

Topics



- Supreme court on inclusion of scheduled caste
- Human Auditory system
- Agarwood
- Intergenerational equity And financial distribution
- Agriculture and post harvest losses
- What about women representatives in independent India?
- Indo Pacific Economic Framework for Prosperity (IPEF)
- *Battir – Land of Olives and Vines*
- Mains



By saurabh Pandey



THE HINDU

Target Mains -2024/25 -

Q 'Intergenerational and intragenerational equity has to be the major consideration in financial transfer between states'
Examine

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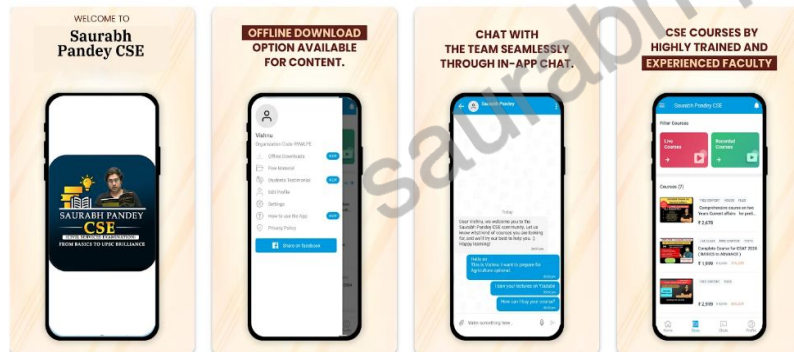
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Batch-1

States cannot tinker with the Scheduled Castes List, says SC

The Hindu Bureau

NEW DELHI

The Supreme Court has held that the States cannot tinker with the Scheduled Castes List notified under Article 341 of the Constitution.

“Any inclusion or exclusion of any caste, race or tribe or part of or group within the castes, races or tribes has to be, by law, made by the Parliament, and not by any other mode or manner,” a Bench of Justices Vikram Nath and P.K. Mishra said while clarifying on the law.

The judgment by the top court came in a challenge by Dr. Bhim Rao Ambedkar Vihar Manch, Patna, to a July 1, 2015 notification issued by the Bihar government, on the basis of the recommendation of the State Backward Classes Commission to merge the Extremely Backward Class (EBC) of Tanti-Tantwa with the Scheduled Caste of Pan/Sawasi

in the Scheduled Castes List. The merger would enable the Tanti-Tantwa to claim the benefits of Scheduled Castes.

Justice Nath, who authored the judgment, pronounced the 2015 resolution as “patently illegal and erroneous”.

“The State government had no competence/authority/power to tinker with the lists of Scheduled Castes published under Article 341 of the Constitution,” Justice Nath concluded in the July 15 verdict.

The court said the State Backward Commission, in the first place, had jurisdiction to recommend the joining of a caste or group with a notified Scheduled Caste community.

“Even if it makes such a recommendation, right or wrong, the State has no authority to proceed to implement the same when it was fully aware that the Constitution does not permit it to do so,” Justice Nath observed.

Supreme court on inclusion of scheduled caste

- The Supreme Court has held that the States cannot tinker with the Scheduled Castes List notified under Article 341 of the Constitution.
- “Any inclusion or exclusion of any caste, race or tribe or part of or group within the castes, races or tribes has to be, by law, made by the Parliament, and not by any other mode or manner

Inclusions and exclusions in the Scheduled Castes List are only possible through law made by the Parliament; neither the President nor the Centre can make changes: Supreme Court judgment.

saurabh pandey upsc

Article 341

(1) The President may with respect to any State or Union territory, and where it is a State, after consultation with the Governor thereof, by public notification, specify the castes, races or tribes or parts of or groups within castes, races or tribes which shall for the purposes of this Constitution be deemed to be Scheduled Castes in relation to that State or Union territory, as the case may be.

(2) Parliament may by law include in or exclude from the list of Scheduled Castes specified in a notification issued under clause (1) any caste, race or tribe or part of or group within any caste, race or tribe, but save as aforesaid a notification issued under the said clause shall not be varied by any subsequent notification.

How the same ear senses music and withstands deafening music

At the heart of our auditory system are intricate hair cells nestled within the cochlea. Each cochlea houses around 16,000 of these sensory cells, each with a cluster of hair-like projections called stereocilia. These stereocilia, arranged like a staircase from the shortest to the tallest, are key to hearing

T.V. Venkateswaran

A tree that is flexible enough to shake in a gentle breeze will undoubtedly be uprooted during a squall. On the other hand, a hardy tree that resists the force of a strong gale will hardly shudder during a gentle breeze. But unlike the tree, our ears can handle both ends of the spectrum.

The human auditory system, a marvel of nature, doesn't only detect the faintest sound signals but also demonstrates remarkable resilience in the face of thunderous noises. This adaptability allows us to distinguish the gentlest whispers from our loved ones and immerse ourselves in the thundering music of a nightclub.

Recent research has unveiled a fascinating mechanism that allows our auditory system to adapt to various sound environments. Just as our pupils dilate in the dark and contract in bright light, our ears have mechanisms that help us adjust to "see" in dim sound environments and protect us from harsh sound environments.

How do we hear?

At the heart of our auditory system are intricate hair cells nestled within the human cochlea. Each cochlea houses around 16,000 of these flask-shaped sensory cells, each with a cluster of hair-like projections called stereocilia. These stereocilia, arranged like a staircase from the shortest to the tallest, are the key to our hearing.

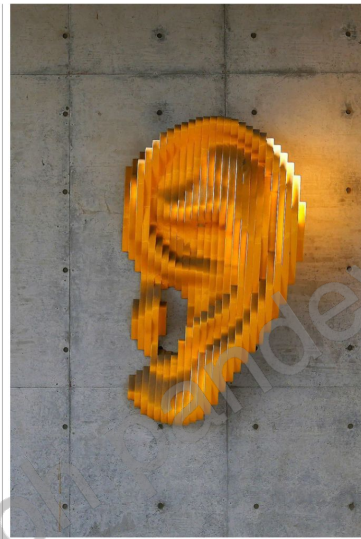
Two adjacent stereocilia are connected by a filamentous extracellular tether called a tip link. These tip links functioning like a complex network of connections, are pivotal in our hearing process, converting sound waves into electrical signals our brain can interpret.

When sound waves reach the ear, they create vibrations in the inner ear fluid. These vibrations cause the stereocilia to bend, stretching the tip links that connect them. This stretching generates ion currents in the stereocilia that allow potassium ions to enter the hair cell and create an electrical signal. Nerve cells attached to the hair cells pick up this signal and send it to the brain, where it is interpreted as sound. This mechanism is similar to a microphone converting sound waves into electrical signals.

A mechanical circuit breaker

Humans can perceive sound in the range of 20 Hz to 20 kHz in frequency and 5-120 decibels (dB) in intensity. These sounds produce a force of 10-100 piconewtons (pN) on tip links. We must apply roughly one newton (N) of force to hold an apple or orange in our hands. One newton is equal to one thousand billion piconewtons. So we can imagine how small the force acting on the tip links is.

The auditory system relies on tip links. Each tip link consists of two proteins, cadherin-23 (CDH23) and protocadherin-15 (PCDH15). These proteins are at risk of breaking when exposed to loud noises. Surprisingly, this breaking is actually a protective mechanism that prevents damaging sounds from reaching the hair cells in the ear, which can't regenerate once they are damaged. But unlike hair cells, the tip links can regenerate, which helps preserve our hearing.



Humans can perceive sound in the range of 20 Hz to 20 kHz in frequency and 5-120 dB in intensity. Representative image: JAKEE JIAN/UNIFLASH

The tip links disassociate naturally in response to ambient sounds. Typically, a tip link complex's average lifetime is about 3-8 seconds. The tip links unbind and rejoin repeatedly and maintain the network in the hair cells.

The temporary hearing loss we might experience after a loud blast or blaring music is the result of losing multiple tip link complexes at the same time. Once the complexes re-form, hair cell function returns to normal levels. In effect, they function like a mechanical circuit breaker in the auditory system.

The lifetime of the tip links is related to the loudness of the sounds to which they are exposed. If the loudness is high, the tip links survive only for a short duration. They break fast. At 1 kHz, the tip links experience a tension of 5 pN. At a higher frequency of 4 kHz, the tension shoots up to 34 pN. The average lifetime of the tip link complex is just eight seconds when subjected to a force of 10 pN. This implies that the tip links must break up within minutes in noisy environments.

"The human ear is sensitive to even 5 dB, and the tip link that can respond to those low stimuli ought not to survive the piercing sound in a nightclub or orchestra, rendering most people deaf. Since this does not occur, it seems appropriate to expect a mechanism that

secure the tip link complexes and observed the lifespan of the tip link; how long it survived without breaking when the amount of force was changed.

They found that a tip-link complex exhibits three distinct types of responses based on the force.

As anticipated, the complex's lifetime decreased when the applied force was low. But when the magnitude of the force was increased, the lifetime decreased. The complex was also surprisingly unaffected by mid-range tensile forces between around 36 pN and 70 pN.

When subjected to strong forces greater than 80 pN – representing intense sounds – the tip links are disconnected in order to protect the hearing system. At even higher forces, the tip links only remain intact for a short period of time.

"The tip links act like the force sensor, balancing the incoming force and slipping in to protect us from the danger. This response at a louder noise level cuts off the transmission protecting the hair cells," Dr. Rakshit said.

Like a sensitive switchboard in our car, the tip-link first detects the subtle mechanical signals from incoming signals. It then converts them into electrical signals, allowing us to hear faint sounds. "However, this tiny protein-protein complex transforms into a gatekeeper when the sound is loud," Dr. Chaudhuri said. We discovered that tip links act as force filters, selectively transmitting low forces to activate ion channels while blocking intermediate force levels. Moreover, when faced with extremely high forces, the tip links disengage altogether, preventing damage to our hearing apparatus."

It is well known that a mutation in the PCDH15 protein results in inherited deafness. "We conducted similar studies with mutated tip links, and found that the lifetime-force curve of the mutant is dramatically different," says Sabyasachi.

The lifetime of the tip link showed three kinds of responses across the force range for regular tip links. However, in the mutated tip link, the response is reduced with increased force across all the force ranges.

"We were not able to see the mid-range behaviour found in the normal tip link, in the mutated tip links," he added.

This implies that the ability of the normal tip link to respond to mid-range forces is crucial for hearing, and inherited deafness results from mutation-related loss of this function.

"By unravelling the intricate mechanisms of tip-links, we are paving the way for developing innovative strategies to protect against hearing loss caused by loud noises. With further research, we aspire to unlock new secrets of this fascinating biological system. This could potentially enhance the quality of life for millions affected by hearing impairment." Anir Sagar, a lead author and a former postdoc at IISER Mohali, said.

The team consisted of Nisha Arora, Jagadish P. Hazra, Sandip Roy, Gaurav K. Rathi, Sarika Gupta, K. P. Yogenndran, Abhishek Chaudhuri, Anir Sagar, and Sabyasachi Rakshit. The study paper was published in the journal *Nature Communications*.

(T.V. Venkateswaran is a science communicator and visiting faculty member at the Indian Institute of Science Education and Research, Mohali.)



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safeguards the transduction at large forces," Sabyasachi Rakshit, a lead author of the new paper and associate professor in the Department of Chemical Sciences at the Indian Institute of Science Education and Research, Mohali, said. Abhishek Chaudhuri, the other lead author and an associate professor in the Department of Physical Sciences at the same institute, added: "We were interested in finding the mechanism that enables tip links to survive forces of varying frequency and amplitude and capture the features that can explain uninterrupted hearing."

Testing tip links

We can determine the strength of a length of thread by securing one end with a clamp to the roof and hanging weights on the other end. Similarly, the researchers used an atomic force microscope (AFM) to

Human Auditory system



- At the heart of our auditory system are intricate hair cells nestled within the human cochlea.
- Each cochlea houses around 16,000 of these □ flask-shaped sensory cells, each with a cluster of hair-like projections called stereocilia.
- These stereocilia, arranged like a staircase from the shortest to the tallest, are the key to our hearing.
- Two adjacent stereocilia are connected by a filamentous extracellular tether called a tip link.
- These tip links, functioning like a complex network of connections, are pivotal in our hearing process, converting sound waves into electrical signals our brain can interpret.



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- **This stretching opens ion channels in the stereocilia that allow potassium ions to enter the hair cell and create an electrical signal.**
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- These proteins are at risk of breaking when exposed to loud noises



Please send in your answers to
science@thehindu.co.in

THE SCIENCE QUIZ

The odoriferous life of agarwood

Vasudevan Mukunth

QUESTION 1

Agarwood is a fragrant wood produced naturally by trees belonging to a few genera. The principal among them is _____, trees of which are distributed around South and Southeast Asia. The genus name in Latin roughly means “eagle.” Fill in the blank.

QUESTION 2

The process by which these trees produce agarwood, a.k.a. agalloch, begins when they are infected by a particular fungus. Name the fungal species.

QUESTION 3

Name the tree that provides most of the world’s agarwood, which is used to make perfumes, incense sticks, and other aromatic products. The first half of its binomial nomenclature is the answer to Q1. It is also the state tree of Tripura. What is the scientific (species) name of this tree?

QUESTION 4

Due to unchecked demand for agarwood, trade in the tree that produces it (in Q3) and its products is protected by a multilateral treaty called _____. This treaty also requires countries that ratify it to ensure agarwood isn’t harvested in a way that affects its survival. Name the treaty.

QUESTION 5

Researchers have found several compounds in the oil extracted from agarwood using steam distillation.

Many of them belong to the class called Z. These compounds are derived from another compound that’s the main component of natural rubber. A Z compound is also responsible for eucalyptus’s unique fragrance. Name Z.

Answers to July 16 quiz:

1. Mathematicians who first developed a reasoned answer to the problem of points – **Ans: Blaise Pascal and Pierre de Fermat**

2. The mathematical foundation for statistics – **Ans: Probability**

3. Aristotle’s hypothesis that Pascal overturned in 1647 – **Ans: Horror vacui**

4. Theorem that Andrew Wiles solved in 1994 – **Ans: Fermat’s Last Theorem**

5. Subject of Fermat’s principle that takes the shortest path – **Ans: Ray of light**

Visual: **Voltaire**

First contact: Irfan Ali | Pratyush Shukla | Seema Das



Visual: Over time, the resin saturates a part of the tree called X (a.k.a. Y), shown above. This X (or Y) is called agarwood. Name X and Y. This woody part of the tree derives one of its names from its location rather than its function. RBREIDBROWN

Agarwood



- Agarwood, aloeswood, eaglewood, gharuwood or the Wood of Gods, most commonly referred to as oud or oudh is a fragrant, dark and resinous wood used in incense, perfume, and small hand carvings.
- It forms in the heartwood of *Aquilaria* trees after they become infected with a type of *Phaeoacremonium* mold, *P. parasitica*. The tree defensively secretes a resin to combat the fungal infestation.
- Prior to becoming infected, the heartwood mostly lacks scent, and is relatively light and pale in colouration.
-



- However, as the infection advances and the tree produces its fragrant resin as a final option of defense, the heartwood becomes very dense, dark, and saturated with resin.
- This product is harvested, and most famously referred to in **cosmetics** under the scent.
- Since 1995, the **Convention on International Trade in Endangered Species of Wild Fauna and Flora** has listed *Aquilaria malaccensis* (the primary source) in its **Appendix II (potentially threatened species)**.

Q Neurotechnology with neuroethics will impact Neurorights. Illustrate (10m)

Neurotechnology refers to a technology that interacts with brain or nervous system.

GROWING IMPORTANCE -

1. Neurotechnologies have come long way since development of Electroencephalography (EEG). It has obvious effect on knowledge of human brain & treatment of brain disorders.
2. Example, Elon's Musk Neuralink has also kindled hope about using brain computer link to help physically impaired people.
3. Range from Magnetic Resonance Imaging (MRI) to brain computer interface, Neurostimulation & Neuropharmacology.

CONCERNS -

1. Privacy Issue → Data extracted from real time tracking - digitised, increased risk of monitoring can control over individual's behaviour.
2. Neurocognitive Risks → These can probe individual physiological states, interacting actively with human brain, human autonomy, as it gives access to sensitive info. stored in brain.
3. Neuromarketing → Developed by industry to evaluate, advt campaign preference - raising concern on mental health.

NEUROETHICS - NEURORIGHT - PRO-ACTIVE RIGHT -

- Internationally accepted human rights principles & universal declaration of Human Rights do provide some linking as to individual Neuro Right.
- But extent has yet to be decided on enforceable part, in each jurisdiction.
- In 2021, Chile became first country to legally recognize its citizen's Neuro Right. followed by Colorado Jan 2024, & California deliberating similar instrument.
- UNESCO has expected to adopt "first global framework on ethics of Neurotechnology" by 2025.
- Here, important challenge is developing suitable Neuro ethical standards with the rapidly evolving technologies. The context in which people use these technologies are also diverse, beset by disparate expectations & cultural norms.

To address ethical concern proactively, ensuring advancement with benefiting the society, while minimizing potential risks & ensuring individual autonomy & Right is need of the moment.

Intergenerational equity as tax devolution criterion

The devolution of Union tax revenue to States is a topic that has been in discussion in the political sphere in recent times. However, it is an evergreen subject of discussion for economists. One of the points in this discussion is the factors in the horizontal distribution of States' share in Union tax revenue among States. The Finance Commission (FC) decides the horizontal distribution formula once every five years. Despite repeated quinquennial revisits to this distribution formula, conceptually, it is predictable that equity is prioritised over efficiency. Equity in the distribution formula is about intragenerational equity, that is, to redistribute tax revenue among States. The undesirable consequence of this is the accentuation of intergenerational inequity within States. The argument is that intergenerational equity should be a factor in India's horizontal distribution formula for tax devolution.

Intergenerational fiscal equity

In general, intergenerational equity is the principle of providing equal opportunities and outcomes to every generation. Intergenerational equity ensures that the decisions or actions of current generations should not burden the future generation. From a public finance point of view, it refers to a situation where every generation pays for the public services it receives and does not burden the future generation through borrowings.

For any government, there are only two ways to raise its revenue: tax or borrowing. If, in a period, the tax revenue equals the current expenditure of the government, then the current taxpayers pay for the public services they receive. If the government finances the current expenditure through borrowings, it means the future generation is going to pay higher taxes to repay this borrowing and interest. In other words, borrowing to meet the current expenditure of the government amounts to intergenerational inequity.

There is an argument in fiscal economics called Ricardian Equivalence Theory that whenever the government resorts to borrowing to finance current expenditure, households react through higher savings and thus enable the future generation to pay higher taxes as well as keep aggregate demand in the economy constant over different periods. This theory assumes that the current generation pays tax less than the value of



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Member, Tamil Nadu State Planning Commission

The Finance Commission needs to have a relook at the indicators in rewarding State fiscal efficiency

the current public services it receives, and thus saves. Whereas in our present federal situation this is not the case. Households in developed States pay taxes that are not entirely used within the specific States, thus compelling such States to borrow more or curtail current expenditure. On the contrary, households in developing States pay taxes much less than the value of current expenditure and fill the gap by receiving higher financial transfers from the Union government.

Versus intragenerational equity

To give the broader picture, let us divide some of the major States into high-income and low-income – Tamil Nadu, Kerala, Karnataka, Maharashtra, Gujarat, and Haryana as high-income States and Bihar, Uttar Pradesh, Madhya Pradesh, Rajasthan, Odisha and Jharkhand as low-income States. Let us analyse only the 14th FC period (2015-20). The own tax revenue financed up to 59.3% of revenue expenditure in high-income States, while in low-income States, their own tax revenue was financing only 35.9%. The Revenue Expenditure to GSDP ratio for high-income States was 10.9%, which is lower than the similar ratio of 18.3% for low-income States. Thus, while high-income States curtailed their revenue expenditure and began financing a substantial part of it through their own tax revenues, the low-income States not only had higher Revenue Expenditure to GSDP but also financed only a smaller portion of it through their own tax revenues. Nearly 57.7% of revenue expenditure in low-income States was financed by Union financial transfers, and only 27.6% of revenue expenditure was financed by Union financial transfers in high-income States.

We can see through aspects of federal finances. First, low-income States finance a smaller portion of their revenue expenditure with their own tax revenue and also receive larger amounts of Union financial transfers. Second, high-income States finance a substantial portion of their revenue expenditure with their own tax revenue but receive too little Union financial transfers. Third, we can also deduce that the high-income States had to incur a deficit of 13.1%, and the low-income States ended up with a deficit of only 6.4% of revenue expenditure. Thus, the high-income States raise higher amounts of their own tax revenue and curtail their own revenue expenditure, yet incur higher deficits because of lower Union financial transfers compared to low-income States.

People of a State know the level of direct and indirect taxes they pay and expect an equivalent value of services from the government. So, the public services provided to the people of a State by both the State and the Union government should match this expectation. Any other fiscal behaviour would only result in burdening the high-income States with higher tax payments for both present and future generations. We understand the need for intragenerational equity across States in a federal system as it provides a larger unified market for everyone. Balancing both intragenerational and intergenerational equity is important, and it reiterates the need to balance equity and efficiency in the distribution formula for tax devolution to States. This squarely falls under the purview of the FC to have a fair mechanism to address the conflicting equity issues

Address conflicting equities

Usually, FCs use indicators such as per capita income, population, and area in the distribution formula. These indicators reflect the differences between States in terms of demand for public services (population and area) and the size of public revenue available (per capita income). These indicators carry a larger weight and assure equity in the distribution of Union financial transfers among States. Variables such as tax effort and fiscal discipline carry smaller weight in the distribution formula to reward the fiscal efficiency of States.

You may find that the equity variables are proxy variables, and that they do not reflect the actual fiscal situations in States. The efficiency indicators are fiscal variables from the State budget. The Union financial transfers make an impact only on the Budget and alter the fiscal behaviour of States. Therefore, it is appropriate to include more fiscal variables in the tax devolution criterion such that the Union financial transfers change the fiscal behaviour of the States in the desired direction.

Every State has a Fiscal Responsibility Act restricting the quantum of deficit and public debt. However, reduced Union financial transfers to some States compel them to breach this legal limit. Therefore, the FC should assign a larger weight to fiscal indicators and incentive tax effort and expenditure efficiency through larger Union financial transfers. This will automatically ensure intergenerational fiscal equity and sustainable debt management by States.

Intergenerational equity And financial distribution



- horizontal distribution of States' share in Union tax revenue among States.
- The Finance Commission (FC) decides the horizontal distribution formula once every five years.
- Despite repeated quinquennial revisits to this distribution formula, conceptually, it is predictable that equity is prioritised over efficiency.
- Equity in the distribution formula is about intragenerational equity, that is, to redistribute tax revenue among States.
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- **Intergenerational ☐ fiscal equity** In general, intergenerational equity is the principle of providing equal opportunities and outcomes to every generation.
- **Intergenerational equity ensures that the decisions or actions of current generations should not burden the future generation.**
- **From a public finance point of view, it refers to a situation where every generation pays for the public services it receives and does not burden the future generation through borrowings.**
- **For any government, there are only two ways to raise its revenue: tax or borrowing.**

- If, in a period, the tax revenue equals the current expenditure of the government, then the current taxpayers pay for the public services they receive.
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- **Every State has a Fiscal Responsibility Act restricting the quantum of deficit and public debt.**
- **However, reduced Union financial transfers to some States compel them to breach this legal limit.**
- **Therefore, the FC should assign a larger weight to fiscal indicators and incentivise tax effort and expenditure efficiency through larger Union financial transfers.**
- **This will automatically ensure intergenerational fiscal equity and sustainable debt management by States.**

Choosing the right track to cut post-harvest losses

India ranks second in global agriculture production, but its share in global agricultural exports is only 2.4%, placing it eighth in the world. This is attributed to several factors that include low productivity, an inability to meet desired quality standards and inefficiencies in the supply chain such as an inadequate transportation network and infrastructure, which also leads to significant post-harvest losses.

India's post-harvest losses amount to approximately ₹1,52,790 crore annually, according to a Ministry of Food Processing Industries 2022 study. As India's population continues to grow, the challenge of meeting the food and nutrition demand of its people will continue to intensify. While growing more food is part of the solution, the prevention of post-harvest losses is crucial.

A closer look at India's post-harvest loss

The biggest loss is from perishable commodities, which include livestock produce such as eggs, fish and meat (22%), fruits (19%) and vegetables (18%). During the export of perishables, approximately 19% of food is lost, particularly at the import-country (trade partner) stage. Storage, transportation and marketing play a critical role in ensuring that perishable products reach the consumer in time. The strengthening of agri-logistics is recognised as a priority by the Committee on Doubling Farmer's Income (DFI).

There are multiple logistical requirements in a single supply chain. Starting with first mile transport from farmgate to *mandi* (wholesale/retail), long haul or wholesale transportation by rail, road, water or air, and last mile transportation to the consumer. The trade of perishables faces a time shortage once the crop is harvested. The latest agriculture Census shows that 86% of farmers in India are small and marginal (SMF). They struggle to attain economy of scale due to the small production. Together with a lack of assured market connectivity, this



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Integrating the Railways with agricultural product logistics management can cut post-harvest losses significantly; it will also help the environment

results in post-harvest losses, which includes income losses for the farmers.

In India, food price volatility has been caused partly by supply constraints affecting perishable produce. As in a NITI Aayog report, the revenue of the Indian Railways is primarily driven by freight transport, which includes commodities such as iron, steel, fertilizers and agricultural produce. In the 2022 fiscal year, it accounted for 75% of its total earnings. The Indian Railways efficiently connects urban centres and rural areas across the country. The Food Corporation of India is heavily dependent on the Indian Railways to move approximately 90% of its food grains. In contrast, about 97% of fruits and vegetables are transported by road.

Initiatives by the Railways

The Indian Railways has taken a few initiatives to improve its freight operations in perishables. The truck-on-train service carries loaded trucks on railway wagons. Efforts are being made to expand this service following successful trial runs involving commodities such as milk and cattle feed. During the COVID-19 pandemic, the Railways introduced parcel special trains to transport perishables and seeds between market and producers.

Additionally, to support SMFs, the Kisan Rail was initiated to connect perishables (inclusive of milk, meat and fish) production surplus regions to consumption regions more efficiently. A recent study highlighted the impact of the Kisan Rail scheme on reducing post-harvest losses and enhancing farmer incomes in India. For example, grape growers in Nashik, Maharashtra, secured a net profit of ₹5,000 per quintal by supplying about 22,000 quintals using Kisan Rail. This highlights the advantage of using rail-based long-haul of fruits and vegetables.

In recent times, the role of the Railways in the agricultural sector has shown promising results. However, initiatives must also focus on increasing awareness and accessibility of farmers to

available Railway schemes. Friends of Champions 12.3 India, a coalition of food supply chain actors powered by WRI India, also identified that multiple touch points during the transport of perishables using the Railways is a challenge.

Therefore, investment in specialised wagons for temperature-controlled transport and the establishment of rail-side facilities for safe cargo handling are essential. This would also present a significant opportunity to enhance food safety in the agriculture sector, by minimising spoilage and contamination risks, thereby supporting both domestic and export markets. Further, the DFI committee recommends streamlining loading and unloading processes to minimise transit times. It also emphasises addressing staffing shortages through recruitment and training initiatives. Prioritising the Railways over roadways, particularly for fruit and vegetable transportation, promises efficient transportation.

Untapped opportunities

The Railways offers a tremendous opportunity to reduce post-harvest losses and positively impact not just livelihoods but also the environment. Findings from the Logistics Division, Ministry of Commerce, state that the Indian Railways generates up to 80% less carbon dioxide for freight traffic than road transport.

There is a need for adopting systems-based approach, cutting across modes of transport and geographies. The private sector can play a crucial role in enhancing operational efficiency and strengthening the rail infrastructure through public-private partnerships. The budgetary allocation for agriculture 2024 also aims to bridge the farm-to-market gap with modern infrastructure and value-addition support. Such Railway initiatives complement these efforts by supporting the efficient transportation of perishable goods and minimising post-harvest losses.

Agriculture and post harvest losses

- India ranks second in global agriculture production, but its share in global agricultural exports is only 2.4%, placing it eighth in the world.
- This is attributed to several factors that include low productivity, an inability to meet desired quality standards and inefficiencies in the supply chain such as an inadequate transportation network and infrastructure, which also leads to significant post-harvest losses.
- India's post-harvest losses amount to approximately ₹1,52,790 crore annually, according to a Ministry of Food Processing Industries 2022 study

- **The biggest loss is from perishable commodities, which include livestock produce such as eggs, fish and meat (22%), fruits (19%) and vegetables (18%).**
- **During the export of perishables, approximately 19% of food is lost, particularly at the import-country (trade partner) stage.**
- **Storage, transportation and marketing play a critical role in ensuring that perishable products reach the consumer in time.**
- **The strengthening of agri-logistics is recognised as a priority by the Committee on Doubling Farmer's Income (DFI).**

- **There are multiple logistical requirements in a single supply chain.**
- **Starting with first mile transport from farmgate to mandi (wholesale/retail), long haul or wholesale transportation by rail, road, water or air, and last mile transportation to the consumer.**
- **The trade of perishables faces a time shortage once the crop is harvested.**
- **The latest agriculture Census shows that 86% of farmers in India are small and marginal (SMF).**

- The Food Corporation of India is heavily dependent on the Indian Railways to move approximately 90% of its food grains.
- In contrast, about 97% of fruits and vegetables are transported by road.
- to support SMFs, the Kisan Rail was initiated to connect perishables (inclusive of milk, meat and fish) production surplus regions to consumption regions more efficiently.
- A recent study highlighted the impact of the Kisan Rail scheme on reducing post-harvest losses and enhancing farmer incomes in India

- **investment in specialised wagons for temperature-controlled transport and the establishment of rail-side facilities for safe cargo handling are essential.**
- **This would also present a significant opportunity to enhance food safety in the agriculture sector, by minimising spoilage and contamination risks, thereby supporting both domestic and export markets**

- **The Railways offers a tremendous opportunity to reduce post-harvest losses and positively impact not just livelihoods but also the environment.**
- **Findings from the Logistics Division, Ministry of Commerce, state that the Indian Railways generates up to 80% less carbon dioxide for freight traffic than road transport.**
- **There is a need for adopting systems-based approach, cutting across modes of transport and geographies.**
- **The private sector can play a crucial role in enhancing operational efficiency and strengthening the rail infrastructure through public-private partnerships**

On political representation of women

Have women been fairly represented in Parliament in independent India? Should political parties provide internal reservations to increase women's political participation? When will the 106th constitutional amendment be implemented?

EXPLAINER

Rangarajan. R

The story so far:

In the recently concluded general elections in the U.K., a record 263 women MPs (40%) have been elected to the House of Commons. The South African National Assembly has around 45% women representation, while the U.S. House of Representatives has 29%. Universal suffrage was achieved in various parts of the world after prolonged political movements. New Zealand was the first to grant universal women suffrage in 1893. The U.K., itself provided all its women the right to vote only in 1928. The U.S., granted equal voting rights through the nineteenth amendment only in 1920.

What about women representatives in independent India?

India as a sovereign republic provided the right to vote for all its women right from the first general elections in 1952. While the right to vote was provided to all women since the commencement of the Constitution, the representation of women in the Lok Sabha and State legislative assemblies has been far from satisfactory. The percentage of women MPs in the Lok Sabha had been very low between 5% and 10% till 2004. It rose marginally to 12% in 2014 and currently stands at 14% in the 18th Lok Sabha. The representation in State Legislative Assemblies is even poorer with the national average being around 9%.

The 73rd and 74th amendments of the Constitution in 1992/1993, provided for one-third reservation for women in panchayats and municipalities. However, attempts between 1996 and 2008 to provide similar reservation in the Lok Sabha and assemblies were unsuccessful.

How do women MPs fare worldwide?

Women representation in parliament varies across different democracies. It is a



Long fight: From a protest march demanding the women's Reservation Bill in 2016. FILE PHOTO

perennial issue to promote higher representation for women who constitute half the population in all countries. The important methods used across the world to ensure higher representation of women are (a) voluntary or legislated compulsory quotas for candidates within political parties and (b) quota in parliament through reservation of seats. Quotas within political parties provide more democratic choice to voters and allows flexibility to parties in choosing

Country wise data on women representation*

Women representation in parliament varies across different democracies

Country	% of elected women	Quota in Parliament	Quota in political parties
Sweden	46%	No	Yes
South Africa	45%	No	Yes
Australia	38%	No	Yes
France	38%	No	Yes
Germany	35%	No	Yes
U.K.	40%	No	Yes
U.S.	29%	No	No
Pakistan	16%	Yes	No
Bangladesh	20%	Yes	No

Moving forward: Trinamool Congress MPs take selfies at the Parliament House complex during the first session of the 18th Lok Sabha, on June 25. PTI

*[as of September 2023] | Source: PRS legislative research

Voluntary or legislated quotas within political parties are unlikely to yield the desired representation in our country

women candidates. Opponents of having a reserved quota in parliament for women argue that it would be seen as women not competing on merit. As the seats reserved for women would be rotated after each delimitation, it may also reduce the incentive for MPs to work hard to nurture their constituencies. The table above provides a snapshot of women's representation in some democracies across the world. As can be seen, countries like Bangladesh and Pakistan that have quotas in parliament fare poorer than countries with political party quotas.

What is the 106th amendment?

As on April 2024, India ranks 143 in the list of countries in the 'Monthly ranking of women in national parliaments' published by the Inter-Parliamentary Union, a global organisation for national parliaments. The Trinamool Congress has the highest proportion of women MPs in the current Lok Sabha at 38%. The ruling Bharatiya Janata Party and principal Opposition Congress party have around 13% each. Naam Tamilar Katchi, a State

party in Tamil Nadu, has been following a voluntary quota of 50% for women candidates in the last three general elections.

However, voluntary or legislated quotas within political parties are unlikely to yield the desired representation in our country. This is why the Parliament through the 106th constitutional amendment, in September 2023, provided for one-third reservation of seats for women in the Lok Sabha and State legislative assemblies. This would ensure a fair representation of women in legislatures that would increase gender sensitivity in parliamentary processes and legislation. It would also hopefully increase the number of women Ministers in the Centre and States.

This reservation shall come into effect based on the delimitation exercise after the relevant figures of the first Census conducted after the commencement of this act is published. Hence, the Census which is overdue since 2021 should be conducted without any further delay to ensure that this reservation is implemented starting with the general elections in 2029.

Rangarajan. R is a former IAS officer and author of 'Polity Simplified'. He currently trains civil-service aspirants at 'Officers IAS Academy'. Views expressed are personal.

THE GIST

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IPEF: India likely to sign clean, fair economy pacts

Amiti Sen
NEW DELHI

India is likely to soon be able to sign the clean economy and fair economy agreements under the U.S.-led Indo Pacific Economic Framework for Prosperity (IPEF) as the Cabinet notes on the pacts are in an advanced stage of finalisation, official sources said.

The country, however, is not yet ready to join the trade pillar of IPEF as it continues to be uncomfortable with some of its components, such as framing of high-standard rules on digital economy, including cross-border data flows and data localisation, and labour and environment issues, the source added.

"The Cabinet notes on clean economy and fair economy pacts have almost been readied by the Commerce Department as other Ministries and Departments are largely on board on its contents.

"Since India is not set to take on heavy additional obligations by signing the two pacts, the domestic discussions are not complicated," an official told *businessline*.

India was the only country in the 14-member IPEF bloc that had not endorsed the clean economy and fair economy pacts at the Ministerial level meeting in Singapore held in June because of general elections. It had assured other members that it would get domestic clearances after a new government was in place.

Countering China

In a move seen by many as an attempt to counter China's growing influence in the Indo-Pacific region, U.S. President Joe Biden unveiled the IPEF in Tokyo



Taking off: All 14 IPEF members, including India, have signed the supply chains resilience agreement. GETTYIMAGES/ISTOCK

'India hopes to attract investments and concessional financing for clean energy projects'

on May 23, 2022.

The 14 members include the U.S., India, Australia, Brunei, Fiji, Indonesia, Japan, Korea, Malaysia, New Zealand, the Philippines, Singapore, Thailand and Vietnam.

Four pillars

The IPEF framework is structured around the four pillars of trade, supply chains, clean energy and tax and anti-corruption, but there are no provisions on tariff cuts on goods.

All 14 IPEF members, including India, signed the supply chains resilience agreement which entered into force on February 24.

Energy security

The clean economy pact focusses on energy security and transition, climate resilience and adaptation; GHG (greenhouse gas) emissions mitigation; find/develop innovative ways of reducing dependence on fossil fuel energy; promote technical cooperation, workforce development,

capacity building, and research collaborations; and collaborate to facilitate development, access, and deployment of clean energy and climate-friendly technologies.

"India hopes to attract investments and concessional financing for its clean energy projects," the official said.

'More transparency'

The agreement on fair economy intends to create a more transparent and predictable business environment that can spur greater trade and investment in the markets of member countries; enhance efforts to prevent and combat corruption by strengthening anti-corruption frameworks, support efforts to improve tax transparency and exchange of information for tax purposes between competent authorities.

The pillar 1 of IPEF which deals with trade is nowhere near finalisation as the U.S. does not seem to be interested any more in the chapter on digital trade. India had opted out of the negotiations on trade pillar right at the beginning.

(The writer is with *The Hindu businessline*)

Indo Pacific Economic Framework for Prosperity (IPEF)

- India is likely to soon be able to sign the clean economy and fair economy agreements under the U.S.- led Indo Pacific Economic Framework for Prosperity (IPEF).

-



- **The third Indo-Pacific Economic Framework for Prosperity (IPEF) Ministerial Meeting was held in San Francisco, California on 14 November 2023 hosted by the US.**
- **Union Minister for Commerce and Industry, Consumer Affairs, Food and Public Distribution, and Textiles, Shri Piyush Goyal participated in the Ministerial meeting.**
- **IPEF was launched jointly by the USA and other partner countries of the Indo-Pacific region on May 23, 2022 at Tokyo.**
- **IPEF has 14 partner countries including Australia, Brunei, Fiji, India, Indonesia, Japan, Republic of Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand, Vietnam & USA.**
- **It seeks to strengthen economic engagement among partner countries with the goal of advancing growth, peace and prosperity in the region.**

- The framework is structured around four pillars relating to Trade (Pillar I); Supply Chains (Pillar II); Clean Economy (Pillar III); and Fair Economy (Pillar IV).
- India had joined Pillars II to IV of IPEF while it has an observer status in Pillar-I.

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Israeli settlement threatens Palestinian UNESCO village

Agence France-Presse

BATTIR

On a hillside near Palestinian landowner Olayan Olayan's olive groves, young Israeli settlers are hammering out a new, illegal outpost in a UNESCO-protected zone.

Mr. Olayan and his neighbours have long battled attempts to settle the land in Battir, one of the four UNESCO listed heritage sites in the Israeli-occupied West Bank, famed for its ancient stone terraces.

Israeli construction in the West Bank has boomed since the war began in the Gaza Strip, even though all settlements in the territory are considered illegal under international law.

The new outpost on a Battir hilltop, also not approved by Israel, was served an eviction notice



A new Israeli settlers outpost seen from the village of Battir, a UNESCO heritage site in the occupied West Bank, on July 8. AFP

that Mr. Olayan's cousin Ghassan Olayan said has not been enforced because of the Gaza war.

The outpost already has a flagpole, living quarters and a barn for sheep that roam a rocky hill covered by olive trees belonging to Palestinian farmers.

Battir's inhabitants have beaten in court at least three previous Israeli settlement outpost attempts.

But Mr. Ghassan Olayan fears the war on Gaza will make the new, government-approved settlement more likely to become reality.

If that is achieved, Battir and the nearby Palestinian villages would be cut off from Bethlehem and the rest of the West Bank, a process they fear will fragment a future Palestinian state.

Battir – Land of Olives and Vines

- Battir is a **Palestinian** village in the **Bethlehem Governorate** of the **State of Palestine**, in the **West Bank**, 6.4 km west of **Bethlehem**, and southwest of **Jerusalem**.
- Battir has long history that dates back to ancient times.
- Within its area is an **archaeological site** containing the remains of **Beitar**, the last stronghold of the **Bar Kokhba revolt** against the **Roman Empire**.
- The village is particularly known for its ancient **terraces** and an **irrigation** system that dates back to the Roman period.
-

- Due to this, In 2014, Battir was inscribed in the **List of World Heritage Sites** as a **World Heritage Site** in the **State of Palestine**, under the name *Battir – Land of Olives and Vines — Cultural Landscape of Southern Jerusalem*

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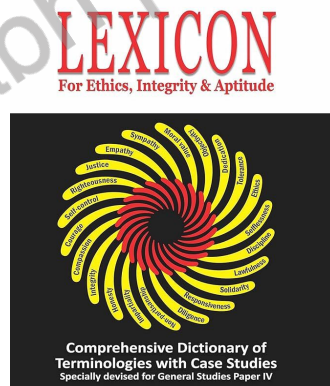
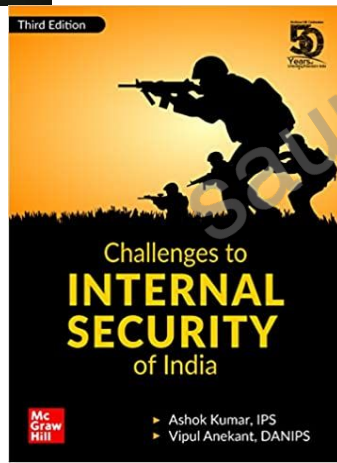
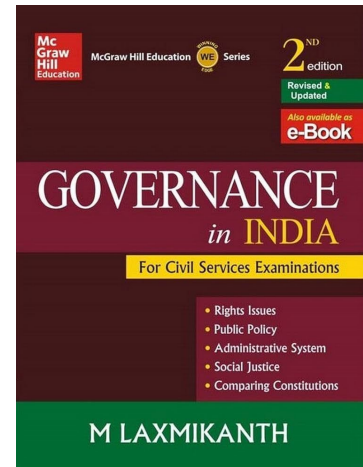
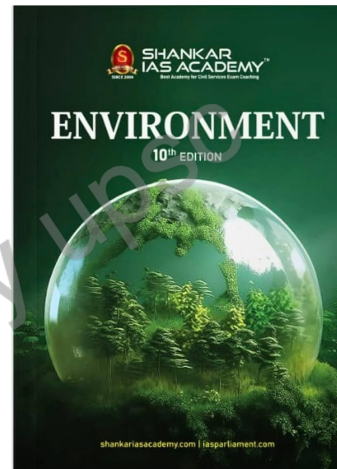
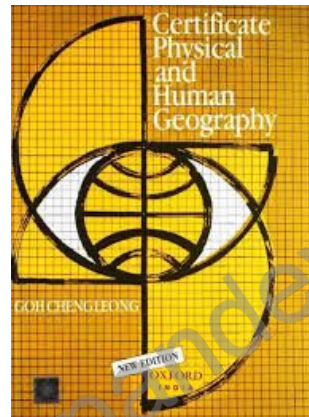
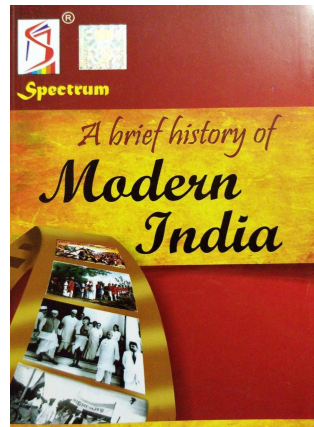
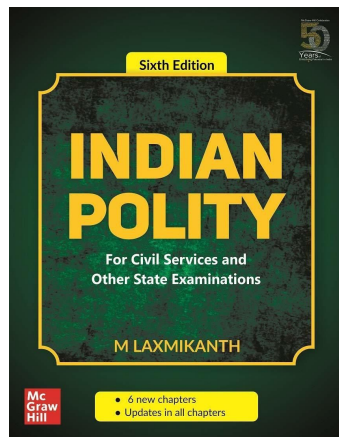
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