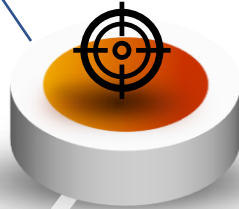


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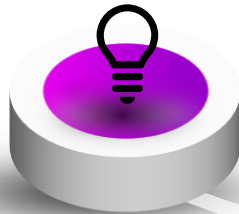
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The Hindu



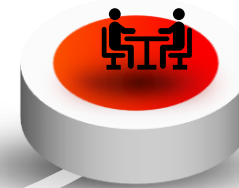
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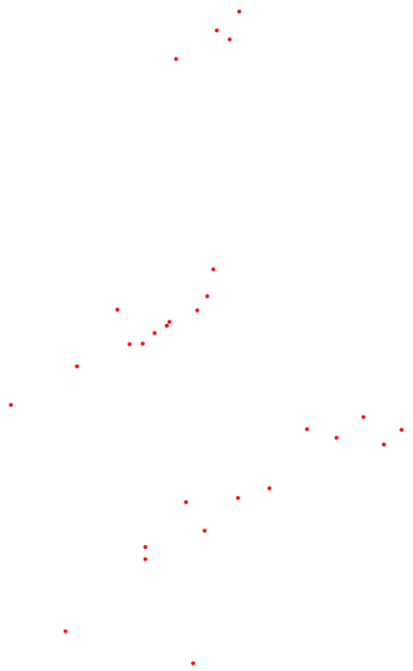


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10 MCQ QUIZ

1

10 MCQ



What report was recently released by the Ministry of Statistics and Programme Implementation (MoSPI)?

- **हाल ही में सांख्यिकी और कार्यक्रम कार्यान्वयन मंत्रालय (MoSPI) ने कौन सी रिपोर्ट जारी की है?**
 - A. India's GDP Forecast Report
 - B. Gender Equality Index
 - C. Women and Men in India 2024
 - D. Sustainable Growth Report

Exercise INDRA 2025 is a joint military exercise between which countries?

- **एक्सरसाइज INDRA 2025 किन देशों के बीच संयुक्त सैन्य अभ्यास है?**
 - A. India and France
 - B. India and Russia
 - C. India and USA
 - D. India and Japan

What is Project Varsha related to?

• **प्रोजेक्ट वर्षा किससे संबंधित है?**

- A. Climate monitoring
- B. Nuclear submarine base
- C. Rainwater harvesting
- D. Weather forecasting system

In which field is Project Varsha being developed?

• प्रोजेक्ट वर्षा किस क्षेत्र में विकसित किया जा रहा है?

- A. Space technology
- B. Naval defense
- C. Artificial intelligence
- D. Meteorology

Where is the new vertical lift Pamban bridge located?

• **नया वर्टिकल लिफ्ट पंबन पुल कहाँ स्थित है?**

A. Kerala

B. Andaman Islands

C. Tamil Nadu

D. Gujarat

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- › ISFR 2023: Key Findings on India's Forest Cover & Climate Goals
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If you don't design
your own life plan,
chances are you'll fall
into someone else's plan.

And what they have
planned for you
is not much.

SKYMET FORECASTS 'NORMAL' MONSOON
FIR FILED
900 engines missing from Kia plant in A.P.
STATES > PAGE 3

SKYMET FORECASTS 'NORMAL' MONSOON
FIR FILED
900 engines missing from Kia plant in A.P.
STATES > PAGE 3

TRUMP ANNOUNCES DIRECT TALKS WITH IRAN
NUCLEAR PROGRAMME
WORLD > PAGE 14

AN EXODUS OF EXPERTISE IN U.S.
RIPPLE EFFECTS
Trump's assault on science could lead to a research brain drain
EDITORIAL > PAGE 8

BKS BEATS CSK; LSG EDGES KKR IN THRILLER
IPL ACTION
SPORT > PAGE 16

INSIDE



Slight relief for markets a day after meltdown

MUMBAI
India's benchmark NSE Nifty recovered 1.7% to 22,535.45 points on Tuesday after tanking more than 3% in the previous session, providing much needed respite to investors. The Nifty opened at 22,446.75 points, about 285 points more than the previous close. > PAGE 12



Two arrested over grenade attack in Punjab

CHANDIGARH
Two suspects were held within 12 hours of the grenade attack on BJP leader Manoj Kumar Kalia's house in Jalandhar. The police have linked the attack to a Pakistan ISI-backed terror module. > PAGE 4



'China's military expansion has been staggering'

TOKYO
China's expansion of its armed forces is "staggering," NATO chief Mark Rutte said, as he embarked on a visit to Japan from Tuesday. The US defence secretary said the "projecting" the alliance's power in the Asia-Pacific region, he said. "Let us not be naive about China." > PAGE 14

China vows 'fight to the end' in tariff war

Reuters
BEIJING/WASHINGTON
China on Tuesday vowed not to bow to "blackmail" from the United States as a global trade war ignited by U.S. President Donald Trump's sweeping tariffs showed little sign of abating, even as battered stock markets steadied. The rebuke came after Mr. Trump threatened to ratchet up tariffs on U.S. imports from the world's second-largest economy more than 100% on Wednesday in response to Beijing's decision to match "reciprocal" duties Mr. Trump initially unveiled last week. The U.S. side's threat to escalate tariffs against Chi-

SC slams T.N. Governor, fixes time for assent

Court slams R.N. Ravi's inaction on 10 re-passed Bills, deems them to have received assent

It cites sense of expediency in Article 200, says Governor should be a 'guide' and not a 'hindrance'

Justice Pardiwala emphasises that Governors have no such 'absolute or pocket veto'

Krishnasdas Ramesh
NEW DELHI

The Supreme Court on Tuesday slammed Tamil Nadu Governor R.N. Ravi for his conduct as "unconstitutional", criticising his prolonged inaction on 10 key Bills. The court noted that he failed to act for months before swiftly referring the Bills to the President, only after they were re-passed by the State Legislature and came under judicial scrutiny. The top court deemed the 10 Bills to have received assent, declaring the actions of President Droupadi Murmu – who chose to assent to only one of the Bills, rejecting seven, and not considering two others – to be void. It also fixed time limits, of one to three

months, for Governors to take action on future Bills. The court said that a Governor must be a "friend, guide and philosopher" to the State, not a hindrance, as a sagacious counsellor... What unfolded in the current litigation was quite the opposite, a Bench of Justices J.B. Pardiwala and R. Mahadevan observed. Justice Pardiwala, who authored the judgment, said that Mr. Ravi had acted as a "roadblock" by delaying action on the Bills sent to him for consent by the Assembly under Article 200 of the Constitution. The Article gives a Governor three choices to assent, withhold assent, or reserve the Bills for consideration by the President. A Governor cannot indefinitely delay exercising his

On the clock

SC sets time frame for Governors, saying the phrase 'as soon as possible' permeates Article 200 with a sense of expediency
■ A Governor has a maximum of one month to withhold assent on the aid and advice of the State Cabinet.
■ A maximum of three months is given to return the Bill with a message specifying reasons if the Governor withholds assent contrary to the Cabinet's advice.
■ The Governor 'must' grant assent to a Bill requested by the State Legislature under Article 200 within a maximum of one month.

or her choice, the court said. "Once a Bill is presented to the Governor, he is under a Constitutional obligation to opt for one of the three choices... The phrase 'as soon as possible' permeates Article 200 with a sense of expediency

in line with the Constitutional ethos and aspirations of the people. Delaying assent indefinitely on Bills passed by the State Legislature reduced these 200 within a maximum of one month, Justice Pardiwala observed. Time limits In a significant move, the court set time limits of one to three months, voluntarily, for Governors to take a call on Bills. A Governor has a maximum of one month to withhold assent on the aid and advice of the State Cabinet, the court said. If he withholds assent contrary to the Cabinet's advice, he has a maximum of three months to return the Bill with a message specifying his reasons. The Governor has three months to reserve a Bill for the Pres-

ident's consideration against the advice of the State Cabinet. The Governor "must" grant assent to a Bill re-passed by the State Legislature under Article 200 within a maximum of one month. Justice Pardiwala said that Governors should be put on the clock, as the constitutional significance of Article 200 and federal polity required that their conduct answer "deter-minable judicial standards." Any failure by a Governor to comply with the timelines would invite judicial review, the court warned. Senior advocates A.M. Singhvi, Rakesh Dwivedi, P. Wilson and advocate Sa-harish Subramanian ap-peared for the State of Tamil Nadu. The Attorney General of India K. Venka-

aramani appeared for the Governor's office in the case. The judgment said Mr. Ravi had flouted the first proviso of Article 200, which required Governors to communicate with the Assembly "as soon as possible" their reasons for refus-ing consent to Bills. Justice Pardiwala emphasised that Governors have no such "absolute or pocket veto". "Governors cannot withhold assent simpliciter [in a summary manner]," the court de-clared. Besides, a Governor cannot exercise his personal discretion if a House passed the same Bill again and returned it to him for consent, the court pronounced.

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'Historic' SC verdict is a victory for all State governments, says Stalin

The Hindu Bureau
CHENNAI

The Supreme Court judgment on Tuesday, invoking its powers to declare 10 pending Bills withheld by Tamil Nadu Governor R.N. Ravi for President's assent effectively approved, was a huge victory for all State governments in the country, Tamil Nadu Chief Minister M.K. Stalin said in the Assembly, terming the verdict "historic". "Breakthrough 'good news' amidst thumping of drums by members of the DMK and its allies in our Constitu-tion," Mr. Stalin said. "On behalf of the Tamil Nadu government, the MLAs, and the people of



T.N. Chief Minister M.K. Stalin meets Dravidar Kazhagam president K. Veeramani and others after the verdict. © JOTHI/SHANMUGAM

Tamil Nadu who elected us, I thank the Supreme Court for having protected the rights of the State Legis-lative Assemblies en-gaged in the Constitu-tion," Mr. Stalin said. Welcomes verdict All political parties repre-sentatives, except the AIADMK and the BJP, wel-comed the judgment and lauded the DMK govern-

ment and the Chief Min-ster's efforts in this regard. The top court had come down heavily on Mr. Ravi, stating the reservation of 10 Bills by him for consid-eration of the President was in contravention of Constitutional provisions. Recalling the steps taken by the Tamil Nadu government through litigation in the Supreme Court against Mr. Ravi, over the Bills adopted in the House, Mr.

The Hindu Bureau
NEW DELHI

Stalin termed the Supreme Court verdict "historic". Leader of the House and Minister Duraimurugan so termed it "historic" and recalled how the House dismissed the Rajamam-nar Committee report on State autonomy when former DMK leader M. Karunanidhi was Chief Minister in 1974. Like ancient Chola em-peror Rajendra Chola and Pallava emperor Narasim-havaram I, Mr. Stalin did his father proud, Mr. Du-ramurugan said. On Mr. Stalin's appeal to members of the DMK and its allies in the House, they all stood in the hall, yet again to applaud the Su-preme Court judgment. Af-ter the DMK government journeyed for the day, DMK MLAs were seen sharing sweets to the members of the Assembly camp.

The CJI, who is set to retire on May 13, listed it for mid-May without committing to the request

blamed Governors in Op-position-ruled States trig-gering an "endemic" of de-laying assent or indefinitely sitting on cru-cial Bills passed by the Leg-islative Assemblies. In a hearing on Novem-ber 20, 2023, Mr. Venugop-al had said eight key Bills were pending for eight to 23 months. The State had argued that the Govern-ment of the DMK, who ex-pressed reluctance to hear the case on Tuesday, to list the case before Jus-tice Pardiwala's Bench. The CJI, who is set to re-tire on May 13, listed the case for mid-May without committing to the request. The petition by Kerala

which shall consist of the Governor and two Houses to be known respectively as the Legislative Council and the Legislative Assembly". The Supreme Court had at the time issued notice to seven Governors in that hearing. In the next hearing, on November 29, 2023, it had not escaped the attention of the court that some of the Bills had since been dealt with by the Governor. The then Governor Arif Mohammad Khan had as-sented to one Bill and re-ferred the remaining seven to the President for con-sideration. Mr. Venugopal had how-ever demanded in court that the Governor explain if the seven Bills referred to the President had violated Article 254 (inconsistency between Central and State laws) of the Constitution.

RGI flags delay by hospitals in reporting births and deaths

Vidhita Singh
NEW DELHI

The Registrar-General of India's (RGI) office has cau-tioned private and govern-ment hospitals that they must report incidents of birth and death within 21 days, after it was found that many medical institu-tions were flouting the law, delaying universal registra-tion. Instead of immedi-ately reporting births and deaths, many hospitals are waiting for relatives to re-quest it or even directing relatives to report it them-selves, the RGI said. In a March 17 circular, the RGI's office said that 90% of birth or death events are getting regis-tered in registering any birth or death" is punishable with a fine.



With Census being delayed, the statistics obtained through civil registration records enable estimation of population. FILE PHOTO

The RBD Act, 1969, which was amended in 2023, mandates the registration of all births and deaths on the Centre's portal from October 1, 2023. Under the Civil Registration System (CRS), the Centre's online portal, govern-ment hospitals have

reather, they begin the pro-cess of registration. In-stances have also been reported that some private hospitals don't report birth and death events to the concerned registrar. It has also been reported that some of the private hospi-tals deny the reporting of events and advise the rela-tives to report it them-selves directly to the con-cerned registrar," the cir-cular said. Certificates in 7 days With the last decadal Cen-sus exercise last conducted in 2001 and the next Cen-sus pending since 2021, the vital statistics obtained through civil registration records at different admin-istrative levels enable the estimation of population. The RGI also asked the

registrar to issue birth and death certificates to citi-zens within seven days. From October 1, 2023, the digital birth certificate is the single document to prove the date of birth for various services such as admission to educational in-stitutions, government jobs, marriage registration, among others. The centralised data-base will be used to update the National Population Register (NPR), ration cards, property registra-tion, and electoral rolls. The RGI has not re-leased the "Vital Statistics of India Based on the Civil Registration System" and "The Report on Medical Certification of Cause of Death" since 2020. The last released reports pertained to the year 2019.

On the clock

SC sets time frame for Governors, saying the phrase 'as soon as possible' permeates Article 200 with a sense of expediency

- A Governor has a maximum of **one month** to withhold assent on the aid and advice of the State Cabinet

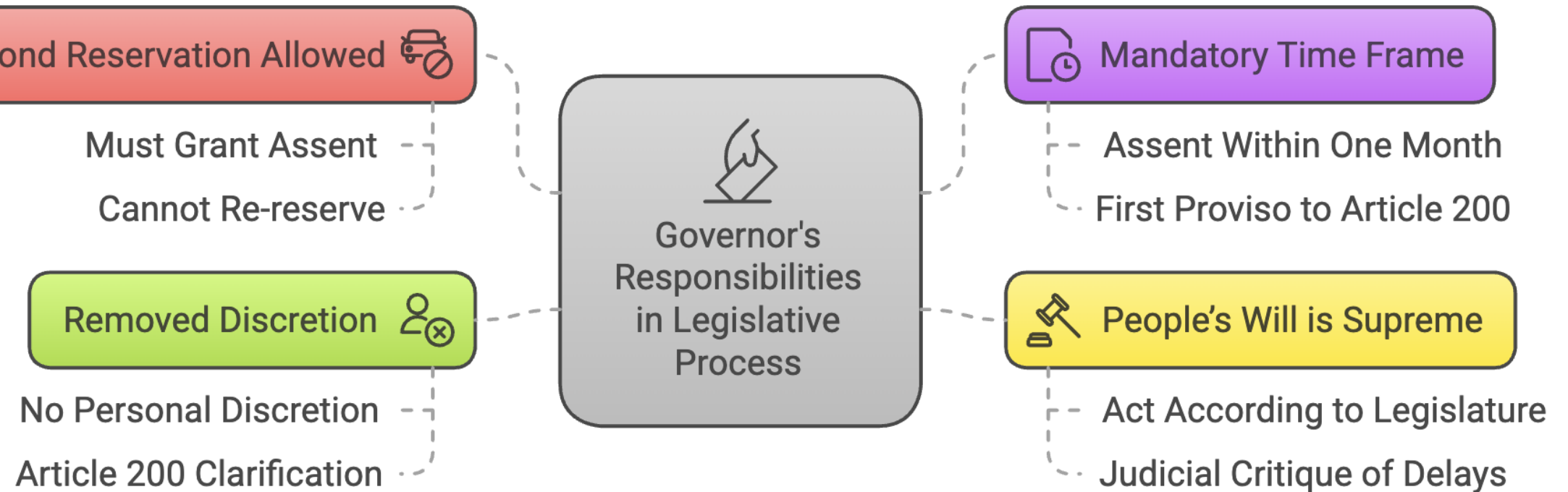
- A maximum of **three months** is given to return the Bill with a message specifying reasons if the Governor withholds assent contrary to the Cabinet's advice

- The Governor has **three months** to reserve a Bill for the President's consideration against the advice of the Cabinet

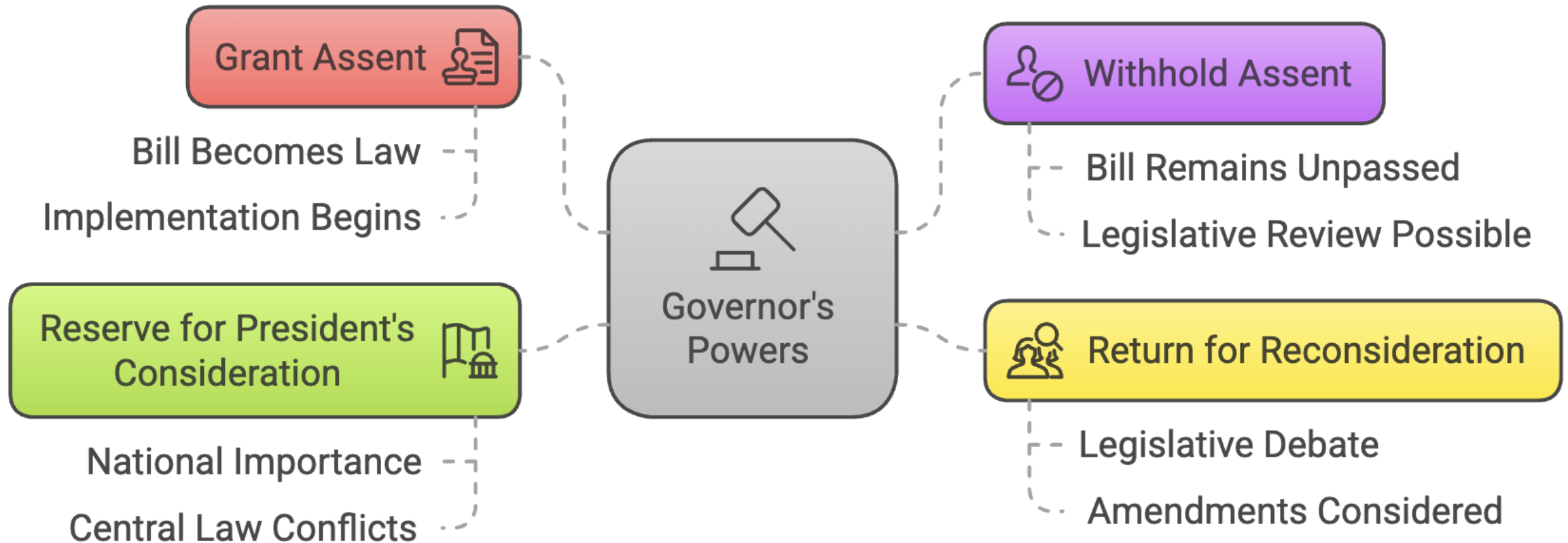
- The Governor 'must' grant assent to a Bill re-passed by the State Legislature under Article 200 within a **maximum of one month**

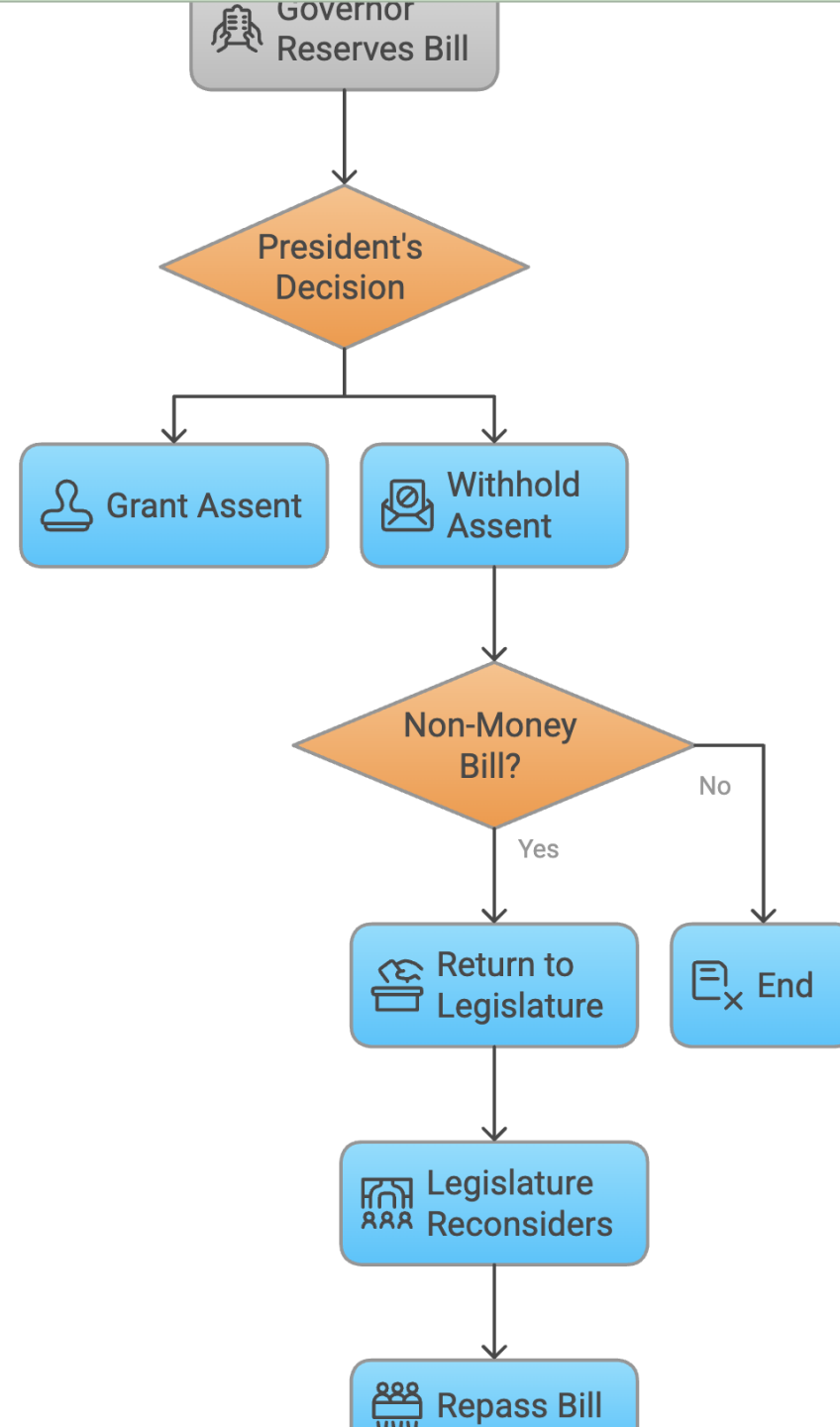


Governor's Role in Assenting Bills



Governor's Powers Regarding State Legislature Bills





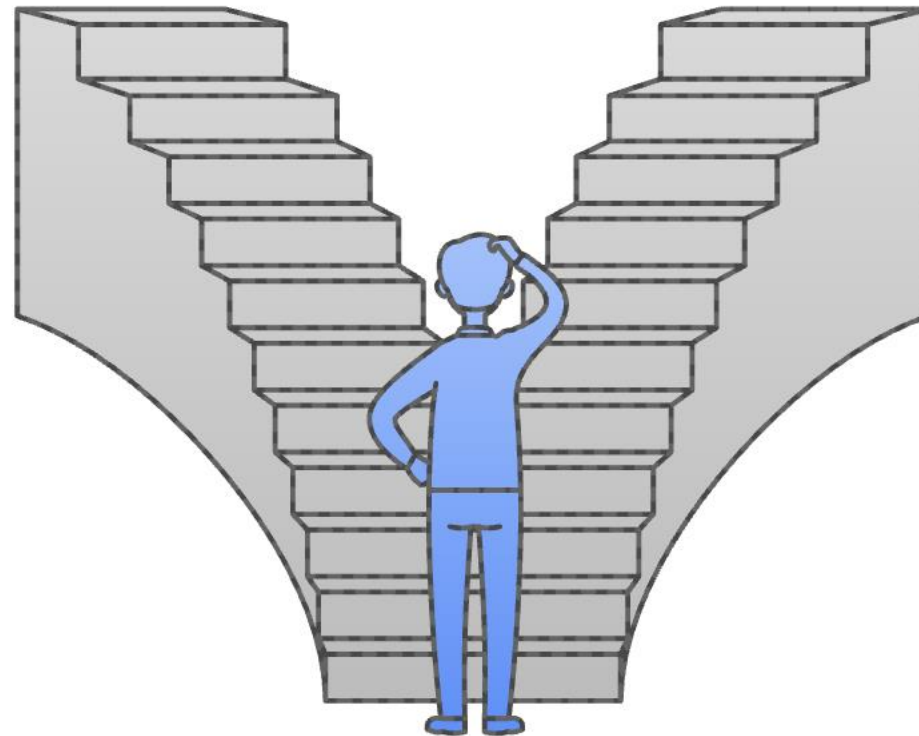
How to introduce a Money Bill?

Obtain Governor's Recommendation

Essential for introducing a Money Bill in the assembly

Proceed without Recommendation

Not permissible, violates constitutional requirement



Eligibility Criteria

- Must be a **citizen of India**
- At least **35 years** of age
- Must **not be a member of (either) house** of Parliament/State Legislature
- Must not hold any **office of profit**

Appointment and Tenure (Part VI)

- Appointed by President (**Article 153**)
- One person can be appointed as Governor for **2+ States (7th Const. Amendment in 1956)**
- Holds the office at the **Pleasure of the President** (maximum **5 years**)

Powers (Part VI)

- Article 161: **Pardoning powers**
- Article 164: Power to **appoint the CM and other Ministers**
- Article 176: **Special Address** by Governor
- Article 200: Power to **(withhold) assent/reserve a bill** (Legislative Assembly)
- Article 213: Power to **promulgate Ordinances**

'Dual Capacity'

- **Constitutional head of the state** and **Representative of the Union government**

Ending Tenure before 5 Years

- **Dismissal by President** (on advice of the Council of Ministers headed by PM)
 - Dismissal of governors without a valid reason is not permitted
- On grounds of **acts upheld by courts as unconstitutional** and malafide
- **Resignation** by the governor

Responsibilities

- **Appoints** – CM, other Ministers, Advocate General of State, Members of State PSC, judges of HC and districts
- Act as **ex-officio chancellor** of state Universities

IN BRIEF



EPFO joiners can now create UAN with Aadhaar biometrics

The Universal Account Number (UAN) of the Employees' Provident Fund Organisation (EPFO) can now be created using face and fingerprint authentication, Union Labour Minister Manuakh Mandavaya said on Tuesday. At present, UANs are generated by employers and all allied employees have to provide their data to the EPFO. Though this data is validated using Aadhaar data, many errors occur in other fields such as father's name and mobile number, Mr. Mandavaya noted. "Due to these errors, many employees had to update their data while submitting claims or for other benefits," he said. New employees or any employer can generate UAN using the Aadhaar face authentication technology using the Umang App, he added.

SC sets aside CBI probe into Bengal supernumerary posts

The Supreme Court on Tuesday set aside a Calcutta High Court direction for a Central Bureau of Investigation (CBI) probe into a decision taken by the West Bengal State Cabinet to create supernumerary posts in State-run and aided schools. A Bench headed by Chief Justice of India Sanjay Khanna clarified that the other directions in the Calcutta High Court judgment into the now-terminated appointment of 25,753 teachers and staffers in West Bengal's State-run and aided schools would continue to be valid. A "supernumerary post" refers to a temporary position created to accommodate an employee who is entitled to a regular post that is currently unavailable.

New Aadhaar app with face ID released for testing

The Hindu Bureau

CHENNAI

A new Aadhaar app will be released by the Unique Identification Authority of India (UIDAI) secretary, Minister of Electronics and Information Technology Ashwini Vaishnaw said at the Aadhaar Samvad event in Delhi on Tuesday. The app is available to only a small group of users.

The new app has a revamped design, compared with the existing mAadhaar app. It has a facial recognition feature to securely share Aadhaar data with "requesting" entities without the need to share a hard copy.

"Now, with just a tap, users can share only the necessary data, giving them complete control over their personal information," Mr. Vaishnaw said.

Bilateral arrangements taking over multilateralism: Finance Minister

Sitharaman says rise in global uncertainties, along with the ineffectiveness of multilateral institutions, is driving countries to be more proactive with bilateral arrangements; she denies that India-U.K. trade talks will be accelerated in view of U.S. tariffs

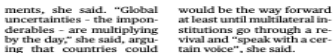
Siddharth Lakshman
LONDON

Countries are prioritising bilateral arrangements in an increasingly fragmented and multipolar world, Union Finance Minister Nirmala Sitharaman said on Tuesday.

However, she denied that the India-U.K. trade negotiations were going to be sped up because of the tariffs announced by U.S. President Donald Trump, even as she was optimistic that the negotiations would be concluded "sooner rather than later".

Ms. Sitharaman made the remarks during a moderated discussion on India's development trajectory, with ISE Professor Nicholas Stern and BJP member and former bureaucrat N.K. Singh at the Indian High Commission in London. Ms. Sitharaman is in London for the 13th India-U.K. Economic and Financial Dialogue (EFD) with her counterpart, U.K. Chancellor Rachel Reeves.

"So bilateral arrangements were more multipolar, and that, along with the effectiveness of multilateral institutions to create a common global framework, is what we need to be more proactive with bilateral arrangements," she said.



"So it is not as if we are rushing into a U.K. FTA, because India and the U.K. have been discussing in parallel to a trade agreement, the mutual recognition of professional qualifications, and cooperation in the education sphere, the Minister said.

The two sides are expected to discuss opportunities for U.K. universities to set up campuses in India and also look into environmental issues with the number of Indian students who were studying in the U.K.

Asked if the U.S. tariffs were creating momentum for the U.K. and India to conclude a trade deal, the Minister answered in the negative. India and the U.K. had been negotiating

at least until multilateral institutions go through a revival, she said. "India has a certain voice," she said.

The latest source of uncertainty in the world factor them into their policies. Therefore, she said, it was simpler and more effective to look at these challenges through a bilateral lens. "And when bilateral arrangements are being made, you find that ideological or bloc-related affiliations no longer hold," Ms. Sitharaman said.

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Skymet forecasts 'normal' monsoon; 'La Nina weak'

The Hindu Bureau

NEW DELHI

The private weather agency Skymet Weather has forecast a "normal" monsoon from June to September. The monsoon rainfall will be 3% more than the long-term average of 869 mm (with an error margin of 5%) during the period. The monsoon rainfall will be 3% more than the long-term average of 869 mm (with an error margin of 5%) during the period.

"La Nina (a half-degree or more of the Equatorial Pacific) this season was weak and brief. The vital signs of La Nina have started fading now. The occurrence of El Nino (a half-degree heating in the same region) which is the opposite of La Nina is ruled out," said Skymet, said in a statement. "The second half of

Modi says 52-cr. loans given under MUDRA

The Hindu Bureau

NEW DELHI

Prime Minister Narendra Modi, interacting with beneficiaries here on Tuesday on the 10th anniversary of the Pradhan Mantri MUDRA Yojana, said the scheme has turned several dreams into reality, empowering people who were previously overlooked with financial support to shine. "It illustrates that for the people of India, nothing is impossible," he said.

Mr. Modi said 52 crore loans had been disbursed under the scheme so far. He said ₹33 lakh crore has been disbursed to the citizens of India under the scheme without the need for guarantees.

"This amount is unprecedented and surpasses any financial support extended to wealthy individuals collectively," the PM said, adding that job creation through the scheme has significantly contributed to economic growth.

"The earnings of common citizens have increased, enabling them to improve their living standards and invest in education for their children," he said.

He said half of the beneficiaries belonged to SC, ST and OBC communities, and over 70% of them are women.

Genome study: 180 million genetic variants found in 9,772 individuals

R. Prasad

CHENNAI

Preliminary findings of the GenomeIndia project, which genotyped 10,074 healthy and unrelated Indians from 85 populations in 32 tribal and 53 non-tribal populations - across India, were published in the journal Nature Genetics on Tuesday. Blood samples from 32 tribal and 53 non-tribal individuals, of which DNA samples from 10,074 individuals were subjected to whole genome sequencing.

Nearly 100 samples were collected from each population with a median of 159 samples from each non-tribal group and 75 from each tribal group to estimate the relatively rare variants that are important to understand complex diseases.

After excluding two populations, the preliminary findings are based on the genetic information of 9,772 individuals - 4,696 male participants and 5,076 female participants. The genome sequence data are deposited in the Indian Biological Data Centre (IBDC) and the Genome Centre for Biotechnology in Faridabad, Haryana.

The genomes of Tibeto-Burman tribe, Indo-Euro-

The samples were collected from 32 tribal and 53 non-tribal populations, researchers

found, are based on the genetic information of 9,772 individuals - 4,696 male participants and 5,076 female participants.

The genome sequence data are deposited in the Indian Biological Data Centre (IBDC) and the Genome Centre for Biotechnology in Faridabad, Haryana.

The genomes of Tibeto-Burman tribe, Indo-Euro-

pean tribe, Dravidian tribe, Austro-Asiatic tribe, and continentally admixed outgroup were sequenced. In the case of non-tribes, the genomes of Tibeto-Burman non-tribe, Indo-European non-tribe, and Dravidian non-tribe were sequenced.

Different variants In all, 180 million genetic variants were found in the genomes of 9,772 individuals were sequenced.

Some of the variants are associated with diseases; some others are rare while some variants are unique to India; and some others are unique to particular communities or small populations.

"We are now trying to find out the implications of these variants," said Dr. Kumarasamy Thangaraj of the Centre for Cellular and Molecular Biology (CCMB), Hyderabad, and

one of the corresponding authors of the Comment piece. "We are looking for variants which are functionally relevant - related to diseases, those that interact with therapeutic responses or no responses, and those that are causing adverse effects to therapeutic agents."

Dr. Thangaraj said the information on variants as well as the associated diseases can be utilised for developing low-cost diagnostic kits and for personalised medicine. "In-"

formation on variants as well as the associated diseases can be utilised for developing low-cost diagnostic kits and for personalised medicine. "In-"

formation on variants as well as the associated diseases can be utilised for developing low-cost diagnostic kits and for personalised medicine. "In-"

THE CROSSWORD 14454
(set by Saral)

- Across
- Metal chip one brought forward (8)
 - A democrat near California engaged in election campaign (11)
 - Department preparing cities for peace treaty (11)
 - Gift of articles by letter (5)
 - Order food containing good nutrients primarily (9)
 - Nymph animatedly fly right leaving fairyland excitedly (5)

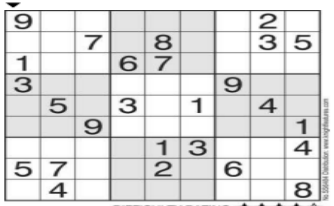
To solve this puzzle online, get access to our crossword site at: <https://grg-prg-jeez.in/crossword>



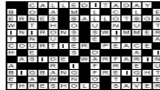
- Down
- Falsely sue queen with anger for title (7)
 - Expert creating some art (7)
 - Inundated villa was horrible inside (5)
 - An Indian again chasing very drunk showing patience (10)
 - Joint meeting is huge (9)
 - A time with goal amended in reminder list (9)
 - Stun America rejecting report issued every now and then (8)
 - Open temporary shelter after pilgrims' arrival at first (8)

- Amplify complex case delayed (10)
- Some calumnyed former student (6)
- Mostly crowded retreats (4)
- Star lost ring near eastern lounge (4)
- Europe, say, curbing German company (10)
- Press Association silent about fireplaces (8)
- Story line for example with point (6)
- Dead flies collected around the French sea initially (8)
- People next-door building new big house, having terrace essentially (10)
- Propose to drop criminal model (8)
- Problem of a cat covered by papers (10)
- About to interrupt poet collapsing on volunteer in drama (8)
- Change metric ahead of fair (10)
- One section moved behind fireplaces (8)
- Endless chess perhaps for money (4)
- Block wild food (4)

SUDOKU



Solution to previous puzzle



Solution to yesterday's Sudoku



FAITH

Mahalakshmi's greatness

Parasara Bhattar composed Sri Guna Ratna Kosa in such a way that it brings out the significance of dhyaana mantra. In Rangaraja Stava too, he shows the importance of dhyaana. It can be said that in Rangaraja Stava he explains the first portion of the mantra and in Guna Ratna Kosa, he explains the second portion. Equally it can be said that the reverse is the case, namely that the first portion is explained in Guna Ratna Kosa and the second portion is explained in Rangaraja Stava. Without the dhyaana mantra, cetanas cannot survive. The name 'Narayan' in the mantra must be seen as referring to the archa form of the Lord, which reveals the Lord's saulabhyo, said T.A.K. Srinivasacharya in a discourse. Guna Ratna Kosa is about the greatness of Mahalakshmi, just as Alavandar's Chatussloki is.

Sri Guna Ratna Kosa has sixty-one slokas. Every word in it is a gem, and like all gems, every word is precious. Gems are not easily found. In the same way, the meaning of Sri Guna Ratna Kosa cannot be easily understood, without the guidance of an Acharya. The first four slokas are mangala slokas in praise of the Goddess. In the first sloka, Parasara Bhattar offers his anjali to the Goddess, who gives an approving glance to the Lord's many tasks. Just by shutting Her eyes or opening them, or opening them partially, she indicates to the Lord what actions are needed on His part. Creation, protection, dissolution are accomplished by Her just through the movements of Her eyes and eyelids. Parasara Bhattar was the pampered child of Lord Ranganatha and Goddess Ranganayaki of Srirangam. Bhattar was the recipient of Her glances right from infancy, and was eminently qualified to speak of them.

Genome study: 180 million genetic variants found in 9,772 individuals

R. Prasad
CHENNAI

Preliminary findings of the GenomeIndia project, which genotyped 10,074 healthy and unrelated Indians from 85 populations – 32 tribal and 53 non-tribal populations – across India, were published in the journal *Nature Genetics* on Tuesday. Blood samples were collected from nearly 20,000 individuals, of which DNA samples from 10,074 individuals were subjected to whole genome sequencing.

Nearly 100 samples were collected from each population with a median of 159 samples from each non-tribal group and 75 from each tribal group to estimate the relatively rare variants that are important to understand complex diseases.

After excluding two populations, the prelimi-



The samples were collected from 32 tribal and 53 non-tribal populations. ISTOCKPHOTO

ary findings are based on the genetic information of 9,772 individuals – 4,696 male participants and 5,076 female participants. The genome sequence data are deposited in the Indian Biological Data Centre housed in the Regional Centre for Biotechnology in Faridabad, Haryana.

The genomes of Tibeto-Burman tribe, Indo-Euro-

pean tribe, Dravidian tribe, Austro-Asiatic tribe, and continentally admixed outgroup were sequenced. In the case of non-tribes, the genomes of Tibeto-Burman non-tribe, Indo-European non-tribe, and Dravidian non-tribe were sequenced.

Different variants

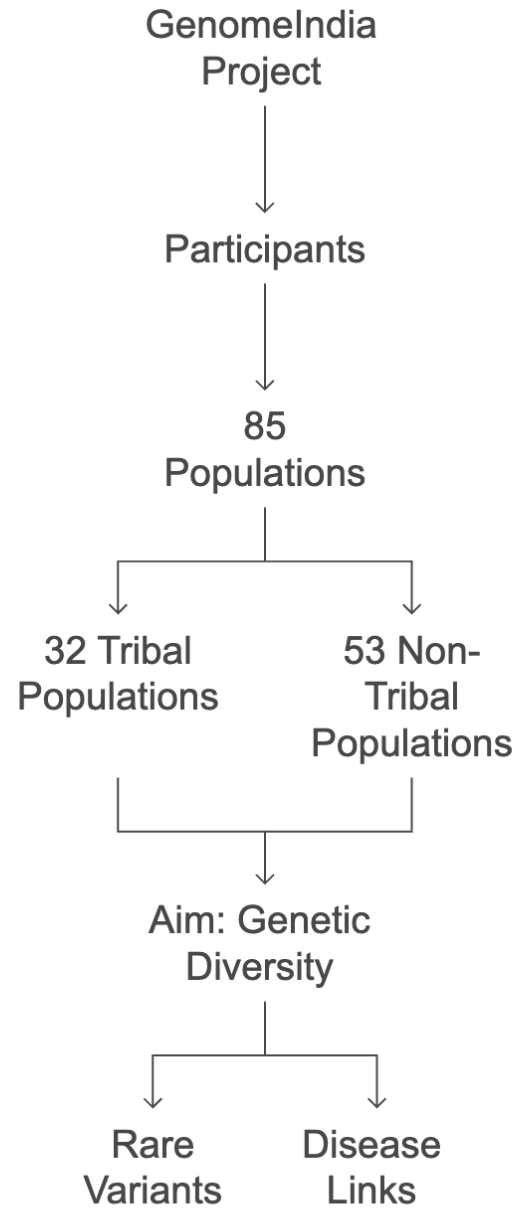
In all, 180 million genetic variants were found when the genomes of 9,772 individuals were sequenced. Some of the variants are associated with diseases; some others are rare while some variants are unique to India; and some others are unique to particular communities or small populations.

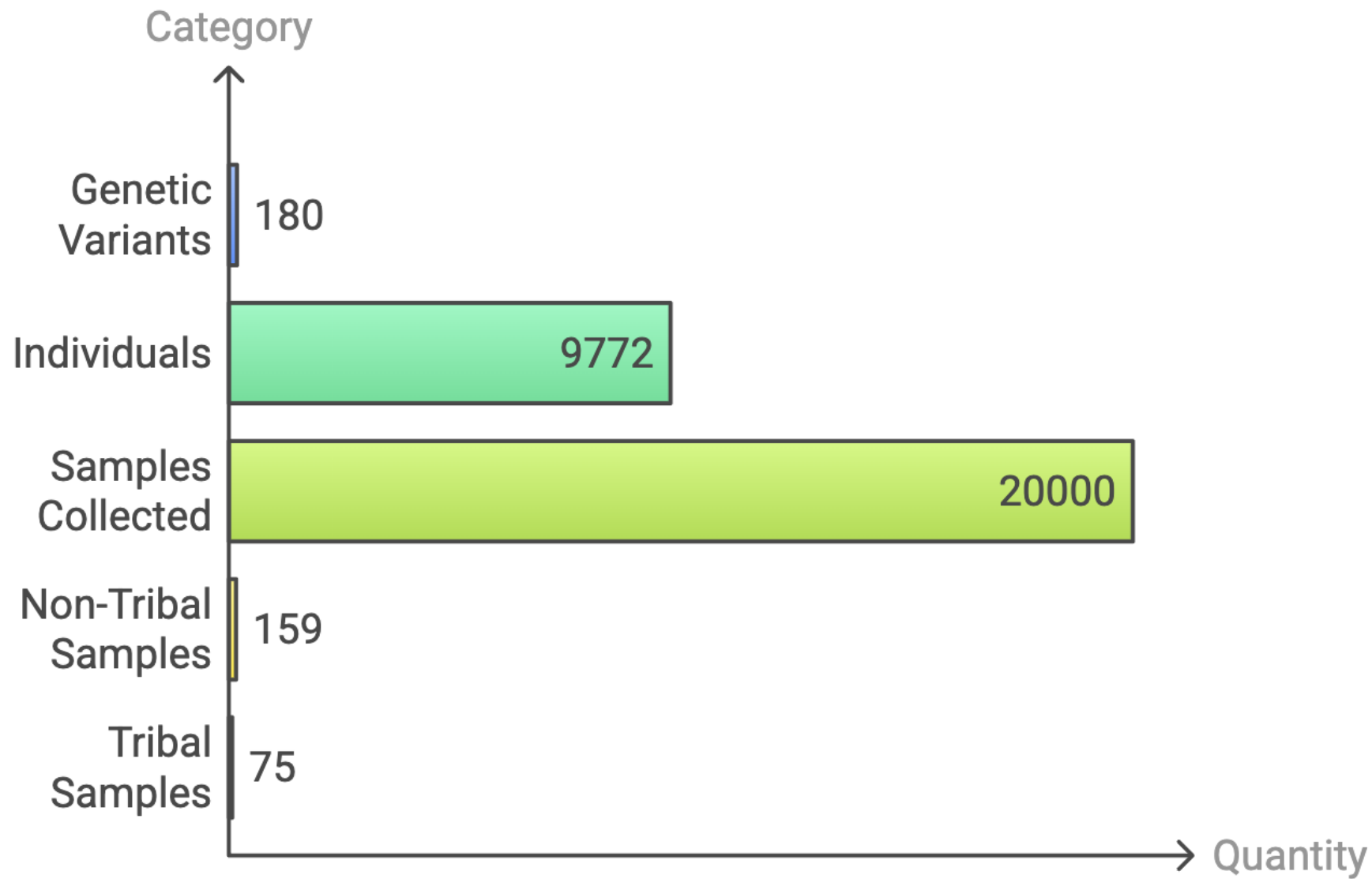
“We are now trying to find out the implications of these variants,” said Dr. Kumarasamy Thangaraj of the Centre for Cellular and Molecular Biology (CSIR-CCMB), Hyderabad, and

one of the corresponding authors of the Comment piece. “We are looking for variants which are functionally relevant – related to diseases, those associated with therapeutic responses or no responses, and those that are causing adverse effects to therapeutic agents.”

Dr. Thangaraj said the information on variants associated with specific diseases can be utilised for developing low-cost diagnostic kits and for personalised medicine. “In-depth analyses of 9,772 diverse genomes along with the blood biochemistry and anthropometry data will improve disease diagnostics, predict the genetic basis of drug responses, and kickstart precision medicine efforts in India,” the authors write. A detailed paper will be published in the next couple of months.

GenomeIndia Project Flowchart





Genetic Study Population and Variants

Medical Applications

Diagnostics

Identifying diseases through advanced methods.

Personalised Treatment

Tailoring medical treatment to individual needs.

Drug Response Prediction

Anticipating how patients will respond to medications.

Low-Cost Kits

Affordable diagnostic solutions for India.

Genetic Data Storage Process

Genetic Data
Collection



Indian
Biological
Data Centre



Data
Organization



Data
Accessibility



Research
and Analysis

Scientists demonstrate clear quantum advantage using simple game

Previous attempts at showing quantum supremacy have used complicated problems. Google used random circuit sampling for its Sycamore processor, and Chinese researchers used the Gaussian boson sampling problem for the Jiuzhang computer. Both require specialised equipment to perform, making it difficult to verify the results

Telajari Gururaj

For a long time, researchers have been looking for the sort of task that a quantum computer will be better at doing than a classical computer. Because if a quantum computer shows that it can be superior, it will achieve a milestone called quantum supremacy.

Researchers from the University of Oxford and Universidad de Sevilla recently demonstrated quantum supremacy using a simple game.

Their finding, published in *Physical Review Letters* in February, borrowed a concept from the odd-cycle graph. The aim here is simple: to colour a circle containing an odd number of points with two colours, such that no two adjacent points have the same colour. This is mathematically impossible.

The researchers adapted this game to use as a test of quantum supremacy.

Previous attempts at showing quantum supremacy have used complicated problems. For example, Google used a problem called random circuit sampling to demonstrate the supremacy of its Sycamore processor in 2019.

Researchers in China went with the Gaussian boson sampling problem for the Jiuzhang quantum computer. Both these problems require complex mathematics and specialised equipment to perform, which makes it difficult to verify the results.

The colouring problem

The setup for the odd-cycle problem is simple. Consider a circle with an odd number of points inside it, say three.

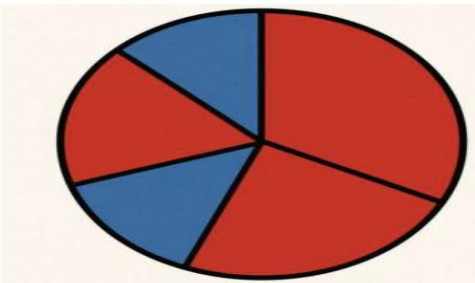
The challenge is to use two colours, blue and red, to colour the points such that no two adjacent points have the same colour.

Once one of the points is coloured red and the other blue, the third point has to be red or blue, breaking the rule.

In the researchers' experiment, there are two players named Alice and Bob who can't communicate with each other. A referee asks them questions about the colour of the points in an odd-numbered circle.

The game ends in victory if two conditions are met: when asked about the same points, the players must answer with the same colour (e.g., both must say "blue"), and when asked about adjacent points, they must answer with different colours (i.e., Alice says "blue" and Bob says "red").

In the classical scenario, the players agree on a colouring pattern for the points before the game begins, yielding a success rate of 83.3% for a three-point



Can you colour a circle containing an odd number of sections with two colours, such that no two adjacent sections have the same colour? IMAGE CREATED WITH CHATGPT

circle. In other words, the game can be won 83.3% of the time.

Playing the quantum game

To implement the quantum version of the experiment, the researchers trapped two strontium atoms in separate locations 2 m apart.

Using lasers, the researchers entangled the two atoms. When two particles are entangled, they are correlated in a way that classical physics cannot explain.

Measuring one particle – i.e., checking its present condition – will instantaneously affect the other.

A single computer acted as the referee, sending the questions to two separate control systems controlled by Alice and Bob.

After receiving the questions, each player performs specific quantum operations on the atom using laser pulses.

These operations involved rotating their particles through specific angles that were mathematically related to which point on the circle a question was about.

The first question meant rotating some angle, say, and the second question meant rotating through a different angle.

After performing the operations, the players measured their atoms to determine the answer, which could be 0 or 1.

Each number was mapped to a colour, blue or red, and its value was reported to the referee.

The researchers played this game for circles containing 3 to 27 points 101,000 times, which took about a minute.

They also performed additional tests to verify the strength of the correlations and

ensure they are quantum in nature.

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ensuring they are quantum in nature.

As demonstrated in the study, the odd-cycle game approach is much simpler to implement to establish quantum supremacy.

In order to prove the Sycamore processor had achieved quantum supremacy, Google fitted it with 53 superconducting qubits, an enormous computational resource. On the other hand, the researchers used only two entangled qubits, which is much simpler and less computationally demanding than Google's setup.

According to the researchers, their approach could be used in practical scenarios where collaborating agents can't communicate, such as the rendezvous task. A type of coordination problem, the rendezvous task is about two or more people meeting at a particular location without communicating with each other.

A classical computer may try to determine where they will meet by systematically exploring potential meeting points and the routes the two people may take to get there. A quantum computer will leverage quantum entanglement to create correlations that classical physics can't reproduce, speeding up its search for the most likely meeting point.

If there are 1 million meeting points, for example, the worst-case number of steps for a classical computer to find the meeting point is 1 million, whereas for a quantum computer using Grover's algorithm, would be 1,000 steps.

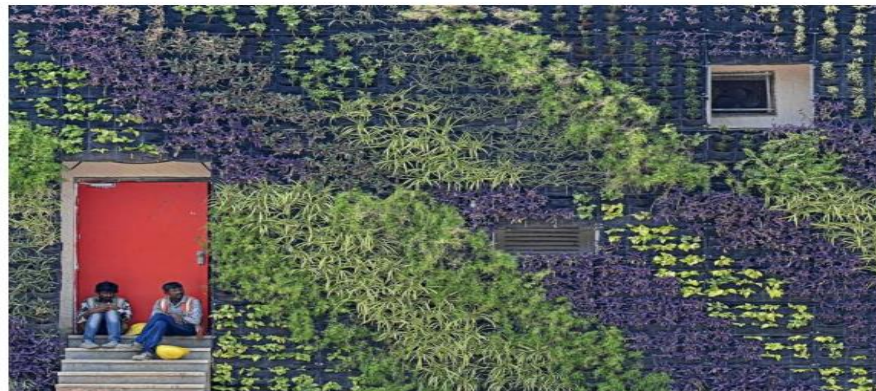
For now, the odd-cycle game is an example of the kind of power quantum computers have, without requiring complicated mathematics to make sense of.

(Telajari Gururaj is a freelance science writer and journalist with a master's degree in physics. telajarigururaj@gmail.com)



Google Quantum AI's Hartmut Neven (L) and Anthony Megrant (R) examine a crystal refrigerator for cooling quantum computing chips at Google's Quantum lab in Santa Barbara, California. REUTERS

BIG SHOT



Labourers take cover in the doorway of a building decorated with plants on a hot day in Mumbai on April 8. India can expect hotter-than-usual temperatures this summer with more heatwaves taking a toll on lives and livelihoods, the India Meteorological Department has warned. AP

QUESTION CORNER

The making of a fruit

Q: How do fruits ripen?
A1: Ripening of fruits is associated with the process of senescence or ageing in plants. It involves changes in colour, texture, flavour, sugar content, and acidity, and is influenced by the ripening hormone ethylene.

As ripening begins, there is a corresponding increase in respiration, which is followed by increased ethylene production.

It triggers a series of biochemical changes such as lateral growth and loosening of cell walls, resulting in more intercellular spaces, the conversion of starch and organic acids into sugars, hydrolysis of stored materials, decrease in chlorophyll content, with corresponding increase in colouring pigments, and emission of characteristic volatile oils.

— T. Nagendra Pillai of Gurugurpur

A2: Colour changes occur due to synthesis of carotenoids (yellow and red) and phenolic compounds like anthocyanins (red and blue). Changes in texture occur by limited degradation of cell walls followed by an increase in



Ripening of fruits is associated with the process of senescence or ageing in plants. JONAS KARAROTO/UNSPASH

polygalacturonase and pectinesterase activity. In bananas and apples, the enzymes phosphorylase and in mangoes amylase break the starch into glucose and sucrose, leading to their sweet taste. Volatile compounds such as ethyl-2-methyl butyrate (in apples) also elicit a sweet smell.

Acidity of fruits is due to the presence of malic acid (in apples, apricots, bananas, cherries, and plums), citric acid (in gooseberry, tomatoes, and peaches), and malic acid and tartaric acid (in grapes).

Ripening is a prerequisite for the development of embryos after fertilisation and for better dispersal of seeds for survival.

— P.S. Dheendrayan, Coimbatore

For feedback and suggestions for 'Science', please write to science@thehindu.co.in with the subject 'Daily page'

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science@thehindu.co.in
with the subject 'Daily page'

Mango Ripening Process

Sugar Content Increase

Sugar content increases, enhancing sweetness.

Flavor Change

The flavor profile of the mango develops.

Texture Change

The texture of the mango becomes softer.

Color Change

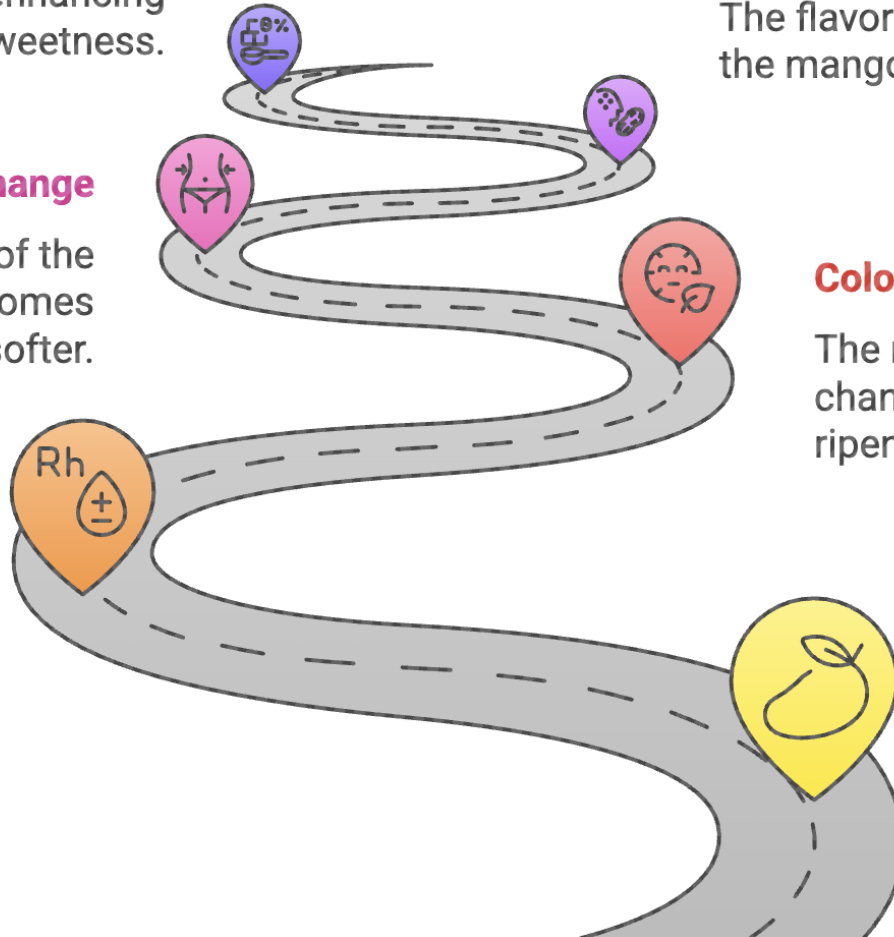
The mango's skin changes color as it ripens.

Ethylene Hormone Release

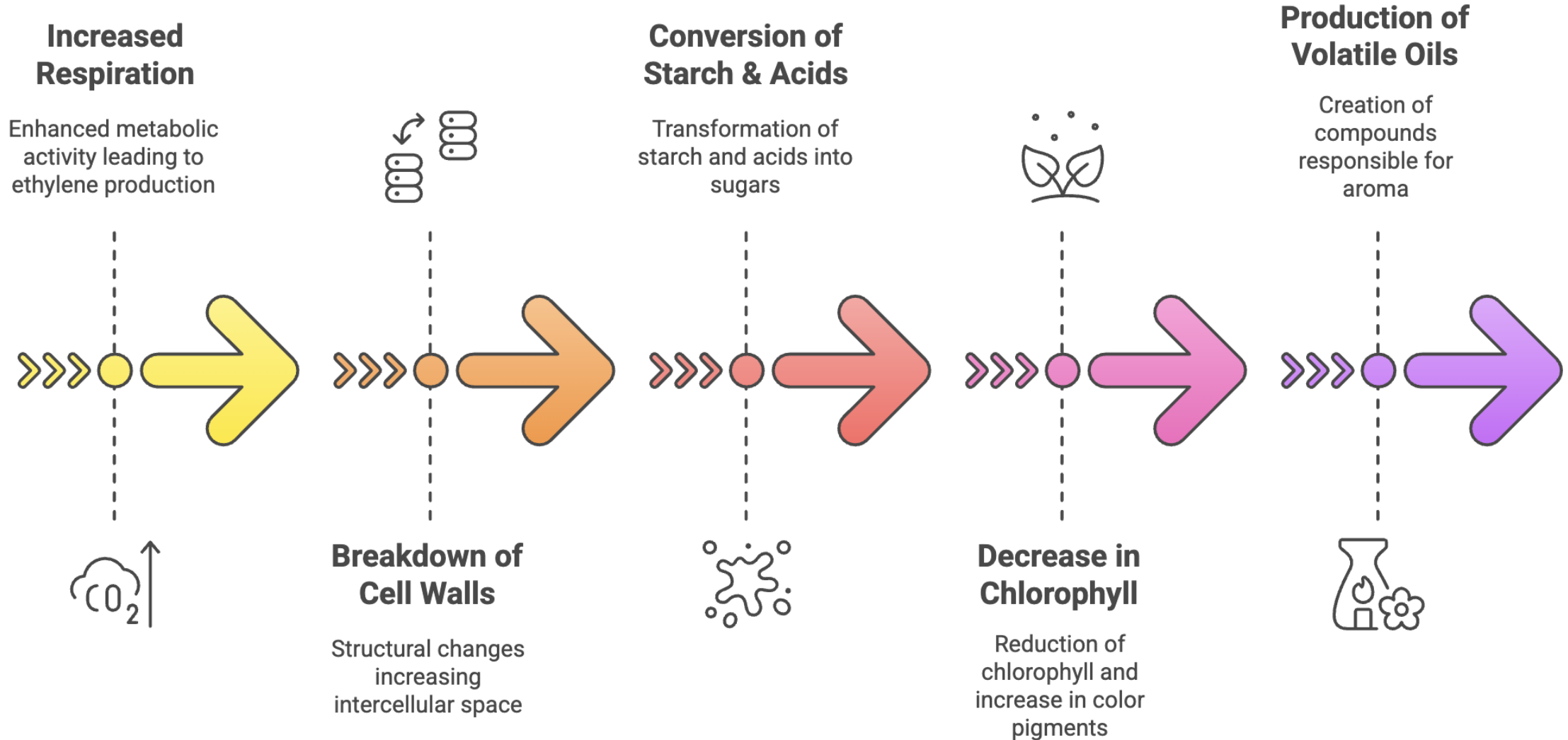
Ethylene is released to control the ripening process.

Initiation of Ripening

The ripening process begins as the mango ages.



Ripening Process in Fruits



Fruit
Ripening



Carotenoids &
Anthocyanins



Polysaccharide-
degrading
Enzymes



Polygalacturonase

Pectinesterase



Bananas/Apples:
Phosphorylase

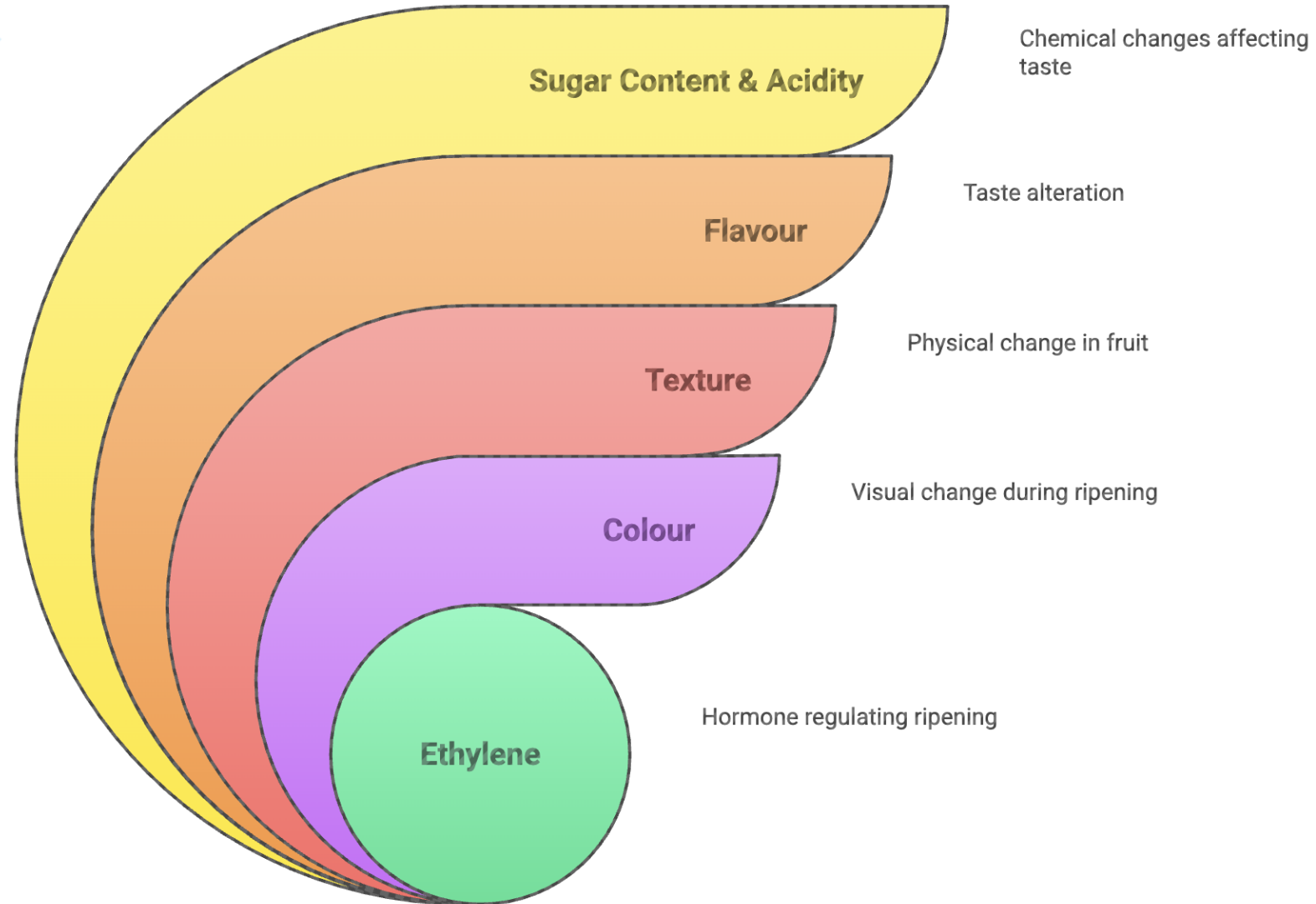
Mangoes:
Amylase



Sweetness in
Bananas/Apples

Sweetness
in Mangoes

Mango Ripening Process



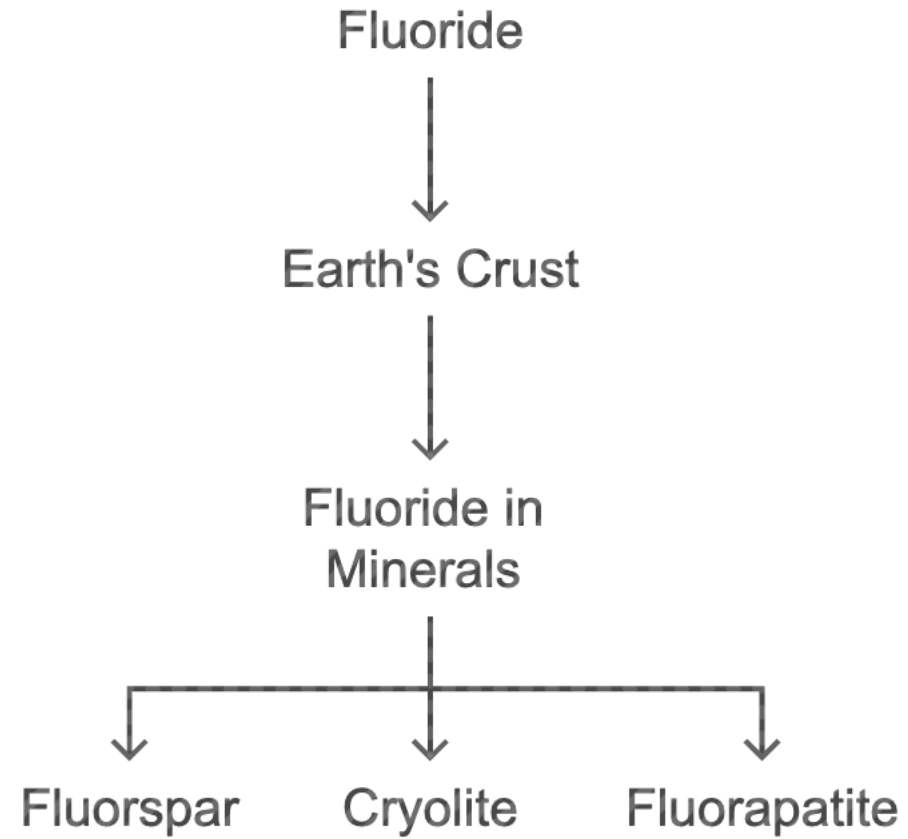


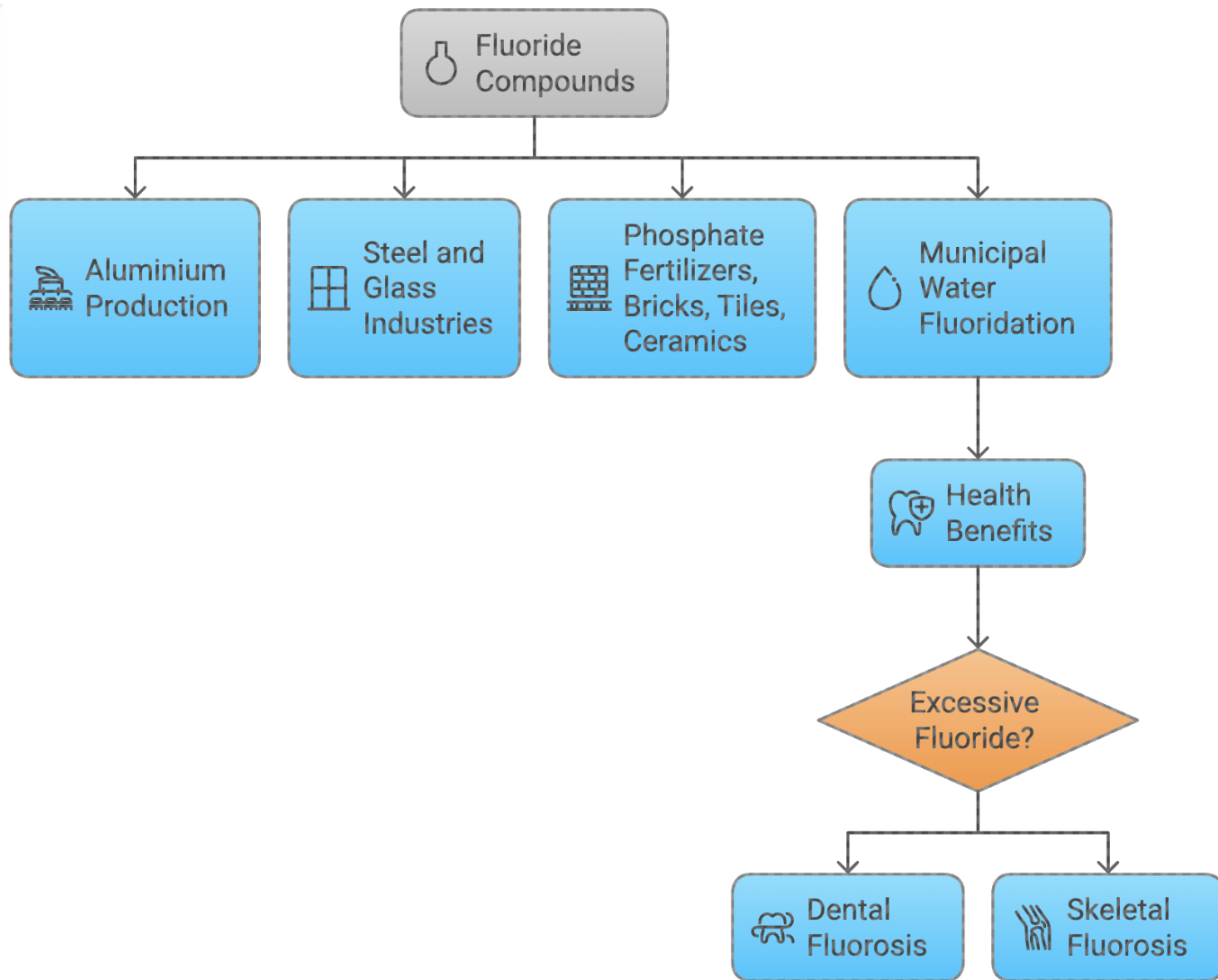
Fluoride Contamination

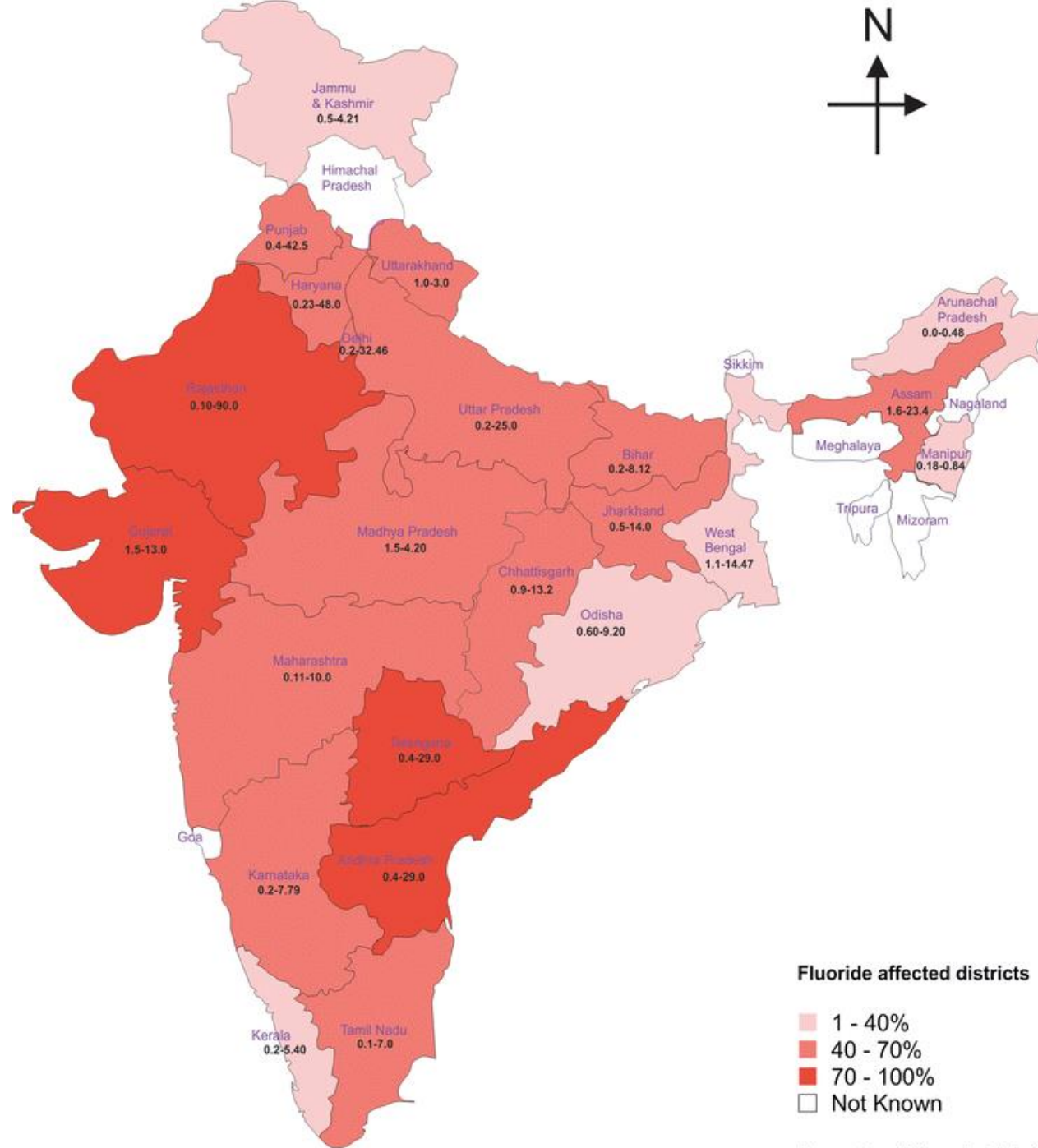


Excess Fluoride in Sonbhadra's
groundwater (Uttar Pradesh),
has triggered a growing public
health crisis.

Fluoride Occurrence and Characteristics







Fluoride affected districts

- 1 - 40%
- 40 - 70%
- 70 - 100%
- Not Known

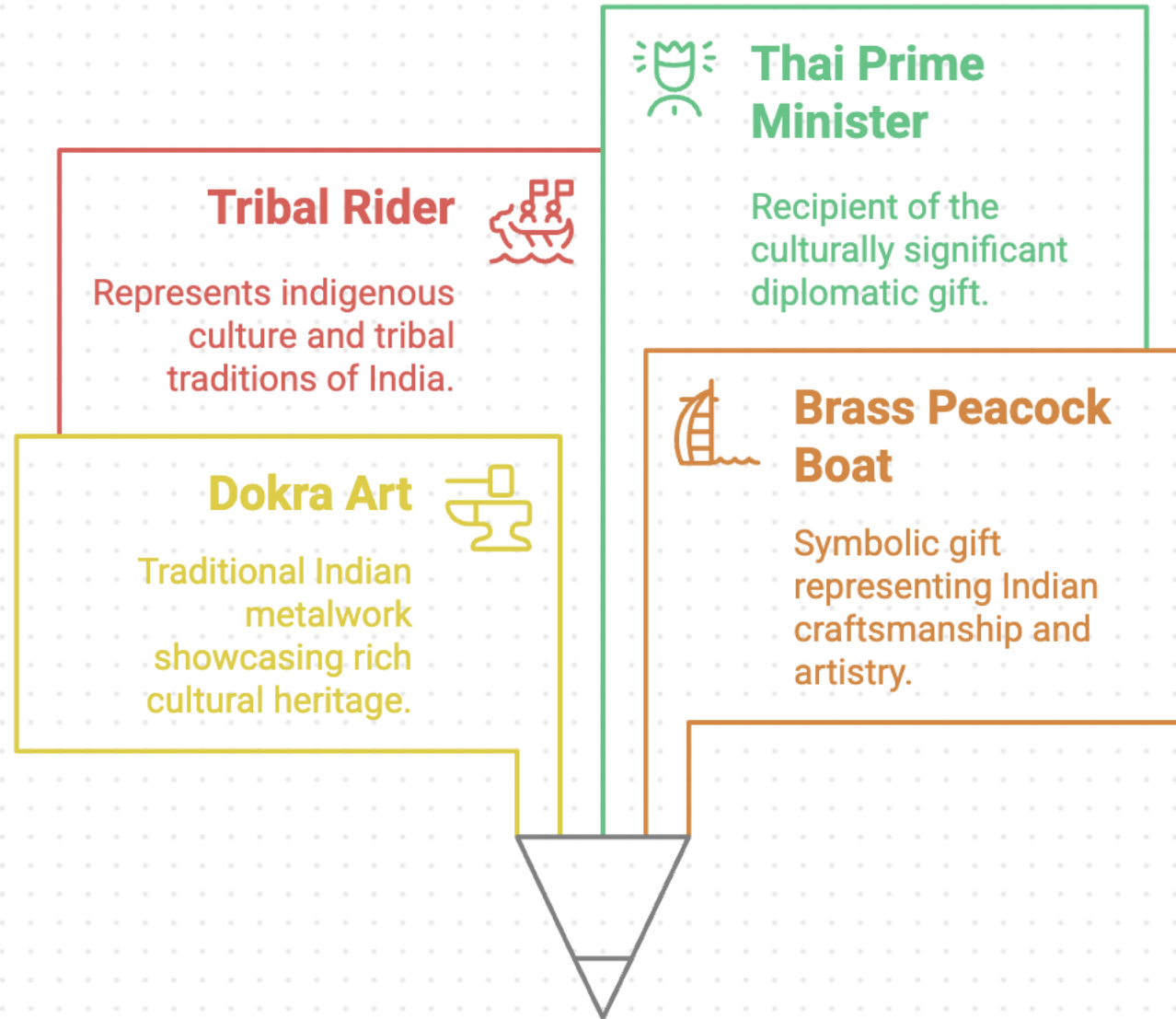
The number within each state is the fluoride range in drinking water

Dokra Art

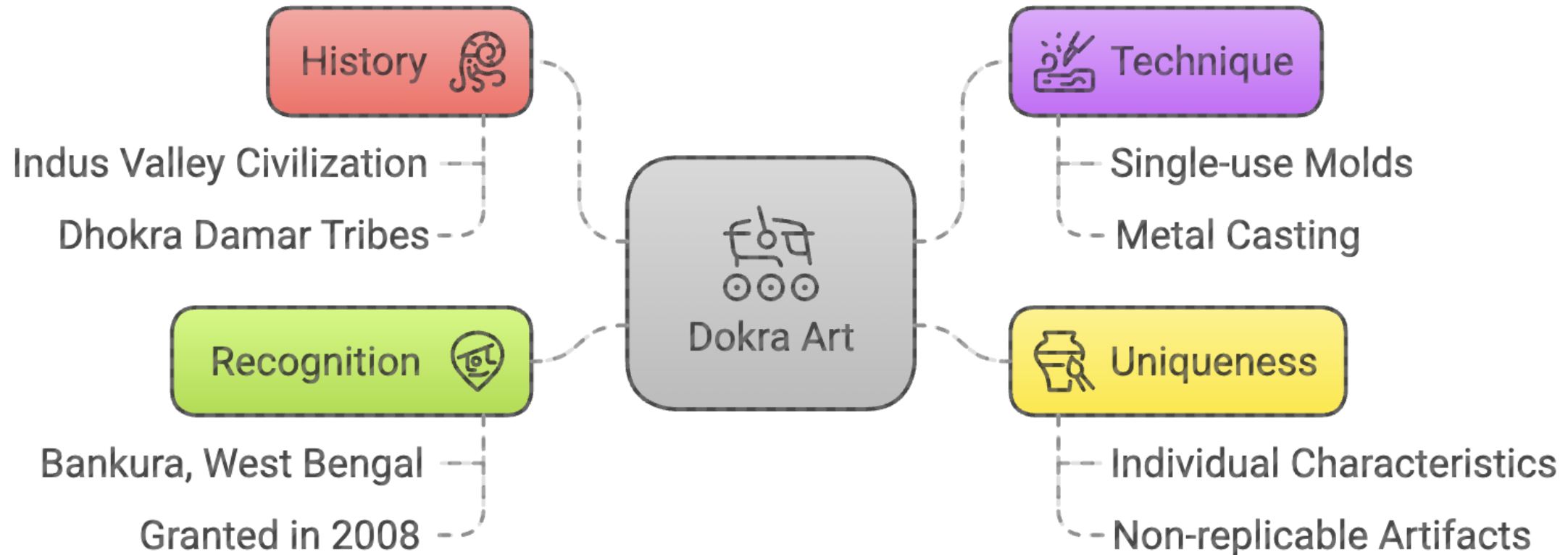




Crafting International Bonds



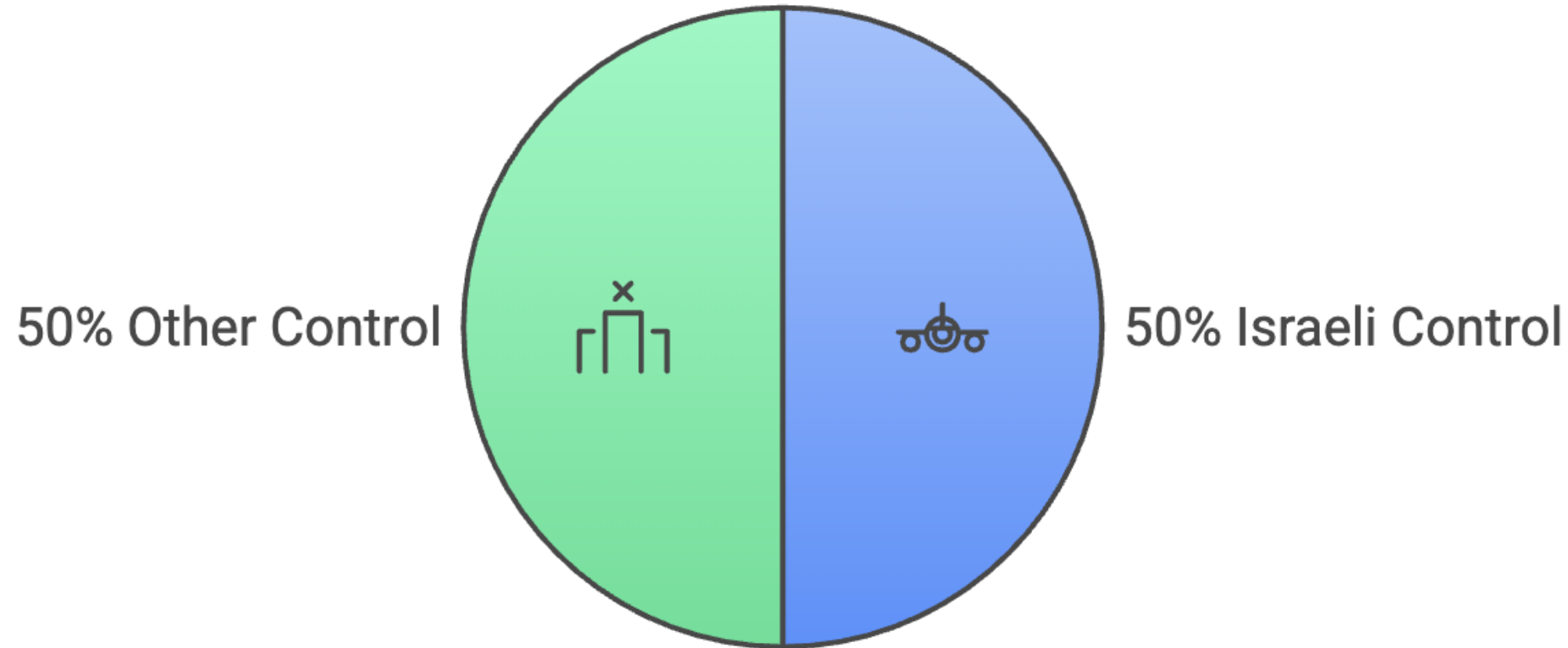
Dokra Art: History, Technique, and Recognition





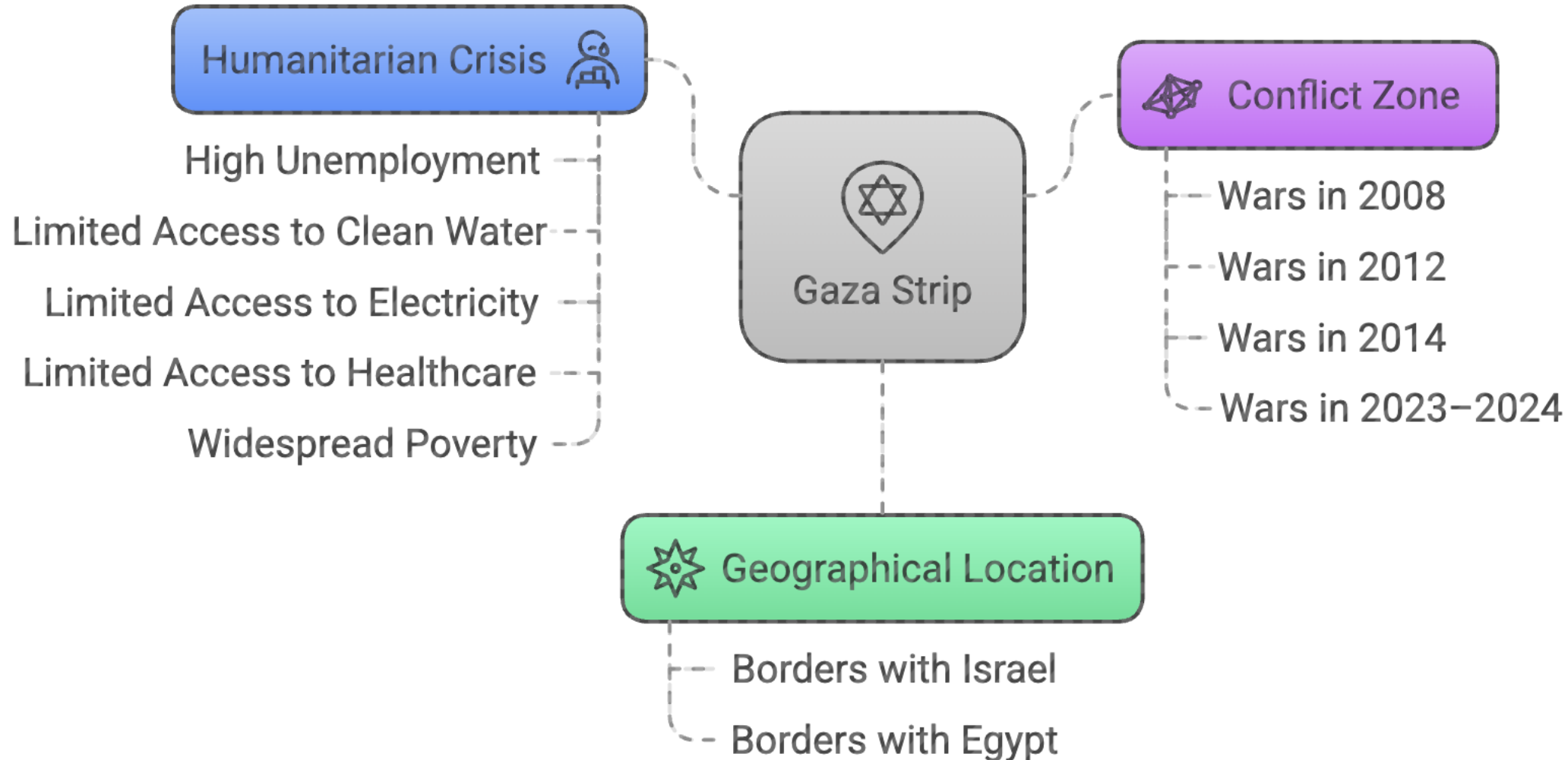
Gaza Strip

Territorial Control in Gaza





Gaza Strip: Geopolitical and Humanitarian Context



New Rules to Get Equivalence Certificates for Foreign Degrees

Name (Print)

Signature

Date

Process of Granting Equivalence Degrees



UGC Notification

The UGC issues a new regulation



Regulation Issued

Details of the regulation are outlined



Application Submission

Institutions submit applications for recognition



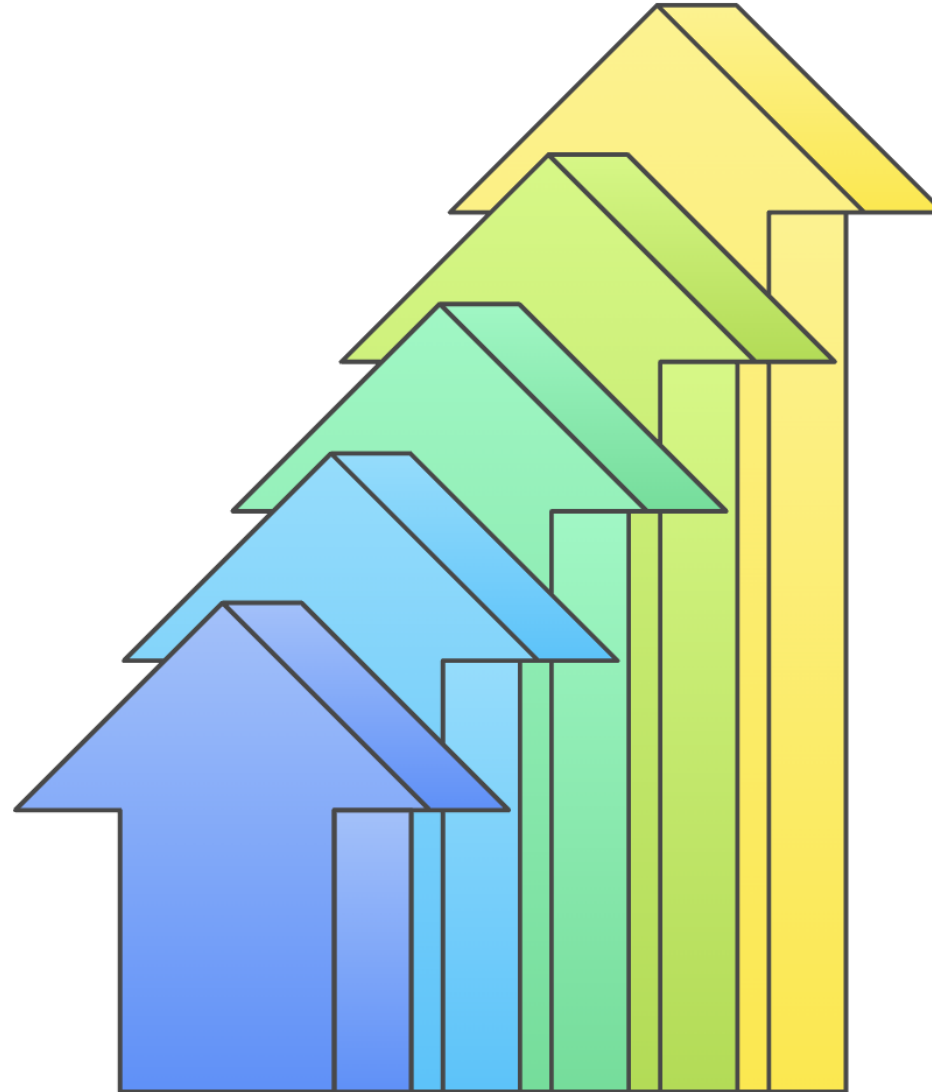
Evaluation Process

The UGC evaluates the submitted applications

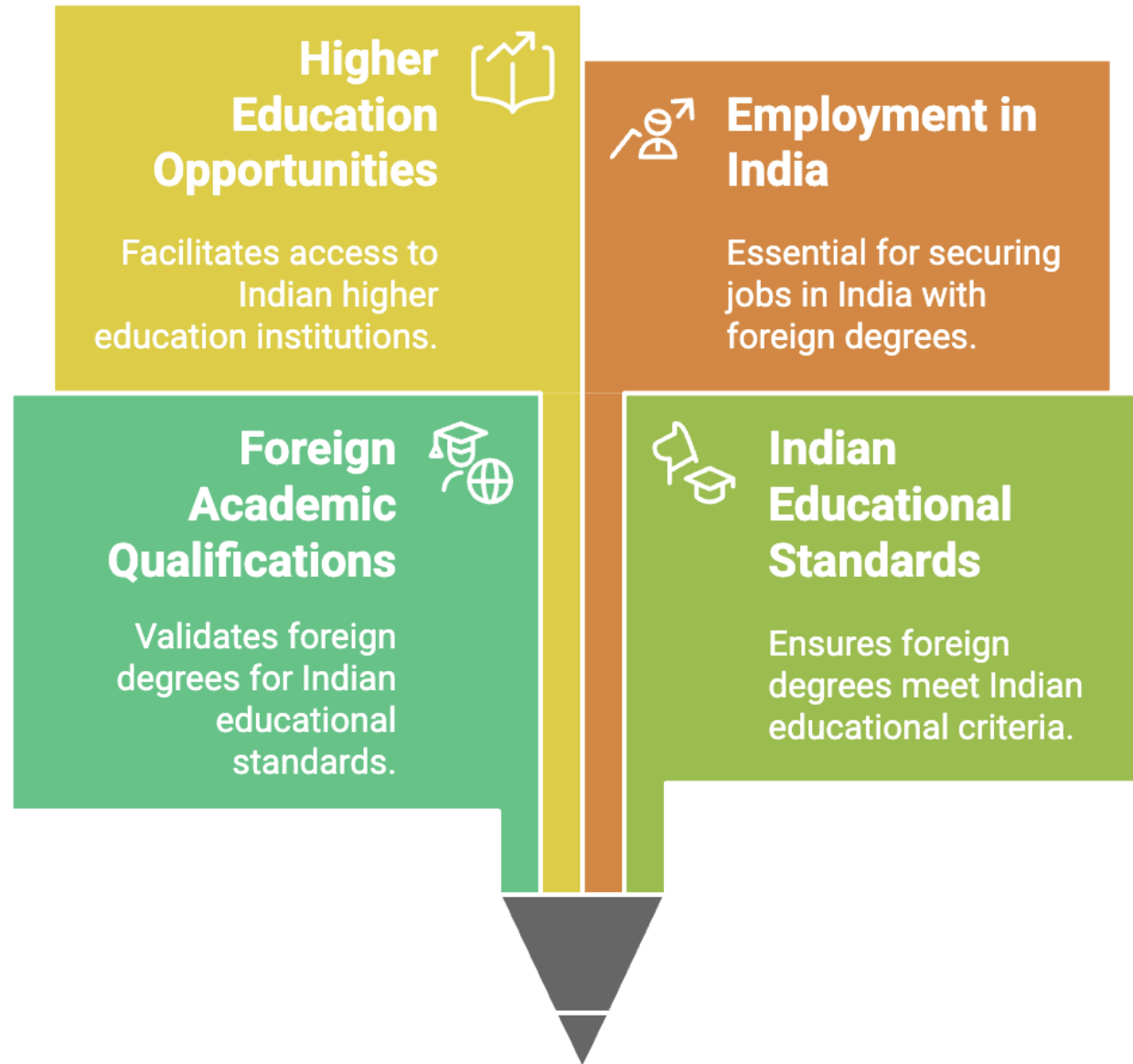


Equivalence Granted

Equivalence degrees are granted to qualified applications



Bridging Global Education



How to determine if a foreign degree is equivalent?

Recognized Institution

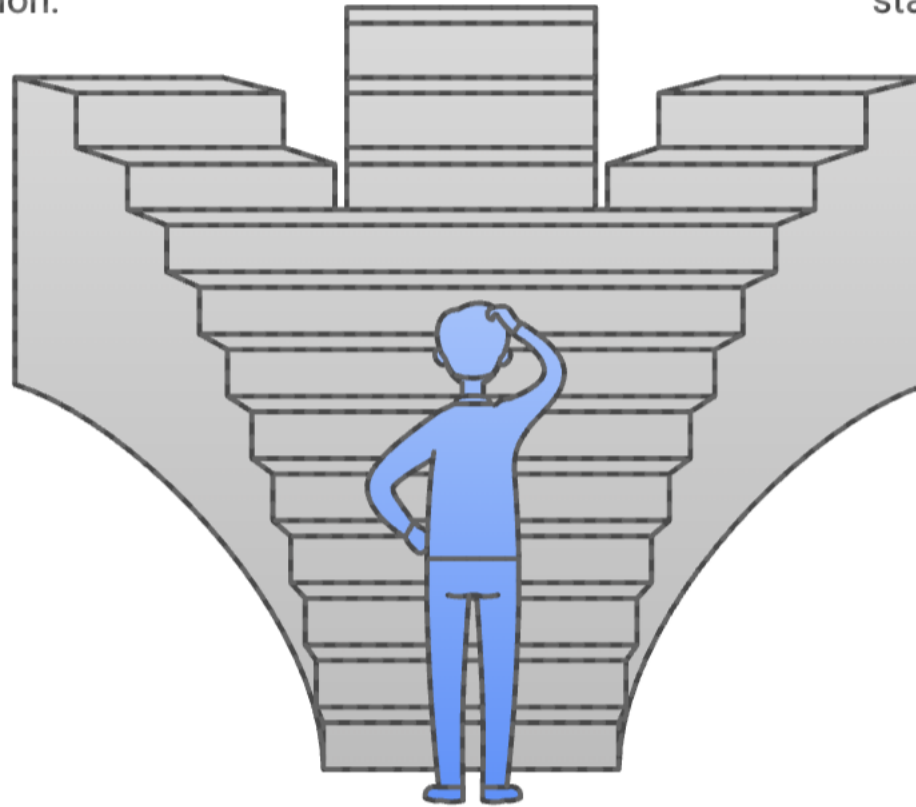
Ensures the degree is from a legally recognized foreign institution.

Entry-Level Requirements

Confirms the program's entry requirements match Indian standards.

Academic Standards

Verifies the program was pursued according to the institution's standards.



Biomass Mission



Forests and Carbon Emissions

Annual CO2 Absorption

Forests absorb 16 billion metric tonnes

Carbon Storage

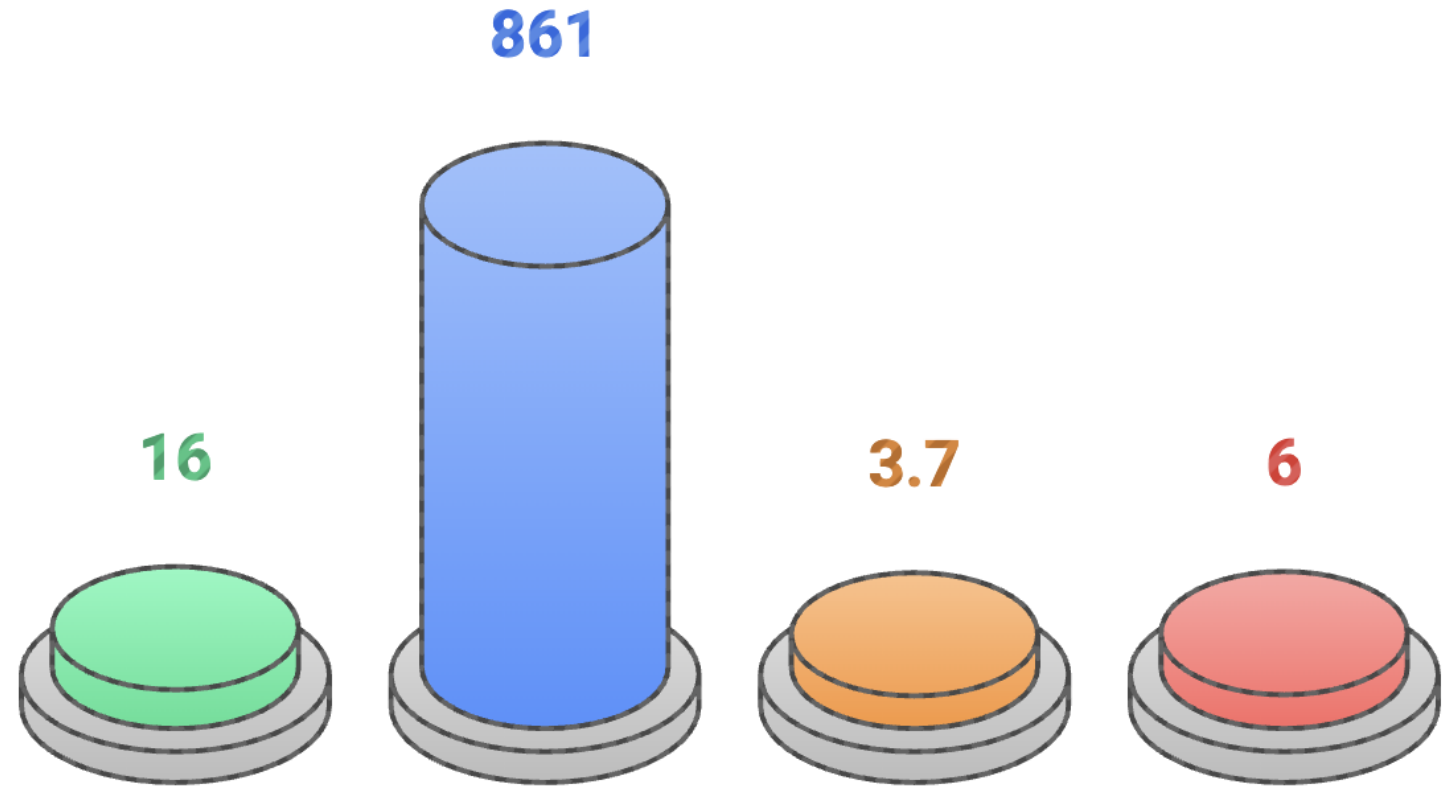
Forests hold 861 gigatonnes of carbon

Tropical Forest Loss

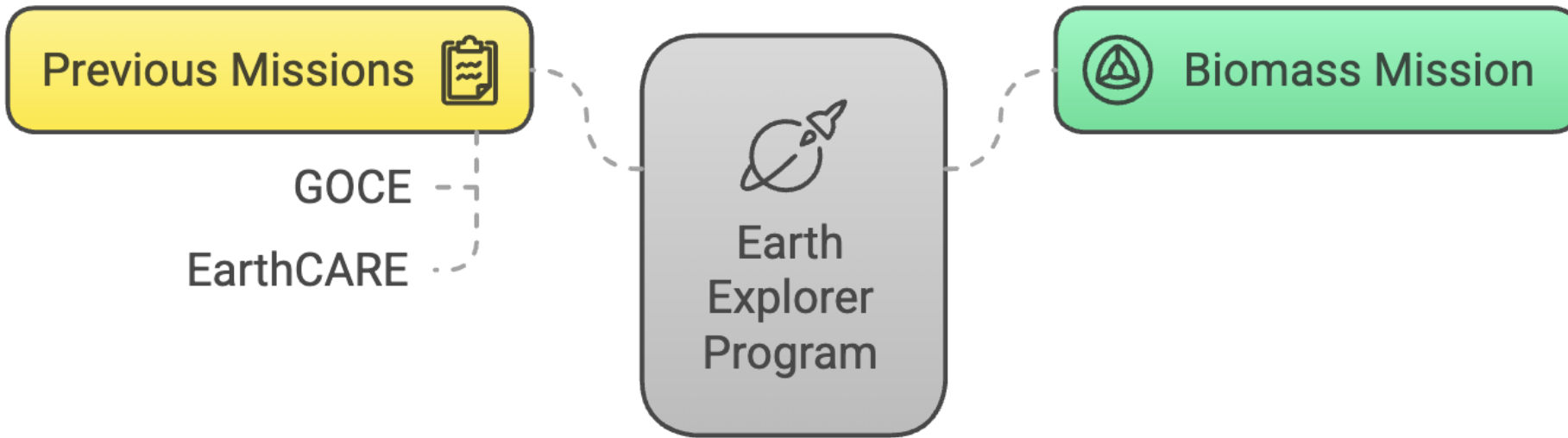
2023 loss of 3.7 million hectares

Global CO2 Emissions Contribution

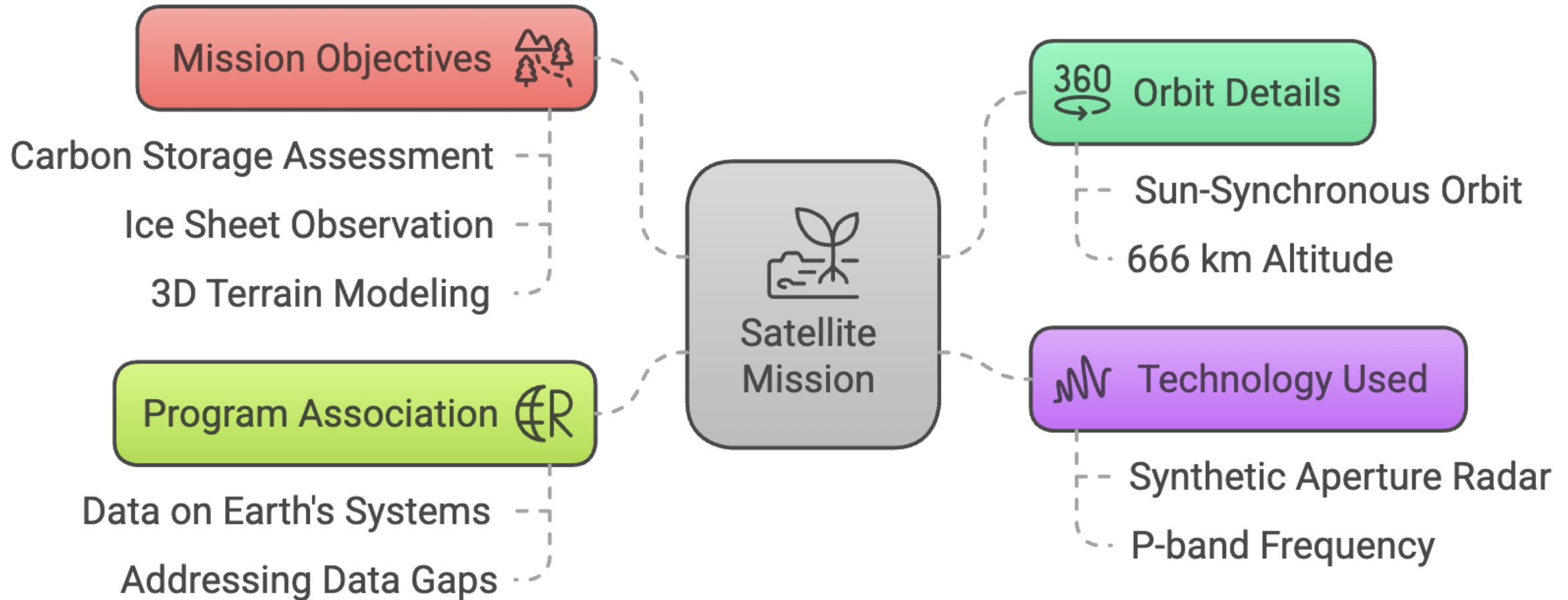
Tropical forests contribute 6% of emissions



Earth Explorer Missions and Biomass's Role



Satellite Mission: Forests and Environmental Monitoring



Breakthrough Prize 2025



2025 Breakthrough Prize Categories



Life Sciences

Recognized
advancements in
biological and health
sciences.



Mathematics

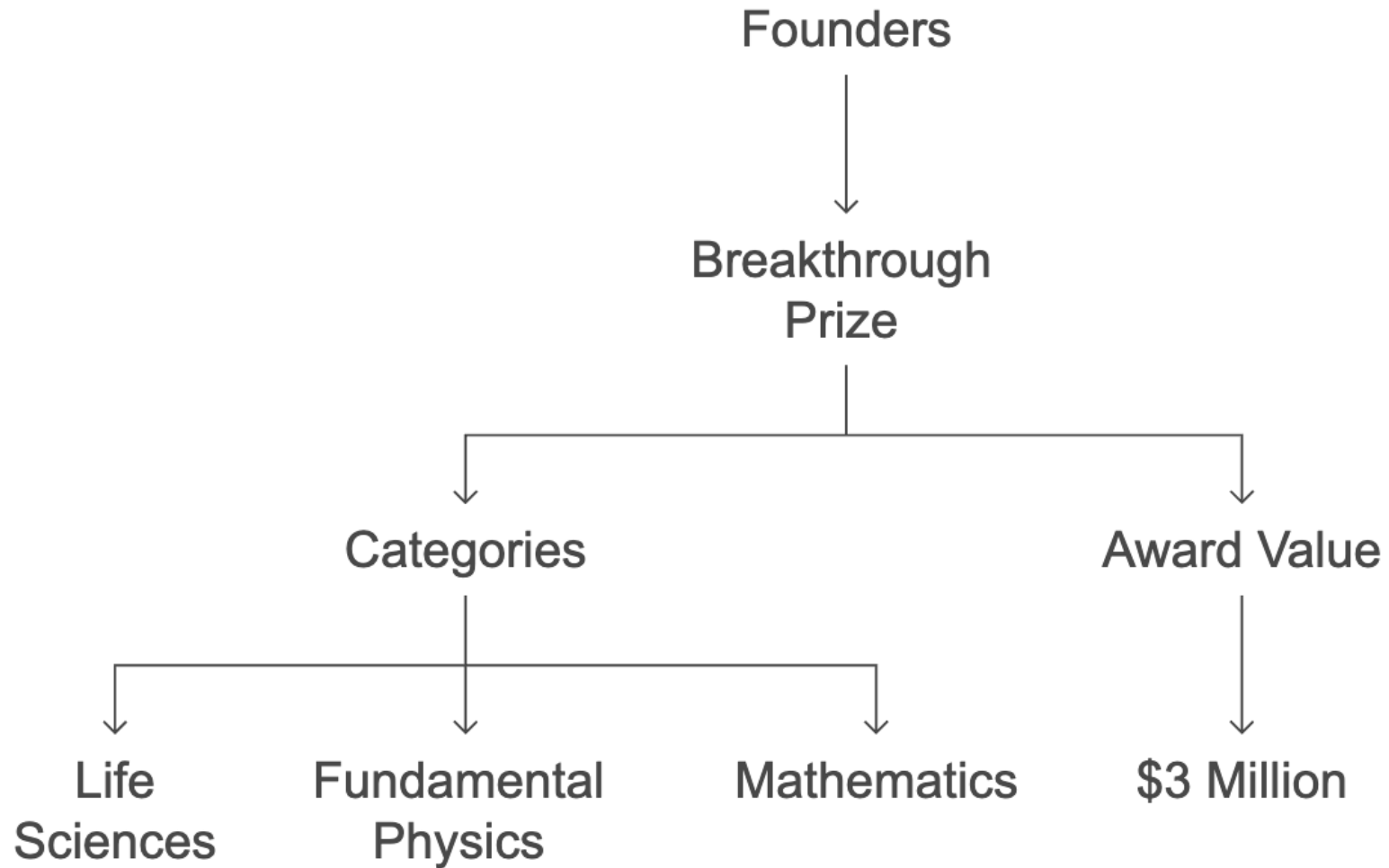
Honored significant
contributions to
mathematical
theories.



Fundamental Physics

Celebrated
breakthroughs in
understanding
fundamental
physical laws.

Breakthrough Prize Structure and Recognition



Breakthrough Achievements in Science



Fundamental Physics prize

Awarded to 13,508
physicists for Higgs
boson research.



Life Sciences

Recognized for
advancements in
weight-loss, MS, and
gene-editing.



Mathematics prize

Honored Dennis
Gaitsgory for
Langlands
conjecture
contributions.



10 MCQ

What is the Breakthrough Prize 2025 awarded for?

• **ब्रेकथ्रू प्राइज 2025 किस क्षेत्र के लिए दिया जाता है?**

A. Business innovation

B. Global diplomacy

C. Scientific achievements in life sciences, physics, and mathematics

D. Climate policy

What has caused a public health crisis in Sonbhadra, Uttar Pradesh?

• सोनभद्र (उत्तर प्रदेश) में कौन सी समस्या सार्वजनिक स्वास्थ्य संकट का कारण बनी है?

- A. Lead contamination
- B. Excess fluoride in groundwater
- C. Arsenic in drinking water
- D. Industrial air pollution

Dokra art is primarily associated with which type of craft?

- **डोकरा कला मुख्यतः किस प्रकार की शिल्पकला से संबंधित है?**
 - A. Textile painting
 - B. Bell metal casting
 - C. Stone carving
 - D. Wood inlay work

What is the objective of the Biomass Mission in India?

- **भारत में बायोमास मिशन का उद्देश्य क्या है?**
 - A. To develop organic fertilizers
 - B. To promote bioenergy and reduce fossil fuel dependency
 - C. To increase sugarcane production
 - D. To monitor air quality

What are the new rules for equivalence certificates for foreign degrees?

• विदेशी डिग्रियों के समकक्ष प्रमाणपत्र के लिए नए नियम क्या हैं?

A. Now issued by AICTE only

B. Mandatory for all private jobs

C. Based on curriculum matching and UGC recognition

D. No equivalence required now

Word of the day

Malleable:

easily influenced; capable of being shaped or bent or drawn out


Synonyms: ductile, pliable, tensile, tractile

Usage: *The crowds are very malleable.*

Pronunciation: newsth.live/malleablepro

International Phonetic

Alphabet: /ˈmæl.iː.ə.bəl/

The background image shows a group of people in a meeting or workshop setting. Several hands are raised, suggesting an interactive session. The image is overlaid with a dark gradient on the left side, where the text is located. There are also some decorative elements: a solid orange rectangle and a cluster of small, faint dots in orange, red, and blue in the upper left corner.

Thank you
guys.
