

**DIRECTIONS AND POLICIES FOR DEVELOPMENT
OF SCIENCE-TECHNOLOGY HUMAN RESOURCE IN VIETNAM:
ASSESSMENT OF THE PAST STRAGIES AND SOLUTIONS
FOR PROMOTION IN FUTURE TIME**

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Abstract:

Innovation of policies for science and technology (S&T) human resource in our country passed long extended stages mainly due to missed opportunities from opened contexts, some deadlocks in policy setting practice, lacked decisive moves in realization of breakthrough solutions and orientation of innovation, and delayed works of assessment and adjustment of issued policies. For stronger promotion of innovation of policies for S&T human resource in future time, the main attentions should be oriented to certain solutions such as classification of S&T human resource for issuance of adequate policies, definition of right relations between S&T human resource and assigned tasks, and higher role of scientific leaders in R&D organizations.

Keyword: Science and technology human resource; Policy.

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During recent years, the Party and the State promulgated many directions and policies (jointly called “policies” afterwards) for development of S&T human resource. Issued policies were made including efforts of many leaders of the country. The implementation of policies is also developed with high costs during long stages. Therefore, we should have responsibilities to make analysis for useful lessons from last experiences.

1. Main policies on S&T human resource

For development of S&T human resource, the Party and the State promulgated policies on training and administration of S&T human resource (favoured recruitment, evaluation, selection and self-governance of human resource in State-owned S&T organizations), incomes of scientists, honouring tributes for scientists, democratic environment for S&T activities, working conditions for scientists, extended age of retirement, higher promotion of scientific ambitions and revolutionary

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ethics for high qualified S&T human resource (leading scientists, general project managers, chief engineers, high skilled technicians), young scientists, women-scientists, overseas Vietnamese scientists, foreign scientists, strong research teams, coordination of S&T staffs in large programs, S&T human resource in specific S&T fields, S&T human resource in enterprises, in rural and difficult regions, and master plans for development of human resource. Some policies passed even basic adjustments such as:

- *Policies for training works:* On basis of general directions of great attentions, many policies were issued, namely from training of high qualified S&T staffs for research and technical management works in important sectors and enterprises², and down to concrete measures in favour for their higher qualification through practical activities, extended post-graduate training programs, early search and selection of young talents since school ages and their development up to high qualification staffs, and establishment of some universities in key sectors to train high qualification scientists and to rise their eagerness for high S&T carriers (*Resolution No. 37/ND/TW on 20th April 1981, Resolution No. 02-ND/HNTW on 24th December 1996*); focused measures for some priorities such as selection of best staffs for integrated training programs in advanced S&T countries in certain national key S&T sectors (for selection and preparation of S&T talents including leading scientists, general project managers, chief engineers and high skilled technicians), adjustment of training structures (with favours for high skilled technicians) for FDI attracting sectors and key socio-economic sectors (*Decision No. 272/2003/QD-TTg on 31st December 2003*); encouragement and supports for other economic components (not only State-owned one) to participate directly in activities of training of S&T human resource, encouragement of establishment of international universities and technology research institutes in Vietnam (*Decision No. 272/2003/QD-TTg on 31st December 2003*); establishment of training programs for higher qualification and administration skills of S&T management staffs in all levels (*Decision No. 418/QD-TTg on 11th April 2012*);
- *Policies for incomes:* they cover a large range of regulations from wage scale systems for scientific staffs which reflect the respectful use and adequate treatment of talent S&T staffs on basis of quality and effectiveness of their works and encouragement bonuses (*Resolution No. 6-NQ/TW on 30th March 1991*) down to measures to remove subsidiary mechanisms and egalitarian schemes (which were provided with

² Resolution of the 8th Conference of the Party Central Committee, Session III, March 1963.

mechanisms to secure legitimate incomes of scientists through their participation in R&D projects (*Resolution No. 02-NQ/HNTW on 24th December 1996*); implementation of fair competition mechanisms, gradual removal of egalitarian schemes and practice of no-limit incomes for S&T staffs, reduction and exemption of personal income taxes for incomes generated from S&T activities (*Decision No. 272/2003/QD-TTg on 31st December 2003*); special favours for scientists who produce outstanding S&T works and great contributions for the country (*Article 35, Law on S&T, 2000*); opportunities to chair the implementation of national S&T projects, produce research works with international publications of high level (*Resolution No. 20-NQ/TW on 1st November 2012*);

- Policies on management of human resource: they cover a large range of regulations from standardization of selection, recruitment and periodical assessment (*Resolution No. 26-NQ/TW on 30th March 1991*) down to the shift from permanent staff scheme to contract based system of recruitment and appointment, and establishment of labor market in S&T activities, implementation of self-governance rights towards human resource control within S&T organizations (*Decision No. 27/003/QD-TTg on 31st December 2003*); the renovation of the system of scientific titles (*Resolution No. 418/QD-TTg; Article 3, Law on S&T, 2013*);
- Policies for leading scientists in charge of important tasks: they cover a large range of requirements from the necessity to have leading scientists and high qualification experts in research and teaching activities (*Resolution No. 37-NQ/TW on 20th April 1981*) down to concrete measures to honour outstanding scientists and to fix the adequate retiring age (*Resolution No. 02-NQ/HNTW on 24th December 1996*); actual privileged schemes for scientists who chair important S&T tasks and excellent research teams (*Decision No. 418/QD-TTg, Article 23, Law on S&T, 2013*);
- Policies for young scientists: they cover a large range of regulations from measures to encourage the use of young scientists with high capacities and qualifications (*Resolution No. 37-NQ/TW on 20th April 1981*) down to programs to train young scientists, particularly the talent ones (*Resolution No. 26-NQ/TW on 30th March 1991*); concrete measures to mobilize capacities of young scientists, to develop young research teams in universities and research institutes and to assign research tasks to young scientists (*Decision No. 418/QD-TTg*); and initiatives to select and train young talents in schools, colleges and universities (*Resolution No. 20-NQ/TW on 1st November 2012*);

- *Policies for overseas Vietnamese and foreign scientists:* they cover a large of requirements from the necessity to issue adequate policies and organizational measures for overseas Vietnamese scientists to participate in S&T development of the country (*Resolution No. 37-NQ/TW on 20th April 1981*) down to application of State budgeted hiring of foreign experts (*Decision No. 418/QD-TTg*) and other favours such as expert scale wages, favoured immigration rules, provision of residential facilities, leading positions in S&T organizations and assignment of S&T tasks (*Article 24, Law on S&T, 2013*).

The evolution of the above noted policies has some highly particular points. *First*, there are no general modes for adjustment of policies. The amendments of policies were conducted not only in direction of gradual concretization, extension and addition of new regulations and requirements but also in the shift of approaches in innovation of policies (search for new orientations) as required by new contexts. The adjustments diversified between policies come from specificities of every policy, efforts to try different initiatives and also embarrassed solutions for difficult problems. *Second*, despite of considerable progress between stages, many problems remain unsolved. For example, some recent documents still put down tasks of innovation of S&T human resource management works³ or innovation of policies for overseas Vietnamese and foreign scientists⁴. *Third*, the changes made during the past stages are meaningful as making suggestions for new trends which can lead to appropriate policies in future.

In addition to many policies which experience multiple changes with basic adjustments, there exists some policies which were repeated many times without any adjustment of basic contents. For example, the topic of innovation of planning for development of S&T human resource in direction of socio-economic development had been outlined in Resolution No. 37-NQ/TW on 20th April 1981 then repeated in Resolution No. 20-NQ/TW on 1st November 2012; the requirement to establish and implement rules for democratization in scientific research had been recorded in a few documents such as Resolution No. 26-NQ/TW on 30th March 1991,

³ “Innovation of works of recruitment, evaluation and appointment of S&T staffs” (Resolution No. 20-NQ/TW of the 6th Conference of the Party Central Committee, Session XI on S&T development for service of industrialization and modernization in conditions of socialist oriented market economy and international integration), “Innovation of mechanisms and policies for using S&T staffs through creation of motivation and practical interests for liberation and mobilization of creative potentials of S&T staffs” (Decision No. 418/QD-TTg by the Prime Minister on 11th April 2012 to approve Strategies for S&T Development, 2011-2020 period).

⁴ “Amendment and completion of policies to attract of overseas Vietnamese and foreign scientists for participation in S&T activities in Vietnam, application of mechanisms to hire local and foreign experts from State budgets” (Decision No. 418/QD-TTg by the Prime Minister on 11th April 2012 for approval of Strategies for S&T Development, 2011-2020 period).

Resolution No. 02-NQ/HNTW on 24th December 1996 and Decision No. 418/QD-TTg on 11th April 2012; the regulation of establishment of strong scientific research teams were recorded in Resolution No. 37-NQ/TW on 20th April 1981, Decision No. 272/2003/QD-TTg on 31st December 2003, Decision No. 418/QD-TTg on 11th April 2012; the promotion of cooperation between scientists had been noted in Resolution No. 37-NQ/TW on 20th April 1981 and Resolution No. 02-NQ/HNTW on 24th December 1996; the stimulation of S&T human resource to work in rural and difficult areas had been noted in Resolution No.26-NQ/TW on 30th March 1991, Resolution No. 02-NQ/HNTW on 24th December 1996 and Decision No. 272/2003/QD-TTg on 31st December 2003.

The facts that the policy contents were repeated many times which reflect clearly not only difficulties and deadlocks in innovation of policies for S&T human resource but also the remaining practice to repeat the evaluation of shortages in documents issued in different stages.

Also the remaining problems were remarked in documents. For example, the weakness in management of S&T human resource was identified clearly and underlined in Resolution No.26-NQ/TW on 30th March 1991, Decision No. 272/2003/QD-TTg on 31st December 2003 and Resolution No. 20-NQ/TW on 1st November 2012; the unreasonable regulations in policies towards incomes of scientists was noted in Resolution No.26-NQ/TW on 30th March 1991; the lack of leading scientists in Resolution No. 37-NQ/TW on 20th April 1981, Resolution No.26-NQ/TW on 30th March 1991, Decision No. 272/2003/QD-TTg on 31st December 2003. The weakness in planning of development of S&T human resource was noted in Resolution No. 37-NQ/TW on 20th April 1981, Resolution No. 26-NQ/TW on 30th March 1991, Decision No. 272/2003/QD-TTg on 31st December 2003 and Resolution No. 20-NQ/TW on 1st November 2012.

The above noted remarks provide a global and complex view on policies for development of S&T human resource in our country. Particularly, there are differences in process of establishment, development and completion of policies. Many aspects remain unsolved and long extended as results of incompleteness and deadlock of actual policies.

2. Impacts from contexts to policies for S&T human resource

On basis of general contexts of the country, the policies for S&T human resource passed 5 stages: war time (from 1945 to 1975); centrally planned and controlled mechanisms and subsidiary economic model (from 1976 to 1985); innovation of management mechanisms (from 1986); intensification of industrialization and modernization (from 2000) and strong promotion of international integration (from 2010).

The impacts from contexts are well reflected through specific policies issued in every stage. During the war time stage, the Government was active in searching and mobilizing favourable conditions for training and using S&T human resource. Since 1951 when the north border areas were connected to socialist countries, the Government conducted the selection and training of a big number of S&T staffs. By 1957, the Government sent abroad the first team of 17 students for post graduate training⁵, mainly in natural science and technical sectors. Scientific staffs were used in certain research facilities where some researches were conducted with success such as medico-pharmaceutical research activities (production of drugs from local medicinal sources, treatment of war injuries, treatment and preventive medicine), improvement of cultivation techniques, and application of advanced techniques in road and bridge construction in war conditions and etc.

During the stage of centrally planned and controlled mechanisms and subsidiary economic model, the attentions were focused on planning for development of S&T human resource in global, unified and centralized manner. The inventory and evaluation works of S&T staffs were conducted. A State council was established to conduct the training and dispatching works of S&T staffs. The Council was in charge also to set up budget plans for training activities and was powerful in dispatching S&T staffs between localities and sectors⁶ and management of S&T human resource⁷.

During the stage of innovation of management mechanisms, some policies were issued to secure the legitimate incomes for S&T staffs through participation in R&D contracts, to build up democratic environment in scientific activities, to stimulate S&T staffs to work in production, business and service facilities, particularly in the rural and difficult areas, to shift the labor status of S&T staffs from permanent schemes to contract based practice, to facilitate the mobility of S&T staffs and to set up the labor market in S&T sectors, to implement the practice of self-governance and self-liability in management of S&T human resource, to mobilize and to

⁵Ministry of Science-Technology-Environment, 1995. "50 years of Vietnam S&T (1945-1995)". Hanoi, *Science-Technics* Publishing house, page 28.

⁶ Namely, "Immediate establishment of the State Council for training and dispatching of S&T staffs. The Council was in charge to set up budget plans for training activities and was powerful in dispatching S&T staffs between localities and sectors in necessary cases. As authorized by rules, the heads of organizations including the S&T ones are in charge to dispatch S&T staffs under their administration in the most adequate manner to meet assigned tasks and their individual capacities. From another side, when executing the tasks assigned by controlling organizations, S&T staffs can submit their wishes for their appointments on basis of their capacities to meet social needs in the best way" (*Resolution No. 37-NQ/TW on 20th April 1981 by the Party Politbureau*).

⁷Namely: "Realization of good links between the dispatching order of controlling organizations, responsibilities of direct heads and personal wishes of S&T staffs in order to set up immediately creative S&T teams, well integrated and specialized" (*Resolution No. 37-NQ/TW on 20th April 1981 by the Party Politbureau*).

support in maximum various economic components for participation in training of S&T staffs, to implement fair competition mechanisms and to remove the egalitarian schemes, to implement the schemes of reduction and exemption of personal income taxes from S&T activities and practice of no-limit incomes of S&T staffs.

During the stage of intensification of industrialization and modernization, the main attentions were focused on policies of integrated selection and training of S&T staffs in advanced countries, close coordination between S&T staff training and using organizations, training programs of talents, scientists, general project managers, chief engineers and skilled technicians, formation of strong research teams to meet requirements of S&T tasks from production, life, national defence and security practice, adjustment of training structure to increase the number of technical workers (particularly the high skilled ones) for FDI attracting sectors and national key socio-economic sectors, attraction of talents for realization of key State S&T tasks, close links between plans for development of S&T human resource and plans for socio-economic development and training of S&T experts in priority S&T sectors.

During the stage of promotion of international integration, policies were issued for application of State budgeted hiring of local and foreign experts, implementation of democratic rules in S&T activities, addition of new titles of general project managers, chief engineers in the schemes for S&T staffs, additional supports for S&T staffs sent for termed works in foreign S&T organizations to settle national S&T tasks, protection of legitimate rights of authors of S&T works, revision, amendment and completion of policies to attract overseas Vietnamese and foreign scientists for their participation in S&T activities in Vietnam, effective use of students, post-graduate students and S&T experts who actually study and work abroad, individual overseas Vietnamese scientist while working in Vietnam may get appointed or hired to take leading positions in S&T organizations, assigned to chair S&T tasks, appointed for S&T titles, and get expert wages according the Government rules and other contract based favours, get favours for immigration, residence and other favours according to legal regulations, and get expert scale wages.

So, the actual context requires and allows to develop and to adjust policies for S&T human resource on basis of certain conditions. At the same time, some other remarkable points can be notes as follows.

There exist aspects of policies for S&T human resource common for many concrete contexts. These aspects in different contexts are related to policies

for leading scientists, young scientists, strong research teams and etc. Here, the adjustments can be conducted for better completion of policies and may be independent from context changes. The focused attentions on common aspects of S&T human resource would keep policies continuous and linked between stages with different contexts.

The impacts from general contexts to S&T human resource policies are seen clearly from the nature of S&T sectors and actual conditions of Vietnam. As it is seen, many experiences gained from practice of innovation of management mechanisms of human resource in economic sectors (globally conducted shift from centrally planned and controlled mechanisms and subsidiary economic model) are not found suitable for management of S&T human resource. Many policies of S&T human resource management in other countries are not also applicable for Vietnam which was seen well through failures in their application for management of S&T human resource in Vietnam recently.

The subjective awareness of possibilities to catch up the real contexts in advance, in time or in delay causes certain affects to S&T human resource policies. In Vietnam, there were recently certain considerable gaps between the time moment of formation and adjustment of policies for S&T human resource management and the time moment of appearance and existence of related contexts. The typical cases were the policies related to the shift of labor status from permanent scheme to contract based practice for S&T staffs. These new rules facilitate the mobility of S&T staffs, formation of labor market in S&T sectors, implementation of self-governance and self-liability mechanisms for management of human resource in S&T organizations, maximal mobilization and supports for various economic components to participate in training of S&T human resource, realization of fair competition mechanisms, gradual removal of egalitarian distribution schemes, practice of no-limit incomes of S&T staffs, reduction and exemption of individual income taxes from S&T activities and etc. which were issued by 2003 (recorded in Strategies for Development of Vietnam S&T up to 2010 as attached to Decision No. 272/2003/QĐ-TTg on 31st December 2003 by the Prime Minister) while the context of intensification of innovation of management mechanisms (removal of centrally planned and controlled mechanisms and subsidiary economic model) started by 1986.

Some delays seem to be here in catching up with requirements and opportunities offered by the context. The delay reflects a left-behind state of policies in comparison to real situations and is a factor to slow down the process of innovation of policies for S&T human resource in our country.

3. Identification of key problems and focused solutions on active innovation of policies in S&T human resource sectors

Success and limitation in process of innovation of policies are reflected not only in scale of recovered shortages (as seen in reality) but also in the clear identification of models to be targeted for policies. As required to meet basic needs of innovation and development in our country, the identification of the models of targeted policies is highly important and difficult at the same time.

A retrospective vision to the past shows some particular points our model of policies for S&T human resource needs to target, namely: development of the covering scale enough to meet large needs of socio-economic development, formation of structure of diversified S&T human resource with focused attentions for leading scientists, talent and young scientists, S&T human resource in enterprises, S&T human resource in spearhead fields and S&T human resource management on basis of self-governance and self-liability mechanisms and etc. However these are only preliminary points and there exist still unclarified important aspects. Namely, we have three types of policies: (i) Type 1: clearly confirmed policies for S&T human resource (including the high scientific ambitions, stimulation of creativity of S&T staffs, protection of legitimate rights of authors of S&T works, favours and stimulations for international publications, protection of author rights and patents); (ii) Type 2: adjusted but not completed policies (including the training of S&T human resource, incomes of scientists, management of S&T human resource and etc.); (iii) Type 3: inconsiderably adjusted policies (including the innovation of plans for development of S&T human resource, policies for wages of scientists, stimulation for S&T human resource to work in rural and difficult areas and etc.). These types of policies cover different aspects of policies. Type 1 of policies includes problems which are clearly settled. Type 2 includes problems which get gradually settled but not fully solved. Type 3 includes problems which do not get considerable settlement of basic contents. A deeper analysis of policy related problems would show the next moves for policies:

- Problems in Type 1 are not the basic concern. They are well settled and play the fundamental roles to govern policies of S&T human resource. They are also the main axe for covering of other existing shortages;
- Problems in Type 2 are related to more basic and fundamental features to be adjusted than the ones of Type 1. They are to cover existing shortages and also are used to target the future model of policies;
- Problems in Type 3 face difficulties in settlement but they cannot be removed from consideration. They are related to more basic and

fundamental features than the ones of Type 2 and are used much more to target the future models of policies.

Here the remarkable point in relations between problems in these types of policies is the different level of discrepancies of their nature but not the sets of their solutions. For Type 1, the innovation of policies basically gets clear and the next moves simply are implementation and propagation of solutions. For Type 2, the main aspects do not get caught up. The next moves of innovation depend on the identification of these main aspects. The margin of propagation of Type 1 and the next development of Type 2 depend on the settlement of problems of Type 3. In Vietnam, the innovation of policies for management of S&T human resource is related to the policies of Type 2.

Therefore, we have to face with basic embarrassing problems which cause the deadlock of our measures of settlement. At the same time, the recent efforts of their settlement reveal many factors and provide valued suggestions for orientations to go and destinations to come. This analysis lets define some key problems which require focused efforts for their settlement.

Key problem No. 1: classification of types of S&T human resource for preparation of adequate policies

There are many way to classify S&T human resource as subjects of specific policies. They include academic S&T human resource, State owned S&T human resource and S&T human resource for enterprises. They are different in motivation of activities, scope and level of State intervention.

The motivation of academic S&T human resource mainly comes from faith, aspiration and sacrifice spirit. Here the scope and level of State supports are rather limited. It is impossible for the State to subsidize all the people to satisfy their high aspiration for scientific research. Contrarily, the limited budget resources require a tough selection of individuals for destination of supports. They are people who have not only great aspirations of scientific research but exhibit well their outstanding research capacities.

The motivation of State owned S&T human resource is oriented to national values. The science to serve the State needs to be oriented to the State related concerns, namely the orientation of tasks, budget provision, organization and management. Particularly, the State needs to identify clearly the tasks which require the science to give solutions to. Here, the intervention from the State must be rightly established (according to requirements of tasks) and rightly dosed (provided with investments big enough and management tough enough).

The motivation of S&T human resource for enterprises is related to production activities and promotion of competition in business activities. It is enterprises to decide the orientation of S&T activities, investments, organization and management works. The State intervention is conducted mainly through measures of indirect supports.

The clear distinguishing between these types of S&T human resource would facilitate the promotion of innovation on basis of application of adequate policies for different groups of S&T actors. It includes particularly policies for incomes of scientists, self-governance and self-liability mechanisms in management of S&T human resource, mobilization of participation of social resources for training of S&T human resource, selection of right scale of development of S&T human resource, mobility of S&T human resource between the State sector and the private sector of enterprises.

Key problem No. 2: Right relations between S&T human resource and defined S&T tasks

It is possible to define the needs of S&T human resource on basis of defined tasks. Attentions should be paid to the classification of groups of assigned tasks (bottom up order): i) Ordinary S&T projects and research topics; ii) Projects to produce national priority products and technologies; iii) Projects to establish new S&T fields and new S&T based economic fields; iv) Projects to raise up the national position in international ranks of the world scale. This classification would let define concrete S&T human resource required for solution of the tasks. In terms of human resource scale, the higher ranked tasks would require more S&T human resource. The S&T human resource required for each group has to be capable to meet requirements for solution of assigned tasks. It is worth to mark that the qualification level the S&T human resource mobilized for solution of tasks gets increased in this order.

For the tasks in Group 2, Group 3 and Group 4, the structure of S&T human resource needs to be defined on basis of priorities of subjects and scopes of interests (concrete products, concrete technologies, concrete new S&T field, and concrete S&T fields to be upgraded). From another side, when some types of tasks exist at the same time in a single program, the structure of the mobilized S&T human resource can be defined on basis of general components of tasks (Group 1), national priority products and technologies (Group 2), new technological fields, new S&T based economic fields (Group3) and S&T fields to be upgraded (Group 4).

It is needed also to turn attentions to the number and the structure of leading scientists mobilized for solution of tasks and they have an increasing qualification order from Group 2 to Group 4.

The development of S&T human resource needs to be justified and gets reflected through the results they can provide. The close binding between the required S&T human resource and the assigned tasks is the main factor to secure the further efficient development of S&T human resource. The reciprocal relations between the assigned tasks and the mobilized S&T human resource including the aspects of scale, structure and leading scientists offer opportunities to make match the development and the efficient use of S&T human resource⁸. In addition, there exist some other opportunities such as the evaluation, training, selection, links and cooperation of S&T human resource on basis of completed tasks, saving of time and human resource through right preparation and in-time use of human resource for solution of tasks.

It is possible to state that the strong growth of S&T human resource needs to be based on service of tasks of equivalent importance. Being outside of tasks, the development of S&T human resource gets easy to become a heavy burden for the country.

For Vietnam actually, the right identification of relations between S&T human resource and assigned tasks would be highly useful because it can lead to the innovation of ways to plan the development of S&T human resource, clear identification of the number, qualification and role of leading experts, identification of strong S&T teams to be developed, development of strong research teams and efficient use of existing S&T human resource⁹.

Key problem No. 3: Higher roles of scientific leaders in R&D organizations

There exist, in public R&D organizations, leaders which still operate with administrative minds. Here we need to have higher roles of scientific leaders. The higher roles of scientific leaders relate not only to the selection of scientists with high scientific qualification and reputation to lead R&D organizations but also to empower them to chair research directions of the

⁸ This topic is getting attentions in our country. We see usually a popular type of remarks of shortage: “Despite of presence of strong S&T human resource, Vietnam, in fact, does not yet have remarkable products and works of break-through value in the regional and world’s level” (Tran Dac Hien: “Training and developing of S&T human resource: innovations starting from conducting way”, *Vietnam S&T Journal*, Volume 3(A)/2016).

⁹ The note in Resolution No. 37-NQ/TW on 20th April 1981 by the Party Politbureau which marked “the actually immediate problem is to organize better and to use more efficiently the existing S&T staffs” still remains right in the present stage.

organization. They have powers and are responsible for global administration in the scope of assigned duties: directions of research works, identification of S&T tasks, management of costs and management of human resource. The management of human resource includes a large range of works such as selection of staffs, fixation of wages, assignment of jobs, training, dismissal and etc. The management skills of a S&T organization (being limited by assigned functions and duties of the organization) cannot replace the management skills of a research collective (being limited by concrete research directions). The scientific research, by its nature, is works highly complex, novel and individualized. It is complex and novel in terms of topics of research, contents of research and way of organization of research activities. The imprint of scientific leaders, as individuals, is seen in both results of research works and practical management of research works.

The addition of other staffs in management works and the promotion of decentralization of management works in R&D organizations bring in clear benefits thanks to closer management practice by immediate leaders. The assistance of supporting staffs in management works would share burdens for scientific leaders who can concentrate more efforts on implementation of research activities. Actually in Vietnam, the higher position of scientific leaders and the deeper de-administration in State owned R&D organizations would settle problems of research teams related to self-governance mechanisms of State owned R&D organizations and lead to formation of strong research teams.

The focused efforts for the three key problems are the novel way to settle the deadlocks which actually block the innovation of policies for S&T human resource, particularly seen for problems of Type 2 and Type 3. Also, the key problems give contributions to define clearly the role of S&T human resource.

The Party and the State, in many documents, underline the roles of S&T human resource, namely: “S&T intellectuals are the high value assets of the nation and the resource of deciding factors for successful outcome of industrialization and modernization of the country” (*Decision No. 272/2003/QĐ-TTg on 31st December 2003*), and “The investments made for S&T human resource are the investments for sustainable development which directly enhance the intellectual level and the strength of the nation” (*Resolution No. 20-NQ/TW on 1st November 2012*) and others. However, these statements are not seen in reality. The awareness of the roles of S&T human resource causes impacts to policies for S&T human resource. There were times, in our country, the policies for S&T human resource were made

on basis of heavy wills due to the lack of real understanding of the roles of S&T human resource¹⁰. The key problems, as noted above, would open a vision to the roles of S&T human resource which satisfy the requirements of the society, the State and enterprises (Key problem No. 1), settle important tasks (Key problem No. 2) and participate in management of R&D activities (Key problem No. 3).

A retrospective vision to the past shows that the innovation of policies for S&T human resource in Vietnam passes long extended stages due to the delayed action of catching up of opportunities opened by contexts, deadlocks in some policy aspects, low decisive moves for implementation of break-through measures, delayed assessment and adjustment of issued policies and embarrassed decisions for orientation of innovation. The right classification of S&T human resource which would let decide adequate policies, right relations between S&T human resource and defined tasks and the higher roles of scientific leaders in R&D organizations are the solutions for intensive promotion of innovation of policies to recover the lost time. Here the consideration of the key problems would have the role to guide the coming innovation of policies in our country.

The policies get established and then enter into implementation in the following order: ideas of policy → actual policies → implementation of policies. There were views which find the main impediments of policies for S&T human resource in the third stage (implementation of policies) or even in the second stage (actual policies). However, as provided by the above analysis, the essential problem is found in the first stage where the ideas of policies get shaped¹¹. Here the focused attentions should be made for the future promotion of innovation of policies./.

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¹⁰There were notes which mark: “Measures and main directions during the war time for strong development of S&T human resource may be guided partially by heavy wills and may not be suitable for war conditions and for practical needs of that time. This was seen through the low quality of training works and low efficient use of S&T staffs” (Ministry of Science-Technology-Environment, “50 years of Vietnam Science-Technology, 1945-1995”, *Science and Technics* Publishing house, 1995, page 30). It can be seen that the note remains right for other stages.

¹¹ This is found compatible with the introductory notes of some recent documents. For example, Decision No. 418/D-TTg by the Prime Minister on 11th April 2012 to approve Strategies for Development of S&T, 2011-2020 period provided the orientation “The innovation of mechanisms and policies to use S&T staffs on basis of promotion of motivation and actual benefits for liberation and mobilization of creative potentials of S&T staffs”...

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