VIETNAM SCIENCE AND TECHNOLOGY POLICY: OPPORTUNITIES AND CHALLENGES

Editorial Board

Narration:

This paper was compiled from studies, discussions and exchanges of the National Institute for Science and Technology Policy and Strategy Studies. The paper pointed out the role of science and technology (S&T) in different stages of economic development, requirements for S&T policy, current orientations and policies, and clearly indicated opportunities, challenges for S&T policy development and the way to respond to challenges.

Keywords: *Science and technology policy; Policy reform; Policy enforcement.*

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1. Requirements for science and technology policy

According to the objective set in the socio-economic development strategy for the period 2011 - 2020, by 2020 Vietnam basically shall become an industrialized, modern technology oriented, rapid and sustainable development country, as well as an increasingly independent, autonomy economy in the context of increasingly intensive and extensive international integration. Resolution 20-NQ/TW dated 01st January 2012 of the sixth conference of the Party Central Committee, XI session, on S&T Development had set the goal of making S&T be a key driver for the country's fast, sustainable development and play a key role to create breakthrough development in productive forces, renew the growth model, improve competitive capacity of the economy, accelerate the industrialization and modernization process of the country. At the same time, by 2020 some S&T areas shall reach the modern, advanced level of ASEAN region and the world. Thus, both the socio-economic development goal and the S&T development objective require S&T policy to be, on the one hand, for socio-economic interests and improve S&T capacity of some selected areas, on the other.

In the present development stage, Vietnam's GDP in 2013 reached $1,960/capita. The target for 2020 shall increase up to $3,000/capita. According

to the classification of World Bank, Vietnam is now in the transition from resource based development to result based development[1] phase.

According to the World Economic Forum (WEF), in this period the role of S&T is expressed in two factors: *First,* technology readiness, meaning the capacity to adapt technology to enhance competitive and technological development capacity in order for creating a foundation for innovation of products and services. *Second,* scientist education and training, it means arising the passion for research; developing technology absorptive skills, mastering imported technology and developing endogenous technology; promoting collaborative research and development, linkage by cluster and network[2]. In this prospective, S&T needs to meet the requirement of both above two factors if it wishes to contribute to the achievement of socio-economic development objectives.

Thus, in terms of policy making, a good S&T policy must be the vehicle to meet the requirement of S&T objective for socio-economic development as well as for the development of S&T itself. It is easy to recognize that the greater expectation of the objective we set, the higher challenge will we meet in policy undertaking. Then, it is required that the policy set out should meet in terms of enough quantity, full category and harmonization among S&T policies.

S&T policy is a key driving force for socio-economic development, and in return, socio-economic development creates necessary and sufficient conditions to meet the requirement of S&T development.

2. Present science and technology directives, policies

With the above requirements, the major directives for S&T development policy were clearly defined in Resolution No. 20/NQ-TW, Law on S&T 2013. Recently, these policy directives have been specified and streamlined into policy solutions in legal documents applied in the area of S&T such as Law on S&T and 8 specialized laws (Law on Intellectual Property, Law on Technical Standards and Norms, Law on Metrology…). They have also been integrated into National Programs (such as National Technological Innovation Program up to 2020, National Program on High-tech Development up to 2020, and other national S&T programs). A number of other under-law

[1] Sources: World Bank

[2] Source: World Economic Forum, 2013

documents (decrees, circulars, joint circular, etc.) have also been issued. For 2013 and 2014, the Ministry of S&T has developed over 120 documents in response to the materialization of the prevailing S&T policies.

The policies being under development so far have touched upon many aspects of S&T activities, creating a foundation for the formation of a policy system sufficient in quantity and diversified in category in response to the set requirements. Accordingly, there is a real need to improve this policy system by consolidating its enforcement, increasing its effectiveness coupled with the organization of policy advocacy and dissemination, timely conducting monitoring and making adjustment in order for the policy implementation to be synchronized, focused, and put policies into life.

S&T policies can be divided into 2 groups:

- Group of policies to strengthen the link of S&T with economic activities making S&T become the driving force for socio-economic development, such as: policies to support and encourage the application of research results, technology transfer and S&T market development, promote the linkage between research institutes, universities and businesses;
- Group of policies to develop S&T potential so as to make S&T be strong enough and play a dynamic role, namely policies on financial investment for S&T, S&T human resource development, S&T institution development, S&T information, S&T infrastructure development, etc.

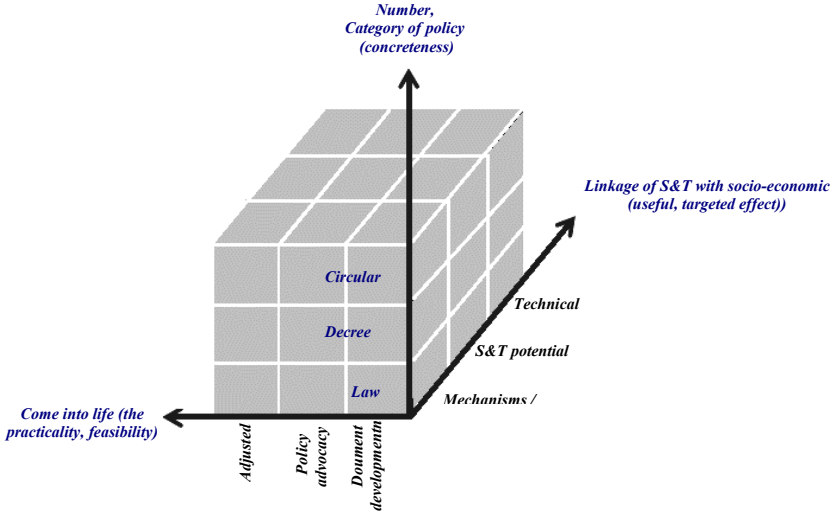

Figure 1. S&T policy in three dimensional correlations

When considering S&T policy in 3 dimensional correlations, it can be observed that despite of having foundation, S&T policy still needs to develop and be adjusted to meet the requirements of the new changing context. The question here is the need to "strengthen" directives and policies for S&T development so as that policies become useful (expressed in their cohesion with socio-economic), feasible (come into life) and specific, whereby special attention should be given to specific regulations, monitoring and adjustment so as to be close to reality for the purpose of socio-economic development.

3. Opportunities for scienc and technology policy

Opportunity plays a role as important impetus for favorable policy implementation with a view to promoting the existing policies, which look very reasonable but are difficult to implement because it is put under an unfavorable circumstance. In addition, some opportunities need to be seized in a timely manner, otherwise they will be missed out and very hard to reappear. For instance, spirit of scientists would be reduced if the Law on S&T was not materialized due to slow issuance of decrees, circulars guiding the enforcement. Policy in respect of diversified and socialized investment in S&T will be of failure if there is no specific, open provisions for businesses to excitedly make investment in S&T from their pre-tax revenue.

Taking opportunity right is not only for implementing existing policies but also to promote the development of new policies aiming at enhanced implementation of the current directives and policies; strengthening the participation of industry, society, scientific community in the policy development and implementation, proactively coordinating chances and creating new opportunities.

The opportunities which have been appeared to facilitate the implementation of current S&T development policies are as follows:

- *From the side of Party and State:* It is seen that there is a great determination, clear guidelines by the Party and State with respect to the national S&T development. In official documents, policies and directives of the Party and State, S&T has been recognized as a driving force of the country development;
- *From the economic aspect:* The stage of available natural resources based development was over and it is now moving to the stage of in-depth, competitive economic development. This new economic model places new requirements for S&T, but on the other hand, it provides a favorable condition for S&T development;

- *From the social aspect:* The society is getting more respects and appreciations to S&T and higher awareness of S&T. The role of policy is highly appreciated, society also requires improved quality of prevailing policies;
- *From the scientific community:* Innovation ideology in newly issued laws and policies was initially responded to the desire of scientists. Recent conclusion of the Politburo concerning the use, high appreciation of personnel working in S&T activities was also responsive to the aspiration of the scientific community, especially young scientists;
- *From the international integration requirement:* In parallel with the world trend of S&T policy reform, S&T is no longer stand-alone, it must be associated with innovation. In addition to placing focus on R&D, commercialization of research results is being a prerequisite for many countries. Furthermore, with the international support for socio-economic and S&T policy reform (e.g., FIRST, IPP project) there is a growing innovation trend enhanced in S&T of our country.

4. Challenges

4.1. Challenges for science and technology development policy

Challenges relate to increased gap between policy orientation and specific policy solutions, between policy advice and practical life, between policy objectives and policy implementation results. Experience shows that under or overestimation of these challenges can lead to failure. Therefore, it should recognize properly relevant challenges and bear in mind that challenges do not change the policy objectives but provide suggestions for us to consider the appropriate way to adjust policy.

Challenges do not change major policies or policy orientations but it requires us to consider to adjust specific policy solutions. Challenges do not alter strategic solutions but they can affect situational solutions. The question here is not only to be aware of challenges, but also the action to respond to challenges.

Challenges in S&T policy implementation can be classified into three groups: general challenges, challenges occurred in policy making process and challenges in the policy implementation.

4.1.1. General challenges

The biggest challenge is the way to create link between S&T and socio-economic development so as that it does not become a vicious circle of negative impact, but a circle of positive impact.

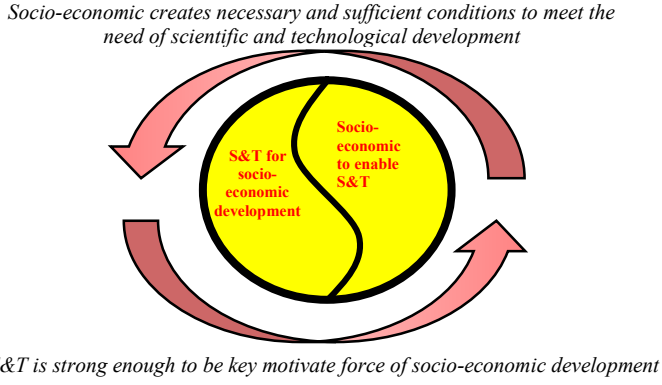

Figure 2. Relationship between S&T policy with socio-economic policy

In the positive effect circle, on the one hand, S&T is a driving force of socio-economic development by providing it with right arguments in socio-economic policy-making process and technological tools for socio-economic development. On the other hand, socio-economic will play the role as demand side of S&T and generate resources for S&T development.

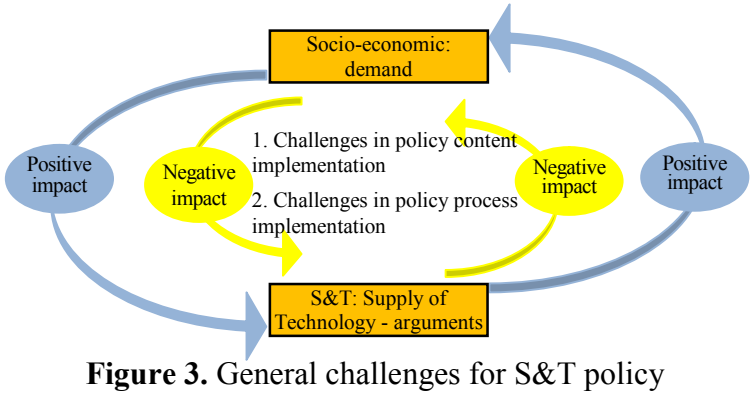

Figure 3. General challenges for S&T policy

4.1.2. Challenges in policy implementation

In reality, challenges always exist in the implementation of any policy, including S&T policy. The higher requirement it set for policies, the more challenges it get, challenges are often very specific for each type of policy. It is possible to point out some challenges in the implementation S&T policy, as follows:

a, *In relation to science and technology organization*

- Mechanism of autonomy and self-responsibility of public S&T institutions under Decree 115/2005/ND-CP

Autonomy, self-responsibility mechanism is a right policy. However, since the effectiveness of this Decree, its impact has still been very limited. There are different interpretations of autonomy and self-responsibility between policy makers and implementing organizations. The issue of harmonization of interest between organization and individuals has not yet been resolved. There still exists inertia of the system of S&T institutions during the transition from centralized administration to autonomy and self-responsibility mechanism. The S&T organizations themselves are also hampered by the inertia of the old system after a long period of operation in the state subsidy mechanism. An example, the Decree 115 issued in 2005 stipulated that after 4 years, i.e., by 2009, all S&T public organization should switch into the autonomy, self-responsibility, self-financed mechanism, but in reality, not so many organizations could dare to assume this "autonomy". In this context, the Government issued subsequently the Decree 96/2010/ND-CP whereby allowing to prolong the transition period until the end of 2013. It was expected as of 2014, all S&T public organizations shall complete their transition to the new mechanism.

- Restructuring the S&T institutions network

Restructuring of S&T system is limited due to its dependence on the demand and plan of socio-economic development. Benefits of restructured S&T institutions should be taken into account. The planning associated with the restructuring of public S&T organizations will encounter specific matters such as whether to adjust functions of ineffective public S&T organizations or merge or dissolve them. In reality, the system had undergone two large rearrangements of S&T institutions in 1992 (Decision No. 324-CT of President of the Council of Ministers dated 11th September 1992 regarding reorganization of the R&D institutions network) and in 1996 (Decision 782-TTg dated 24th October 1996 of Prime Minister on the rearrangement of R&D institutions), but the results obtained were not as expected. The Law on S&T promulgated in 2000 also referred to the issue of restructuring the national S&T system but after more than 10 years this directive has not been implemented yet.

b, With respect to science and technology manpower

- Remuneration for scientists corresponding to their contributions

Currently, there exist many problems in terms of wage/income of scientists compared to their actual contribution. In Vietnam, the wage regime applied for scientists as same as for officers working in administrative offices. Therefore, no preferential treatment is given to scientists, with only salary it

is not enough for them to reproduce labor power. It should be paid based on work productivity and efficiency. However, the adjustment of wages is a difficult problem in the current payroll system which is composed of levels and scales.

Many countries in the world have adopted special incentive policies to attract qualified experts. Typically, the Republic of Korea has since the 60s followed the policy of attracting Korean scientists working abroad to return and work at the Korea Institute of S&T (KIST) with salary 3 times higher than that of local professors, together with other preferences in respect of housing, investment. As a result, after only 40 years, KIST became one of the world's top 10 institutes and Republic of Korea also became the most successful industrialized country. Shall Vietnam be able to use this approach of Republic of Korea?

- *Rights of the leading scientists in performing S&T tasks*

Rights of leading scientists seem a natural matter in the world. In our country today, the culture of missing cooperation, lack of respect on scientist qualification as well as the unequal, non-transparent mechanism, and negative assessments on S&T manpower has led to lack of trust on scientists.

c, With regard to investment and finance for science and technology

- *Socialization of investment for S&T from businesses*

Socialization of investment for S&T will increase the competitiveness of businesses by S&T. However, at present even businesses with foreign investment are not so interested in making investment in research. On the other hand, the majority of medium and small scale enterprises with low total before tax revenue, it is difficult for them to build up capital accumulation capacity for technology innovation. Furthermore, very few businesses could access to and enjoy the support and incentive policies and programs of the government.

As a consequence, after 5 years of implementation of the Law on Corporate Income Tax, investment by business sector in S&T has not been improved compared to the past performance.

- *Simplification of administrative procedures in payment and final financial clearance*

It should resolve the contradiction between simplifying procedures and ensuring effective control of the use of state budget. Although package

funding has been applied under Joint Circular No. 93/2006/TTLT/BTC-BKHCN, the actual control of budget spending is still based on the approved estimates. Scientists wish to receive an advance or settlement of final payment in an easier manner but they must comply with the approved estimates. When there is fluctuation in price or necessary revision in research content, the approval procedure by competent authorities is very time consuming and complicated. So it makes scientists instead of applying for approval try to legalize supporting documents to match up with the approved estimates.

d, In respect of science and technology Market

- Commercialization of the results of scientific research and technological development

Current policies on commercialization of R&D results still encounter many challenges. The need of competition by technology is not high. Over 90% of Vietnamese enterprises has legal capital below VND 10 billion, are of small-scale, simple production process, financially restricted, leading to difficult association. The majority of small and medium scale businesses in Vietnam has not participated in the value chain of global production, their level of STI capacity is still low. Furthermore, they have not paid adequate attention to financing mechanism to make investment in scientific research and technological innovation, technology price appraisal, etc.

With the present scale of operation, there are not much need of Vietnam enterprises on technology and technological innovation, this really hinders the commercialization of R&D results.

- With regard to intermediary organizations

Low responsive capacity of S&T organizations and lack of intermediary system to link demand and supply sides in technology market. Although the directive of linking R&D organizations with enterprises has been emphasized in several legal documents but in reality there exists a certain gap between research orientation of S&T organizations and technology needs of enterprises. Internal capacity of S&T institutions is restricted by many factors such as poor facilities and equipment, lack of highly qualified personnel, low technological decoding capacity, etc. These weaknesses could not meet the technology need of enterprises. The number of enterprises operating in the field of S&T is very limited. The number of scientists and professionals working in enterprises accounted for only 0.025% of the total workforce in the S&T area.

e, As concerned international integration

- Cooperation with foreign scientific and technological institutions

Research and collaboration capacity of S&T institutions in the country is limited. Personnel working in the system of R&D are restricted in terms of update modern knowledge and lack of knowledge on science.

Basically, Vietnam scientific personnel can very well realize function as researcher provided they work in scientific groups abroad. It is impossible for such a capacity to work effectively under the present condition of management and organization in the country.

- Attracting foreign experts

Conditions and working environment does not ensure for foreign experts to bring into full wing of their talent.

f, Regarding social perception

The coordination between agencies at different levels has not been tight yet. The promotion of the role of S&T in our country has been received attention through historical development stages, from the Third Congress of the Party (1976), Fifth Congress (in July 1994), Eighth Congress (in June 1996), and the most recent Eleventh Congress in 2011. In all these directive documents, the slogan "S&T along with Education and Training is the top national policy, the foundation and impetus for industrialization and modernization of the country" is always mentioned, even repeated in the national and international very changing context over the period of last 40 years. This partly reflects the embarrassment in taking specific actions to implement this consistent policy. The coordination between agencies concerned in policy advocacy to raise the interest of people, especially of the business sector in S&T activities is still limited.

The dedication of young people to S&T is not high. Today, the percentage of students enrolled in engineering sciences, high-tech industries is still low. In addition, the number of outstanding graduated students who wish to join research organizations is not high due to less attractive remuneration, inappropriate working conditions for them to satisfy the needs of their living and passion as young generation.

4.1.3. Challenges in policy implementation process

a, Challenges in policy development and policy issuance

- Limited scientific basis for policy design and issuance

Policy formulation has mainly been based on top-down approach, expressing the will and aspiration and sometimes the order of policy making agency rather than from practical requirements. Furthermore, the majority of studies for policy design has constraints in terms of time and methodology. The current policy-making exercise exposes a lot of restrictions, it is mostly of "vegetarian academy", little evidence-based or sample policy model study.

- *Policy making process without the participation of all stakeholders, including policy beneficiaries*

The involvement of stakeholders is still formal to satisfy a necessary administrative procedure to mainly get comments of ministries and management agencies concerned. If there is no conflict to interest of the consulted ministries and agencies the policy in question will be supported. Innovation policy is closely associated with businesses as policy implementation agents and beneficiaries, but the involvement and role of businesses in the process of policy making is very limited. In addition, the feasibility of policies is not high. For example, in innovation policy for enterprises, Law on corporate income tax has allowed businesses to deduct 10% of before tax revenue to invest in technology innovation, S&T activities of their own. But in reality, it faces many difficulties to realize. Particularly, state funding is only 22VND, businesses funding 78VND, but the actual mechanism considers that all 100 VND must be managed as if they were of the state budget origin, making many difficulties to businesses. In market mechanism market, the business contribution accounts for three quarter, accordingly enterprises should have had a stronger decision on the use of this fund, but it was not the case in reality.

b, Challenges in policy implementation

Asynchrony, inconsistency between policies making makes the enforcement difficult or ineffective. For example: the self-protection of specialized tax policies is inappropriate to S&T, coupled with the asynchrony in the specific guidelines leading to different interpretations and making it difficult to implement in practice.

The discrepancy between passion and ability of scientists to respond to the need of businesses makes policies be as expectations only or far from expectation. Currently, scientists are generally not much interested and have less pressure in commercialization of innovative research results as well as have low motivation to follow the study to an end. In addition, S&T organizations in Vietnam have not been so familiar with the

commercialization of research results. Many S&T institutions were established under the centrally planned economy whereby it entirely relied on bureaucratic and subsidy mechanism.

c, Challenges in policy evaluation

The policy assessment (prior to issuance of policy, in and post policy implementation) has not yet become a custom and obligation of management agency due to shortage of professional evaluation method, particularly for the external/independent evaluation; the formulation of policy models to perform monitoring and timely adjustment of the policy is not a routine practice; no mandatory requirement set up to evaluate policies as many countries undertake.

5. Suggested scenarios to respond to challenges

Following are suggested solutions to cope with challenges in implementing prevailing directives and policies for S&T development:

- *First,* to take challenges into consideration as influenced objects of policy: positive significance of challenges is the identification of additional issues need to be addressed; it should clearly define specific challenges. It needs to supplement additional policy objects in order to have more policy solutions;
- *Second,* adjust the way of policy making: better coordination between agencies of concern at different levels in the development and implementation of S&T policy; attract policy beneficiaries to actively participate in the S&T policy development and review; enhance pilot policies, establishment of policy models policies for complex issued; pay due attention to policy evaluation and adjustment;
- *Third,* improve the capacity of S&T policy making teams.

In summary, in order to expand the scope of effect of policies it should take opportunities and challenges of the policy into consideration, then it will move towards scenarios in which necessary measures will be taken to implement timely the policy in the right way to promote the expansion of the policy impact.

The question is not only the correct identification of problems and practical capacity, but also the definition of the time of implementation as well as the implementation methods, it will help strengthen the policy impact, thus the specific level of the policy will also be increased./.