



Vietnam’s Innovation System: Toward a Product Innovation Ecosystem.

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1. Vietnam’s innovation system and new challenges

Structure of the R&D system in Vietnam

The structure and characteristics of the economy shape the kinds of knowledge, technologies and R&D activities needed to upgrade production capabilities. R&D activities are organized in research institutes of line ministries, two national research centers (now called as academies) devoted to natural and engineering sciences and social sciences and some universities. As depicted in Table 1, the bulk of R&D activities are conducted not in universities but in research institutes. There is very modest financing of R&D via the state budget: Vietnam spent less than 0.5% of its GDP on R&D in 2003 (Asian Productivity Association, 2003), whereas in most OECD countries and China around 2% of GDP is devoted to this purpose. Moreover, most publicly funded R&D is conducted in government research institutes. Only a limited number of university faculties have adequate resources for significant R&D. The research infrastructure is below international standards, and what research is being carried out tends to be theoretical, supply-driven, and not connected to the needs of the productive sector.

	Share in number of research projects (%)	Share in number of research projects (%)
Research Institutes	17	35
Universities	6.1	28

Source: NISTPASS. 2000.

Table 1. Contracts with enterprises per total projects and funding

The university system

According to Ministry of Education and Training, in 2000 Vietnam had 77 universities and 114 colleges, housing 160 institutes and research centers. Total teaching staff was 55,887, of which 35,938 were lecturers with university degrees and above. Expenditure for the R&D activities of universities is about 4% of total investment for national science and technology. Most Vietnamese universities are not perceived as centers of R&D excellence. They lack autonomous status, and despite the fact that their operations have been increasingly independent, they still receive many directives from above and operate under regulations of MOET. Concerning *human resources* for teaching, the number of professors and lecturers is inadequate given the number of students. Due to the overload of teaching, there is little time for staff to engage in research and technology development or other learning activities. Teaching staff in Vietnamese universities reflect a generalized problem of ageing throughout the science and technology system. The majority of full

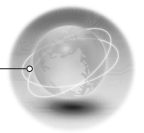
and associate professors are above 55 years old, and there are insufficient replacements in the pipeline. This is likely to lead to a generational gap in human resources of the university system in the near future. Notwithstanding isolated exceptions, there has been no entrepreneurial spirit among academics working in universities.

▮ *Firms and innovation*

Different types of firms exhibit different behaviour and extent of engagement with regard to innovation. The SME sector in general is weak and sources its R&D externally, relying little on R&D institutions and universities. Large corporations are in somewhat better position to do the same. FDI firms tend to rely on their home country R&D organizations. Taken as a whole, what this suggests is that there are few opportunities for Vietnamese R&D institutions and universities to play a significant role in helping firms, and even when they do, these activities involve mainly incremental and minor technical change. The linkages between universities, research institutes and enterprises in general, and between universities and firms in particular, still face many hurdles that undermine university attempts to better serve the needs of the local economies where universities are located. The view from firms, reflected in various surveys, confirms that there is a demand for technology and training services provided by R&D institutes and universities. However, the demand has been hardly met, and the extent of relationship of firms with universities is less than satisfactory. The contribution of R&D and training institutions in general and of universities in particular is below the desirable level.

▮ *Institutional framework*

The Law on Science and Technology promulgated in 2000 is served as backbone for the innovation in the country. In addition a range of many other regulations are in place. Still, there is shortcoming in supporting system for innovation with weak infrastructure for IPR, financial incentives and other mechanism conducive for innovation. Lack of macro incentive regimes has discouraged motivation and dynamism for staff in R&D institutions. There are little incentives encouraging them to interact with other institutions and the firms. Emerging issues of integration and globalization make firms having more demand for eco-sensitive products, for both export and local market. Concepts such as Ecodevelopment and Ecotechnology have been explored and promoted, not only for environmentally sensitive product in low tech areas, but even for high-tech productive activities (Uchida, 2005). When it comes to specific business activities or production areas, the notion/concept of innovation system and more recently innovation ecosystem (IBM concept, ...?) appear to be more comprehensive in helping to deal with complexity of innovation for the sake of competitiveness and sustainability. The globalization made producers more sensitive and fragile to external pressures of new standards and requirement of international markets. This felt even stronger for agro-based products coming from developing countries hoping to enter the high demanding market of industrialized countries. New international institutions like WTO certainly impose their imprints on innovation behaviour of actors and organisations in every economy.



2. Toward a product-based innovation ecosystem: case of tea, fruit and vegetable and shrimp production in Vietnam

The interim findings of a project on 'Market institutions for technology transfer to SME in Vietnam: the study of knowledge system in agro-based food processing industry' will serve as a test bed for innovation system concept in a specific context of developing country. This project look at innovation activities in three agricultural sectors/products, to examine the factors influencing creation and operation of the technology market institutions in terms of government policies, technology transfer models (S&T application models) implemented by different local organisations like R&D and extension institutions, universities, and activities of other actors such as foreign technology carriers in strengthening the competitiveness of SME in agro-industry.

As a core analytical framework, the concept of ten innovation functions (Edquist, 2005) has been examined in the context of three specific products of Vietnamese agriculture production: tea, fruit and vegetables and shrimp production. The ten innovation functions are:

- Provision of R&D
- Competence building
- Formation of new product markets
- Articulation of quality requirements: demand side
- Creating and changing organizations
- Networking
- Provision of institutions, laws, regulations
- Incubating
- Financing innovation
- Provision of consultancy

These ten innovation functions are examined for each of the product sector along the value chain of the production and business, ranging from R&D for seeds and species to planting, harvesting, packaging and sales. The innovation system related to these three products have been mapped and pointed out two key features: *Actors/organizations* of the innovation system and issues, problems in *institutions*.

Actors, and organisations in the innovation system under the examination are:

- Research institutes, centers, pilot units,
- University department, provincial universities, colleges, vocational schools
- Value chain organizations: shops, marketers, Associations of producers and exporters and other groups from private sector like VCCI; Collectives
- Government administration organisations such as Department of Science and Technology (DOST), Department of Agriculture and Rural Development (DARD), v.v.
- Government supported professional bodies: Standard and quality control organizations; National Office of Invention
- Law firms and other regulators: quality control, standards, safety and environment, etc. and IPR consultancy organizations

- Enterprises incubators
- Financial institutions like Agribank; Credit collectives; Private funders

Interim findings of the project pointed to institutional issues and problems in the institution such as:

- Lack of R&D, testing and training, incubating facilities
- Limited financial resources
- Weak research and training capacity; shortage of marketing skills, information
- Lack of will for change and inertia
- Lack of credibility and trust among financial institutions toward innovation
- Policy environment is not conducive sufficiently
- Innovative linkages are weak

Despite some commonalities among three product sectors, rate and patterns of innovation (both strength and weaknesses) contain also differences. Behavior of actors and organizations may seem similar among products, but impact of institutions may differ, even of the same regulations or policy. This calls for more specific 'treatment' of the innovation system from product to product. This is especially true for dealing with institutions like regulations, set of rules, and more broadly the overall policy environment for innovation.

3. From national innovation system to product-based innovation ecosystem.

The concept of innovation system is moving from national perspective to sectoral (Malerba, 2004), to corporate innovation system. It could be worthwhile to focus on a product and surrounding eco-environment of the innovation related to that particular product.

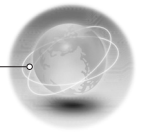
A product-based innovation ecosystem seems to work better at the specific level of particular product in the context of a sector like agriculture containing many kinds of products destined for different types of market (local and export) and users (high-end, medium and low end). In addition, the notion of 'eco' in the term innovation eco-system could reflect both the ecological aspect of the innovation for sustainability and the complete environment for innovation to take place. These product-based innovation ecosystems in fact contribute directly to the competitiveness and sustainability of development in general and a business in particular.

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