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Exploring India and Vietnam S&T Cooperation: Potential and Prospects

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The Background

India and Vietnam relations can be traced back to the Asian Relations Conference held in New Delhi in 1947, or even before, dating back to more than 78 years of bilateral relations. The formal diplomatic ties were later established in 1972, which is marked by mutual respect for sovereignty and a shared vision towards regional stability. The partnership has evolved into cooperation across several sectors. However, the first agreement between India and Vietnam, signed in 1976, was inter-governmental, and focused on political and diplomatic relations. It was followed by an agreement in the cultural domain.

The earliest agreement in the field of science and technology came into force in 1978. The agreement viewed cooperation as a medium to strengthen diplomatic ties, and promote the development of both countries. It also aimed to foster scientific exchange and implementation of joint S&T programmes. The focus was on facilitating the exchange of scientists, researchers, specialists, and S&T information, organising S&T seminars, courses as well as formulating and executing S&T research programs. These efforts were intended to support the application of research outcomes in industry and agriculture.

Areas of Cooperation

Cooperation in nuclear S&T has continued to remain integral to India-Vietnam S&T cooperation. About a decade after diplomatic relations were formalised, in 1986, India and Vietnam, through the Atomic Energy Commission of India and the National Atomic Energy Institute of Vietnam agreed to cooperate on the use of atomic energy for peaceful purposes. In this direction, both countries agreed to exchange unclassified S&T publications, reports, etc. and exchange of S&T personnel and equipment. Several MoUs have been signed between institutions of both countries like the Atomic Energy Commission, India, the Atomic Energy Commission of Vietnam, the Department of Atomic Energy, India, the Ministry of Science, Technology and Environment (MOSTE), Vietnam, India's Atomic Energy Regulatory Board (AERB) and Vietnam Agency for Radiation and Nuclear Safety (VARANS) (Embassy of India, Hanoi (a). Capacity building and technical support have also been an important characteristic of India-Vietnam cooperation in this field. Collaborative projects include the Vietnam India Nuclear Science Centre in Da Lat city of Vietnam, where the Department of Atomic Energy of India provides technical support. India also offers a training programme on the peaceful application of nuclear energy at the Bhabha Atomic Research Centre (BARC) to scientists from Vietnam since 1998. In nuclear energy, both countries have long-standing cooperation, and new avenues of cooperation can be explored.

India-Vietnam Joint Statement (2003) highlighted the focus on investments in several areas, including IT. The bilateral relations were elevated to a Comprehensive Strategic Partnership in 2016 from a strategic partnership in 2007 during the Indian Prime Minister's visit to Vietnam. During the Vietnamese Prime Minister's state visit in July 2024, he acknowledged Indian companies' active investment projects in Vietnam, amounting to a total investment of US$1.03 billion. He called for further expansion of investment in sectors aligning with both countries' priorities and Vietnam's needs. These sectors include high technology, electronics, science and technology, artificial intelligence (AI), infrastructure development, renewable energy, emerging energies like hydrogen, biotechnology, innovation, high-tech agriculture, and pharmaceuticals (Vietnam Briefing, 2023). The August 2024 Joint Statement also recognised national priorities of both countries for digital transformation and energy transition, emphasising on greater exchanges and cooperation in areas such as digital public infrastructure, space technology applications, renewable energy, biotechnology and disaster resilience technologies.

Through the Indian Technical and Economic Cooperation programme, the Government of India shares expertise, development experience and best practices with 160 partner countries, including Vietnam. 3400 Vietnamese have attended ITEC courses (in IT, renewable energy, agriculture, water resources, space, cyber security, etc.). ITEC is recognised as an important component of India Vietnam Comprehensive Strategic Partnership, which has significantly contributed to '*improving human resource quality and advancing Vietnam's goals of industrialisation and modernisation'* (Vietnam Times, 2024; Embassy of India, Hanoi, 2024) Additionally, as part of India's initiative for ASEAN Integration, India extended technical assistance for entrepreneurship development through the Vietnam-India Entrepreneurship Development Centre (VIEDC) in Hanoi.

During the last decade, MoUs were signed between several institutions of India and Vietnam in areas like high performance computing, spectrum management, cyber security, IT, energy efficiency, and clean energy, together with outer space and nuclear safety and radiation. ICT and cyber security emerge as important areas of cooperation. As both India and Vietnam advance their digital economies, cybersecurity, and data protection have also become critical concerns. India's Cybersecurity Framework and CERT-In (Computer Emergency Response Team), has shared its expertise with Vietnam to help safeguard its growing digital infrastructure. Earlier, the Centre for Development of Advanced Computing (CDAC) under the Ministry of Electronics and Information Technology, India implemented the establishment of an Advanced Resource Centre in Information and Communications Technology (ARC-ICT) in Hanoi. With the Posts and Telecommunications Institute of Technology, CDAC also worked towards setting up of a Sustainable IT Infrastructure for Advanced IT Training in Ho Chi Minh City by supplying of the necessary equipment and IT training.

Artificial Intelligence has the potential to revolutionise agriculture, health, education, urban planning and manufacturing. During 2012-2019, scientific publications on AI and robotics in India and Vietnam stood at 87,465 and 4,080, respectively. Both countries have released national AI strategies for AI R&D and application (NITI Aayog, 2023; Vietnam Plus, 2024). As adverse outcomes of AI technologies were identified as one of the top global risks (WEF, 2025), there are several areas of potential cooperation in AI R&D, its applications in various sectors and policy dialogues between India and Vietnam. India and Vietnam have the potential to form a strong partnership in the fields of rare earth elements, semiconductors, and nano-materials. This collaboration could reduce dependence on foreign markets, and help them

achieve self-reliance in critical sectors, thus enabling scope for diversifying global supply chains for advanced materials and technologies.

Further, a MoU was signed in 2016 for Cooperation in the Exploration and Uses of Outer Space for Peaceful Purposes. India has started working on the ASEAN-India Tracking, Data Reception Station, and Data Processing Facility in Vietnam to enhance cooperation in space technologies between India and ASEAN countries. This facility has the potential to significantly boost space capabilities in the ASEAN region, enhance data-driven decision-making, and foster greater regional collaboration in the field of space exploration and technology.

In the agriculture and the health sector, under the India, Brazil and South Africa (IBSA) framework, a Rice Seed Improvement Project was undertaken in 2012 by the Da Nang Department of Agriculture and Rural Development at the cost of USD 529,000. Under the project, a hub for rice seed production was established in Hoa Vang District aimed at improving farmer's production, introducing of new varieties with high yield, improving post-harvest technology and establishing a seed quality control and certification system. IBSA e-Learning Project for health was implemented at the Hai Phong University of Medicine and Pharmacy in Ngo Quyen District in January 2015 with the assistance of about USD 900,000. The IBSA e-Learning Project for Health was developed to provide pre- and in-service training to healthcare workers aimed at improving coverage and quality of health services in Vietnam (Embassy of India, Hanoi (b). India's biotechnology sector has been growing rapidly. Vietnam has also recorded a growth rate in biotechnology, with output doubling from 155 (2012–2015) to 313 (2016–2019) publications. In 2019, Vietnamese researchers contributed to 0.68 per cent of global output on biotechnology, rising from 0.17 per cent in 2011. India and Vietnam have strong potential for collaboration in biotechnology to address common challenges in healthcare, agriculture, and environmental sustainability (WEF, 2025).

In 2007, an MoU between the Ministry of Agriculture of India and the Ministry of Fisheries of Vietnam focused on cooperation through joint ventures and technology transfer in fisheries and aquaculture. Additionally, an MoU between the National Maritime Foundation, New Delhi and the Scientific Research Institute of Sea and Islands, Vietnam was signed in 2020. The recent joint statement also recognised that as two coastal nations, India and Vietnam, Joint marine research and data sharing, have strong incentives to enhance cooperation in the fields of oceanography, marine sciences, and the blue economy. Such collaboration through joint endeavours has significant potential to address common challenges. India's technical expertise in marine research and Vietnam's rich coastal resources can create a sustainable, innovative, and mutually beneficial framework for ocean and coastal management.

Some environmental risks identified by the Global Risks Report 2025 include extreme weather events, shortage of natural resources, biodiversity loss, decline in health and infectious diseases and pollution. Environmental degradation, air pollution, climate change induced natural disasters, biodiversity loss, energy transition and healthcare are common issues faced by both countries. India's efforts and initiatives like the National Green Hydrogen Mission, PM-KUSUM, PM Surya Ghar, and the PLI schemes for solar PV modules are a testament to its commitment to enhancing energy generation capacity while reducing reliance on fossil fuels. Vietnam's National Climate Change Strategy upholds its role in energy and green transition and commitment towards carbon neutrality and reduction of carbon emissions. But, 50 per cent of the country's energy mix remains dominated by coal. It is also identified as a major source of air pollution, which is a cause of concern for both countries (IQAir, 2021). In India,

pollution (air, water and soil) is one of the top five risks identified during the survey (WEF, 2025). With large solar power infrastructure and offshore and onshore wind farms, Vietnam is making efforts to transition to more renewable sources of energy. This is also evident in Vietnam's greater focus on topics like eco-friendly construction materials and waste management, hydrogen energy, smart grid technologies, biofuels and biomass (UNESCO, 2021). It also announced its National Hydrogen Development Strategy, aiming to produce 1,00,000-5,00,000 metric tonnes of hydrogen in 2030 (S&P, 2024). Vietnamese research output on biofuels and biomass has increased five-fold from 67 (2012–2015) to 350 publications (2016–2019) following the establishment of a 25 per cent target for the share of biofuels in total vehicle fuel consumption by 2050 in Vietnam's *Renewable Energy Development Strategy 2016–2030* (2015) (UNESCO, 2021) Vietnam appreciated India's Global Bio-fuel Alliance initiative. However, procedures to sign the International Solar Alliance Framework Agreement are underway.

Both countries are highly vulnerable to climate change and natural disasters, with Vietnam facing flooding and tropical cyclones and India witnessing rising heatwaves, floods, landslides, cloudbursts, droughts and cyclones. India is a key player in the Coalition for Disaster Resilient Infrastructure. Vietnam became a member of the global initiative in August 2024. Additionally, both countries face issues of biodiversity degradation and have national plans/strategies for biodiversity conservation. India and Vietnam are also members of global initiatives like the Convention on International Trade in Endangered Species (CITES) and the Ramsar Convention. Scientific output in poaching and trafficking of endangered species has at least doubled in most countries in Southeast Asia, including Vietnam (UNESCO, 2021). Therefore, there is immense scope for joint research initiatives on related topics and the sharing of technologies and best practices for biodiversity mapping and monitoring for tackling biodiversity loss.

The Way Forward

With India's 'Act East' policy, Vietnam has members as a key partner in the ASEAN region. Both countries advocate rules-based order and multilateralism and share common interests in terms of regional security, economic development and maritime security. As a result of these synergies, India-Vietnam bilateral relations continue to grow and diversify. Several mutual convergences will further strengthen diplomatic ties between the two countries in the following years, together with addressing emerging challenges and opportunities in the Indo-Pacific. Besides economic cooperation, with increasing trade and investments between the two countries, strategic ties in defence cooperation are also growing significantly. Additionally, training and capacity building and S&T cooperation, too, continue to be an important pillar of their bilateral relations. However, there is a greater scope of cooperation in higher education and research, Information and Communication, emerging technologies, health, agriculture, space, cyber security, etc. as well as finding S&T solutions, sharing best practices and data in tackling common challenges like climate change, floods, biodiversity loss, air pollution, and exploring clean and renewable energy sources. However, issues pertaining to funding and institutional barriers need to be addressed together with long-term plans and joint R&D projects.

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