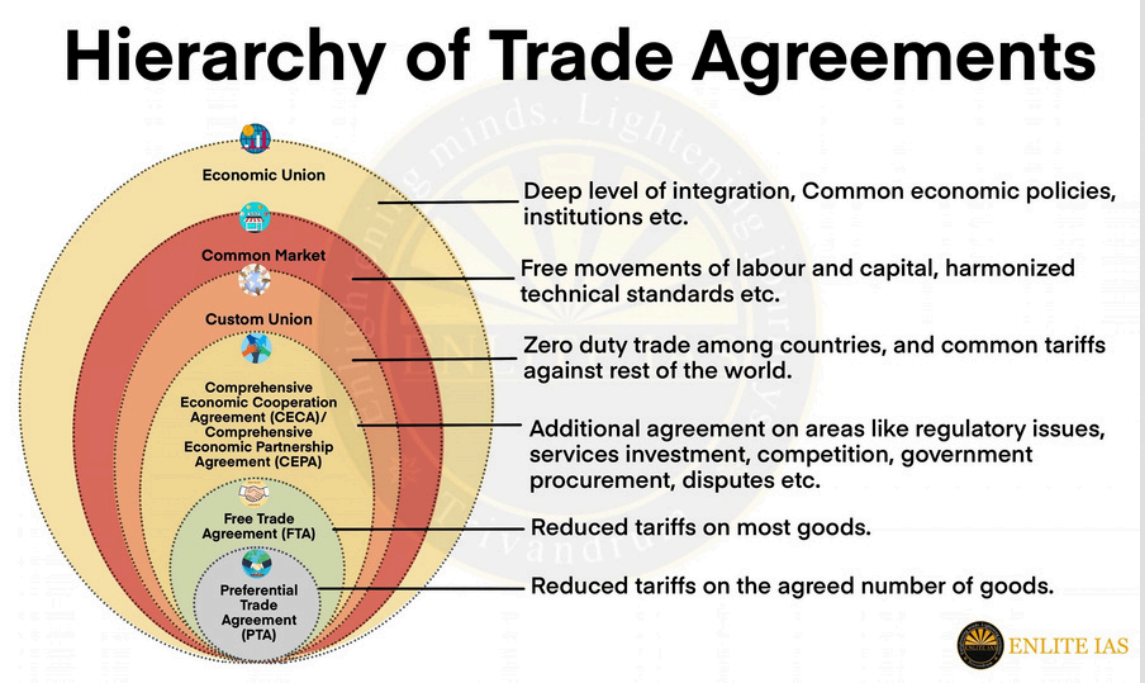
DATE: 12 SEPTEMBER 2026

1 Free Trade Agreement (FTA) (Source: The Hindu)

FTA refers to eliminates tariffs and quotas on most goods and services among members, but each retains its own external tariffs. Examples include NAFTA (now USMCA) and EFTA.

Levels of Economic Integration

- **Preferential Trade Agreement (PTA)**: Countries offer reduced tariffs on select goods to each other while maintaining individual trade policies with outsiders. This is the shallowest form.
- **Free Trade Area (FTA)**
- **Customs Union**: Adds a common external tariff (CET) on non-members to an FTA, harmonizing trade policy toward outsiders. The EU began as one.
- **Common Market**: Extends customs union by allowing free movement of factors like labor and capital across borders.
- **Economic and Monetary Union**: Harmonizes fiscal, monetary policies, and often adopts a single currency, with supranational institutions. The Eurozone exemplifies this.
- **Complete (Political) Union**: Full unification of economic, fiscal, and political policies under a central authority, with synchronized sovereignty.



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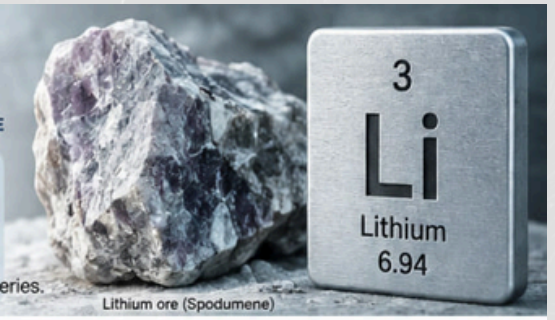
2 Lithium and the Application of Lithium (Source: The Hindu)

LITHIUM

A CRITICAL MINERAL FOR A CLEANER AND SMARTER FUTURE

- **Lithium (Li)** is a soft, silvery-white alkali metal.
- **Atomic number: 3 | Symbol:** Li
- Lightest metal and highly reactive.
- Occurs naturally in mineral deposits, brines and clays.
- Key to **energy transition** due to its use in rechargeable batteries.



Lithium ore (Spodumene)

MAJOR SOURCES

- Occurs in **pegmatite minerals** (e.g., spodunbene, lepidolite, petalite).
- Found in salt-lake brines (e.g., in in arid regions).
- Also present in clay deposits and geothermal brines.
- **Major producers:** Australia, Chile, China, Argentina, USA.
- In **India:** resources in Jammu & Kashmir, Ladakh, Rajasthan and Karnataka (exploration stage).

KEY PROPERTIES

- Soft, silvery-white, low-density metal.
- Highly reactive (stored in oil).
- Excellent electrochemical properties.
- High energy-to-weight ratio.
- Forms stable compounds (e.g., lithium carbonate, lithium hydroxide).
- Used mainly in the form of compounds, not as pure metal.

SIGNIFICANCE

- **Essential for clean energy transition** and decarbonisation.
- Key input for **electric vehicles** (EVs) and **renewable energy storage.**
- Designated as a **Critical Mineral** by many countries including India.
- Strategic importance for **energy security**, technological leadership and economic resilience.
- **Growing global demand** due to EV adoption and grid-scale storage.

APPLICATIONS OF LITHIUM

1. RECHARGEABLE BATTERIES

- Lithium-ion batteries for EVs, smartphones, laptops and portable devices.
- Lithium iron phosphate (LFP), NMC and other chemistries.

2. ENERGY STORAGE SYSTEMS

- Grid-scale storage for renewable energy (solar and wind).
- Helps in balancing intermittent power supply.

3. CERAMICS AND GLASS

- Improves strength, durability and thermal resistance.
- Used in heat-resistant glass, ceramics and cookware.

4. LUBRICATING GREASES

- Lithium-based greases in automobiles, industrial machinery and aerospace.

5. MEDICINE

- Lithium salts used in the treatment of bipolar disorder and other mood disorders.

6. NUCLEAR APPLICATIONS

- Lithium-6 used in nuclear fusion research.
- Also used in tritium breeding in nuclear reactors.

7. ALLOYS AND METALLURGY

- Improves strength and reduces weight of alloys (e.g., aluminium-lithium alloys) used in aerospace.

CHALLENGES

- Geopolitical concentration of resources.
- Environmental concerns from mining and brine extraction.
- Growing demand–supply gap.
- High extraction and processing costs.
- Need for recycling and sustainable supply chains.

WAY FORWARD

- Accelerate domestic exploration and mining.
- Promote efficient extraction and recycling technologies.
- Develop strategic partnerships for secure supply chains.
- Focus on research and innovation for alternative sources (e.g., clay and geothermal brines).
- Ensure environmentally sustainable and socially responsible mining.

LITHIUM TODAY, A SUSTAINABLE TOMORROW

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3 Thirukkural (Source: The Indian Express)

Thirukkural (Tamil: "Sacred Couplets") also called Kural, is a classic Tamil text written by ***Thiruvalluvar.***

Structure

- Thirukkural contains 1,330 couplets (Kurals) arranged into 133 chapters, with 10 couplets in each chapter. It is broadly divided into three sections:
  - **Aram (Virtue)**: Deals with morality, righteous conduct, compassion, self-discipline and domestic as well as ascetic virtues.
  - **Porul (Wealth/Polity)**: Discusses governance, kingship, administration, justice, ministers, diplomacy, warfare, agriculture and social life.
  - **Inbam (Love)**: Deals with love and emotional relationships.