Proposal for Joint Actions

JAPAN - INDIA ECONOMIC SECURITY COOPERATION

August 2025

Contents

Foreword

The joint study *"Japan–India Economic Security Cooperation,"* prepared by JETRO, CII and JCCII comes at a critical juncture in the evolving global economic order. Economic security has become central to national strategies, requiring nations to safeguard supply chains, protect emerging technologies, and build resilience against global disruptions.

The study highlights that Japan and India are strategically complementary partners. Japan brings advanced technology, quality manufacturing, and expertise in sustainable industries, while India offers scale, talent, and a rapidly growing industrial base. By aligning these strengths, the two countries can secure critical sectors such as semiconductors, clean energy, pharmaceuticals, and batteries and establish resilient frameworks for long-term prosperity.

The report also underscores opportunities in emerging areas like AI, healthcare, and green technologies, where joint R&D and exchanges among government, industry, and academia can drive transformative innovation. Practical pathways include addressing non-tariff barriers, facilitating human exchanges and deepening institutional dialogue between the two countries.

From JETRO's perspective, Economic security is not only about mitigating risks but also about creating opportunities and fostering sustainable growth. Japan's investments in India in infrastructure, advanced manufacturing, and clean technologies align with India's vision for self-reliance and global integration. Together, Japan and India can strengthen bilateral resilience and contribute to a more stable Indo-Pacific.

This collaborative report itself reflects the spirit needed for economic security. JETRO reaffirms its commitment to working with Indian stakeholders to translate these recommendations into action, building a partnership defined by trust, innovation, and shared prosperity.

Mr. Takafumi Suzuki
Executive Vice-President, Japan External Trade Organization (JETRO)

Foreword

Economic security has become a critical dimension of international relations in the current global landscape. For India and Japan, two major Asian economies and strategic partners, strengthening economic security is a shared priority. Both countries face vulnerabilities from overdependence on limited partners for trade, technology, and supply chains. At the same time, both countries possess strong complementarities in economic structures, technological strengths, and development goals, creating a foundation for deeper cooperation.

The Confederation of Indian Industry is pleased to present the report Japan–India Economic Security Cooperation, developed with the Japan External Trade Organization (JETRO) and the Japan Chamber of Commerce and Industry in India (JCCII). The study explores strategic complementarities and shared vulnerabilities, especially those linked to concentrated dependencies in trade and technology.

The report highlights how single source dependencies can create supply-chain risks and strategic exposure, with wider implications for national security and economic stability. It emphasizes the need to secure supply chains, protect critical and emerging technologies, and foster skilled human resource exchange. Recommendations focus on enabling trade and investment, promoting innovation, and advancing sustainable development in line with the vision of a free, open, and resilient Indo-Pacific.

CII believes that India–Japan Economic Security cooperation is both timely and essential. By acting on the insights of this study through policy measures and industry partnerships, the two countries can reduce risks, diversify value chains, and build a more resilient regional economic order. We extend our appreciation to JETRO, JCCII, and all contributors who enriched this report, and look forward to continued collaboration in shaping a secure and sustainable future.

Mr Chandrajit Banerjee
Director General, Confederation of Indian Industry (CII)

Foreword

The joint study “Japan–India Economic Security Cooperation”, undertaken by JETRO, CII and JJCCII, represents an important step in advancing the bilateral economic agenda. By integrating insights from government, industry, and policy research, the report provides a comprehensive assessment of complementarities, vulnerabilities, and opportunities that define the evolving economic security landscape for India and Japan.

The report identifies priority areas where Japanese industry can expand its presence in India, including semiconductors, pharmaceuticals, batteries, and renewable energy components. Leveraging India’s scale, cost competitiveness, and growing innovation ecosystem, such collaborations can reduce overdependence on concentrated sources while strengthening supply reliability across the Indo-Pacific. In frontier sectors such as generative AI, advanced healthcare, and clean technologies, industry–academia–research partnerships can deliver transformative innovation and globally competitive solutions.

Jointly developed by JETRO, JCCII, and CII, this study demonstrates the collective resolve of government and industry to enhance bilateral economic security. For Japanese industry in India, it provides a practical roadmap for strengthening supply chains, fostering innovation, and advancing sustainable growth. JCCII remains committed to working closely with stakeholders in both countries to translate these recommendations into concrete action. By deepening strategic cooperation, India and Japan can not only secure their economic interests but also contribute meaningfully to regional resilience and global prosperity.

Mr. Setsuya YOSHINO
President of the Japan Chamber of Commerce and Industry in India （JCCII）

Background

- Economic security refers to a government's efforts or a state power to mitigate risks both traditional and emerging that threaten the stability, resilience, and competitiveness of its economy and the livelihoods of its citizens. While traditionally focused on protecting sensitive technologies and securing supply chains from foreign adversaries, the concept has expanded to encompass a wide range of market failures, externalities, and systemic vulnerabilities, including those posed by COVID-19, Russia-Ukraine war, US-China technological competition, climate change led protection and policies, and insufficient domestic production capabilities.
- India and Japan, as natural partners with shared democratic values, strong economies, and a common vision for a free and open Indo-Pacific, are deepening cooperation to secure resources, technologies, and resilient supply chains.

Objective of the Study

- The study aims to examine India–Japan economic security relations with a focus on their strategic complementarities and shared vulnerabilities arising from economic dependence on certain countries, particularly in trade and technology.
- The objective is to identify priority sectors for collaboration and further assess opportunities, challenges, and policy pathways for enhancing bilateral cooperation, securing supply chains, protecting critical and emerging technologies, fostering skilled human resource exchange, and promoting sustainable development.

India-Japan Economic Security Narrative

- India and Japan stand in a strategically complementary relationship in the realm of economic security.
- In response to the global supply chain issues, there lies a significant opportunity for Japan to increase the production of strategic goods, such as semiconductors, solar panels, batteries, and pharmaceuticals in India by leveraging India's scale advantages. This relocation could reduce vulnerabilities for both Japan and India and lead to stronger economic security of both countries.
- Moreover, in frontier domains such as generative AI, renewable energy, and healthcare, there is considerable potential for deepening innovation partnerships.

By collaborating with India's industry, academia and research institutions, both nations can jointly advance large-scale demonstrations, develop cost-competitive mass production models, and drive transformative R&D efforts.

- To realize this vision, it is imperative that public and private stakeholders in both countries align their investment plans and strategies, coordinate policy responses, and execute a coherent Joint Action framework.

- One of the potential areas of the forward-looking strategic partnership is to support joint business projects in India, which contribute to strengthening economic security of both Japan and India. For this sake, both governments are encouraged to consider strengthening governmental measures to make the projects financially viable and competitive. Possible sectors for such projects include infrastructure development in various areas such as logistics and energy. Promoting these economic security related projects will help Japan and India enhance their strategic autonomy.

Vulnerability Analysis

- This study conducted a matrix-based analysis of India and Japan's import dependence on certain countries using trade statistics, the Herfindahl–Hirschman Index (HHI), and the Product Complexity Index (PCI). The analysis identified several highly vulnerable products for both India and Japan (high HHI & high PCI, defined as Category A). Notably, many of these products, such as lithium-ion batteries, solar panels, flat-panel displays, and antibiotics, are areas where Japan once led globally and where some Japanese firms still retain related technologies and manufacturing capabilities. This indicates that by collaborating and relocating the production of these products to India, Japan and India can harness India's scale advantages to rebuild and expand production capacity, thereby reducing their import dependence.

- In contrast, mineral resources such as rare earths and critical minerals are concentrated in certain countries for geological reasons. While these items may not score high on the PCI scale, their geological constraints make supply chain diversification extremely challenging. In these sectors, it is imperative to strengthen global collaboration, not only between Japan and India but also with resource-rich countries across the Global South, to advance supply chain diversification.

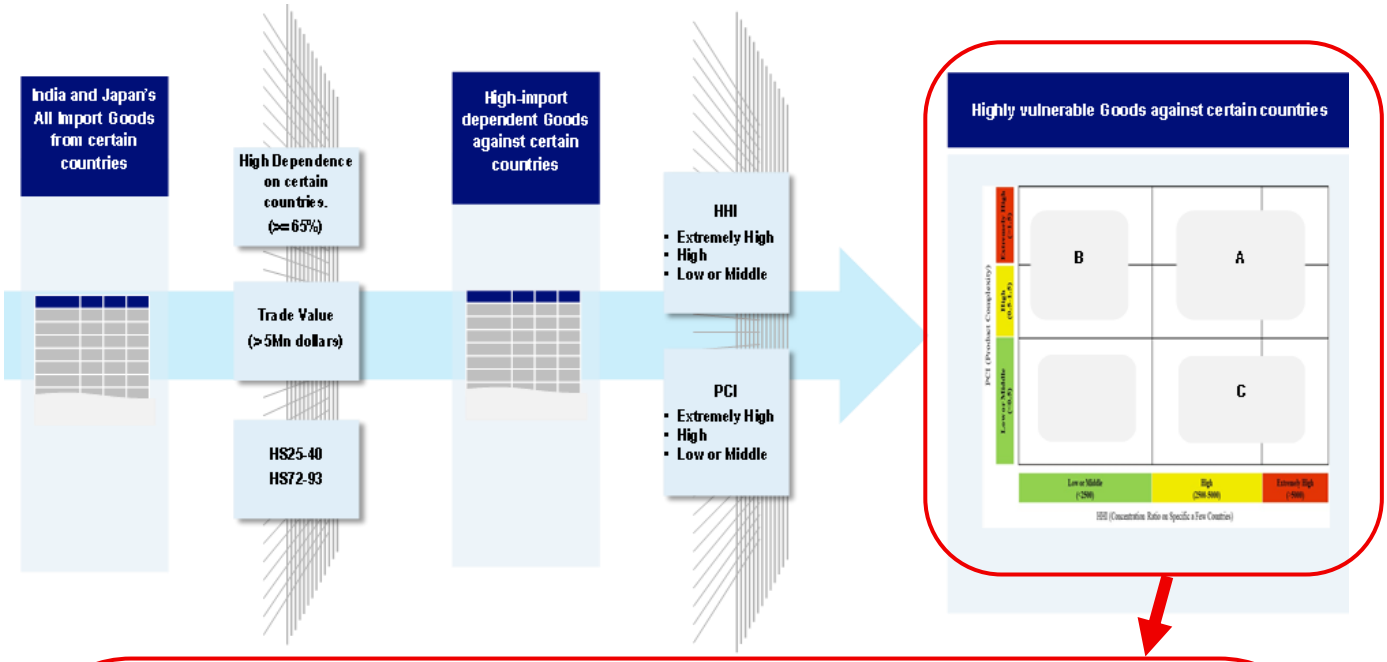
Research Methodology – Vulnerability Analysis Index

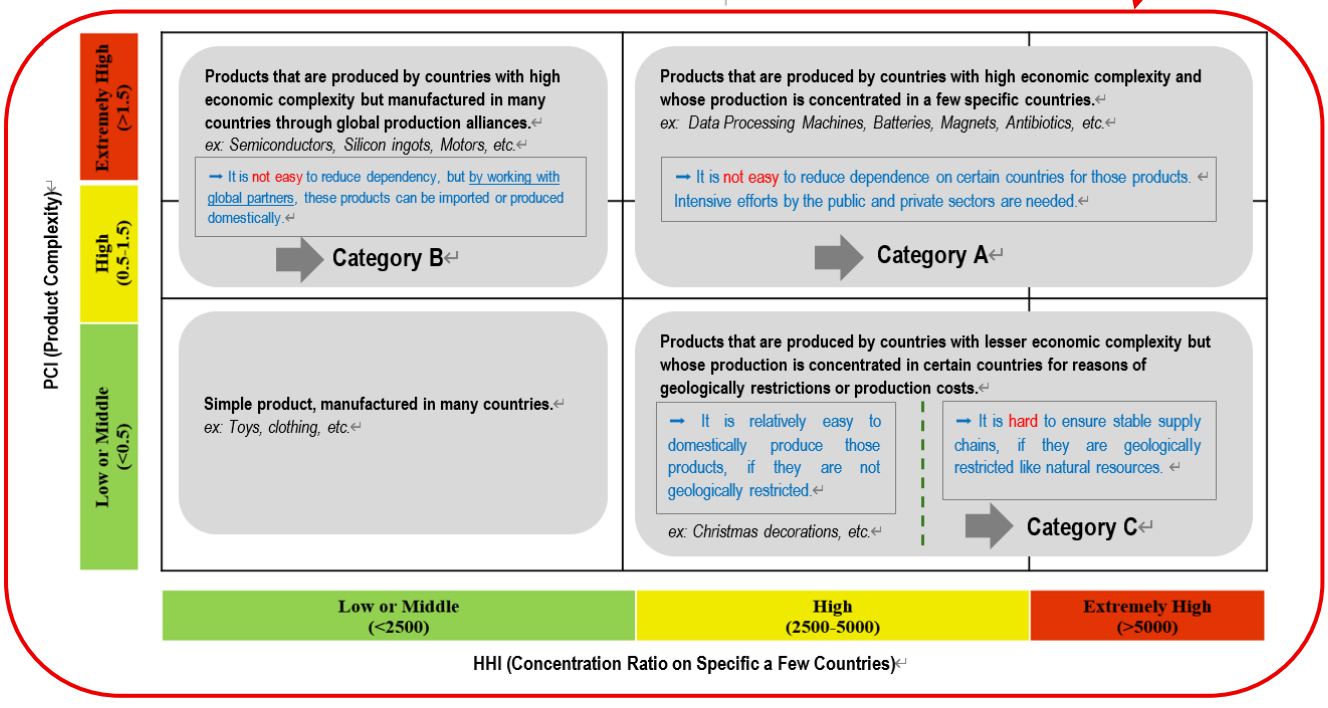
INDICATORS USED

- **Import Dependency**
  Percentage share of imports from source countries for each product
- **Herfindahl-Hirschman Index (HHI)**
  An index of market concentration to assess supply-side risks
- **Product Complexity Index (PCI)**
  A measure of how many countries can produce a product and their respective 'economic complexity'

CATEGORIZATION OF PRODUCTS

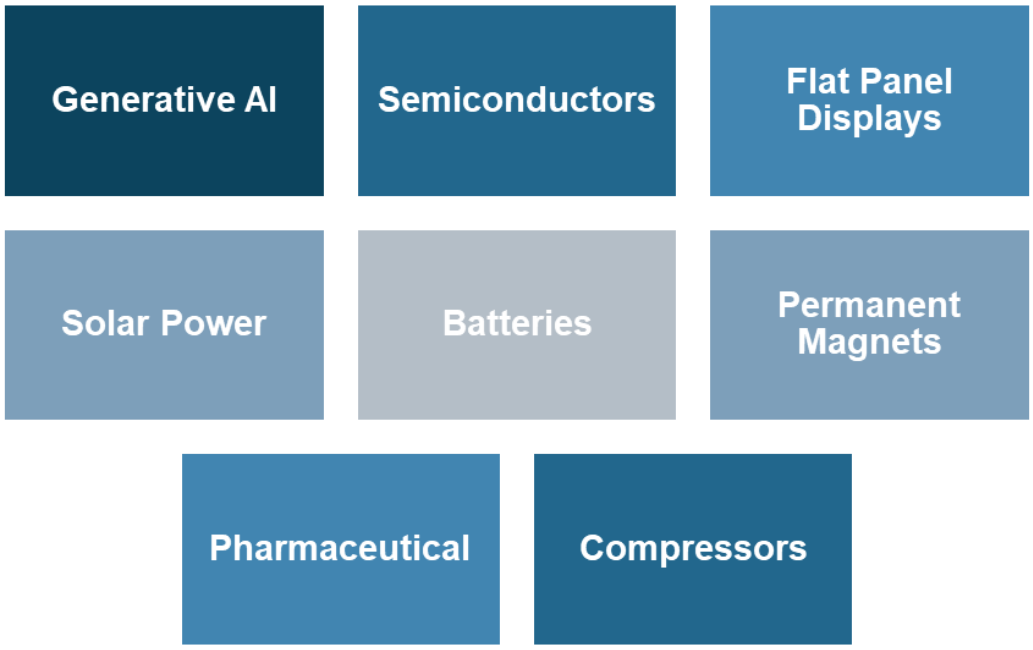
- **Highly Vulnerable Products**
- **Economic Complexity but Geographically Dispersed**
- **Geologically Restricted** *like natural resources*





Priority Products and Technologies

Based on the study, the following **8 priorities within 4 sectors (1 Digital and EE (Electrical and Electronic), 2 Energy and Critical Mineral Resources, 3 Bio-Healthcare, 4 Industrial Base Technologies) are considered as potential areas for Japan-India cooperation on Economic Security**. It is essential for public and private stakeholders in both countries to share strategies and implement projects.



Generative AI

Japan has been advancing generative AI technology through Ministry of Economy, Trade and Industry (METI)'s Generative Artificial Intelligence Accelerator Challenge (GENIAC) program, achieving world class capabilities in local language LLMs (full scratch) and domain-specific foundation models. Similarly, India is promoting sovereign AI development by supporting companies like SarvamAI under IndiaAI Mission. By fostering knowledge exchange between leading companies under GENIAC and IndiaAI, Japan and India could emerge as global leaders in generative AI. Japan's ABCI 2.0 developed by AIST could provide computing resources for joint India-Japan AI development projects under the GENIAC and IndiaAI collaboration.

Semiconductors

In India, conglomerates such as Tata and CG Power are planning to establish semiconductor front-end and back-end manufacturing facilities. Japanese materials and equipment makers are showing growing interest in entering the Indian market. Collaboration between Indian and Japanese firms is expected to support the creation of India's first full-fledged semiconductor manufacturing ecosystem. Japan possesses

extensive experience in securing reliable infrastructure. There is significant potential for collaboration with Indian government in enhancing infrastructure resilience. In terms of human resources, there is strong potential for collaboration, particularly in leveraging India's abundant semiconductor design talent that contributing 20% of global semiconductor design by Japanese companies.

Flat Panel Displays

Indian companies are already assembling LCD panels in India, but they rely on imports for most of their components. There is potential to reduce dependence on certain counties by transferring Japanese LCD panel manufacturing capability to India and manufacturing key components in the front-end and back-end processes domestically. The possibility of local production of OLEDs should also be considered in the future.

Solar Power

The Indian PV total supply chain is not completed due to critical gaps in both upstream and downstream segments, such as silicon ingots/ polysilicon and solar inverters. These gaps need to be effectively addressed and if the supply chain is fully developed, Indian PV industry could not only satisfy domestic demand but also emerge as a competitive exporter to global markets.

Batteries

India and Japan hold significant potential for collaboration across the entire value chain. In the mining sector, the two nations should work together to develop both domestic and overseas projects to ensure a stable supply of critical resources. In the manufacturing of battery cells and materials, combining India's scale advantages with Japan's advanced technological expertise could enable the establishment of a robust and resilient supply chain in downstream applications such as electric vehicles (EVs), India and Japan should jointly explore and cultivate new markets, aligning their industrial strategies to drive sustainable growth and innovation.

Permanent Magnets:

Magnets play an indispensable role in promoting the energy transition toward achieving carbon neutrality. Global demand for magnets is expected to increase significantly over the next few years. However, the magnet supply chain (including upstream sectors) faces a major bottleneck asJapan and India are overly dependent on certain countries and it would be extremely important to reduce such excessive dependence and foster a more diverse and resilient supply chain.

Pharmaceutical:

India and Japan heavily depend on imports from a certain country for some of Key Starring Materials (KSMs), drug intermediates, and Active Pharmaceutical Ingredients (APIs). Indian companies have the capability to scale up production, whereas Japanese companies bring advanced technologies such as expertise in fermentation processes.

Compressors:

Demand for compressors in India is growing while Japanese companies plan to expand their compressor production capacity in India over the coming years, with the goal of significantly increasing localization rates. They are also planning to manufacture key components domestically in India; however, since India's supporting industries for such components are still underdeveloped, it will be necessary in the short term to import the required materials from overseas. In this regard, it is essential to ensure that non-tariff measures, such as Quality Control Orders (QCO) (which is currently facing many operational challenges) do not hinder the smooth import of necessary materials. A step-by-step approach is therefore essential while the initial stage will inevitably rely on imported raw and semi-finished materials, the long-term goal is to further increase localization, including the procurement of raw materials within India.

Strategic Sectors and Key Recommendations

Digital and Electrical & Electronic

- India and Japan should **strengthen cooperation to develop Artificial General Intelligence** (AGI) across all layers—software, hardware, and infrastructure.
- To reduce external dependence, **India and Japan must co-develop EE products and components** such as semiconductors, smartphones, inverters, and batteries.
- India and Japan can **extend their collaboration by offering secure and inclusive digital infrastructure to the Global South**.
- While **India emphasizes data localization and sovereignty, and Japan supports Data Free Flow with Trust** (DFFT), **both nations must bridge this policy gap** to enable smoother AI cooperation.
- **A strong cybersecurity framework is essential to protect joint digital and AI infrastructure**.
- **Deepening Semiconductor and AI Hardware Collaboration.**
- **Additive manufacturing is a high-potential area for India-Japan collaboration in strategic sectors** like aerospace, automotive, defense, and healthcare.
- **Blockchain-based solutions offer a new frontier** in India-Japan cooperation.

Energy and Critical Mineral Resources

- **Joint investment in solar gigafactories by major Indian conglomerates and Japanese firms** will reduce strategic vulnerabilities.
- Japan and India should **co-invest in battery gigafactories with an emphasis on local production and building a reliable supply chain** of critical components.
- **Collaborative Development and Export of Green Hydrogen and Derivatives**
- India and Japan should **jointly invest in refining facilities for minerals such as lithium and rare earths,** not only within India but also through third-country partnerships in resource-rich regions like Africa.
- **Upgrading Grid and Transmission Infrastructure** while Japan can support India's move towards programmatic deployment of High Voltage Direct Current (HVDC) systems and smart grid technologies.
- Both governments must **actively facilitate private sector participation in clean energy, grid infrastructure, and mineral supply chains**.

Bio-Healthcare

- Both governments should **work towards harmonizing drug approval processes, allowing Indian generics to enter the Japanese market more efficiently**.
- Japan can be **encouraged to invest in India's pharma production capabilities.**
- **Establishing a secure and diversified supply chain for pharmaceuticals and medical raw materials** to reduce dependence on certain countries.
- Indian and Japanese firms should **co-invest in drug development, particularly for lifestyle diseases.**
- **Japan can invest in India's medical device industry** under the Make in India initiative and **Strengthen collaboration in AI-powered diagnostics, robotic surgeries, and healthcare automation**.
- **Facilitating Japanese patients to access affordable, world-class treatment in Indian hospitals**.
- Japan can **support the expansion of healthcare infrastructure in India**, particularly in rural and semi-urban areas.
- **Establishing medical training programs where Indian healthcare professionals can learn advanced medical techniques in Japan.**

Industrial Base Technologies

- **Strengthening Collaboration in Machine Tools and Inspection Equipment**.
- **Localizing Critical Component Manufacturing**: Compressors and Motors.
- **Collaborating in Defence and Electronics Base Technologies.** India is ramping up its Defence manufacturing and electronics system design and manufacturing sectors and Japan's industrial base technologies can significantly contribute to India's goals in these sectors.
- India and Japan **need diversification of engineering goods trade and rare earth dependencies**. Collaborating with Japan, one of the few nations actively pursuing rare earth diversification strategies, can help India secure alternative sourcing, invest in extraction and processing technologies, and jointly explore resource-rich third countries for strategic mineral cooperation.

Horizontal Challenges

- Technological Threats: There is also a growing technological dominance in multiple technological domains such as generative AI, quantum computing, biotech, drone and genome editing.
- Despite the deepening strategic ties between India and Japan, several structural and regulatory challenges continue to constrain trade and investment cooperation. High and frequently revised tariffs in key sectors like electronics and automobiles, coupled with expanding technical regulations (such as QCO/ Omnibus Technical Regulation) and non-transparent non-tariff measures, create uncertainty for Japanese investors.
- Technology transfer remains a friction point in joint ventures, with Japanese firms hesitant to share proprietary know how due to IP concerns, while Indian partners expect access in return for market entry and scale. Japan's export controls on dual-use technologies sometimes become issues in high-tech collaboration in sectors critical to India's industrial goals.
- Additionally, language barriers and divergent business cultures hamper coordination at the operational level.

Conclusion and Way Forward

India - Japan economic engagement is at a pivotal moment, shaped by converging geopolitical interests, complementary strengths, and shared priorities in advanced manufacturing, clean energy, critical technologies, and skilled human resource development. While significant progress has been made through bilateral agreements, targeted investments, and collaborative initiatives, structural barriers, regulatory misalignments, and underutilized opportunities still constrain the full potential of the partnership.

Japanese investments, with their emphasis on quality, localization, and capacity building, align well with India's goals of self-reliance and integration into global value chains. However, unlocking greater trade, technology transfer, and innovation collaboration requires deeper institutional linkages, robust IP protection, infrastructure upgrades, and a more favorable business climate. Skill development, research cooperation, and startup linkages remain underleveraged avenues that can strengthen both countries' global competitiveness and strategic resilience in the Indo-Pacific.

Way Forward

1. **Deepen Strategic Industrial & Technology Collaboration** – Prioritize joint ventures, production transfers, and supply chain resilience in 8 high-potential sectors (e.g., semiconductors, renewable energy, healthcare). Explore new frontiers like deep-sea mining of critical minerals.
2. **Enhance Investment**– Japan's expertise can support India's priorities in transport, smart cities, and green manufacturing. Focus should be placed on encouraging Japanese FDI in sustainable sectors aligned with "Make in India" and decarbonization goals.
3. **Align Policies & Frameworks** – Review and modernize CEPA, harmonize regulatory standards, and improve verification and transparency to boost high-value, advanced technology trade. Also, it is necessary to remove NTBs such as QCO and OTR in order to facilitate Japan-India business cooperation.
4. **Institutionalize Dialogue Mechanisms** – Create joint government–industry–academia platforms for ongoing coordination, problem-solving, and trust building, supported by regular roundtables and sector-specific forums.
5. **Boost Japanese Global Capability Centres (GCC) Presence in India** – Japanese companies have been slow to capitalize on India's engineering talent and cost-effective innovation infrastructure. There is a need to promote awareness, fast-track clearances, and develop innovation clusters to attract Japanese firms to India's GCC ecosystem.
6. **Accelerate Collaborative R&D & Talent Utilization** – Fund joint research in Critical and Emerging Technologies (CET) sectors, facilitate researcher mobility, ease visa processes, and establish co-location models for Indian and Japanese scientists.
7. **Leverage India's Market for Scaling Japanese Tech** – Launch pilot-to-production programs for Japanese innovations in India, de-risked through PLI and public R&D funding.
8. **Strengthen Startup Collaboration** – Establish Indo-Japan innovation hubs, soft-landing programs, and a Startup Exchange Platform to enhance cross-border co-creation.

9. **Intellectual Property** – Both Indian and Japanese government need to take practical steps to enhance bilateral IP evaluation mechanisms to mitigate risks during technology transfers and be more facilitative.

10. **Expand Skill Development & Mobility** – Align Indian skilling initiatives with Japanese industry needs, scale Technical Intern Trainee Program (TITP) and Specified Skilled Worker (SSW) programs, integrate Japanese language training, and develop joint skill hubs.

11. **Deepen Education & Research Linkages –** Strengthen India Japan Education Program (IJEP) and National Education Policy (NEP) 2020 collaborations, expand industry-academia partnerships, and create joint vocational and technical training programs.