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DAILY CURRENT AFFAIRS DATED 21.04.2026

GS Paper II: Current Affairs

1. India's LPG Supply Model and Strategic Vulnerability

a. Introduction

Liquefied Petroleum Gas, commonly known as LPG, has become one of India's most important household fuels. For millions of families, especially after the expansion of LPG connections under the Pradhan Mantri Ujjwala Yojana, the LPG cylinder is not merely a cooking device. It represents clean energy access, women's dignity, better household health and a visible improvement in everyday living conditions.

However, behind this welfare success lies a serious strategic vulnerability. India consumes much more LPG than it produces domestically. A large part of India's LPG requirement is imported, and most of these imports pass through the Strait of Hormuz, one of the world's most sensitive maritime chokepoints. This means that India's kitchen fuel security is directly connected with global energy markets, West Asian geopolitics and maritime security.

Therefore, the LPG issue is not only about petroleum supply. It is also about household welfare, women's health, strategic reserves, foreign policy, sea-lane security and crisis preparedness.

b. Understanding LPG

Liquefied Petroleum Gas is a fuel mainly made of propane and butane. These gases are converted into liquid form under pressure, which makes them easier to store, transport and distribute through cylinders.

LPG has many uses. It is used in households for cooking, in hotels and restaurants, in small industries, in petrochemicals and, in some countries, as vehicle fuel. In India, however, its most important role is as a household cooking fuel.

This makes the Indian case special. If LPG supply is disrupted, the impact is not limited to factories or commercial users. It can directly affect ordinary families and their daily cooking needs.

In this sense, LPG should not be seen only as a commercial fuel. In India, it is also a social fuel, a welfare fuel and a strategic household fuel.

c. Why LPG is Important for India

LPG has played a major role in India's clean cooking transition. Before the expansion of LPG access, many households depended on traditional fuels such as firewood, dung cakes, coal and crop residue. These fuels produce smoke inside homes and expose women and children to serious health risks.

The importance of LPG can be understood through five major dimensions.

Public Health

Traditional biomass fuels release smoke and harmful particles. These increase the risk of respiratory diseases, eye irritation and other health problems.

LPG reduces indoor air pollution and creates a cleaner cooking environment.

Women's Welfare

In many households, women are mainly responsible for cooking and collecting fuel. Firewood collection is time-consuming, physically tiring and often unsafe.

LPG reduces this burden. It makes cooking faster, cleaner and less exhausting.

Environmental Protection

Traditional dependence on firewood can increase pressure on forests and local ecosystems. LPG can reduce this pressure by providing a cleaner household fuel option.

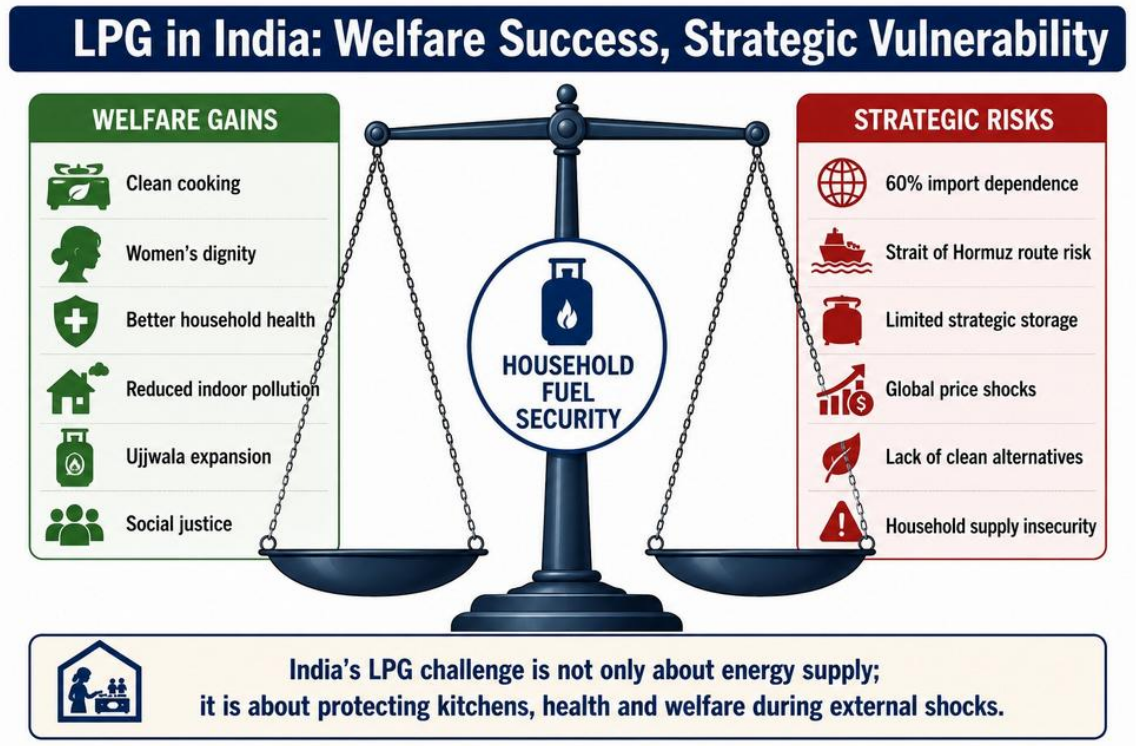
Household Convenience

LPG allows faster cooking and gives families a cleaner kitchen environment. It also reduces the daily uncertainty associated with collecting biomass fuels.

Social Justice

Through schemes like the Pradhan Mantri Ujjwala Yojana, LPG access has reached poorer households that were earlier dependent on polluting fuels.

Thus, LPG is connected with health, gender justice, welfare delivery and inclusive development.



d. India's LPG Supply Model

India's LPG supply model has three main components.

- **Domestic Production:** Some LPG is produced domestically in refineries and natural gas processing units.
- **Imports:** Since domestic production is not enough, India imports a large share of its LPG requirement from global markets.
- **Distribution:** Oil marketing companies distribute LPG to households, commercial establishments and industries through cylinders and related supply networks.

The central weakness in this model is that domestic production is not sufficient to meet national demand. India consumed around 33.15 million tonnes of LPG last year, but domestic production met only about forty per cent of this demand. The remaining sixty per cent had to be imported.

In simple terms, if India needs one hundred units of LPG, it produces only about forty units domestically and imports about sixty units.

This shows that India's LPG system is structurally dependent on external supply. The problem is not a temporary shortage. It is a long-term mismatch between domestic production and national consumption.

e. Why Import Dependence is Risky

Many countries import energy, so import dependence is not automatically a crisis. The risk becomes serious when three factors come together.

- **High Import Share:** India imports around sixty per cent of its LPG requirement. This means domestic production alone cannot protect national demand.
- **Sensitive Maritime Route:** Most of India's LPG imports pass through a geopolitically sensitive sea route. Any conflict or disruption along that route can affect supply.
- **Household-Centric Demand:** LPG in India is mainly used for cooking. Cooking fuel demand cannot be postponed easily.

A factory may reduce production for a few days during a shortage. A household cannot stop cooking.

This is the core reason why India's LPG import dependence has a strong welfare dimension. It is not only an energy security issue; it is also a household survival and welfare issue.

f. LPG as a Household Fuel

In India, LPG is primarily a household cooking fuel — commercial LPG accounts for less than ten per cent of national consumption. This means that imported LPG is not mainly going to flexible industrial users. It is going into domestic kitchens.

This makes LPG demand relatively rigid.

- **Households Need Cooking Fuel Every Day:** Cooking cannot be delayed for long. Families need fuel daily for preparing food.
- **Poor Households Have Fewer Alternatives:** Many poor households do not have access to piped natural gas, electric cooking or other reliable clean substitutes.
- **Disruption Can Push Families Back to Polluting Fuels:** If LPG becomes unavailable or unaffordable, households may return to firewood, dung cakes, coal or crop residue.

Such a reversal would damage the public health, women's welfare and clean cooking gains achieved through Ujjwala.

Therefore, LPG supply disruption is not only an economic problem. It can quickly become a public welfare problem.

g. Strait of Hormuz: The Strategic Chokepoint

The Strait of Hormuz is a narrow sea passage between the Persian Gulf and the Gulf of Oman. It is one of the world's most important energy routes because a large share of global oil and gas trade passes through it.

Around ninety per cent of India's LPG imports normally pass through the Strait of Hormuz. This creates a serious strategic concern.

The route can be affected by:

- **Conflict in West Asia:** Any military tension in the Persian Gulf region can disrupt shipping movement.
- **Shipping Delays:** Tankers may face rerouting, inspection delays or movement restrictions.
- **Higher Insurance Costs:** If the region becomes risky, insurance costs for ships may rise sharply.
- **Sanctions and Diplomatic Tensions:** Geopolitical restrictions can affect energy flows and payment systems.
- **Blockade Threats:** Even the fear of blockade can create uncertainty in global energy markets.

A temporary disturbance in this corridor can raise prices, delay cargoes and create uncertainty in supply. This means that a crisis far away from Indian homes can still affect Indian kitchens.

h. Why India Cannot Easily Shift to Other Suppliers

India cannot assume that it can quickly replace disrupted LPG supplies from other countries. The reason lies in the structure of the global LPG market.

The exportable global LPG pool is limited and already heavily used by major Asian buyers such as China, India, Japan and South Korea. Much of the global supply is tied to household cooking, heating, petrochemicals, autogas and long-term contracts.

During a crisis, replacement supplies may face several problems.

- **Limited Availability:** Other countries may not have enough spare LPG cargoes available at short notice.
- **Higher Prices:** When supply is uncertain, global prices can rise sharply.
- **Longer Shipping Time:** Cargoes from distant suppliers may take longer to reach Indian ports.
- **Increased Freight and Insurance Costs:** Crisis conditions can raise transport and insurance expenses.

Therefore, India cannot depend only on the assumption that the global market will always provide quick replacement LPG cargoes.

Diversification is necessary, but diversification alone cannot fully remove vulnerability. It must be supported by storage, alternative fuels and demand-side resilience.

i. Comparison with Other LPG-Importing Countries

Countries such as Japan, China and South Korea also import LPG. However, India's vulnerability is more socially sensitive because of the household nature of its LPG use.

Japan

Japan imports a large share of LPG, but its household energy system is more diversified. Japanese households also use electricity, city gas and other residential energy sources.

Japan has about 110 days of LPG stock through national and private reserves. This gives Japan a stronger emergency cushion.

China

China imports large volumes of LPG, but a significant part of its LPG demand is linked with the petrochemical sector.

Industrial users can reduce production or shift feedstock more easily than households can reduce cooking demand.

South Korea

South Korea also has a stronger household energy mix, supported by natural gas and electricity. LPG is not the only critical household fuel.

India

India's case is different. Imported LPG goes mainly into domestic kitchens. Many Indian households still do not have reliable alternatives such as piped natural gas or electric cooking.

This makes India's LPG dependence more socially sensitive and strategically important.

j. India's LPG Storage Problem

Storage is the buffer that protects a country during supply disruption. India has operational LPG storage at import terminals, bottling plants, refineries and fractionators — about fifteen days of operational tankage cover.

However, operational storage is different from strategic storage.

Operational Storage

Operational storage supports daily movement, bottling and distribution. It is part of the normal supply chain.

It helps oil companies manage regular supply operations.

Strategic Storage

Strategic storage is different. It is designed to protect the country during a crisis.

It acts like an emergency reserve.

India's visible underground cavern-based deep LPG storage is limited — about 1,40,000 tonnes of such storage, including 60,000 tonnes at Visakhapatnam and 80,000 tonnes at Mangaluru. This equals only about one and a half days of national demand.

This means that India has routine supply-chain storage, but its deep crisis reserve is thin. In a prolonged disruption, such limited reserves would not be enough to protect household supply.

k. Why LPG Storage is Difficult

LPG storage is more complex than storing coal or crude oil. Since LPG is stored under pressure, it requires specialised infrastructure.

- **Specialised Tanks or Caverns:** LPG needs pressure-controlled tanks or underground caverns to remain safe and usable.
- **Pressure-Control Systems:** Since LPG is stored in liquefied form under pressure, pressure management is essential.
- **Strong Safety Mechanisms:** Leakage or mishandling can create fire and explosion risks. Therefore, strict safety systems are necessary.
- **Trained Manpower:** Workers must be trained in handling, monitoring and emergency response.
- **Distribution Linkages:** Storage alone is not enough. Stored LPG must be connected with ports, pipelines, bottling plants and distribution networks.

Without these linkages, stored LPG cannot be moved quickly to households during a crisis.

This makes LPG storage expensive and technically demanding. However, for a country of India's size and dependence, such investment is necessary. Strategic storage should be seen not as a luxury, but as insurance for household energy security.

l. Main Vulnerabilities in India's LPG Model

India's LPG vulnerability can be understood through six major weaknesses.

- **High Import Dependence:** Around sixty per cent of India's LPG requirement is imported.
- **Low Domestic Production:** Domestic output meets only about forty per cent of demand and cannot be increased quickly.
- **Route Concentration:** Most imports pass through the Strait of Hormuz, which is exposed to geopolitical tensions.
- **Household-Centric Demand:** Since LPG is mainly used for cooking, demand is daily and difficult to postpone.
- **Limited Strategic Storage:** India's deep reserve-style LPG storage is small compared to national demand.
- **Lack of Quick Alternatives:** Many households do not yet have access to piped natural gas, reliable electric cooking or other clean substitutes.

Together, these weaknesses create a strategic vulnerability that directly affects household welfare.

m. Why LPG is a Strategic Issue

LPG security affects several dimensions of national governance.

- **Energy Security:** India must ensure reliable and affordable fuel supply for households and the economy.
- **Household Welfare:** Cooking fuel is a daily necessity. Any disruption directly affects family life.
- **Women's Welfare:** If LPG is unavailable, women may be pushed back toward firewood collection, smoke-filled kitchens and physical drudgery.
- **Public Health:** Clean cooking reduces indoor air pollution and protects women and children from smoke-related diseases.
- **Maritime Security:** LPG supply depends heavily on sea lanes, especially the Strait of Hormuz.
- **Foreign Policy:** Stability in West Asia directly affects India's energy supply.
- **Economic Stability:** Supply shocks can raise LPG prices and increase the subsidy burden.
- **Social Stability:** Fuel shortages can create distress among ordinary citizens, especially poor households.

Thus, LPG should be treated as a strategic household fuel, not merely as a petroleum product.

n. Link with Pradhan Mantri Ujjwala Yojana

The Pradhan Mantri Ujjwala Yojana expanded LPG access among poor households. This was an important welfare intervention because it promoted clean cooking, women's dignity, better health and reduced exposure to indoor air pollution.

However, as LPG connections expanded, national LPG demand also increased.

This creates a new policy challenge: welfare expansion must be supported by supply security.

If households receive LPG connections but cannot afford refills or face uncertain supply, they may return to traditional biomass fuels. Such a reversal would weaken the purpose of Ujjwala.

Therefore, LPG policy should not be judged only by the number of connections. It should also be judged by:

- **Regular Refill Use:** A connection is meaningful only if households use it regularly.
- **Affordability:** Poor households must be able to afford refills.
- **Delivery Reliability:** Cylinders must reach households on time.
- **Crisis Resilience:** Supply must remain stable during external shocks.

o. Policy Measures Needed

India needs a layered strategy to reduce LPG vulnerability.

Prioritise Domestic LPG for Household Cooking

Domestically produced LPG should be prioritised for household cooking, especially during tight supply conditions.

Households cannot postpone cooking. Industrial and petrochemical users may have more flexibility to arrange separate feedstock imports or adjust operations.

Separate Household and Industrial Demand

India should clearly distinguish between household, commercial, industrial and petrochemical LPG use.

Household cooking should receive the highest priority because it is directly linked with welfare and daily survival.

Build Deeper Strategic LPG Storage

India needs deeper strategic LPG storage.

At current demand levels:

- **Fourteen days of cover** would require around 1.3 million tonnes of LPG.
- **Twenty-one days of cover** would require around 1.9 million tonnes of LPG.

This would be a major increase from existing deep storage capacity, but it would greatly improve crisis resilience.

Diversify Import Sources

India should increase imports from the United States, Africa, Southeast Asia and other non-Gulf suppliers.

However, diversification alone is not enough because global LPG supplies are limited. It must be combined with storage and alternative clean cooking options.

Promote Electric Cooking

Electric cooking should be promoted in urban and semi-urban areas where electricity supply is reliable.

Induction stoves, electric pressure cookers, improved wiring, affordable appliances and consumer financing can gradually reduce exclusive dependence on LPG.

Expand Piped Natural Gas

Piped natural gas should be expanded in dense urban areas.

PNG is suitable where city gas networks are developed and population density is high. It cannot replace LPG everywhere, especially in rural and remote areas, but it can reduce cylinder demand in cities.

Promote Household-Level Fuel Diversification

A household may use LPG along with an induction stove, piped natural gas along with electric cooking, or LPG along with biogas in suitable rural areas.

The objective is not to replace LPG immediately. The objective is to ensure that families have more than one clean cooking option.

Protect Poor Households During Transition

Poor households must not be forced back to firewood, dung cakes or coal.

Targeted subsidy, affordable refills, priority allocation, reliable delivery and clean alternatives are essential.

p. Challenges in Reforming the LPG Supply Model

Reforming India's LPG model will face several difficulties.

- **High Cost of Strategic Storage:** Strategic LPG storage is expensive. Underground caverns, specialised tanks, pressure systems and safety infrastructure require major investment.
- **Technical Complexity:** LPG is stored under pressure and can be hazardous if mishandled. Therefore, strict safety standards and trained personnel are essential.
- **Limited Domestic Production:** Domestic LPG production cannot be expanded quickly. India's dependence on imports is therefore likely to continue in the near future.
- **Limited Global LPG Market:** The global LPG market is not unlimited. Alternative cargoes may not always be available during a crisis.
- **Constraints in Electric Cooking:** Electric cooking requires reliable electricity, proper household wiring and affordable appliances. These conditions may not exist everywhere.

- **Limits of Piped Natural Gas:** PNG is costly to expand and works best in dense urban areas. It may not be suitable for rural, hilly, remote or sparsely populated regions.
- **Affordability Challenge:** Poor households may have LPG connections but may not purchase regular refills if prices are high.

Therefore, fuel security must include not only physical availability, but also economic access.

q. Way Forward

India should adopt a comprehensive strategy for LPG resilience.

- **Recognise LPG as a Strategic Household Fuel:** India should formally treat LPG not only as a market commodity but as a critical welfare and resilience resource.
- **Create a Protected Household LPG Pool:** Domestic LPG should be prioritised for kitchens. Industrial and petrochemical users should be encouraged to make separate arrangements, especially during tight supply conditions.
- **Build Two to Three Weeks of Strategic LPG Cover:** India should gradually build two to three weeks of strategic LPG cover for household needs. This will require underground caverns, coastal terminals, inland storage, safety systems and strong distribution linkages.
- **Diversify Suppliers and Routes:** India should reduce excessive dependence on the Gulf route by building long-term contracts with suppliers beyond the region. However, diversification must be realistic and supported by storage.
- **Promote Electric Cooking Where Feasible:** Electric cooking should be promoted in areas with reliable electricity. Induction stoves, electric pressure cookers, consumer financing and improved household wiring can help reduce exclusive dependence on LPG.
- **Expand Piped Natural Gas in Urban Areas:** PNG should be expanded in dense urban areas where pipeline infrastructure is economically viable. This can reduce cylinder demand and create a more diversified household energy mix.
- **Encourage Biogas and Local Clean Fuels:** Biogas and other local clean energy options should be promoted in suitable rural contexts. This can support decentralised energy security.
- **Strengthen Ujjwala Through Refill Affordability:** The Ujjwala programme should be strengthened by ensuring affordable refills. A connection is meaningful only when households can regularly use it.
- **Integrate LPG Policy with Clean Energy Transition:** India's household energy future should include LPG, piped natural gas, electric cooking, biogas, solar cooking where feasible and improved energy efficiency. The aim should be clean fuel diversification, not sudden replacement.

Conclusion

India's LPG vulnerability is not a temporary supply problem. It is a structural issue created by high household demand, limited domestic production, import dependence, concentration of imports through the Strait of Hormuz and thin strategic storage.

The answer is not simply to buy more LPG from the global market. India must redesign its household fuel security model. Domestic LPG should be protected for kitchens, industrial demand should be separated where possible, strategic storage should be expanded, imports should be diversified and clean alternatives such as electric cooking, piped natural gas and biogas should be gradually promoted.

The larger lesson is clear: energy security is not only about powering industries. It is also about protecting households, women's welfare, public health and national resilience.

A truly secure energy system is one that keeps both factories and kitchens running, even during external shocks.

GS Paper II: International Relations

2. India–South Korea Economic and Strategic Partnership

a. Introduction

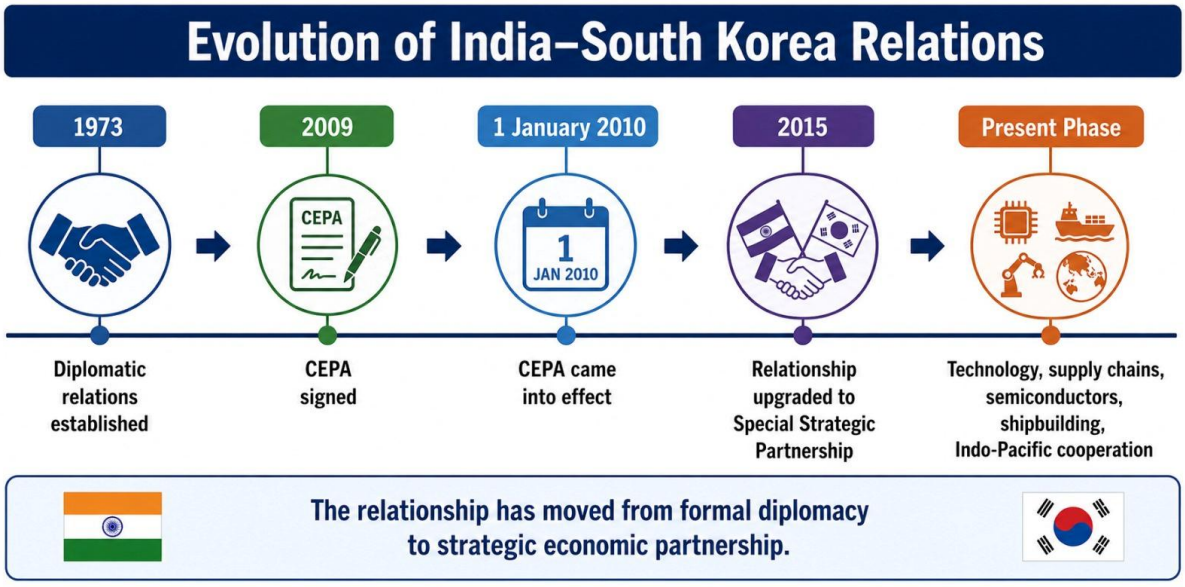
India and South Korea are two important Asian democracies whose partnership has gradually moved beyond ordinary trade. Today, their relationship is increasingly shaped by technology, manufacturing, maritime cooperation, supply-chain resilience and strategic convergence in the Indo-Pacific.

South Korea is a global leader in semiconductors, electronics, automobiles, shipbuilding, batteries and advanced manufacturing. India, on the other hand, offers a large domestic market, a young workforce, digital capabilities, a growing manufacturing base and a strategic location in the Indian Ocean.

This makes the relationship highly complementary. South Korea has advanced technology and industrial expertise, while India has scale, market depth, manpower and strategic geography.

The phrase "from chips to ships" captures this broadening partnership. "Chips" refers to cooperation in semiconductors, electronics, artificial intelligence and digital technologies. "Ships" refers to shipbuilding, maritime logistics, defence production and port-led industrial development.

India–South Korea relations show how modern diplomacy is changing. Bilateral relations are no longer limited to trade and culture. They now include technology security, manufacturing strength, supply-chain resilience and maritime strategy.



b. Background of India–South Korea Relations

India and South Korea established diplomatic relations in 1973. Over time, the relationship expanded from political contact and trade to investment, technology, culture, defence and strategic cooperation.

A major milestone came in 2015, when the relationship was upgraded to a Special Strategic Partnership during Prime Minister Narendra Modi's visit to South Korea. This upgrade reflected the growing importance of defence cooperation, economic partnership, regional coordination and high-level political engagement.

The significance of this upgrade is simple: India and South Korea no longer see each other only as trading partners. They increasingly view each other as long-term strategic partners in Asia.

This change has taken place because both countries are facing a new international environment. Technology competition, China-centric supply chains, maritime tensions, energy transition and geopolitical uncertainty have made reliable partnerships more important.

c. Why South Korea Matters to India

South Korea matters to India because it has strengths in exactly those sectors where India wants to build national capacity.

South Korea is one of the world's major centres of:

- **Semiconductor technology:** Semiconductors are essential for mobile phones, computers, cars, defence systems, satellites, medical devices and artificial intelligence.
- **Electronics manufacturing:** South Korean firms have global strength in consumer electronics, displays, mobile devices and electronic components.
- **Automobiles and electric vehicles:** Companies like Hyundai and Kia already have a major presence in India.
- **Batteries and clean technology:** Battery technology is critical for electric mobility, renewable energy storage and future industrial growth.
- **Shipbuilding and heavy industry:** South Korea is one of the world's leading shipbuilding nations.

For India, Korean cooperation can support Make in India, Digital India, the India Semiconductor Mission, defence indigenisation, Sagarmala, green mobility and the larger goal of becoming a high-value manufacturing economy.

The importance of South Korea can be understood through a simple idea: India wants to move from being only a large consumer market to becoming a serious manufacturing and technology power. South Korea has already achieved this transition. Its firms, experience and technology can help India strengthen its own industrial base.

d. Why India Matters to South Korea

India is equally important for South Korea. Korean firms need large markets, stable investment destinations and alternative production locations in a world marked by supply-chain disruptions and geopolitical uncertainty.

India offers several advantages.

- **Large Consumer Market:** India has a vast and growing consumer base. This is attractive for Korean companies in automobiles, electronics, appliances, smartphones, batteries and digital services.
- **Young Workforce:** India's young population can support manufacturing, services, technology and innovation-led industries.
- **Digital Economy:** India has strong digital public infrastructure, a large startup ecosystem and growing software capabilities.
- **Strategic Location:** India's location in the Indian Ocean gives it importance in maritime trade, logistics and Indo-Pacific strategy.
- **Bridge to the Global South:** For South Korea, India can act as a partner in engaging with developing countries, especially in Asia, Africa and the Indian Ocean region.

Thus, India is not merely a market for Korean cars, phones and electronics. It is also a potential manufacturing base, technology partner and strategic bridge to the Global South.

This is especially relevant as South Korean companies seek to reduce overdependence on limited markets and diversify their supply chains.

e. Comprehensive Economic Partnership Agreement

The Comprehensive Economic Partnership Agreement, commonly called CEPA, is the main trade framework between India and South Korea. It was signed in August 2009 and came into effect on 1 January 2010.

CEPA is broader than an ordinary tariff-reduction agreement. It covers several areas.

- **Trade in Goods:** It reduces or regulates duties on goods traded between the two countries.
- **Trade in Services:** It provides a framework for service-sector cooperation, including professional and business services.
- **Investment:** It supports investment flows between the two economies.
- **Customs Cooperation:** It helps reduce procedural difficulties in trade.
- **Rules of Origin:** These rules decide whether a product genuinely belongs to a country and qualifies for trade benefits.
- **Standards and Intellectual Property:** These are important for technology, manufacturing and quality-driven trade.

However, CEPA is now more than a decade old. Since 2010, the global economy has changed substantially. Trade today is not limited to finished goods. It is increasingly shaped by digital technology, supply chains, semiconductors, batteries, critical minerals, services, investment flows and product standards.

Therefore, both countries have discussed upgrading CEPA. The goal is not only to increase trade volume but also to make the economic relationship more balanced, diversified and future-ready.

f. Meaning of "From Chips to Ships"

The phrase "from chips to ships" is useful because it shows the full range of India–South Korea cooperation.

"Chips" Symbolise High Technology

"Chips" refers to semiconductors, electronics, artificial intelligence, digital platforms and advanced technologies.

These sectors are important because they form the foundation of modern economic and military power.

Semiconductors are used in:

- **Mobile phones:** They power smartphones and communication devices.
- **Automobiles:** Modern cars use chips for braking, navigation, sensors, safety systems and electric mobility.
- **Defence systems:** Missiles, radars, drones, communication systems and surveillance platforms depend on advanced electronics.
- **Space and satellites:** Satellites and space missions require reliable high-performance chips.
- **Artificial intelligence:** AI systems require advanced computing power, which depends on semiconductor capacity.

"Ships" Symbolise Maritime and Industrial Power

"Ships" refers to shipbuilding, ship repair, maritime logistics, naval platforms, port infrastructure and port-led industrial development.

These sectors are important because India is a maritime country with a long coastline, growing trade needs and strategic interests in the Indian Ocean.

Wider Meaning

The phrase shows that the partnership is not narrow. It connects:

- **High technology with heavy industry:** India and South Korea can cooperate in both advanced digital systems and large-scale manufacturing.
- **Digital systems with maritime power:** Semiconductors and AI support modern ships, ports and naval systems.
- **Economic growth with strategic autonomy:** Manufacturing and technology cooperation can reduce excessive dependence on any one country.

g. Major Areas of Cooperation

Trade and Investment

Trade and investment remain the foundation of the relationship. Korean companies such as Hyundai, Kia, Samsung and LG already have a strong presence in India.

Their investments have contributed to employment, manufacturing capacity, technology transfer and consumer market development.

However, the next phase of cooperation should not remain limited to assembly. It should move toward:

- **Component manufacturing:** India should become part of deeper manufacturing chains, not merely final assembly.
- **Research and design:** Korean firms can expand research and product development activities in India.
- **Supplier networks:** Indian small and medium enterprises can be integrated into Korean supply chains.
- **Export-oriented production:** India can become a base for exports to third countries.

Semiconductors and Electronics

Semiconductors are the backbone of the modern economy. A country that depends heavily on imported chips remains vulnerable in defence, telecommunications, automobiles, space technology and digital infrastructure.

South Korea has strong semiconductor capabilities. India is trying to build its own semiconductor ecosystem through:

- **Chip design:** This involves creating the architecture and design of semiconductor chips.
- **Fabrication:** This means actual manufacturing of chips in specialised plants.
- **Assembly, testing and packaging:** This is the process of preparing chips for final use in devices.
- **Skilled manpower development:** India needs trained engineers, technicians and researchers for the semiconductor sector.

Cooperation with South Korea can help India learn from an established semiconductor power. It can also support India's effort to reduce technological dependence and build strategic autonomy.

Artificial Intelligence and Digital Economy

Artificial intelligence and digital technologies are emerging as major areas of cooperation.

India has scale, software talent, digital public infrastructure and a large startup ecosystem. South Korea has advanced industrial technology, electronics expertise and strong research capacity.

Together, the two countries can cooperate in:

- **Smart manufacturing:** AI can improve production quality, automation and factory efficiency.
- **Health technology:** Digital tools can support diagnostics, telemedicine and medical devices.
- **Cybersecurity:** Both countries need secure digital systems for economy and national security.
- **Language technologies:** AI can improve translation, education, communication and cultural exchange.
- **Fintech and robotics:** India's digital finance ecosystem and Korea's robotics expertise can create new opportunities.

This is important because future economic competitiveness will depend not only on physical manufacturing, but also on digital intelligence embedded into manufacturing and services.

Small Enterprises and Startups

Large corporations are important, but broad-based industrial growth requires strong small and medium enterprises.

South Korea's industrial success was built not only by large firms, but also by supplier networks, specialised manufacturing units and technology-driven smaller firms.

India can benefit from Korean experience in:

- **Vendor ecosystems:** Indian firms can become suppliers to larger Korean and global companies.
- **Industrial clusters:** Cluster-based development can improve quality, logistics and competitiveness.
- **Quality-driven manufacturing:** Korean experience can help Indian firms improve standards and productivity.
- **Startup cooperation:** Indian startups and Korean technology firms can collaborate in AI, fintech, mobility, electronics and clean energy.

This is especially important for employment generation because small and medium enterprises absorb large numbers of workers.

Shipbuilding and Maritime Industry

Shipbuilding is one of the most promising areas of India–South Korea cooperation.

South Korea is among the world's leading shipbuilding nations. India has a long coastline, growing maritime trade, expanding port infrastructure and strategic interests in the Indian Ocean.

India can benefit from Korean expertise in:

- **Commercial vessels:** This can support trade, logistics and coastal shipping.
- **Green ships:** Future shipping will require cleaner fuels and lower emissions.
- **LNG carriers:** These are important for energy trade and gas transportation.
- **Ship repair:** India can become a regional ship repair hub.
- **Naval platforms:** Cooperation can support defence manufacturing and maritime security.

For India, shipbuilding has three advantages. It can create employment, support maritime trade and strengthen strategic capacity. It also fits well with Make in India and Sagarmala.

Defence Cooperation

Defence cooperation has significant potential.

India and South Korea can cooperate in:

- **Shipbuilding:** This includes naval vessels, patrol vessels and support ships.
- **Artillery and armoured platforms:** South Korea has experience in advanced land systems.
- **Electronics and surveillance systems:** Modern defence depends heavily on sensors, radars and communication systems.
- **Joint production:** Both countries can explore co-development and manufacturing in India.

For India, this is important because it wants to reduce dependence on defence imports and develop domestic defence manufacturing. For South Korea, India offers a large defence market and an opportunity to deepen strategic presence in the Indo-Pacific.

Defence cooperation also strengthens trust and gives the relationship a long-term strategic character.

Critical Minerals and Clean Energy

Modern technologies require critical minerals such as lithium, cobalt, nickel and rare earth elements. These are essential for batteries, electric vehicles, renewable energy, electronics and defence systems.

India and South Korea can cooperate in:

- **Critical mineral supply chains:** Both countries need secure access to minerals for future industries.

- **Battery recycling:** Recycling can reduce dependence on imported raw materials.
- **Green hydrogen:** This can support clean industry and energy transition.
- **Energy storage:** Battery storage is essential for renewable energy expansion.
- **Electric mobility:** EVs require batteries, electronics, charging systems and software.

This is important because the clean energy transition itself can create new forms of dependence. Countries that secure critical minerals and battery technologies will have greater control over the future economy.

Culture and People-to-People Relations

South Korean culture has gained popularity in India through Korean dramas, K-pop, cinema, food, beauty products and language learning.

This cultural connection improves public goodwill and makes the partnership socially deeper.

India can also promote yoga, Buddhism, films, cuisine, tourism and educational exchanges in South Korea.

Cultural diplomacy may appear soft, but it creates long-term trust and social familiarity between societies.

h. Strategic Importance of the Partnership

India–South Korea relations are important because both countries operate in a changing Indo-Pacific.

The region is marked by the rise of China, maritime competition, technological rivalry and supply-chain uncertainty.

Indo-Pacific Convergence

Both India and South Korea have an interest in a free, open, stable and rules-based Indo-Pacific.

India's Act East Policy and South Korea's regional engagement can complement each other.

Supply-Chain Resilience

The Covid-19 pandemic, wars, trade tensions and technology restrictions have shown that countries cannot depend excessively on one geography or one supplier.

India and South Korea can cooperate in building resilient supply chains in:

- Semiconductors
- Batteries
- Electronics
- Defence components
- Critical minerals

Economic Security

Economic security means protecting access to essential technologies, raw materials, markets and supply chains.

In the twenty-first century, strategic power depends not only on armies and borders. It also depends on chips, ports, data, batteries and manufacturing ecosystems.

Diversification from China-Centric Supply Chains

India–South Korea cooperation can help both countries reduce excessive dependence on China-centric supply chains.

This does not necessarily mean open confrontation. It means practical diversification, resilience and strategic flexibility.

i. Key Challenges in the Relationship

Trade Imbalance

India has often run a trade deficit with South Korea. This means India imports more from South Korea than it exports.

This creates concern in India and makes the CEPA upgrade politically sensitive.

Limited Indian Export Basket

India must expand its exports to South Korea in areas such as:

- Pharmaceuticals
- Information technology services
- Agricultural products
- Textiles
- Engineering goods
- Chemicals
- Auto components
- Digital services

Non-Tariff Barriers

Even when tariffs are reduced, exporters may face strict standards, certification requirements, sanitary rules, language barriers and complex customs procedures.

Indian exporters need institutional support to overcome these barriers.

Slow CEPA Upgrade

Unless concerns related to market access, services, rules of origin and investment are addressed, the trade relationship may remain below potential.

Competition from Other Asian Economies

South Korean firms have invested heavily in countries such as Vietnam and Indonesia.

India must improve logistics, land availability, contract enforcement, policy stability and ease of doing business to attract more Korean investment.

Technology Transfer Concerns

High-end technology cooperation does not happen automatically.

Korean firms may be cautious about sharing sensitive technologies. India must build a strong ecosystem for intellectual property protection, skilled labour, reliable infrastructure and domestic supplier capacity.

j. Significance for India

The India–South Korea partnership can support India in several ways.

- **Strengthening Make in India:** Korean investment can strengthen electronics, automobiles, batteries, shipbuilding and advanced manufacturing.
- **Supporting the India Semiconductor Mission:** South Korean experience can help India build chip design, fabrication, assembly, testing, packaging and skill ecosystems.
- **Improving Maritime Capability:** Shipbuilding and ship repair cooperation can strengthen India's maritime economy and naval capacity.
- **Creating Employment:** Manufacturing, small enterprises, industrial clusters and shipbuilding can generate large-scale employment.
- **Improving Export Competitiveness:** Indian firms can become part of Korean and global supply chains.

- **Supporting Strategic Autonomy:** India can reduce excessive dependence on any one country for technology, components and manufacturing capacity. For India, South Korea is therefore not only a source of investment. It is a partner in the larger project of becoming a technologically capable and strategically resilient power.

k. Way Forward

Upgrade CEPA in a Balanced Manner

The CEPA upgrade should address India's concerns on trade imbalance and market access.

India should seek greater access for:

- Services
- Pharmaceuticals
- Agricultural products
- Textiles
- Engineering goods
- Skilled professionals

At the same time, both sides should address rules of origin, standards and non-tariff barriers.

Build a Deeper Semiconductor Partnership

Korean firms should be encouraged to invest in:

- Chip fabrication
- Assembly, testing and packaging
- Electronics components
- Semiconductor training centres
- Research and design facilities

This will help India move from chip consumption to chip capability.

Develop Dedicated India–Korea Industrial Clusters

Dedicated industrial clusters can be developed in electronics, electric vehicles, batteries, shipbuilding, defence and steel.

Such clusters should provide:

- Land
- Logistics
- Reliable power
- Skilled workers
- Single-window clearances

Deepen Shipbuilding Cooperation

Shipbuilding cooperation should include:

- Technology sharing
- Ship design
- Green shipping
- Naval platforms
- Ship repair facilities
- Maritime skill development

This would support both economic growth and maritime security.

Connect Small and Medium Enterprises

Small and medium enterprises from both countries should be connected through:

- Joint ventures
- Supplier development programmes
- Startup exchanges
- Digital platforms

This will make the partnership employment-generating and not merely corporation-driven.

Help Indian Exporters Overcome Non-Tariff Barriers

India should support exporters through:

- Certification assistance
- Language support
- Product standardisation
- Trade fairs
- Logistics support

This will help Indian firms enter the South Korean market more effectively.

Expand Critical Minerals and Clean Energy Cooperation

Both countries should cooperate in:

- Battery recycling
- Green hydrogen
- Electric mobility
- Renewable energy
- Energy storage

This will prepare both economies for the clean technology future.

Strengthen Cultural Diplomacy

Korean cultural popularity in India should be matched by greater promotion of Indian culture in South Korea.

India can promote:

- Buddhism
- Yoga
- Indian cuisine
- Cinema
- Education
- Tourism

Culture can create public goodwill and deepen the social base of the strategic partnership.

Conclusion

India–South Korea relations have moved beyond conventional trade and investment. The phrase “from chips to ships” reflects a partnership that now covers semiconductors, artificial intelligence, electronics, shipbuilding, defence, critical minerals, clean energy and cultural ties.

For India, South Korea can be a major partner in Make in India, semiconductor self-reliance, maritime capacity, green transition and strategic autonomy. For South Korea, India offers a large market, a manufacturing base, a young workforce and a strategic location in the Indo-Pacific.

The way forward lies in upgrading CEPA in a balanced manner, reducing trade imbalance, improving market access, deepening technology cooperation, attracting Korean investment and building resilient supply chains.

India–South Korea relations show how modern diplomacy is changing. Bilateral relations are no longer only about political friendship or trade figures. They are increasingly about technology, supply chains, manufacturing strength and the ability of nations to protect their economic security in a multipolar world.

Reader's Note — About This Current Affairs Compilation

Dear Aspirant,

This document is part of the PrepAlpine Current Affairs Series — designed to bring clarity, structure, and precision to your daily UPSC learning.

While every effort has been made to balance depth with brevity, please keep the following in mind:

1. Orientation & Purpose

This compilation is curated primarily from the UPSC Mains perspective — with emphasis on conceptual clarity, analytical depth, and interlinkages across GS papers.

However, the PrepAlpine team is simultaneously developing a dedicated Prelims-focused Current Affairs Series, designed for:

- factual coverage
- data recall
- Prelims-style MCQs
- objective pattern analysis

This Prelims Edition will be released separately as a standalone publication.

2. Content Length

Some sections may feel shorter or longer depending on topic relevance and news density.
To fit your personal preference, you may freely resize or summarize sections using any LLM tool (ChatGPT, Gemini, Claude, etc.) at your convenience.

3. Format Flexibility

The formatting combines:

- paragraphs
- lists
- tables
- visual cues

—all optimised for retention.

If you prefer a specific style (lists → paras, paras → tables, etc.), feel free to convert using any free LLM.

4. Monthly Current Affairs Release

The complete Monthly Current Affairs Module will be released soon, optimized to a compact 100–150 pages — comprehensive yet concise, exam-ready, and revision-efficient.