# Developing and implementing a research and innovation policy framework in Vietnam

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## 1 Context

The status and challenges facing Vietnam's National System of Innovation (NSI) and its Research and Innovation Policy Framework (RIPF) are in many ways typical of economies in transition. Science and Technology (S&T) capabilities were almost non-existent when the Vietnam war ended in 1975 but increased steadily thereafter with government support. However, recent indicators show that despite progress made the country still lacks the advanced S&T skills and technologies necessary to develop a modern technology-intensive economy.

Vietnam's government recognized the importance of S&T soon after the country became independent by prioritizing higher education, research and innovation. Over a period of four decades, Vietnam's NSI emerged stepwise, starting with efforts to develop basic S&T capacities that were urgently needed for the transition from a rural to an industrial society. In parallel, first legal and administrative regulations were formulated, which are the foundations of today's RIPF.

Meeting the challenges of the global and networked economy requires a system-oriented approach. Future success requires better interaction between S&T stakeholders who must work together in seamless innovation chains. Research produces new knowledge and technologies that are successfully applied and commercialized by their users, especially enterprises. To initiate and enable this development, Vietnam must now initiate the next step in the development of its NSI and RIPF.

## 2 Empirical Approach and Main Findings

To fully appreciate Vietnam's development and to also derive lessons for other countries in transition, it is important to understand the evolution from its post-war beginnings with almost no S&T resources to its current status as a lower-middle-income country with an emerging NSI. Understanding this development provides valuable insights into the strengths, weaknesses, opportunities, and challenges that Vietnam faces today, and provides valuable "lessons learned" and possible development pathways for other emerging countries.

The development of Vietnam's RIPF can be described in four development phases.

**Phase 1 : Building basic research competencies and capacities (1945–1986)** — The initial focus until 1964 was training scientists and engineers and constructing universities and research institutes. By 1965, the Government established 23 universities and 16 research institutes, including 6 social sciences research institutes. In the decade that followed, S&T goals shifted toward promoting scientific and technological development to increase labour productivity and food production, develop and maintain transportation, local industrial capacities, and a health system.

When war ended in 1975, social and economic reconstruction was the priority and S&T activities supported the development of industry, agriculture, forestry, fishery, construction and transport sectors. Under the centralized economy, the state had the exclusive right to organize S&T activities, and a division of labour emerged : research organizations performed scientific research activities, and universities and colleges provided the training.

**Phase 2 : Integrated NSI and support for socioeconomic development (1987–1995)** — A profound rethinking of the government's centralized S&T management started with the beginning of economic reforms ("Đôi mới") in 1987. Decrees on foreign technology transfer (1988) ; on organizational and individual rights to enter into contracts or to cooperate in S&T activities (1992) ; on external grants in support of S&T (1994) ; and on the protection of copyright, industrial property rights, and a legal framework for technology transfer (1995) changed the organization and orientation of S&T and increased the autonomy of researchers. This period marked a shift toward market-based S&T management and its orientation to multi-sector socioeconomic development. The goal of S&T was to build strong competencies and capacities and to use these to contribute to the development of priority industrial sectors. During this period, the number of research institutions almost doubled from 170 in 1985 to 334 in 1995. In 1992, a decree on the management of S&T prescribed that at least 2% of the state budget should be set aside for S&T.

**Phase 3 : Reform of state management of S&T, and capacity building for policymaking (1997–2010)** — In 1997–2000, the government framed S&T as the foundation and driving force for industrialization and modernization of the country. S&T policies sought to encourage investment and to strengthen the links between research and its application. To accelerate these efforts, international S&T cooperation was expanded. Research institutes were given greater autonomy to pursue international and domestic linkages. Government policy and funding increased the number

of S&T institutions. During this expansion, two weaknesses became evident : the absence of a framework for coordination and limited transparency and accountability of S&T investments.

In response, the government formulated a law on science and technology and launched its first 10-year S&T strategy. These developments served as an umbrella for complementary detailed regulations on issues such as intellectual property and technology transfer. During this phase, there was a move toward open policy dialogue and debate that aimed to involve stakeholders in a participatory policymaking process approach.

**Phase 4 : Toward comprehensive NSI and RIPF and integration into global S&T (2011–present)** — The second ten year S&T strategy (2011–2020) sets ambitious objectives. Vietnam aspires to fully develop natural sciences and engineering, as well as social sciences and humanities, to become the key driving forces for modernization and growth. The objective is that by 2020, S&T in Vietnam will reach an advanced level in key areas, comparable with other ASEAN countries. Policymakers realize that this will require a dedicated effort that combines an accelerated development of research, enhanced transfer of new knowledge and technologies from research, and improvements in the technological level and innovation skills of enterprises.

Policymakers now seek to complement the initial focus on building research performance by enhancing technology transfer and commercialization. High priority is being given to developing the capabilities of enterprises to absorb and apply new scientific knowledge and technologies. S&T collaboration with partner countries is now gradually shifting from a traditional research-project orientation to longer-term integrated joint programs that seek to promote innovation in priority areas.

## 3 Main messages for policy and practice

This review of Vietnam's efforts to develop its RIPF and NSI shows that further progress and reforms are required. Immediate action in priority fields must be complemented by longer-term reorientations of the current RIPF. These immediate actions must focus on the following areas.

**Improvement of research performance and restructuring of the research system** — A major shortcoming of the current research system is low research output, not only compared with high-income countries, but also with other Asian countries. Improvement measures include increased R&D financing and investment in improving the qualifications of researchers and the human resource base for S&T. But this alone is not enough. S&T policymakers can influence research performance and output in three ways : by providing performance incentives to research organizations ; by increasing transparency about research performance and results ; and by restructuring the research landscape. Addressing structural challenges is a major area for policy action, and this mainly relates to overcoming fragmentation. Vietnam has a high number of S&T institutions and staff but research output is low.

**Science–industry collaboration, technology transfer, spillovers, and the role of foreign enterprises** — Recent high GDP growth rates suggest that Vietnam has a dynamic industrial sector. The government has enacted regulations on techno-

logy transfer within Vietnam, from foreign countries to Vietnam, and from Vietnam to other countries. At a first glance, this policy has been very successful. Vietnamese firms have attracted significant foreign direct investment leading to economic growth and job creation. However, this development has led to a dependency of Vietnam's manufacturing sector on foreign investors, and the hoped-for spillover to close the technology gap with indigenous enterprises is not evident. Domestic technology transfer is low in Vietnam, especially when compared with OECD countries. Many indigenous enterprises, especially small- and medium-size enterprises (SMEs), lack the technological level necessary to compete internationally and suffer from a lack of resources. Many still work with outdated equipment and have low productivity.

**Modernization of industry and enhanced technological capabilities of enterprises** — Following the liberalization of the economy, the number of enterprises in Vietnam has grown at an average annual rate of 28% since 2000. The number of private sector enterprises is growing fast, even if state-owned enterprises (SOEs) still account for a large part of the overall number of enterprises and of employment. But the capability of Vietnamese enterprises to absorb new scientific knowledge and technologies, to apply them efficiently, and to implement product, service, process, and other innovations is hampered by their low R&D spending, the absence of adequate S&T competencies and capacities, and the lack of commitment to S&T as a source of competitive advantage. The potential for a 'technology push' is also limited. Researchers have limited interactions with firms and further effort is needed to stimulate the promotion and transfer new knowledge and technologies.

**Human Resources for S&T** — Vietnam's authorities are fully aware of the key importance of higher education for the development of innovation capacities and for sustainable economic development. To remain competitive in global markets and to integrate into global supply chains, enterprises must be able to master technological change and integrate new technologies at an ever-faster pace. But despite reforms, Vietnam's higher education system is not graduating sufficient numbers of graduates with skill sets to meet current demand. Qualitative development has not always kept pace with the impressive quantitative growth of a number of universities and graduates. A number of plans, projects, and policies to reform the higher education system have been promulgated and implemented. Recent policy measures recognize that in addition to technical skills, technology management skills are important to improve the skills set of Vietnamese workers. Reforms to reduce the fragmentation of tertiary education seek to complement efforts to improve education quality.

**Reform of the S&T governance system to move toward evidence-based policymaking** — Development and technology cycles, global innovation and supply chains, and associated globalization trends are accelerating at a pace that place additional demands on Vietnam's efforts to strengthen its NSI. Vietnam must further improve its ability to react to these challenges by improving and streamlining the S&T governance framework, and by removing current bottlenecks in cross-agency coordination, decision-making, and transparency. Three areas require action : (1) reduce fragmentation of the governance system and improve coordination and collaboration between all authorities at the national and regional level that formulate and implement

S&T policies; (2) introduce performance-oriented management that couple financing mechanisms with result-oriented research performance; (3) enhanced transparency of research activities and impact, and efficient use of research funds. S&T evaluations have supported progress along these lines but it is a relatively recent policy tool. Further work is needed to increase the number of experienced evaluators, build accurate performance data, stakeholder acceptance of evaluations, and use of evaluation results for better decision-making.

Beyond these short- to medium-term priorities, our findings suggest that Vietnam, as well as other developing countries, should reconsider the long-term orientation of its NSI. First, Vietnam needs a long-term strategic view of the country's competitive position in the global economy, what position in global value chains it can take, and how S&T can support this position. Most industrial production still takes place in sectors with high labour intensity and low value added, like the garment sector which compete on the basis of low wages. Production of technology-intensive goods is also growing fast, but it is typically limited to assembly of final products. Assembly work boosts employment in lower-skilled labour but it neither generates high margins nor does it contribute to building advanced technological capabilities. Changing this requires investment in S&T.

Second, development and implementation of this strategy must be inclusive. In a well-working NSI, all stakeholders, especially producers and users of new scientific knowledge and technologies must learn to work together from scientific discovery *via* technology development, to protection of intellectual property, and successful commercialization. The task of S&T policy is to stipulate and support this "moving closer together" and to provide the necessary framework conditions and incentives.

Overcoming current limitations and reaching this described next NIS level requires that Vietnam rethinks the traditional barriers between different policy domains. A well-working new generation NSI requires that S&T policy, innovation policy, educational policy, industrial policy, and other policy domains (e.g., environmental, energy, urban development, and traffic) learn to work hand in hand to pursue shared overall high-level objectives. Traditional silos must be replaced by a system-oriented approach.