

**W A R T A**  
**PENGELOLAAN PENELITIAN DAN PENGEMBANGAN**  
**(R & D MANAGEMENT)**

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**WARTA PENGELOLAAN PENELITIAN DAN PENGEMBANGAN  
(R & D MANAGEMENT)**

1. Merupakan wadah komunikasi bagi masyarakat ilmuwan, para pengelola penelitian dan pengembangan pada umumnya, dan antar-alumni Widyakarya-Penataran Pengelolaan Penelitian dan Pengembangan pada khususnya.
2. Memuat karangan dan berita mengenai perkembangan pengelolaan penelitian dan pengembangan.
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**DAFTAR ISI**

**KATA PENGANTAR DEWAN REDAKSI** **iii**

**KARANGAN**

1. Peramalan Teknologi  
Oleh : Sujoso Soekarno . . . . . 1
2. Beberapa Aspek Pengelolaan Proyek Penelitian dan Pengembangan.  
Oleh : Bachtiar Ginting . . . . . 7
3. Suatu Teknik Perencanaan Kegiatan Proyek  
Oleh : Nilyardi Kahar . . . . . 19
4. R & D Evaluation in the European Communities : an analysis.  
Oleh : C.P.F Luhulima . . . . . 29
5. Pokok-Pokok Rancangan Sistem Informasi Pengelolaan Secara Partisipatif.  
Oleh : Sularti S.U. Ismusubroto . . . . . 34

**YANG PERLU DIKETAHUI**

- Petunjuk Menulis Naskah Ilmiah  
Oleh : Sumengen . . . . . 43

**BERITA**

- Pertemuan Alumni Widyakarya—Penataran Pengelolaan Penelitian dan Pengembangan.  
Jakarta, 28 Pebruari dan 1 Maret 1983 . . . . . 51

**Tulisan dalam "Warta" dapat dikutip dengan menyebutkan sumbernya**

## KATA PENGANTAR DEWAN REDAKSI

Penerbitan nomor 2 tahun 1983 memuat serangkaian tulisan yang berkaitan satu dengan lainnya. Tulisan pertama mengemukakan mengenai suatu teknik peramalan teknologi. Unsur teknologi di masa depan, walaupun tidak pasti, dapat diduga baik secara regresif atau gambaran kreatif. Berbagai skenario harus diciptakan agar berbagai kemungkinan timbulnya unsur teknologi dapat diwaspadai. Suatu teknik peramalan teknologi harus dapat dimanfaatkan agar kegiatan penelitian dan pengembangan dapat diarahkan.

Tulisan kedua mengemukakan mengenai beberapa aspek pengelolaan proyek penelitian dan pengembangan. Dikemukakan bahwa untuk dapat memahami apa yang sebenarnya dimaksud dengan pengelolaan proyek dan peran seorang pengelola proyek, perlu diketahui karakteristik proyek, sifat pengelolaan dan kedudukan proyek dalam organisasi. Pendekatan yang dipergunakan ialah pendekatan sistem dan piramida sistem perencanaan. Menurut pengalaman penulis, pendekatan dan cara itu banyak sekali membantu dalam melaksanakan dan mengelola proyek penelitian dan pengembangan.

Tulisan ketiga, suatu teknik perencanaan kegiatan proyek, mengemukakan suatu teknik yang berusaha mengkombinasikan pendekatan logis teknik jaring dengan kesederhanaan yang mudah diterima yang ada pada diagram balok. Teknik itu, yang disebut sebagai teknik ABC, dapat sepenuhnya digunakan untuk proyek penelitian dan pengembangan, karena faktor-faktor ketidakpastian yang umum terdapat pada rangkaian kegiatan litbang dapat diakomodasikan dengan baik.

Tulisan keempat mengemukakan mengenai evaluasi penelitian dan pengembangan di Masyarakat Eropa, yang merupakan rangkaian lanjutan tulisan dalam Warta No. 1 A. Tulisan ini memberikan gambaran mengenai pengalaman Masyarakat Eropa dalam menerapkan sistem evaluasi penelitian dan pengembangan. Analisa daripada pengalaman itu memberikan garis pedoman bagaimana mengembangkan komponen struktural dan substansial daripada evaluasi. Komisi Eropa menganggap bahwa pengkajian sosial ekonomi dari hasil penelitian sangat penting dan segala usaha dilakukan untuk mengembangkan metodenya. Demikian pula halnya dengan pengetengahan masa depan dalam evaluasi.

Tulisan kelima mengemukakan mengenai pokok-pokok rancangan sistem informasi pengelolaan secara partisipatif. Pengembangan sistem secara partisipatif itu dipilih karena lebih serasi dengan ciri khusus sistem pengelolaan organisasi penelitian dan pengembangan.

Dalam rubrik YANG PERLU DIKETAHUI dikemukakan tulisan mengenai petunjuk menulis naskah ilmiah. Tulisan ini mengemukakan menge-



nai ketentuan umum, dan secara terperinci dikemukakan apa saja yang harus ada dalam kerangka naskah ilmiah.

Dalam rubrik BERITA dikemukakan bahwa pada tanggal 28 Pebruari dan 1 Maret 1983 telah diselenggarakan pertemuan alumni Widyakarya-Penataran Pengelolaan Penelitian dan Pengembangan. Sebanyak 150 orang telah hadir dalam pertemuan tersebut. Di samping suatu pertemuan ilmiah, pada tanggal 1 Maret 1983 disepakati untuk membentuk suatu Perhimpunan, yang intinya terdiri dari para alumni, yang akan dikembangkan sebagai suatu perhimpunan profesional. □

## R & D EVALUATION IN THE EUROPEAN COMMUNITIES : AN ANALYSIS

By :

C.P.F. Luhulima \*)

### SARI KARANGAN

Analisa tentang evaluasi penelitian dan pengembangan di Masyarakat Eropa dapat dibagi dalam dua kelompok komponen, yaitu kelompok struktural dan kelompok substansial. Unsur struktural dibagi dalam metode evaluasi, pemilihan para pembuat evaluasi, waktu yang tepat untuk melakukan evaluasi, dan jangka waktu evaluasi. Unsur substansial dari evaluasi yang dilakukan ialah tujuan dan sasaran, pengkajian dampak sosial-ekonomi dari hasil-hasil penelitian, dan orientasi masa depan dalam evaluasi. Komisi Eropa menganggap pengkajian dampak sosial-ekonomi dari hasil penelitian sangat penting dan segala usaha dilakukan untuk mengembangkan metodenya. Demikian pula halnya dengan pengetengahan masa depan dalam evaluasi masa depan dalam evaluasi. Tulisan ini berusaha untuk menguraikan usaha-usaha evaluasi Masyarakat Eropa itu.

### INTRODUCTION

In an earlier article the structure and methods of R & D evaluation in the European Communities were discussed. Three methods of evaluation were employed : the *external* evaluation applied to direct research conducted at the four European Communities' research centres; the *hearings*, a lighter form of evaluation which is applied to concerted research; and the *peer review* or *peer evaluation*, the most elaborate method of evaluation, which is applied to indirect actions and focussed on the management and coordination aspects.

This article will elaborate on the analysis of the evaluations which were discussed in depth at a conference on Evaluation of Research and Development in Brussels in January 25 - 26, 1982 and at the briefing of ASEAN - COST Senior Officials, also in Brussels on October 19, 1982.

### USERS OF R & D EVALUATION REPORTS

From the viewpoint of the European Commission the various types of evaluations are considered to be quite successful. A wide range of sources have requested copies of the reports. Two committees have discussed the evaluations and have found them to be very useful for assessing the substance, value and potential impact of the Communities' programmes. These two committees are the CERD and the CREST. CERD, the committee for research and development is composed of high level independent experts whose task it is to advise the European Commission on the technical content of its re-

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search programme proposals. CREST, the scientific and technical research committee periodically ensures that the role and objectives of the Joint Research Centres (JRC) are in accordance with the objectives of and perspectives for a common R & D policy. CREST has also used the evaluations to assess the progress of work and to decide on the Commission's proposals for extension or revisions of the R & D projects. The staff of the European Commission responsible for R & D programmes have generally found the recommendations very useful as input into preparing programme revisions or extensions. Views from higher bodies, such as the Economic and Social Committee, the European Parliament and the Council of Ministers have not yet been obtained, but can be assumed to be favourable as well.

The users can be further grouped into three distinct levels : the policy level, the managerial level and the scientific level. At the policy level the output of the evaluations are necessary to make decisions on new components in the Communities' R & D strategy. The management level needs the evaluation output and the recommendations for improving the effectiveness of management, whereas the scientific level needs the output for programme management improvements as well as for scientific feed-back purposes.

The comments of the users can generally be categorized into two major components : the structural elements and the substantial elements.

#### EVALUATION METHODS

The exercises have proven that both *hearing* and *peer evaluation* are very well suited for evaluating concerted actions and indirect actions. It was found that retrospective assessment by independent, external experts who are not at all involved in the programme are important for two specific reasons : to provide objective views and thus to ensure credibility to the recommendations.

There are efforts to combine peer evaluation with the hearing evaluation method. These endeavours are, however, still in the proposal stage; yet preliminary views expressed on the matter indicated that the combination may produce practical and fast evaluations.

However, it should again be emphasized here that there seems to be no single system of evaluation that is applicable to all the European Communities' R & D programmes.

#### CHOICE OR SELECTION OF EVALUATORS

It is also convincingly proven that good and successful evaluation depends on the choice of experts. This is as a matter of fact the most critical issue in evaluation. It was, therefore, suggested that the European Commission only select the chairman who is responsible for the selection of the panel members, although in conjunction with the Commission. It is advisable that



the members should be as heterogenous as possible: they should be competent, independent, originating from parts of the European Communities as widely spread geographically and as complementary in their field of specialization as possible. They should consist of scientists, potential producers and especially of the users of the R & D results in order to make recommendations for faster and more effective exploitation of the R & D output. If possible at least the European Communities should strive for it -- the chairman and the panel members should have experience in evaluation methodology (which will be extremely difficult at this stage bearing in mind the current status-of-the-art of evaluation) and--what may be more important-- in socio-economic impact assesement. On the other hand, the panel should be as harmoniously as possible, thus excluding evaluators who have difficulties in adapting themselves to the chairman's and the Commission's policies and guidelines and in cooperating with other panel members. For the European Commission staff the exercise will contribute to their experience in evaluation methodology which they can transfer to other panel members in successive evaluations which are already planned.

#### TIMING OF THE EVALUATION

The correct timing of the evaluation was found to be a key factor in measuring the effective impact of the R & D results. So far evaluations have been made at the end of a programme to ensure that most of the final results of the R & D are available for the panel members. Yet it was felt that evaluations could be more effective if they were available at an earlier stage, as input into decisions on programme extensions, taking into account both the results of the previous programme and the partial results of the current programme. The Commission suggested that the most appropriate timing for the evaluations may be the time scheme indicated below, with a five year sliding programme scheme as a reference.

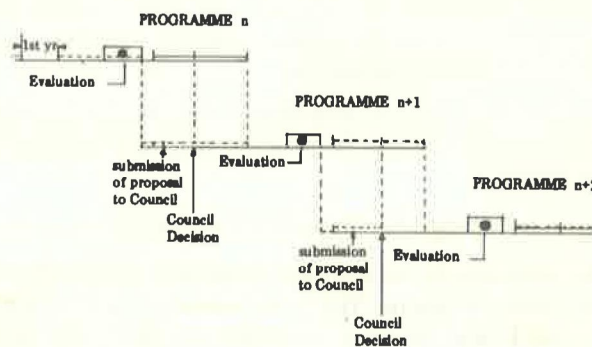


Figure 1 : Five years sliding programme scheme.



Evaluations would thus start after approximately two years of implementation of the current programme (n) and would in this way provide updated assessments and recommendations for the adoption of the next programme (n+1) which will start during the third year of the current programme. This means that the next programme (n+1) commences one year before the current programme is wound up which means that the current programme will slide smoothly into the next or subsequent programme. It should, however, be pointed out that the five-year sliding programme has not been adopted for or applied to all programmes, but it is assumed that the principle would be valid for the non-sliding programme concepts as well. Substantiation for this last statement has not been available yet. In cases where programmes are discontinued, the evaluation will be conducted immediately after the programme results are available.

#### LENGTH OF THE EVALUATION

Up to now the length of evaluations has averaged six to eight months which consisted of monthly meetings of two days each. Taking into account the additional time of four to ten months which are needed for translation into the several Community languages and for printing, the whole period up to the distribution of peer evaluation will last for one whole year or even one year and a half. This time span is certainly too long, particularly if one considers the need for providing decision-makers with the most up-to-date information and, also, considering the fact that *peers* have their own full-time occupation. Moreover, the European Commission is envisaging to develop programme evaluation into a systematic procedure and thus organize quite a few evaluations each year.

So the time factor for finalizing evaluations will be a very important consideration indeed. Efforts are underway to reduce peer evaluation to six months plus an additional three months for the final publication of an evaluation report.

#### OBJECTIVES OF THE EVALUATION

After discussing the structural elements of the evaluation exercise in the European Communities, we have now come to the discussion of the more substantial components.

The evaluation exercise have shown that the objectives of each evaluation should be spelled out distinctly and lucidly from the very beginning. The European Commission should, therefore, inform the various panels of the evaluation objectives that need specific emphasis, such as the type and nature of the R & D programme (whether basic or applied research, whether short-term or long-term), the kind of actions (whether *direct*, *indirect*, or

*concerted*), and also the specific needs of the users. This is necessary to be able to select a panel of a manageable size which fulfil the evaluation objectives.

Yet the wide variety of evaluations conducted have produced one common principle : that evaluation *a posteriori*, i.e. assessment of the R & D results, should necessarily be future oriented; it must contain suggestions as to improvements in future R & D designs and implementations. Only then will evaluation be of any constructive value. Any evaluation which do not yield future prospects will not meet the essence of a *a posteriori* evaluation.

#### SOCIO-ECONOMIC ASSESSMENT OF R & D RESULTS

From the exercises conducted so far one of the evaluation objectives which have received the least coverage is the socio-economic assessments of the results. This includes the contribution of R & D results to both the development of the European Communities' policies and strategies and their implementation. The present status-of-the-art in socio-economic impact assessments, particularly for long-term research, is such that it allows for little more than just intelligent guesses. It is common knowledge that the results of quite a number of R & D programmes will not be known, or applied, for quite a number of years, sometime a decade or even longer, and thus require some forecasting. One difficulty is the setting of common goals on which to base the assessments. The other difficulty is the lack of experts with sufficient experience both in the field of forecasting and the relevant field of research. These shortcomings can be partially met by including potential research results users to judge the potentialities of the exploitation of the R & D results or experts in the socio-economic fields, such as economists.

The European Commission seem to consider this kind of evaluation extremely important, especially for inferring the usefulness of the R & D, and plan to focus its endeavours in this particular field. The Commission has contracted out a study to develop socio-economic impact assessment methods to be used by evaluation panels whose members have limited experience in the field. The study should cover the time constraint in producing socio-economic impact assessments. These methods will be developed on the basis of the biomass and the heat-pump sectors of the European Communities' First Energy R & D Programme (ERET 1). It is expected that the study will come out with a practical checklist which can be utilized by the panels when conducting socio-economic impact assessments. So far no information has been made available to indicate whether the effort has been successful.

#### FUTURE ORIENTATION IN EVALUATION

Another substantial aspect of evaluation which should be strengthened



by way of these exercises is the development of the capability of outlining future strategies and the various options for inclusion in future R & D programmes. Suggestions as to the incorporation of future orientations or prospects or even future impacts into the R & D programme which have been assessed by experts in the field, yet uninvolved in the execution of the programme, will undoubtedly be extremely valuable for decision-making on future programme strategies.

#### C O N C L U S I O N

This article has highlighted the European Communities' experience in the application of her evaluation system for the three R & D programme categories. The analysis of her evaluation exercises have given the Commission guidelines on how to develop the structural and substantial components in the evaluation of her R & D programmes. The major thrust of the R & D programmes evaluation should be in socio-economic assessments stretching out over a decade or even longer, thus emphasizing equally strongly the future orientations in evaluation judgements.

Exercises of this kind will be very useful if applied to R & D programmes in ASEAN both on the regional and national levels. So far, ASEAN R & D projects evaluation have mostly been conducted internally, by the researchers engaged in the projects themselves. External evaluation have also been conducted. Seminars and workshops at the ASEAN level to discuss the research results have been attended by foreign experts, from Australia, Japan, the United States and others, who give suggestions as to improvements of R & D programmes. Yet, this type of evaluation remains very much an internal sub-committee or working-group affair. On the ASEAN organizational level no built-in evaluation has as yet been devised. This would mean that the ASEAN Committee on Science and Technology (COST) or the ASEAN Secretariat create or institutionalize an external, independent panel of experts to evaluate all the COST science and technology projects, specifically to establish the relationship between the funds appropriated for research and the impact of the research results on society. Let us hope that this type of evaluation can be institutionalized in ASEAN as well, both regionally and nationally. □