field crops and fisheries are distinct sub-sectors; do not interchange their units or totals.

Concept illustrations are schematic.

Two palms, two different national ranks

2.6 Oil palm versus coconut

OIL PALM



AP 2020–21 area: 1.86 lakh ha out of India's 3.70 lakh ha.

More than half of national area → no other State can have more. Highest AREA, worked out from these figures.

AP 2023–24 district area: Eluru 116,073 of State total 226,527 ha; East Godavari and Kakinada follow.

Do not mix the 2020–21 national comparison with the 2023–24 district figures.

COCONUT • Ministry final estimates, 2022–23



AP FOURTH in area and production.

Area: AP 106.86 of India's 2,277.18 thousand ha.

Production: AP 1,705.98 of India's 20,535.88 MILLION NUTS.

Karnataka, Kerala and Tamil Nadu are above AP by production.

Yield: AP 15,964 nuts/ha; national 9,018 nuts/ha.

High yield does not mean first in total production.

Konaseema is known for coconut trees and paddy: islands between Godavari distributaries and the Bay of Bengal, in Dr B.R. Ambedkar Konaseema district.

Remember: oil palm–most AREA (2020–21); coconut–FOURTH output (2022–23). Nuts are not tonnes.

Concept illustrations are schematic.

GI identity, farm returns and exam checks

2.7 Agricultural geographical indications

Guntur Sannam Chilli
- 2010–11



Banaganapalle Mangoes
- 2017–18
- Andhra Pradesh + Telangana



Araku Valley Arabica Coffee
- 2018–19
- Andhra Pradesh + Odisha



These three GI registrations are agricultural goods.

Tirupathi Laddu and Bandar Laddu are **FOODSTUFFS**, not agricultural goods.

2.8 Red gram economics · kharif 2025 ANGRAU cost study

Return: ₹48,766 per hectare.



− Cost: ₹63,207 per hectare.



→ Net return = 48,766 − 63,207 = **−₹14,441** per hectare.

A high output does not guarantee a positive farm return.

4 Three checks before answering

1. Which measure?
In groundnut 2022–23, Sri Sathya Sai leads AREA; Ananthapuramu leads OUTPUT.



2. Which district list?
Bengal gram 2020–21 uses 13 old districts; paddy 2022–23 uses 26. Kakinada appears in the latter.



3. Which rank?
Largest total fruit producer does not mean first in every fruit. Yield, area and production ranks need not agree.



Question checklist: CROP → SEASON → YEAR/ ESTIMATE → UNIT → DISTRICT VINTAGE → MEASURE.

Concept illustrations are schematic.

NAPCC: the plan and its governing logic

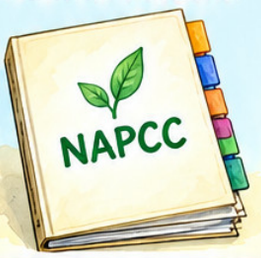
1 2.1 National Action Plan on Climate Change

13 July 2007 → **30 June 2008** → **December 2008**

first meeting of the Prime Minister's Council on Climate Change (PMCCC); it decides to prepare a national document.



Prime Minister releases NAPCC with EIGHT National Missions.



mission documents due to PMCCC, with objectives, strategies, timelines and monitoring criteria.



Original objectives covered the remaining 11th Plan and the 12th Plan (2012–13 to 2016–17).



PMCCC → overall oversight and periodic review.

→



Nodal ministries → implement their missions and publicly report annual performance.

→



2 2.2 Co-benefits approach

Choose measures that advance development AND address climate change.

Development benefits → **Co-benefits approach** ← **Climate change benefits**





Adaptation: adjust to climate-change effects.



Mitigation: cut the emissions causing climate change.



India's per-capita pledge: its per-capita greenhouse gas emissions will at no point exceed those of developed countries.

CBDR-RC: common but differentiated responsibilities and respective capabilities.



Recall Topic 96: warming; Topic 107: UNFCCC and Paris Agreement; Topic 117: solar mission; Topic 196: energy mix.

Concept illustrations are schematic.

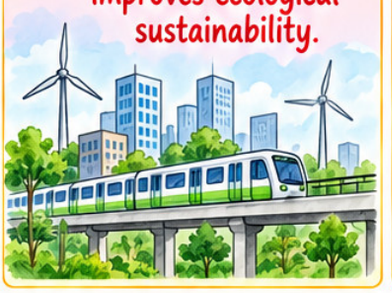
Seven principles: development with climate safeguards

2.2 Principles in the original NAPCC

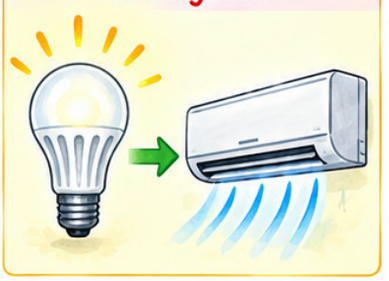
1. Protect poor and vulnerable groups through inclusive, climate-sensitive sustainable development.



2. Meet national growth objectives through a qualitative change that improves ecological sustainability.



3. Use efficient, cost-effective strategies for end-use demand-side management.



4. Deploy appropriate adaptation and mitigation technologies widely and rapidly.



5. Use innovative market, regulatory and voluntary mechanisms for sustainable development.



6. Link implementation with civil society, local government and public-private partnerships.



7. Welcome international cooperation for research, development, technology sharing and transfer, with additional funding and a supportive global intellectual-property regime.



The 2021 MoEFCC FAQ lists the first SIX only.
The seventh in the original plan is **INTERNATIONAL COOPERATION**.

Co-benefits is the plan's **APPROACH**, not an eighth principle.
Adaptation versus mitigation: different purposes can coexist.

Illustrative adaptation: rainwater storage helps manage drought impacts.



Illustrative mitigation: energy-efficient equipment reduces energy demand and associated emissions.



Do not infer that every mission belongs exclusively to just one category.

Concept illustrations are schematic.

Eight original missions: who leads what?

2.3–2.4 Original NAPCC mission–ministry matrix

1	National Solar Mission	Ministry of New and Renewable Energy (MNRE)	raise solar's share in the energy mix.
2	National Mission for Enhanced Energy Efficiency (NMEEE)	Ministry of Power, through Bureau of Energy Efficiency (BEE)	certified savings, efficient appliances and finance.
3	National Mission on Sustainable Habitat (NMSH)	Ministry of Housing and Urban Affairs (MoHUA)	buildings, waste and urban transport.
4	National Water Mission (NWM)	Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation	efficient water use.
5	National Mission for Sustaining the Himalayan Ecosystem (NMSHE)	Department of Science and Technology (DST)	glacier assessment, monitoring and community management.
6	National Mission for a Green India (GIM)	MoEFCC	forest/tree cover and forest quality.
7	National Mission for Sustainable Agriculture (NMSA)	Ministry of Agriculture and Farmers Welfare	climate-resilient farming.
8	National Mission on Strategic Knowledge for Climate Change (NMSKCC)	Department of Science and Technology (DST)	human and institutional climate-science capacity.










DST leads TWO missions: Himalayan ecosystem AND strategic knowledge.

MoEFCC coordinates the plan but does NOT run all eight missions.

Later human-health addition is separate from the original eight.

Concept illustrations are schematic.

Solar and energy efficiency: supply versus demand

2.3–2.5 | National Solar Mission • MNRE

Goal: raise solar's share in the energy mix.

Original 2008 plan targets for 2017:

at least 1,000 MW concentrating solar power; local production of 1,000 MW of photovoltaic capacity per year.



Concentrating solar power

Photovoltaic (PV) solar cells

Later solar capacity target:

20 GW by 2022, raised in 2015 to 100 GW by 2022.

20 GW by 2022 → **100 GW by 2022**

These are dated TARGETS, not achievement claims.



NMEEE • Ministry of Power through BEE • implemented since 2011

Four initiatives:

- **PAT:** Perform, Achieve and Trade.
- **MTEE:** Market Transformation for Energy Efficiency.
- **EEFP:** Energy Efficiency Financing Platform.
- **FEEED:** Framework for Energy Efficient Economic Development.

PAT mechanism:



designated energy-intensive consumers receive targets → certified energy savings → energy saving certificates (ESCerts) → certificates can be traded.

Other NMEEE tools:



faster adoption of efficient appliances

demand-side finance from future savings

and fiscal instruments.

BEE dashboard labelled 2025:

- **1,333** energy-intensive industries
- **55%** of industrial energy use
- savings of **25.78** million tonnes of oil equivalent.

Solar adds clean energy supply; efficiency lowers energy needed for a service.
Do not equate installed capacity with electricity generation.

Concept illustrations are schematic.

Habitat and water: efficient cities and resource use

2.3–2.5 Sustainable Habitat • MoHUA

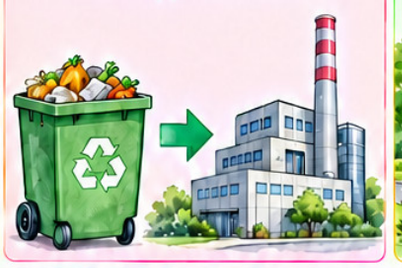
Approved by PMCCC in June 2010.

Three parts:

1. Extend Energy Conservation Building Code (ECBC) to more buildings.



2. Urban waste management, including energy from waste.



3. Better urban planning and a shift to public transport.



Works through AMRUT, Swachh Bharat Mission and Smart Cities Mission.

National Water Mission • Ministry of Jal Shakti

FIVE GOALS

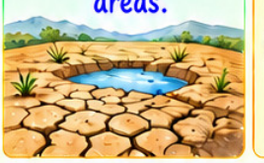
1. Comprehensive public water database AND assessment of climate-change impacts on water resources.



2. Citizen and State action for conservation.



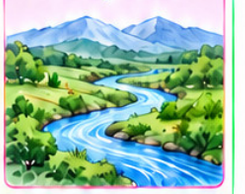
3. Attention to vulnerable areas, including over-exploited areas.



4. Increase water-use efficiency by 20%



5. Basin-level water-resource management.



State Specific Action Plan grants: ₹50 lakh for a major State. ₹30 lakh for a minor State.

20% is a mission target, not a measured achievement here.

Jal Shakti Abhiyan: Catch the Rain began in 2021, promoting rainwater harvesting.



Water conservation, information and basin management are complementary; no single city building represents the whole mission.



Concept illustrations are schematic.

Two DST missions: monitoring versus knowledge

2.3–2.5 Department of Science and Technology leads BOTH

1 NMSHE: National Mission for Sustaining the Himalayan Ecosystem

Assess whether, and how far, Himalayan glaciers are receding.
Build a monitoring network.
Promote community-based ecosystem management.



Monitoring network on Himalayan glaciers → Observations from the network → Assessment of whether, and how far, glaciers are receding.

2 NMSKCC: National Mission on Strategic Knowledge for Climate Change

Build human and institutional capacity in climate science and technology.
Climate Science Research Fund; university climate-research units; private innovation through venture capital.



University climate-research units → Climate Science Research Fund → Private innovation through venture capital

Original knowledge targets:

- At least 10 thematic knowledge networks.
- 50 chair professorships.
- About 200 trained professionals.
- At least 3 public-private partnerships.

Reported 30 July 2025:

DST had established 18 Centres of Excellence under NMSKCC.



Do not confuse a TARGET count with a reported institution count:
18 Centres of Excellence is not the same measure as 10 thematic networks.

Both use networks, but their purposes differ.

Matching trap: monitoring + community management → HIMALAYAN.
Thematic networks + chairs + trained professionals → STRATEGIC KNOWLEDGE.

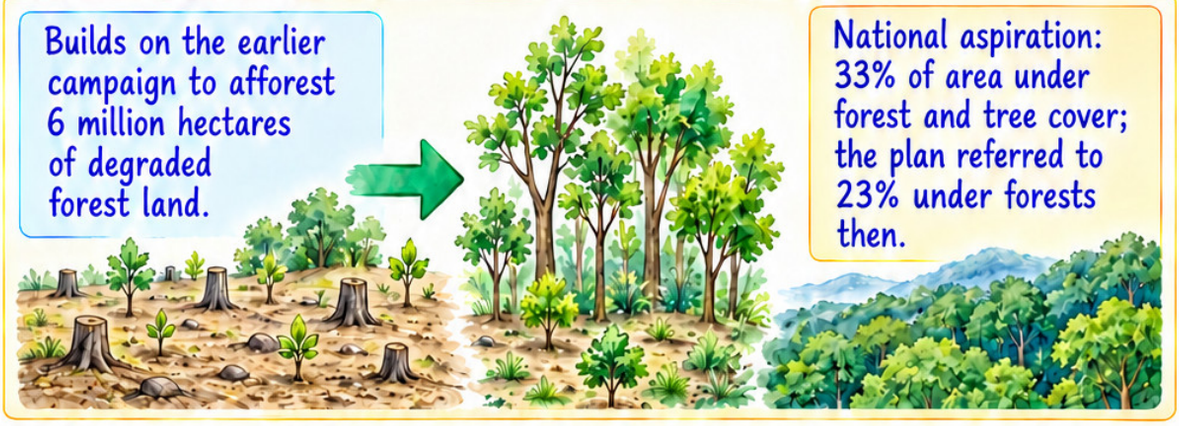
Concept illustrations are schematic.

Green India: keep three target frameworks separate

2.3–2.5 Green India Mission • MoEFCC

A Original NAPCC context (2008)

Builds on the earlier campaign to afforest 6 million hectares of degraded forest land.



National aspiration: 33% of area under forest and tree cover; the plan referred to 23% under forests then.

B Mission objectives in MoEFCC's 2021 FAQ

5 million ha: INCREASE forest/tree cover.



Another 5 million ha: IMPROVE forest quality.



Together 10 million ha, not 10 million ha of new forest.

Higher forest-based livelihood income for about 3 million households.

Annual CO_2 sequestration increase of 50–60 million tonnes by 2020: a historical TARGET, not an achievement statement.

C Revised mission document: 2021–2030

TARGET: afforestation/restoration interventions over 24 million ha through GIM and converging schemes (2021–2030).
Portal: 20–24 million ha by 2030.
NOT total national forest cover or achieved area.

Additional carbon sink target: 2.5–3 billion tonnes CO_2 equivalent by 2030.



Implementation report, 24 July 2025: ₹982.34 crore released to 17 States and one UT.



Finance released ≠ area restored ≠ carbon sink achieved.

Concept illustrations are schematic.

Agriculture, State plans and adaptation finance

2.3–2.6 Sustainable Agriculture • operational 2014–15

NMSA: Ministry of Agriculture and Farmers Welfare.

Climate-resilient crops, including heat-tolerant varieties; improved rainfed productivity; better credit and insurance.

Soil health and farm water management; Soil Health Cards issued since February 2015.

Schemes include Per Drop More Crop and Rainfed Area Development.

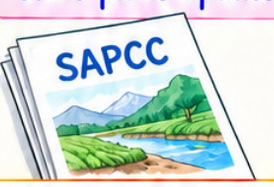


State Action Plans on Climate Change (SAPCCs)

State/UT plans align with NAPCC; they are not separate national missions.

July 2015: about 27 States + 5 UTs. → March 2022: 33 States/UTs. → 18 August 2025: 34 States/UTs; some plans updated.

Assam SAPCC 2.0 covers 2021–2030.



National Adaptation Fund on Climate Change (NAFCC)

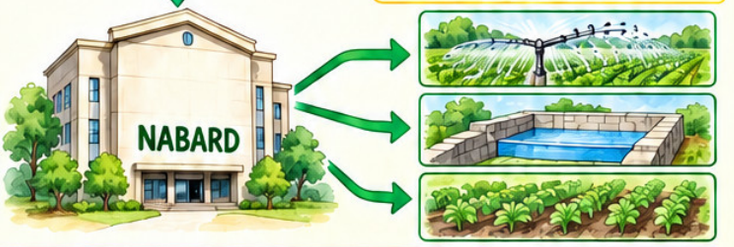
Central Sector Scheme, approved July 2015; set up 2015–16.

NABARD was appointed National Implementing Entity.

By February 2018: 23 projects sanctioned, ₹236.32 crore. Andhra Pradesh received one in 2016–17.

₹350 crore for 2015–16 and 2016–17.

Supports concrete adaptation projects in particularly vulnerable States/UTs.



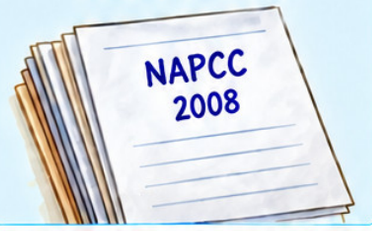
These are dated scheme records, not a claim about a new 2026 allocation.

Concept illustrations are schematic.

Eight in 2008; health added in later reporting

1 2.7 The health distinction

Original NAPCC, 2008: EIGHT missions.



Official releases of 2023 and 2025: NINE areas/missions, adding human health.



National Programme on Climate Change and Human Health (NPCCHH): Ministry of Health and Family Welfare; reported in all 36 States/UTs.



2 Original eight missions (2008) and the later addition

Eight missions in the original 2008 NAPCC

- Solar Energy
- Enhanced Energy Efficiency
- Sustainable Habitat
- Water Resources
- Himalayan Ecosystem
- Green India
- Sustainable Agriculture
- Strategic Knowledge for Climate Change

Human health added in later reporting

Human Health



(included in official reporting of 2023/2025)

3 Key points from official information

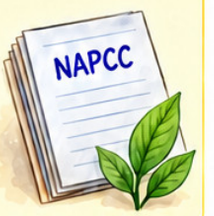
MoEFCC reply, 24 July 2025: six of nine focus on adaptation and climate resilience of vulnerable communities.

The reply does not name those six—do not invent a six-mission list.



2022–2023 releases describe NAPCC as an overarching framework for climate actions.

July–August 2025 replies report mission progress, without announcing a revised NAPCC.



4 Chronology checkpoints

- 2007 — PMCCC first meeting.
- 2008 — NAPCC released.
- 2010 — habitat approved.
- 2011 — energy efficiency implemented.
- 2014–15 — agriculture operational.
- 2015 — NAFCC approved.
- 2021 — Catch the Rain.
- August 2022 — updated NDC.
- 2023/2025 — official reporting includes human health.



5 Exam checks

- Original 2008 plan → eight.
- Later official list → nine, with health.
- A revised individual mission document is not automatically a revised entire NAPCC. Do not confuse NAPCC missions with NDC target years.

Concept illustrations are schematic.

India's climate targets: two different periods

2.7 Dated NDC comparison • TARGETS, not achievements

August 2022 update — targets for 2030

GDP emissions intensity	**45%** below the 2005 level.	↓ 45% below 2005 in 2030
Non-fossil sources	About **50%** of cumulative installed electric-power capacity, supported by technology transfer and low-cost international finance, including the Green Climate Fund.	
Forest/ tree cover	An additional carbon sink of **2.5–3** billion tonnes CO_2 equivalent by 2030.	

April 2026 NDC — targets for 2035 (period 2031–2035)

GDP emissions intensity	**47%** below the 2005 level.	↓ 47% below 2005 in 2035
Non-fossil sources	About **60%** of cumulative installed electric-power capacity, supported by technology transfer and low-cost international finance.	
Forest/ tree cover	Carbon sink of **3.5–4.0** billion tonnes CO_2 equivalent relative to the 2005 baseline by 2035.	

Read the measure

- Intensity = emissions per unit of GDP, NOT an absolute emissions-cut pledge.
- Installed capacity ≠ electricity generated.
- These are **TARGETS**, not claims that each has been achieved.

Keep the August 2022 targets for 2030 separate from the April 2026 targets for 2035.

Long-term goal: net zero by 2070.

LiFE: Lifestyle for Environment.

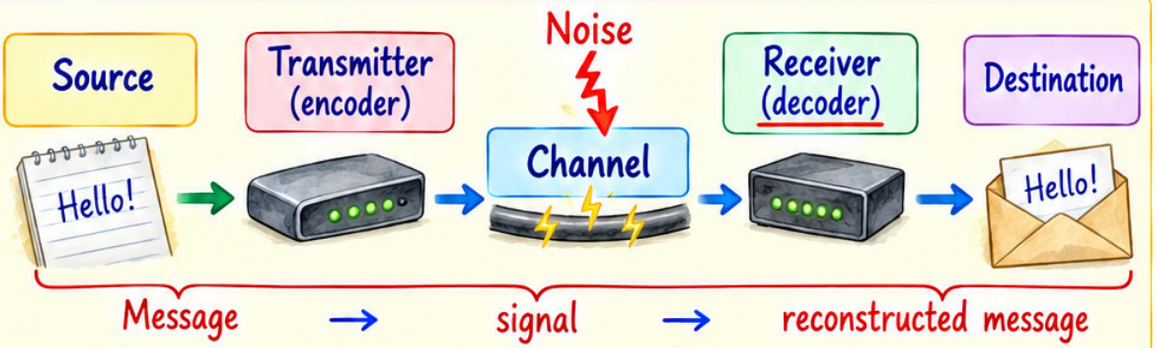
Concept illustrations are schematic.

Communication: one-way or two-way?

2.3 Communication needs shared meaning

Words and non-verbal cues carry feelings and ideas. Speaking alone does not ensure that the intended meaning is understood.

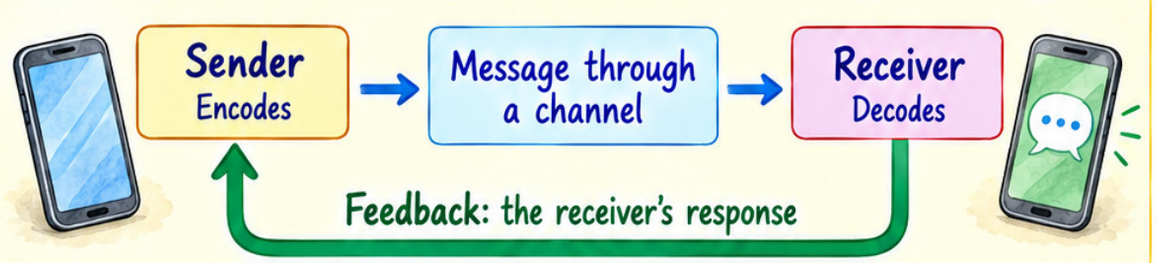
1 LINEAR MODEL — Shannon and Weaver



Noise can distort the signal in the channel.

NO feedback loop in this linear model.

2 INTERACTION MODEL — a two-way exchange



Feedback helps the sender check what was understood.

3 Encoding, decoding and the channel

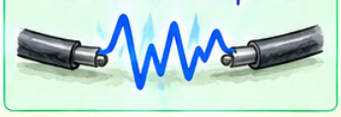
Encoding: putting an idea into a message using a code.



Decoding: interpreting the received message.



A **channel** carries the message; **feedback** carries the response.



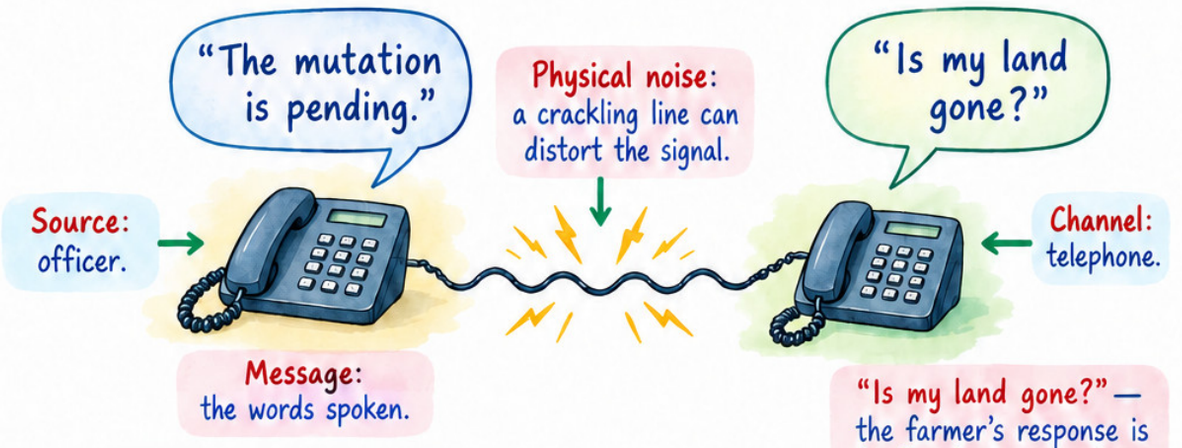
Do not add a feedback arrow to the linear model.

Concept illustrations are schematic.

When the words arrive but meaning fails

2.3 A public-service telephone call

Illustration: a Village Revenue Officer tells a farmer, "The mutation is pending."



Semantic difficulty: the farmer does not know what "mutation" means, so decoding fails.

"Is my land gone?" — the farmer's response is **feedback.** It reveals misunderstanding; receipt of words is not proof of shared meaning.

Schramm: communication needs overlapping fields of experience. Encoding uses a code, such as a language; both sides need enough common understanding to interpret it.



2.2 Why interpersonal skills matter

Communicative competence is the ability to communicate effectively.

Interpersonal intelligence is the ability to understand others;

interpersonal skills are the actions used in dealing with them.

At a ration-card counter, hearing the citizen out and checking the request can prevent answering the wrong question.

Listening supports cooperation and conflict resolution; it is also used in community organising and patient communication.

Recall Topics 68, 128 and 138: notice emotions and cues, interpret the whole situation, and listen with full attention.

Topic 108: choose among alternatives for an objective.

Concept illustrations are schematic.

Words, tone, space and touch

2.4 Verbal and non-verbal communication

VERBAL: language-based messages. Speech and writing; listening and reading are their counterparts.

NON-VERBAL: non-linguistic cues accompanying or replacing words.

KINESICS — bodily behaviour: gestures, posture, walking style and facial expressions.

Example: saying "go on" while looking at a phone gives conflicting cues.



PARALANGUAGE / VOCALICS — how speech sounds: rhythm, intensity, pitch, fluency and loudness.

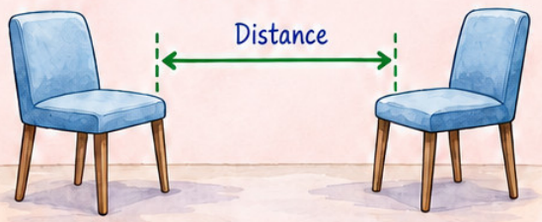
"Come tomorrow" can sound dismissive when shouted.



Illustrative speech wave

PROXEMICS — personal space and distance between speakers.

A high counter and a large gap can affect an interaction.



HAPTICS — information through touch.

Example: a doctor's reassuring hand on a patient's shoulder.



CONGRUENCY: harmony between verbal and non-verbal communication.

Matching words "Come tomorrow" ⟷ Matching tone (calm and friendly)

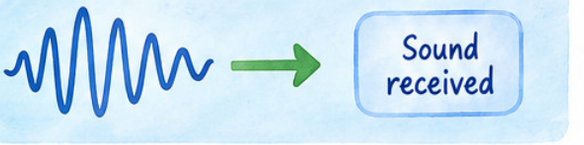
- **Read cues together:** gestures, posture, eye contact, clothing, movement and context. One cue alone is not enough to judge a feeling.
- **Do not treat** a fixed percentage of meaning as universally non-verbal. The supplied sources establish no such all-purpose percentage.
- **Remember:** proxemics concerns distance; kinesics concerns movement and expression.

Concept illustrations are schematic.

Hearing is reception; listening adds attention

2.5 Hearing versus active listening

HEARING:
biological reception of a message through sensory channels.



LISTENING:
reception → attention → assigning meaning → responding.



Active listening means intentionally engaging with communication to reduce misunderstanding and clarify thoughts, perceptions and ideas.
Carl Rogers and Richard Farson used the term in their essay "Active Listening".
An active listener is attentive, patient, non-judgemental and non-interrupting; listening also involves analysing and responding.



ATTENDING:
focus on the message, remain present and allow time for a response.



WITHHOLDING JUDGEMENT:
do not decide against the speaker before understanding the message.



OPEN-ENDED QUESTIONS:
invite the speaker to expand, rather than limiting the reply to yes or no.



NON-VERBAL FEEDBACK:
suitable eye contact and body language show attention.



EMPATHIC LISTENING:
attend to feelings as well as facts. Reflecting feelings can help the speaker feel understood.

Rogers' three facilitative conditions:
- empathy
- genuineness
- unconditional positive regard.

Receiving a sound is not the same as checking its meaning.



Concept illustrations are schematic.

Four listening techniques that must not be swapped

2.5 Identify what the reply does

Speaker: "My pension has not been paid since my address changed."

PARAPHRASING: restate the speaker's message in your own words.



restate

Listener: "So your pension has not been paid since your address changed."

This restates the content of one message.

Speaker: "The bank might not wait. I don't know what to do."

REFLECTING FEELINGS: identify a feeling, even when it is not directly stated.



name

Listener: "You are worried that the bank will not wait."

This names anxiety, not a missing fact.

Speaker: "My name was not on the list."

CLARIFYING: ask a question to make the meaning precise.



ask

Listener: "Was your name missing from the list, or was it there and then struck off?"

This distinguishes two possible meanings.

Speaker: "My name was removed. I have the survey receipt. I want a fresh field check."

SUMMARISING: give a concise overview of the main points and intent of the whole message, often near the end.



overview

Listener: "Your name was removed, you have the survey receipt, and you want a fresh field check. Is that right?"

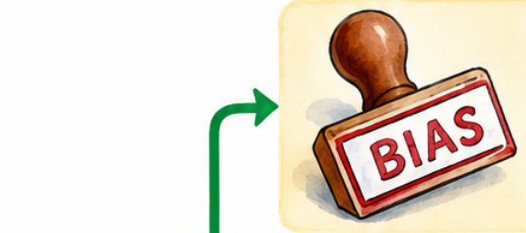
This summarises the main points and intent of the whole message.

- Content restated ≠ feeling reflected.
- A clarifying question ≠ a summary.
- Paraphrasing often follows one message; summarising pulls together the main points of a longer account.

Concept illustrations are schematic.

Why a listener misses the message

2.5 Barriers to listening



PREJUDGING: an earlier bias makes the listener notice weaknesses and ignore strengths.

At a grievance hearing: "These petitions are always exaggerated." The conclusion has been formed before listening.



FILTERING: keeping only what one expects to hear.

Example: listening only for the expected survey number and missing the complaint.





REHEARSING: preparing one's own reply while the other person is still speaking.

Example: drafting the order before the petitioner has finished.



DAYDREAMING: attention wanders to unrelated thoughts.

One textbook estimate contrasts processing about 500 words a minute with speech at about 125; these are an attributed estimate, not a universal measured rule.



ENVIRONMENTAL / PHYSIOLOGICAL: noise, poor telephone reception, headache, hunger or fatigue.

Exam distinction: prejudging starts from a bias; filtering selects expected content; rehearsing prepares a reply; daydreaming loses focus.

Do not decide the barrier from one familiar word.
Read what the listener is actually doing.

Concept illustrations are schematic.

Communication barriers: where does meaning break?

2.6 Four teaching categories

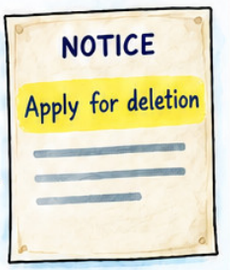
PHYSICAL:

interference on the way to the receiver.
Example: a bus-stand announcement lost in surrounding noise, or a crackling telephone line.



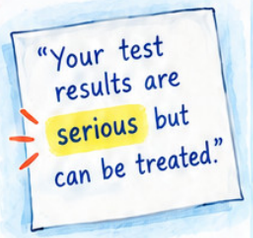
SEMANTIC:

unfamiliar or ambiguous words. Slang, region-specific expressions and euphemisms can obstruct meaning.
"Apply for deletion" is unclear unless the notice says what will be deleted.



PSYCHOLOGICAL:

distraction, selective perception or failure to attend to feedback.
A worried listener may hear only "serious" and miss the rest of the message.



CULTURAL:

different meanings attached to a gesture or form of address. What is polite in one setting may be rude in another.



Process rail: where a barrier can occur

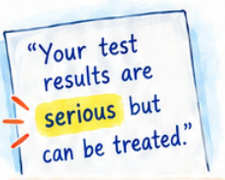
Channel (physical) → Word meaning (semantic) → Attention (psychological) → Context (cultural) → Receiver understands meaning



Failure example: a bus-stand announcement lost in surrounding noise.



Failure example: "Apply for deletion" is unclear unless the notice says what will be deleted.



Failure example: a worried listener may hear only "serious" and miss the rest of the message.



Failure example: different meanings attached to a gesture or form of address. What is polite in one setting may be rude in another.

Three examination checks

1. Feedback belongs to interaction models, not the one-way Shannon-Weaver diagram.
2. There is no fixed percentage of non-verbal meaning valid for every communication.
3. Filtering, rehearsing and daydreaming describe different failures of attention.

These are teaching labels; identify the described mechanism rather than assuming every textbook uses an identical classification.

A grievance hearing: listen, check, then summarise

Illustration: Ramaiah's crop-loss compensattion has not reached him.

1. ATTEND.

The officer puts the file aside, turns towards him and offers a seat. Non-verbal cues show that he will be heard.



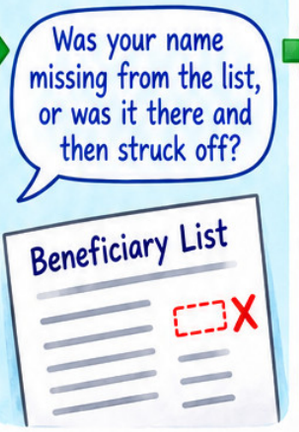
2. INVITE THE STORY.

"Tell me what happened with the compensation." An open-ended question; no interruption.



3. CLARIFY.

"Was your name missing from the list, or was it there and then struck off?" The unclear word "cut" is checked.



4. PARAPHRASE.

"So your name was on the first list, and it was removed after the field check." Content is restated.



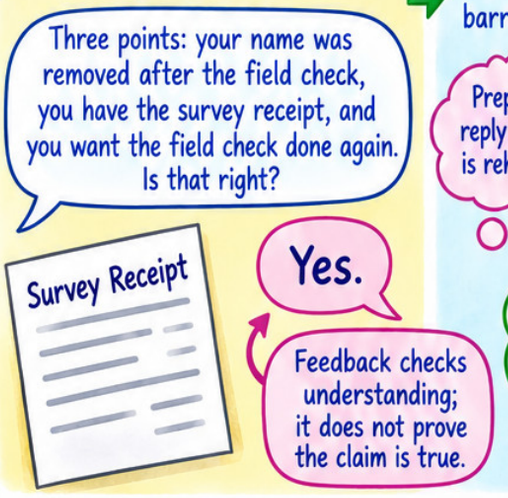
5. REFLECT FEELINGS.

"You are worried that the bank will not wait." The officer notices anxiety about the loan.



6. SUMMARISE AND CHECK.

"Three points: your name was removed after the field check, you have the survey receipt, and you want the field check done again. Is that right?" Ramaiah's "yes" is feedback.



7. WATCH FOR BARRIERS.

Preparing a reply too early is rehearsing; listening only for the survey number is filtering; unexplained "ineligible under the norms" creates a semantic barrier.



The aim is shared understanding—not merely waiting for a turn to speak.

Base, exponent and brackets

2.1 Read the expression before calculating

1 What does a power mean?

Base: repeated factor

Exponent: number of factors

$$5^4 = \underbrace{5 \times 5 \times 5 \times 5}_{\text{4 factors, not } 5 \times 4} = 625$$

For a counting number n, a^n is the product of n factors, each equal to a.

2 The bracket decides the base

$-3^2 = -(3 \times 3) = -9$

Square 3 first; apply the minus last.

$(-3)^2 = (-3) \times (-3) = 9$

The whole negative number is squared.

3 Negative base: count the minus signs

$(-2)^4 = 16$ → even exponent: positive

Sign only: (−) × (−) × (−) × (−) = (+)

$(-2)^5 = -32$ → odd exponent: negative

Sign only: (−) × (−) × (−) × (−) × (−) = (−)

$(-1)^{\text{even}} = 1$

$(-1)^{\text{odd}} = -1$

4 A power tower is not a power of a power

$2^{(3^2)} = 2^9 = 512$

Evaluate the top exponent first.

$(2^3)^2 = 8^2 = 64$

Brackets change the grouping.

Same digits, different brackets, different answers.

Recall Topic 109: order of operations

Same base: add, subtract or multiply?

For integer exponents m and n:

1 Product: add the exponents

$$a^m \times a^n = a^{m+n}.$$

$\underbrace{2^3}_{2\times2\times2} \times \underbrace{2^4}_{2\times2\times2\times2} = 2^{3+4} = 2^7 = 128.$

$\underbrace{p^4}_{4\text{ factors}} \times \underbrace{p^6}_{6\text{ factors}} = p^{10}.$

Same base is essential; a must be non-zero if an exponent is zero or negative.

2 Quotient: subtract the exponents

$$a^m \div a^n = a^{m-n}, \quad a \neq 0.$$

$$\underbrace{2^{100}}_{2\times2\times\cdots\times2\ (100\text{ factors})} \div \underbrace{2^{25}}_{2\times2\times\cdots\times2\ (25\text{ factors})} = 2^{100-25} = 2^{75}.$$

3 Power of a power: multiply the exponents

$$(a^m)^n = a^{mn}.$$

$8^6 = (2^3)^6 = 2^{18}.$

Again exclude a = 0 if an exponent is zero or negative.

4 Do not mix the operations

$3^2 \times 3^4 = 3^6$ (add exponents)

but $(3^2)^4 = 3^8$. (multiply exponents)

5 A sum has no corresponding exponent-combining law

$2^3 + 2^4 = 8 + 16 = 24$, NOT 2^7.

Look at the operation between the powers before choosing the rule.

Same exponent: distribute the power

1 Power of a product

$$(ab)^n = a^n \times b^n.$$

The same exponent applies to both factors.

$$3^4 \times 2^4 = (3 \times 2)^4 = 6^4 = 1{,}296.$$

$$(-3)^2 \times (-5)^2 = 9 \times 25 = 225.$$

If n is zero or negative, a and b must both be non-zero.

2 Power of a quotient

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}.$$

$$\left(\frac{2}{3}\right)^3 = \frac{2^3}{3^3} = \frac{8}{27}.$$

Always $b \neq 0$; also $a \neq 0$ if n is zero or negative.

3 Choose the right match

Same base:

$2^3 \times 2^4$

↓

add exponents.

$2^3 \times 2^4 = 2^{3+4} = 2^7.$

Same exponent:

$3^4 \times 2^4$

↓

multiply bases.

$3^4 \times 2^4 = (3 \times 2)^4 = 6^4 = 1{,}296.$

Neither:

$2^3 \times 3^2$

↓

has no direct same-base or same-exponent simplification.

4 Do not change both bases and exponents at once.

$2^3 \times 3^2 \neq (2 \times 3)^{3+2}.$ ✗ NOT

Same exponent n: $a^n \times b^n = (ab)^n$.
Never add the exponents in this rule.

Zero and negative exponents

1 WHY $a^0 = 1$, for $a \neq 0$:

$a^m \div a^m = 1$, but also $a^{m-m} = a^0$. → $a^0 = 1$ for $a \neq 0$

For $a = 0$ this would use $\frac{0}{0}$, which is undefined.

2 NEGATIVE EXPONENT = RECIPROCAL:

$$a^{-m} = \frac{1}{a^m}, \quad a \neq 0$$

a must be non-zero.

$2^{-3} = \frac{1}{8}$, not -8.
$2^{-3} \times 2^3 = 1$.

$10^{-1} = \frac{1}{10}$; $10^{-2} = \frac{1}{100}$;
$10^{-3} = \frac{1}{1000}$.

$\left(\frac{2}{3}\right)^{-2} = \left(\frac{3}{2}\right)^2 = \frac{9}{4}$.

$\frac{1}{3^{-2}} = 9$.

$\left(\frac{1}{2}\right)^x = 2^{-x}$.

3 DRILL 1:

$(3^4 \times 3^{-6}) \div 3^{-3}$
$= 3^{4-6+3} = 3^1 = 3$.

DRILL 2:

$\left(\frac{3}{5}\right)^{-2} \times \left(\frac{3}{5}\right)^4$
$= \left(\frac{3}{5}\right)^2 = \frac{9}{25}$.

4 Zero exponent belongs only to its base:

$(-7)^0 = 1$, but $-7^0 = -(7^0) = -1$.

0^0 is left aside; 0 to a negative power is undefined.

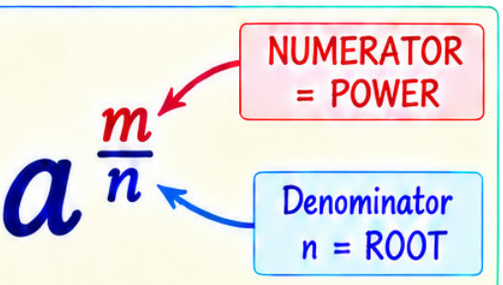
Concept illustrations are schematic.

Fractional exponents: root then power

For $a > 0$ and positive integer n:

$a^{\frac{1}{n}}$ is the positive nth root of a.

$$a^{\frac{m}{n}} = \left(a^{\frac{1}{n}}\right)^m.$$



Examples: root first, then power

$27^{\frac{2}{3}}$: cube root of 27 → 3; then $3^2 \rightarrow 9$.

$32^{\frac{2}{5}}$: fifth root of 32 → 2; then $2^2 \rightarrow 4$.

More examples

$$16^{\frac{3}{4}} = 2^3 = 8.$$

$$125^{-\frac{1}{3}} = \frac{1}{5}.$$

Product of fractional exponents

$$2^{\frac{2}{3}} \times 2^{\frac{1}{3}} = 2^1 = 2.$$

DRILL 3

$$81^{\frac{3}{4}} = 3^3 = 27.$$

$$125^{-\frac{2}{3}} = \frac{1}{5^2} = \frac{1}{25}.$$

A half exponent is a square root, not half the number:

$$16^{\frac{1}{2}} = 4, \quad \text{NOT } 8.$$

Keep bases positive when applying these fractional-exponent laws.

An odd root of a negative number can be real: cube root of $-8 = -2$.

An even root such as $\sqrt{-4}$ is not real.

Scientific notation: move the decimal

1 Standard form

For a positive number, standard form is $x \times 10^{y}$, where $1 \le x < 10$ and y is an integer.

2 Large number: move the decimal left → positive exponent.

8 places left

$$308\,100\,000 = 3.081 \times 10^{8}$$

DRILL 4:
6,05,00,000
$= 6.05 \times 10^{7}$

3 Small positive number below 1: move it right → negative exponent.

$$0.00045 = 4.5 \times 10^{-4}$$

1 2 3 4

4 Textbook examples (values used for calculation)

Sun-Earth distance:	1,49,60,00,00,000 m	$= 1.496 \times 10^{11}$ m
Sun diameter:	1,40,00,00,000 m	$= 1.4 \times 10^{9}$ m
Earth diameter:	1,27,56,000 m	$= 1.2756 \times 10^{7}$ m
Paper thickness:	0.0016 cm	$= 1.6 \times 10^{-3}$ cm
Plant-cell example:	0.00001275 m	$= 1.275 \times 10^{-5}$ m
Red-blood-cell example:	0.000007 m	$= 7 \times 10^{-6}$ m
One micron:		$= 10^{-6}$ m

Always retain the unit; the cell figures are examples, not universal sizes.

Calculate with scientific notation

1 Divide coefficients and powers separately:

$$(1.4 \times 10^{9}) \div (1.2756 \times 10^{7})$$

$$= (1.4 \div 1.2756) \times 10^{2} \approx 110.$$

Using the supplied textbook diameters, the Sun is about 110 Earth diameters across. NCERT rounds this to about 100.

2 For the textbook cell-size examples:

$$(7 \times 10^{-6}) \div (1.275 \times 10^{-5})$$

$$= 0.7 \div 1.275 \approx 0.55, \text{ about one-half.}$$

3 Do not add exponents when adding numbers.

FIRST ALIGN THE POWERS:

$$5.97 \times 10^{24} + 7.35 \times 10^{22}$$
$$= 597 \times 10^{22} + 7.35 \times 10^{22}$$
$$= 604.35 \times 10^{22}$$
$$= 6.0435 \times 10^{24}.$$

4 Final check: $1 \leq$ coefficient < 10.

These are arithmetic illustrations; no additional physical identities are assumed.

Equations: convert both sides to one base

1 For real exponents, use a positive base $a \neq 1$:

$$a^m = a^n \quad \text{implies} \quad m = n.$$

2 For integer exponents, negative bases other than -1 also work.

$$1^5 = 1^7 \qquad (-1)^2 = (-1)^4$$

show why the exceptions matter.

3 METHOD: same base → multiply the WHOLE bracket → equate exponents.

$$4^{x} = 8^{x-1}$$

4 Examples

$$2^{2x} = 2^{3x-3}$$
$$2x = 3x - 3 \rightarrow x = 3.$$

$$2^{x+1} = 32 = 2^5$$
$$x = 4.$$

$$3^{2x} = 81 = 3^4$$
$$x = 2.$$

For integer m:
$$(-3)^{m+6} = (-3)^7$$
$$m = 1.$$

5 DRILL 5

$$5^{2x-1} = 125 = 5^3$$

$$2x - 1 = 3 \rightarrow x = 2.$$

6 DRILL 6

$$\left(\frac{1}{3}\right)^x = 9^{x-3}$$
$$3^{-x} = 3^{2x-6}$$
$$-x = 2x - 6 \rightarrow x = 2.$$

Check: $\left(\frac{1}{3}\right)^2 = \frac{1}{9}$ and $9^{-1} = \frac{1}{9}$.

Comparing powers without huge calculations

1 SAME BASE $a > 1$: larger exponent → larger value.

$2^{60} > 2^{50}$

$8^{20} = 2^{60} > 4^{25} = 2^{50}$

2 SAME POSITIVE EXPONENT, positive bases:

larger base → larger value

$81^{10} > 64^{10}$

3 NEITHER MATCHES? Use a common factor of the exponents.

$2^{60} = 64^{10}$ $3^{40} = 81^{10}$ $5^{20} = 25^{10}$ $7^{10} = 7^{10}$

Since 81 is largest, 3^{40} is largest.

4 DRILL 7: compare 2^{30}, 3^{20} and 5^{10}.

2^{30}, 3^{20} and 5^{10} → 8^{10}, 9^{10} and 5^{10}

3^{20} is largest.

5 If $0 < a < 1$, increasing the exponent makes the value smaller:

$$\left(\frac{1}{2}\right)^3 = \frac{1}{8} < \left(\frac{1}{2}\right)^2 = \frac{1}{4}$$

6 Do not swap base and exponent:

$3^4 = 81 > 4^3 = 64$

$2^8 = 256 > 8^2 = 64$

Units digits: follow the cycle

1 The repeating units digits

For a positive integer exponent, only the base's units digit matters.

Base digit → repeating units digits:

0, 1, 5, 6	each stays unchanged.	4	4, 6
2	2, 4, 8, 6	9	9, 1
3	3, 9, 7, 1	7	7, 9, 3, 1
8	8, 4, 2, 6		

2 Use the remainder when dividing the exponent by 4

Divide the exponent by 4. Use its remainder; if remainder is 0, use the **FOURTH** power.

Every cycle length is 1, 2 or 4, so it divides 4.

3 Examples

7^{95}: $95 = 4 \times 23 + 3$

$7^3 = 343$

units digit **3**.

13^{42}: only 3 matters; remainder 2

$3^2 = 9$

units digit **9**.

4 More practice

DRILL 8:

3^{65} has units digit 3; 8^{47} has units digit 2.

Check: $65 = 4 \times 16 + 1$; $47 = 4 \times 11 + 3$ and $8^3 = 512$.

$2^{224} \div 4^{32} = 2^{160}$:

remainder 0 → $2^4 = 16$

units digit **6**.

Concept illustrations are schematic.

Three traps: operation, minus and zero

1 TRAP 1: adding versus multiplying exponents.

$2^3 \times 2^4 = 2^7$

$2^3 \times 2^4 = 2^7$, NOT 2^{12}.

$(2^3)^4 = 2^{12}$

$(2^3)^4 = 2^{12}$.

$3^2 + 3^4 = 9 + 81 = 90$

$3^2 + 3^4 = 9 + 81 = 90$; there is no corresponding law that combines the exponents of a sum.

2 TRAP 2: where is the minus sign?

$5^{-2} = \frac{1}{25}$

$5^{-2} = \frac{1}{25}$, NOT -25 or -10.

$-5^2 = -(5^2) = -25$

$-5^2 = -(5^2) = -25$.

$(-5)^2 = 25$

$(-5)^2 = 25$.

3 TRAP 3: zero exponent belongs to its own base.

$7^0 = 1$

$7^0 = 1$, NOT 0 or 7.

$(-7)^0 = 1$

$(-7)^0 = 1$; $\left(\frac{3}{4}\right)^0 = 1$.

$-7^0 = -1$

$-7^0 = -1$.

A final root check:

$16^{\frac{1}{2}} = \sqrt{16} = 4$

$16^{\frac{1}{2}} = \sqrt{16} = 4$, NOT 8.

0^0 is outside this lesson. Zero to a negative power is undefined.

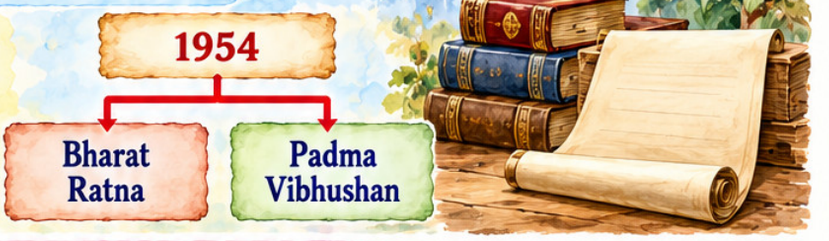
Read the operation, brackets and exponent sign before calculating.

Concept illustrations are schematic.

2.1 Padma Awards: origin and constitutional status

1. Two civilian awards in 1954

In 1954, two civilian awards were instituted — Bharat Ratna and Padma Vibhushan.



2. Original classes of Padma Vibhushan

The original Padma Vibhushan had three classes:

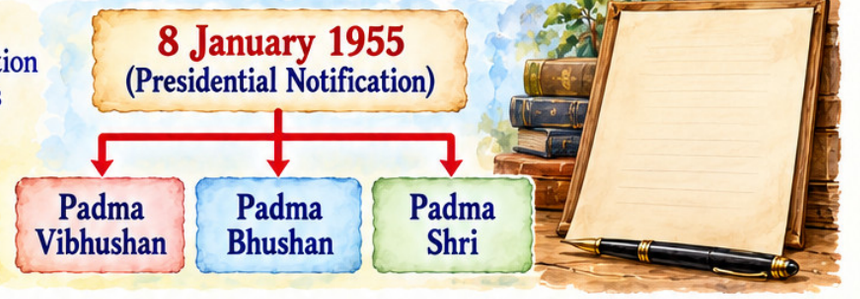
- Pahela Varg
- Dusra Varg
- Tisra Varg.



3. Renaming of the three classes (8 January 1955)

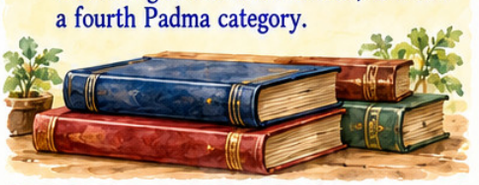
On 8 January 1955, the Presidential Notification renamed the three classes as:

- Padma Vibhushan
- Padma Bhushan
- Padma Shri.



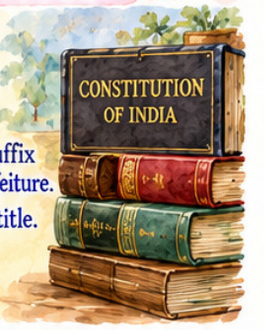
4. Important clarifications

- Two awards in 1954 ≠ three Padma names from 1955.
- Bharat Ratna remains a separate award, India's highest civilian honour; it is **not** a fourth Padma category.



5. Balaji Raghavan v. Union of India

- 15 December 1995 • five-judge Supreme Court bench.
- National Awards are **NOT** titles under Article 18(1).
- They must **NOT** be used as a prefix or suffix to a person's name; misuse can lead to forfeiture.
- Recognition of service does not confer a title.
- Recall Topic 73: Right to Equality, Articles 14–18.



6. Award package

The award package comprises:

- a Sanad signed by the President,
- a medallion and
- a small replica wearable at ceremonial or State functions.



Illustrations are schematic; no official medal design is depicted.

Concept illustrations; buildings and symbols are schematic.

Field illustrations are symbolic; not portraits or personal instruments.

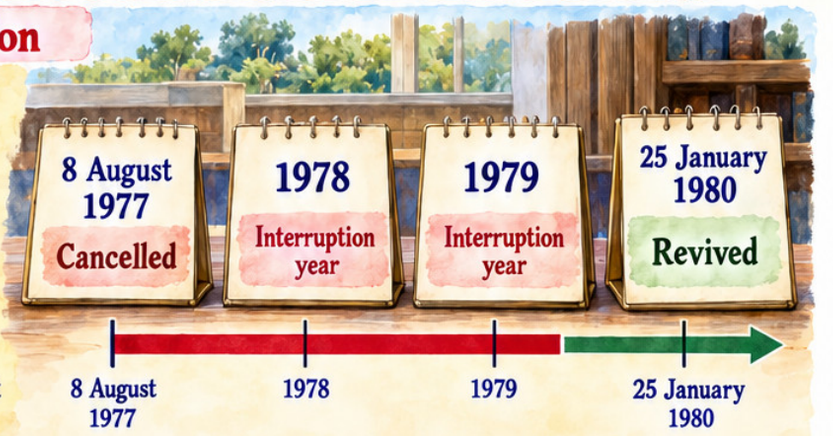
2.1 Interruptions and the question of limits

1. First interruption

8 August 1977: institution of the National Awards cancelled, as recorded in Balaji Raghavan.

1978 and 1979: interruption years listed on the official Padma Awards website.

25 January 1980: Government revived the awards.

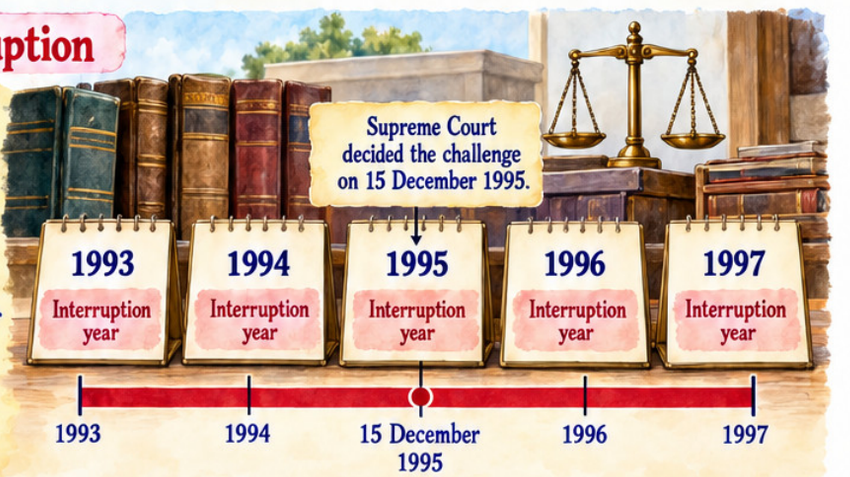


2. Second interruption

1993–1997: interruption years listed on the official website.

The awards were under challenge in the courts; the Supreme Court decided the challenge on 15 December 1995.

Do not infer that the whole interruption ended on the judgment date.



3. Two different numerical statements

1995 judgment

The majority noted that no maximum had then been prescribed.

Justice Kuldip Singh's separate opinion

suggested not more than 50 awards in a year.

That proposal is NOT the present binding guideline.

Current guideline

not more than 120 in a year, excluding posthumous awards and awards to NRIs, foreigners and OCIs.

Separate opinion ≠ majority holding ≠ current administrative guideline.

4. Gap between awards for a higher category

A higher Padma category normally needs at least five years since the earlier award; the Committee may relax this in highly deserving cases.



Concept illustrations; buildings and symbols are schematic.

Field illustrations are symbolic; not portraits or personal instruments.

2.2 Categories recognise different levels of service

Padma Vibhushan

5 in 2026

Exceptional and distinguished service.



Padma Bhushan

13 in 2026

Distinguished service of a high order.



Padma Shri

113 in 2026

Distinguished service; the MHA release adds "in any field".



5 + 13 + 113 = 131 awards.

Bharat Ratna is separate: do not include it in this sum.

Fields recognised

Art • Social Work • Public Affairs • Science and Engineering • Trade and Industry • Medicine • Literature and Education • Civil Service • Sports • Others.

"Others" is not a single occupation. The 2026 list specifies fields such as Archaeology, Agriculture, Animal Husbandry, Spiritualism and Radio Broadcasting.



A **category** describes the level of service; **a field** describes the area of work.

Example: Padma Shri + Medicine + Telangana are three different columns: award category, field and State.

Award category	Field	State
Padma Shri	Medicine	Telangana



Counts are from the MHA announcement of 25 January 2026, not a count of a single presentation ceremony.



Concept illustrations; buildings and symbols are schematic.

Field illustrations are symbolic; not portraits or personal instruments.

2.3 From nomination to presidential approval

1. Nominations

Nominations are open to the public; self-nomination is allowed.



2. Padma Awards Committee

The Prime Minister constitutes the Padma Awards Committee every year.

Committee chair: Cabinet Secretary.

Members:

- Home Secretary
- Secretary to the President
- four to six eminent persons.

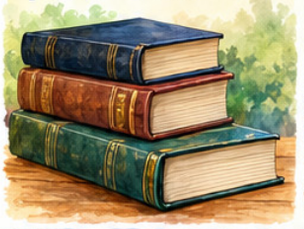


3. From recommendations to approval

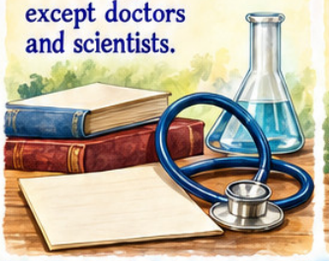


4. Eligibility and exceptions

All persons are eligible without distinction of race, occupation, position or sex.



Government servants, including PSU employees, are not eligible — except doctors and scientists.



Posthumous awards are not normally conferred; highly deserving cases may be considered.



A higher category normally requires at least five years since the previous Padma award; the Committee may relax this in highly deserving cases.



5. Limits, announcement and presentation

Annual limit: 120, excluding posthumous awards and awards to NRIs, foreigners and OCIs.



Announcement: annuallly on the eve of Republic Day.



Presentation: by the President, usually March or April; names are published in the Gazette on the presentation day.





Chair trap: Cabinet Secretary, NOT Home Secretary. The Home Secretary is a member.



Concept illustrations; buildings and symbols are schematic.

Field illustrations are symbolic; not portraits or personal instruments.

2.4 Count awards, persons and exceptions correctly

1. MHA announcement • 25 January 2026

131 awards approved:
5 Padma Vibhushan + 13 Padma Bhushan + 113 Padma Shri.



2. Two duo cases — both Padma Shri

2 duo cases: in each case, two persons count as ONE award.

Gayatri Balasubramanian and Ranjani Balasubramanian
Art; Tamil Nadu.



Each pair → one award entry.

Ramchandra Godbole and Suneeta Godbole
Medicine; Chhattisgarh.



Each pair → one award entry.

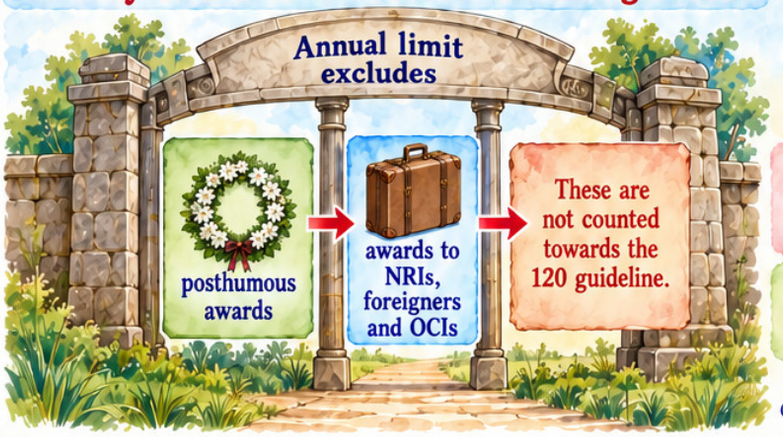
Therefore 131 awards went to more than 131 persons.

3. Demographic groups among the awardees



These labels overlap; do not add 19 + 6 + 16 to the total.

4. Why 131 does not breach the 120 guideline



The annual limit excludes posthumous awards and awards to NRIs, foreigners and OCIs. The headline total is not the ceiling's counting base.

Do not subtract overlapping groups twice or assume every demographic figure forms a separate slice of a pie.

Announcement count ≠ persons count ≠ a single ceremony's count.

Concept illustrations; buildings and symbols are schematic.

Field illustrations are symbolic; not portraits or personal instruments.

2.5 Five Padma Vibhushan awardees in 2026

MHA list of 25 January 2026 • State/Country column

Name	Field	State/Country
Dharmendra Singh Deol (posthumous)	Art	Maharashtra
K T Thomas	Public Affairs	Kerala
N Rajam	Art	Uttar Pradesh
P Narayanan	Literature and Education	Kerala
V S Achuthanandhan (posthumous)	Public Affairs	Kerala

Read the pattern

Three of the five entries are under Kerala: K T Thomas, P Narayanan, V S Achuthanandhan.

Two of the five are posthumous: Dharmendra Singh Deol and V S Achuthanandhan.

Fields:

Art	2
Public Affairs	2
Literature and Education	1

Concept illustrations; buildings and symbols are schematic.

Field illustrations are symbolic; not portraits or personal instruments.

2.6 Andhra Pradesh: four Padma Shri entries

MHA list • 25 January 2026 • counted by the State column

Andhra Pradesh: FOUR awardees, all Padma Shri.

Gadde Babu Rajendra Prasad	Garimella Balakrishna Prasad (posthumous)	Maganti Murali Mohan	Vempaty Kutumba Sastry
Art.	Art.	Art.	Literature and Education.



Pattern: three Art entries + one Literature and Education entry = four.

State-column rule

No 2026 Padma Vibhushan or Padma Bhushan is listed under Andhra Pradesh or Telangana in this announcement.

Dr Nori Dattatreyudu:
Padma Bhushan; Medicine; United States of America.
His listing is NOT counted in the Andhra Pradesh or Telangana State totals.



Identity, ancestry or birthplace must not silently replace the official State/Country column.

AP + Telangana: 4 + 7 = 11; all eleven are Padma Shri awardees.



All eleven are Padma Shri awardees.

Field comparison

Vempaty Kutumba Sastry → Literature and Education; Both are Andhra Pradesh entries.



Maganti Murali Mohan → Art. Both are Andhra Pradesh entries.



Concept illustrations; buildings and symbols are schematic.

Field illustrations are symbolic; not portraits or personal instruments.

2.6 Telangana: seven entries and one source difference

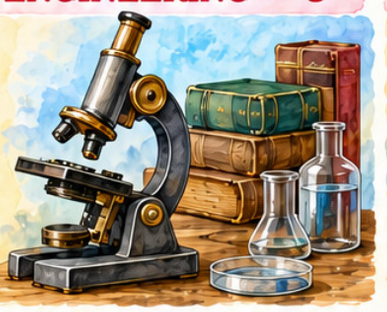
MHA list • 25 January 2026
all seven are Padma Shri.

SCIENCE AND ENGINEERING — 3

Chandramouli Gaddamanugu.

Krishnamurty Balasubramanian.

Kumarasamy Thangaraj.



ART — 1

Deepika Reddy.



MEDICINE — 2

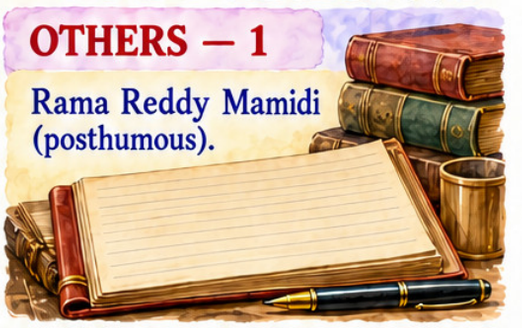
Guduru Venkat Rao.

Palkonda Vijay Anand Reddy.



OTHERS — 1

Rama Reddy Mamidi (posthumous).



3 + 1 + 2 + 1 = 7 Telangana entries.

Preserve a real official-source difference

25 January MHA list:
Rama Reddy Mamidi — Others (Animal Husbandry).

23 June Gazette notification:
Rama Reddy Mamidi — Cooperative Development.

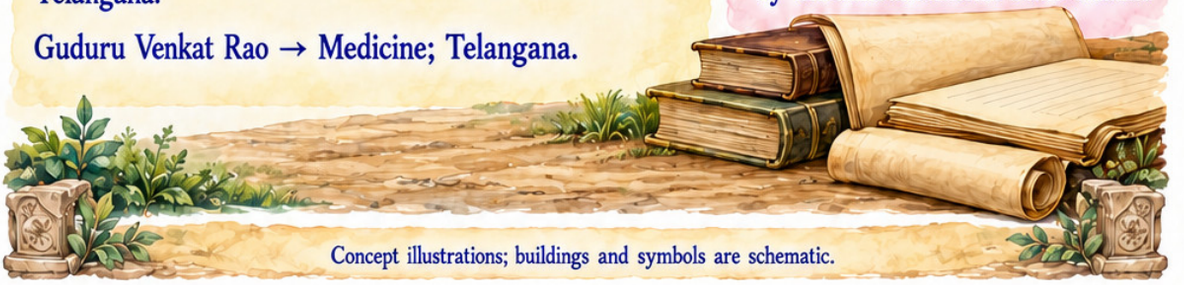


Name–field recap

Chandramouli Gaddamanugu → Science and Engineering; Telangana.

Guduru Venkat Rao → Medicine; Telangana.

The four Andhra Pradesh entries plus these seven Telangana entries make eleven Padma Shri awardees by the announcement's State column.



Concept illustrations; buildings and symbols are schematic.

Field illustrations are symbolic; not portraits or personal instruments.

2.7 Announcement is not investiture

1. Three key events in 2026

25 January 2026 — ANNOUNCEMENT
MHA announces 131 Padma Awards on the eve of Republic Day.



25 May 2026 — CIVIL INVESTITURE CEREMONY-I
President Droupadi Murmu presented the awards at Rashtrapati Bhavan.



23 June 2026 — CIVIL INVESTITURE CEREMONY-II
President Droupadi Murmu presented the awards at Rashtrapati Bhavan.



2. Gazette notification lists 65 awards

Gazette notification No. 75-Pres/2026, dated 23 June, lists 65 awards:

2 Padma Vibhushan	+	7 Padma Bhushan	+	56 Padma Shri	=	65



Do not call 65 the annual total.
Do not infer a Ceremony-I category split by subtraction.

3. Usual schedule versus actual events

Usually: presentations around March or April.



Actually in 2026: 25 May and 23 June.



4. Bharat Ratna is separate

The MHA release of 25 January 2026 did not announce a Bharat Ratna.

Five Bharat Ratna awards were announced in 2024. Bharat Ratna is separate from the Padma Awards.



5. Three distinctions to retain

announced ≠ presented | annual list ≠ one ceremony | Padma Awards ≠ Bharat Ratna



Concept illustrations; buildings and symbols are schematic.

Field illustrations are symbolic; not portraits or personal instruments.