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Dealing with China's weaponisation of e-supply chains

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With large-scale electronics manufacturing important to India, New Delhi needs to speed up its future-proofing

In mid-January this year, news emerged of China preventing travel by its citizens working as engineers and technicians in Foxconn's facilities in India. It was also reported that those already in India were being recalled, and that the restrictions extended to curbs on exports of critical specialised manufacturing equipment, over which China has a monopoly. While Foxconn has reportedly scrambled to bring in Taiwanese workers to fill the gap in manpower, it is the stoppage of specialised equipment that is crippling. Apple-Foxconn remains critical to India's ambitions of becoming a global manufacturing power, and, therefore, such strangulation will affect that larger objective.

What is at play

These zero sum measures by China expand geopolitical competition with India through regulations on flow of capital and other factors of production. Fully cognisant of its dominance in advanced machinery and a well-trained workforce in tightly integrated global electronics production, China intends to also curb the tacit transfer of knowledge from Chinese technicians to their Indian counterparts on the assembly line. Combined with the disruptions on account of non-availability of specialised equipment, China has sought to weaponise its strategic location in the network of supply chains to slow down production in India, and place itself in an advantageous negotiating position.

The growing trade tensions between China and the West, specifically the United States, along with the COVID-19-related disruptions have led many global corporations to adopt a China Plus One diversification strategy to future-proof themselves. India has been in the forefront to seek benefits from this move along with countries such as Vietnam and Mexico.

Given the scale and the development trajectory of India's manufacturing sector bearing potential similarities to that of the Chinese experience, Beijing realises the need to limit the rise of its geopolitical rival and also remind global corporations of its own indispensability to the production ecosystem.

Over the last few years, the Indian government, in coordination with its State governments, has pulled out all stops to entrench Apple-Foxconn's investments in the southern part of the country. The efforts bore fruit in 2023, with the assembling of iPhone 15 models at Foxconn's facility in Sunguvarchatram, Tamil Nadu along with another line in Tata Electronics' plant in Hosur, Karnataka.

In the fiscal year ending March 2024, Apple assembled $14 billion worth of iPhones in India, through contract manufacturers Foxconn, Pegatron and Tata Electronics. In 2024, for the first time, iPhone 16 Pro models were assembled by Foxconn in India. State governments in south India have prioritised Apple-Foxconn in their pursuit of investments.

The conferment of the Padma Bhushan on Young Liu, Chairman of Foxconn, in 2024, further underscores the company's importance for India. It appears that the emphasis has been on replicating Apple's symbiotic relationship with China.

A pillar of 'Make in India'

Large-scale electronics manufacturing, especially of smartphones, is one of the important pillars of the 'Make in India' programme. The Production-Linked Incentive (PLI) scheme, which was launched first in the electronics industry in 2020, has witnessed increased allocation by the central government – a sum of ₹8,885 crore ($1.02 billion) in the Union Budget this year, rising from ₹6,125 crore in the Union Budget 2024 ($0.70 billion).

A recent news report revealed that over three financial years, from 2022-23 to 2024-25, Apple's contract manufacturers in India (Foxconn, Pegatron and Tata Electronics) had cumulatively received close to ₹6,600 crore ($0.76 billion), out of the total disbursed amount of ₹8,700 crore ($1 billion) under the PLI scheme. In addition, the Union Budget 2025 has completely removed basic custom duties/import taxes on mobile phone components such as printed circuit boards, camera modules, connectors, and sensors, as also different capital goods/machinery for use in the manufacture of lithium-ion batteries for mobile phones. It is notable that China's zero-sum action happened just a few months after the thaw in India-China ties, post the patrolling agreement in October 2024 to end a four year-long military standoff between the two armies in eastern Ladakh.

Economic necessity – visible in the Indian dependence on China for components and machinery – is believed to have hastened the negotiations process. This illustrates how India-China relations do not (necessarily) hinge on a stable boundary, as geopolitical competition between both sides is only bound to get more acute in the future.

India needs to think long term

There are no easy solutions for India in the short term, and so, it needs to involve both Apple and Foxconn to negotiate with China for easing Beijing's latest measures. Given that these corporations have stakes in both countries, their involvement could possibly help India's case. However, this should also serve as another opportunity to hasten the process of future-proofing in terms of human resources, components and specialised machinery.

It needs to be kept in mind that India is still, largely, a centre of final assembly of smartphones. For a well-rounded and holistic manufacturing ecosystem that includes production of various components, ancillary industries need to be incentivised and scaled up.

The National Manufacturing Mission for small, medium and large industries, announced in the Union Budget is a good step, but it needs credible financial muscle that leads to development of clusters for technological knowledge-sharing. On-site training for workers, which includes tacit sharing of knowledge on the assembly line, needs to be complemented and augmented with industry-specific specialisation in skill development programmes.

More private capital needs to be encouraged in order to create a robust network of indigenous contract manufacturers for not just foreign corporations but also for domestic Indian brands.

The Teesta dam and the long shadow of climate change

Vasudevan Mukunth

On January 27, 2025, an expert committee constituted by the Ministry of Environment, Forests and Climate Change recommended a proposal to rebuild the Teesta-3 dam on the Teesta river in Sikkim. In October 2023, a powerful glacial lake outburst flood (GLOF) from the South Lhonak lake had decimated the dam and its hydroelectric power generation facility. The waters also carried debris from the dam forward like a fluid battering ram, heightening the damage further downstream. In all, over 100 people were killed while more than 80,000 people in four districts were affected.

It became clear later that a moraine on the South Lhonak lake's flank suffered a slope failure, weakening the terminus. The failure also sent rocks tumbling into the lake, generating a strong ripple. The outlet subsequently gave way, with satellite data indicating that around 50 billion litres of water had spilled into the valley. The event also set off multiple landslides about 30 to 40 kilometres downstream. Experts who have since been monitoring the lake also said the moraine has remained unstable.

The link with global warming

As global warming and particulate matter – especially black carbon, also known as soot – accelerate the melting of Himalayan glaciers, more runoff is pooling into new lakes or adding to the existing ones. The rate of melting is inversely proportional to the volume, so, as glaciers shrink, they melt faster. A report by the Central Water Commission of last year found that the number of "glacial lakes and other water bodies" in the Himalayan region had become 10.8% more numerous between 2011 and 2024 and that their combined surface area had increased by 33.7% in the same period. The South Lhonak lake itself was formed in the early 1960s and grew to 167 hectares by 2023. Glacial retreat has also been known to destabilise extant geological formations and create new sources of risk. Against this background, the expert committee's decision to recommend the rebuilding of the Teesta-3 dam is worrisome.

As *The Hindu* has reported, the committee's decision was motivated by the fact that Teesta-3 was "successful" and "commercially viable" and that its power-generating equipment "was largely intact" following the GLOF. Environmental activists and hydrogeology experts alike have expressed misgivings about large hydroelectric power projects in the Himalaya and have questioned the new design's green clearance.

The key line that the dam was 'commercially viable' is a weak reason to reconstruct it

Teesta-3 has also been the subject of several public interest litigations asking for it be scrapped: because of its location (in an earthquake- and landslide-prone area); issues in its techno-economic clearance; its non-compliance with a 1996 notification to have Sikkim hold 51% equity; and alleged corruption.

According to the committee, Teesta-3 2.0 is to be built with concrete alone rather than concrete and rocks as before; to have a spillway nearly three-times more voluminous; and to have an early-warning system for flooding. The facility's new design is reportedly based on a "worst-case scenario" modelled by the India Meteorological Department, with the "maximum possible rain" in the next century in the region.

But one of the hallmarks of climate change is that it is a risk-multiplier. If the slope failure off the South Lhonak lake had occurred without there being a lake, there is unlikely to have been a flood. Likewise, if the moraine had not collapsed, the gradual accumulation of water may have caused the overtopping to flow into the valley less violently than during a GLOF.

The views of experts

The proliferation of glacial lakes, geological instability, dynamics of transient landscape features, and even the flux of atmospheric soot blowing in from industrial centres in the Gangetic plains all increase risks in a way that cannot reasonably be captured by a rainfall-centric model, however. Experts had already doubted whether the 2023 GLOF was triggered by heavy rain because local weather stations recorded only moderate rainfall or less in the area around the time. Professor Raghu Murtugudde has also written in *The Hindu* ("The value of attributing extreme events to climate change | Explained", May 24, 2024) that the relationships between climate change and local rainfall are hard to characterise because the data for modelling is seldom sufficient. In his words, climate models are "notoriously bad at properly capturing normal rainfall and worse at extreme ones".

On January 30, 2025, an international team including experts from the Indian Institute of Technology Bhubaneswar, the Indian Institute of ScienceBengaluru, the Indo Tibetan Border Police, and the Government of Sikkim published a comprehensive assessment of the GLOF ("The Sikkim flood of October 2023: Drivers, causes and impacts of a multihazard cascade"). Among other things, they wrote: "Prevailing GLOF modeling and assessment approaches insufficiently account for processes of erosion and sediment transport, as well as hillslope-channel interactions such as riverbank collapses and landslides triggered by toe-undercutting as well as the impact of sediment transport on local bed elevations and hence water levels. The latter is of particular importance in large river basins because water waves move faster than sediment waves...".

The commercial viability of Teesta-3, pre-GLOF, speaks to India's soaring power demand and the pressing need to produce it somewhere. But since climate change multiplies risk everywhere, production in specific locales should be weighed against the consequences. Property and livelihoods downstream of Teesta-3 1.0 suffered greater damage due to the dam being in the swelling river's way. If the new design holds, Teesta-3 2.0 may be able to reduce the downstream damage due to a (hypothetically) identical flood. But if a stronger and/or significantly different flood occurs, the damage could be even greater. A new facility with more moving parts will also create both new success and failure modes.

The people form the larger picture

The social security of the region's residents will have to be improved accordingly so that, in the event of a disaster, they are able to piece their lives back together without slipping on any social, health, and/or economic indicators. Brian Stone, Jr., a professor in the School of City and Regional Planning at the Georgia Institute of Technology, U.S., wrote in a 2024 article ("The lunacy of rebuilding in disaster-prone areas"), "We cannot engineer our way out of climate change; retreat is inevitable." That is, if the climate-change-induced risk to X in an area is to be kept constant, in time either the area will shrink or the costs of maintaining X will increase. X could be property, livelihoods, even human lives.

That the facility was commercially viable is an insufficient excuse to restore it. Instead, the decision should be made within a framework of priorities led by the need to minimise risk to locals, their property, and their livelihoods and maximise their socio-economic resilience. The framework should also include a risk determination matrix with a response plan and a hard 'unacceptable risk' level. The cost of these measures should be included in the dam's hydroelectric power tariff rather than externalising it in the determination of commercial viability. Anything else would be unsustainable by definition.

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As part of energy partnership, U.S.-designed nuclear reactors to be built in India

Sriram Lakshman
WASHINGTON DC

The U.S. and India have agreed to fully implement the 123 Civil Nuclear Agreement and collaborate on building U.S.-designed nuclear reactors in India as part of their energy partnership. "The U.S. side affirmed its firm support for India to join the International Energy Agency as a full member," a joint statement released on Thursday said.

During Prime Minister Narendra Modi's visit to Washington DC, India and the U.S. also announced a partnership termed "Transforming the Relationship Utilising Strategic Technology" (TRUST) to enhance cooperation across government, academia and the private sectors to support the application of critical and emerging technologies in a wide range of sectors from space and energy to biotechnology. TRUST is the tech pillar of COMPACT, and as such it replaces the Initiative on Critical and Emerging Technology (ICET) framework agreement the government had with the Biden administration, two sources, including one White House official, told *The Hindu*.

"U.S. investments to build resilient supply chains, such as the semiconductor fab in India, would fall under this initiative," a White House official said. U.S. support for a national security semiconductor fabrication unit in India was announced when former U.S. President Joe Biden and Mr. Modi met in September 2024 in Delaware.

The two sides also agreed to streamline legal mobility for students and professionals

The countries also agreed to formulate a roadmap on accelerating infrastructure for artificial intelligence.

In terms of multilateral cooperation, in addition to reaffirming the Quad, the two sides planned to convene partners of the IMEC (India-Middle East-Europe Corridor) group and I2U2 (India, Israel, the U.S. and UAE) within six months to announce new initiatives.

"The leaders recognised the need to build new plurilateral anchor partnerships in the Western Indian Ocean, Middle East, and Indo-Pacific to grow relationships, commerce and cooperation across defence, technology, energy and critical minerals," the statement said, adding that the two countries would announce initiatives for each of these sub-regions by the autumn of 2025.

The two sides agreed to streamline legal mobility for students and professionals, as well as short-term business and tourist travel. They committed to aggressively combating illegal migration and human trafficking. The U.S. had returned 104 undocumented migrants to India last week, with the government facing criticism for the U.S. shackling many of the deportees during the 40-hour flight. Mr. Modi assured U.S. President Donald Trump of India's support in combatting illegal migration during their joint press conference.

"Anybody who enters another country illegally, they have absolutely no right to be in that country," Mr. Modi said. He said the government was "fully prepared" to take back any individual, verified to be Indian, and present illegally in the U.S.

"These are children of very ordinary families and they are lured by big dreams and big families," he said, as called for efforts to fight human trafficking. "Our bigger fight is against this ecosystem [of human trafficking]," he said.

U.S. pushes for more defence deals, offers F-35 fighter aircraft to India

Dinakar Peri
NEW DELHI

The U.S. will be increasing military sales to India "by many billions of dollars" starting this year, President Donald Trump said on Thursday at the joint press conference with Prime Minister Narendra Modi, while also offering America's most advanced military platform, the F-35 fifth generation fighter jet, to India.

A F-35 fifth-generation fighter jet flying over Yelahanka Air Force Station during Aero India earlier this week. DINAKAR PERI

However, Foreign Secretary Vikram Misri later pointed out that there was a process to be followed for military procurements and that the formal process in this regard had not started "as yet".

In a significant move that will liberalise the regulatory framework in both countries, the U.S. and India announced that they will review their respective arms transfer regulations, including the International Traffic in Arms Regulations (ITAR), in order to "streamline defence trade, technology exchange and maintenance, spare supplies and in-country repair and overhaul of U.S.-provided defence systems" and also begin negotiations this year for a Reciprocal Defence Procurement (RDP) agreement to "better align their procurement systems and enable the reciprocal supply of defence goods and services".

"We are also paving the way to ultimately provide India with F-35 stealth fighters," Mr. Trump said. The leaders pledged to accelerate defence technology cooperation across Space, air defence, missile, maritime and undersea domains, with the U.S. announcing a review of its policy on releasing fifth-generation fighters and undersea systems to India, the joint statement said.

In his remarks, Mr. Modi said America had an important role in India's defence preparedness. "As strategic and trusted partners, we are actively moving in the direction of joint development, joint production and transfer of technology," he said.

Mr. Modi further added that the Defence Cooperation Framework will be created for the next decade and defence interoperability, logistics, repair and maintenance will also be its main aspects. The leaders also announced plans to pursue new procurements and co-production arrangements for Javelin Anti-Tank Guided Missiles and Stryker Infantry Combat Vehicles.

India, U.S. to double bilateral trade by 2030

The two sides aim at negotiating the first part of the mega deal this year as they agree on a broad agenda for trade, defence and technology; Trump announces that his administration has cleared way for extradition of 26/11 accused Tahawwur Rana; he calls India's tariffs 'unfair' and a 'problem', agrees to negotiations to reduce the deficit

Sriram Lakshman
WASHINGTON DC

India and the U.S. agreed to negotiate the first segment of a trade agreement by the autumn of 2025, with India looking to increase energy purchases from the U.S. to address U.S. President Donald Trump's concerns about the U.S.'s trade deficit with India, as Prime Minister Narendra Modi met Mr. Trump for bilateral discussions in Washington.

Mr. Trump announced that his administration had cleared the way for the extradition of Tahawwur Rana, wanted in India in connection with the '26/11' terrorist attack in Mumbai, in 2008. The logistics of Rana's surrender and extradition to India are being worked out, Foreign Secretary Vikram Misri told presspersons on Thursday evening at a briefing.

The U.S. President also offered to "help" India with its border issue with China.

In terms of defence, the U.S. was "paving the way to ultimately provide India with F-35 stealth fighters", Mr. Trump said.

The delegates met for around four hours on Thursday. Attendees included External Affairs Minister S. Jaishankar, Foreign Secretary Vikram Misri, National Security Adviser Ajit Doval and others.

The joint statement by the U.S. and India covered a range of topics: defence, trade, energy, technology, multilateral cooperation and people-to-people ties. The two sides agreed to more than double bilateral trade to $500 billion by 2030, as part of 'Mission 500'. The Prime Minister and President first met at the Oval Office where they spoke of their friendship.

Mr. Modi told Mr. Trump that, like him, he kept the national interest at the top of his mind, as he compared Mr. Trump's 'Make America Great Again (MAGA)' theme to his 'Viksit Bharat' (developed India) theme.

Power point: Prime Minister Narendra Modi with U.S. President Donald Trump during a meeting at the White House in Washington DC on Thursday. PTI

Standing beside Mr. Modi in the East Room at a joint press conference, Mr. Trump called India's tariffs "unfair" and a "problem". Earlier in the day, the President had announced a broad policy for reciprocal tariffs, specifically citing Indian tariffs during the signing of the order.

Asked by *The Hindu* whether Mr. Trump would withhold reciprocal tariffs given that a trade negotiation has been announced, Mr. Misri did not have a definitive answer, saying he did not want to get ahead of the discussions.

At the joint press conference, Mr. Trump said the two sides had agreed to negotiations to reduce the deficit. Mr. Trump said the deficit could be made up with the sale of American oil and gas (LNG) to India.

To strengthen oil trade

"We will strengthen the oil and gas trade to ensure India's energy security. Investment in energy infrastructure will also increase," Mr. Modi said in his opening remarks.

The Foreign Secretary suggested that India could increase its energy purchases from the U.S. from $15 billion last year to $25 billion "in the near future". The two countries also agreed to work on Small Modular (nuclear) Reactors for India.

The two countries announced a framework of cooperation, the U.S.-India COMPACT (Catalysing Opportunities for Military Partnership, Accelerated Commerce & Technology) for the 21st Century.

They also announced a decade-long framework to deepen defence cooperation, including the procurement of six additional P-8I Maritime Patrol aircraft for India for surveillance of the Indian Ocean Region.

While the joint statement finds no mention of the co-production of General Electric F-414 engines for India's Light Combat Aircraft-MK2, a White House official confirmed for *The Hindu* that the U.S. "looked forward" to the conclusion of the deal between General Electric and Hindustan Aeronautics Limited on the engines.

The two sides will reopen negotiations for a Reciprocal Defence Procurement (RDP) agreement to align their procurement systems and reconsider their arms transfer regimes. Specifically, the U.S. would look into its International Traffic in Arms Regulations (ITAR) rules to enable transfers of military technology.

The countries announced the scaling up of production and partnerships in the Indo-Pacific for underwater domain awareness technologies, under a new initiative called the Autonomous Systems Industry Alliance.

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