STUDIES OF STRATEGIES AND MANAGEMENT

STUDY TO PROPOSE A POST- IMPACT ASSESSMENT FRAMEWORK FOR SCIENCE AND TECHNOLOGY POLICY

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Abstract:

The system of science and technology (S&T) legal documents in Vietnam is increasingly completed. Together with the issuance of specific guidelines for the implementation of the Law on S&T, the State has promulgated a number of specialized laws to amend or supplement one or various issues of S&T activities. This provides a legal framework for S&T operation in Vietnam. In fact, a number of S&T policies has been put into effect, but the question of whether their objectives have been achieved, what are their impacts on organizations/individuals working in the field of S&T, as well as on socio-economic, S&T and other sectors' development, are still pending with proper answer due to no proper attention has been so far paid to S&T policy impact assessment in Vietnam. In the scope of this article, the author introduced the concept and role of S&T policy impact assessment in S&T management, highlighted its advantages and disadvantages in realizing this exercise in Vietnam, and based on that, proposed a framework for post assessment of the impact of S&T policies.

Keywords: Legal documents; S&T Policy; Policy Assessment.

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1. Necessity for post-assessment of S&T policy impacts

The post assessment of S&T policies' impact is the review and evaluate the impact of the policy enforcement after it became effective with a view to providing evidences (*in terms of policy effectiveness, positive/negative, desirable/undesirable policy effects on S&T, socio-economic development, in general, and on intended policy beneficiaries and other sectors' in particular*), for competent authorities concerned to have a scientific basis to justify, amend, complete or abolish, in case of need, the policy in question with the aim to improve the policy efficiency as well as the effectiveness of management.

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Ignorance or inappropriate assessment of S&T policies after issuance may likely lead to some cases whereby ineffective policies existed for implementation but untimely adjusted, causing waste of resources or even when a policy was really effective with positive impacts but there was no evidence available for proving.

However, post-assessment of all the policy impacts at once may require excessive resources or make resources spread out. Therefore, for an effective assessment, it is necessary to identify priority of policies to be evaluated and used a uniform assessment framework.

2. Advantages and disadvantages of post-assessment of S&T impacts in Vietnam

In terms of advantages, we have in Vietnam an increasingly completed system of S&T legal documents. Along with the issuance of under-law documents guiding the implementation of the Law on S&T of 2000, the State has promulgated a number of specialized laws to amend or supplement one or various issues of S&T activities such as Law on Intellectual Property in 2005, Law on Technology Transfer in 2006, Law on technical standards and compliance in 2006, Law on High technology in 2008, Law on Measurement in 2011, amended Law on S&T enacted in 2013. This provides the legal framework for S&T activities in Vietnam.

The policy has whether achieved its objectives or not, it depends on the soundness, appropriateness and feasibility of the policy. In fact, the identification of S&T tasks has not entirely relied on socio-economic development demand. This was one of the difficulties in assessing the impact of S&T policy on socio-economic development, especially for unclear qualitative target policies.

Effective policy enforcement was also a very important factor for policies going on right track and achieving the intended objectives. In fact, the implementation and enforcement of S&T policies in Vietnam exposed many shortcomings. The guidelines for implementation of new policies were often not fully synchronized, there were sometimes contradictory clauses, affecting the progress of implementation. Training in S&T policy implementation has not been received due attention leading to not uniform S&T policy enforcement from the central to local level. The coordination in policy implementation between functional agencies was not close. Moreover, Vietnam had no effective mechanism to assess the policy implementation, therefore no basis existed for timely detection and adjustment of irrational issues, thus resulting in limitations to achieve policy goals, causing difficulties in assessing the policy impact.

At present, there is no database for S&T assessment. The available sources of information are incomplete, lack of uniformity. The collection, update of information was difficult because there not exist regulations for the evaluation so that no sanctions for cases of not having the information as provided. The lack of information and data is inevitable. This is the difficulty for evaluation, in general and for the impact assessment of S&T policy, in particular.

According to Decree No 24/2009/ND-CP dated 05th March 2009 guiding the implementation of Law on Promulgation of Legal Documents dated 03rd June 2008 where indicated that the evaluation of legal documents, must be carried out after three years from the effective date of laws, ordinances and decrees, Ministries, ministerial-level, government agencies drafting the legal document shall have to assess their impacts on the practice. However, there have not been specific guidelines for impact assessment of legal documents (laws, ordinances, decrees), only a decree exists for the concerned authorities to develop action plans of policy post-impact assessment. Therefore, necessary resources (human, financial, etc.) for the evaluation were not allocated. In principle, to conduct policy assessment it needs an assessment framework including evaluation processes, methodologies, criteria/indicators and scope of system-wide application of the framework. However, Vietnam has so far no such a post-impact assessment framework for S&T policies. Thus, the post-assessment of S&T policy impact in Vietnam is still not mandatory, systematic, lack of functional authorities accountable for the evaluation thus bringing on the effectiveness of the agencies issuing and implementing policies.

To enhance the effectiveness of policy making and enforcement process, Vietnam needs to have a framework developed for post-impact assessment of S&T policy. The assessment results will indicate how far the policy achieve its objectives, what impacts of the policy made on organizations/individuals working in the field of S&T, on the S&T, socio-economic as well as the other areas' development. Thereby managers, policy makers can have facilities to make right decisions improve the policy efficiency and the management effectiveness.

3. Proposed framework for post impact assessment of S&T policies

3.1. Evaluation process

Stage 1: Planning for evaluation steps

Step 1: Defining the policy objectives and expected results

The first step in evaluation planning is to identify the objectives and expected results of the policy, thus it can obtain the issues to be assessed. This is the basis for comparison, determination of the level of the policy objectives achievement.

Step 2: Identifying customers of evaluation

To ensure that the assessment provides useful evidences, it should determine: who are users of the assessment results? What is the objective of assessment? These considerations need to be taken before the assessment starts.

Users of evaluation results can be managers, policy makers, analysts of ministries or government agencies, leaders at local level, policy implementing agencies and stakeholders such as industrial, social organizations, local community groups and other relevant stakeholders.

Step 3: Determining evaluation objectives and evaluation questions

The third step in evaluation planning is to determine the objective of evaluation and the evaluation questions. These questions should be in line with the evaluation objectives for each particular policy, and the current status of information to be collected.

The impact assessment should focus on a small number (5-7) of key evaluation questions related to evaluation objectives. Open questions can be used in interviews or by questionnaires. Normally, the issues to be considered when asking evaluation questions are:

- To what extent the policy objectives have achieved?
- What are expected/unexpected positive/negative impacts for the target policy beneficiary groups?
- Attitude, views of the target policy beneficiary groups?
- How to measure the impact of the policy? Qualitative or quantitative?
- Available evidence on the impact of the policy? If no, how to get additional information?
- How to estimate costs and benefits of the policy? What contribution of policy to socio-economic development?
- So on…

Step 4: Selecting evaluation methods and tools

A successful evaluation depends on good information collected because it can help answer evaluation questions as outlined. An evaluation method is the way by which the information requirements are identified and the

relevant data is collected, managed and interpreted. Data can be qualitative, quantitative, or a combination of both.

The impact of the policy is the change of the result before and after the policy is issued. Difficulty in the impact assessment is to forecast the scenario that may have occurred before the policy is effective. This is called counterfactual assumption. The impact assessment will be easier if the assumption exists, otherwise it needs to build up evidence control groups (including direct and indirect individual/organizational beneficiaries of the policy) for comparison with target policy groups (including direct individual/organizational policy beneficiaries). All of these methods use assumptions to develop evidence control groups to compare with the participating group. Several methods have been used to determine evidence control groups, namely:

(1) Prior-post event comparison method;

(2) Dual difference method;

(3) Trend points comparison method.

In terms of the assessment tool, it takes into account of combined use of tools such as: use of experts; extrapolative analysis; surveys; consultation with stakeholders,... An economic efficiency assessment is used when doing cost-benefit and cost-effectiveness analysis of the policy.

Simulation, statistical probability methods were used in the identification of the above evidence control groups.

Step 5: Selection of evaluation criteria and indicators

Quantitative and qualitative criteria, indicators are used in order to measure the impact of S&T policy after issuance, which is the change of the subjects before and after the issuance of policy. The selected indicators should be feasible in terms of the availability of data.

Impact assessment is essentially the assessment of effectiveness, which is the level of achievement of the objectives set out and the effects (positive/negative) on the stakeholders involved. Thus, the criteria/indicators of S&T policy impact should be related to the degree of achievement of the set out policy objectives and the extent of policy effect on S&T activities, on the perception of the policy target organization/individual beneficiaries. The application of the S&T research results will affect industries and influence the socio-economic development. Besides, the attitude/viewpoint of organizations/individuals towards the policy is also a factor to be considered, because through it, we know the level of support/objection to as

well as the reasonableness of the policy. We would propose 6 criteria for assessment of the impact of S&T policy, namely:

- The impact on research in terms of funding for research activities, quantity/quality of scientific publications, training of researchers, local and international research cooperation, cooperation between universities, research institutes and enterprises, investment in research equipment,…

- The impact on technology as the influence on creative operation to generate competitive new technologies/processes/services/products; Intellectual Property; Technology transfer; domestic and international cooperation in technology/hi-tech areas; training of personnel capable of technology absorption/technology improvement; infrastructure for technology incubation and transfer,...

- Impact on attitude, viewpoint of people involved in S&T management such as in management mechanism, financial mechanism, incentive mechanism, meritocracy, the attitude towards S&T services used and the belief on IPR protection system.

- Impact on the perception of participants in S&T activities such as altering the perspective of S&T staff in identifying S&T tasks (derived from the socio- economic development plan, taking enterprises as the center); links between universities/research institutes and enterprises; international S&T publication, cooperation; awareness of technology transfer/commercialization of research results, awareness of businesses on investment/application of S&T results/introduction of technology into production, business; innovation to create new competitive product/process; S&T strategy development for the organization; ... impact on other S&T policies,…

- The impact on socio-economic development such as improved quality of goods/services, influence on interests of consumers, contribution to total export/import of high-tech products, percentage (%) contribution of S&T in TFP, impact on the job market, reduced costs by increasing the performance efficiency/effectiveness,...

- The impact on other sectors such as health, environment, agriculture ... through the application of S&T results.

Step 6: Making detailed plans

Evaluation agencies need to make detailed plans for evaluation activities, including: objective/scope of the evaluation; specific activities to be carried out; evaluation criteria and indicators; evaluation methods; the time schedule of the evaluation, time required; the progress of implementation

and allocation of funds; requirements for reporting; the use of evaluation results.

After drafting the plan, the evaluation agency should organize stakeholder, expert consultations in order to gather comments on evaluation methods, tools, criteria/indicators and evaluation plan. The consultation will also create consensus between the stakeholders, thus promoting the success of evaluation.

Stage 2: Evaluation implementation

Step 7: Collection of data/information for policy impact assessment

The collection of data/information can be done in two ways: through survey questionnaires or in-depth interviews. In the case of information collected via questionnaires, it should carefully pay attention to the questions set out to ensure objectivity, avoid imposing or suggesting so that interviewees can give assessment of their own. In this regard, evaluators should consult with experts experienced in social investigation, with a view to achieving a best questionnaire for data collection.

Step 8: Analysis on impact assessment results

The data and information collected shall be screened by the evaluator. In some cases, some additional consultations need to be held to get additional information, or to confirm the information collected if it seems uncertain.

Based on the data/information collected, the evaluator makes comments, observations on the extent of achievement of the policy objectives, the desirable/undesirable positive/negative impact on S&T, socio-economic and other sectors' development, on attitude, perception of the scientific community which is the beneficiary S&T policy. In addition to collecting evidence to show how significant the impact is, an important feature of the impact assessment is to understand the role of the intervention that makes relevant impacts.

Step 9: Providing suggestions and making proposals to improve the policy (if any)

First, the evaluator should identify possible causes of the effect, including of two types: (i) by the inadequacy of the policy itself; (ii) due to process of policy implementation. Then, from the evaluation of identified positive/negative effects and related causes, the evaluator shall provide recommendations, proposals. The proposals may consist of two groups: (i) for amendment, adjustment of missing items or duplication/point of concern, which have been identified; (ii) Amendment of organizing policy implementation minimizing some negative impacts of implementation.

Step 10: Consultation with stakeholders on assessment results

After the assessment is completed, it needs to make a draft evaluation report and then bring it up for extensive consultation with stakeholders. The consultation can be done through workshops widely organized for stakeholders concerned including management agencies at central and local level, businesses, socio-political organizations, associations, experts, communities... For professional experts, it can ask for peer-review opinions while for communities, it can publish the draft report on electronic information pages for collecting comments.

Stage 3: Reporting, using assessment results

Step 11: Publishing and using assessment results

After consultation with the stakeholders on the draft assessment report, the evaluator needs to edit/finalize the report and publish it to share information with policy-makers concerned for further policy improvement. The evaluation results also should be shared widely with stakeholders, research institutions, universities... to raise awareness and understanding on the impact of the policy implementation process. The evaluation results can be synthesized in a concise, easily understandable manner, in the form of policy recommendations/discussions to provide for managers/decision makers.

3.2. Methods and tools used in the impact assessment

a. Methods

(1) Prior vs post event comparative approach

The method of comparing the outcome difference taken place in policy beneficiaries before and after the policy intervention. Representing the control group was the group participating before the policy intervention. An initial baseline survey data before the policy intervention is very necessary. Policy assumptions are the unique factor affecting changes in the outcome.

(2) Dual difference method

This is a method of natural test using special situations to create randomness in the distribution of respondents participating in the survey and the control group. Representing the control group is the policy beneficiaries, but not be dominated by the policy. The assumption was that if there were no policy existed, both groups would have the same development trend along the time.

Steps of application: (i) Collecting baseline data for each group before the policy takes effect; (ii) Collecting monitoring data for each group after the policy takes effect; (iii) Calculating the difference of before - after for each group; (iv) Taking the performance of the participating group minus the performance of the control group.

(3) Method of comparing trend points

This is a method of building control groups based on statistical probability model involved in the intervention by available statistical data. Target beneficiaries are compared based on this probability, or is known as trend point compared with not participating objects. The average efficiency of the policy intervention is then calculated by the median difference in the results between the two groups.

Steps to apply comparative method of trend points:

Step 1: Gathering information about the characteristics of participants and non-participants (control group) in the policy.

Step 2: Estimating the function of participants in the policy using a regressive method for profit model[2]. Predictive value of participation can be obtained from this function. Each participant and non participant will have a specific predicted probability (trend point).

Step 3: Identifying the general support region and verifying its balance.

Step 4: Based on trend points, linking an object of participating group with one or several subjects of non-participating group which have most similar estimated probability, and then compare the difference in outcome of these two groups. Using techniques such as closest comparison, range or radius,... to compare the two groups. Calculate the difference, and that is the policy impact of each participant.

- Compare closest: Each participant will be compared with those who are non-participants based on most similar trend points;

- Range or radius: This technique creates a distance range of maximum trend points, called range or radius. Therefore, this technique can be done by substitution between points in the same trend range/radius.

Step 5: Calculation of average value of all the difference value of each participant to find out the overall average value, this is the impact of the policy on all participating stakeholders.

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[2] Profit model is the regression model with a dependent binary variable.

Step 6: The results find a problem that is an inaccurate estimated difference. To fix this problem, it can apply the estimated standard error by activating traps.

(4) Economic effectiveness assessment

Assessment of economic effectiveness is to compare the costs involved with the benefits that the policy brings about. Types of economic effectiveness evaluation include:

-   Cost - Effectiveness Analysis (CEA), this is a kind of analysis of the costs involved in policy enforcement compared to the total results obtained for calculating the "cost per result";

-   Cost - Benefit Analysis (CBA), this is a type of more in-depth assessment than CEA in evaluating the monetary value of the change in the results (for example, assessment of the value of increased number of employed people). This means that CBA can examine the overall evidence of a policy ("Is the benefit greater than the cost of money involved?") as well as comparison of policies relating to different benefits. CBA quantify costs and benefits that a policy can have and be feasible, including the wider impact on the environment and society.

Assessment of economic effectiveness is a very complicated task and needs to be carefully planned with input from economists, economics law, or policy quantitative research experts in the evaluation planning stage.

b. Tools used for policy evaluation

In terms of evaluation tools, it could use a combination of tools such as: use of qualified experts; conducting investigations and surveys; consultation with stakeholders,...

4. Conclusions

Post evaluation of the impact of S&T policy needs clearly defined objectives and compliance with the assessment process outlined. Methods and assessment tools should be carefully considered to obtain useful information to be as the basis for a quality evaluation. The consultation with stakeholders involved in the evaluation process is essential to obtain timely feedbacks. The evaluation results should be disseminated to policy makers, appropriate functional agencies so that policies can be improved, modified or abolished. A Framework for Post Impact Assessment of S&T policy presented in this article is the result of a research project at ministry level in 2015 of which the author was the leader./.

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