

SOME DEVELOPMENT ORIENTATIONS OF SCIENCE, TECHNOLOGY AND INNOVATION IN VIETNAM'S SOCIO- ECONOMIC DEVELOPMENT PHASE 2021-2030

Hoang Minh¹, Nguyen Lan Anh

Vietnam Institute of Science, Technology and Innovation,

Abstract:

The development of Science, Technology and Innovation (STI) in Vietnam has always been interested and focused by the Party and the State, has been confirmed in many important documents such as the National Development Platform, the acts, resolutions of the Party,... Over the past years, the Party's lines and policies have oriented the development of the science and technology industry and through which STI have achieved remarkable achievements, contributing to the national socio-economic development. However, compared to the social expectation as well as the important mission of STI, Vietnam's STI has not really become a driving force to improve labour productivity, enhance competitiveness, and promote socio-economic development.

The article summarizes the major guidelines and orientations of the Party and State on the development of STI, it presents an overview of the contributions of STI to socio-economic development in our country in the past, then it introduces an overview of the domestic and international context affecting the development of STI in the future and introducing the contents of STI presented in the draft 10-year socio-economic development strategy for the period of 2021-2030 to submit to the 13th National Party Congress.

Keywords: Science-technology; Innovation; Socio-economic.

Code: 20101101

1. Large orientations and policies of the Party and the State for STI development

Many documents by the Party and the State have dealt with aspects of STI development, namely: National Development Guiding Platform in transition period to socialism; Resolution No. 20-NQ/TW on 1st November 2012 of science-technology (S&T) development for industrialization and modernization in context of socialist oriented economic development and international integration and Conclusions No. 50-KL/TW on 30th May 2019 on deciding the continuous realization of Resolution No. 20-NQ/TW; Strategies for socio-economic development, 2010-2020 period; Strategies for S&T development, 2011-2020 period and others. These documents by the Party and the State show well large guidelines and main policies for STI development, namely:

¹ Authors' contact email address: hoangminh.most@gmail.com

- S&T development is the national policy and considered as one of the most important driving forces for fast and sustainable socio-economic development of the country;

Many countries in the world, not only Vietnam, also consider S&T development as national leading policies. Investments for STI development play always important roles and are the prerequisites which give contributions to economic development, politico-social stability, enhancement of human development index and higher national mind-sets. This vision was confirmed in the 1992 Constitution and the Resolution of the Party Central Committee, VIII-th Session which always state the S&T Program as the leading national policy;

- Investment for STI human resources as the ones for sustainable development and enhancement of national mind-sets and strengths.

Human resources in general and high qualified workforces in particular (including STI ones) keep important roles for national development and are platforms for social progress, all the times. STI human resources are core forces for creation, diffusion and application of knowledge in practical life. As component for fast development of S&T revolutions, STI human resources become specifically important resources to create national forces. Investments for STI human resources keep the deciding roles for fast and sustainable development of the country;

- Priorities and focus of national resources for STI development and intensification of socialization of investment sources, particularly from business communities, for STI development.

Reserving the important roles of national leading policies for STI development, the State needs keeping priorities of all the resources for STI development. In addition to State resources, however, it is necessary to mobilize other social resources to enhance investment rates for STI development and pro-active initiatives of other actors to get involved into STI activities. Stimulation focus should be extended particularly for STI activities by enterprises for the future role of key forces for innovation and the centre role of the national innovation system (NIS);

- Renovations of STI activities and management mechanisms; development of S&T markets and extension of STI international cooperation.

Globally, the main streamlines of STI policies by the Party and the State are reflected in all aspects exhibiting the desire and determination for socio-economic development on background of STI development. These contents were stated consistently in documents related to STI development and socio-economic development in all central and local levels. They are also legal background for practical realization of these objectives and then lead to remarkable contributions for socio-economic development of the country.

2. Contributions of STI for recent socio-economic development in Vietnam

2.1. Main results

Recently, systems of legal regulations and STI development policies get increasingly improved and then offer more comfortable legal spaces for STI activities. Vietnam economy experiences strong development with clearly enhanced growth quality, labour productivity and credit extension. Economy gradually reduces dependence to exploitation of natural resources and orients to STI application, namely: (i) Value shares of high tech product exports increases from 19% by 2010 to about 50% by 2020 in total export values; (ii) Contributions of total factor productivity (TFP) increase from 33.6% averagely for 2011-2015 period to about 44.3% for 2016-2020 period; and (iii) Approximate GDP per capita rate is about VND58.5 million (USD2,587) (*Party Central Committee, 2020*). These figures show the gradual shift of growth models of Vietnam economy. There are important contributions of STI sectors for this development, particularly agriculture, industry, transport, construction, health care, banking, information and communication, tourism and etc. STI activities make contributions to assure national defence, security, natural disaster prevention, environment protection, climate change response and sustainable development.

National STI potentials get consolidated together with development tasks and objectives of each stage. High qualified S&T workforces are promoting their roles for development of certain key sectors of the country.

Innovation and innovative start-up get promoted and propagate largely. STI investments from private sectors get intensified. The private sector plays increasing important roles in efforts to enhance national STI potentials. The ratio between STI investments from State budgets and non-State-budget sources varies with gradually increasing trends of investments from private sources of business sectors and reducing trends of investments from State budgets. The national start-up eco-system gets formed and gives contributions to innovation activities in economic activities (*Party Central Department for Propaganda-Education, 2018; Ministry of Science and Technology, 2019*).

S&T market started initial steps to link STI activities with production-business activities. Technology transfer promotion activities such as Techmart, Techdemo and others get implemented. Systems of technical standards and activities of protection and enforcement of IP rights gradually meet requirements of development and international integration and orient intensively to improvement of trade environments for enterprises. International cooperation develops positive moves making contributions to enhance quality of activities of scientific research, technology transfer and training of high qualified human resources (*Party Central Department for Propaganda-Education, 2018; Ministry of Science and Technology, 2019*).

The objectives as stated in Resolution No. 20-NQ/TW and Strategies for S&T development, 2011-2020 period, basically were achieved. In the group of lower-middle income countries, Vietnam is making efforts to get up to the leading ranks in terms of STI level. In the 2020 Global Innovation Index (GII) rating, Vietnam is 42nd ranked among 131 countries/economies and maintains well the achieved position. In comparison to 2019, Vietnam GII gets numerous positive results with improvement in development rate of business, general infrastructure and innovation outputs (innovative products advance up by 9 ranks in comparison to 2019). A report by WIPO shows the countries ranked higher than Vietnam in the 2020 GII rating are developed countries/economies with high income level. Among 29 countries with lower-middle income level listed in the 2020 GII rating, Vietnam always holds the leading position. Among the 10 ASEAN countries Vietnam maintains the third position, behind Singapore and Malaysia. The most remarkable progress is made in innovative linking activities with a better position in the Institute-University-Business index (10 ranks up from 74th rank to 65th rank), the industrial cluster index (32 ranks up from 74th rank to 42nd rank) and the knowledge absorption index (13 ranks up in comparison to 2019) (*Ministry of Science and Technology*). The group of knowledge-technology indexes of Vietnam has high ranks which are especially important roles for higher TFP and, at the same time, reflect the substantial moves of growth model transforming and economic-restructuring process toward modern and sustainable orientations.

2.2. Analysis of shortages and causes

a) Shortages

There exist certain shortages in STI activities. With a global view, the national STI level of Vietnam remains far from the leading ASEAN countries. STI activities do not make yet large and deep shifts in transformation to productivity-based growth models, clear contributions for enhancement of productivity, quality, efficiency and competitiveness of economic activities, and close links of STI activities for development of sectors and localities (*Party Central Department for Propaganda-Education, 2018; Party Central Committee, 2020*).

Research institutes and universities do not have capabilities to meet demands from social communities and enterprises. Universities are not strong research actors and lack international class research facilities, strong research teams and leading experts (*Party Central Department for Propaganda-Education, 2018; Ministry of Science and Technology, 2019*). As shown by MOST statistic figures, by 2017, Vietnam has averagely 7.02 researcher per 10,000 habitants (*Ministry of Science and Technology, 2019*) which is much lower than the 2016 figures of some countries in Asia region such as Korea (71.1), Japan (52.1), China (12.1), Singapore (66.8), Thailand (12.1) and Malaysia (22.7 by 2015) (*Ministry of*

Science and Technology, 2019). Despite of having numerous S&T personnel with Doctor and Master of Science grades, Vietnam still experiences lack of leading experts and general architects with full capabilities to lead important S&T tasks of national and international scale. From financial investment view, the GDP shares for S&T sectors in Vietnam were 0.39% by 2013, 0.35% by 2014 and 0.41% by 2015 which are much lower than the ones of some regional countries (by 2015, 2% of China, 1.3% of Malaysia and 2.2% of Singapore). Also, for 2011-2016 period, in the total expenditures for S&T sectors, the shares for operational tertiary sectors were 56% and the remaining shares of 44% were made for development investment (*Ministry of Science and Technology, 2019*).

Enterprises do not exhibit the central and deciding roles for innovation. Globally there are not so many enterprises to conduct innovation activities, particularly for products or procedures. Some deeper analysis can be provided as follows. Large and JV enterprises do more innovation activities than SMEs. As shown by innovation surveys conducted by National Agency for Science and Technology Information (2017), large and export companies have trends to make more efforts for innovation which is seen in all the innovation output indicators. From geographical location views, Hanoi based enterprises make more product innovations than the ones in Da Nang and Hochiminh City. From economic sector status views, 59% of State own enterprises do innovations of products or procedures, the corresponding figures are 51% for FDI enterprises and 48% for local non-State own enterprises. The fact is explained by difference in gained supports for access to capital sources and high quality human resources. From scale views, 44% of small size enterprises do innovations of products or procedures which are lower than the figure of 54% for medium size enterprises and 60% for large size enterprises. Globally, the capabilities of technological absorption and application are low in groups of large leading enterprises, SMEs, S&T enterprises and innovative start-ups. Only some sectors have high speed of requirement meeting technological renovations such as information-communication, oil and gas, air traffics and finance-banking sectors while many enterprises in other sectors still operate with out-dated technologies, even in comparison to world middle levels. The transfer of high level and competitive technologies from FDI enterprises to local ones remains limited yet. Vietnam NIS is still in initial formation stages with many components and links between them getting gradually improved (*Party Central Department for Propaganda-Education, 2018; Ministry of Science and Technology, 2019*).

Some documents (*Party Central Department for Propaganda-Education, 2018; Ministry of Science and Technology, 2019*) also remark other shortages such as: operations of investment and finance mechanisms in STI activities are not effective; budget allocation mechanisms are not reasonably set up; social mobilization of non-State budget sources for STI activities are not carried out

well; infrastructure for STI activities remains limited and not integrated; information systems do not meet requirements of quality, systematic structure and reliability of information sources; international cooperation does not provide in-depth and focused activities without paying attentions to transfer, absorption and mastering of technologies.

Globally, the above noted shortages show package of organically and global connections to bind STI development with socio-economic development which are observed not only in national scale but also in sectors, fields and localities. STI activities seemingly are seen as operating by side with social-economic activities but not really get involved into and keep pace with them for expectation to become crucial tools for development of socio-economic sectors.

b) Causes

Many causes, both objective and subjective, are indicated as leading to these shortages of contribution of STI activities for socio-economic development. Causes also come from shortage of integrating linkages, through-out steering lines, feasibility and low implementation operation rates of some guiding documents. Some of them can be listed under here.

First, contents noted in STI guiding line documents are still low integrated, even certain of them are of formalistic indications without being bound to main objectives and indexes of socio-economic sectors and localities. They, when being implemented, have no concrete scopes and objectives of actions leading to difficulties in interpretation of guiding documents;

Second, there exist discrepancies in compatibility and integrity between documents governing different fields. Many legal documents in investment and finance field are disintegrated with the ones of STI fields. For example, Law on Science and Technology, Law on Technology Transfer and Law on Intellectual Property govern activities in STI field but some articles in Law on Export Taxes, Law on Import Taxes, Law on Corporate Incomes and some other regulations have trends to reduce powers of STI related laws and then reduce their propagation actions and enforcement effectiveness for socio-economic development;

Third, some contents in governing documents are not found compatible with actual situations of the country and then require in-time amendments to meet new development trends. Typically, for example, saturated states of traditional growth modes, new development objectives of Vietnam to escape middle income traps, the world trends of Revolution 4.0 development, new FTA generation and orientations of Vietnam, USA-China trade wars, Covid 19 outbreaks and others set up new contexts which require high attentions for determination of STI development orientations of Vietnam. Necessary to note, the STI development of Vietnam is defined to be based on efficient mobilization of development trends of the world is the concretized “combination of national powers and contemporary era strengths”;

Fourth, practical activities for implementation of Party guidelines and State regulations still lack integrated solutions, effective control, supervision mechanisms and clear responsibility rules.

The causes related to guiding document aspects have been gradually indicated and correction measures are taken when the orientations for the next stage of STI development get defined for mobilization of sources and potentials for socio-economic development.

3. Some contexts affecting the orientations of STI development in Vietnam, 2021-2030 period

We are facing new development domestic and international contexts affecting directly the determination of new orientation of STI development within 10 years to come, namely:

- STI roles and positions for development of the country get more full and clear awareness by the Party and the State (*Party Central Department for Propaganda-Education, 2018*). It is the favourable condition for practical implementation of the defined orientation for STI development;
- Requirements are raised to bind STI development to economic development, social progress and equity, effective environment protection and higher efficiency of State administration activities for sustainable development of the country (*Party Central Economic Department, 2019*);
- Revolution 4.0 opens not only new opportunities but also identifies new challenges toward contributions of STI activities for socio-economic development (*National Agency for Science and Technology Information, 2016*). This new context requires Vietnam to take proactive measures for maximal use of opportunities and prepare solutions to overcome these new challenges;
- New orientations of STI development are taken, when facing tougher competitions, as solutions and driving forces for global socio-economic development with the center roles being defined for enterprises in NIS (*Party Central Committee, 2020*);
- STI achievements made during 2011-2020 period are favourable for strong and effective promotion of links between STI development and socio-economic development of the country where STI demands from sectors, localities and enterprise communities get increasing highly;
- Participation of Vietnam in FTAs and CPTPP would offer new opportunities to get more external STI sources for socio-economic development of the country;
- Many opportunities and challenges rising from USA-China trade tensions would affect economic development of Vietnam in coming time;

- Covid 19 outbreaks require Vietnam to take proactive measures to respond the development and overcome consequences;
- Objectives of industrialization, modernization and becoming basically a modern oriented industrial country are defined as to be achieved by 2030 (*Resolution No. 23/NQ/TW on 22nd March 2018*).

4. Some orientations of science-technology-innovation development in Draft Strategies for socio-economic development, 2021-2030 period, submitted to the XIII-th Party Congress.

The Strategies for socio-economic development, 2021-2030 period (called afterward the Strategies) are doing a large collection of views and comments from ministries, sectors, localities and individuals. It is the important document to be submitted to the XIII-th Party Congress. As shown in the Draft Strategies, STI contents, particularly in relation to socio-economic development, are presented in integrated, systematic and consistent ways. The document plays legal background roles for implementation of other related contents afterwards. STI contents are presented as follows (*Party Central Committee, 2020*) as follows.

4.1. Global visions

STI is emphasized as background for fast and sustainable development of the country, namely: *“Raising aspirations for development of the country, stronger promotion of Vietnamese culture and personality values and strengths of contemporary eras, mobilization of all resources for fast and sustainable development on STI basis for becoming a developing country with modern industries and upper-middle income level by 2030 and a developed country with high income level by 2045”*.

4.2. View stands for development

STI development is noted in 3 of 5 main views of the Strategies, namely:

- Fast and sustainable development based mainly on STI and digital translation. It is necessary to change mind-sets and actions, catch up and use effectively all opportunities from Revolution 4.0 and advances from international integration for re-structuring moves of economy, digital economy development, digital society, enhancement of productivity, quality, efficiency and competitiveness (View stand 1);
- Legal systems for innovation promotion, digital translation and development of new products, services and economic models (View stand 2);
- Construction of independent and self-governance economy on basis of mastering technologies (View stand 3).

4.3. Strategic objectives

STI is noted in global objectives and main indexes of the Strategies as follows:

- Economy to develop dynamically, fast and sustainably, in independent and self-governance ways and on science-technology-innovation basis (Global visions);
- Higher contributions from TFP for growth rate (up to 50%) (Main objective);
- Higher growth rate of social productivity (over 6.5% per year) (Main index).

4.4. Strategic breakthroughs

STI is defined as the contents of strategic breakthrough moves together with improvement and enhancement of institutional quality, global development of human resources, promotion of Vietnamese culture and personality values, completion of socio-economic infrastructure systems. In the Strategies, the strategic breakthroughs are noted as the second group of actions, namely:

- Keeping on global development of STI human resources bound with raising aspirations for development of the country, national pride, self-rising wills and mobilization of Vietnamese culture and personality values;
- Developing strongly STI and digital translation for making breakthroughs in productivity, quality, efficiency and competitiveness;
- Providing specific and advantageous institutions, mechanisms and policies for promotion of application and technology transfer activities;
- Enhancing research capabilities towards mastering new technologies;
- Putting enterprises into center of R&D activities, application and transfer of technologies, particularly digital technologies;
- Developing NIS and innovative start-up ecosystems.

4.5. Orientations, tasks and solutions for socio-economic development

While confirming important roles of STI for socio-economic development, and enhancement of productivity, quality, efficiency and competitiveness of national economy, the Strategies put high attentions for orientations, tasks and solutions for STI activities to the second position among 10 groups of orientations, tasks and solutions for socio-economic development. Orientations, tasks and solutions for STI development are indicated for many aspects, namely: institutional renovation, center position of enterprises in STI development, integrated development of STI sectors, renovation of S&T programs, promotion of investment, development of S&T human resources and markets, international cooperation and higher roles of sectors. Some concrete measures are listed as follows:

- Focusing efforts for: (i) Development of institutional systems, policies and legal regulations in conformity to market mechanisms and international practice for S&T development; (ii) Removal of barriers in terms of economic and financial rules and policies for STI activities; (iii) Mechanisms for trial of new policies for promotion of implementation and application of new technologies, innovation and new business models;
- Developing strongly social sciences and humanities in close binding with natural and technological sciences;
- Re-structuring S&T programs and tasks in close binding with social needs, value chains and higher added values;
- Enhancing STI potentials;
- Making STI as main driving forces for economic development;
- Developing and enhancing efficiency of activities of NIS, innovative start-up ecosystems with putting enterprises in center of activities and promoting development of new business models, digital society and digital economy;
- Making efforts to achieve, by 2030, the rate 40% of enterprises to conduct innovation activities;
- Enhancing capabilities of absorbing, mastering and renovating technologies of enterprises;
- Focusing efforts for development of priority technologies with high applicability, particularly digital technologies, biotechnologies, artificial intelligence, mechatronics, automation, bio-medical electronics, energy and environment;
- Enhancing efforts for protection and enforcement of intellectual property rights;
- Extending and upgrading systems of standards and norms in harmonic compatibility with international ones;
- Defining clearly indicators and programs of action for STI application and development in all aspects and all levels;
- Renovating mechanisms of STI activities and management works;
- Developing strongly S&T markets in close binding with development of national S&T database;
- Promoting strongly international cooperation and integration activities.

5. Remarkable STI aspections in the Draft Strategies for socio-economic development, 2021-2030 period

Main contents relating to STI in the Draft Strategies for socio-economic development, 2021-2030 period reflect well efforts for legacy inheritance, development of existing documents as well as reduced impacts of their limitations, taking new domestic and international contexts in consideration, namely:

- STI contents are noted in systematic and integrated manners in all sections of the Draft Strategies from main lines, development view platforms, strategic objectives, strategic breakthrough moves down to orientations, tasks and solutions for socio-economic development;
- Developing close links between STI. Innovations as bridges for connection with socio-economic activities where S&T activities can make breakthroughs for higher productivity, quality, efficiency and competitiveness of national economy and the center position for socio-economic development belongs to enterprises;
- Emphasizing the roles of integrated links between sectors of S&T and social sciences and humanities;
- Concretizing aspects and actions of STI service for socio-economic development;
- Putting enterprises into center of NIS;
- Removing institutional barriers for promotion of STI service for socio-economic development, particularly the ones for removing obstacles from mechanisms, economic policies, investment and trade rules.
- Emphasizing the setup of advanced institutions with acceptance of risks in STI activities;
- Keeping high awareness for proactive roles of all sectors and levels in STI development and promotion of STI service for socio-economic development.

6. Conclusion

As determined by the above indicated objectives, Vietnam will become, by 2030, a modern oriented industrial country in the upper group of high-middle income countries, and, by 2045, a modern industrial country with high income level. With these objectives, the previous growth model based on capitals and labours would not be appropriate longer due to their low remaining development margins, slowing-down trends, eventual risks of middle income traps and larger lag gaps. The previous growth model also would not be appropriate longer since Vietnam has moved to a higher level with better indicators of productivity and quality of national economy and keeps pace with Revolution 4.0 moves where digital economy has become one of the main development trends of the contemporary time.

The Draft Strategies for socio-economic development, 2021-2030 period submitted to the XIII-th Party Congress confirm the new economic growth model in the new stage to be based on STI sectors. Many STI activities should be implemented in practice. They are the background to keep on concretization of Party and State leading lines and policies in the coming time. They are also tasks, responsibilities, challenges and opportunities for STI development as well as background for contributions of STI activities for fast and sustainable

socio-economic development to lead our country to the rank of developed countries in the region and in the world./.

REFERENCES

1. Party Central Committee, (2020). “*Draft Summary Report of implementation of the Strategies of socio-economic development, 2011-2020 period and building the Strategies of socio-economic development, 2021-2030 period*” (Draft as made by October 2020).
2. Party Central Economic Department, (2019). “*Theoretical background and practical implementation of global, sustainable and innovative development*”. Workshop proceeding, Hanoi, March 2019.
3. Party Central Department for Propaganda-Education, (2018). “*Primary Report of 5 years of realization of Resolution No. 20-NQ/TW on 1 November 2012 by the Party Central Committee, Session XI on S&T development for industrialization and modernization in context of socialist oriented market economy and international integration*”. Hanoi, August 2018.
4. Ministry of Science and Technology, (2012). “*S&T development for industrialization, modernization and sustainable development*”. Hanoi, National Political Publishing House.
5. Ministry of Science and Technology, (2018, 2019). *Vietnam Science-Technology*. Hanoi, Science and Technics Publishing House.
6. Ministry of Science and Technology, (2018, 2019). “*Report of S&T activities*”.
7. National Agency for Science and Technology Information, (2016). “Industrial Revolution 4.0”. *Review of science, technology and economics*, No. 8, 2016.
8. National Agency for Science and Technology Information, (2017). “Global trends affecting STI”. *Review of science, technology and economics*, No. 4, 2017.
9. National Agency for Science and Technology Information, (2019). “Innovation policies in digital times”. *Review of science, technology and economics*, No. 3, 2019.
10. Ministry of Science and Technology, (2020). “Report of 2020 GII and Vietnam status”. See 9 September 2020, <<https://www.most.gov.vn/vn/tin-tuc/18350/gioi-thieu-bao-caochi-so-gii-nam-2020-va-ket-qua-cua-viet-nam.aspx>>.
11. Phan Xuan Dung, (2018). *Fourth Industrial Revolution - a revolution of convergence and saving*. Hanoi, Science and Technics Publishing House.
12. Nguyen Xuan Phuc, (2019). “Making strategic breakthroughs in STI development in Vietnam”. See 17 May 2019. <<http://baochinhphu.vn/Cac-bai-phat-bieu-cua-Thu-tuong/Tao-dot-pha-chien-luoc-trong-phat-trien-KHCN-va-doi-moi-sang-tao-o-Viet-Nam/366116.vgp>>.
13. World Bank, OECD, (2014). “*Evaluation of STI in Vietnam*”.
14. World Bank, Vietnam Ministry of Planning and Investment, (2016). “Vietnam 2035 - Moving to prosperity, creativity, fairness and democracy”. Review Report.
15. Cameron A. *et al.*, (2020). “Moving to innovation based growth: Economic strategies helping Vietnam to become a high income country”. *Journal Science and Technology Policy and Management*. No. 2, 2020.
16. Cameron A., Pham. T. H., Atherton J., Nguyen D H., P., N. T., and Tran S T., (2019). *Vietnam's future digital economy - Towards 2030 and 2045*. Retrieved from Hanoi.