# INTERNATIONAL EXPERIENCE IN IMPLEMENTING AUTONOMY AND SELF-RESPONSIBILITY MECHANISMS FOR PUBLIC R&D ORGANIZATIONS

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***Summary:***

*Japan and the US represent a group of countries with advanced science and technology development, which have built and developed a research system with many achievements and outstanding contributions to the country's socio-economic development as well as science and technology. China is one of the countries that applies the Soviet model of organizing a research system. Recently, there have been many major and continuous reforms in the system and moved closer to the model of research organization system of the world's advanced countries. Based on the experience of implementing autonomy and self-responsibility mechanisms of public R&D organizations in these 3 countries, the authors have proposed some useful lessons for Vietnam in implementing autonomy and self-responsibility mechanisms for public R&D organizations in the coming time.*

***Keywords:*** *Science and Technology organization; R&D organization; Autonomy, Self-responsibility mechanism.*

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## 1. Some related terms

### *1.1. Science and technology organizations, research and development organizations*

According to UNESCO, *S&T organizations* are the organizational system including institutes and centers with the function of performing scientific research tasks; and experimental development, to draw scientific conclusions on different levels. They can be purely theoretical conclusions, but they can also be experimental conclusions, patterns of organizational and management solutions, or technical and technological solutions (in the field of technology) *(School of Science and Technology Management, 2016).*

Article 3, the Law on Science and Technology 2013 explains: A S&T organization is an organization whose main functions are scientific research, experimental research and development of technology, and S&T service activities, and is established and registered for its operations according to the provisions of law.

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A country's S&T organization system normally includes the following components: Scientific research and technological development (R&D) organization; University; and Organization of science and technology services. Many countries around the world, including Vietnam, have used the above definition of UNESCO to determine the number of S&T organizations.

An *R&D organization* is understood as a type of organization that carries out activities to produce science and technology products to serve the whole society (as a public benefit activity). Regardless of the economic sector, the subordinate level, or the field of Science and Technology, R&D organizations have the function of implementing one or more stages of the "research-production" cycle *(Ministry of Science and Technology, 2004).*

In the book "*Key Issues of Science and Technology Policy*" by Yd. HEMPTINE[2], R&D organizations are organizations that conduct scientific and technical activities on a regular and organized basis. Scientific and technical activities can be carried out by public or private R&D organizations. The term organization covers a wide spectrum of entities with legal status such as institutes, academies, universities, associations, centers, laboratories, etc.

R&D organizations are organized in the form of academies, institutes, centers, laboratories, research stations, monitoring stations, and testing stations with the main function of conducting scientific research and technology development activities.

### *1.2. Autonomy, self-responsibility*

#### *1.2.1. Autonomy*

According to the Vietnamese Dictionary (2016)[3], "Autonomy" is to operate and manage all one's work alone, without being influenced by anyone.

"Autonomy" means to operate and manage all one's affairs without being influenced by anyone.

*"Autonomy"* is understood as the **right** of science and technology organizations to make their plans and find means to carry out science and technology activities *(Vu Cao Dam, 2017)*. Autonomy, semantically, can be understood as the right to independently plan and program activities for oneself and the right to independently seek funding sources and means to carry out those activities. Autonomy also refers to the right to make their own decisions without being influenced by the management system and external factors.

Regarding public S&T organizations, the developed countries have paid early attention to the issue of autonomy because it is consistent with the characteristics of S&T activities (freedom and creativity). Here, the aspects of autonomy are mainly

[2] Translated by Tran Duc Quang, Institute of Scientific Management, Hanoi, 1987.

[3] Vietnamese Dictionary (2016), Social Sciences Publishing House

autonomy rights in determining tasks and professional plans; financial independence; autonomy in human resources; and autonomy in using research results. Depending on the capacity development situation of S&T organizations, market demand for S&T organizations' products, as well as the views and policies of the state, autonomy rights are given to S&T organizations with different levels (complete autonomy or partial autonomy) *(Nguyen Vu, 2015).*

*1.2.2. Self-responsibility*

*"Self-responsibility"* is understood as the **constraints** and **commitment**s of responsibility of the S&T organization for the S&T activities that it has "autonomously" implemented. "Autonomy" is always associated with "self-responsibility" as a reason for existence, including the right to self-determination and being responsible for that self-determination right *(Vu Cao Dam, 2017).*

Thus, along with the granting of autonomy, state management agencies also require science and technology organizations to be responsible for their assigned rights. That is the right to explain to state management agencies about the effective use of investment resources and physical facilities that the state has assigned units to manage and use. Normally, countries periodically conduct public assessments of the activities of science and technology organizations so that science and technology organizations can explain their responsibility for using resources and the science and technology results achieved by organizations according to the level of assigned autonomy, and self-responsibility.

*1.2.3. Autonomy and self-responsibility for public science and technology organizations in Vietnam*

In Vietnam, the issue of autonomy and self-responsibility for public S&T organizations was first mentioned in Decision No. 171/2004/QD-TTg dated September 28, 2004, of the Prime Minister approving *the Project to reform the S&T management mechanism,* outlining the autonomy and self-responsibility mechanism for public S&T organizations as follows:

- Autonomy in science and technology activities;
- Autonomy in finance;
- Autonomy in human resource management;
- Autonomy in international cooperation.

These autonomy contents were later reiterated in several documents on the management of S&T organizations and activities such as Decree No. 54/2016/ND-CP dated June 14, 2016, of the Government regulating the autonomy mechanism of public science and technology organizations. In Decree No. 54/2016/ND-CP, the autonomy mechanism includes the following contents: Financial autonomy; Autonomy in performing tasks; Autonomy in organizational structure; Autonomy in personnel; Autonomy in management, and use of assets.

## 2. Autonomy and self-responsibility mechanism for public R&D organizations in Japan

In Japan, all activities of public R&D organizations are governed by the *Law on National Research and Development Institutes*. These are the units with basic research, applied research, and development research which are functioning under sectorial ministries. As of March 2019, the total number of R&D organizations under ministries is 27 organizations. Along with the university system, these public R&D organizations have a particularly important position in the national innovation system, where they directly create R&D results, cooperating with the industrial production sectors to offer science and technology products, and services that contribute to the development of the national economy and ensure social community benefits *(Ministry of Science and Technology, 2022).*

R&D organizations under ministries have been transformed into an independent and autonomous operating model according to the *Law on General Rules for Independent Administrative Organizations* since 2009 (amended and supplemented in 2014, effective from 2015). After that, these research organizations were reorganized and merged, resulting in a reduction from 31 research organizations in 2015 to 27 in April 2016. Since then, 27 research organizations under the Ministry have been classified as national R&D institutes, of which 3 institutes have been designated as special national R&D institutes, including the National Institute of Materials Science (NIMS), Institute of Physical and Chemical Research (RIKEN) and the National Institute of Advanced Industrial Sciences (AIST). The general mission of national R&D institutes is to carry out the functions of basic research, applied research, and development research, contributing to economic development, and ensuring public benefits of society depending on the industrial operations of each organization. The 3 organizations designated as special national R&D institutes, have a very important mission, serving as core organizations in promoting the production, dissemination, and use of world-class R&D achievements and in leading R&D innovation in Japan.

### *Operation model*

According to the *Law on General Rules for Independent Administrative Organizations*, 27 national research and development institutes operate under an autonomous and independent mechanism but are managed according to the medium and long-term science and technology orientation of the ministries, such as Cabinet Office (01), Ministry of Home Affairs and Communications (01), Ministry of Education, Culture, Sports, Science and Technology (8), Ministry of Health, Labor and Welfare (7), Ministry of Agriculture, Forestry and Fisheries (4), Ministry of Economy, Trade and Industry (2), Ministry of Land, Infrastructure, Transport and Tourism (3) and Ministry of Environment (1). Among these, 03 specially designated National R&D Institutes (including NISM, RIKEN, and AIST) are also subject to development goal orientation and performance evaluation from the National Science, Technology and Innovation Policy Council (CSTI) headed by the Prime Minister of Japan.

Besides the above 27 organizations, ministries still have many affiliated agencies called research institutes, which are not classified as national research and development institutes (performing one of three functions: basic research publications, applied research, and technology development research). These agencies also operate under the *General Law on independent, autonomous administrative agencies* and are managed according to the medium and long-term goals of the sectorial ministries (For example, the National Institute of Cultural Heritage under the Ministry of Education, Culture, Sports and Science and Technology; Institute of Labor Policy and Training under the Ministry of Health, Labor and Welfare; Institute for Commercial and Industrial Economics Research under the Ministry of Economy, Trade and Industry,...). In addition, in the organizational structure of some universities, there are also affiliated institutes and research centers that are not classified into the national research institute system. Universities operate under an independent administrative mechanism and have their autonomy, and their affiliated institutes and research centers largely perform research functions associated with the mission of the universities' sector which is basic research and partially applied research - in cooperation with the industrial sector. In addition to the public research institute system, institutes, and research centers belong to private technology corporations, mainly performing research and development functions to introduce new materials, equipment, products, systems, and processes,... or improvements to existing materials, equipment, products, systems, and processes to serve the innovation needs of businesses.

***Operational resources of public R&D organizations***

Funding sources from the Government for national R&D institutes include (1) Operating cost subsidies provided by the Government as a financial source for necessary costs to maintain operations. (2) Facility maintenance expense allowance is granted for expenses related to the maintenance of the institute's operational facilities. In particular, operating expense allowance is paid for research costs, and personnel costs including researchers and non-research staff. In addition to operating cost subsidies and facility maintenance subsidies, institutions also obtain additional funding through research missions from competitive research funds, which are awarded from appropriate research funding agencies, such as Japan Society for the Promotion of Science (JSPS), Japan Science and Technology Agency (JST), Japan Agency for Medical Research and Development (AMED), Industrial Technology and New Energy Development Organization (NEDO),... and funding from external collaborative sources such as contract research from the private sector, income from joint research activities, donation income,... In 2016, the proportion of funding from external cooperation became one of the indicators to evaluate the performance of national R&D institutes.

***Mechanism for evaluating and ranking public R&D organizations***

The Japanese Ministry of Internal Affairs and Communications guides the evaluation and ranks of the activities of national R&D institutes. Accordingly, there are 2 rounds of evaluation to be carried out: (1) The evaluation council under the specialized ministry conducts an annual evaluation, at the end of the medium-term

period (5-7 years) according to the criteria and objectives, set out and approved by the Minister for the operational orientation of each institute; (2) The evaluation council established by the Ministry of Internal Affairs and Communications will evaluate each institute annually, at the end of the medium-term period (5-7 years). Particularly, 3 special national research institutes are also subject to evaluation by the Evaluation Council of the Cabinet Office.

Evaluation opinions and recommendations are sent to Ministers of the specialized ministry for reviewing and adjustment for the investment plan in the next stage. Evaluation results include 5 levels:

- S: Achieve exceptionally excellent achievements or have the potential to achieve in the future;
- A: Not yet rated S but has achieved excellent performance or is likely to achieve it in the future;
- B: Standard level, with achievements or potential to create future achievements and the institute's professional activities are solid and stable;
- C: Further innovation and improvement is needed;
- D: There is a need for extensive innovation and improvement, including immediate changes.

**3. Autonomy and self-responsibility mechanism for public R&D organizations in the United States**

In the US, depending on their assigned functions and tasks, public R&D organizations will have specific missions and roles for each field of S&T, but they all share the mission of being key components of the public research system and primary tools for the State to promote S&T development, foster economic innovation, and protect the security and defense of the United States.. Public R&D organizations are invested by the State in research activities to create knowledge and develop new products and service designs as well as to build prototypes to prove their feasibility. Businesses can then use these prototypes to convert them into products or services that can be offered to the market, or into processes that can be used to produce commercial products and services *(Ministry of Science and Technology, 2022; Nguyen Thi Minh Hanh, 2014).*

In the United States, most basic research is performed at universities, laboratories, and federal public research institutes/centers. Therefore, R&D institutions at universities, laboratories, and federal public research institutes/centers are particularly important for innovation, as early-stage research there will expand the source of knowledge or create new knowledge, from which the private sector draws ideas and carries out innovation activities. Public R&D organizations along with universities also act as a hub for concentrating and reallocating resources for innovation as well as a place to create and promote innovation development, and new human resources and knowledge. In addition, public R&D organizations also act as a bridge between basic research and the application development and

commercialization of new technologies. The activities of public R&D organizations often play a leading role and are considered the main means of the State in converting R&D results into innovations and thereby realizing the economic benefits of public investment in R&D.

Thus, public research organizations along with universities in the US will have a common mission, which is to play the role of the main agents creating the origin of innovation as well as playing a leading role in converting R&D results into innovative products, realizing the economic benefits of public investment in R&D to promote socio-economic development and protect the country's security and defense.

***Operating model***

In the United States, the system of state management of science and technology is highly decentralized, the decision to establish and coordinate the management of activities of public R&D organizations is also very diverse and implemented by many agencies, from Congress and federal regulatory agencies to state and local governments, specifically as follows:

- The National Congress decided to approve the establishment of independent federal R&D organizations such as the National Science Foundation (NFS), the United States Aeronautics and Space Administration (NASA), and the United States Environmental Protection Agency (EPA),... these are considered the public R&D organizations and the coordination and management of these organizations' activities will be carried out by the Management Council of these organizations, but full authority is assigned to their director to operate and manage daily activities according to the plans and strategies approved by the management board;
- The National Congress also approved the establishment of several public R&D organizations under federal ministries and branches based on the President's proposal such as the National Institute of Standards and Technology (NIST) under the Ministry of Commerce, National Health Service (NIH) of the Department of Health and Human Services, Advanced Research Projects Agency (DARPA) of the United States Department of Defense, Advanced Research Projects Agency-Energy (ARPAE) of the Department of Energy, the Homeland Security Advanced Research Projects Agency (HSARPA) of the Department of Homeland Security, the Intelligence Advanced Research Projects Agency (IARPA) of the Office of the Director of National Intelligence,... The coordination and management of activities of the public research organizations in this group are carried out by the managing ministries and branches. However, the President and the National Congress still have the supreme authority to make decisions on coordinating and managing the activities of organizations of this type in case of necessity;
- The President can sign a decree establishing several independent public S&T organizations such as the United States Agency for International Development (USAID), and the United States Office of Global Change Research Program

(USGCRP),. .. and appoint the Board of Directors. The direct coordination and management of the activities of these research organizations will be carried out by the Board of Directors and periodically reported to the President according to regulations;

- Ministries and agencies under the federal government cabinet decide to establish public R&D organizations under the assigned management fields and branches, such as the Ministry of Agriculture with the Agricultural Research Service Agency (ARS), National Institute of Food and Agriculture (NIFA), Agricultural Economics Research Service (ERS), Forest Service Research and Development Authority,... Department of Health and Human Services has a Research and Healthcare (AHRQ), Biomedical Advanced Research and Development Authority (BARDA), National Institute for Occupational Safety and Health (NIOSH),... The Department of Defense has a Navy Research Authority, Missile Defense Systems Research Agency,... The Ministry of Education has the National Institute of Educational Sciences,... the Department of Energy has the National Oceanic and Atmospheric Administration (NOAA), the United States Geological Survey (USGS),... The management of activities of research organizations of this type is carried out by the managing ministry;
- States and local governments can decide to establish their affiliated public research organizations depending on requirements and authorize specialized departments to coordinate and manage the activities of these organizations. For example, New York State established 15 advanced technology centers and 13 centers of excellence, the State of California established the Institute for Regenerative Medicine, the Office of Digital Innovation, and the State of Texas established the Cancer Prevention Research Institute, the Institute of Genetic Medicine,...
- Federal independent R&D organizations or independent R&D organizations under federal ministries, branches as well as public universities can also decide to establish their affiliated public R&D organizations according to their assigned authority level and manage the activities of these organizations.

The types of activities of public research organizations in the United States are very diverse and currently exist mainly in the following types:

- *Administrative organization*: Some public research organizations in the United States are established and operate as administrative organizations. Research organizations of this type do not carry out any R&D activities but only perform the tasks of managing approved research programs, organizing the selection of units to preside over research topics, funding grants, monitoring, checking, and evaluating the results of R&D activities of sponsored research projects,... typically is the National Science Foundation (NFS);
- *Public service organizations under the Government*: Many public R&D organizations are established and operate as public service organizations under the National Congress and federal government agencies. These public research organizations directly carry out R&D activities to serve the governing agency

according to assigned functions and tasks, such as the Institute of Educational Sciences under the Ministry of Education. These public R&D organizations mainly perform R&D tasks for public purposes ordered by the State or the host agency or according to assigned functions and tasks;

- *Non-profit organizations*: Some public R&D organizations in the United States are established and operate as non-profit organizations such as research centers under USAID, or collaborative research centers between universities and industry funded by the National Science Foundation, etc. Public research organizations of this type are required to perform R&D tasks as ordered and under the direction of the funding federal agency.

Currently, public funding for US S&T activities is concentrated in several ministries, federal agencies, and independent research organizations depending on the assigned S&T management functions and tasks, most notably the Department of Defense, Department of Health and Human Services, and Department of Energy.

***Mechanism for management and supervision of public R&D organizations***

According to the current S&T management regime, public R&D organizations in the United States are decentralized and given a very high degree of autonomy and self-responsibility. Heads of public R&D organizations have almost complete authority to decide on all activities of their organizations according to assigned functions and tasks and according to annual plans and budgets approved by competent authorities. However, these decisions must ensure compliance with current relevant laws as well as the internal management regulations of the organizations and the superior management agency. A lot of federal ministries and agencies have established the Office of the Chief Scientist, the Department of Science, or an independent management unit to coordinate research activities of their affiliated public R&D organizations as well as manage the implementation of approved R&D programs, to ensure the most effective use of R&D resources and leverage the strengths of partners in the scientific community.

The management and supervision of activities of public R&D organizations are mainly based on annual plans or plans to implement assigned functions and tasks approved by competent authorities and evaluate implementation task results through annual reports.

Although the heads of public R&D organizations in the United States are given a very high degree of autonomy and self-determination, they must also bear great personal responsibility. The head of a public R&D organization if fails to manage and coordinate the activities of his/her unit well to complete assigned tasks, as well as commits errors in administration and violates the provisions of law may be forced to resign or be dismissed.

***Mechanism for evaluating and ranking R&D organizations***

Evaluating an R&D organization is a systematic analysis of the effectiveness of S&T activities, strengths, weaknesses and the benefits that the R&D organization brings to the socio-economy and national S&T. Regulatory bodies may use the

evaluation results to consider the continued investment, the rank of R&D organizations, to determine the ability to improve and maximize the benefits of R&D organizations to the society and economy. In addition, the evaluation also helps management agencies know whether funds allocated for science and technology activities of R&D organizations are used effectively or not, as well as whether the output results of public R&D organizations are equivalent and commensurate with the input resources and appropriate to the role, functions, and tasks of that organization or not.

The general principle of evaluating R&D organizations is that the evaluation must be appropriate and useful, of high quality and serious, based on appropriate designs and methods, ensuring independence and objectivity, ensuring transparency and reproducibility, operating to the highest ethical standards to protect the dignity, rights, safety, and privacy of stakeholders.

For R&D organizations, key and important indicators commonly used to evaluate outputs may include mobility of researchers, collaboration with partners, intellectual property and commercialization pathways, scientific publications, policy influence, development, or intervention to create new products. Two common methods used in evaluating R&D organizations are the method of using experts in the same industry (peer-review) and using the evaluation indicators system.

According to the current US S&T management regime, public R&D organizations will self-assess through annual reports the results of implementing assigned tasks according to functions and annual operating plans which have been approved by the direct superior governing body according to hierarchy, to provide an annual overview of the activities of the R&D organization. Then, the superior governing body will summarize and prepare a general assessment report of its unit and send the report to the governing ministry or branch. The relevant ministries and branches will compile annual evaluation reports and send them to the President and the National Congress according to regulations. At the same time, the annual self-assessment report will be disclosed to the public on the electronic information portal of the federal ministries and branches. Public R&D organizations will conduct self-assessment according to the provisions of the Government Performance and Results Act, promulgated in 1993 and amended and supplemented in 2010.

In the annual self-assessment report, it is necessary to clearly state the level of achievement of planned goals, indicators proving output results and investment efficiency as well as explain the reasons why goals were not achieved. In the United States, in addition to requiring annual self-assessment by public R&D organizations, Congress and federal management agencies can also request and order some professional assessment organizations with staff equipped with in-depth knowledge as well as modern assessment methodologies, will organize periodic or thematic assessments of public R&D organizations to rank and make specific recommendations for the federal regulatory agencies. Recommendations made by professional evaluation organizations after evaluating public R&D organizations must be trustworthy, authoritative, objective, independent, appropriate, useful, and timely for the needs of Congress, OSTP (US Office of Science and Technology Policy) as well as federal regulatory agencies.

Currently, the sources of information for evaluating and ranking science and technology organizations most often used by the National Congress and federal management agencies are the evaluation reports of the State Audit Office (GAO), the Congressional Research Service (CRS), National Research Council (NRC) of the National Academies of Sciences, Engineering, and Medicine (NASEM).

Normally, the ranking of public R&D organizations will be based on several quantitative indicators such as the number of scientific publications, number of patents, number of technologies transferred or commercialized, or ranking "Top 5", "Top 10", ... R&D organizations in the United States. In addition to independent rating organizations, also have several professional associations, non-governmental funds as well as reputable scientific publishers that rank US R&D institutions in world or group rankings. Although ratings are not an official product of the Government, they still influence R&D organizations. Highly ranked public R&D organizations often receive incentives in considering increased investment funding as well as in considering and selecting the unit to preside over R&D tasks. In contrast, other low-ranking public R&D organizations typically will not receive the above incentives and may be subject to additional scrutiny from federal regulators as well as Congress.

## 4. Autonomy and self-responsibility mechanism for public R&D organizations in China

China is one of the countries that has continuously reformed state management policies on science and technology in recent times to improve the effectiveness of science and technology activities as well as affirm the contribution of science and technology to socio-economic development *(Ministry of Science and Technology, 2022; Nguyen Thi Minh Hanh, 2014)*.

The reform of the S&T management mechanism emphasizes the importance of the market regulatory mechanism. In 1985, China issued a Decision on reform of the S&T system, which stipulated the implementation of market mechanisms in operating the R&D system. The purpose is to form a technology market, viewing the technology market as an intermediary institution where transactions take place between the supply side (public R&D organizations) and the demand side (organizations and individuals using R&D products). This is a breakthrough reform, creating a premise for the formation and development of the technology market. For the technology market to operate, a series of management policies have been issued such as the Law on technology transfer contracts, establishing a system of non-profit organizations to register technology transfer contracts.

Conduct comprehensive reform of the system of public R&D organizations with many methods and ideas but with the same goal of improving the quality and efficiency of S&T activities. Granting the highest level of autonomy to R&D organizations, granting autonomy to heads of public S&T organizations to decide to sign research contracts and S&T service contracts, and decide on joint ventures with businesses, organizations, and individuals, and giving them autonomy in managing and using science and technology human resources; the autonomy in the management, to use and distribution of income from technology transfer contracts, scientific research contracts and contracts to perform S&T services.

Reform the financial allocation mechanism from the state budget for science and technology activities according to a mechanism that is linked to output results and economic efficiency. Implement a competitive mechanism in allocating and sponsoring funds to carry out science and technology tasks using the state budget. Promote the adjustment of public S&T organizational structure towards compactness, reduce indirect departments and intermediary departments, increase joint ventures and partnerships to make the most use of resources, and save resources in science and technology activities. Encourage and promote scientific research and technological development activities in businesses. The Chinese government has used many measures to encourage businesses to invest in scientific research and technological development activities such as value-added tax exemption and reduction for the sale of computer software, corporate income tax exemption for income from technology transfer activities, technology development, etc., and provides financial support for businesses to establish research and development facilities.

The mechanism for managing and using the S&T human resources team has been changed and improved strongly, changing the lifetime recruitment regime to a fixed-term appointment for positions regime, allowing scientific staff to hold many different jobs. Scientific staff have complete autonomy in choosing topics and how to organize research activities. China has also implemented many policies to encourage and create favorable conditions for S&T human resources in research activities: create conditions for scientists to freely move scientific activities from domestic environments abroad to foreign countries environments, promulgating regulations to encourage Chinese scientists to return from abroad to work in domestic organizations, implementing the National Program to attract talented scientists such as the "100 Talents" program of the Chinese Academy of Sciences, as well as the program of the Natural Science Research Foundation (funding about 120,000 USD over four years for Chinese scientists abroad who want to return to the country to work).

Regarding the autonomy of public research institutes, in July 2019, the Ministry of Science and Technology, Education Reform and Development Commission, Ministry of Finance, Ministry of Human Resources and Social Security, and Chinese Academy of Sciences coordinated their activities to promulgate several important policies to promote autonomy mechanisms, including:

### *4.1. Improve the organization's operating and management mechanism*

*a) Strengthen management according to the Charter*

Universities and scientific research institutes need to promote the development of charters, scientifically determining the functions and boundaries of rights and responsibilities of different types of units.

Carry out scientific research activities by the functions and scope of business specified in the charter, improve the internal management structure, and establish effective management and operation mechanisms. Management agencies do not

interfere with the work that has been decentralized to universities and research institutes.

*b) Strengthen effective management*

Universities and research institutes develop medium and long-term development goals and plans, and at the same time clarify S&T performance goals and indicators. Management agencies manage and assess the medium- and long-term performance of universities and research institutes. The results of this assessment will be published appropriately. This will be an important basis for the management agency to allocate finances to the unit.

*c) Optimize the management of institutional settings*

Science and Technology Management Agencies need to develop plans to change, develop, and arrange scientific research facilities according to the principle of clear, reasonable, streamlined, and effective functional arrangement, to promote optimal allocation of science and technology resources.

Within the scope of functions specified in the Charter of Universities and Research Institutes, according to national strategic needs, industry development needs, and technological development trends, by lean and effectiveness principles, universities and research institutes can independently establish, change, and abolish internal institutional setting that is no longer appropriate within the unit.

### *4.2. Optimize scientific research management mechanism*

In July 2018, at the Standing Conference of the Chinese State Council chaired by Premier Li Keqiang, it was decided to expand the autonomy of researchers, release creative energy, and reform the S&T research project management system. Measures decided to implement include:

(1) Reform of scientific research management methods, project and project documents that have been registered on the national science and technology management information system, do not require the project leader to provide them repeatedly;

(2) Minimize all types of inspection, evaluation, and appraisal of scientific research projects, combining technical and financial acceptance into one comprehensive assessment at the end of the project period;

(3) Researchers are allowed to free themselves from administrative work by purchasing or hiring professional services such as accounting and translation;

(4) Completely trust scientific research staff, respect their talents, and provide them with greater autonomy regarding the use of research funds. Equipment and supplies necessary for scientific research may receive special treatment and do not need to go through bidding;

(5) Researchers can self-adjust research content and direction if the goals do not change;

(6) Scientists in charge of core technology research projects in important fields receive salary increases and incentives, implementing an annual salary regime for full-time research team leaders and highly talented people (foreigners subject to "invited to China"), make a corresponding increase to the total salary received in the current year;

(7) Build an evaluation system that values results and performance and discriminates against failed research projects due to the uncertainty of scientific research that leads to not achieving the desired goals with misconduct behavior leading to failure to severely punish acts of fraud and counterfeiting;

(8) Focus on improving the indirect cost ratio of basic research projects, simplify scientific research budget estimation, and realize research funding guarantees differently, giving researchers ownership of scientific achievements or long-term use rights;

(9) Pilot implementation of the "green path" in approving scientific and technological research topics, projects, and tasks, to speed up the formation of models towards nationwide application.

### *4.3. Reform human resource management methods*

*a) Create a flexible operating environment for research staff*

Universities and scientific research institutes can develop recruitment plans, set recruitment conditions, publish recruitment information, organize public recruitment independently, and standardize management after recruitment.

Support and encourage professional and technical staff in universities and research institutes to engage in innovation activities in the form of temporary employment, participation in project collaborations, part-time work, and starting the business on the spot.

Scientific research institutes are allowed to improve their internal employment systems and independently recruit people in charge of internal research facilities. The head of an internal research facility is rewarded with money and equity for converting scientific and technological achievements according to the provisions of law.

*b) Establish positions independently*

Universities and scientific research institutes can independently develop establishment plans and management measures in the facility or the total number of personnel and determine the ratio of work structure in accordance with relevant State regulations and according to the needs of the development of science and technology organizations.

Implement labor contracts and open recruitment and job management systems. The proportion of senior professional and senior technical positions may be appropriately increased internally, and the adjustment will be reported to relevant departments for recognition according to management authority.

Universities and research institutes are allowed to introduce outstanding talents to participate in innovation activities by establishing creative and flexible positions.

### *4.4. Improve the way that salary is distributed according to work performance*

*a) Enhance salary distribution based on work performance*

Universities and research institutes can independently determine the performance pay structure, evaluation methods, distribution methods, salary category names, norms, and scope of distribution in the total wage amounts to comply with relevant national regulations.

In evaluating total realized salaries, priority should be given to universities and research institutes that have a high concentration of talent and demonstrate excellent innovation performance.

*b) Strengthen the incentive effect of performance-based pay on technological innovation*

Piloting the application of flexible allocation methods such as annual salary, negotiated salary, project salary, etc. for team leaders undertaking core technology research tasks in key national fields and high-level talents introduced by the research unit.

Increase fair incentives for the converting of scientific and technological achievements of staff in universities and scientific research institutes. Monetary rewards for converting scientific and technological achievements for scientific research staff, income through part-time work or outside the main job is not limited by the total salary made.

## 5. Overview of the implementation of the autonomy and self-responsibility mechanism for public science and technology organizations in Vietnam

Implementing the mechanism of autonomy, self-responsibility, and restructuring of public S&T organizations is one of the urgent requirements to reform the organization, management mechanism and improve the quality and efficiency of S&T activities of public S&T organizations are mentioned in many important S&T management documents in Vietnam over the past 20 years.

Recently, according to Decision No. 569/QD-TTg dated May 11, 2022, of the Prime Minister approving the Science, Technology, and Innovation Development Strategy until 2030, the goals have been affirmed: *The S&T organizational system has been restructured in line with the prioritized orientation of national, sectoral, and field development towards autonomy, linkage together and approaching international standards.*

The above objective of the Strategy has been concretized in one step in the content of the Strategy's tasks and solutions: *Amending and improving legal regulations on the autonomy mechanism of public science and technology organizations. Research on allocating funds to public science and technology organizations based on periodic assessment of results and operational efficiency, associated with implementing the State ordering method, implementation of science and technology*

*tasks bidding, and implementing the contracting funds mechanism until the output final product; assign autonomy and self-responsibility to public science and technology organizations in building organizational structures, recruiting, using human resources, using funds, and performing science and technology tasks.*

Next, to implement the Strategy for developing science, technology, and innovation until 2030, on December 28, 2022, the Minister of Science and Technology issued Decision No. 2667/QD-BKHCN approved the direction, goals, tasks of science, technology, and innovation until 2025. In Decision No. 2667/QD-BKHCN on the content of direction, it was affirmed: *Continue basically, comprehensive, and synchronously reforming in terms of organization, financial mechanism, management, and autonomy mechanism of public science and technology organizations by the characteristics of science and technology activities*.

Next, the goal of Decision No. 2667/QD-BKHCN was affirmed: *Continue to reform the autonomy mechanism of public science and technology organizations by the characteristics of public science and technology activities, restructure and improve the performance of public science and technology organizations is consistent with the characteristics of public science and technology activities and approaching international standards.*

The content of tasks and implementation measures set out in Decision No. 2667/QD-BKHCN is reviewed *and evaluated to propose amendments and completion of the autonomy mechanism of public science and technology organizations.*

The implementation of the autonomy and self-responsibility mechanism for public R&D organizations in Vietnam has passed nearly 20 years with important milestones and has been based on legal bases guiding that implementation. To be:

(1) Period 2005 to 2015, implemented according to the provisions of Decree No. 115/2005/ND-CP dated September 5, 2005, of the Government regulating the autonomy and self-responsibility mechanism of public science and technology organizations;

(2) Period 2016 to 2022, implemented according to the provisions of Decree No. 54/2016/ND-CP dated June 14, 2016, of the Government regulating the autonomy mechanism of public science and technology organizations;

(3) From 2023 to the present, comply with the provisions of Decree No. 60/2021/ND-CP dated June 21, 2021, of the Government regulating the financial autonomy mechanism of public service units.

Although Decree No. 60/2021/ND-CP is considered to have resolved some inadequacies of Decree 54/2016/ND-CP, the new regulations on autonomy mechanism under Decree No. 60/2021 /ND-CP, when applied to public science and technology organizations, have revealed several contents that are not suitable for the field of science and technology activities, especially concerning the financial autonomy. For this reason, on September 5, 2022, the Government issued Resolution No. 116/NQ-CP on the plan for autonomous classification of public

service units in 2022 while the Decree No. 60/2021/ND-CP has not been amended or supplemented yet.

According to Resolution No. 116/NQ-CP, public science, and technology organizations continue to implement the financial autonomy plan according to Decree No. 54/2016/ND-CP until the end of 2022, and at the same time develop a plan to become financially autonomous according to the provisions of Decree No. 60/2021/ND-CP and Circular No. 56/2022/TT-BTC dated September 16, 2022, of the Minister of Finance guiding many contents on the mechanism financial autonomy of public service units; handling assets and finances when reorganizing and dissolving public service units to be implemented from 2023.

On June 24, 2023, the 15th National Assembly issued Resolution No. 100/2023/QH15 on questioning activities at the 5th Session, 15th National Assembly, in section 2, point 2.3. Regarding the field of science and technology, the Resolution mentions: "*Building a mechanism for autonomy and self-responsibility of public science and technology organizations by the characteristics of science and technology activities*".

Implementing Resolution No. 100/2023/QH15 mentioned above, on July 7, 2023, the Prime Minister issued Official Dispatch No. 627/TTg-QHDP on implementing the Resolution of the National Assembly, 5th session, term XV, which assigned the Ministry of Science and Technology to preside over the task of *"Building a mechanism for autonomy and self-responsibility of public science and technology organizations by the characteristics of science and technology activities*". Currently, the Ministry of Science and Technology is presiding over the preparation of a draft Decree stipulating the autonomy and self-responsibility mechanism of public science and technology organizations to submit to competent authorities for approval according to regulations.

## 6. Conclusion

Research on international experience in implementing autonomy and self-responsibility mechanisms for public R&D organizations in Japan, the United States, and China shows that:

***(1)*** Clearly defining the objects of public R&D organizations in terms of mission, role, functions, and tasks in the national S&T organization system plays a particularly important role. Public R&D organizations are research organizations established and funded by competent State agencies to perform the functions and tasks assigned by the State. The common principle is that the State only maintains public R&D organizations in certain fields where the State needs to encourage development but other economic sectors in society are unable or unwilling to invest in them.

***(2)*** Autonomy and self-responsibility for S&T organization and activities are attributes associated with a research organization, whether it is a public or private research organization. The nature of autonomy is comprehensive in all aspects of S&T activities, international cooperation, attracting and using funds effectively, and

attracting high-quality S&T human resources. According to this logic, just because an R&D organization is established and funded by the State does not mean that the organization is limited or restricted in its autonomy. The State (Government) will issue regulations (Laws) managing S&T activities in public research organizations, which determine the mission, roles, and assignment of functions and tasks between public R&D organizations.

***(3)*** The issue of autonomy and self-responsibility of public R&D organizations in many countries is resolved synchronously in the following aspects:

- Restructuring the national S&T organization system, including the national R&D organization system;
- Determine the mission, and roles and assign functions and tasks to public R&D organizations in the national S&T organization system;
- Develop and promulgate legal instruments such as laws on the management of the organization and operations of public R&D organizations, which specifically clearly define the rights, obligations, and responsibilities of the head of the organization. Laws were promulgated in the direction of giving maximum autonomy to public R&D organizations, especially the heads of the organizations, along with a mechanism to take responsibility for implementing autonomy rights;
- Develop regulations and organize periodic, public, and strict evaluations of the results of science and technology activities of public R&D organizations.

***(4)*** Regarding the mechanism for evaluating the performance of public R&D organizations: although the implementation roadmap in different countries is different, there is a consensus that public R&D organizations receive funding from the state need to have their science and technology activities evaluated regularly and transparently. This evaluation, on the one hand, provides necessary feedback for the investment agency (Government), and on the other hand, allows the R&D organization itself to recognize the strengths and weaknesses in its organization and S&T activities. From there, there will be plans to improve quality and operational efficiency in the future./.

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