Vietnam's innovation system: toward a product innovation ecosystem

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Vietnam: basic data

- Population: 83.22 million (2005); Urban – 20%; Rural – 80%
- Land Area: 330,991 km2
- Regions: 64 Provinces
- Climate: Tropical and temperate
- Geography: Two major rivers (Red River and Mekong River); More than 3000km of coastline
- People: *Kinh* people – 87%; 53 ethnic minority groups – 13%, of which 90% are living in rural areas

The development context

- The economy is experiencing double transition: moving from centrally planned economy to market economy; from agricultural economy to industrial economy: shortcut industrialisation and modernisation
- Multiple challenges of globalization
- Achieving MDG (Millennium Development Goals)
- Favourable conditions: stable growth (6-7% GDP growth on average; 8.4% for 2005), large potential and existing system of organisations

S&T system transformation

Early reforms 1980s:

- Autonomy of R&D institutions: direct contracts with industry, operate like an enterprise.
- Increased flexibility to develop and provide a full range of services: technology transfer, consulting services, experimental and pilot manufacturing, etc.
- Financing diversification, retaining of profits and legal authority to seek bank credit.
- Privatization of R&D activities, legal framework: intellectual property rights.

R&D

- Two national centers for R&D: VAST and VASS
- R&D institutes under line ministries: industry, healthcare, agriculture, environment, etc.
- Some institutions under MOST: National Institute of Technology Application, Institute of Atomic Energy, etc.
- S&T programs and four techno-economic programs

Priorities and orientation

- One of the two key ingredients of Vietnam S&T development: high-tech development and reform of S&T management mechanism
- Priorities technologies by S&T Strategy until 2010: ICT, Biotech, Automation, Advanced material, New energy, Mechanical engineering, Environment technologies
- High-tech priorities by Government Action plan 2005-2010: ICT, Biotech, Automation, New Material and nano, Mechatronics

Finance for S&T

(Source: S&T in Vietnam Yearbook)

Year	State budget (bln. VND)	GDP %	State exp.budget %
2000	1,885	0.42	2
2001	2,322	0.48	2
2002	2,814.7	0.52	2
2003	3,180	0.52	2
2004	3,727	0.52	2

The university system

- Vietnam had 77 universities, 114 colleges, housing 160 institutes and research centers. Total teaching staff: 55,887
- University faculties: little research, overload of teaching
- Only a limited number of university faculties have adequate resources for significant R&D: about 4% of total investment
- Lack autonomous status

Firms and innovation

- Most are SME (80%)
- Most of innovation are minor/incremental changes
- Many SMEs innovated by importing embodied technology
- Technology transferred from MNCs of parent company
- Few cooperation with R&D organizations and other enterprises

Obstacles in conducting innovation

- Lack of technology information
- Do not know how to evaluate technology
- Lack of knowledge to select appropriate forms of external technology acquisition
- No experience in negotiation of technology transfer agreements
- Difficult to access capitals to implement technological innovation activities
- IPR issues

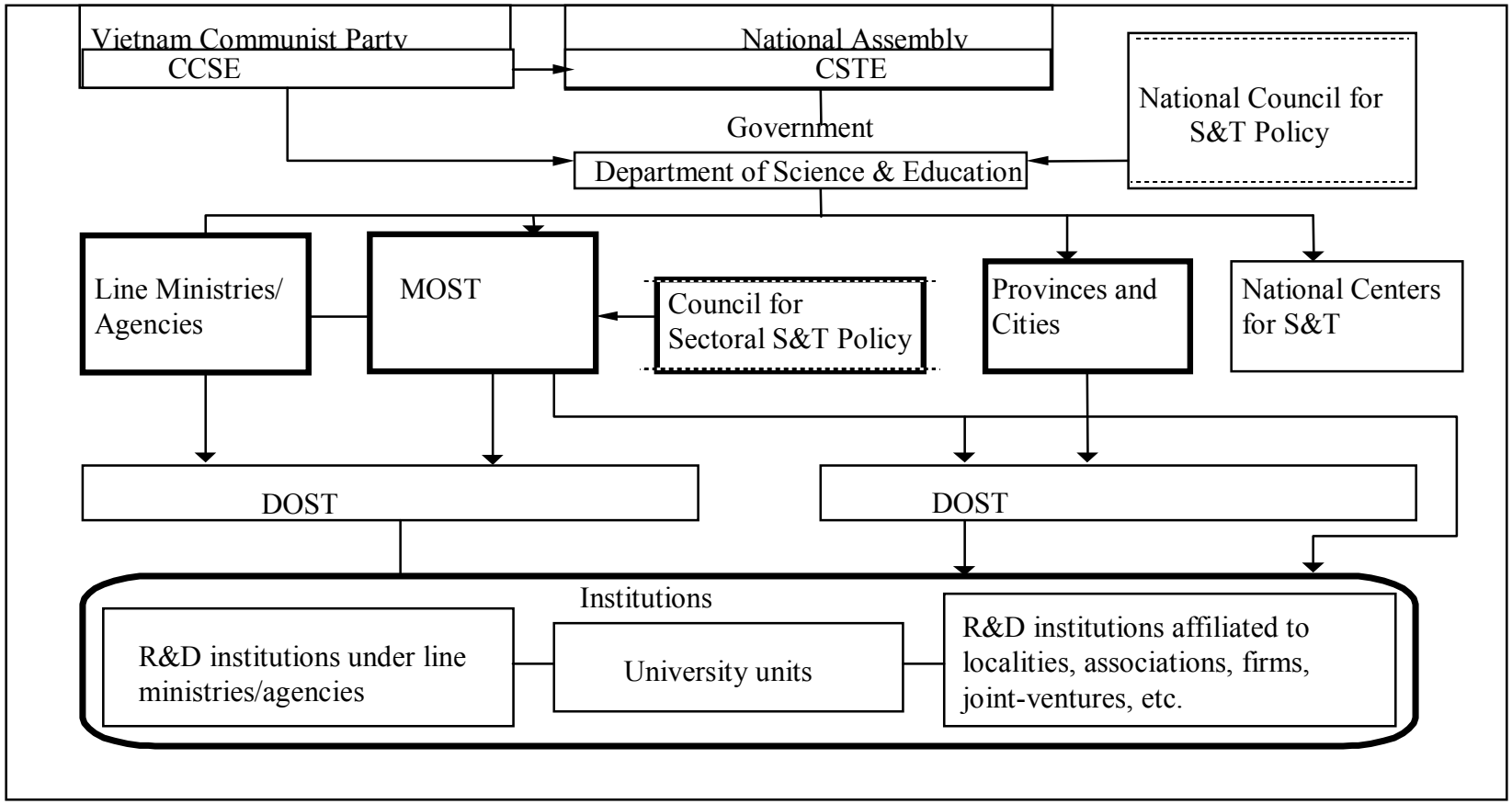
Sources of innovation
(Source: NISTPASS, 2005)

Sources of information	All activities (%)
Originated from the production processes (self learning)	89.7
Follow other enterprises (domestic/foreign)	36.2
Suggestions/requirements of customers	48.3
Suggestions of suppliers/contractors	10.3
Information from professional associations	10.3
Cooperation with research institutes	6.9
Cooperation with technical colleges/universities	5.2
Investigated or survey overseas	34.5
Provided by domestic consulting agencies	13.8
Provided by foreign consulting agencies	3.4
Participate in fairs/exhibitions	39.7

Institutional framework

- Ministry of Science and Technology: the focal point, state management body
- S&T Strategy to 2010
- Reforms of S&T management mechanisms
- Development of technology market
- International integration in S&T, etc.
- Law on S&T (2001)
- Law of IPR (2005)
- Law on Technology Transfer (2006)

National System of S&T in Vietnam



MOST: Ministry of S&T; DOST: Dept of S&T

SI in Vietnam: plus (1)

- Leadership commitments
- Build up and maintain a system of S&T personnel and institutions to carry our R&D activities
- Set up a system of supporting organizations for innovation: standardization, quality, IPR, information and libraries, consultancy, etc.
- Some contribution to the production activities (the impact is still debatable)

SI in Vietnam: plus (2)

- Some achievement in technology application (airlines, oil and gas, telecom, transport, textile-garment, banking, finance).
- Increase of investment for R&D and higher education
- 19 priority laboratories
- Two high-tech parks: Hoa Lac (North), HCMC (South)
- Other software parks

SI in Vietnam: minus (1)

- Numerous personnel, problems of qualification, structure and location. Generation gap: age, desire and capability
- Despite improvements, poor infrastructure
- S&T organizations: not structured reasonably, strong imbalance, lack of linkage
- Poor research quality, tends to be theoretical, supply-driven, and not connected to the needs of the productive sector, assessment process
- Weak internationalization: Isolation versus networking

SI in Vietnam: minus (2)

- Management needs flexibility; Autonomy: finance, human resources
- Capability of self-adjustment and respond to change almost non-existed
- Slow implementation of policies, confusion in orientation, weak coordination
- Underdeveloped market for technology

New requirement

- Long-term goals for modernization versus immediate need for poverty reduction
- Industrialization versus current agro-based rural development
- International integration versus interest of domestic productive enterprises
- New kind of capability and skills needed
- Examination of new setting

Ten innovation functions: background

- Project on ‘Market institutions for technology transfer to agro-based SME: cases of tea, fruit and shrimp production in Vietnam’
- Theoretical background: concept of NIS by Lundvall (1992), Nelson (1993), Edquist et al. (1997, 2005), sector innovation system (Malerba, 2004)
- Study of ten European and Asian economies on innovation system and functions (Edquist et al, 2006)

Ten innovation functions: four groups

- 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

1. Provision of R&D

- ***Actors/organizations***:
  - Tea research institutes (TRI), centers, pilot units,
  - Regional universities in provinces: Thai Nguyen, Xuan Mai
  - Some foreign organizations
- ***Issues/problems***:
  - Lack of R&D facilities/ financial resources;
  - Weak capacity of human resources

2. Competence building

- ***Actors/organizations***:
  - Regional universities: Thai Nguyen, Xuan Mai
  - Colleges, vocational schools and others
  - Firms' learning
- ***Issues/problems***:
  - Lack of training facilities/financial resources;
  - Inappropriate curriculum
  - Shortage of teachers: time, practical skills
  - Few skilled labor forces
  - Lack of organized learning within firms

3. Formation of new product markets

- ***Actors/organizations***:
  - Value chain organizations: shops, marketers,
  - Associations of producers and exporters
  - Government buyers via procurement, IPR actions: MOT, MOST
- ***Issues/problems***:
  - Lack of marketing skills, information
  - Lack of resources to develop new markets
  - Specificity of agro-based business and market development: more difficult to create market
  - Various actors (associations) → various degrees of innovation functions

4. Quality requirement

- ***Actors/organizations***:
  - MOT, MOST
  - Quality control organizations/STAMEQ
  - Law makers
- ***Issues/problems***:
  - Lack of testing facilities/financial resources;
  - Weak capacity of quality service providers
  - Demand for organic/clean products; pressure of import markets

5. Creating and changing organizations for innovation

- ***Actors/organizations***:
  - Ministry of Domestic Affairs
  - Law makers: Law of enterprises, investment, etc.
  - MOST: spin-off regulation 115; MARD
  - Private sector actors: associations, VCCI, etc.
  - Foreign buyers for tea, shrimp and vegetables
- ***Issues/problems***:
  - Lack of will for change; Inertia
  - Low productivity in agro-based business
  - Agribusiness is not a fast pace sector

6. Networking

- ***Actors/organizations***:
  - Association of tea producers/exporter; collectives
  - DOST, DARD, v.v.
  - VCCI
  - Local governments
- ***Issues/problems***:
  - Lack of facilities and resources
  - Lack of cooperation: trust and good will
  - Few intermediary actors, market is imperfect, government policies are even more necessary

7. Provision of institutions

- ***Actors/organizations***:
  - National Office of Invention, MOST
  - IPR consultancy organizations: Investip, Invenco, etc.
  - Law firms and other regulators: quality control, standards, safety and environment, etc. Reform of S&T, I management
- ***Issues/problems***:
  - Institutions: role of private sectors
  - Weak technology market
  - Corporate culture/norms, rules are weak

8. Incubating

- ***Actors/organizations***:
  - Incubators programs: university spin-off
  - MOST, DOST, local governments
  - EU projects
- ***Issues/problems***:
  - Incubators in agriculture not a common and developed concept: agro-hightech zones
  - Not conducive enough incentives for incubators, for SMEs

9. Financing innovation

- ***Actors/organizations***:
  - Agribank
  - Credit collectives
  - Private funders: loans from families and friends
- ***Issues/problems***:
  - Weakest function: lack of credibility and trust; discrimination for private sector (transitiponal mentality)
  - Lack of capability: financial analysist
  - No VC or Business Angels; banks are not helpful for innovation
  - Infant stock market

10. Provision of consultancy

- ***Actors/organizations***:
  - Associations: Vinatea, Vinafruit, VASEP, VCCI
  - Technical consultants from universities and R&D
  - Nacestid, MOST, DOST
- ***Issues/problems***:
  - Weak capability, quality for money
  - Mismatch of supply and demand
  - Government providers are weaker

Overall SI mapping (1)

- ‘One function, many actors’ or ‘One actor, many functions’
- Common actors and issues/problems for all product groups in a developing economy
- Specific features of transitional economy and Vietnam in particular; imperfect market mechanism

Overall SI mapping (2)

- Public innovation policy: private players are still weak, role of public organizations and institutions (government) is important
- Specific features of agro-based production, agriculture has different problems than others
- Globalization: foreign actors are important also in agro-business

Product-based SI

- Differences are observed among products
- Actors maybe the same but act differently toward products
- The same policies across agricultural sector, but different impact for various products
- Market factors and types of technologies are important in differentiation
- Need for more specific product-based innovation system?

Further implementation of innovation functions

- Autonomy for research: Decree 115 turning R&D into firm-type operation
- International expertise and cooperation: ASEAN, ASEM, APEC, bilateral, NGO, foreign firms, etc.
- Promoting networking and linkage
- Training and cooperating
- From centers of excellence to network of excellence: Millennium Science Initiative

Thank you

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