

An Analysis of National and EU Research Programmes Related to Sustainable Land and Groundwater Management

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Abstract

This paper summarises the results achieved by CLARINET Working Group 4 on the co-ordination of research, technological development and development (RTD) needs at a European level. It evaluates the current state of the art in RTD funding on contaminated land and groundwater related issues in Europe and provides recommendations for a future co-operation of RTD Programmes in the European Union.

Keywords: sustainable land management, sustainable groundwater management, CLARINET, NICOLE, Working Group 4, RTD programmes

INTRODUCTION

The conceptual paper by CLARINET on sustainable management of contaminated land (Vegter *et al.*, this issue) presents a general vision of the development of contaminated land and groundwater policies in EU countries. According to this paper, contaminated land and groundwater problems can be viewed from two policy perspectives. Polluted sites that endanger human or ecological health are generally considered as an environmental problem. On the other hand, derelict land that does not cause any immediate risk may be considered as a spatial planning problem. The major trend in policy development is to address environmental issues and spatial planning issues simultaneously. Efforts to develop

such an integrated approach have resulted in a shift in the attention of policy makers from the assessment of problems to the formulation of solutions that will meet the needs of society.

Such an integrated risk-based approach needs to be based on comprehensive scientific knowledge. The development of such knowledge is managed through national RTD programmes in various European countries, and through the EC RTD Framework Programmes at an EU level.

Since 1997, the European networks CARACAS (Concerted Action on Risk Assessment for Contaminated Sites in Europe) and NICOLE (Network on Industrially Contaminated Land in Europe), have identified priority research needs, to increase the currently existing scientific basis for sustainable contaminated land and groundwater management in Europe (CARACAS/NICOLE 1997; Ferguson *et al.* 1998). These recommendations have been recently updated and further defined with the *CLARINET RTD Needs Catalogue* (Kasamas, in prep).

Some of these RTD priorities are addressed in national RTD programmes; however, a European forum for research programme planners to exchange experience and to co-ordinate their approaches on a European level has not so far existed.

To initiate such a novel communication process between RTD programme planners in Europe, the Concerted Action CLARINET established a specific Working Group on 'Co-ordination of RTD on a European level' (van Veen *et al.*, in prep).

The aims of this working group are:

- to survey currently funded research issues related to contaminated land and groundwater in the various RTD programmes in Europe;
- to initiate collaboration and co-ordination between RTD programme managers in the EU Member States, including the associated countries (e.g. Norway, Switzerland).

This paper summarises the achieved results in this CLARINET Working Group. It evaluates the current state of the art in RTD funding on contaminated land and groundwater related issues in Europe and provides recommendations for a future co-operation of RTD Programmes in the EU.

NATIONAL AND EU RTD PROGRAMMES

General information

The CLARINET RTD working group made an inventory of national and EU RTD programmes related to contaminated land and groundwater issues. Overall, eleven countries provided the requested information on their national research activities/programmes related to contaminated land. Table 1 summarises some general information on these programmes. Additionally, related website addresses are listed where further information can be

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obtained on particular RTD programmes.

Management of the programmes

Table 2 summarises relevant management issues of the various programmes. The table indicates the duration, project funding, the available budget and eligibility. Several common themes are evident. RTD programmes and initiatives in most countries are limited by time and budget. The average duration of the programmes is about four years; how-

ever, the budgets vary widely from country to country.

The total budget of national RTD programmes in all European countries is about 20m Euro/year. The budget provided by the European Commission for ongoing FP 5 projects is about 12m Euro/year. Overall, the total research budget in Europe for contaminated land and groundwater issues can be estimated at about 30m Euro/year.

Most programmes are restricted to research institutes and universities;

however, some RTD programmes are also open to other stakeholders (e.g. the EU RTD Programme).

Dissemination of knowledge

The dissemination of knowledge obtained from funded RTD projects is considered as an essential issue of programme efficiency. The tools to transfer such information are reports, websites, and/or more interactive ways such as workshops, meetings, etc.

All programmes use written reports to transfer obtained knowledge, only a few

	Title of research programme	Managed by	WWW information
Austria	Support of studies and R&D projects for remediation of contaminated sites	Kommunalkredit Austria AG Environmental support	www.kommunalkredit.at www.kommunalkredit.at/altlasten/F_E-Projekte/f_e-projekte.htm (<i>English version</i>)
Belgium	OVAM R&D programme	OVAM Dienst Sanering	www.ovam.be www.ovam.be/english/multilang.asp (<i>English version</i>)
Denmark	The Danish EPA's technology programme for soil and groundwater contamination Various programmes	Danish EPA Cross-ministerial programme Strategic Environmental Research Programme Danish Ministry for Trade and Industry	www.mst.dk/homepage/ (<i>English version</i>) www.dmu.dk/1_english/default.asp (<i>English version</i>)
Finland	Various programmes	Various institutions	www.vyh.fi/eng/fei/fei/html (<i>English version</i>) www.vyh.fi/eng/research/r%5Fdprog/r_dprog.htm (<i>English version</i>)
France	Various programmes	Ministry MATE and ADEME	www.environnement.gouv.fr/english/default.htm (<i>English version</i>) www.ademe.fr/anglais/vadefault.htm (<i>English version</i>)
Germany	National R&D programme of the Federal Administration 'Research for the Environment' (Forschung für die Umwelt)	Ministry BMBF	www.bmbf.de/ (<i>in German</i>) www.umweltbundesamt.de/index-e.htm (<i>English version</i>)
Greece	No national R&D programme, but various relevant projects	Ministries of Development and Agriculture and Environment	www.minenv.gr/ (<i>in Greek</i>)
Italy	Various programmes, not specific to contaminated land issues	Mainly Ministry for Scientific Research, Ministry for Environment, Italian ANPA and National Research Council	www.minambiente.it (<i>in Italian</i>) www.sinanet.anpa.it (<i>in Italian</i>) www.idg.fi.cnr.it/homeeng.htm (<i>English version</i>)
Netherlands	Centre for soil quality management and knowledge transfer	SKB	www.skbodem.nl (<i>in Dutch</i>)
Norway	Pollutants: Sources, dispersal and effects 'ProFo'	The Research Council of Norway	www.forskningsradet.no/english (<i>English version</i>)
United Kingdom	Various programmes e.g. Waste pollution management WPM Environmental biotechnology EB Biological treatment of soil and water BSW Urban regeneration and environment URGENT	Three research councils, Environmental Agency and two ministries	www.bbsrc.ac.uk www.epsrc.ac.uk/programmes www.nerc.ac.uk www.environment-agency.gov.uk www.detr.gov.uk
EU	Fifth Framework Programme Theme: Environment and sustainable development	DG Research (D1.2) Key action: Sustainable Management and quality of water	www.cordis.lu/eesd/src/overview.htm#3 europa.eu.int/comm/research/fp5.html www.cordis.lu/fp5/home.html (in all languages)

Table 1. General information

	Duration	Funding rate by programme	Total budget (Million Euro)	Eligibility
Austria	Not limited	Up to 100%	c. 1.5 a year	Not limited
Belgium		Max. 50% for demonstration 100% for basic/applied	1.0 a year	Not limited
Denmark	Not limited for EPA programme. Other programmes – 2001	100% of additional costs	c. 2 a year for EPA programme c. 1.7 a year for all other programmes	Not limited
Finland	Limitation is programme specific		Ministry: 0.4 a year Tekes: 1.3 in 5 years Research foundation: 0.2 a year Total: 0.9 a year	Not limited
France	Limited for ministry programme, not for ADEME	Up to 50%	2.0 a year	Universities, research institutes
Germany	Limited, some 1999 – 2000, some 2000 – 2005	Up to 100% of additional costs	6.0 for 1999 and 2000: 12.5 for 2000 to 2005 average 2.5 a year	Public/private sector, universities, research institutes
Greece			c. 1.7 a year	Universities/research institutes
Italy		Up to 100%	Not possible to estimate	Public/private sector, universities, research institutes
Netherlands	1999 – 2003, possible extension to 2007	Up to 100% for fundamental research; max. 60% for applied research and demonstration	26 in 4 years average 6 a year	Fundamental research: universities. Applied and demonstration: not limited
Norway	PROFO 2000 – 2005	Up to 100%	c. 3.0 a year	Mainly universities and institutes
United Kingdom	WPM 1995–2000 EB 1996 – BTSW 1994–1997 URGENT 1997–1999	100% for scientists and research institutes	WPM 2.7 pa closed EB 1.4 pa ongoing BTSW 1.2 pa closed URGENT 2.3 pa closed Ongoing: 1.4 a year	WPM, EB, URGENT: universities and research institutes BTSW also industry
EU	FP 5 1998 – 2002	100% for concerted actions/thematic networks; up to 50% (full cost) and 100% (additional cost) for shared cost research	25 in the first two years, less in second part of the programme	Financial support is limited to Member States and associated countries

Table 2. Management of the programmes

have additional instruments to disseminate the created knowledge. The EU Programme uses among others Concerted Actions as a tool to disseminate research results and to update the state of the art. The working group members agreed that more effort should be given on the effective transfer of knowledge towards potential end-users; for example, the WWW is not sufficiently used as a powerful information transfer medium for research results.

International collaboration

International collaboration provides a significant opportunity to accelerate the development and dissemination of scientific knowledge. Table 3 indicates, if and how such an opportunity

for international co-operation is provided in the national RTD programmes.

Conclusions

As can be seen, there is hardly any possibility for international co-operation on joint RTD projects and tasks, except within the EU Framework Programme. Some RTD programmes provide schemes for the exchange of experts on an international level, but co-operation in joint RTD projects is in most cases not feasible.

Only Germany and the EU have special bilateral agreements with non-European countries, e.g. the USA.

EVALUATION AND CONCLUSIONS

Research plays a central role in the implementation of public policy. In areas such as health, sustainable development and industrial, food and nuclear safety, policy options and decisions must be based on solid scientific knowledge and a comprehensive understanding of the environmental, economical and social aspects of the specific problems under discussion. Complex matters like sustainable land and water management require involvement of societal, economic and scientific stakeholders for integrative problem-solving approaches. In this regard, RTD programmes are an excellent instrument to facilitate the effec-

	Programme open for international participation	The programme implies ongoing or terminated international projects	Bilateral agreements
Austria	No		
Belgium	No		
Denmark	No		
Finland	No		
France	No		
Germany	Yes		USA
Greece	No		
Italy	No		
Netherlands	Yes	Yes	
Norway	No	Yes: expert exchange only	
United Kingdom	No	Yes: expert exchange only	
EU	Yes	Yes	USA, Australia, New Zealand, etc.

Table 3. International co-operation

tive implementation of sustainable policies with all stakeholders involved (CARACAS/NICOLE 1997).

International co-operation in research would accelerate the development of an appropriate knowledge portfolio, which is needed to implement sustainable land and water management policies efficiently. The EU provides a legal basis to initiate suitable measures for international co-operation in research and technological development, but the principal reference framework for research activities in Europe is national. Co-operation among the national RTD programmes is an important condition for this acceleration of knowledge development. However, the analyses of national and EU programmes performed in the CLARINET RTD Working Group revealed that the current real-life management practice in the field of sustainable land management falls short of ideal practice.

Some major conclusions derived by the CLARINET RTD Working Group are as follows:

- The budgets of national RTD programmes in Europe add up to a total of about 20m Euro/year, and approx. half of that amount is added from the EU budget. Altogether, there are about 30m Euro/year

available for contaminated land and groundwater research all over Europe. The costs for clean-up in Europe are estimated to be at least about 90bn Euro (EEA-ETC/S 1999). This means that the RTD effort for sustainable land management is less than 0.5%, considerably less than for other areas of environmental management.

- There is no co-ordination between national RTD programmes in Europe. The consequence is that all countries go through similar learning curves, resulting in a considerable overlap of research projects and targets. Up to now, there has also been a lack of co-ordination between national and EU research programmes. Overall, the missing co-ordination of RTD activities in Europe results in parallel expenditures and less efficient management of limited resources for European research.
- Almost all national RTD programmes are restricted to their own national research community and activities. Only a few countries provide certain funding possibilities for the exchange of experts with other countries, but real co-operation on a project level is rarely feasible. This means that cross-fertilisation and knowledge exchange among countries due to focused partnership projects is not available.

- The dissemination of achieved project results through national RTD programmes is very modest. The opportunities provided by the WWW are insufficiently used. The advantages of broad dissemination of project results at a European level have not been given particular consideration by most national RTD programmes so far. However, this situation is one of the main reasons for the creation of various contaminated land and groundwater networks in Europe over the past few years. One major aim of all these networks is 'to disseminate knowledge'. A co-ordinated approach by various European RTD programmes would be of substantial benefit in this regard.

- There is no co-ordinated approach in focusing the various RTD programmes in Europe towards the major gaps in scientific knowledge. The stakeholder networks CLARINET (regulators) and NICOLE (industry) have identified priority research issues needed to implement sustainable solutions for contaminated land and groundwater related problems in Europe (CARACAS/NICOLE 1997; Ferguson *et al.* 1998). So far, these research recommendations do not appear to be considered in the national research programmes.

As an overall conclusion enhanced co-ordination between countries' national research approaches will considerably increase the effects and yields of invested resources for focused scientific knowledge, which is urgently needed to meet the demands for sustainable solutions in Europe (Commission of the European Communities 2000).

RECOMMENDATIONS: TOWARDS A EUROPEAN RESEARCH APPROACH FOR SUSTAINABLE LAND AND WATER MANAGEMENT

The CLARINET RTD Working Group recommends taking steps/establishing measures towards a co-ordinated European research policy on contaminated land and water management.

Such a co-ordinated approach would be in line with recent EU recommendations for a future European research policy (Commission of the European Communities 2000). Some of these measures in accordance to these EU recommendations should be:

- A platform of research programme managers to exchange information on national research priorities, funding mechanisms and knowledge dissemination. The already established CLARINET RTD working group could be a suitable starting point for such a European platform.
- More coherent integration of national and European research activities. These could be achieved through a closer collaboration between various scientific and technological research organisations in Europe. The existing stakeholder networks such as NICOLE, CLARINET and ANCORE could provide a suitable platform to interlink and co-ordinate available resources and facilities towards a future 'research infrastructure' for contaminated land and groundwater at a European level. The involvement of various stakeholders in such a platform would enable far-reaching implementation of achieved research results into the formulation of problem-solving approaches.
- A joint approach to the needs and means of financing large research projects in Europe. For example, European researchers and technology developers could test and compare their products at specific demonstration sites in Europe.
- Better use of instruments and resources to encourage investment in research and innovation: systems of indirect aid (within the Community rules on state aid), patents, risk capital.
- Networking of existing centres of excellence and competence in Europe and the creation of virtual centres through the use of new interactive communication tools.
- More abundant and more mobile human resources:
 - increased mobility of researchers and introduction of a European dimension to scientific careers;
 - stimulating young academics for research careers in land and water management;
 - bringing together the scientific communities, companies and researchers of Western and Eastern Europe;
- Co-ordination of an agenda of joint research priorities and stimulation of transnational RTD projects;
- Stimulation of transdisciplinary research involving all stakeholders in the projects;
- More attention on the dissemination of knowledge in the national programmes. The focus should be shifted from pure knowledge supply to 'information on demand'.

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CLARINET information is available at www.clarinet.at/

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