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EVALUATION OF THE R&D PROGRAMMES

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Evaluation fulfils a number of different functions. Evaluation of public policies and in particular of research can be seen from two different points of views : control and management. An external independent control of the use of public funds is essential in a democratic society and is an important element for the political decision-makers. However it would be wrong to see evaluation from a negative point of view implying control and sanction. Its essential function is to assist management at all levels from the political decision-makers down to the people charged with the daily execution of the programme under scrutiny. Therefore evaluation has become an integral part of the R&D management process and should not be seen as an exceptional action to be taken when problems arise.

It is important to distinguish between programme evaluation and scientific peer review. Scientists have been accustomed since a long time to a scientific and technical analysis of R&D activities conducted by their peers (peer review). While this continues to be an indispensable element of the R&D process, evaluation of publicly funded research programmes is intended to go beyond scientific peer review in order to analyze these programmes as R&D operators (see R. Chabbal - Organization of Research Evaluation in the Commission of the European Communities - EUR 11545, 1988). It becomes therefore essential to assess, beside the individual research projects, the managing structure of the programme in order to analyze the particular contribution given by the public national or international intervention.

Seen under this point of view evaluation is a continuous function which takes place at all phases of the programme. It is primarily an internal activity conducted at all different levels of programme management. However, at given intervals in time, it is important to analyze R&D programmes under a more general perspective different from the one of the specialized point of view of their managers.

Public funding of R&D programmes, even in the case of basic research, is normally justified by short or longer term goals which go beyond the pure increase of scientific knowledge. History has proven that economic prosperity and quality of life are in the long term strictly related with past R&D expenditures, even if the relations of cause and effect are not straight forward and cannot be easily schematized. It is therefore essential that the best utilization of public funds be regularly assessed from a point of view which cannot be limited to the one of pure science and technology.

Evaluation by external experts is then the occasion to bring into the scientific chain of thought different points of view ranging from the one of different but related scientific disciplines to the one of economists and management specialists. External evaluations conducted by independent people, beside fulfilling the function of democratic control, has therefore the function to avoid schemes of thought becoming too inflexible.

We can therefore distinguish the following phases of evaluation :

- a general ex-ante definition of priorities, objectives and milestones,
- a continuous day-to-day evaluation which is part of the normal management functions
- an external independent evaluation which can take place either at the end of the programme (ex-post) or during the course of its execution (mid-term).

Ex-ante evaluation

The function of the ex-ante evaluation is to define as clearly as possible the objectives of the programme and plan its development as a function of time. A particular problem is posed by the definition and further interpretation of the objectives of R&D programmes.

In the past, these have often been very general, e.g. "to contribute to better knowledge of the marine environment" and "to encourage the development of new technologies for ... marine resources". However there is now a greater awareness among decision makers and programme managers that the objectives should be written in verifiable form, and so they are tending recently to be at once more specific and much longer and more detailed.

However one should be aware of the need for objectives to respond flexibly to changed external circumstances, and that unexpected spin-offs may be so important that they can make the original targets almost irrelevant. An often-quoted example is the voyage of Columbus which failed dismally to meet its original objective and yet changed the course of history.

The objectives of a programme can be of two types, to solve a particular stated problem, or to cause particular things to happen. Both can in principle be stated in verifiable form. A famous example of the first type is Kennedy's goal of putting an American on the moon and returning him safely to earth before 1970. The latter might be exemplified by the requirement that European industry fund further development of the ideas contained in the projects with twice the money spent by the Commission. This would allow for the possibility that some projects would fail.

The writing of clear objectives is done not only to facilitate the task of the external evaluators, but even more to provide a discipline for the programme managers, who thereby state what they intend their programme to achieve. It also provides appropriate signals to the programme participants and assists in the development of their plan of activity. It is thus a fundamental part of the management of a research programme.

The programme managers are asked to consider the current situation, and how they would like this to be changed and improved in, say, five (or ten) years time as a result of the implementation of their programme. There should be a demonstrable causal connexion between the work undertaken under the programme, which is additional to what would otherwise have taken place, and the results intended. Whenever

reasonably feasible, objectives should be expressed in a quantitative form and the means of testing them should be specified.

A good example of testable objectives is afforded by the BRIDGE programme in biotechnology. This includes a requirement for transnationality, to be expressed in multi-nationally co-authored papers, or ones with acknowledgements to other contract partners for the provision of materials and/or methods. Another requirement is for direct industrial involvement in at least one-fifth of the projects, either during implementation or afterwards.

The check of the fulfilment of objectives may require the collection of important amounts of information and is a non-trivial exercise. The evaluators may well feel constrained to make a selection among the evaluation criteria if they cannot check them all. In any event, it would not be reasonable to expect a programme to achieve every single one of its objectives, and some order of priority needs to be established. The check of the fulfilment of individual objectives will help the evaluators to reach a judgement on the success of the programme as a whole, but cannot replace this judgement.

Beside this definition of verifiable objectives ex-ante evaluation is intended to plan the programme development as a function of time setting up the relevant milestones.

Internal evaluation

This function cannot be easily distinguished from the normal management of the programme. It is conducted by the programme managers with the help of their advisory committees and includes a peer review both for the selection of new proposals and for the analysis of terminated projects.

Internal evaluations should also put together all information and data needed for subsequent external evaluations. It is useful to make sure that such information is collected from the beginning of each programme. This should include the programme decisions, calls for proposal, selection criteria, list of proposals retained and rejected, progress and final reports of each contract, published articles, patents, seminars, conferences, opinions of the advisory committees, etc. It is however very difficult to convince a busy programme manager to devote time to the preparation of an evaluation due to take place three or four years later. The best way to proceed is to make sure that the files and databases which have to be kept for the normal administration of research contracts also include the information needed for evaluation.

Timing of external independent evaluation

For the R&D programmes of the European Communities external independent evaluation has become a necessary process which is officially required whenever a programme has to be extended or modified. This has the advantage of eliminating

discussions on the need for evaluations, but it implies a constant control on the quality of these exercises in order to avoid them becoming simply a bureaucratic hurdle.

Evaluations are required when decisions have to be taken about programme continuation, termination or re-orientation. However it is a truth universally acknowledged that evaluations are always started too early and evaluation reports always come too late.

A good evaluation should be started when results are available or, even better, when scientific results have produced all of their social and economic effects. On the other hand evaluation reports are needed when decisions have to be taken. Very often these decisions are required when the programmes have been in existence only for a short time and no scientific results are yet available.

An evaluation report published after the relevant decisions have been taken is good for science historians but useless for managers.

Therefore real ex-post evaluations are seldom conducted. The main evaluation work is centred on mid-term analyses assessing the available results and the management structure of programmes. Furthermore external independent evaluation should, as we have seen, introduce different points of view in the management of R&D programmes, and this has to be done at regular intervals. Ex-post evaluations come too late for this function. Since Community R&D programmes often cover several multiannual cycles, it is frequently possible to conduct at the same time a mid-term evaluation of the current activities and an ex-post evaluation of the previous programme(s).

Sometimes there is a problem when a large number of proposals for different R&D activities have to be submitted at the same time for political decisions. It is indeed difficult to conduct too many evaluations in parallel in order to have their reports available just on time for decisions. In this case the Commission has made use of older evaluation reports accompanied by an update.

Panels and consultants

An external independent evaluation can be conducted either by a specialized organization or by a panel of independent experts. Organizations specialized in R&D evaluation are still rare. Most consultants are specialized in various technical fields, management or marketing. All of these functions are needed for evaluations but are seldom brought together in the same organization. Moreover expertise in the particular field of research evaluation is not often available.

At the level of the European Communities it has been felt that the use of panels can give a better guarantee of independence and have a higher political impact. European evaluations have to be accepted by the representatives of the Member States, by the European Parliament and by the scientific community. The involvement in this process of well known personalities from different countries can strongly help in this respect. Furthermore consultants are seldom multinational and are often seen as executors of

the wishes of their customer rather than independent judges. In this respect the situation is politically very different from the one of a national agency asking a contractor to organize an evaluation for its own use.

The use of panels also gives the possibility of putting together expertise in a number of different fields. Indeed experience has shown that the best evaluations are those conducted by the most heterogeneous panels. If the panel members are too specialized in the technical field under examination the discussion tends to concentrate on narrow issues and technical detail and neglects the more difficult analyses of the general impact of the programme. One should not forget that decision makers must also be able to use evaluations to set priorities between different fields. This is only possible if the evaluation panel, beside the specialists of the relevant technical field, also includes specialists of different technical domains. Indeed people who have spent much of their lives in research tend to believe that their field always deserves the highest priority, and only the inclusion of people with experience in other fields of research can guarantee the necessary objectivity.

Users of research results should be included, and particularly industrialists, whenever relevant. Expertise in science policy, management and economics is also needed.

The choice of evaluators

The choice of panel members is the most delicate part of an evaluation, influencing both its value and its credibility.

The independence of the evaluators is an important element if evaluations are to be used in the democratic decision-making process. Therefore panel members should not directly benefit from the programme and should at the same time be seen to represent the different points of view in controversial cases (e.g. industry versus environment). They must be sufficiently eminent to make the evaluation report credible.

A reasonable balance of nationalities must be obtained but one should avoid having a bureaucratic group of official national representatives. It is in any case impossible to include all Member States since an efficient panel cannot contain more than 7 or 8 members. Experts from outside the Community often add an important contribution, particularly for those programmes that have involved the quasi-totality of the scientific community of the Member States. However the inclusion of members from the USA or other distant parts of the world must be balanced against the problems posed by the long journeys, jet lag, costs, etc.

The method chosen by the Commission for the choice of panel members consists of the following steps :

- *Drafting of a list of profiles defining the types of expertise required and background sought (e.g. economist from industry specialized in raw material problems) ;*

- Collection of a large number of names corresponding to these profiles. Suggestions are sought from many different sources including the programme managers, their management or advisory committee members, other Commission officials, and the database or other contacts of the evaluation unit ;
- Check of independence (see below);
- Selection of a "short" list of possible panel members taking into account expertise, professional affiliation and a reasonable balance of nationalities. This list is formally submitted to the Director General, who may add additional names, or delete some.
- Invitation of people on the list to serve on the panel. Very often the panel chairman is selected first and the other members are chosen with his help.

This selection process takes a long time. High-level experts, especially from industry, are not readily available and sometimes a short list of 25-30 names is needed in order to arrive at a panel of 6 or 8 experts.

Every time a proposed member declines to participate it is necessary to re-assess the balance of expertise, affiliation and nationality and contact other potential members. Some experts ask for documentation, analyze it and then declare that they have no time to participate so that more than one month is lost on a single refusal.

Based on an examination of six recent evaluations, the average time needed from the decision to start the procedure to the first panel meeting was 9 months with a minimum of 6 months and a maximum of 16.

The concept of independence is also rather vaguely defined. It is almost impossible to find Europeans who have never benefitted in some way from the activities of the EC. The normal check consists in ensuring that they have not received contracts from the programme to be evaluated nor have participated in one of its committees. This check is not always easy. In the Medical Research programme, for example, approximately 4000 teams of researchers have been involved and some of the people who were originally proposed as independent had later to be excluded because they had participated in the research. Experts in the field covered by the programme are seldom totally independent even if they did not participate in its contracts. However, by involving people with different background, the panel as a whole can be more independent than each of its individual members.

Programme managers are allowed (within reasonable limits) to refuse specific persons they feel would be unduly biased against their programme and therefore lack independence.

The involvement of the programme managers and the members of their advisory committees in the selection process for the panel gives them more confidence in the evaluation process.

During the evaluations, it is a common experience that the panel members tend to develop a feeling of responsibility toward the programme they are evaluating. We have

even found that, after some years, a few individuals who were originally independent have been retained to assist with the programme and they can no longer be used for subsequent independent evaluations. This does not mean that the original evaluation was not objective. Moreover the evaluators have fulfilled their main role of introducing new ideas and different points of view into the management process.

External support

The use of panels of experts does not exclude the employment of external consultants. Indeed high level experts are usually very busy and cannot devote a high percentage of their time to an evaluation. A considerable amount of the work needed for an evaluation requires specialized analyses of the programme both from the scientific and from the economic and sociological point of view. Besides scientific output, it is usually necessary to measure the impact of the programme on scientific structures and cooperation and its actual or potential effect on the European economy, industrial competitiveness, the environment, the quality of life, etc. The collection and analysis of these data requires techniques only available through some specialized contractors. Therefore all preparatory work such as collection of data, conduct of interviews, mailing of questionnaires, bibliometric studies, detailed technical or economic analyses will have to be conducted by specialized contractors. With questionnaires, it is particularly important that replies be treated confidentially by an organisation separate from the Commission so that the results are only made available in an aggregate form. Whenever possible the choice and terms of reference of these contractors should be made in cooperation with the panel in order to be sure that the results of these studies are fully accepted by and integrated in the work of the evaluators.

However this is not always possible because sometimes the work of the contractors requires many months. This creates a conflict between the importance of having the study conducted under the supervision of the panel and the need to start the work in advance in order to have the results available when the panel needs them. In some cases, particularly when the study was large and particularly expensive (e.g. a big programme of interviews) this problem has been solved by seeking tenders well in advance so as to be able to respond rapidly to the needs of the panel.

In some cases it is important to compare the situation before and after the programme so that the study has to be conducted twice. The first study has then to be conducted when the programme is starting, long before the evaluation, and only the second phase of the study can be supervised by the panel.

Terms of reference

In setting up an evaluation it is important that the task of the evaluators is clearly specified. This is usually done in the terms of reference which are part of the contract made with the members of evaluation panels.

For EC research programmes, some general guidelines were drafted in 1986 (Official Journal of the European Communities C 14 of 20.1.87). These general terms of

reference state the need to assess both the scientific value and achievements of the Community R&D programmes and the added value resulting from their implementation at the European level. For programmes financed with Community funds it is not only necessary to show that they are technically and scientifically sound and properly administered, but also that Community action was justified and has resulted in some added value which could not have been obtained at the private or national level.

The EC terms of reference state that evaluations will cover the following :

- "- the scientific and technical achievements of the programme or activity taking into account its original objectives and milestones, and whenever relevant of changed circumstances,
- the quality and practical relevance of the results including (whenever relevant) commercial development and exploitation, and possible spin-offs,
- the effectiveness of management and of the use of resources,
- the programme's or activity's contribution to the development of Community policies and to the social and economic development of the Community,
- the benefits resulting from the implementation of the programme or activity at Community level (Community added value)."

The first point (scientific and technical achievements) is usually dealt with in the internal evaluations or peer reviews conducted regularly by the programme management and their advisory committees. A programme evaluation conducted by a panel of external experts has the task of assessing the general impact of the programme and its rationale. It cannot analyze in depth every single project of which the programme is composed. Furthermore such work would require detailed expertise in all fields covered by the programme, which is usually not available in an external evaluation panel. A group of experts capable of analyzing the Community added-value of the programme and the quality of management is anyway ill-suited for such a detailed task.

It is therefore essential that evaluators be able to base themselves on more detailed work conducted by other experts on each project during internal evaluations, and check only that this exercise has been done fairly and competently. Besides these project analyses, general output indicators (e.g. involving bibliometrics) can be used to complete the scientific picture of the programme. These analyses based on other evaluations have sometime been called "meta-evaluation" (B. Bobe and H. Viala, *A decade of R&D evaluation at the Commission of the European Communities*, EUR 13097, 1990).

The general terms of reference we have just listed must be specified taking into account the characteristics of each specific research programme. Some will be aimed at helping industry and increasing its competitiveness, others will deal with environment, health and quality of life, while some will have more basic research

goals. All of these specificities are of course detailed in the original decision that set up the programme together with its verifiable objectives and evaluation criteria.

On the basis of these original objectives a detailed mandate is then specified in which the terms of reference listed above are expanded into a number of questions suited to the specific goals of each programme. For example, in the case of the Aeronautics programme the panel was asked to consider the following specific additional points :

- the contribution of such research to the technological competitiveness of the European aeronautical industry ;
- the benefits accruing to technological areas other than aeronautics ;
- the added value of dedicated research in this area.

In other cases a much more detailed list was prepared. However it is important not to circumscribe the panel too tightly, partly because it could limit their independence, and partly because of the amount of time at their disposal. It may be helpful if the programme managers agree with the evaluation unit on a more detailed list of points to examine which can then be passed to the panel to guide them but not for them to follow slavishly. These detailed points are usually discussed with the chairman of the evaluation panel during the preparatory phase of the evaluation.

Considering that evaluations are not organized for historic purposes, but in order to improve future activities, their mandate always includes a requirement to give recommendations for the future continuation, alteration or termination of the programme or activity, for its management and for the use of research results either directly or through technology transfer.

In practice the question of continuation or termination of a whole R&D programme is seldom discussed by an evaluation panel. Panels have never considered whether to stop entirely research on energy or on the environment, but some parts of programmes have been stopped or re-directed following the recommendations of an evaluation.

Relations between evaluators and programme managers

Even if the main customers of the evaluation are the decision makers, its recommendations will have to be implemented by the programme managers who are also one of the main sources of information for the panel. Therefore a situation of conflict between evaluators and programme managers cannot lead to a good evaluation.

The fact that evaluation has become a necessary process in the management of EC research programmes has strongly reduced these conflicts because these exercises are not felt to have an exceptional or punitive character. Furthermore the situation can be improved by involving the programme managers in the various preparation phases of the evaluation, asking their opinion in the selection of the panel members and in the conduct of the supporting studies.

Sometimes scientists resent being evaluated by people who are not deeply specialized in their scientific field. They are accustomed to peer review and it must be clearly explained that the goals of a general impact evaluation of a programme are quite different from those of a scientific peer review.

During the evaluation there should be continuous contact between programme managers and evaluators. The programme managers must initially provide the panel with the necessary information on the programme, its goals and historical development, and its management structure and achievements. The results of the internal evaluations conducted by the programme managers must also be transmitted to the panel. The panel must subsequently maintain a dialogue with the programme managers and keep them informed of their findings so that they can be taken into consideration in real time.

The panel must also take contact with the persons charged with the administrative aspects of programme management (e.g. the contract department) in order to avoid proposing administrative improvement which are too difficult to implement.

Individual meetings on a one to one basis between panel members and programme managers have been found extremely valuable. They allow the members to learn about the separate sub-programmes in much more detail, and they are apt to yield information that would not be vouchsafed in the context of a more formal presentation.

It is usual that while a programme is being evaluated by the panel, its next phase is being planned by the programme managers who should be able to make use of the evaluation results as soon as they become available. Furthermore, before an evaluation report is released, the programme managers should be able to see it and transmit their comments to the evaluators. The final decision on the report belongs of course to the panel, but this procedure is intended to avoid misunderstandings or factual errors.

However, the need for continuous contact between evaluators and evaluated does not mean that the programme managers should be present at all panel meetings. In particular, interviews with contractors or users of research should be conducted confidentially in order to obtain better information. This means in practice that the programme managers, or a representative of them, should be present only when specifically requested by the panel.

A practice which several panels have found very useful is to invite the programme managers to suggest the names of people whom the panel could usefully interview. The panel should, however, not confine itself to seeing only these people, and must retain its right to interview, or take written evidence from, anyone who may be able to give relevant information - even if this is not in accordance with the views of the programme managers.

In practice not all evaluations can take place in perfect accordance with these ideal procedures, and the personality of the programme managers and of the panel

members can in some cases give rise to some tensions. It is the task of the evaluation unit and of the panel secretary to avoid as far as possible such tensions.

The role of the panel secretary

The members of the evaluation panels are usually high level experts in different fields who are not necessarily familiar with evaluation. Furthermore they change from one evaluation to the next and the experience gained in one exercise would be lost for the following ones.

To avoid these problems, in almost all EC evaluations a secretary has been provided for the panel by the Commission's evaluation unit. This secretary plays a key role in the conduct of an evaluation. He (or she) is naturally responsible for making the arrangements for panel meetings and for the presentation of papers. He also advises the panel on how they can set about their tasks, what supporting studies could be undertaken, and the people who should be called to meet the panel or individual members thereof. In performing this task, he relies on the experience of his own and other colleagues' research evaluations, and on the activities pursued by the Commission in the field of evaluation methodology.

This enables him, for example, to prepare draft specifications for external studies, and to advise on their likely cost and the suitability of particular contractors. He also briefs the panel as necessary on the context of each programme and on which other services of the Commission may be involved with the definition of the programme or with the use of its results.

In turn, the lessons learned from an evaluation and in particular from its supporting studies enable the panel secretary to make an effective input to the development of evaluation methodology which in this way reflects the real needs of ongoing evaluations. For example, a major bibliometric study performed for the Commission on measurement of scientific cooperation and coauthorship (F. Narin and E.S. Whitlow. *Measurement of Scientific Cooperation and Coauthorship in CEC related areas of science*, EUR 12900, May 1990) arose directly from the needs identified in a small bibliometric study in connexion with the biotechnology research evaluation.

The task of the secretary is a delicate one. He should not influence or bias the independence of the panel while at the same time he should provide a methodological guide. Since most panel members are his seniors, the suggestions of the secretary have to be given with a certain degree of diplomacy.

The panel secretary also acts as the main interface between the panel and the programme managers. He transmits to them the panel's requests for information and then presents this to the panel in the form that they require. In order to have an amicable professional relationship with them, he needs to explain the panel's and the manager's viewpoints to the other. Much of the success of an evaluation depends upon his persuading the managers of the reasons underlying the panel's conclusions and recommendations, so that they too become convinced that this is the route to follow and in a sense adopt the panel's views as their own.

The role of the panel chairman and the conduct of evaluations

The evaluation is the collective work of the panel, but this cannot be done without the coordination of a chairman whose task is to guide the meetings and to be responsible for the planning of the work.

To be chairman of an evaluation panel is a demanding task and it must be ascertained that the chairman has sufficient time to devote to this activity.

An important task of the chairman consists of creating a good team spirit among the evaluators. Experience has shown that problems have been posed both by chairmen with a very strong personality who conducted the evaluation as a one man show, as well as by chairmen who lacked the strength to guide the work of the panel. This has to be kept in mind when choosing the chairman : a good and well known expert may prove to be a bad chairman.

As we have already said, the chairman of the panel is often chosen first in order to discuss with him the panel membership. One or two meetings of chairman, secretary and programme managers usually take place before an evaluation is formally started. In these meetings the chairman is familiarized with the programme and its objectives, and possible evaluation procedures are discussed. Any studies which need to be started in advance are identified in this preparatory phase, so that firm proposals can be put to the panel at their first meeting.

The evaluation unit and the panel secretary brief the chairman, and later the other panel members, about available methods and current practices.

Evaluations conducted up to now by the EC evaluation unit have required between 4 and 9 panel meetings. These meetings usually last two days. This reduces the number of travels and the fact of spending an evening together tends to improve the team spirit of the members. There has been one case (the BRITE programme evaluation) where panel members have only been able to meet during week-ends. This was of course a heavy burden for the members, the secretary and the persons to be interviewed, but created a team atmosphere unequalled by any other panel. Between meetings panel members conduct interviews or visit laboratories in various countries either alone or in small groups, often accompanied by the secretary.

For an evaluation to be accepted it is important that all interested parties and countries be in some way involved in the process. Thus meetings of the panel or a group of members with officials in most or all Member States are often considered necessary. Depending on the characteristics of the programme to be evaluated, the panel is seeking evidence from potential users of the programme's results, representatives of industry, consumers, trade unions, local authorities, environmental groups, etc. Some evaluation panels have solicited outside parties to submit evidence by sending a notice to the appropriate scientific journals. The response has not been particularly strong, but some written evidence was obtained in that way.

Since the more work-intensive collection of data, and studies are normally conducted by external organizations, the panel must concentrate on the most important interviews with managers, scientists, users of research and Member State officials.

The chairman usually subdivides the work among panel members according to their background, affiliation and nationality. Each member is often contributing some part of the report which has then to be assembled by the chairman with help of the secretary. The final evaluation meetings are usually devoted to this task.

Utilization and diffusion of evaluation results

The publication of the results of external independent evaluations of programmes funded with public money is an important aspect of the democratic administration process. Evaluation is an important, even if not the only, tool of decision making in the R&D field. It contributes to this process by presenting reliable data and high level opinions. Therefore it is important that evaluation reports be made widely available to the political decision-makers, the scientists, the users of research and the general public.

This also means that these reports are addressed to very heterogeneous readers. In order to be effective they must be easily readable. A good executive summary must be available for busy politicians ; technical detail, if needed, must be confined to annexes. Work carried out for the panel by consultants may also be included in such annexes. It must be kept in mind that the document is often "used as a reference to check certain points, but not read in total" (PREST : The Impact and Utility of EC Research Programme Evaluation Reports, EUR 13098, 1990). For EC evaluation reports, translations in all official Community languages are also required, at least for the executive summary.

The current practice of the Commission of the EC is to publish evaluation reports, without necessarily endorsing their content, which remains the sole responsibility of the Panel members. In this way the Commission retains its freedom of action while at the same time providing the decision makers with the independent opinion of the evaluators.

In theory the evaluation panel may decide that certain material of a confidential nature (e.g. industrial property information or personnel matters) should be restricted to a confidential annex and be communicated privately to the Director General or other appropriate person. In practice in more than 10 years of evaluation this provision has never been used.

The dissemination of evaluation results is not a simple matter. Publication of the reports does not give any guarantee that they reach the right audience. Presentations to the specialized press and to a large public of scientists on the occasion of particular scientific events has proved to be an interesting method of diffusion.

Articles about evaluation reports by science journalists have sometimes shocked the programme managers because of their very negative interpretation : we all know that

good news is no news. Therefore it is inevitable that the focus of the reporters is centred on the negative remarks of the evaluators.

An example is given by the evaluation of Biotechnology. The report published in September 1988 did of course contain some criticism but was generally favourable and well balanced. It was sent to a number of scientific journals and a few articles were published, some of which chose to pick up only the points of criticism. On 15 October 1988, the report of the "New Scientist", under the title "Europe's biotechnology blues" started with the words : "Biotechnologists working on two of the European Community's research initiatives have failed to score any significant achievements". Another report of the "Biotechnology Bulletin", referring to the Biotechnology Research for Industrial Development and Growth in Europe (BRIDGE) had the title "A BRIDGE TOO FAR ?" and started saying : "Over-ambitious targets, poor funding, a shortage of staff and a lack of co-operation with industry have all conspired to ensure that the European Community's two major biotechnology research initiatives to date have produced few useful results".

Reports of this type appear sometimes and should not scare programme managers and evaluators from disseminating the evaluation results. Experience has shown that it is better to be criticized than to be ignored and articles like these have enormously increased the readership of some evaluation reports thus helping to spread information about the programmes.

Cost of evaluations

Evaluation costs ranging between 0.5 and 1% of the total cost of the programme (or even higher) are often quoted. However these costs usually include those internal evaluations, peer reviews and ex-ante assessments which the Commission of the EC classifies as a normal part of the activity of the programme managers. The figure officially given by the Commission for external independent evaluations only, i.e. the cost of panels and related support studies, is of 0.25% . This is however an average figure which varies from programme to programme. Since the cost of a panel is not dependent on the size of the programme to be evaluated, large programmes are relatively cheaper to evaluate. Indeed one could estimate that a minimum expenditure of 60,000 to 70,000 ecus is needed for the pure operation of a panel. The cost of support studies varies strongly according to their nature. While bibliometric studies or questionnaires can be relatively cheap, large programmes of interviews and economic impact studies can be very expensive and will have to be justified from case to case.

Impact of evaluations

The impact of evaluations is twofold : on the decision making process and on the programme management. The first is conveyed by the report and essentially by its executive summary, while the impact on the programme management is taking place during the whole evaluation process starting with the setting up of verifiable objectives.

A recent study (PREST : The Impact and Utility of EC Research Programme Evaluation Reports, EUR 13098, 1990) after having interviewed a large number of programme managers and decision makers concludes that "where there was favourable timing most recommendations appear to have been implemented in subsequent programme planning". However evaluation is not the only tool of decision making and it may be difficult to identify a single cause for any given research programme modification. Whenever the panel developed a constructive dialogue with the programme managers many suggestions for change emerged naturally and were spontaneously adopted by the programme.

The utility of evaluation for the programme managers is proven by the fact that many evaluators have subsequently become regular advisors to the programme and that several evaluation support studies have been further extended at the cost of the programme managers.