STEM diplomacy, special schemes—how India can attract diaspora to lead global technology race

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Strengthening our research, development, innovation, and technology commercialisation capabilities is accepted by all stakeholders as a pre-requisite to the goal of Viksit Bharat by 2047. The government has taken important steps toward this by creating the Anusandhan National Research Foundation, which aims to invest Rs 50,000 crore from 2023 to 2028 in R&D by academia and research institutions. This will be complemented by a Rs 1 lakh crore fund to encourage R&D in the private sector.

An important complement to this financial commitment is a well-structured programme to attract and involve the Indian diaspora in an active way.

India will need to focus on many of the emerging sectors like AI, quantum technologies, batteries, EVs, semiconductors, electronics and robotics, hydrogen and green energy, sustainability and environment, medical equipment, advanced materials, pharmaceuticals, and aerospace, etc.

The diaspora is well embedded into the best global professional networks in their relevant domains of expertise. Tacit knowledge plays an important role in R&D, innovation, and commercialisation of technology. These knowledge networks are also crucial for having access to latest technology developments. While virtual networks are helpful, being a first-hand participant in the network can be even more beneficial. The Indian diaspora returnees can tap into these networks to ensure that we are abreast of contemporary developments.

We are not questioning the quality of Indian talent working in India. In terms of motivation, ideas, and competence, they are right at the top. But successfully commercialising technologies and taking them to market is very challenging, and we lack experience in this. We have already seen in multiple domains—from manufacturing mobile handsets to making batteries for electric vehicles—that it is not enough to have good talent. Besides product technologies, we also need to have the right capital goods and manufacturing process technologies that will enable value addition and capture in India without hold ups from global competitors. For this, we need to tap into people who have done it before.

The window of opportunity

The current geopolitical context provides a unique opportunity to attract our diaspora. It appears that the immigration curbs in many developed countries are causing difficulties for Indian students, post-docs, and young professionals. Reports indicate that there is a disruption in the US research

funding environment and that it is starting to impact researchers in their university system. Some countries are going through internal churn resulting in xenophobia and racial threats that are adversely affecting the Indian diaspora.

This is a unique opportunity to attract some of our best STEM talent back to India and plug them into the new research, development, and innovation opportunities that will be opened by the big thrust on R&D by the government.

The Indian diaspora is a treasure house of cutting-edge STEM R&D, corporate leadership, and entrepreneurship capabilities. They are among the most successful in the world. For example, in 2023, 16 of the Fortune 500 companies with a combined annual revenue of close to $1 trillion had Indian-origin CEOs. And, 72 of the 648 unicorn startups in the US are co-founded by Indian-origin entrepreneurs. Moreover, around 22,000 faculty members in US universities are of Indian descent.

Crucial role of the diaspora

The Indian diaspora has already played a key role in India's industrial development over the last three decades and more.

Members of the diaspora were some of the early customers and evangelists who facilitated early large contracts when the Indian IT sector was gaining legitimacy on the global stage. In the early 1990s, Diju Raha, former vice president of Nortel, not only facilitated outsourcing to Infosys, TCS, and Wipro, but was also the champion for the Indian R&D global capability centers (GCCs) for Nortel. In the last couple of decades, we have seen our diaspora return to India and take on leadership roles in the Indian GCCs. In recent years, members of the Indian diaspora, including venture capitalists and investors, have spurred the growth of the Indian startup ecosystem. Last but not the least, the Indian diaspora has returned to become leaders of Indian innovation and commercialisation in key industries like automobiles, and pharmaceuticals.

The auto industry provides strong evidence of this. Mahindra & Mahindra and Tata Motors are today prominent players in the Indian passenger vehicle market, especially in the SUV segment. These companies owe their success to two individuals who returned to India and played important roles in their evolution—Pawan Kumar Goenka and V Sumantran.

Goenka joined Mahindra & Mahindra as General Manager (R&D) in 1993 after a 14-year stint at General Motors R&D Centre in the US. He had gone to the US for his doctoral studies in mechanical engineering. In a career spanning nearly three decades at Mahindra, Goenka rose to become the MD & CEO and was instrumental in the launch of the Scorpio—an important landmark in Mahindra's product development journey—and other products that Mahindra launched over time.

V Sumantran, too, served at General Motors Technical Centre before returning to India and joining Tata Motors in 2001 as executive director (passenger car business and engineering research centre).

Sumantran led the development of the enhanced Indica platform. This was the foundation for Tata Motors' eventual success in the Indian passenger car market.

India has a long history of returnees who have built national programmes, including Homi J Bhabha, the father of India's nuclear programme, and Vikram Sarabhai, the father of India's space programme. Today, both these national programmes compare well with the best in the world.

Experience of other countries

Other countries have also leveraged 'return to home' schemes to grow their STEM capabilities. In 2008, China launched the Thousand Talents Plan (TTP) to recruit diaspora talent from foreign countries and reverse the perceived brain drain to build an innovation-led economy. Estimates indicate that China attracted about 7,000 diaspora researchers, science and technology professionals, and entrepreneurs living abroad with the TTP.

The scheme provides a one-time bonus of 1 million yuan to select individuals and offers substantial resources for research funding and assistance with housing costs. A subset of the TTP targeted at the younger diaspora is the Young Thousand Talents (YTT) programme. The YTT programme includes a one-time award of 500,000 yuan and start-up grants between 1-3 million yuan. These amounts were typically matched by host institutions or local governments. The YTT returnees also received subsidised housing and prioritisation when applying for other grants.

The most successful programme in bringing back the diaspora for national development was from Taiwan. The Taiwanese diaspora working in the semiconductor industry in the US advised that Taiwan should develop a semiconductor industry using the emerging Complementary Metal Oxide Semiconductor (CMOS) technology. This, according to researchers, was perhaps the single most important knowledge transfer that created the Taiwanese semiconductor industry.

Some of the Taiwanese diaspora working in the US returned to help Taiwan achieve a strong capability in the semiconductor industry. They helped the Electronics Research and Service Organization (ERSO) of the Industrial Technology Research Institute (ITRI) get semiconductor technology from the Radio Corporation of America (RCA) in 1976.

The most impactful initiative to attract the Taiwanese diaspora was when the government convinced Morris Chang, a 25-year veteran in Texas Instruments and the leader responsible for the US' global semiconductor business, to head ITRI. Within a couple of years, Chang founded a semiconductor foundry, the Taiwan Semiconductor Manufacturing Company (TSMC), with government support.

Today, TSMC is the world's largest, most valuable, and most technologically advanced semiconductor foundry in the world.

What we need to do

We need to develop multipronged mechanisms to attract some of our diaspora to return.

First, we need to focus on diaspora both in industry and in academia. To date, we have focused only on the diaspora of young researchers in academia. We need to attract the diaspora that includes senior researchers and leaders in academia.

So far, we have let Indian companies independently attract the Indian diaspora. While many of them take up positions as expats in India, some of them have returned for good.

The Indian diaspora needs to be nudged to make the decision to return. Institutional mechanisms can facilitate this. For example, The Ministry of External Affairs can set up a single window scheme to simplify and smoothen the process for the Indian diaspora to settle here. Similarly, industry bodies like the Confederation of Indian Industry (CII) can set up a talent discovery office for the diaspora to engage with potential employers.

Second, India's premier STEM higher education institutions like IITs, NITs, IISc and BITS need to set up special cells for alumni diaspora interested in returning to India. These cells need to be closely networked with the Ministry of External Affairs and CII to make quick and impactful connections. The HEIs can also have a buddy cohort where designated India-based alumni can help answer questions on softer aspects of living in India.

Third, for many of our diaspora, the motivation to return to India and contribute is an emotional decision. The MEA must increase its focus on STEM diplomacy with a strong 'Return to India' component. As Prime Minister Narendra Modi said at the 14th Pravasi Bhartiya Divas in 2017, "We don't see the colour of the passport, but the blood ties". This summarises the spirit with which we should engage with the over 35 million people of Indian origin living abroad and attract some of them to return.

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