

5. Pax Silica Initiative–International Relation

India has been excluded from the US-led Pax Silica initiative, a new US critical mineral diversification plan

Pax Silica– Strategic Overview

Pax Silica is a United States–led strategic initiative aimed at creating a secure, resilient, and trusted silicon-centric technology supply chain. The initiative responds to growing geoeconomics fragmentation, supply chain weaponization, and strategic competition in advanced technologies, particularly artificial intelligence (AI), semiconductors, and quantum systems. The name “Pax Silica” symbolically mirrors earlier global orders (e.g., Pax Britannica, Pax Americana), signalling an attempt to shape technological order and norms around silicon-based innovation.

Inaugural Pax Silica Summit– Strategic Partners– The first Pax Silica Summit brought together key US allies and technology powerhouses

1. Japan
2. Republic of Korea
3. Singapore
4. The Netherlands
5. The United Kingdom
6. Israel
7. United Arab Emirates
8. Australia

Collectively, these countries host

1. Advanced semiconductor fabrication and equipment firms.
2. Leading AI software, chip design, and cloud-computing companies.
3. Deep capital markets and sovereign investors funding next-generation technologies.

Strategic Objectives of Pax Silica

Reducing Coercive Dependencies– Minimise over-reliance on

1. Single-country dominance in critical minerals.
2. Concentrated semiconductor manufacturing nodes.

Protect supply chains from

1. Export controls
2. Sanctions
3. Political coercion

Securing AI-Foundational Materials and Capabilities– Focus on safeguarding

1. Silicon and compound semiconductors.
2. Rare earth elements and advanced metals.
3. Chip design software (EDA tools).
4. Advanced manufacturing equipment (lithography, deposition, etching).

Trusted Technology Collaboration– Promote “friend-shoring” and “ally-shoring” of strategic industries. Enable aligned nations to

1. Co-invest in fabrication facilities.
2. Share standards and best practices.
3. Accelerate deployment of AI and digital infrastructure.

Strategic Technology Stacks– Cooperation extends beyond hardware to

1. Software applications.
2. AI platforms and cloud ecosystems.

3. Cyber-secure digital infrastructure.

Reflects a full-stack approach to technological sovereignty.

Critical Minerals

Critical minerals are natural resources that

1. Are essential for modern technologies.
2. Have high economic importance.
3. Face high risk of supply disruption.

Vulnerability arises due to

1. Geographic concentration of extraction.
2. Limited refining and processing capacity.
3. Export controls and geopolitical tensions.

Strategic Importance of Critical Minerals– Critical minerals underpin

1. Semiconductors and AI hardware.
2. Renewable energy technologies.
3. Electric vehicles and batteries.
4. Defence, aerospace, and space systems.

Disruptions can

1. Halt industrial production.
2. Inflate costs.
3. Undermine national security and digital sovereignty.

India's Critical Minerals List– India has identified 30 minerals as critical, reflecting its

1. Energy transition goals.
2. Manufacturing ambitions.
3. Strategic autonomy concerns.

Key Categories and Examples

Semiconductor & Electronics–Grade Minerals

1. Silicon
2. Gallium
3. Germanium
4. Indium
5. Tin
6. Selenium
7. Cadmium

Battery & Energy Transition Minerals

1. Lithium
2. Cobalt
3. Nickel
4. Graphite
5. Vanadium

Aerospace, Defence & High-Temperature Alloys

1. Titanium
2. Tungsten
3. Rhenium
4. Hafnium
5. Niobium

6. Tantalum

Rare Earths & Strategic Materials

1. Rare Earth Elements (REE)
2. Platinum Group Elements (PGE)
3. Zirconium
4. Strontium

Agricultural & Industrial Inputs

1. Phosphorous
2. Potash

Critical Minerals Are Strategically Sensitive- Many of these minerals

1. Are not abundantly available in India.
2. Require complex and capital-intensive processing.

Global supply chains are often dominated by a few countries, creating

1. Pricing power.
2. Political leverage.

Processing is more concentrated than mining, making downstream vulnerability higher.

Pax Silica and the Global AI Supply Chain- AI systems rely on

1. Advanced chips.
2. High-purity silicon wafers.
3. Specialised metals and rare earths.

Pax Silica seeks to

1. Secure upstream minerals.
2. Protect mid-stream fabrication.
3. Strengthen downstream AI deployment.

This reflects a shift from market-driven globalisation to security-driven techno-globalism.

Geopolitical and Economic Implications

Geopolitical- Reinforces bloc-based technology ecosystems. Deepens strategic competition in semiconductors and AI. Marginalises non-aligned or late-industrialising countries.

Economic- Encourages large public-private investments. Raises entry barriers for latecomers. Drives reshoring and friend-shoring of high-tech manufacturing.

Developmental Risks- Developing countries risk

1. Being locked into raw material exporter roles.
2. Missing value-addition opportunities.

Necessitates capacity-building in

1. Refining.
2. Advanced manufacturing.
3. Skill development.

Implications for India- India is not a formal member of Pax Silica but is strategically relevant due to-

1. Large semiconductor market.
2. Expanding electronics manufacturing ecosystem.
3. Identified critical minerals strategy.

India must

1. Diversify import sources.
2. Invest in overseas mineral assets.
3. Build domestic processing and refining capacity.

Align selectively with trusted technology partnerships while preserving strategic autonomy.

Way Forward

Domestic Capacity Building

1. Exploration and mining reforms.
2. Incentives for processing and refining.

International Partnerships

1. Mineral security partnerships.
2. Technology co-development agreements.

Sustainable Mining Practices

1. ESG-compliant extraction.
2. Circular economy and recycling.

Strategic Stockpiling– Buffer reserves for key minerals.

Conclusion

Pax Silica represents the emergence of technology-centric geopolitics, where control over silicon, critical minerals, and AI supply chains defines power in the 21st century. For India, the challenge lies in balancing integration with trusted partners while ensuring long-term self-reliance and equitable access to strategic resources.

Source- <https://indianexpress.com/article/business/india-left-out-of-new-us-critical-mineral-plan-pax-silica-10416588/>

