

Building a bridge between research programmes and the needs of society

Gérard Valenduc
Patricia Vendramin

Project coordinator

Fondation Travail-Université ASBL
Work & Technology Research Unit
Rue de l'Arsenal, 5 B-5000 Namur

Project partners

- Vincenzo Ardente, Sistemaricerca, Rome (Italy)
- Alicia Duran, Fundación 1° de Mayo, Madrid (Spain)
- Detlef Garbe, Akademie für Technikfolgenabschätzung, Stuttgart (Germany)

Final report
December 1995



Research carried out for the VALUE programme – Interfaces
for innovation, DG XIII, European Commission

Project VALUE PD4-01

*Forms of relay and expression of public demands and social
needs in R&D, in the areas of work and environment.*

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Edited by :

Fondation Travail-Université asbl, 1996

Rue de l'Arsenal, 5 B-5000 Namur

Tel. +32-81-725122 Fax : +32681-725128

E-mail 101233.1465@compuserve.com

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Dépôt légal D/1996/6624/15

ISBN : 2-930062-08--8

Printed in Belgium

English translation: Kim Garrido
Full report available in French

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Introduction



1. Presentation of research institutions

This research was conducted in 1995 under the European Commission's VALUE II programme (DG XIII-2) which has now become the « Innovation » programme. It was carried out by a European partnership coordinated by the Fondation Travail-Université. The partners were :

- **Fondation Travail-Université**
Rue de l'Arsenal, 5, B-5000 Namur
Gérard Valenduc and Patricia Vendramin
- **Fundación Primero de Mayo**
Calle Zurbano, 29-3ª, E-28010 Madrid
Alicia Durán
- **Akademie für Technikfolgenabschätzung in Baden-Württemberg**
Industriestrasse, 5, D-70565 Stuttgart
Detlef Garbe
- **Sistemaricerca**
Via Nomentana, 175, I-00151 Roma
Vicenzo Ardente

The Fondation Travail-Université was responsible for the overall coordination and management of the research, the devising of the scientific analysis and the drafting of the final report.

All four partners in the project were involved in the collection of empirical data and took part in an international workshop in Brussels in October 1995. They all helped to compose the panorama of interfaces between research and society and contributed to the case studies for their own countries. The Fondation Travail-Université then broadened the panorama to include other countries of Europe.

The report was drafted at the Fondation Travail-Université by Patricia Vendramin and Gérard Valenduc. The authors would like to thank their colleagues and partners Vincenzo Ardente, Patrizio Di Nicola, Alicia Durán, José Galante, Detlef Garbe and Gert Schienstock for their productive and amicable collaboration.

2. Context and objectives of the research

It has become clear from research projects carried out in association with social groups that the latter have a series of wishes or behests with regard to research, technology and development. However, most of these groups are not in a position to formulate their wishes themselves. They therefore need intermediary structures to serve both as interfaces and as « relay-points » between the « social demand » and the research system.

Work and the environment are two areas in which organizations and other relay structures centralize the needs and wishes of various social groups. They are not the only such areas. Similar conditions exist in fields such as health, land use, town planning, etc. The choice of the issues of work and the environment was prompted by the recent convergence of these two themes, reflected by a convergence of the respective organizations in the field.

The above-mentioned « relay organizations » actually represent a broad spectrum of formal and informal organizations and initiatives.

- Structured organizations such as trade unions and nature conservation organizations.
- Specialized advice centres such as technology counselling agencies.
- Mediation services such as « science shops ».
- Specialized networks for cooperation between the scientific community and social organizations.
- Research centres particularly geared to « social demand ».
- Other more limited, less structured manifestations of social needs such as local fora on technology, public debates on science and technology, etc.

These different « organizations » share the common feature of acting as relay-points for social groups (workers, local inhabitants, environmental activists etc.). The demands, problems and needs the groups express are likely to draw attention to particular fields of scientific research or technological development : neglected fields, emerging fields or fields of specific interest to certain groups. But a long and difficult road still has to be trodden before such proposals can find their way into research programmes at regional, national or community level.

Two principal difficulties have to be overcome :

- The social needs have to be translated into research problems (i.e. into a form appropriate for the application of scientific methods and criteria).
- Relay systems are needed to communicate emerging issues to the appropriate bodies so that they can be examined by the people

responsible for research policy at different levels (from the local to the European level).

The present study aims to contribute to overcoming these two difficulties by working on two fronts.

- It investigates means of *furthering the formulation* of emerging problems in appropriate terms for research.
- It investigates means of improving the *communication or « relay »* of research needs to the appropriate bodies and decision-making structures.

3. Working method

A three-phase research programme was designed.

- Phase I – a fact-finding phase including the production of a typology of social groups' « relay organizations » and the drawing-up of an inventory.
- Phase II – a deeper analysis based on the case studies and international comparisons.
- Phase III – the formulation of the key issues, conclusions and recommendations, including a two-day European workshop.

3.1. Phase I – fact-finding

The FTU produced an initial draft of a typology of « relay organizations » and discussed it with its partners. The typology was based on three main categories.

- Organizations, referred to as « *interface structures* ».
- Roles involving representation or counselling, referred to as « *interface functions* ».
- Channels for information, communication or public debate, referred to as « *interface media* ».

This typology is examined to greater detail in Chapter III of the first section of this report. It served as a rudimentary framework for the collection of information in the different countries.

The collection of data was carried out by the four project partners, each using the methods they considered most adequate.

- In Germany the Akademie für Technikfolgenabschätzung used a questionnaire to conduct a survey of a large range of organizations. The

survey showed how varied the interfaces were and provided information on their main areas of interest.

- In Spain the Fundación Primero de Mayo focused on organizations dealing both with the topic of work and the topic of the environment, highlighting the points of convergence and synergies.
- In Italy the empirical data collected by Sistemaricerca mainly pertained to institutions playing an interface role alongside other roles (research, consulting).
- The Fondation Travail-Université collected information on Belgium plus a series of significant examples from other European countries : Austria, Denmark, Great Britain and the Netherlands.

3.2. Phase II – analysis

Using the information gathered in the fact-finding phase, the FTU conducted an initial analysis of the modalities used by the interfaces and of their difficulties and needs with respect to the relaying of research needs.

While this was being done the partner institutions conducted more detailed case studies, exploring interesting forms of interfaces with prospects for use at European level.

The results of the inventory and the case studies can be found in the second section of this report.

3.3. Phase III – definition of key issues and formulation of recommendations

The interim results of the research were presented at an international workshop on 2 and 3 October 1995 in Brussels, and the two key questions facing the project were examined in greater depth.

- How can social needs be translated into suitable topics for research ?
- How can communication between representatives of social groups and decision-making bodies in the research field be improved ?

The workshop was attended by fifty-five participants from Austria, Belgium, Denmark, Spain, France, Italy and the Netherlands. Representatives of various departments of the European Commission were also present.

The final report draws on the results of the three phases of research and the findings of the international workshop.

4. Outline of the final report

The report delivered in French to the European Commission is in two parts.

1. The *first part* is the *scientific report*. It includes chapters on the scientific analysis, the use of the empirical data and the formulation of conclusions. Chapter I takes stock of current reflection on the relationship between science and society. Chapter II suggests a typology of social demands for research and development and chapter III suggests a typology of means of relaying social demands. Finally, chapter IV draws a series of conclusions from the scientific analysis and puts forward recommendations.
2. The *second part* is an *information package*, providing a summary of the empirical data collected by the project partners. The introduction contains a description of the common criteria used for data collection. Chapter I deals with the case studies, chapter II presents a panorama of interfaces between research and society in Europe, and chapter III, the last chapter, gives a list of the institutions contacted in the course of the investigations, whether for the case studies, for the broader overview (panorama) or for the workshop.

Only the first part is published in English.

The information package is only edited in the French publication. The list of institutions (chapter III of the second part of the French report) is published here as annex to the English publication.

Chapter I

State of the art



The issue of the relationship between scientific research and « social demand » has already been studied by many authors, particularly in the Netherlands, Germany, France and Belgium. In this chapter we take stock of the different concepts and frameworks of investigation they suggest, their validity and their relevance. We proceed as follows :

- First we analyze the concept of « social demand » to clarify how our research project's approach to the notion of needs emanating from society.
- Then we highlight a number of recent developments in the R&D system which foster a closer links between research institutions and social groups.
- Finally we indicate what we see as possible pointers for further work and a number of methodological errors to be avoided in a new approach to interfaces between research and society.

This type of « state of the art » is all the more important because the relationship between research and « social demand » has changed significantly in the course of recent years. Some frameworks of investigation have lost some of their relevance, while others have become more credible.

1. Development of the concept of social demand

1.1. From « latent social demand » to « issues of social interest »

In the 1970s the role of science was called into question and attention was drawn to a gap, not to say a chasm, between the priorities of research institutions and the demands being expressed within society. Once the gap had been described and charted several times, the question arose as to how to build bridges across it, in other words how to enable communication between the research institutions and the social groups, make sure that this communication was a two-way process, and enable it to develop into interaction.

Many investigations were founded on an implicit belief that civil society had a « latent social demand » for research. The generally accepted hypothesis was that social groups and individuals had a large number of questions of a technical and scientific order, revealing the existence of a gap between academic knowledge and practical requirements. Most of these problems were connected with the improvement of the living and working environment. Science was potentially capable of meeting this social demand, but was prevented from doing so by its institutional structures, which acted as barriers (1).

This approach to the relationship between science and social demand can be roughly outlined as follows :

- There is a « latent social demand » which is simply waiting to surface but needs adequate structures to allow it to do so.
- There are also scientists who are willing to leave their ivory towers and meet this demand, once they are made aware of the social interest of their work.
- The types of interfaces needed between research and society are therefore meeting places and mediation procedures.

This approach was developed at the beginning of the 1980s. Many references were made to the « science shops » experiment in the 12 Dutch universities. These science shops were designed to function as service centres, mediating between people with questions and researchers and facilitating access to knowledge, expertise and scientific resources. They fuelled a lot of reflection on relations between science and society, not only in the Netherlands but also in Germany, Belgium and France, and influenced a number of public programmes such as, « les Assises de la recherche » in France (1982-83) and the federal programme for the humanization of work in Germany (1984-87).

In practice, however, the « Dutch model » was never successfully transplanted into other contexts. Our hypothesis is that this failure was not solely due to cultural

(1) Here is a selection of some synthesis studies related to the eighties:

Block-Künzler G., Graf D., *Wissenschaft von unten: Zwischenbilanz und Perspektiven der Wissenschaftsladen Bewegung*, Verlag Akademische Schriften, Frankfurt, 1993.

Buitelaar W., Kanters H., Smits R., *De toegankelijkheid van kennis voor werknemers*, STB/TNO, Apeldoorn, Nederland, 1987.

Pennings F., Weerdenburg J., *Een deurtje in de toren, tien jaar wetenschapswinkels*, Bureau Studium Generale, Rijksuniversiteit Utrecht, 1988.

Steffen M., Droste G., Krahn K., *Transferatlas Nordrhein-Westfalen*, Mensch & Technik, Landesministerium für Arbeit, Düsseldorf, 1990.

Wassermann W., *Ein Europa der Berater ?*, Hans Böckler Stiftung, Düsseldorf, und Büro für Sozialforschung, Kassel, 1989.

Zaal R., Leydesdorff L., *The Amsterdam science shop and its influence on university research: the effects of ten years of dealing with non-academic questions*, in *Science and Public Policy*, vol. 14 n° 6, Surrey, December 1987.

factors, but was also the result of an inaccurate conception of « latent social demand. »

During the 1980s, interface structures receptive to social demand underwent a significant degree of professionalization. The tasks of counselling, research and training began to prevail over the task of responding to questions raised. More recent studies confirm this trend (2), which took three different forms :

- In the Netherlands and Germany most of the « shop »-type interfaces based on the presumption of the expression of a latent social demand developed into thematic advice centres. They provide - free of charge, it is worth noting - a range of counselling, research and knowledge-transfer services with regard to *issues of social interest* : work, health, the environment, town planning, etc. The case study on the *Chemiewinkel* in Amsterdam (Part II, Chapter I) provides interesting reading on this subject.
- In France the projects spawned by « les Assises de la recherche » all developed into popularization and documentation services (« centres de culture scientifique et technique »). They have abandoned the « society → research » side of their role as interfaces between research and society to concentrate on the « research → society » side. It is rare for a single institution to carry out both of these functions with equal success.
- In other countries such as Belgium, Italy, Spain and Austria, neither the concept of « latent social demand » nor science shop projects ever really played a decisive role. However, these countries do have many research and counselling institutions created explicitly to build bridges between university and society. These interface structures have freed themselves to some extent from the vagaries of social demand and have concentrated on developing a capacity for thematic research which can be made available to social groups.

Today we prefer to talk of « *research issues interesting to certain social groups* » than of social demand. Institutions develop their interface role in these issues through the provision of research, counselling, information and training services.

1.2. Need for the participation of « civil society »

Since the third framework programme for R&D began, the European Commission has deployed an impressive battery of interfaces between research and industry :

(2) Valenduc G., Vendramin P., *Boutiques de sciences, centres de conseil: des interfaces entre la recherche et la société*, Collection EMERIT, Fondation Travail-Université, Namur, 1993.
Canini G., Leys M., *De toegang tot expertise en informatie als probleem*, Services Fédéraux des Affaires Scientifiques, Techniques et Culturelles, Bruxelles, 1994.

VALUE relay centres, knowledge-pooling and technology transfer programmes, special measures to help SMEs innovate, etc. More recently (1993) these initiatives have been supplemented with a programme for « interfaces between research and society » of which this study is part. The Commission has considered using this network of various interfaces and information points to improve the dissemination of knowledge and the results of research. The study carried out on this subject (3) makes suggestions for the development of a « public communications module » for these information points.

The explicit recognition of society's role in the conception, realization and profitable application of research programmes stems from two recent developments :-

- The concern to involve « users » in research and innovation processes is recognized today not only in the social sciences (where the concept of research-action is well established) but also in the natural sciences and technology. At European level the need to involve users in technological innovation strategies was one of the concerns identified through the third framework programme. In the forth framework programme the involvement of users actually became a keyword in thematic programmes such as telematics, transport, and targeted socio-economic research. However, we should not forget that there is clearly still a gap between theory and practice in this area.
- The complexity and uncertainty arising from scientific and technical change generate a growing need to study the social acceptance of these changes and thus to pay more attention to the expectations of society.

All of this reveals a need for the « participation » of civil society in orienting research, determining what use is to be made of scientific and technical knowledge and developing innovation strategies. Recently studies have been carried out on the involvement of consumers (4) and workers (5) in technical innovation.

Furthermore, some general developments in today's society facilitate increased societal participation in orienting research and determining how it is to be used. Two trends are particularly significant :

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- (3) Infogroup and G&G Consultants, *Investigation of the role of EC information points as vehicles of R&D information to the public*, European Commission, DG XIII-D2, Luxembourg, 1994
 - (4) Fonk G., *Een constructieve rol van de consument in technologie ontwikkeling*, SWOKA, Den Haag, 1994.
 - (5) Institut Arbeit und Technik, *Public schemes promoting the active involvement of employees in innovation*, Proceedings of the SPRINT conference, Luxembourg, Dec. 1994.

- In civil society there are more and more social groups capable of expressing opinions on research and technology issues in exact and credible terms.
- As the standard of education and competency of groups and individuals rises, civil society is no longer confined to making *demands* on the R&D system. Some social groups can also supply knowledge, advice, or even working methods little known or recognized by scientific institutions. It is therefore possible to speak of a « *latent social supply*. »

The demand for democratic participation in R&D is not confined to the present study on interfaces. It indicates a need for a more global approach to the assessment of scientific and technical choices (technology assessment).

2. Evolution of the orientation and organization of research

2.1. *From a science-driven approach to a problem-driven approach*

Among the key trends in the recent development of the European R&D system there is one which is particularly important for the topic of this study. It is the passage from an « upstream-driven » research policy (i.e. a policy driven by technological supply or scientific potential) to a « downstream-driven » research policy (i.e. a policy directed towards tackling unsolved problems, meeting economic and social needs and applying technologies) (6)..

In this type of approach it is problems requiring solutions and needs requiring satisfaction (rather than the quest for technological performance or scientific excellence) that provide the driving force for research and innovation. In other words we are talking about a shift from a « *science-driven* » approach towards a « *problem-driven* » approach.

The *science-driven* approach is coming under heavy fire today because many studies into the dissemination of technological innovations have revealed the existence of « technologies looking for uses, » « solutions without problems, » or, in more prosaic terms, techniques for which there is no market. This dysfunction of the R&D system is generally blamed on a lack of communication between the

(6) Perriault J., *La logique de l'usage: analyse à rebours de l'innovation*, dans *La Recherche*, n° 218, Paris, février 1990.

Woolgar S., *Rethinking the dissemination of science and technology*, in the *Proceedings of the VALUE Interface 94 Conference*, European Commission, Luxembourg, 1995.

research sector and users, although other macro-economic explanations may also be invoked (7).

The *problem-driven* approach aims to overcome the dysfunctions. There are some areas of research where it is not really a new idea. It has long been present in research in the social and economic sciences, for example, or in health and safety in the workplace, in certain fields of applied research and in environmental research (clean technologies, alternative energies...). But it is a brand new trend in the fields associated with the main technology sectors - information and communication technologies, biotechnology - and in areas which until recently were considered to exclusively suited for fundamental research - climatic change, the study of the biosphere, etc.

There is not doubt that the change in the rationale of the R&D system is beneficial in closing the gap between research and social needs. Whereas ten years ago the creation of advice centres and science shops was almost contrary to the spirit of the times, today interfaces are positively fashionable.

2.2. Need for « positive discrimination »

One of the limitations to the *problem-driven* approach is the deliberately sustained ambiguity with regard to the notion of users. « Users' needs » does not necessarily mean the same as « society's needs » - indeed, the parties that presently dominate the R&D system (States and industries) can also be referred to as « users ». R&D users are not only the SMEs, consumers, workers and the general public but also big companies, major governments and the research institutions themselves.

Both at European level and in the different Member States there is a broad consensus today on the need to operate a certain degree of « positive discrimination » towards social groups and regions which do not number among the dominant partners in R&D.

By « positive discrimination » we mean programmes and measures aiming to increase the contributions of protagonists who are considered to be at a disadvantage (i.e. victims of inequalities or negative discrimination). Some examples :

- Special European Commission programmes to increase the scientific potential of particular regions of Europe (the STRIDE programme in particular).

(7) Caracostas P., Muldur U., *Cycles longs, technologie et emploi: blocages actuels et perspectives*, dans la Revue Science, Technologie et Industrie, OCDE, Paris, n°15, 1995.
Freeman C., *Le nouveau contexte de l'innovation*, dans la Revue Science, Technologie et Industrie, OCDE, Paris, n°15, 1995.

- Other special programmes to bolster SMEs' and SMLs' efforts in the fields of research and innovation.
- Initiatives taken by the Commission (admittedly on a smaller scale than the two preceding programmes) to foster cooperation between the research community and the trade unions.

Positive discrimination cannot be considered as a generally accepted practice in the field of research, despite the fact that the « European report on scientific and technological indicators » sees it as a good tool for using research to foster cohesion in Europe (8).

It is our hypothesis (and we expand upon this point in our conclusions), that the development of interfaces between research and social needs also requires appropriate forms of positive discrimination.

2.3. The development of « technology assessment »

It is impossible to deal with the issue of society's expression of its research and development needs without taking account of the gradual institutionalization of « technology assessment » (T.A.) in several countries and regions of Europe and at the European Parliament. There is plentiful literature available on the development of the goals and methods of T.A. and on T.A. institutions in Europe (9), and it is beyond the scope of this study to summarize all the information. Suffice it to say that there are common denominators between T.A. and the question of interfaces with civil society, and that these are mainly related to the participative methods and public debate techniques developed by research institutions and centres involved in T.A.

It is worth mentioning the following examples of methods used in T.A. which are directly relevant to the issues under discussion :

- The principle of *constructive technology assessment* involves the engagement of all users throughout the integrated T.A. process. The principle applied to technological innovation can just as easily be employed for topics of research. Working methods for the application of this principle have been developed in the Netherlands, in Flanders (Belgium), in Germany and elsewhere.

(8) Commission Européenne, *Rapport européen 1994 sur les indicateurs scientifiques et technologiques*, Bruxelles, 1995; partie III: diversité, convergence et cohésion européennes.

(9) Smits R., Den Hertog P., Kuijper J., *Three clusters of related activities to stimulate the European Technology Assessment Infrastructure*, European Commission, DG XIII-D2, Luxembourg, 1994.

Valenduc G., Vendramin P., *Le technology assessment: évolution conceptuelle et institutionnelle en Europe*, dans *Technologie et société: concepts, tendances*, Services Fédéraux des Affaires Scientifiques, Techniques et Culturelles (Belgian Science Policy Office), Bruxelles, 1994.

- The *consensus conferences* and *scenario workshops* developed by the Danish Board of Technology are means of enabling citizens to contribute to the orientation of research and development programmes. They are effective for subjects which are of direct interest to the population, where people can apprehend the potential consequences of the different options on their daily lives. The VALUE programme investigated the possibility of using these methods at the European level (10) and tried them out (with positive results).
- The *citizens' reports* method has been tried out by the T.A. Academy of Baden Württemberg in areas such as biotechnology, rational energy use and innovations in the transport sector. It entails the organization of decentralized workshops or «*planning cells*» made up of random groups of members of the public who volunteer to take part and are released from their professional obligations to attend a four-day seminar culminating in recommendations, opinions, and proposals for implementation. The Academy summarizes the latter and presents them to the decision-makers and the general public.

A large proportion of the interfaces listed or described in this study are involved in T.A. activities and thus contribute to the public debate side of the evaluation of technical choices.

3. Questions to be elucidated

3.1. Pitfalls to be avoided

Our background reading has made us aware of a number of methodological pitfalls and snares repeatedly encountered in attempts to address the issue of interfaces between research and society. The three main traps are the following :

- Recommending that local « success stories » should be reproduced outside of their original context without flanking them with recommendations on how local contexts can be adapted.
- Excessive application of « best practices » which are effective for dealing with a number of relatively fashionable subjects (e.g. sustainable development, information highways) but useless for other less topical areas (e.g. health and environment at work).

(10) Andersen I., Kluver L., Bilderbeek R., Danielsen O., *Feasibility study on new awareness initiatives* (consensus conferences and scenario workshops), European Commission, DG XIII-D2, Luxembourg, 1995.

- Overestimating either the role of « organized » social groups such as trade unions (which makes interfaces too reliant on institutions) or the role of « the grassroots, » (which makes interfaces too reliant on voluntary action). It is useful to draw attention to initiatives which take a middle road between these two extremes.

3.2. The specific nature of our study

The aim of this study is to look at social protagonists and interest groups who do not belong to the « hard core » of research policy partners, i.e. the big companies and major institutions.

The issue in this study is to show why and how « civil society » can voice demands towards the research community and to identify the most appropriate « relays » to ensure that these demands find their way into research policy.

It is for this reason that the study focuses on the flow of information from society towards research when it is more common to approach the issue from the opposite angle (examining the flow of information from research to society). The latter type of transfer involves the dissemination of knowledge, popularization, the promotion of scientific culture and awareness raising. In general more progress has been made in these areas than in the others - activities are better established and better structured - and we feel that more work on the society → research side of the equation is required if the relationship between research and society is to be a two-way street.

Chapter II

Typology of social demands for R&D



1. Profile of demands and expectations with regard to R&D

Groupings, organizations and social groups (i.e. representatives of society) voice demands connected with their own specific areas of activity. These demands are addressed to scientists. They include requests for expert opinions and questions to researchers. Each of the representatives of society is involved in a particular field : land use, health in the workplace, working conditions, the protection of the environment, work and the environment, etc.

Although the demands addressed to scientists may not all be directly related to scientific research proper, a number of them do tie in with researchers' activities. We can identify three types of demands.

- Demands for popularization
- Demands for expertise
- Demands for real research

1.1. Popularization

The way scientists communicate is generally geared towards informing their peers and advancing their scientific careers. Scientists' language and their channels of communication are largely foreign to non-scientists. Yet many research topics are of direct interest to society in general and certain groups in particular. Because of this situation, many of the demands made to scientists are demands for scientific popularization - the dissemination of knowledge in a form and a language accessible to and usable by the members and the representatives of the above-mentioned groups.

Examples : demands for help in reading and understanding the toxicity data for a substance used in company, help in understanding an environmental impact study, the provision of a bibliography on a scientific subject or participation in training or adult education activities.

The range of activities of « relay organizations » and interface structures described in the following chapter gives sufficient indication of the importance of popularization-type activities in the work of interfaces between research and society. The interfaces' activity reports always include information on dissemination, information, awareness-raising and training work in addition to actual research work.

1.2. Expertise

The demand for expertise differs from the demand for popularization in that it does not concern the dissemination of knowledge as such but rather the application of a particular piece of know-how or a particular skill to a particular situation.

Example : demand for a doctor to produce a dossier on a health problem linked to the presence of a factory in a neighbourhood, demand for an investigation of the consequences of a technological investment.

The aim of the demand is not to seek new knowledge but to use existing expertise (whether of a technical, legal, medical or other order) to throw light on a situation.

1.3. Research

A proportion of social groups' demands are for research proper. This is the smallest group of demands, the group with which this report is concerned and the group which merits examination at European level.

If it is true that a proportion of the questions and topics raised by social groups and organizations can be converted into research problems, what criteria can be used to single out these potential research topics from the mass of the information exchanged between social groups and scientists ?

An analysis of the experiences of the projects included in our panorama of interfaces suggests that the potential research topics are either urgent, original or recurrent.

A problem raised by a social group is **urgent** if it is well-defined in scientific terms and rooted in an critical social situation which itself constitutes part of the problem. Such issues can make good topics for interdisciplinary research or research-action on condition that existing institutions or programmes can be convinced of their relevance.

Example : the epidemiology of environment-related ailments. This an original and very under-exploited topic of research. It is inevitably interdisciplinary and is often signalled by groups of citizens living close to rubbish dumps or other sources of pollution.

A problem raised by a social group is **original** if the group formulates an issue differently to scientists, simply because the two groups approach things differently. This type of problem provides original research themes in existing fields.

Example : research into the dissemination of innovations in society, questions of ergonomics, the rational use of energy, mobility, etc.

A problem raised by a social group is **recurrent** if it identifies lacunae or faults in existing research and grey areas in scientific knowledge. The fact that scientists have been asked a series of questions for many years without any significant progress being made in research shows that the priorities of the research community and those of society do not always coincide. Recurring problems therefore indicate a need for the reorientation of research priorities or resources.

Example : health and security at work, where there have long been grey areas in scientific activities, carcinogenic substances, renewable energy sources.

2. Three ways of translating society's needs into research topics

We have identified three scenarios representing ways of translating needs emanating from social groups into research problems. These three scenarios are based on different rationales, to which we have given the following titles :-

- Supply rationale
- Brainstorm rationale
- Event rationale

Each category of interface has its own rationales. « Interface structures » tend to use a supply rationale, while « interface media » are more frequently associated with an event rationale. In each of the scenarios the relationship with the target group takes a specific form.

2.1. First scenario : supply rationale

In the first scenario, the supply rationale scenario, the research issues actually emanate from the « interface structures » themselves. These « interface structures » are specialized research centres. Such structured interfaces are rarely « general practitioners » in the research field. They have an expertise in particular areas of research (health in the workplace, innovation and the organization of work, the environment and employment etc.).

These interfaces' work plans derive from an experience of working with certain target groups and the early detection of demands, which are reformulated to meet the requirements of existing R&D programmes. The target groups (workers in a particular industry, consumer organizations, inhabitants of a neighbourhood, people living around a factory or a rubbish dump, environmental organizations etc.) are involved in the development and follow-up of the projects, or in the formulation of particular questions.

Example : Stichting Technologie Vlaanderen (B)

STV is what we might call an interface structure. It is a joint workers' and employers' body, with equal representation, managed by the Flemish social partners and funded through a grant from the regional government. STV's task is to carry out research for the social partners and to keep them informed. STV is specialized in the investigation of the social aspects of technological change. The work plan is established jointly by the two partners. They express their needs and STV translates them into a research programme.

This rationale for the identification of research topics (a supply determined by involvement with one or more target groups) is mainly characteristic of interface structures (specialized research centres, advice centres, etc.).

2.2. Second scenario : brainstorm

The brainstorm rationale is not characteristic of particular types of institutions, but of approaches involving the organization of discussions or meetings on issues raised by one or more groups (approaches of research departments, working groups, networks etc.).

In these cases the actual purpose of the « working group » is not to conduct research, but in the course of its discussions it might come up with one or more projects requiring investigation. It will then look for alliances, put together a project and follow it through.

Example : AAA –The Work Environment Action Group of Workers and Academics (Denmark).

This Action Group was founded in 1975. Its goal is to contribute to the development of a better working environment in Denmark. Most of the group's work is done on a voluntary basis. It is composed of workers from different industries and academics from different disciplines. The activities emanate from demands expressed by the workers' representatives. If resources are available a mixed group of workers and academics is set up to study the problems raised and to seek solutions.

To a certain extent this rationale is similar to the supply-based rationale, particularly if a group decides to develop its own research capacity. The research unit will then be entrusted with the demands identified by the working group. For the working group the research activities will remain secondary in relation to its original purpose.

Example : the « Automation und Arbeitsgestaltung » department of the GPA trade union (Austria)

Since 1962 the Austrian white collar union (the GPA) has had a standing committee on problems relating to automation. The committee's aims are threefold: to make proposals for trade union strategy and action, to provide advice and guidance for representatives on firms' councils and to identify problems requiring further investigation. In 1991 a special department of the GPA was created to facilitate the achievement of the last objective. Permanent links have been established with the Technical university of Vienna and the Institute for Interdisciplinary Research (IFZ) in Graz. The topics on which the department works emanate from the standing committee of the trade union.

2.3. Third scenario : event rationale

In this last scenario questions are raised in a population group as a result of a combination of circumstances or an event. Some of the questions raised may involve research activities.

Events of this kind can also generate more long-term structures, because such structures can « keep the event alive » by regularly organizing public debates on the scientific and technical issues involved. This was the case for the Forum Soziale Technikgestaltung in Stuttgart. In this kind of case the event rationale leads to a quest for a greater diversity of contacts with public opinion : memos, newsletters, series of lectures and a network of close collaborators in research institutions.

Example : the Basel Forum (CH)

The event began in 1986. A serious explosion in a chemical plant belonging to the Ciba-Geigy group caused considerable ecological damage. There was uproar in the town of Basel and the surrounding area. This event made the population of Basel acutely aware of the risk of industrial accidents and associated societal problems. Two years later, relations between the chemical industry, the public authorities and local organizations continued to be tainted by an atmosphere of mistrust. The authorities of the canton then decided to launch a broad public debate entitled, « Risk - between opportunity and danger. » The project included awareness-raising activities and discussions, but also some research activities. The Forum made it possible to reach compromises and a consensus on the industrial and ecological future of the region.

3. Transversal characteristics

The examination of social demands with respect to R&D reveals a number of transversal characteristics (applying to all the typologies proposed).

Aptitude for mediation

Our analysis reveals the importance of experts and researchers having a special ability to translate the needs expressed by the social groups into scientific terms and to identify the questions which are most fundamental and require research.

The three-fold nature of mediation

There are three main aspects to the task of mediation carried out by the interfaces :

- The organization of a constructive dialogue between the social groups with demands and researchers in research institutions.
- The formulation of the demand in terms which are meaningful both to the scientific institution and to the social group, and the choice of the most appropriate scientific approach : bibliographical analysis, survey, case study, simulation, critical interpretation of experimental data, empirical research, theoretical research, etc.
- The follow-up of relations between the different partners and of the results of the research (seeing that the latter are disseminated and put to good use, both in scientific milieus and in the field of social action).

Adaptation of instruments to issues under examination

There is no single « best way » to deal with the demands voiced by social groups. The main conclusion we draw from our study is that the instruments (institutions, methods) need to be well-adapted to the topics being investigated. Thus, for example, stable interface structures are suitable for dealing with recurring themes, fora are a good way of dealing with emerging themes and working groups are efficient for themes requiring a lot of preliminary groundwork and clarification.

Furthermore, the choice of the most efficient « relay » will greatly depend on national and local conditions, i.e. on cultural context and the political context in which the demands are formulated.

Chapter III

Typology of relays of social demand



1. Typology of interfaces

At the very beginning of this study, when we were drawing up a plan for the collection of empirical data, we intuitively suggested three main categories of relays between R&D and social demand. The three categories, which were defined in the introduction to this report, were as follows :

- « Relay organizations » or interface structures
- Interface functions or institutionalized forms of consultation
- Interface media or initiatives

This approach on which this classification is based is of rather a static nature. The classification itself is an attempt to organize a huge magma of differing activities, all of which contribute to some degree to some form of dialogue between social groups and the research community. If we were to choose a more dynamic approach to communication between social demand and decision-making bodies in the R&D field, this classification would no longer be satisfactory. However, remains a useful tool for a preliminary approach to the « universe of interfaces. »

1.1. « Relay organizations » or interface structures

Relay organizations are institutions of varying size whose principal role is to act as an interface, i.e. to be a bridge between research and society (even though most such organizations probably do not refer to themselves as « interfaces »).

These relay organizations can take on various institutional forms, for example :

- Specialized advice centres working for particular organizations (trade unions, environmental organizations, consumer organizations).
- « Science shops » or similar organizations which also function as advice centres but work with the general public or a broader range of social groups.
- Networks for cooperation between trade unions and universities or between environmental organizations and universities.

Examples

- ◆ Kooperationsstelle Hochschulen und Gewerkschaften (D)
The « Offices for Cooperation between Universities and the Trade Unions » are interfaces between the German DGB trade union confederation and universities or training colleges. They receive funding from the regional public authorities. There are 14 of them in Germany at the present time, and in 1995 a national coordinating structure was set up at the Hans Böckler Foundation.

- ◆ Onderzoeks- en Adviescentrum Chemie, Arbeid en Milieu (Chemiewinkel Amsterdam)
The « Chemistry Shop » at the university of Amsterdam operated for some fifteen years on the same basis as the sciences shops at the same university, gathering in demands and questions from organizations and using them as topics for science students or young researchers at the university. As time went by it developed its own themes and began to employ its own research staff. In 1993 it stopped calling itself a « shop » and became an « advice centre. » It now establishes five-year work plans together with the interest groups which have become its main partners and works more regularly on a number of topics connected with the issue of work and the environment.

- ◆ European Hazards Network
This European network is a platform for the exchange of information, projects and experiments connected with work-related health risks. It includes workers from different industries, doctors specialized in work-related health problems, scientists, teachers, trade unionists, etc.

In addition to scientific research and the interface function, these organizations often provide other services such as training, awareness-raising and scientific popularization.

Despite these common features, interface organizations are highly diversified. Structural links with the target group(s) and with founding organizations may be close or practically non-existent. The level of involvement of the target groups in the realization of scientific activities may be high or low.

Organizations like trade unions and environmental organizations do not themselves fit into this first category because acting as an interface for R&D issues is not their primary objective. However, these organizations can, under certain circumstances, fulfil interface functions. Interface functions are the second category of our typology.

1.2. Interface functions or institutionalised forms of consultation

The second category of interfaces covers the official participation of social groups in councils, committees and other bodies where the content and orientation of research programmes are discussed. In this category we are concerned not with organizations as such but with their official task or « function » of representation.

The ability of social groups to use these official bodies as vectors of communication between society and research is influenced by many factors relating to :-

- The composition and operation of these committees and councils.
- The nature of the group's relationships with other groups represented on the consultative committees (consensus or conflict).
- The financial and intellectual resources of the committees.
- How skilfully the social group uses its opportunities.

Examples

♦ Le Conseil National du Développement Durable (Belgium)

The National Council for Sustainable Development was set up in the wake of the Rio Conference. It has an advisory role vis-à-vis the Belgian government (at national level) as regards initiatives to be taken in the framework of the commitments undertaken by Belgium at Rio. It is composed of politicians, industrialists, scientists, social movements and environmentalists. The council itself only meets twice a year but its various committees meet more often. The interface function with the scientific community is carried out by a the committee on « sustainable development and research policy » which meets once a month and is one of the most active committees of the CNDD.

♦ Consejo Asesor de Medioambiente (Spain)

The Consultative Council for the Environment was set up in 1994 under the responsibility of the Ministry of Transport, Public Works and the Environment. Its official aim is to « foster the participation of organizations representing social interests and of recognized individuals in the elaboration and follow-up of an environment policy geared towards sustainable development. » Its involvement in research is confined to environmental issues in the broadest sense (including energy, transport and land use). Its membership enables the broad representation of social groups and « listening to civil society » is one of its explicitly-stated tasks. The Council is concerned not so much with the expression of the preoccupations of society but their follow-up by the institutions.

In most countries and at European level there are councils or advisory committees whose primary or secondary role is to deliver opinions on R&D policies and the orientation of research programmes. They range from parliamentary committees to advisory committees and councils. There are three types of advisory committees :

General advisory committees

These are committees and councils that may have to tackle questions of interest to the research community but whose main goals are actually of a broader nature. Examples are the « Economic and Social Committees » which exist at European level, in many regions of Europe and at national level in a number of countries (such as France and Great Britain).

Advisory committees on research

These are committees and councils whose job it is to deliver opinions on the orientation of research. They also exist at European, national and regional levels.

Examples

Examples

◆ At European level:

The IRDAC (International Research Development Advisory Council). This Council mainly composed of representatives of the European Commission and of industry, with symbolic representation of social groups.

The European Science and Technology Assembly. This Assembly was a result of the European Science Summit in 1993. It is dominated by university scientific circles and big research institutes.

◆ At national and regional levels:

The Scientific Policy Council in Wallonia, the Advisory Council on Science and Technology in Spain, the Innovation Committee of Baden-Württemberg, and many more...

Thematic advisory committees

« Thematic » committees and councils are bodies set up by public authorities to organize the participation of social groups in areas of immediate concern to the latter, such as working conditions, public health, consumer issues, the environment, town and country planning, etc. Although research is not their primary objective, these committees may also raise interesting questions for scientific research. There are many of them at national, regional and European levels.

Examples

- ◆ The Consultative Council for the Environment in Spain (see above)
- ◆ The National Council for Sustainable Development in Belgium (see above)
- ◆ Advisory committees and councils in a large number of countries dealing with public health issues, safety in the workplace, etc.

1.3. Interface media and initiatives

This third and last category of interfaces between research and society has to do with « media » (in the broad sense) permitting communication between the R&D community and social demand on potential areas of research.

We are dealing here with media such as newspapers, magazines, fora, open door days, memoranda, etc. Such initiatives may be transitory, or connected with a particular event, or designed for longer-term use.

Example : Forum Soziale Technikgestaltung (D)

The « Social Conception of Technology Forum » was set up in 1991 at the initiative of the regional federation of the DGB trade union confederation in Baden-Württemberg. It is a standing working party which is independent from the trade union structure and whose task is to produce analyses and proposals relating to research policy and technological innovation. It is not only for trade unionists, but also for other social and cultural organizations. It helps to develop mediation skills, formulates research needs for the Technology Assessment Academy in Stuttgart and plays an effective role in structuring public debate on socially-oriented use of technology. The Forum's ambition is to contribute to the development of a « culture of enlightened cooperation » in the field of technological innovation.

This tentative classification we originally proposed turned out to be an adequate tool for establishing points of reference in the general panorama of initiatives contributing to the creation of dialogue between social groups and the research community.

However, a more detailed study of the means used to create this dialogue shows that other vectors of communication must also be taken into account. Communication between the research community and social groups extends beyond « relay » initiatives.

2. Analysis of vectors of communication between the research community and social groups

If we consider the bridge-building process between the research community and social groups to be dynamic rather than static we might propose the inclusion, in addition to the three aforementioned categories, i.e.

- « Relay organizations » or interface structures
- Interface functions or institutionalized forms of consultation
- Interface media or initiatives

of two other channels of communication between society and the R&D system. These would be :

- Groups of experts and « flanking committees »
- The media

Each of these « vectors of communication » between civil society and the research community has its own particular strengths and weaknesses stemming from its structure or its mode of operation.

« Relay organizations » or interface structures

If we examine the capacity of relay organizations or structures to communicate the needs of civil society to R&D decision-making bodies, the following strengths and weaknesses come to light :

- Advantage : they are in direct contact with the needs of social groups, aware of the latter's expectations and capable of formulating demands in terms acceptable in scientific circles.
- Disadvantage : they have little contact with each other (there are few European networks or special meetings for these organizations) and have a low level of representation in R&D consultation systems - particularly at European level.

These features arise from their particular structure - the fact that they have « one foot in academic circles and one foot in social organizations. » The drawback for them is that sometimes, because they talk about science in social circles and social affairs in scientific circles, they are considered as outsiders by both groups.

Interface functions or institutionalized forms of consultation

Not all the countries and regions of the European Union recognize the need for civil society to be represented in consultative bodies on R&D. Even where such systems do exist, the representation of social groups meets with several obstacles :-

- The representation of social groups is weakened by « filtering » and compromise. The pyramid of representation and delegation tends automatically to filter out the questions of social groups. Furthermore when consultative bodies seek consensus they look for a compromise between the different interests represented. This situation is not very propitious to the emergence of new ideas, although occasionally the compromise may be on new ideas rather than established understandings.
- Sometimes the representatives of social groups are not sufficiently qualified in research issues. This is particularly common in cases where these representatives are « general practitioners » of social dialogue. When organizations do have research « specialists » to express opinions, they are few and far between, and sometimes overstretched by their workload.
- Sometimes there is a numerical imbalance between the representatives. Furthermore, because the balance of power is generally unfavourable to groups from civil society, not all representatives have equal access to information.

Interface media or initiatives

These media and events operate through the involvement of the general public.

- Sometimes the public plays a passive role. Examples are the publication of memoranda and the conducting of surveys ;
- Sometimes the public plays an active role. Examples are the organization of fora, public debates and consensus conferences.

Groups of experts and « flanking committees »

Groups of experts and « flanking committees » are another potential vector of communication between society and the research community, although they cannot be considered as interfaces in the sense described above.

The groups of experts set up by the European Commission play an important role in European science policy. They make a meaningful contribution to defining the orientation of research. They contribute to establishing and defining the contents of research programmes, whereas the councils and committees mentioned in the previous section only deliver opinions on pre-drafted texts.

Recourse to groups of experts is less frequent in the different countries and regions because the research programmes are « written » by administrations and ministers. However, there is another type of group of experts often referred to as « flanking committees » or « programme committees ». They are responsible for giving opinions and advice and making assessments of the development and results of research programmes. It is increasingly usual for such committees to include,

alongside civil servants and academic experts in the strictest sense of the term, experts representing social groups directly concerned by the research programme.

Opinions of the role of groups of experts are mitigated :

- On the one hand they have the advantages of working on a thematic basis, having well-defined goals and having direct influence on the contents and follow-up of research programmes.
- But on the other hand they have the disadvantage of being dominated by academics and industrialists and having relatively little contact with the needs of social groups.

The mass media

As well as playing a role in communication on scientific subjects in general, the mass media can also play an important part in conveying the preoccupations of social groups concerning the R&D system.

- Their role can be one of disclosure, pinpointing problem situations and alerting not only public opinion but also scientists and decision-makers.
- Their role can be one of amplification, taking up issues raised by relay organizations or public debate.

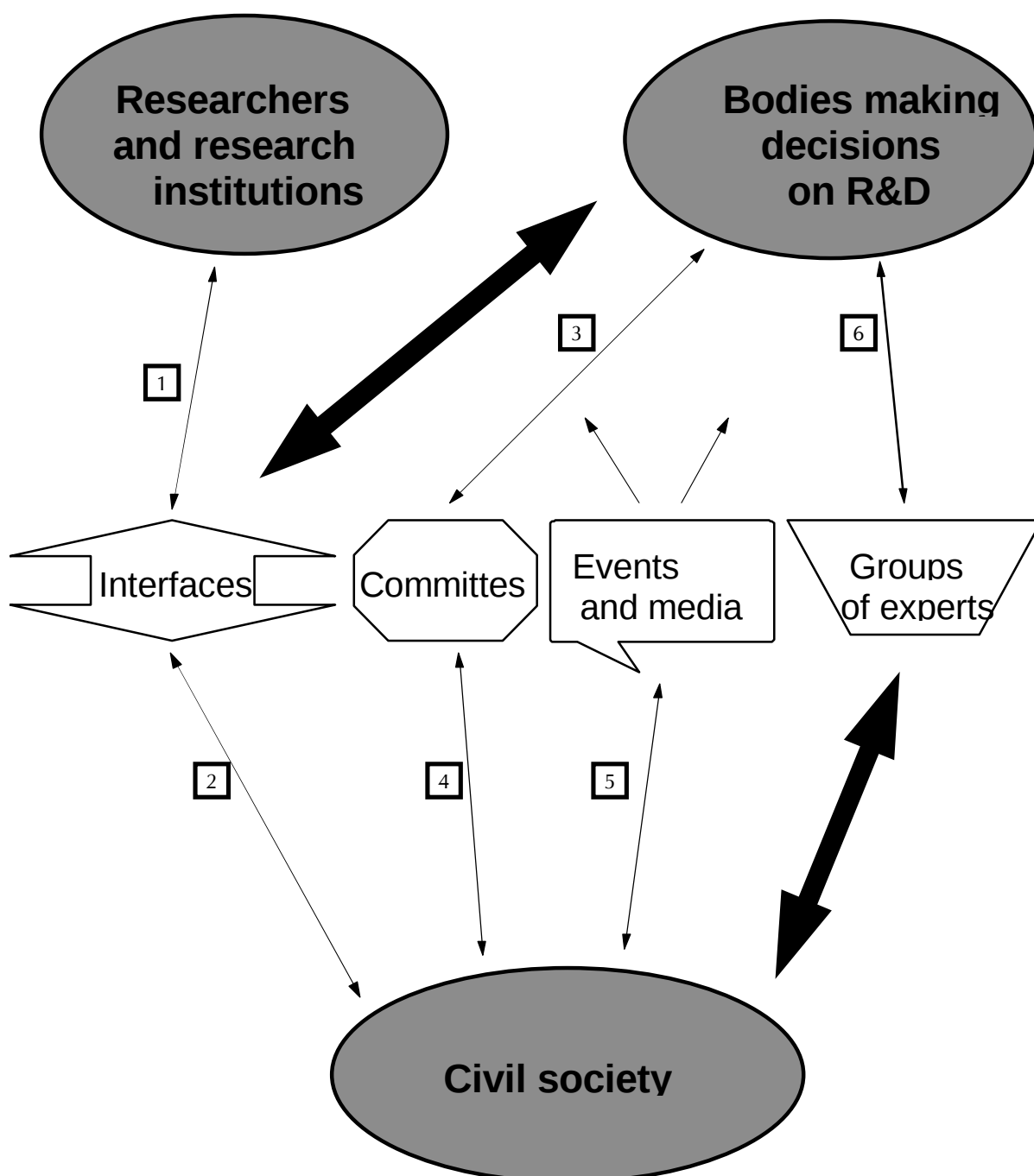
The mass media do not tend to play these roles spontaneously - they have to be « mobilized » through the creation of a newsworthy event. There are also limitations and risks associated with this type of approach :

- The media give a lot of coverage to problems and negative aspects connected with sciences and technologies. They also report on positive solutions when they are found. However, they pay little attention to the difficulties, methods and uncertainties of science. Thus they tend to convey a magical image of science which is not the type of image the interfaces are interested in promoting.
- There is a lack of knowledge of research issues among journalists and a lack of communication skills among scientists.

3. Conclusions

The diagram on the following page portrays the relationships between the three « poles » of communication we have mentioned in this chapter : civil society, research institutions and R&D decision-making bodies. It indicates the kind of links which exist between these three poles and the different vectors of communication examined in this chapter : interface structures, advisory committees, media and events, and expert committees.

Diagram :
The vectors of communication between civil society and R&D



Some of the communication arrows numbered in the diagram call for further comment.

1. Communication between the research institutions and the interface structures can be enhanced by improving the former group's recognition of the latter.
2. Over time, relay structures and interfaces generally develop a thematic specialization which guarantees the recognition of their expertise and their long-term survival.
3. The strength of advisory committees' influence on research policies varies a great deal from one national (or regional) context to another.
4. Interface functions are sensitive to the ambivalent character of systems founded on representation (innovation/bureaucracy). Many advisory committees are demonstrating increased openness to the participation of social groups, but certain imbalances continue to exist in representation, information and consultation procedures and in access to expertise which. These factors place « civil society » at a disadvantage.
5. Interface initiatives (events, media) are more limited in terms of duration. This is not necessarily a handicap, because the problems they deal with may also be of limited duration and geographical relevance. They address themselves to a wide variety of different groups, including R&D decision-making bodies, but they have no formal links with decision-making bodies.
6. The way in which groups of experts and flanking committees work is not always transparent, although they may have considerable influence on R&D policies. They show too little interest in the preoccupations and needs expressed by civil society.

It has not been judged appropriate to include the mass media in this diagram - they should rather be considered as part of the backcloth.

In this analysis of the vectors of communication between civil society and the research community there are two « **missing links** » which can easily be observed on the diagram, where they are represented by grey arrows.

- The first missing link is between the groups of experts, with their principally academic backgrounds, and the social groups.
- The second missing link is between the interface structures with their expertise and the decision-making bodies of the R&D system.

In the following chapter on recommendations we make some suggestions about how to overcome the deficiencies of these channels of communication.

Chapter IV

Conclusions and recommendations



Our investigation of the experiences, structures and working patterns of interfaces between research and society in several countries of Europe leads us to make a number of recommendations which might furnish some solutions to the two problems underlying this research project, i.e. :

- How is it possible to improve the translation of social needs into suitable topics for research ?
- How is it possible to improve communication between representatives of social groups and decision-making bodies in the research field ?

These conclusions and recommendations are the fruit of the workshop organized by the four project partners in October 1995, the transversal analysis of the case studies and the inventory.

The proposals and recommendations are not intended solely for the European Commission. Interest groups in civil society can also give a European dimension to their activities in the R&D field, and are therefore also concerned by the recommendations.

1. How is it possible to improve the translation of social needs into suitable topics for research ?

1.1. Improving the formulation of research issues through the pooling of experiences

The identification of needs emanating from social groups and the formulation of these needs in terms suitable for potential research projects can be fostered through the promotion of exchanges between experts from interfaces (relay organizations, specialized research centres and others).

The experts we are concerned with here are experts who are experienced in working with social groups and familiar with such groups' questions and demands for expertise. The scientists who work in these different types of interfaces develop special skills, as well as the ability to combine an academic approach with a social approach.

These scientists could compare their practical experience of collaboration on issues particular to their field of activity with that of colleagues working on similar topics elsewhere. This « pooling of expertise » would raise the general level of skill in formulating research topics emanating from social groups. It would also contribute to the promotion of a « scientific interface community. »

Quite a broad range of structured and informal means could be used to link up this « scientific interface community. » Examples are :-

- The creation of thematic networks within the framework of European programmes.
- Joint international publications
- Seminars
- Multilateral exchanges on results and methods

Pooling and sharing this special type of experience at European level would generate added value. Public support at European, national and regional levels will be needed to implement the means listed above.

One factor which is essential for the success of this « pooling of expertise » is the specialization of experts and interfaces working in particular areas or on particular themes. Experience at both national and international levels shows that the best and most effective networks, publications and events are ones with relatively well-defined centres of interest. To ensure the success of exchanges it is necessary to identify an « optimum level of thematic specialization » for networks, publications or events.

1.2. Developing « mediation » skills

The ability to mediate has to be developed as a scientific skill in its own right. Mediation involves the selection, from amongst the demands expressed by social groups, of emerging or recurrent questions to which research is likely to provide answers.

Means for developing mediation skills include the following :-

- Showing greater esteem for the skills and methods required for « research action » when training researchers.
- Including tasks involving popularization and communication in scientists' work - particularly in universities and public research centres. Improving the academic status accorded to these tasks.
- Equipping European exchange programmes for students and young researchers with strands permitting scientific exchanges with interface structures.

The capacity for mediation is also a vital with respect to methodology. It is important to develop appropriate ways of organizing public debate and encouraging the expression of the expectations of civil society. Particular attention must be paid to methods engaging both organized and non-organized social groups.

1.3. Increasing representatives of social groups' involvement in R&D questions and their skills in dealing with these questions.

Representatives of social groups sit on councils and committees whose task is to deliver opinions on the orientation of research. Unfortunately their involvement with these issues is often very limited due to the absence of a clear perception of the social benefits of such involvement and the fact that scientific research is not an easy field to enter without at least some degree of previous knowledge.

We therefore recommend that steps be taken to help improve the representatives' training and awareness with respect to R&D in their specific fields of activity.

Another key to success is for social groups to learn to see research as a potential means of solving practical problems they encounter in their areas of activity, and as an important issue which can contribute to the realization of their objectives.

2. How to improve communication between representatives of social groups and decision-making bodies in the research field ?

2.1. Working on the « missing links »

In chapter III we studied different vectors of communication between civil society and R&D bodies and identified two « missing links, » one between groups of experts and social groups and the other between R&D decision-making bodies and scientists working in interfaces. A number of possible solutions may be envisaged.

Including scientists from interfaces in groups of experts

The first suggestion is that scientists with special abilities linked to their work in interfaces should be included in the committees of experts that contribute to the establishment and follow-up of programmes at national and European levels. This would be an indirect way of restoring the missing link between the interfaces and the decision-making bodies. Our study reveals that limited experiments of this kind have already been conducted in several European countries, with positive results. However, this practice is still far from being the norm.

Developing European thematic networks

The second proposal is to encourage the creation of European thematic networks in the different areas covered by the sub-programmes of the EU's fourth framework programme for research, technology and development. These thematic networks should include academics, scientists working in interfaces and groups of « users » from civil society (to use the terms employed in the fourth framework programme).

When such networks are being set up, the Commission should apply a form of « positive discrimination, » promoting networks of researchers in touch with social needs. One possibility would be to reserve a percentage of the funding for thematic networks for networks geared to the specific needs of society in the areas covered by the different sub-themes.

Developing interfaces between universities and society

The third recommendation is to encourage universities to develop interfaces with civil society. Interfaces with industry already exist in most universities. The other formula is less common, but it is not something new. Interfaces between universities and civil society already exist in certain universities in Germany, the Netherlands and Denmark.

2.2. Encouraging thematic specialization of interfaces

Our research did not uncover any positive examples of « society → research » interfaces aiming to serve the whole of society and the whole of the research community. In fact, it became apparent that thematic specialization was a precondition for success. Whatever form they take, thematic interfaces are always more appreciated for their expertise, credibility, stability and relevance to the social groups they target. They also receive more recognition from scientific circles.

It is worth emphasizing that « thematic specialization » does not mean specialization in one or the other scientific discipline but involves the accumulation of know-how and experience in a particular area of work relative to a problem experienced by society. Thematic specialization always requires an inter-disciplinary approach.

A number of means could be used to encourage such specialization. These means would require the support of the Commission. They include :

- The organization of European methodology seminars for scientists from different types of interfaces working with different target groups (trade unions, ecologists, neighbourhood organizations, etc.). These seminars would focus on questions such as research-action methods, public debate methods and the dissemination of the results of research to target groups.
- The organization of European thematic seminars on problems for which a European approach offers distinct advantages. The fields of work and the environment, which were the focal point of this study, are particularly well-suited for this type of thematic seminar.

2.3. Promoting better use of vectors of communication

More « scarcity and efficiency management » of channels of communication.

The social groups that have opportunities to sit on advisory bodies dealing with research questions must improve their scarcity and efficiency management of these channels of representation.

This recommendation goes hand in hand with the recommendation to increase representatives of social groups' levels of involvement and competence in R&D issues (item 1.3.).

Representatives of social groups on committees delivering opinions on research could be helped to improve their scarcity and efficiency management by measures to raise the profile of positive experiences at regional and national levels and the dissemination of information on such experiences at European level. This could

be a stimulating factor and a learning process for the representatives of social groups, who often have to fulfil their role on R&D committees under difficult conditions.

Drawing attention to original and flexible initiatives to trigger public debate

Interface initiatives such as thematic fora, different forms of public debates and meetings between scientists and social groups are more flexible than institutionalized forms of consultation and are complementary to the latter. However, it is difficult to pinpoint « best practices » because local contexts differ enormously. An initiative which is effective in one country or with regard to one particular problem might not survive transplantation in another context or area of work.

However, the European Commission could still support European mutual learning projects for interface initiatives, in the same way as it supported consensus conferences and scenario workshops.

2.4. Supporting and organizing « communication events » proposed by interfaces.

The European Commission could provide financial or organizational assistance for « communication events » involving the research community and society at European level. The Commission could ask the various types of interfaces to suggest initiatives of this kind. « Communication event » is understood here in a broad sense, including conferences, publications, information campaigns, European thematic seminars, etc.

Rather than following the traditional « popularization » approach, these European « communication events » should be « problem oriented » so that they foster the communication of messages from society towards the research community as well as in the opposite direction.

Chapter V

Executive summary



1. Aims and methodology

The research focus on two fundamental difficulties in the communication from society to research : on the one hand, how to formulate and translate the needs of society into research issues, and on the other hand, how to address the emerging issues to R&D policy makers. We have selected two concrete areas for this investigation : the problems related to work and the problems related to environment, which are typical concerns of social groups.

The methodology is based on :

- a literature study and state of the art of the question of the relay and expression of « social demands » towards scientific research ;
- an inventory of interface initiatives in different European countries ;
- case studies of relevant examples of successful forms of interfaces ;
- an international workshop, with participants involved in activities of such interfaces, as well from the research side as from the civil society side ;
- synthesis and policy recommendations.

The study is co-ordinated by the Fondation Travail-Université (Namur) and carried out in co-operation with three partners : Akademie für Technikfolgenabschätzung (Stuttgart), Fundación Primero de Mayo (Madrid), Rivista Sistemaricerca CGIL (Rome).

2. An overview of interfaces between research and social groups

State of the question

The concern about the « interfaces with society » is recent in the European R&D programmes. It results of a need for better social acceptance of technological choices as well as of a tendency to a larger involvement of the users in the research and innovation processes.

Besides the « hard core » of the R&D system, constituted by the big companies and institutions, the « civil society » is forming questions and demands towards the research world. While the activities of vulgarisation, awareness and diffusion of knowledge focus on communication from research towards society, our study has looked to the reverse flow : the communication from society to research.

Within this problem definition, the concept of « social demand » is recurrent. This concept has changed a lot during the last few years. Rather than talking about social demands towards R&D, we refer to « areas of scientific problems » which can interest and mobilise interests groups and stakeholders in the society. The formulation and follow-up of these problem areas requires better interfaces with the R&D system.

A typology of interfaces between research and society.

The study co-ordinated by FTU has classified these interfaces in three categories :

- the *interface structures*, which are organisations created as relay between social organisations (trade unions, environmentalists, consumers, inhabitants) and research institutions ; examples are : advisory centres, science shops, research centres oriented to social groups, etc.

Example : many German « Beratungsstelle » are advising trade unions or citizens' groups for work and environmental problems ; they were created either by trade unions or by local initiatives or by university centres, most often with public funding.

- the *interface functions*, assumed by representatives of interest groups from the society (mainly trade unions and environmentalists) within consultative councils, programme follow-up committees, expert committees, etc.

Example : in Germany, Spain, Belgium, such consultative councils succeeded in proposing public research projects or programmes coming from initiatives of social groups.

- the *interface initiatives or events*, which consist in local initiatives, expression means, or even punctual events of public debate addressing particular questions to the research world.

Example : the forum of Stuttgart on work and innovation produced a memorandum, proposing different research fields to the Academy of Technology Assessment for the Baden-Württemberg.

Generally speaking, the inventory carried out at a European level shows that interfaces with civilian society are changing towards more structured patterns, and more specialised by « problem area ». Many of them also carry out research tasks and, conversely, some research centres are giving themselves interfaces with society.

Example : the former science shop in the University of Amsterdam which is now a advisory centre specialised in chemistry, work and environment (Onderzoeks- en Adviescentrum Chemie Arbeid Milieu)

3. The translation of social needs into research issues

State of the question

The fact that the R&D system and R&D users are getting closer favours a new research paradigm, lead more from « downstream » (uses, needs, demands) than from « upstream » (technological offer, scientific potential). This is an opportunity for a more efficient formulation of society expectations.

Furthermore, it is now recognised that R&D system creates inequalities and that those inequalities need to be corrected by « positive discriminations », for example in favour of small and medium sized companies rather than big companies or in favour of weaker regions. This positive discrimination principle can be extended to interest groups under-represented or left aside from the elaboration of research programmes. One of the major difficulties of those groups is to get able to formulate some of their social needs into research issues.

From the « social problem » to the « research issue ».

The process leading from a social need to a research issue goes through numerous filters. Most of the needs linked with scientific questions consist of demands for information (data or bibliographical research) or punctual expert services. Its the acute or original or recurrent character of the problems that may lead the « interfaces professionals » to the formulation of a research topic and push them to look for relays in the R&D institutions.

Three patterns for formulation

In a first pattern, the research topics are coming from the « structured interfaces » themselves. Their work programmes are based on a cumulative experience, a specific area in interdisciplinary research and an ability for early detection of social demands. The target groups (trade unions, consumer organisations, environmental groups) are associated in the design and the follow-up of the projects, and in the identification of particular questions within the research topic. It is a « *supply side* » logic.

Example : Stichting Technologie Vlaanderen in Belgium is a research organisation which has been created by the social partners. STV is specialised in research and information on the social aspects of technological change. Its pluri-annual work programme is worked out by the social partners.

In the second pattern, a working group starts studying a problem related to work, environment or quality of life and is lead to some questions which can be formulated in terms of research projects. The working group looks for alliances and partnership, build up its project and follows its implementation. This is a logic of « *brain storming* ».

Example : the Spanish trade union CC.OO. sets up a permanent working group on ecology and work. It identifies some research needs in the field of renewable energy and employment. Through an alliance with the federation of environmental associations, it obtains a public project of research and demonstration, carried out in co-operation with them.

In a third pattern, a sudden event or problem raises different partners facing to an urgent situation, which can be enlightened by research and of which a definite project emerges. It is a « *logic of the event* ».

Example : the forum of Basel in Switzerland was created after an important chemical accident and succeeded in analysing the demands of the general public for new research into technological risks in urban areas and possible conversion of industry.

4. The communication between the representatives of social groups and the decision-making bodies

Four channels can be used in the communication process between interest groups in society and R&D system :

- the institutionalised forms of consultation ;
- the experts groups ;
- the structured interfaces ;
- other communication vectors, events, media, etc.

Specificity and limits of the different communication channels

In most of the European countries and at the Community level, there are consultative councils and committees which role is to work out advice and statements about the orientations of R&D policies and the contents of research programmes. Some of them are dedicated to research, some others are general socio-economic councils and some others are dedicated to specific areas : environment, public health, working conditions. The representation of the civil society in the consultative bodies suffers from two main problems :

- the system of representation and delegation acts as a filter and the concrete questions and problems coming from social groups are not easily passing through ; the qualification of the representatives in the scientific field may not be sufficient to forward these questions ;
- the representative system may be affected by unbalanced composition of councils or inequalities in the access to information.

Experts groups are often constituted by the European Commission or at national level, in order to formulate research proposals and policy recommendations. The academic and industrial scientists plays an important part in these groups, but the expertise coming from the « structured interfaces » is rarely integrated. These experts groups are however thematic and targeted and should be a possible relay for problem areas coming from society.

In the consultation processes about R&D, the « structured interfaces » are rarely involved, although they have an original scientific experience and good relationships with social groups. Some events and « interface support initiatives », as described above, take the advantage of disclosing problems to the public opinion, either on a passive way (memorandums, surveys) or by active means (forums, consensus conferences).

This description identifies two missing links :

- between experts groups and social groups ;
- between « experts coming from the interfaces » and the R&D system.

5. Conclusions and recommendations

The study leads to a set of proposals and recommendations in order to improve the interface between research and society in two areas :

- the ability to formulate research problem areas settled on society needs ;
- the ability to relay and promote these research problem areas into the consultative and decision bodies, where R&D policies and programmes are designed.

These proposals and recommendations are not only addressed to the European Commission. They also concern the European dimension that interest groups of the society can give themselves in their intervention in the field of R&D.

Improving the formulation of research problem areas

♦ Sharing the « specific expertise of the interface structures » :

- The scientists who are working in the different types of interface structures are developing a specific experience and skill, which combines both multidisciplinary academic approach and social approach.
- Putting together and sharing this specific experience at the European level can give it an added value. There are many means to consider : thematic networks, international working seminars, joint publications, exchange of results and methods. The implementation of these means requires a form of public support at European and national / regional level.
- A criteria for successful exchange and sharing is the identification of the « optimal level of thematic specialisation » for the networks to be set up.

♦ Developing a mediation capacity :

- The mediation capacity is a part of the scientific qualification, which expresses itself in the ability to detect the emergent or recurrent research issues that are underlying in the social needs.

- The mediation capacity is also a methodological issue. Therefore methods have to be developed for the organisation of public debates and for the expression of the expectations of social groups.
- New and existing methods for public debate must be developed, with a specific concern for methods involving both organised groups and non-organised citizens.

Improving the relay and promotion of the research problem areas

♦ Giving a structure to the « missing links » :

- Among the different means of relay and communication between the society and the R&D system, two missing links have been identified : between experts groups and interest groups in the « civil society » ; between the councils and bodies for R&D programming and the scientists coming from the interface structures. Several solutions can be considered.
- A first proposal leads to the recommendation to integrate scientists who have the specific skill resulting from the interface structures, into the experts committees which take part in the design of research programmes at the European or national level.
- A second proposal consists of encouraging the set up of European thematic networks in the different areas linked with the subprogrammes of the fourth framework programme of RTD of the European Union. This encouragement can be based on a form of « positive discrimination » towards research networks linked with society needs.
- A third proposal aims at developing, within the universities, interface structures with the « civil society », following a similar model as those already existing with industry. Such interfaces already exist in some universities in Germany, Netherlands and Denmark.

♦ Making the communication channels more efficient :

- A preliminary recommendation for the interest groups is to promote a better « management of rarity and efficiency » of the representative functions that are allowed to them in various consultative bodies in which R&D issues are discussed.
- Therefore the European valorisation and dissemination of positive experiences and « best practices » at the regional or national level can have a learning and stimulating effect on the representatives of social

groups within R&D consultative bodies, who often assume their task in a difficult context.

- It is also useful to let know the working methods which allow a better synergy between the institutionalised forms of relay and communication, and other informal or punctual initiatives of consultation or involvement of public opinion.
- ◆ Organising and supporting « communication events » between research and society at the European level, that should have a « problem oriented » character rather than a classical vulgarisation approach.

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Annex

List of institutions that were contacted during the research



Case studies <i>(Chapter I of the second part of the full report)</i>	
Departemente Ecología y Medioambiente de Comisiones Obreras Personne de contact : José Galante	Calle Zurbano, 29-3° 28010 Madrid - ESPAGNE Tél. + 34-1-3080063, fax + 34-1-3197645
European Network for Better Work Environnement Personne de contact : Pieter van Broekhuizen	PO Box 20242 1000 HE Amsterdam - PAYS-BAS Tél. + 31-20-5256591, fax + 31-20-5255615
Forum Soziale Technikgestaltung Personne de contact : Welf Schröter	DGB Baden-Württemberg Willi-Bleicher-Strasse, 20 70174 Stuttgart - ALLEMAGNE
Fundación de Estudios e Iniciativas Sociolaborales (FEIS) Personnes de contact : Juan Xifre, Amat Sánchez	Plaza Naps i Sicilia, 5 46003 Valencia - ESPAGNE Tél. + 34-6-3882100, fax + 34-6-3882107
Onderzoeks- en Adviescentrum Chemie, Arbeid en Milieu (Chemiewinkel Amsterdam) Personne de contact : Pieter van Broekhuizen	PO Box 20242 1000 HE Amsterdam - PAYS-BAS Tél. + 31-20-5256591, fax + 31-20-5255615
Solar Initiativ Heilbronn Personne de contact : Ulrike Zenke	IG Metal Neckarsulm Salinenstrasse, 9 74172 Neckarsulm - ALLEMAGNE

European panorama of interfaces between research and society <i>(Chapter II of the second part of the full report)</i>	
Akademie für Technikfolgenabschätzung Personne de contact : Detlef Garbe	Industriestrasse, 5 70565 Stuttgart - ALLEMAGNE Tél. +49-711-9063220, fax +49-711-9063299
Asociación Ecologista de Defensa de la Naturaleza (AEDENAT) Personne de contact : Lucía Quiñones	Campomanes, 13 Ap. 81 28600 Navalcarnero Tél. +34-1-5411071
Associazione per la Ricerca sulle Istituzioni, l'Economia ed il Lavoro in Europa (ARIELE) Personne de contact : Sabina Tonali	Via Alessandria, 130 00198 Rome - ITALIE Tél. +39-6-8848740, fax +39-6-85303114
Arbeid en Milieu Personne de contact : Dirk Van Braeckel	Waterloostraat, 11 2600 Berchem - BELGIQUE Tél. +32-3-2188077, fax +32-3-2188077
Centre for Alternative Industrial and Technological Systems (CAITS) Personne de contact : Colin Randall	104 Southgrove Road, Sheffield S10 2NQ GRANDE-BRETAGNE Tel. +44-742-665063
Conseil National Du Développement Durable	Rue de la Loi, 56 1040 Bruxelles - BELGIQUE Tél. +32-2-2870676, fax 32-2-2801427
Coordinadora de Organizaciones de Defensa Ambiental (CODA) Personne de contact : Martín Brajas	Plaza de Santo Domingo, 7, 7ºB 28013 Madrid - ESPAGNE Tél. +34-1-5596025, fax +34-1-5597897
Département « Automation und Arbeitsgestaltung » du syndicat autrichien GPA Personne de contact : Paul Kolm	Deutschmeisterplatz, 2 1013 Wien - AUTRICHE +43-1-31393, fax +43-1-31393388
Fondation Travail-Université Personnes de contact : Gérard Valenduc, Patricia Vendramin	Rue de l'Arsenal, 5 5000 Namur - BELGIQUE Tél. +32-81-725122, fax +32-81-725123
Fundación Primero de Mayo personne de contact : Alicia Durán	Calle Zurbano, 29-3º 28010 Madrid - ESPAGNE Tél. +34-1-3080063, fax +34-1-3197645
Groupe de Recherche pour une Stratégie Economique Alternative (GRESEA) Personne de contact : Anne Peeters	Rue Royale, 11 1000 Bruxelles - BELGIQUE Tél. +32-2-2197076, fax +32-2-2196486

Kooperationsstelle Hochschulen Gewerkschaften Personne de contact : Uwe Dieter Steppuhn	Hans Böckler Stiftung Bertha-von-Suttner-Platz, 3 40227 Düsseldorf - ALLEMAGNE Tél. +49-211-7778144, fax +49-211-7778210
Sistemaricerca Personne de contact : Vincenzo Ardente	Via Nomentana, 175 00151 Roma - ITALIE Tél. +39-6-44250382, fax +39-6-44250431
Stichting Technologie Vlaanderen (STV) Personne de contact : Paul Berckmans	Jozef II-Straat, 12-16 1040 Brussel - BELGIQUE Tél. +32-2-2170745, fax +32-2-2177008
Work Environment Action-group of Workers and Academics (AAA)	Valby Langgade, 55 2500 Valby-DANEMARK

Other relevant institutions	
Ambiente e Lavoro	Viale Marelli, 497 20099 Sesto S. Giovanni (Mi) - ITALIE Tél. +39-2-26223120, fax +39-2-26223130
Arbeitskreis Gesellschaft und Technik, VDI/VDE Personne de contact : Jürgen Unfried	VDE/VDI Balingenstrasse, 37 71229 Leonberg - ALLEMAGNE
Centro Ricerche Economia del Lavoro (CREL)	Via Lucullo, 6 00187 Roma - ITALIE Tél. +39-6-4743009, fax +39-6-4753208
Centro Studi Sociali e Sindacali (CESOS)	Via Boncompagni, 19 00187 Roma - ITALIE Tél. +39-6-4818779, fax +39-6-4824463
Conseil de Politique Scientifique (Conseil Economique et Social de la Région Wallonne) Personne de contact : Dominique Graitson	Rue du Vertbois, 13c 4000 Liège - BELGIQUE Tél. +32-41-329841, fax +32-41-329810
European Center for Work and Society (ECWS)	PO Box 3073 6202 NB Maastricht - PAYS-BAS Tél. +31-43-216724, fax +31-43-255712

Fondation André Renard (FAR) Personne de contact : José Verdin	Place Saint-Paul, 9-11 4000 Liège - BELGIQUE Tél. + 32-41-219640, fax + 32-41-231011
GIP-Mutations industrielles Personne de contact : Pierre-Eric Tixier	26, Boulevard Richard-Lenoir 75001 Paris - FRANCE Tél. + 33-1-48070585, fax + 33-1-48070151
Hippotamos Beratungsstelle Personne de contact : Lars Karlsson	Josefstädter Strasse, 64/12 1080 Wien - AUTRICHE Tél. fax + 431-4021992
Institut Wallon d'Etude, Recherche et Formation (IWERF) Personne de contact : Marc Vandercammen	Rue Stevens, 8 1000 Bruxelles - BELGIQUE Tél. + 32-2-5024300, fax + 32-2-5027392
Inter Environnement Wallonie (IEW) Personne de contact : Jean-Luc Rolland	Rue de la Victoire, 26 1060 Bruxelles - BELGIQUE Tél. + 32-2-5390978, fax + 32-2-5390921
Istituto di Ricerca Economiche e Sociali (IRES)	Via Santa Teresa, 23 00198 Roma - ITALIE Tél. + 39-6-857971, fax + 39-6-85797210
Istituto di Sociologia Internazionale di Gorizia Personne de contact : Bruna de Marchi	Via Mazzini, 13 34170 Gorizia - ITALIE Tél ; + 39-481-533632, fax + 39-481-532094
Istituto Europeo di Studi Sindacali (IESS)	Via Po, 22 00198 Roma - ITALIE Tél. + 39-6-8848779, fax + 39-6-8848879
Istituto per la Formazione dei Lavoratory (ISFOL)	Via G.B. Morgagni, 31 00161 Roma - ITALIE Tél. + 39-6-445901
Istituto Ricerca e Innovazione e Trasformazione produzione (SINDNOVA)	Via Boncompagni, 19 00187 Roma - ITALIE Tél. + 39-6-4881288, fax + 39-6-4874303
Progetto e Sviluppo	Via Goito, 39 I-00187 Roma - ITALIE Tél. + 39-6-4441410, fax + 39-6-4452356
Steinbeis Europa Zentrum Personne de contact : Armelle Le Corre-Frisch	Willi-Bleicher-Strasse, 19 70174 Stuttgart - ALLEMAGNE
Volkshochschulenverband Baden-Württemberg Personne de contact : Günter Behrens	Raiffeisenstrasse, 14 70771 Leinfelden Echterdingen - ALLEMAGNE

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