CRUE
FLOODING ERA-NET

Integrate, Consolidate and Disseminate
European Flood Risk Management Research

GOOD PRACTICE GUIDE FOR RESEARCH PROGRAMME IDENTIFICATION, PROMOTION AND VALIDATION

CRUE REPORT



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Project Contract No: ERAC-CT-2004-515742
Project Website: www.crue-eranet.net

IMPRINT

Editor ◄ **WP 3 Leader**
ERA-NET CRUE Partner 4

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Published in October 2007

ERA-NET CRUE is funded by the ERA-NET Scheme under the 6th Framework Programme
General Directorate for Research in the European Commission
Contract number: ERAC-CT-2004-515742

ERA-NET CRUE

GOOD PRACTICE GUIDE FOR RESEARCH PROGRAMME IDENTIFICATION, PROMOTION AND VALIDATION

CONSISTS OF INFORMATION FROM THE FOLLOWING

ERA-NET CRUE Partners

AUSTRIA	FEDERAL MINISTRY OF AGRICULTURE, FORESTRY, ENVIRONMENT AND WATER MANAGEMENT (BMLFUW)
ENGLAND	DEPARTMENT FOR THE ENVIRONMENT, FOOD AND RURAL AFFAIRS (Defra) – Co-ordinator of ERA-NET CRUE
FINLAND	FINNISH ENVIRONMENT INSTITUTE (SYKE), MANDATED BY THE MINISTRY OF AGRICULTURE AND FORESTRY (MMM)
FRANCE	MINISTRY OF ECOLOGY AND SUSTAINABLE DEVELOPMENT (MEDD)
GERMANY	FEDERAL MINISTRY FOR EDUCATION AND RESEARCH (BMBF)
	PROJECT MANAGEMENT ORGANISATION FOR WATER TECHNOLOGIES AND WASTE DISPOSAL (PTKA-WTE)
	PROJECT MANAGEMENT ORGANISATION JUELICH (FZJ-PTJ)
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THE NETHERLANDS	MINISTRY OF TRANSPORT, PUBLIC WORKS AND WATER MANAGEMENT (MinVenW)
POLAND	MINISTRY OF SCIENCE AND INFORMATION SOCIETY TECHNOLOGIES (MSIST)
SPAIN	MINISTRY OF EDUCATION AND SCIENCE (MEC)
SCOTLAND	THE SCOTTISH EXECUTIVE RURAL AFFAIRS DEPARTMENT (SE-ERAD)

Content

1 Summary

The present “Good Practice Guide” gives a comprehensive summary of current practice in the development and management of flood research programmes in various European countries. It was compiled as part of the ERA-NET project, CRUE, financed by funds from the 6th EU Research Framework Programme, which had as its goal the coordination of the flood research programmes as well as the initiation of joint funding activities. ERA-NET stands for European Research Area – Network and CRUE for "Coordination de la recherche sur la gestion des inondations financée dans l’Union Européenne" (coordination of the research financed in the European Union on flood management). Thirteen funding agencies from Austria, Finland, France, Germany, Hungary, Italy, The Netherlands, Poland, Spain and the United Kingdom (England and Scotland) have combined to form CRUE.

This “Good Practice Guide” is mainly aimed at representatives of funding institutions in the field of flood research and is intended to provide suggestions and also an overview of the various opportunities for programme development and organisation. It will serve the CRUE members and future partners joining the network for the development and implementation of joint funding activities.

The present collection of good practices is based on a survey performed with the aid of questionnaires sent to the CRUE Partners as well as individual interviews. The results of the survey were used to identify common practice in the development and management of flood research programmes. They were described in a generalised manner and are illustrated by practical examples from the countries involved.

The content, nature and implementation of research programmes in the European countries differ in part quite considerably since the programmes are constrained by country-related conditions and rules. For this reason, a separate chapter is devoted to the boundary conditions for the programmes.

The selected examples of good practice are given in separate text boxes. They either describe typical approaches which are representative of several countries or they represent special measures serving for the implementation of specific programme goals. The most important conclusions are summarised at the end of the individual chapters and then once again in a separate chapter.

2 Introduction

Flood events present a serious problem in most European countries. Human lives are claimed again and again and the damage caused by extreme flood events can amount to billions of euros. In the light of climate change, we have to expect that in future we will be affected more and more frequently by extreme flood events. Complete protection from floods will never be possible but we are learning how to deal more effectively with the risks. Flood risk management is therefore an integral part of flood policy on both a European and a national level. The principal aim of flood risk management is to avoid and reduce damage – both in terms of preventative measures and during acute floods. The prerequisite for this is knowledge and a good scientific evidence base. The more familiar we are with the processes, for example the formation of precipitation, discharge, the flow of information between emergency staff or the behaviour of those people affected, the more effectively can we avoid damage in the future.

The main prerequisite for this knowledge and for the steady improvement of flood risk management is flood related research & development. Flood research is conducted by almost every country in Europe, but the intensity and the focus are different. Yet many similarities still exist between the countries and often their research overlaps, which is the reason why the ERA-NET project CRUE was set up in 2004. ERA-NET stands for European Research Area – Network and CRUE for "Coordination de la recherche sur la gestion des inondations financée dans l'Union Européenne" (coordination of the research financed in the European Union on flood management). CRUE ERA-NET is financed by the EU with funds from the Sixth Research Framework Programme. Thirteen funding organisations from Austria, Finland, France, Germany, Hungary, Italy, The Netherlands, Poland, Spain and the United Kingdom (England and Scotland) are represented in CRUE. These are exclusively organisations concerned with developing and managing programmes for flood research. CRUE's major objectives are an exchange of information between the funding organisations, the coordination of flood programmes as well as the initiation of joint funding activities as part of calls for proposals and the development of a common research agenda.

The present "Good Practice Guide" is intended to give an overview of the practices implemented in the development and management of flood research programmes in the countries involved. A summary of the research programmes represented in CRUE can be found in the report "National Research Programmes on Flood Risk Management across Europe" published in January 2007. The report can be downloaded from the CRUE website at http://www.crue-eranet.net/publications.asp.

The present collection of practical methods for the development and management of flood research programmes is based solely on the surveys performed with the aid of questionnaires by the CRUE partners. No further information was thus included from other countries or programmes that were not represented in CRUE since this would have gone beyond the scope of the study and would have soon exhausted the available resources. However, consideration was given to information from similar studies on this topic that had already been published and this was in part also included in the present paper.

In compiling a "Good Practice Guide", the question naturally arises of how one identifies good practices and what the criteria are. Two approaches were taken here. On the one hand, methods that have already been applied in the same or similar way in various countries are obviously proven and therefore can be regarded as good practices. The identification of common features is therefore a major objective of this paper. On the other hand, we asked ourselves what programme aims could be fulfilled particularly well and by what measures. Good practices are characterised by the fact that they fulfil various individual or indeed different programme objectives at the same time. However, this second approach is not easy to apply. Here is just one example. A comprehensive pilot study performed by one or more scientific institutions can place the identification of research needs on a solid and broad basis. However, the commissioning of such a study involves a considerable expenditure of time and money. This approach only makes sense if a major research

programme with a considerable lead time is to be initiated. This example shows that the choice of practices therefore depends quite essentially on the objectives and the respective boundary conditions. The good examples identified in this paper are therefore to be regarded in relation to the costs and benefits and the special goals pursued by the funding activities.

This “Good Practice Guide” is mainly aimed at representatives of funding institutions in the field of flood research and is intended to provide suggestions and also an overview of the various opportunities for programme development and organisation. This collection will serve the CRUE members and future partners joining the network for the development and implementation of joint funding activities.

In conclusion, attention should be drawn to the fact that the present “Good Practice Guide” primarily targets the programme level and that it is not concerned with the project level, i.e. the development and management of individual research projects or collaborative research projects. Since, however, research projects are an integral component of any research programme reference will be made again and again to the project level.

3 Framework conditions for the development of flood research programmes

The development and the management of research programmes in the various European countries is organised in very different ways. The major priorities, the scope, the responsibilities and organisation of the programmes can only be understood if one is familiar with the geographical, climatic, political, institutional, economic and legal boundary conditions. This is not the place for an analysis of these conditions for all the countries and programmes involved. However, the most important parameters will be mentioned and their major features described.

3.1 Geographical, climatic and regional conditions

The priorities of the various flood research programmes are essentially defined by the specific flood problems in the various European countries. Flooding issues may differ greatly from region to region and mainly depend on geographical and climatic conditions.

The following table gives an overview of the types of floods, special problems and climatic conditions specified by the CRUE partners.

Table 1: Types of floods, special flood problems and climatic conditions specified by the CRUE partners

		UK-Engl	DE	AT	NL	FR	UK-Scot	I	FI	ES	Total
Important types of floods and specific problems	**Flooding in medium and large river basins**	x	x	x	x	x	x	x			7
	Flash floods	x	x	x		x	x	x		x	7
	Coastal flooding	x	x		x	x				x	5
	Snowmelt	(x)	x	x		x	(x)		x		6
	Ice blockage		x						x		2
	Sediment transport and silting up of river beds	(x)	x	x	x	x					5
Important geographical and climatic conditions	**Steep and/or impervious catchments; mountainous areas**	x	x	x		x		x			5
	Low-lying areas	x			x	x	x				4
	Land subsidence				x						1
	Atlantic climate	x	x	x	x	x	x		x		7
	Continental climate								x		1
	Mediterranean climate					x		x		x	3
	Alpine climate		x	x		x		x			4

Notes: Crosses in brackets signify points of minor significance. If a box is not ticked that does not necessarily mean that the feature is not applicable to the country in question. The feature was not expressly mentioned and may therefore only be of minor significance.

Many countries have a common experience of flood events in large and medium-sized river basins as well as the occurrence of flash floods in mountainous regions. Coastal flooding was said to be significant by five countries. Snowmelt and ice blockage is relevant for a number of countries although the significance of snowmelt, in a flooding context, has declined in the past few decades. The majority of countries experience an Atlantic climate, but for Spain the South of France and Italy a Mediterranean climate is relevant, whereas Finland is influenced by both Atlantic and continental climates.

However, of significance for all participating countries are changes in the intensity of precipitation and the seasonal distribution pattern as a consequence of climate change, and, for countries exposed to coastal flooding, the expected rise in sea level and increased likelihood of storm surges.

3.2 Political targets and strategies

Funding activities and programmes in the field of flood research are developed on the basis of political targets and priorities. The political goals underpinning the different funding programmes are many and varied and range from general goals, such as the protection of health, life, the environment and property, up to very specific formulations of objectives, such as the integration of flood protection and area planning or the implementation of a flood warning system for selected rivers.

The policy goals may be laid down in quite different forms. Resolutions, action plans, programmes, strategies, coalition agreements and legal intiatives are some examples that can be mentioned here. Furthermore, the boundary conditions for research policy are also important. The framework programmes, guidelines and objectives of the responsible ministries can have a quite decisive influence here.

The CRUE partners were asked to specify what political goals, priorities and strategies were decisive for flood research. The answers to this question can be divided into three categories:

1. Strategies and programmes directly related to flood risk management. (mentioned by AT, DE, FIN, FR, ES, I, NL, UK-Scot.)

2. Strategies and programmes related to sustainable development (mentioned by AT, DE, FR, UK-Engl.)

3. Overriding goals with respect to the protection of health, life, the environment and property (mentioned by AT, NL, UK-Engl.)

Political strategies, objectives and programmes influencing flood research in CRUE partner countries

AT
- Protection of health, life and belongings of the Austrian public against natural hazards
- Austrian Strategy on Sustainable Development 2002
- FORNE-Programme for sustainable development (FORNE – Research for Sustainable Development)
- Lisbon summit – lifting the research quota up to 3 % of GDP
- International co-operations on flood protection (e.g. ICPDR, GRK etc.)

DE
- 5 point programme of the federal government (improvement of precautionary flood protection)
- BMBF-Framework programme "Research for sustainability"
- Strengthening of small and medium enterprises in research

FIN
- Water resource strategy 2010 (Ministry of Agriculture and Forestry 2005)
- Research and development guideline for the water resources (the Ministry of Agriculture and Forestry and the Finnish Environment Institute 2005)
- National strategy for the adaptation to climate change (the Ministry of Agriculture and Forestry)

FR
- National implementation of flood forecasting system at the national level (creation of SCHAPI)
- Strategies of sustainable management of flood prevention: Loi Bachelot (31 July 2003)
- Implementation of bodies for the dialogue with and the involvement of stakeholders
- National programmes of actions for flood prevention (called PAPI) at the basin scale
- Strategies of systematic mapping of flood-prone areas of societal interest (PPRI)

I
- Systematic identification of hydraulic risks
- Model forecast and real time monitoring of flood events

NL
- Keeping the Netherlands safe and fit for human habitation
- Incorporate flood protection in spatial development (e.g. 'Space for rivers')

UK-England
- Making space for water: Defra flood and coastal risk management strategy
- Creating a better place: Environment Agency corporate strategy
- Sustainable development: The goal of sustainable development is to enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life, without compromising the quality of life of future generations
- Adapting to Climate Change: Providing the tools necessary to understand changes likely to result from climate change and adapt to it
- Evidence based policy making: Making sound policy decisions based on scientific evidence
- Public safety and environmental risk management: Manage environmental risks to protect as much as possible the public from loss of life and property, and the environment

UK-Scotland
- Statement of Commitments to reduce the risks and impacts of flooding
- National Flooding Framework (action plan). The National Flooding Framework aims to address the problems of flooding through four areas of action, namely, Awareness, Avoidance, Alleviation, and Assistance

3.3 Regulations and laws

Every country possesses a number of laws or regulations which provide a framework for flood risk management. Most of the laws mentioned by the CRUE partners are related to protection against floods or management of watercourses (e.g. national flood and water acts, EU Water Framework Directive and its conversion into national regulations).

Legislation and regulations of significance for flood risk management in CRUE partner countries

AT
- Act on funding of research and technology (defines the extent and the manner of research funding; mainly related to basic research)
- Water Act
- Forest Act
- Laws regarding spatial planning
- Disaster Fund Act
- Water Framework Directive 2000/60/EC

DE
- Article-Law 2005 (change of some articles in the following laws relevant for flood risk management: Federal Water Act; Federal Building Code; Regional Planning Act; Federal Waterways Act; German National Meteorological Service Act)
- Water Framework Directive 2000/60/EC
- DIN 19700 – Standard for constructions in flood protection
- Draft of EU Action Programme on Flood Risk Management

ES
- Act on flooding areas
- Water Act

FIN
- Dam Safety Act 1984 (1.6.1984/413)
- Law, on the compensation of flood damage (284/1983)
- Law on the land use and construction
- Water Act
- Rescue Act

FR
- Loi du 13 Juillet 1982: Act on the national solidarity insurance for natural catastrophes called in French: Garantie CATNAT (CATastrophes NATurelles)
- Loi de 1987: Act on the Organisation of Civil Safety, the Protection of Forests against Fires and the Prevention of major Risks
- Loi sur l'Eau, 1992 (National Water law): Act on global management of water resources
- Loi Barnier, 1995: Act on the Reinforcement of Environmental Protection
- Loi Bachelot, 2003 related to the prevention of technological and natural risk and to the damage reparations
- Loi de 2004: Act on modernisation of civil security
- Water Framework Directive 2000/60/EC

I
- Italian Law 183/89 "Regulations for the functional reorganisation of soil defence"
- Testo Unico sull'Ambiente – Consolidated act on Environment
- Water Framework Directive 2000/60/EC

NL
- Law on flood protection
- Law on spatial planning
- Law on environmental protection

UK-Engl.
- Many Land Drainage, Water and Environment Acts from 1930 to 1995

UK-Scotl.
- Water Environment & Water Services Act 2003
- The Water Environment (Controlled Activities) Regulations 2005 (CAR)
- Flood Prevention (Scotland) Act 1961
- Flood Prevention and Land Drainage (Scotland) Act 1997
- Town and Country Planning (Scotland) Act 1997
- Coast Protection Act 1949
- Civil Contingencies Act 2004 and Civil Contingencies Act and Contingency Planning (Scotland) Regulations 2005

But there are also other regulations dealing, for example, with risk or disaster management or land use and physical planning which are also related to flood risk management research. The influence of laws on setting priorities in flood risk management research can be mainly characterised as indirect. That means that they

provide a background but do not trigger flood research itself. Depending on the topics of the respective laws their influence is different.

A direct influence on flood risk management research can be identified in the case of the preparation or adoption of new regulations. A good example in this context is the preparation of the EU Action Programme on Flood Risk Management and its influence on the first common ERA-NET CRUE call.

Practical Example – Orientation of the first common ERA-NET CRUE call towards the upcoming EU Floods Directive

Excerpt from the preamble of the call text published in November 2005:
"The management of flood risk is a critical component of public safety and quality of life. In the past, EU member states and associated states have mainly promoted their own national flood research without comprehensive co-ordination between their programmes, entailing the risk of redundancies and of neglecting potential synergies. The vision for the ERA-NET CRUE action, which has been started in November, 2004, is to support and develop an extensive co-ordination and integration of national, regional, and European research programmes and policies in the field of flood risk management. This will provide knowledge and understanding for the sustainable management of flood risks in river basins and coastal plains.

The European Commission is currently preparing an EU action programme on flood risk management. It is based on a package of three distinct but closely linked actions: (1) Information and research, (2) EU funding possibilities and (3) a legislative proposal. The first item is dedicated to facilitating exchange of experiences and information and stronger linkages between research and policy, the second to best use of funding tools and the third to a Floods Directive based on risk maps and flood risk management plans. The management plans will be required for potentially endangered river basins and coastal areas in the EU Member States. As envisaged by the Commission and confirmed in the conclusions of the Environmental Council (October 2004), the development of flood risk management plans is an element of integrated river basin management. Therefore, one of the guiding principles of the approach to be developed is that there will be a strong linkage with the Water Framework Directive (WFD). It can be expected that the future implementation of the action programme on flood risk management will require a broad basis of knowledge and tools for which additional research, especially on a transnational level, is necessary. One important aspect which needs further investigation is the effectiveness and efficiency of flood risk management measures, as shown by the communication from the commission on flood risk management from July, 2004. In this paper, a "list of cost-effective flood risk management measures" is named as one of the desired key outputs of flood risk management plans.

This announcement represents the first of two pilot calls agreed to be part of the ERA-NET CRUE coordination action. It is meant to establish transnational collaborative research projects on a specific area within flood risk management research called: "Risk assessment and risk management: Effectiveness and efficiency of non-structural flood management measures". Thus, it may contribute to reach the above-mentioned goals of the European Commission. …"

New regulations can trigger a wide range of new research activities, particularly in the area of applied research. An example of this is the EU Water Framework Directive. Following the passing of the directive, the EU member states initiated a large number of research projects on river basin management and on the scientific implementation of individual parts of the directive. It should be emphasised in this connection that the EU member states must coordinate their research activities in order to avoid the development of isolated national or regional solutions.

The CRUE partners therefore aim to coordinate the research activities needed for the implementation of the Floods Directive. In this way, they prevent the creation of redundancies and unnecessary diversification among the EU countries. Since flood risk management and the Floods Directive currently under preparation are in many ways related to the Water Framework Directive, the partners must also cooperate in order to shape the interconnections between the two directives and their integration.

3.4 Responsibilities for flood risk management and flood research

The responsibilities for the administration and practical implementation of flood risk management and also for research funding and the management of funding programmes are, as expected, distributed differently in the various European countries. A detailed discussion of the situation in the respective CRUE partner countries can be found in the CRUE report mentioned above “National Research Programmes on Flood Risk Management“. At this point the special features and differences will only be summarised. An overview of the most important organisations and interest groups is given in Figure 1.

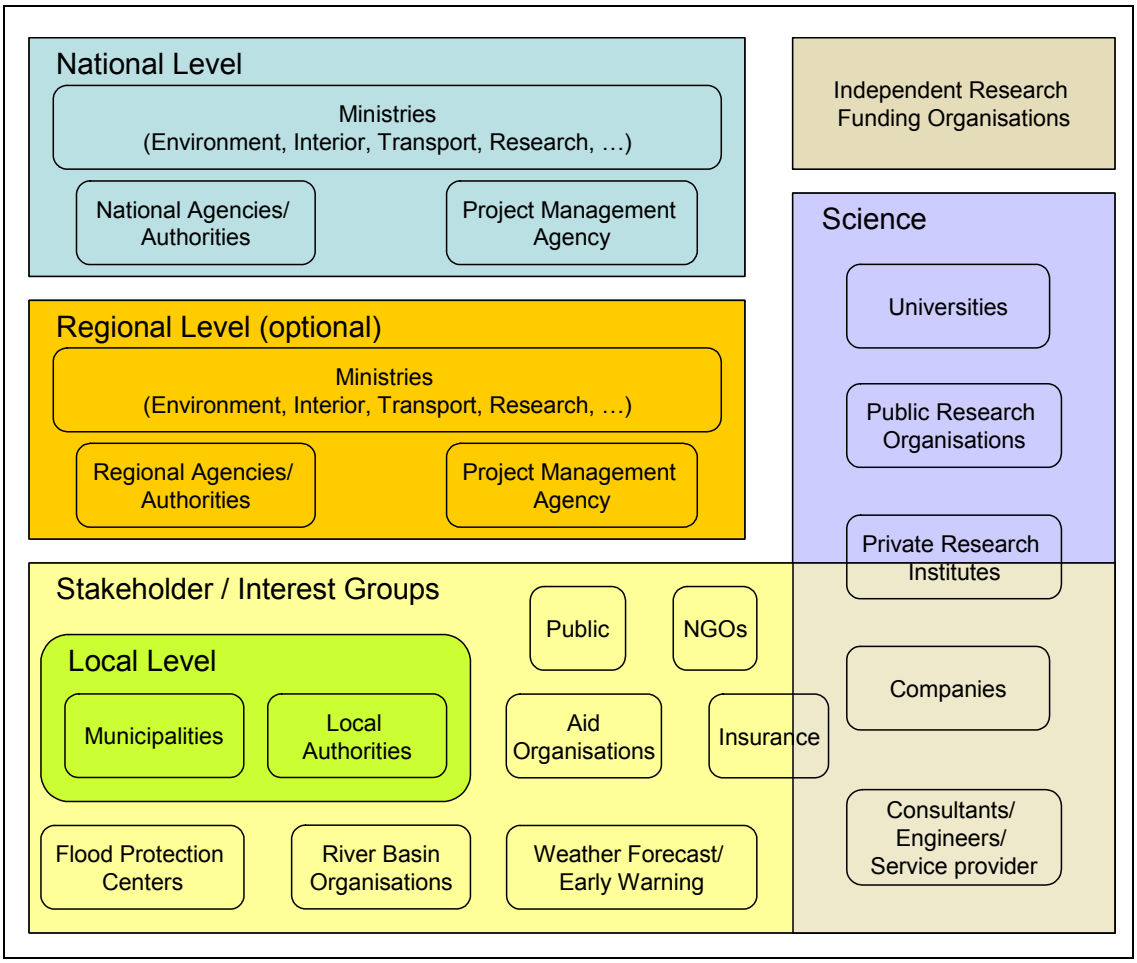


Figure 1: The most important organisations and social groups in flood management and flood research.

- Various authorities and organisations are responsible for flood risk management ranging from the local, through the regional up to the national level (vertical distribution of responsibility). Examples to be mentioned here are national ministries, state ministries (e.g. the federal states in Germany) and regional institutions (e.g. in the Spanish autonomous communities), river basin authorities, as well as public institutions and authorities in the towns and local authorities. Depending on the organisational structure, the size of the country and autonomy of the regions or parts of a country, the responsibilities may in part be very widely distributed or divided between regions.

- The usual situation is that several ministries and their subordinate authorities bear responsibility for flood risk management (horizontal distribution of responsibility). As a rule, the ministries of the environment (water and soil protection, physical planning), transport (waterways), agriculture and forestry (land use) and of the interior (civil protection) are involved, although there are naturally differences in the designations and fields of responsibility between the individual countries.

- The intensity of the link between responsibility for FRM policy and responsibility for research funding is different in the different European countries. In some cases, responsibilities are divided between different ministries (AT, DE, FR, ES (depending on the programme)), so that the transfer of policy targets to research funding is related to an intensive consultation process. In other cases, responsibilities are closely linked or combined in one institution ((e.g. NL, England, Scotland)).

- Whereas flood research, which may be largely characterised as applied research, is generally initiated and funded by the responsible ministries, in contrast basic research related to flooding (e.g. meteorology, climate research) is in many countries funded by separate institutions (see Chap. 3.6).

- Flood risk management is closely linked to river basin management and water management. In some countries, flood risk management and also research funding is therefore part of overarching activities within the framework of the management of bodies of water and water resources.

- Moreover, flood risk management is associated with various disciplines and organisations involved in meteorology, natural hazard and civil protection. In some cases, flood research is therefore initiated by ministries or other organisations responsible for these areas.

In summary, it can be said the more broadly spread the responsibilities the more complex are the consultation processes for preparing and implementing research programmes. It can basically be assumed that the integration of responsibilities for flood risk management and flood research makes it easier to organise the programme.

3.5 Responsibilities for programme development and programme management

Research programmes are usually developed and funded by the ministries responsible, although assistance may be provided by various other organisations. The programmes are in part implemented and managed by the ministries themselves and in part these functions are transferred to other organisations. In the latter case, subordinate authorities, project management agencies or selected research establishments may be taken into consideration. In this context, a distinction must be made between administrative functions such as handling payments and scientific coordination functions (coordination, reporting, scientific support, organising events). In some cases, both functions are transferred to third parties, whereas in other cases only the scientific coordination activities.

Table 2: Responsibilities for various steps in developing and implementing flood research programmes in the CRUE partner countries.

O – Programme Owner (normally Ministry)
M – Programme Manager (Agency, Project Management Organisation, Research Org.)

	Programme	**Programme announcem.**		**Programme management**		**Call announcem.**		**Application procedure**		**Project evaluation procedure**	
		O	M	O	M	O	M	O	M	O	M
UK-Engl	Joint Flood and coastal erosion risk management programme	x	x	x	x	x	x	x	x	x	x
DE	RIMAX	x		x	x	x			x		x
	FRM and Nature Conservation	x		x		x		x		x	
AT	FloodRisk	x		x							x
	StartClim	x	x		x		x		x		x
NL	Water and Safety	x		x						x	
HU		x			x				x		x
IT	Hydro-Meteo-Marine Forecasting System (SIMM)	x		x		x		x		x	
	Italian National System of Functional Centres	x		x	x	x	x	x	x	x	
FR	RDT	x	x	x		x	x	x	x	x	
	RIO	x		x	x	x		x	x	x	
	EPR	x		x	x	x		x	x	x	
	PNRH		x		x		x		x	x	x
PL		x			x	x		x		x	
UK-Scot	Flood risk management research programme		x		x						x
	Environment Group Research Programme	x		x		x		x			x
FI		x		x		x		x		x	x
ES	National Research Plan	x		x		x		x		x	
Total		16	5	13	10	12	5	11	9	12	9

Scientists and also various interest groups / stakeholders usually only have an advisory function in programme development. This ranges from simple personal discussions up to extensive consultation processes as part of one or more meetings or workshops (see Chap. 4.2).

In programme implementation, scientists and the interest groups / stakeholders are frequently consulted as experts for programme control and evaluation. As a rule, a precondition for this function is that they themselves are not active participants in the research programme. In many cases, they are members of specially established boards, panels or committees.

3.6 Categories of research and research needs

Both basic and applied research are relevant for flood research. The research programmes represented in CRUE can mainly be subsumed under the heading of applied research although they may also contain elements of basic research. Apart from these fundamental research categories others are also distinguished such as strategic research, precompetitive or experimental development, or demonstration. These categories are not used or understood, or indeed defined, in a consistent manner. The research categories have only been systematically defined in a few countries. The English CRUE partners refer to the "Frascati Manual - Proposed Standard Practice for Surveys on Research and Experimental Development - 2002", which was published by the OECD and represents a point of reference for international comparisons and surveys on the research and development activities in the various countries.

Practical Example – Definition of research categories
according to the "Frascati Manual - Proposed Standard Practice for Surveys on Research and Experimental Development - 2002"

"**Basic research** is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view. **Applied research** is also original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective. **Experimental development** is systematic work, drawing on existing knowledge gained from research and/or practical experience, which is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed."

Whereas applied flood research is generally initiated and funded by the ministries or the organisations appointed by them to do so, basic research is often undertaken by separate and independent scientific organisations (i.e. AT: Austrian Science Fund - FWF; FIN: The Academy of Finland; FR: Centre National de la Recherche Scientifique – CNRS (National Centre for Scientific Research); DE: German Research Foundation - DFG; UK-Engl.: Natural Environment Research Council-NERC, Engineering and Physical Sciences Research Council - EPSRC, Economic Social Research Council - ESRC).

Research is normally only categorised with respect to its nature and closeness to application. In England, however, a further distinction is made with respect to the research needs (see text box).

Practical Example – Categories of research needs

UK- England - Department for Environment, Food and Rural Affairs (Defra)

Defra has developed an Evidence and Innovation strategy (E&IS) with the following definitions:

Evidence needs: The evidence base helps to spot emerging issues, understand how and why the policy environment is changing, understand uncertainty, establish baseline performance and targets, choose between policy options and evaluate alternatives, and assess the impacts of policies. It covers both qualitative and quantitative information. Evidence needs would be classified as research if they required new knowledge or analysis methods rather than just data gathering.

Innovation needs: Innovation is about successfully exploiting new ideas that help you deliver policy decisions faster/quicker/better and in a sustainable fashion on the ground.

Evidence and innovation covers the full range of social, technological, economic, statistical and scientific areas.

Conclusions

- Although the geographical and climatic conditions are different for the various European countries there are a large number of common features and similar problems (like flooding in medium and large river basins, flash floods etc.) which can be jointly solved by coordinating the flood research programmes.
- Flood research programmes have been developed in the context of different political goals and strategies. The different demands that are thus made on the research projects and programmes should therefore be taken into consideration for joint funding initiatives involving several European partners.
- Existing legislation only has an indirect influence on flood research programmes. New legislation initiatives may lead to research needs and may thus influence the development of new flood research programmes.
- The implementation of new EU directives causes European countries to initiate a large number of projects in applied research. To avoid redundancies and isolated national solutions in this area, it is imperative that the EU member states coordinate their research programmes. As a result, the CRUE partners aim to support the implementation of the EU Flood Directive currently under preparation by conducting joint funding activities and coordinated research programmes.
- Framework conditions are changing over time (e.g. global change; economic and regional development); these changes create new research needs which have to be monitored.
- Different institutional frameworks in different countries require nationally specific communication networks and procedures.
- The integration of those responsible for flood risk management and flood research reduces the need for coordination between different institutions and makes it easier to develop flood research programmes.
- Flood research can be primarily subsumed under the heading of applied research but also contains elements of basic research. In some countries further distinctions are made between research categories and also a typification of research needs, but these are handled in different ways.

4 Programme design and management

This chapter highlights various aspects related to the development, conceptualisation, implementation and management of flood research programmes. The following sub-chapters are more or less arranged in a logical sequence and in chronological order according to a programme's time of initiation, completion and evaluation. The chapter closes with a description of selected programme management structures. The structures are explained by means of examples in which individual aspects that have been previously addressed merge to form an organisational whole. We recommend that readers who are not overly familiar with programme management first gain an overview of the structures of programme management by looking at the examples listed in Chapter 4.11.

4.1 Driving forces for flood research

The development of flood research programmes may be motivated in different ways. The main points are listed in the following:

- Actual flood events
- Climate change
- Political targets and strategies
- Regulations and laws
- Scientific interests
- Economic interests
- Interests of stakeholders

In the preceding chapter, some points were already put forward as the major parameters for flood research programmes. The above-mentioned driving forces of flood research are in part directly related to each other. Thus, for example, as a rule political objectives and strategies are a consequence of previous flood events and initiatives for new regulations and legislation are in turn a result of political objectives. Nevertheless, any of the above-mentioned points may trigger new research initiatives or exert an influence on them.

In the following, the individual driving forces will be discussed if they have not already been considered in detail in Chap. 3.

Actual flood events
According to most of the answers from the CRUE Partners, actual flood events have a strong influence on public and political awareness of flood risk. Consequently, there is a greater readiness to spend money for flood research. Normally, the media (TV, newspapers etc.) do not contribute directly to identifying gaps in knowledge. However, they are important for raising (political) awareness of problems and for the “post-crisis” debate and evaluation.

Practical Examples – Actual flood events as drivers for flood research

Austria: FLOODRISK started as a consequence of the extreme flood in August 2002. Public awareness increased political pressure for action to be taken.

Germany: The RIMAX programme was initiated after the Elbe floods in 2002.

UK-England: Sometimes a flood event can result in new impetus for different areas of work (e.g. the Boscastle flash flood (August 2004) prompted renewed interest in rapid response catchments). Two examples of research initiated are:
(i) Regionalised (geographic or catchment characteristics) impacts of climate change on flood flows.
(ii) To assess and optimise the ability of weather prediction models to predict extreme rainfall events.

France:
The national research programmes on risks (RIO and EPR) were initiated in 1997 following floods in the city of Nîmes, 1988 and the catastrophe of Vaison-la-Romaine, 1992.

Recently, the numerous flash floods in southern France (from the early 2000s) and the floods which had occurred in Brittany (winter 2000-2001), in Somme (spring 2001) and in Gard (September 2002) added to the catastrophic event of Toulouse (explosion in a chemical plant in September 2001), resulted in the "Loi Bachelot", the creation of the Service Central d'Hydrométéorologie et d'Appui à la Prévision des Inondations (SCHAPI) and the launch of the RDT programme on technological and natural risks.

Climate Change
The changes in climatic conditions will have a considerable influence on precipitation events and on sea level. An increasing number and intensity of flood events is to be expected in future. European countries will be affected to different extents. Nevertheless, climate change is regarded by all the countries as very significant for future flood events and for future flood research.

As part of the European Climate Change Programme II (ECCP), a green paper on the EU role in climate change adaptation is currently being drawn up. This paper will be published during the summer of 2007 (http://ec.europa.eu/environment/climat/eccp_impacts.htm). In this context, it is to be expected that flood research will increasingly be impacted by the search for suitable adaptation strategies for dealing with climate change. Flood research will be conducted in close connection with a range of integrated approaches and viewpoints that affect flood risk management. At the same time, the entire field of water resource management, land use and the needs of various interest groups will also have to be taken into account. The main legal foundations for adaptation strategies will be the Water Framework Directive and the future Floods Directive.

Scientific interests
Almost all research projects generate new issues and new ideas for further developments. Only in exceptional cases can an area of knowledge be regarded as thoroughly investigated. To this extent, flood research itself may be termed a driving force for further research activities. Knowledge of deficiencies, problems to be solved, potential for improvement and possible innovations is therefore the province of experts on flood risk management and flood research. Consulting experts and also their active involvement is an important element in generating and formulating funding programmes.

Economic interests
Economic interests may influence the definition of research needs. For instance, in the Netherlands, 66% of the territory (8 million inhabitants, property worth hundreds of billions of euros) is threatened by floods; thus, the design of flood research programmes is largely influenced by economic interests. In various ongoing programmes in different European countries, representatives from private enterprise or their associations have been involved in the consultation process for the development of new research programmes. As floods

cause great damage, in some cases insurance companies also participate in the consultation process. Furthermore, in an Austrian programme an insurance company is a party co-financing research projects.

Interests of stakeholders
The term stakeholder is used here in a relatively non-specific manner for all social groups (see Figure 1) who are involved actively or passively in flood risk management and who participate in the discussion process for improving flood protection and reducing flood damage (and whose behaviour is also the subject of research).

4.2 Identification of research needs

Approaches
The identification of research needs may be based on different approaches, in which case the party launching the initiative and those involved in the process is decisive. An approximate distinction can be made between **top-down** and **bottom-up** approaches, and also mixed forms of the two. In a top-down approach, the research needs and the research topics are defined by the government alone or by the responsible funding organisation. In a bottom-up approach, the research topics are determined by the scientists and/or stakeholders in the flood risk management (Figure 2). As a rule, flood research programmes are developed as a mixed form of the two approaches, although differences between countries and programmes lead to different accents being set. A top-down approach does not preclude the possibility of identifying research needs on the political level in close cooperation with the relevant stakeholders, as is done, for example, in the UK. In such cases, the stakeholders have to be placed on the top level in Figure 2.

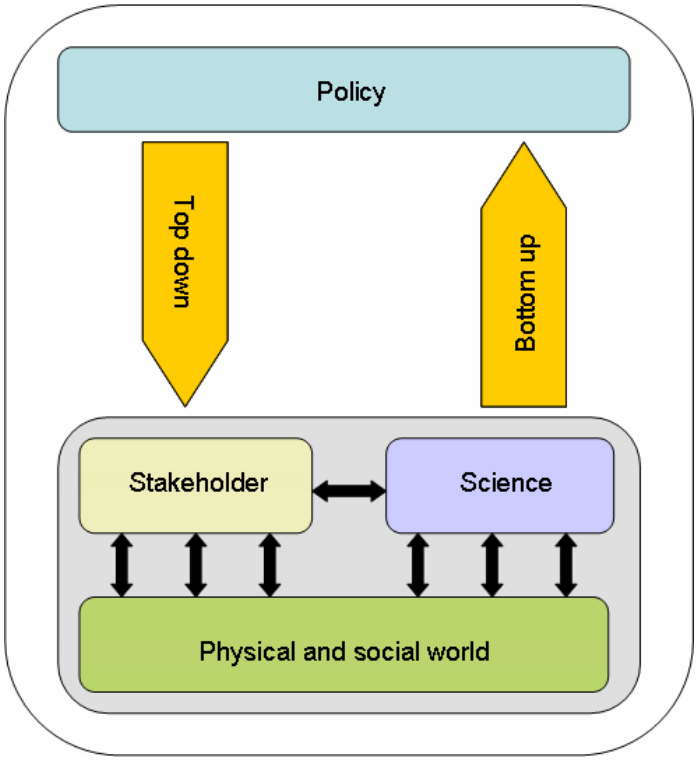


Figure 2: Initiative for the identification of research needs: Top-down and/or bottom-up

Two basic approaches can be differentiated for the identification of research needs:

1. Problems and deficiencies can be identified by a detailed analysis of flood events and the present situation in flood risk management and the resulting research needs can thus be determined (past- and present-oriented approach).

2. By the development of objectives and visions, such as the form flood risk management may take in the future, for example in 10, 20 or 50 years, it is possible to develop ideas and systematically exploit innovation potential (future-oriented approach). Important impetus can be obtained here by including changing parameters such as those of climate change.

Practical Examples – Analysis of flood events

Austria:
The FLOODRISK research programme is based on a detailed analysis of the flood event in August 2002.

Finland:
Almost every major flood event is subsequently investigated and reported. The reports are used to identify gaps in research .

Germany:
As a consequence of the Elbe floods in 2002 the report "Flood prevention in Germany – Lessons learned from the 2002 disaster in the Elbe basin" was published by the German Committee for Disaster Reduction. The report contains a lot of suggestions for improving flood risk management and was used for the preparation of the German RIMAX Programme.

France:
Following the flash flood in the Gard in September 2002, the General Inspectorate for the Environment performed an analysis and a review based on the experience gained as a result of the catastrophe. The network of researchers initiated by the RIO programme supported public bodies in this analysis.

Participants

Responsibility for programme development and identification of research needs generally rests with the responsible funding institutions, i.e. as a rule ministries or the organisations appointed by them. Depending on the constellation and the responsibilities, on the horizontal level the ministries coordinate plans with other ministries whose remit also includes the topic in question.

Research needs can either be identified independently by the staff of the funding body or by the delegation of this task to third parties. This can, for example, be done by placing contracts with public or private science-related establishments. Apart from placing contracts, also experts or stakeholders may be appointed to or invited to join advisory boards or groups. The second variant is as a rule less cost-intensive than placing contracts since normally only expense allowances have to be paid for travel and meetings.

The degree to which third parties are involved, especially experts from the ranks of the flood actors and science, differs in the various countries and for various flood research programmes.

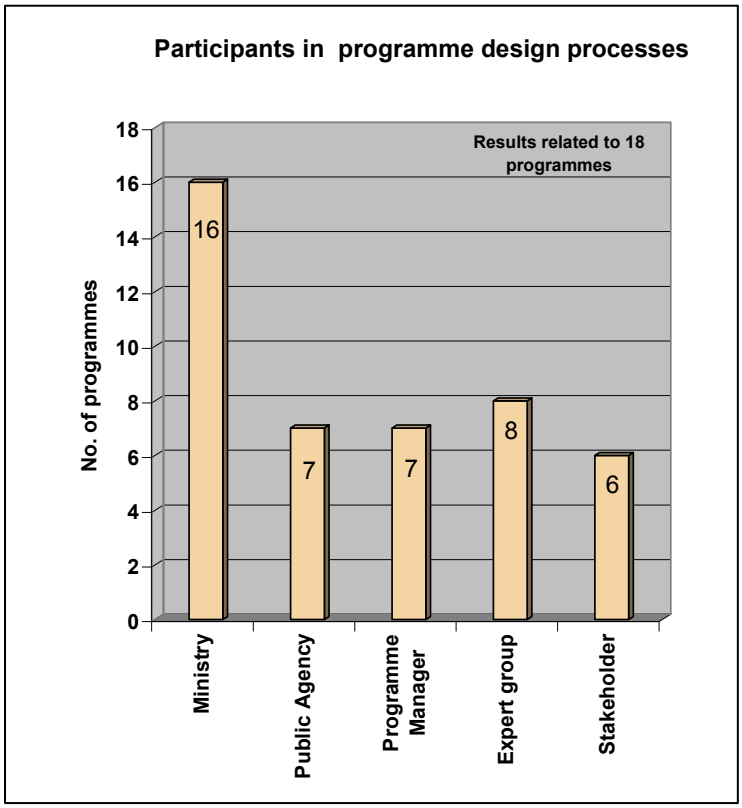


Figure 3: Those involved in developing various flood research programmes in the CRUE Partner Countries.

According to a survey of CRUE Partners, advice on research needs is usually restricted to national experts and organisations.

Methods

Inquiries
The initiation of new research programmes presumes knowledge of the state of the art. In order to obtain an overview of the situation the following sources of information can be used.

- Internet (search engines, databases, e-magazines, …)
- Literature (specialist journals, research reports, reports analysing flood events …)
- Results and evaluations of previous flood research programmes (for example, the French RDT (Risk Décisions Territoires) programme was the follow-up to the preceding RIO and EPR programmes).

Research of this type is generally rather time-consuming and due to the large number and complex nature of the different funding activities in the various countries it is currently mainly restricted to national research activities. At this point, it should be mentioned that the database developed by CRUE, known as CRUISE (http://www.crue-eranet.net/cruise.asp), represents the first instrument available on the Internet to provide a faster, simpler and more comprehensive overview of completed or current flood research programmes in Europe and the projects being funded.

Interviews/bilateral consultation
A faster and simpler opportunity of acquiring information is to ask experts who, due to their professional interests, have essential information for identifying research needs. Interviews with individuals are simple and can, if necessary, be conducted by telephone and generally provide clear statements. A disadvantage of a bilateral consultation is that the information depends on the subject priorities and individual viewpoint of the expert being interviewed. In a bilateral discussion it is not possible to rectify incorrect statements and estimates, put weightings into perspective or supply additional aspects, or rather this depends on the interviewer's know-how.

Practical Examples - Consultation Processes

Austria – proVISION Programme
The preparation of a strategy paper by representatives of the scientific community, several ministries (bm:bwk, BMVIT, BMLFUW) and the Austrian Council for Research and Technology Development was followed by a symposium and a workshop organised in order to frame the central questions to be addressed in more specific terms. This vision was sent to about 5000 people in Austria (NGOs, research community, ministries, agencies etc.) with a request to respond to the vision and to take part in a kick-off meeting six months later. At the proVision kick-off, the invitees were divided into several working groups. They were asked to discuss the central questions again and to come up with three or more specific questions related to a central question. After the kick-off, all participants had the opportunity to make additional comments or suggestions within a timeframe of about 3 months. This resulted in a programme definition paper which was submitted to the Austrian Council for Research and Technology Development for a final recommendation.

Spain – Consultation for the "National Research Plan 2004 - 2007"
Identification of national/regional research needs is mainly carried out through committees of experts (researchers, water managers) directly appointed by the Ministry of Education for consultation on the National Research Plan. Meetings last several days. The research topics have to be carefully justified. The final output is a report submitted to the general directorate (10-15 pages). In addition to thematic focal points the paper contains other points like the need for training people.

Multilateral consultation (workshops, meetings of boards/panels/committees)
The disadvantages of bilateral consultations outlined above can be remedied by joint discussions with several experts. There are naturally a vast range of options with respect to the number and background of the participants, the nature and organisation of the discussions as well as a possible transfer of responsibilities.

The number of participants ranges from small groups of three people up to large panels of, for example, 20 to 50 participants. When large programmes or funding activities are involved in which flood research is just one component, the number of participants can easily expand even further (see for example proVISION in the “Practical Examples – Consultation Processes“ box).

As already mentioned above, the participants can be roughly divided into the ministries responsible and their subordinate authorities, the scientists and also the stakeholders. The relevant social groups are, however, represented to varying extents. Consultations on research needs may be carried out together with all representatives or separately. Sometime separate consultations are held with experts from the science sector.

The time allotted to the consultations may range from several hours to several days of expert discussions or workshops. The process may also be designed in several stages and may comprise several meetings.

The funding body can actively shape and steer the consultations or it may pass responsibility on to a third party so that the consultation process is thus more independent and acts on its own initiative.

Practical Examples - Consultation Processes

CRUE Workshop: “Linking Flood Policy und Research”, April 2007
A workshop was initiated by the CRUE ERA-NET for the identification of research needs, to which participants from science, from the institutions responsible for flood risk management and from the funding institutions were invited from all the CRUE partner countries and also from other European states. Altogether about 100 delegates attended the workshop. In the run-up to the workshop, 7 issue areas were identified for defining research needs and appropriate questions were phrased as a starting point for the discussions. The delegates had the option of signing up for the 7 discussion groups. Since the number of participants per discussion group was limited it was possible to achieve roughly equal numbers in each of the groups.

In the first discussion block, about 10 research topics were to be identified in each issue area and noted on a flip chart. All the delegates subsequently had the opportunity to label the most important topics from their point of view by each assigning a total of 5 adhesive spots to the respective flip charts. The 3 or 4 most important topics were then identified in the discussion groups on the basis of the number of spots assigned and broken down further. The topics and the related subsections were written on slides for an overhead projector and then presented at a plenary session for all delegates. In parallel, a ranking was compiled for the individual topics on the basis of the total number of spots assigned and the top ten topics presented to the plenary session.

The results, or rather the research topics identified, were collated after the workshop, examined with respect to duplication or overlap and then documented. These topics will then be compared with research work in progress or recently completed.

In some cases, the advisory bodies may have an organisational structure of their own (advisory board/panel/committee). These bodies frequently accompany the entire programme. Normally, they have an advisory capacity in order to assist those responsible for the programme. However, it may also be the case that – depending on the composition of the bodies – they take on responsibility for the programme and are able to make their own decisions.

In summary, it can be said that the advisory process ranges from simple to highly complex and may involve a great deal of organisational effort. The extent of the consultations and the choice of the groups to be included depends on the policy goals and the topic of the funding activity (e.g. it is conceivable that a funding activity may concentrate on improving forecasts of precipitation and run-off, so that the focus of the topic restricts the number of experts to be included in such a case) and also the scope of the planned programme. The time factor may also be of major significance in shaping the advisory process.

In the survey of the CRUE Partners, consultation processes play a leading role in identifying research needs (see Figure 4).

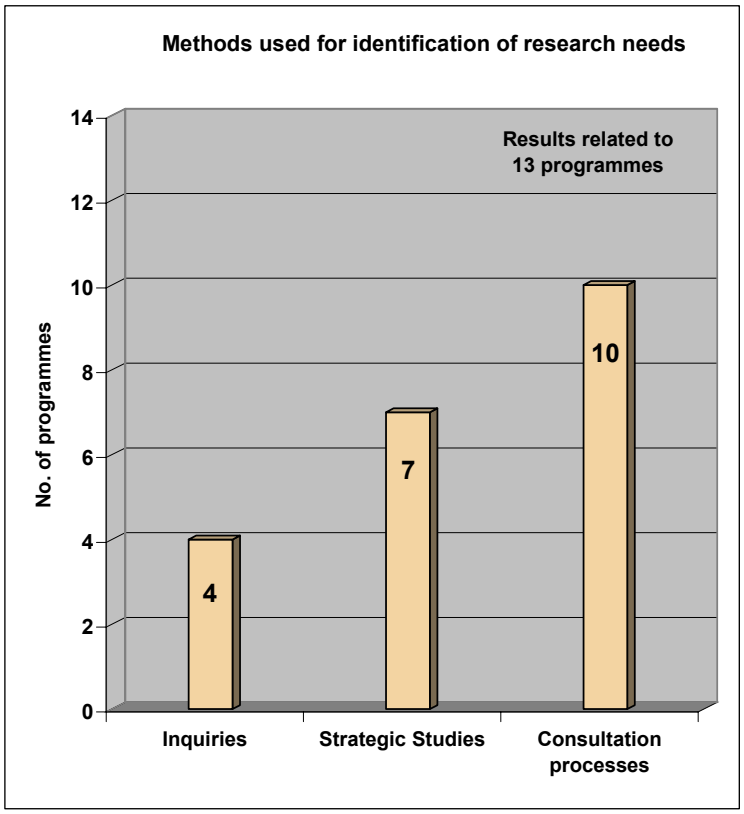


Figure 4: Methods for identifying research needs in the CRUE Partner Countries.

External Studies

Specific research needs can be identified by commissioning studies. Such studies can be initiated in different ways ranging from studies organised by research institutions to studies which have to be advertised or announced by a national call (e.g. independent horizon-scanning exercises). As a rule the study comprises two instruments already discussed above (inquiries, consultations), it may however be made more comprehensive by employing certainly scientifically based techniques or methods (e.g. scenario planning, Delphi technique, foresight study).

It is generally very useful to commission such studies, but they involve a not inconsiderable amount of time and expense. The results can be used directly for programme development or they may function as input and a starting point for a subsequent consultation process.

Strategic studies are a frequently used instrument for the definition of research needs. They have a typical budget of < € 100,000 and a typical duration of < 1 year. The quality and the success of such studies depends on the institution performing them, which is why a very careful selection process should be employed before placing the commission.

Practical Example – Foresight Project

UK-England & Scotland - Foresight project in flood and coastal defence (2002 - 2004)

The foresight project in flood and coastal defence was commissioned to answer two questions:

a. How might the risks of flooding and coastal erosion change in the UK over the next 100 years?
b. What are the best options for Government and the private sector to respond to future challenges?

The work used the best available science to take an independent look at the problem. The findings do not constitute Government policy, but are intended to inform the development of long-term policies. The Office of Science and Technology, Department of Trade and Industry (DTI) sponsored this 'horizon-scanning' project, and other Government Departments and Scotland and Wales were actively involved.

Scope of the work:
The project looked at flood and coastal defence in the UK between 2030 and 2100. It considered all of the UK, and looked at flooding from rivers and the sea, as well as internal flooding in towns and cities. It also considered the risks of coastal erosion.

Because the future is very uncertain, scenarios were used to assess the possible scale and nature of future risks, and to assess options for responding to those risks. These scenarios embodied different socioeconomic visions of the UK, and different amounts of climate change.

The project was comprehensive and drew upon a team of nearly 90 leading experts in the UK, working over 18 months.

A detailed résumé of the project may be found in the project Executive Summary: http://www.foresight.gov.uk /Previous_ Projects/Flood_and_Coastal_Defence/Reports_and_Publications/Executive_Summary/executive_summary.pdf

Source: http://www.foresight.gov.uk/Previous_Projects/Flood_and_Coastal_Defence/

Time frame

The time frame for the definition of research needs (mainly relevant: applied research) is quite different and ranges from two months up to several years. In the majority of cases, the process takes more than 1 year. However, the time span can be much shorter in cases of high priority such as after severe floods.

Table 3: Time frames for identification of research needs

		Typical time frame
UK-Engl	Fundamental research	2 – 5 years
	Applied research	1 – 1.5 years
DE		1 – 1.5 years
AT	START CLIM	4 months
	FLOOD RISK	6 months
	PFEIL 10	1 year
NL		1 – 3 years
FR		2 – 6 months
UK-Scot		2 months – 3 years (in case of low-priority topics)
I		> 1 years
FI		1 – 3 years
ES	National Research Plan	1 - 4 years

Conclusions

- An important driving force for flood research is extreme flood events and consequently the reformulation of political objectives and measures.
- Even today, climate change is an important driving force for flood research and will continue to gain importance in future.
- Flood research is a crucial element when it comes to developing climate change adaptation strategies within the context of the European Climate Change Programme. The European countries can therefore assist the development of cross-border strategies and joint solutions by coordinating their flood research.
- Research needs can either be identified “bottom-up” by science and stakeholders in flood risk management or “top-down” by the politically responsible institutions. As a rule, both approaches are applied but to different extents.
- The CRUISE database developed in CRUE provides a fast, simple and comprehensive overview of completed and current flood research programmes in Europe and the projects funded by these programme and can be used to make a survey of the state of the art in preparing for new funding programmes.
- An analysis of flood events and the current situation in flood risk management helps to reveal gaps and problems (this presumes that the lessons learnt from the event are carefully documented). Furthermore, the development of objectives and visions of the future can identify potential for innovations.
- Ex post evaluation of finished programmes contributes to identifying research deficiencies.
- Expert consultation is a core element of the identification of research needs. The structural framework of consultation processes depends on the country-specific situation, the political targets and the size of the intended programme.
- Within the framework of strategic studies to identify research needs, it is possible to selectively deploy scientific methods such as scenario planning, Delphi techniques and foresight processes.
- Participation, integration of different groups / practitioners and stakeholders in the definition of research needs helps to meet the needs of those affected by floods and to reflect societal changes.
- The time needed for programme development ranges from several months to several years. Political pressure as a consequence of flood events may speed things up considerably.
- The approach and the expenditure invested to determine research needs depends on the objectives, the magnitude of the envisaged programme and the specific boundary conditions and have to be weighed up individually.

4.3 Definition of programme content and scope

On the whole, the groups involved in the process of programme generation are the same as those of relevance for identifying research deficiencies. In most cases, however, the national ministries are ultimately responsible for the content of the programmes and for setting priorities. The flood risk management research programmes are often embedded in higher-level programmes (see Table 4). They are thus also subject to high-ranking goals (cf. also Chap. 3.2), such as:

- directing research towards the goal of sustainability
- developing strategies for adapting to climate change
- promoting international collaboration
- improving cooperation between science and practice
- increasing the quota of women in science
- improving career opportunities for young scientists
- establishing a durable cooperation between research and education

Table 4: Assigning various flood risk management programmes to higher-level programmes and strategies

	Programme	Superordinate programme or strategy
UK-Engl	FCERM	Defra Making Space for Water Environment Agency: Creating a Better Place Defra Evidence and Innovation Strategy
DE	RIMAX	Framework Programme “Research for Sustainability”
AT	PFEIL10 and proVision	Part of the framework programme FORNE – “Research for Sustainable Development”
UK-Scot		Part of the Environment Group programme
FI		National “Water resource strategy 2010”
ES		Part of the “National research plan” launched every four years

The details of the responsibilities differ depending on national conditions. In many cases, however, the ministries are also assisted in drawing up the final funding programmes by subordinate organisations (authorities, agencies) or by advisory groups (cf. Chapter 4.2 Participants).

In England, the Flood and Coastal Erosion Management (FCERM) Programme of Defra (Department of Food and Rural Affairs) and the Environmental Agency are operated jointly via the Joint Programme Board. In France, the Orientation Committee composed of representatives of the ministries involved, representatives of the water authorities and other stakeholders, sets the political priorities, while the Science Committee composed of eminent scientists is responsible for the content quality. The development of the funding programme until it is finally granted funding takes place in an iterative exchange between the Orientation Committee and the Science Committee.

An example of a case in which not the ministry but rather a subordinate authority is responsible for defining the programme can be found in Austria. The Austrian Federal Environmental Agency is responsible for the START CLIM programme. In this case, a university, BOKU (University of Natural Resources and Applied Life Sciences) is responsible for the programme management.

The final decision on and adoption of a research programme is generally taken by the responsible ministry, possibly in cooperation with other ministries involved. The level at which the decision is taken in the ministry depends on the scope of the programme and the available funds. In the case of major programmes, a decision at ministerial or governmental level may be required.

Conclusions

- Programmes in the field of flood risk management are in many cases embedded in higher-level programmes whose strategic objectives must be taken into consideration in shaping the programme.
- Since as a rule various government departments with their various special responsibilities are involved, an efficient exchange of information is of the primary importance.
- The details of the national approach in defining and adopting the programmes are largely dependent on the established structures and the actual boundary conditions.
- Final decisions on the programmes are generally made at the governmental or ministerial level. However, support for these decisions is provided by experts from subordinate institutions and bodies or with the aid of consultations.

4.4 Funding instruments and target groups

Preferred project types and funding instruments

In Table 5 priorities are assigned by the CRUE Partners to various project types and various forms of research funding . In general, it becomes clear that great significance is attached to the inclusion of practical water management in the research work. In contrast to work performed by one project contractor alone, there is a slight preference for collaborative projects. The single projects usually involve clearly defined tasks, whereas collaborative projects deal with more complex issues that can frequently only be handled on an interdisciplinary basis.

Special forms of research funding or funding instruments, such co-financing by other funders or by the project contractors themselves, may be of great significance in individual cases, but on the whole they only occupy a midfield position in setting priorities.

In The Netherlands it is usual for consultant engineers to contact water management authorities with their research ideas. These companies then either fund the work themselves or apply for additional funding. However, in other cases the co-financing of research projects by the competent authorities or the responsible association etc. may also be an effective means of ensuring that research is directed towards actual needs.

In the survey of the CRUE Partners, lowest priority was given to the involvement of educational measures, the funding of research infrastructure, and the exchange of scientists. This is due to the fact that the research programmes are primarily directed to project funding and the measures mentioned may be covered by other research activities or funding. There are some research programmes in which these specific measures are explicitly mentioned, but even then they are of minor significance.

Table 5: Preferred types of projects and funding instruments

		Single Projects	Joint Projects	Involvement of practitioners	Co-payment by applicants	Co-financing by other funding parties	Capacity building measures	Funding research infrastructure	Involvement of educational measures	Exchange of scientists
UK-Engl		2	1	1	2	2	3	3	3	3
DE		3	1	1	2	2	2	2	2	3
AT	FLOOD RISK	1	1	1	3	1	3	3	3	3
	START CLIM	1	3	2	2	3	1	3	3	3
	PFEIL 10	1	1	2	1	1	3	3	2	3
	proVision	1	3	1	2	2	1	3	2	3
NL		1	1	1	3	3		2	3	3
FR		2	1	1	3	2		3	2	3
UK-Scot		1	2	3	3	3	2	3	3	3
I		3	1	2	2	2	--	--	--	2
FI		2	2	1	2	2	3	3	2	3
ES		1	1	--	--	2	--	3		3
Mean value		1.58	1.50	1.45	2.27	2.08	2.25	2.82	2.50	2.92

High preference (≤ 1.5):
- Involvement of practitioners
- Joint projects

Medium preference (1.5 to ≤ 2.5):
- Single projects
- Co-financing by other funding parties
- Capacity building measures (the meaning of this item was unclear for several CRUE partners and therefore left open)
- Co-payment by applicants

Low preference (2.5 to ≤ 3):
- Involvement of educational measures
- Funding research infrastructure
- Exchange of scientists

International Funding

In the programmes of some member states it is also possible for foreign project partners to obtain funds as is the case with the programmes operated by the French Ministry of Ecology and Sustainable Development (MEDD) “Evaluation et Prévention de Risques (EPR)“, “Risque Inondation (RIO)“ and „Risque, Décision et Territoire (RDT)“ or the English “Flood and Coastal Erosion Management” (FCERM) progamme. In France and England, this only involves a few conditions such as project proposals beíng made in French. On the other hand, in some countries there are programmes which permit participation by foreign partners on

condition that they bring their own funding with them, i.e. that they are supported by funding institutions in their own country.

The survey of the CRUE Partners revealed that 9 out of 19 programmes permit the funding of applicants from abroad. The rules are largely programme-related or are valid for the funding organisation, i.e. there may be different definitions for international funding within one country.

Target groups of funding

In most of the countries involved there are no restrictions on target groups for government funding – any public or private institution can apply for government funding. However, since priority is given to the public interest in many of the issues involved in flood risk management, public institutions such as universities and research centres are very well represented on the investigator side.

Assistance for private institutions or companies can be restricted if stipulations of the EU state aid framework for research, development and innovation, or of similar national regulations have to be taken into account. Depending on the type of research being conducted and a number of other criteria, this can lead to a reduction in the funding rate (for example, the funding rate is between 40% and 80% for private institutions participating in the German RIMAX programme). As a result, a share of the funding for research projects has to be provided by the private institutions themselves. However, this generally only occurs if the company's interest in the research results is sufficiently high or if the results can later be marketed in some way.

Involvement of flood risk management practitioners and stakeholders

Great significance is attached to the inclusion of institutions concerned with practical applications of flood risk management in the research projects. This primarily means authorities charged with making decisions related to water management, as well as consultant engineers whose job is usually to create site-specific solutions. "Practical applications" also include planning institutions in the broadest sense such as architects' offices as well as disaster control teams on the spot, who are frequently not familiar with the latest research results.

There are basically three possibilities or stages for actively including practitioners and stakeholders in the research programmes and projects:

1. Exchange of information between the research groups and the practitioners and stakeholders

2. Involvement of practitioners and stakeholders in project- or programme-related bodies (cf. Chap. 4.9)

3. Inclusion of practitioners and stakeholders in the research work as project partners and recipients of funding

The final option in particular enables very intensive cooperation to be established in the form of transdisciplinary work in which the objectives and needs of the users are included in the projects from the very beginning. The initiative for a research project can also come from a partner who is concerned with practical applications. In such a case, for example an authority can apply to the government for financial support for a research project.

Conclusions

- Both individual projects and collaborative projects can be funded. The preferred type of project depends on the given structures and boundary conditions.

- Various funding measures and instruments can be applied such as co-financing by third parties or the inclusion of educational measures. However, these measures are programme-specific and are not given general priority.

- In all the programmes, very high priority is given to the inclusion in the research work of partners involved in practical water management activities and other stakeholders. The most intensive form of involvement is achieved in transdisciplinary collaborative projects in which practitioners or stakeholders are included as project partners in the research projects.

4.5 Programme duration and financing

Programme duration

In Chapter 4.2, a period for the identification of research needs was specified ranging from a few months to several years. The average duration is somewhat more than one year. This period can be roughly equated with the development of a programme until it has been finalised, although there may be incalculable delays for political reasons or due to a lack of budgetary funds.

The subsequent programme duration was then specified by the CRUE Partners as between one and five years. The decisive factor is the usual duration of research projects (mainly 1 to 3 years) and the period in which new projects are initiated and receive funding.

Financing (assignment of budget, co-financing)

The volume of funds required for a programme can rarely be precisely defined from the very beginning although there are usually benchmarks. However, depending on the development of the funding situation and competition with other programmes actual funds may exceed or fall below these levels of funding. If there are an especially large number of high-priority projects in a particular field then the allocation funds may be adjusted accordingly. In some cases, however, it was stated that a budget might be set for a specific period (e.g. three years).

Conclusions

- The timetables for compiling a programme and the duration of funding programmes may differ considerably, and it is at most possible to identify upper and lower limits. The usual duration of a programme is in the range of one to five years.

- The financial resources of the programmes are in some cases defined from the outset and in other cases they are based on reference values, which are, however, regarded as flexible. In the latter case, the provision of funds may depend on a programme evaluation or else on competition with other programmes.

4.6 Publication of programmes

The following basic options are available for publishing the programmes:

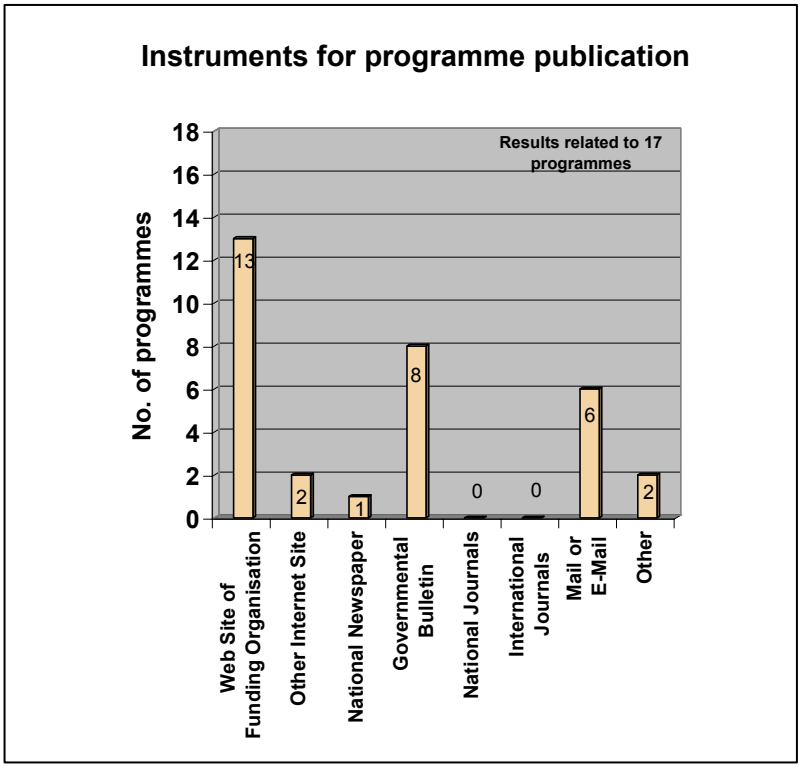
- Funding body's website
- Websites of scientific institutions and actors/organisations involved in flood risk management
- E-mail, post and newsletters
- Official journals or bulletins (for official announcements)
- Daily or weekly newspapers
- National and international journals
- Press releases or press conferences
- Programme brochures and flyers
- Announcements at meetings

Options for publishing programmes can be roughly divided into two categories:

1. The provision of information in publicly accessible media, where those interested have to make the effort to inform themselves.

2. Active and targeted information for those potentially interested.

In particular, the dissemination of information on programmes via e-mail, post or newsletters and announcements at specialist events can be assigned to the second category. This approach requires more effort but it has been made much easier and become automated in the past few years due to the introduction of e-mail and Internet-based newsletters.



Other means brochure, press release, press conference

Figure 5: Instruments used by CRUE Partners for the publication of flood research programmes

According to the survey of CRUE partners, the greatest significance is attached to the publication of programmes on the websites of the funding bodies (see Figure 5). Furthermore, in many cases, an official announcement is made in official journals or bulletins. Active provision of information via e-mail and newsletters is used in part, generally as a back-up to the methods described above.

It is rare that the programmes are specifically published on websites that do not belong to the funding body. National and international journals were not used by the CRUE Partners for publication purposes.

Conclusion

- It is common practice to publish flood research programmes on the websites of the funding bodies. Targets groups can be actively addressed by e-mail and newsletters.

4.7 Call for proposals and call for tenders

Research programmes define the framework for the research projects in terms of topics and organisation. The topics may be formulated in very specific terms or the issues may be outlined in general terms.

Research projects are generally initiated by public announcements. Two basic approaches can be distinguished here.

1. If research programmes only provide a relatively unspecific framework for the topic then this is fleshed out by the elaboration of project proposals. This approach corresponds to the bottom-up principle, i.e. the actual research topics are defined by the scientists and the actors in flood risk management involved in the proposals. The usual method is a "call for proposals". (Examples: French programme "Risques, décisions et territoires (RDT)"; German programme "Risk management of extreme flood events" (RIMAX).

2. If the research topics within a programme are largely predefined then a competition is initiated. This approach corresponds to the top-down principle, i.e. the research topics are defined by the political side or by the funding organisations. The usual method is a call for tender.

The nonspecific call for project proposals is often used by research ministries, whose primary intention is the generation of innovations and new knowledge, whereas the call for tender on a special subject is applied by the specialist ministries to fulfil their specific political task. However, this generalisation is not always valid and in practice there are different variants that range between the two cases described. For example the Joint FCERM programme from England utilises a mixed approach. Stakeholders are engaged at the definition stage through the Theme Advisory Groups which could be described as a bottom up approach, however the funding organisation prioritises the proposals prior to calls for tender.

It should be added that there are also cases in which there is no call for proposals or tenders. Examples are given in the following text box.

Practical Examples – Programme implementation without call for proposals or call for tender

Austria:
FLOODRISK was launched on the basis of a comprehensive documentation of the flood events in August 2002. FLOODRISK comprises 46 projects in 10 work packages. In the initial phase of programme preparation, several research units in Austria were asked about the FRM research topics they were currently working on. After consulting the experts in the respective departments of the BMLFUW and BMVIT, the programme vision was developed in several internal meetings (with the participation of representatives of the Ministries, the Swiss Agency for Development and Cooperation (SDC) and the programme manager (UBA and ZENAR)); and a decision on project selection was made upon the recommendation of the Scientific Advisory Board as well as by representatives of the Ministries.

The Netherlands – Programmes funded by Rijkswaterstaat:
All Rijkswaterstaat work on flooding research (including the work given to other/market parties) is part of the so-called "Management Contracts" that prescribe the work to be done annually by each Rijkswaterstaat Institute.

Contract versus notification
Attention should be drawn to the fact that there are two different legal principles on which project funding can be based and which are related to the character of the call (call for proposals/bottom up versus call for tenders/top down).

1. The form of a contract is usually selected if the research project is to serve the purposes of the funding body and takes on the character of contract research.

2. The form of a notification is selected if the research project primarily results from the investigator's own interests and this interest corresponds to the political interests and goals of the funding programme.

Both forms can be found in the CRUE Partners' funding programmes.

Number of calls and time of opening
The number of calls issued is very variable. The following responses were given in the survey of the CRUE Partners:

- No call
- Varying number of calls
- One call per programme
- Two calls per programme
- One call per year
- Two calls per year

The procedure depends, amongst other factors, on the size of the programme, the specificity of the content and sometimes on the boundary conditions or the standard practice in the individual countries.

As a rule, the call specifies a deadline for submitting project proposals or tenders. The period between the publication of the call and the submission deadline usually ranges between 1 and 4 months. There are, however, programmes which are kept open throughout their duration so that submissions can be made at any time (example: Netherlands – "Water Innovation Platform"). This procedure has the disadvantage that the selection of project proposals cannot take the form of a competition and that the evaluation has to be made separately for each proposal. The advantage is that good ideas often require time and sometimes only emerge after the call deadline has been passed. Furthermore, strategic gaps can be bridged by the specific selection of appropriate project proposals at a later date. The publication of several calls as part of a programme – if there is no strict differentiation with respect to content between the calls – can come very close to supplying the benefits of continuous submission.

One-step or two-step approach
Both calls for project proposals and also specific calls for predefined research topics may take a one- or two-step approach for the submission of project proposals. In a one-step approach, a complete proposal or a complete tender is submitted according to the national regulations. In a two-stage approach, a pre-proposal or an expression of interest is first submitted. After evaluation and selection, a small number of candidates are asked to submit a complete application. As a rule, full applications and tenders are then submitted to a re-evaluation and selection procedure.

The advantage of the two-step approach is the reduction in the work load for the applicants and also for the reviewers in the first step. The disadvantages are the length of the selection procedure and the overall effort required. The two-step approach is recommended if the call covers a relatively broad range of topics and a large number of applicants are to be expected.

Practical Examples – One-step or two-step approach for submission of project proposals

Spain – National Research Plan
The basis for research funding in the flood area is the "National Research Plan" valid from 2004 to 2007 and the relevant subprogrammes contained in it. Different topics are identified and published in a call for proposals each year. A one-stage procedure is used, i.e. full applications are submitted.

France - Programme National de la Recherche en Hydrologie (PNRH):
In the 2005 call, the submission of an expression of intent was first required within a period of two months, then after a further two months an evaluation was performed, and finally the selected candidates had another two months to expand their applications and submit full project proposals. This procedure is intended to make it possible to create large collaborative projects with various common topics at an early stage. Important aspects were the encouragement of communication, the formation of collaborations and the differentiation of research goals.

Germany - Programme Risk Management of Extreme Flood Events:
The flood research programme, RIMAX, is based on a call for proposals published as part of the comprehensive framework programme “Research for Sustainability”. The call defined key topics which had previously been agreed with various ministries, federal states and experts. 153 pre-proposals for individual or collaborative projects were submitted. After evaluation and selection, 32 of these applicants were invited to submit full proposals. The applications were then internally reviewed and examined by the project management agencies. If necessary, in individual cases external reviewers were consulted once again.

Italy
The first step is the identification of the state of art for the project topic, and consequently the identification of research institutions or organisations (private and public) which have experience in this field. Once the economic resources available for the project have been defined, a call for tender (which have to be submitted by a fixed deadline) with economic and technical specifications is sent to at least 3 organisations.

UK-England and UK-Scotland
Announcements for flood research are normally calls for tender. It varies as to whether they are published in one or several calls – the themes are published, but since this is applied research, the projects are normally quite clearly specified. Generally, this is a one-step approach where full proposals are sought from tenderers with clearly defined specifications.

Sometimes research is commissioned through non-competitive actions (single tender), e.g. if a particular organisation has specific skills or expertise that cannot be found elsewhere.

Conclusions

- In practice both calls for proposals and also calls for tenders are used. Calls for proposals are generally preferred for programmes in which only the outline of the topic is defined. Calls for tenders usually refer to clearly defined project topics and specifications.

- The number of calls is variable and ranges from programmes without calls, through programmes with two or more calls, up to programmes that remain open throughout their duration for proposals or tenders. Several calls within a programme have the advantage of a periodic staggering and openness of the programme with at the same time the option of selecting projects by competition.

- Due to the shorter selection process, the one-step procedure with the submission of complete proposals or tenders can be recommended in the case of limited calls where only a small number of applicants is to be expected.

- In the case of a large number of applicants, a two-stage procedure with a preliminary selection process on the basis of pre-proposals or expressions of interest reduces the work load on the candidates and reviewers. However, the selection process is then more time-consuming.

4.8 Proposal evaluation

Evaluation steps
The project proposals can be evaluated in one or more steps. In the case of multistep procedures, the following cases can be distinguished:

1. In the case of a two-step application procedure (cf. Chap. 4.7), as a rule pre-proposals and full proposals are evaluated separately. The intensity and the effort (e.g. participation of third parties or international experts, meetings of reviewers etc.) involved in the evaluation may differ in the two steps.

2. Various panels of experts composed of different members may be used in the evaluation process. For example, in the French programmes, an evaluation of the scientific quality is first made by the "Science Committee" and then a selection of projects is made by the "Orientation Committee" giving consideration to the political and social significance. Primarily scientists are represented on the "Science Committee" and political decision-makers from various institutions on the "Orientation Committee". A different approach is taken in Spain where a parallel evaluation is initiated by two different institutions in order to obtain the most independent and thus objective evaluation of the project proposals.

Practical Example – Evaluation and selection of project proposals

France – Programmes: Evaluation et Prévention de Risques – EPR, Risque Inondation – RIO, Risque, Décision et Territoire - RDT:

1. Evaluation by the Science Committee (SC):
In response to the call, the project proposals are first evaluated by the Science Committee with respect to their scientific quality. Each proposal is evaluated by two members assigned by the chairman of the science committee and the person in charge of the programme. However, for some specific themes, external experts may also be assigned. The reviewers have to fill in evaluation forms (updated for each programme) whose criteria are in general:

- Accordance with objectives
- Scientific and operational networks
- Scientific methodologies
- Prospects for success
- Adequacy of requested funding
- Relevance of dissemination and communication

The results of each evaluation are presented by the reviewers and discussed at a meeting of the Science Committee. A collegial decision is taken during this meeting in order to rank the projects from A (very good) to D. Moreover, the Science Committee can ask the researchers to improve their project proposals.

Finally the conclusions, the proposals and a ranking list of proposals are sent to the Orientation Committee.

After the proposals have been evaluated, the same reviewers have to ensure the monitoring and the evaluation of the selected projects.

2. Evaluation by the Orientation Committee (OC):
The Orientation Committee meeting takes place after the Science Committee meeting to consider the relevance of the projects and to take the final decision. The Orientation Committee chooses amongst the projects judged to be of sufficient quality on the basis of their policy relevance. Given that, on average, only a third of the proposals is funded they are usually able to select between grade A projects. However, they may opt for a grade B project if it is judged to be particularly relevant or to fill a gap.

Internal or external evaluation

The project proposals may be evaluated by expert members of the funding body and/or by consulting external experts. In the German RIMAX programme, for example, a panel of experts was convened with the participation of international experts for the selection of pre-proposals. The full proposals subsequently submitted were evaluated internally by the project management agencies responsible. In the second step, external experts were only consulted in exceptional cases.

Practical Example – Evaluation and selection of project proposals

Spain - Evaluation of project proposals in the National Research Plan (2004 – 2007):

Full applications are submitted in response to calls. They are evaluated in duplicate by two independent organisations, the Agencia Nacional de Evaluacion y Prospectiva (ANEP) and the CICYT-MEC, the agency in charge of project funding and management.

Two anonymous reviews are made by the ANEP, which is mainly in charge of the scientific evaluation of the projects. ANEP submits one integrated evaluation per project to the CICYT-MEC. From the CICYT-MEC a separate panel of evaluators is established, two per project. They carry on their evaluation electronically via the Internet. In a consensus meeting, a final list of projects for funding is compiled taking into account the ANEP evaluation and the two independent reviews from the CICYT-MEC panel. If necessary, recommendations and suggestions, which have to be introduced in the proposals, are formulated by the panel for the individual project proposals.

An evaluation by external experts is applied in almost all programmes for selecting the projects. The advantages of this procedure in comparison to an internal evaluation are the inclusion of a broader range of expertise and perspectives from different disciplines as well as providing support and an objectivisation of the selection process. An external evaluation is naturally always more complex and time-consuming than an internal appraisal.

Practical Example - Evaluation and selection of project proposals

Austria

Programme PFEIL 05/10:

- The evaluation process is organised and managed by the programme owner (BMLFUW)
- For each thematic area there is a “pool” of scientific evaluators, of which one or two per proposal are requested for proposal evaluation
- Full proposals are evaluated in a written procedure
- The evaluation criteria for the proposals are:
  - Project management (scientific and organisational competence)
  - Scientific excellence of the research approach (methods according to the state of science and research)
  - Significance of the problem
  - Contribution of the project to solving the problem
  - Appropriateness of the project size (time, financial, other resources)
  - Coordinated implementation (use of scientific networks)
  - Urgency of problem solving
  - Implementation feasibility of the expected events
  - Suggestions for changes and supplements
- For each of the criteria the experts are asked to rate the proposals with scores from 1 to 5 (1 = excellent, 5 = unsatisfactory) and to give explanations for their assessment.
- Based on the results of the evaluation, the funding decision on individual project proposals is taken at regular meetings of the “Forschungs-Jour Fixe” (involving staff members of all the different policy departments of the ministry).
- Intended end-users are involved in the evaluation of the proposal and the results as advisors.

Appointment of the reviewers / panels of experts (composition, international experts)
As a rule, the reviewers are appointed by the funding institution, if necessary in consultation with the organisation charged with project management. In the majority of cases, panels of experts are appointed who also play a significant role in the subsequent implementation of the programme and the funded projects (Cf. Chap. 4.9). As a rule, scientists, decision-makers from relevant government organisations and also experts from practical flood risk management are represented on the panels of experts. In order to have experts covering all the topics, the choice of reviewers is generally related to the content of the initial call for proposals and the project proposals submitted. Calls for proposals with a broader scope therefore often require a larger panel of reviewers.

Written evaluation and/or meeting of reviewers
An assessment of the project proposals can be made by an individual evaluation, by a meeting of reviewers or a combination of the two processes. In the latter case, all the reviewers or a selected group first compile a written evaluation and then come together at a meeting. As a rule, the evaluations are presented at the meeting and discussed.

The advantages of expert meetings are the joint discussions and chance to form an opinion whereby mis-judgements can be rectified and any further information required by the individual reviewers can be supplied.

Practical Example – Evaluation and selection of project proposals

UK-England - Joint Defra / Environment Agency Flood and Coastal Erosion Risk Management R&D Programme

Defra and Environment Agency use their respective guidelines for the procurement of research, but this can, where appropriate, be adapted according to the size and/or topic of any one project.

A project officer from the funding organisation forms an evaluation board. The tender board will include the relevant policy personnel, experts and in some cases stakeholders, in most cases these people will have contributed to the production of the specification of work. Full proposals are evaluated using a standard scoring system against a set of evaluation criteria very similar to the example above.

The meeting assesses the strengths and weaknesses of each proposal and identifies any additional information required prior to a decision being taken, if appropriate. The outcome of a tender evaluation board will simply be the award of a contract, but in most cases there is process of clarification and discussion between the Research Contractor and the Project Officer prior to contract award. It is possible that a contract may not be awarded following the evaluation phase.

Where there is only a single authoritative group in a particular science area, or the work is predicated by the use of particular datasets, a single organisation will be asked to submit a proposal. In such cases an evaluation by an evaluation board will still take place.

Evaluation methods
As a rule, the evaluation and selection of project proposals are performed on the basis of predefined criteria. On the one hand, these criteria are oriented to the goals and the content of the programme and the related call for proposals, and furthermore also represent general requirements such as the level of innovation of the project proposal, the reasonableness of the calculated costs and the expertise of the applicant. Examples of evaluation criteria are given in the practical examples in the various text boxes in this chapter.

Different evaluation methods are applied in selecting the project proposals which can only be briefly outlined here. Here evaluation methods are taken to mean the way in which an individual project proposal is evaluated. The evaluation method is a component of the evaluation procedure comprising all the steps from the choice of experts up to the final selection of the project. Common evaluation methods are listed in the following:

- The strengths and weaknesses of the project proposal are described by the reviewer in a verbal argumentative evaluation. This may be done in a self-contained text or with respect to the given evaluation criteria.

- As a rule, the overall result of the evaluation is summarised in categories. These categories can be described in words (e.g. “recommended for funding”, “conditional funding” or “project proposal rejected”) or characterised by grades, points or letters. The classification usually varies between 3 and 7 stages.

- The allocation of grades or points can also relate to the evaluation of individual criteria and subcriteria. Threshold values or minimum number of points may also be defined for individual criteria, which if not reached lead to a proposal being rejected. In order to achieve an overall evaluation, an algorithm must be defined on how the overall grade or number of points is to be derived from the grading or allocation of points. As a rule, the points are added up or averages formed from the criteria and subcriteria groups. The significance of individual criteria can, if necessary, be taken into consideration by weighting factors.

The above-mentioned evaluation methods are applied in various ways and in a combined form. For example, even if the procedure consists of the allocation of points nevertheless a verbal argumentative evaluation is normally also included in order to discover the reasons for the reviewers’ evaluation.

The methods of assigning grades or points have the advantage of establishing direct comparability between different project proposals since the reviewers’ evaluation is reflected in a uniform scale. However, the assignment of grades / points is often made in a very individual manner by the reviewers. This is shown, for example, by the evaluation of project proposals within the framework of the first joint calls by the CRUE Partners. Some reviewers tended to allocate a high number of points whereas others were less generous. Such discrepancies can best be avoided by a meeting of reviewers so that they undertake a joint assessment after a discussion. Normally, grades and points are also discussed leading to more balanced assessments among the reviewers.

Practical Example – Evaluation and selection of project proposals

Italy
- There are at least 3 evaluators (two scientists and one adminstrator) per proposal, who are appointed by the programme owner.
- Full proposals are evaluated.
- A meeting of evaluators is first organised; and then a written evaluation is made.
- Important criteria are: skills of applicants, structure of organisations submitting the proposals, precision and clarity regarding call specifications, adequacy of costs. Skills of applicants and proposal characteristics are considered to be more relevant than the other factors.
- The result of the evaluation process is a proposal ranking list.

Result of the review procedure and final selection of project proposals
The selection of project proposal depends on the type of call and two basic cases can be distinguished:

1. If specific projects were advertised in a call for tender then the best proposal is identified and the contract awarded to the successful candidate.

2. A group of the most highly rated project proposals is generally selected on the basis of the project proposals received in response to a call for proposals. Since normally the number of projects eligible to receive funding exceeds the available budget a selection must also be made among these high-quality project proposals. In this case, it is useful to compile a ranking list. A selection can then be made according to the ranking until the budget is exhausted. However, strategic considerations and issues of funding policy are usually also of significance. It may therefore be the case that projects that are similar to or overlap with other projects are removed from the list. On the other hand, it is also conceivable that

a less highly rated project proposal could be among the top contenders if it involves an important topic or problem.

As a rule, the results of the reviewers and meetings of reviewers have the nature of a recommendation. The final decision on funding is taken by the responsible funding institutions, although they normally accept the vote of the reviewers of the panel of experts.

Practical Example – Evaluation and selection of project proposals

Finland – Water Resources Programme

- The evaluation process is organised by the funding organisation
- Usually full proposals are evaluated.
- Evaluators are selected by the programme managers who know the field of research very well.
- For the evaluation a panel of 6 people is sometimes used. All the experts may be foreigners. A representative of the funding institution also attends the meeting.
- It depends on the programme whether written evaluations, evaluation meetings or both are utilised.
- Important criteria for evaluation are: research plan (quality, innovativeness, feasibility), research environment (competence, networking, consortium) and overall assessment (strengths and weaknesses).
- Scores are sometimes used. Evaluators can give scores individually, so that a panel discussion is held to arrive at the final scores.

Conclusions

- The involvement of various external reviewers (experts who are not part of the funding institution) means that a broader range of expertise and different expert opinions can be included in the evaluation. This provides support and objectivisation for the selection process.

- The choice of reviewers should reflect the topics of the programme of the call and also be related to the project proposals submitted.

- Depending on the closeness to application and the political and social significance of the topics, it may also be beneficial to include experts involved in practical flood risk management in the evaluation process as well as various social groups and institutions.

- A meeting of the reviewers is recommended since the joint discussions and formation of opinions can be used to rectify misjudgements and supply any further information required by the individual reviewers.
-
- The grading or assignment of points for the evaluation of individual criteria enables a transparent scaling of the overall assessment and is of assistance in ranking the projects. However, the option of presenting a verbal argumentative explanation should always be included. Since grading and the assignment of points vary among individuals these aspects should always be included in a discussion by the reviewers before the final evaluation is made.

- In making a choice between several project proposals, in addition to the criteria-related evaluation, consideration should also always be given to strategic aspects and issues of funding policy (redundancies, missing topics etc.).

4.9 Programme steering

In this chapter, steering of funding programmes is primarily taken to mean activities such as project monitoring, programme evaluation and active intervention in research projects. Other tasks are also undertaken which serve to support the flow of information between the investigators and the transfer of results to the target groups. Steering in this sense is performed both on the level of research projects as well as on the programme level, although the present “Good Practice Guide” focuses on the programme level so that only a brief discussion of the project level is included.

Project level
With respect to third parties, the steering of research projects is primarily undertaken by the funding institution or the programme managers employed by them. This is based on the regulations and agreements laid down in the contract or notification of funding. For instance, the investigators' obligations to present reports are included here. Project advisory boards are sometimes also set up on the project level. In this way, external experts or practitioners are able to monitor the project and also contribute advice on the progress of the project. Special consideration should be given to establishing a project advisory board in the case of large projects and collaborative projects.

Programme level
In most cases, the steering of research programmes is not subject to any predefined rules and therefore takes on different forms in the various programmes. The funding institution responsible plays a decisive role in determining the steering procedures, possibly in cooperation with other, usually public, organisations.

Programme steering may comprise the following tasks:

- Organisation of the exchange of information between research projects / networking (Internet platform, establishment of a central liaison office)
- Organisation of conferences, workshops, expert meetings
- Monitoring by means of interim and final reports, presentation of results and on-the-spot visits
- Preparation of research results and transfer to target groups (potential users, politics, public, other countries, scientific community)
- Programme evaluation (performance review, goal attainment with reference to the project schedule and expenditure profile, identification of gaps etc.)
- Specifications or recommendations for the research projects
- Etc.

As shown in this chapter by the various practical examples from the different countries, there are a wide range of procedures and options for steering research programmes. The procedures are dependent on the institutional boundary conditions and common national practice. Instead of a detailed description of the various possibilities and options, attention is drawn to the practical examples. In the following, a description will merely be given of the monitoring and evaluation of research programmes, and of some instances of common practice. Furthermore, a brief description of the actors and organisational structures will be given without making any claim to being exhaustive.

Actors and organisational forms for programme steering
The steering of some programmes is undertaken by the funding body itself. In the case of larger programmes, various tasks are usually transferred to special panels (programme management team, advisory board, steering committee, scientific committee, theme advisory group etc.). With more complex programmes there may well be several bodies involved with different areas of responsibility (cf. Chap. 4.11). The bodies accompanying the research work are appointed by the funding institutions, which is usually already done at the same time as the evaluation and selection of project proposals and was described in Chap. 4.8. These bodies normally have an advisory function, but in some cases they also have responsibilities and powers of decision. The composition of these bodies is extremely varied and depends on

the major project topics, the organisational structure of the programme and the respective tasks of the bodies etc. As a rule, scientists, users from flood risk management and political decision-makers (e.g. ministries) and the funding institutions or the programme managers they have appointed are represented on these bodies.

Another possibility of programme steering is the transfer of selected tasks to a scientific institution. For example, the German RIMAX Programme is coordinated by a research centre (National Research Centre for Geosciences, Potsdam), which has proven expertise in flood research. This coordination includes amongst other aspects networking the research projects, coordination with external initiatives and actors in flood risk management, preparatory work for CRUE, operating an Internet platform, organising conferences and workshops, as well as summarising and presenting results for specialist audiences.

Ex ante, interim and ex post programme evaluation
An ex ante evaluation of programmes is usually performed as part of programme development by consultation on and harmonisation of programme objectives and content. It is thus implicitly an integral part of programme design.

An interim evaluation is normally undertaken if a programme is implemented in several steps, for example with several calls for proposals, or if a reorientation of the programme is planned. Such an evaluation may, however, be made for instance in preparation for annual conferences if the current status of the research projects is to be presented and discussed.

An ex post evaluation is performed in some cases, especially if the experience gathered and the state of the art is required for subsequent funding activities or programmes. As the examples from France and England show, the evaluation of the application and effectiveness of the research results is of central interest. This involves an evaluation of the extent to which the original goals of the programmes have been achieved and whether they have led to a practical implementation and improvements. As described by the French CRUE Partner (see text box below), this is not always easy to implement and involves some basic difficulties.

Practical Example – Programme Evaluation – Empirical Procedure

France – Programmes: Evaluation et Prévention de Risques – EPR, Risque Inondation – RIO, Risque, Décision et Territoire - RDT:

While a programme is running, its evaluation is performed in an empirical way. The lessons learned from the preceding and the current programmes are used to improve the programme management, communication and content. The programme is first evaluated during the programme design:

- First, by the expert groups involved in formulating the call.
- Then by the Science Committee
- Finally, by the Orientation Committee, in order to approve the programme.

A final evaluation is carried out during the “final seminar”, where the final results of the projects are presented. The people in charge of the programme (programme owner, programme manager and chairmen of the two committees) identify the deficiencies and opportunities of the programme according to their own experience and collect the remarks of the Science Committee and the Orientation Committee. The conclusions are then used in the design of future programmes.

In addition, external experts can also make reports.

Practical Example – Programme Evaluation – Formal Procedure

France – General description of a new evaluation procedure for programmes in the Ministry of Ecology and Sustainable Development (MEDD):

The French government requires a formal evaluation of the impacts of budgetary expenditure. This measure was initiated with three programmes and will be extended to all MEDD research programmes.

How it works:
The person in charge of the evaluation and the person in charge of the research programmes (supported by the programme manager and the coordinator) set up a committee to assist in defining the evaluation questions.

This steering committee of the evaluation is in charge of supervising the process, defining the "requirements" and controlling the evaluation quality.

The evaluation is not performed by the committee itself. There is a procedure of calls for proposals published by the committee so that the evaluation is performed by an (external and independent) "service provider".

The steering committee typically consists of the person in charge of the research programme within MEDD, the chairman of the Science Committee, members of the Orientation Committee, the coordinator and the person in charge of the evaluation process; some other people may be involved as well such as: programme research managers from other ministries, foreign experts, lay persons, etc.

The main task of the steering committee is to formulate explicit questions for the evaluator ("service provider"). The criteria laid down in the "requirements" (a document in which the committee explains the work to be done) are as follows:

- Relevance of the programme and its objectives compared to the societal interests
- Effectiveness
- Efficiency
- Internal coherence : objectives and sub-objectives
- External coherence : relation to other policies
- Sustainability
- Usefulness

Within each category, the committee formulates specific questions for each programme.

There is a first meeting at which a "requirements document" is drawn up. Then this document is circulated for validation by the members of the committee.

Then the call for proposals is launched. Around 4-5 months is necessary for the submission of proposals from evaluators. Once selected, there could be a "kick-off" meeting to launch the evaluation process and to present the programme and the requirements to the evaluator. The evaluator must provide interim and final reports that will be discussed, respectively, in a mid-term and a final meeting. The steering committee will examine the quality of the evaluation and implement the conclusions of this evaluation.

The criteria for the selection of the evaluator are:

- References of the applicant: good experience of public policy evaluation; expertise in the relevant thematic field and good knowledge of the research world
- Relevance of the methodology and dedicated means
- Costs of the service

In addition, the satisfaction of attendees of the programme workshops is evaluated through questionnaires: they have to identify what they will do, or take up, as a result of attending the workshop.

The level of satisfaction will be reported to Parliament, but the qualitative information arising from these evaluations will be more useful to the management of the research programme in refining their approach.

Difficulties in programme evaluation

The preparation of programme evaluations identified a number of methodological difficulties:

- Commonly used measures such as citations or patents are inappropriate for this kind of policy relevant research.
- It is difficult to trace the extent to which research is implemented in policy-making. The research results will be just one of the considerations taken into account by policy-makers, who in France are not required to explain the evidence base for their policy decision. Attribution is therefore very difficult.
- A lot of research is aimed at building conceptual understanding rather than at developing instrumental tools, which is generally easier to evaluate. This also exacerbates the usual problem of delays before implementation.
- The relevance of a programme may be reviewed against its starting conditions or the context prevailing when it is completed.
- Programme objectives tend not to be precisely defined, making the achievement of objectives difficult to evaluate.
- It is difficult to identify appropriate benchmarks for evaluating the efficiency of programme management.

Procedure for evaluating research programmes

- In many cases, the monitoring and evaluation of research programmes by committees is performed at events such as conferences, seminars or workshops. At these events, interim or final results of the research projects are presented and put up for discussion. As a rule, interim or final reports are also available and can be used by the evaluators for assessing the results. The evaluators consider the results on the basis of the professional expertise and – if required – on the basis of programme objectives and predefined demands on the research projects. Criticism, suggestions and recommendations can either be passed on directly to those involved or first discussed by the committee. The committee can make comments and recommendations on the research projects or advise the funding institution with respect to the future orientation of the programme.

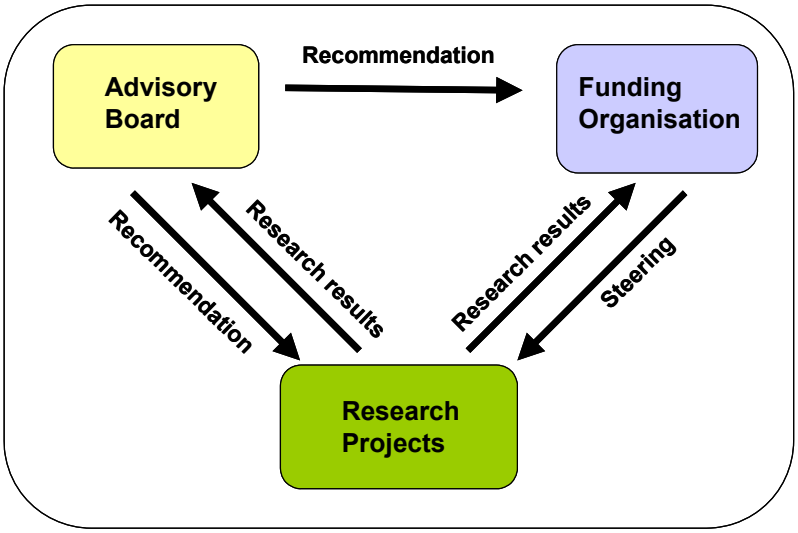


Figure 6: Typical schema and relations for the evaluation and steering of research programmes.

- A detailed evaluation of the research programme requires a thorough analysis of the research findings obtained. In some cases an appropriate organisation is charged with the evaluation in order to obtain the necessary in-depth analysis. The objectives and criteria for the evaluation are predefined by the funding institution or a committee responsible for steering/evaluating the programme. As part of the external evaluation, other experts are often included in order to ensure the most comprehensive range of opinions. An external evaluation has the advantage that ideally the assessment will be as objective as possible. However, this means that the organisation performing the evaluation should be independent and properly qualified, and that a wide range of experts is consulted in the evaluation process so that subjective opinions are revealed.

- Another common method of monitoring funding programmes is the documentation of scientific publications, patent applications and similar. However, this does not provide any information on the practicability of the research results since these are merely common indicators for documenting the research activities as such.

Practical Example – Programme monitoring and evaluation

UK England - Joint Defra / Environment Agency Flood and Coastal Erosion Risk Management R&D Programme (FCERM)

This programme has a 5 year cycle; it is subject to an independent review at the end of each cycle. The review team focuses on programme outputs and outcomes (capturing information via questionnaire, interviews and workshops) and assesses whether the programme objectives have been achieved. The report also lays down a set of recommendations that might be adopted to improve the effectiveness of the programme. The Joint Programme Board (JPB) review progress against the 5-yr programme objectives on an annual basis, they also approve the prioritisation of the annual programme of work based on policy requirements. The latest review was completed in June 2005, a full report is accessible from the programme website, http://www.defra.gov.uk/environ/fcd/research/RandAboutProg.htm.

The programme is split into four themes, each theme has a manager, a policy champion and an advisory group of up to 10 experts. The groups monitor progress and linkages at a project level and consider any cross cutting programme issues. The experts and stakeholders that participate in this fora also provide useful insights and feedback about the uptake of research in their organisations.

An annual conference, attended by about 400 river and coast engineers and environmentalists, combines dissemination of policy with dissemination of recent research and also best practice in a practical sense.

Practical Example – Programme monitoring and evaluation

UK England - Joint Defra / Environment Agency Flood and Coastal Erosion Risk Management R&D Programme (FCERM)

The following description of monitoring and ex post evaluation tasks within the FCERM Programme is taken from the "Draft Programme Definition" (Dec. 2006):

"…..
Monitoring and Evaluation (…)
The 2005 Joint Programme Review identified the clear need to establish a series of metrics, by which the benefits of the programme and the research carried out within it can be assessed. Whilst it is recognised that identifying the costs and benefits arising from science can be difficult, especially when they arise several years after the completion of a study, a suite of measures have been identified to provide key information on benefits without being excessively onerous to measure and monitor. Project officers will work with the end-user of the research to monitor these benefits. The measures themselves will be derived from the following questions:

1: Developing the FCERM knowledge base:
- With reference to the Joint Programme RO statements, what was/were the key "answer(s)" provided by the research (in no more than one paragraph)?
- Has the project identified important "knowledge gaps" and/or the need for further research?

2: Research output circulation:
- Have the outputs been circulated to, and received by, all of the recipients identified in the project benefit plan(s)?
- Were the outputs intended to be circulated to a specific wider audience, if so has this been done? Who has received them?
- Were the outputs intended to be circulated to a general audience, if so, when and how many copies (both in paper or digitally)?
- Did the project include training or dissemination events? If so how many people attended?
- Have any scientific papers been produced as a result of the research? (if so provide full reference)
- Was a website produced as part of the research? - if so how many hits does it receive per month? Does it have an ongoing role? – if so has this been taken on through the Joint Programme or elsewhere?
- If appropriate, did the research receive any media coverage in the trade or popular press?

3: Research impact (in brief):
- How has the research been received by the planned recipients?
- What was the feedback from any training or dissemination events?

4: Policy and operational outcomes:
- Please outline the key outcomes of the research outputs, for example, in policy development, process management or operational good practice (in one paragraph).

5: Cost savings:
- Has the research led to any cost savings that can be (reasonably) readily quantified, for example in staff time or delivery/monitoring costs? - if so please state what these are and any assumptions used in the calculation.

It may not be possible to provide all of the above information from every individual project, but it will provide strong evidence of the success of the programme when collated together and taken as a whole. Individual Project Officers/Managers will track benefits through the Benefits Realisation Plan. Theme Managers will collate that information for presentation to the Board as part of the annual review. It will be the responsibility of the Theme Manager to obtain information to maintain the benefits profile beyond the life of a project.
….."

The above is under review and is likely to be refined. Changes will be documented and posted on the Programme website.

Practical Example - Programme Monitoring and Evaluation

Germany – Programme Risk Management of Extreme Flood Events (RIMAX)

The RIMAX programme has an Advisory Board. The members of the Advisory Board are recruited from the experts involved in selecting the research projects. The members of the Advisory Board are each concerned with selected projects. The project results achieved so far are presented once a year by the project investigators at a status seminar. At this event, the members of the Advisory Board pass their recommendations on directly to the research groups. Furthermore, members of the Advisory Board are also invited to other conferences or workshops at which RIMAX projects are involved.

The project management agencies are responsible for monitoring the projects. At regular intervals, they receive reports presenting the most important results and also the project status with reference to the original planning. Necessary modifications to the programme of work and, if applicable, the financial programme are agreed upon and adjusted as required.

According to the present status, it is not planned to evaluate the RIMAX programme after its completion. Programme evaluations are performed in individual cases, especially if subsequent funding activities are to be initiated. The evaluation can then be performed by external organisations or by the project management agencies.

Conclusions

- An advisory board on the project level is particularly recommended for large research projects if no monitoring or evaluation is to be implemented by external experts on a superordinate level.
- In the case of larger and more complex programmes, it is appropriate to set up advisory bodies with external experts in order to place the programme steering on the broadest possible basis with respect to science, practice and policy.
- Steering large programmes is labour-intensive, time-consuming and requires extensive scientific expertise. It may therefore be beneficial if the funding institution transfers selected tasks to an experienced scientific organisation.
- An interim evaluation of a programme may be useful if the programme is to be reoriented or if, for example, the programme is to be continued by further calls.
- An ex post evaluation can be used to assess whether the goals have been achieved and whether the programme has had a practical impact. Furthermore, the findings and conclusions of an evaluation form an important starting point for the development of follow-on programmes.
- The evaluation can be performed internally by staff from the funding institution or externally by commissioning a proven and competent organisation. Transferring this function to a third party has the advantage that the evaluation can then be performed in an independent and largely objective manner. As many experts as possible should be consulted in the evaluation.
- Research findings and programmes are generally evaluated on the basis of the underlying objectives. Furthermore, other criteria must be additionally used for an evaluation of political relevance such as strategic significance, potential improvement of the course of the programme and the management of decision and implementation processes, business and economic benefits, participation of the general public etc.
- The intensity of research activities can be documented by referencing the publication of papers in high-impact scientific journals or patent applications. Since these are generally accepted indicators in the scientific community they permit comparisons to be made with other scientific fields or other countries.

4.10 Promotion and dissemination of programmes and programme results

The methods and options for publishing new flood research programmes have already been discussed in Chapter 4.6. The present chapter is therefore primarily concerned with more extensive measures for advertising programmes currently under way and disseminating the results.

The survey of the CRUE partners led to the following list of frequently used methods.

- Internet site (site of funding organisation, own programme site or site of research organisation (as contractor))
- Newsletter (e-mail)
- Conferences, workshops etc.
- Programme presentation at various meetings and conferences
- Reports, books, publication in journals
- Programme brochure
- Governmental periodicals
- Press release, press conference
- Targeted financial support of dissemination measures on project level

Of the points listed above, greatest significance is attached to the dissemination of programme information and results on the Internet. Apart from this, various events are also of importance.

Practical Example – Dissemination of programme results

UK-England - Joint Defra / Environment Agency Flood and Coastal Erosion Risk Management R&D Programme

It is a requirement of the contract for each project that research outputs are identified from the outset and that dissemination activities are timetabled to take place during the life of the project or at its completion. Such activities are not just limited to the production of reports or scientific papers but can include specialised events such as workshops, seminars, and science days or software training sessions, or papers presented at the annual Flood and Coastal Management conference.

All project outputs are placed on the Defra / Environment Agency joint website and key users are notified by an e-mail that includes a summary of the work carried out. Dissemination to a wider audience at both programme and project level is achieved using the e-news service provided by the flood management policy area, the research news is sent out alongside other policy news. A limited number of hard copies are usually produced for key stakeholders. Where possible publication of outputs is timed to coincide with high profile conferences or events in order to maximise publicity, or specific dissemination events for the project or a suite of related projects are organised. In some cases the publicity related to a completed project may be delayed slightly in order for a policy amendment to be drafted, in such a case the project outputs and the policy amendment will be launched at the same time. Notification of research outputs is also posted in other relevant publications where possible. Dissemination methods are reviewed for each individual project to ensure that they are pro-active so as to maximise the benefits of the research.

The Joint Programme website retains access to project outputs beyond what is usually available from project specific websites, usage statistics are monitored annually. The programme produces a biannual newsletter that highlights particular research and draws links to other research where relevant. Changes to either the website or the newsletter are monitored using questionnaires that are circulated at the conference.

Practical Example – Programme promotion and dissemination of programme results

Germany – Programme Risk Management of Extreme Flood Events (RIMAX)

For the German RIMAX programme, a website was set up by the coordinators with information on the programme and the projects. Furthermore, the website functions as a forum for various purposes such as information on forthcoming events, downloading reports, brochures and scientific articles, collection of links, newsletter etc.

A brochure with information on the ongoing research projects in RIMAX was published in German and English describing all the research projects. The brochure can be downloaded from the RIMAX website (http://www.rimax-hochwasser.de/fileadmin/RIMAX/download/ Allgemeines/rimax_broschuere.pdf).

The newsletter provides regular reports on new developments in RIMAX research.

Once a year, a status seminar is held for all research groups, to which actors in flood risk management are also invited.

In order to disseminate the research results, a plan was drawn up for public relations activities consisting of four fields of work (publications, events, databases, cooperations) for four target groups (science, practice, politics and general public) with the respective detailed measures.

With respect to the information disseminated, a distinction must be made between general information about the research programmes and research results obtained as part of the programme. The latter are primarily disseminated by the scientists and actors in the research projects themselves whereas information about the research programmes (e.g. objectives, structure, organisation) is usually provided by the funding institutions. Furthermore, in some cases summary reports on the programme level are sometimes compiled on the research results obtained. For example, a synthesis report is planned as part of the CRUE funding initiative that will summarise the major results of 7 collaborative projects. This is intended to create an overview of the research results obtained and will facilitate transfer to the target groups.

Digression - Intellectual property rights (IPR)

In Europe, the intellectual property rights to the research results are governed differently from country to country. However, the rights are basically handled in one of two ways:

1. The research results are the property of the funding organisation.

2. The research results are the property of the institution receiving the funding.

Usually, the property rights to the research results are regulated by the contracts or the written notifications. In most countries, the institutions receiving funding have the right or the obligation to utilise the results. In some cases, however, the organisation providing the funding reserves the right to ownership of the research results, particularly if the latter are of great public interest or if the research was initiated for the special purpose of the funding organisation.

In collaborative projects, the partners generally have to reach an agreement regarding property rights and the use of the research results by drawing up a consortium agreement. It should be pointed out that the difficulties attendant with these agreements can be particularly pronounced in the case of international collaborative projects in which the partners receive funding from their respective national organisations on the basis of national regulations, as this can lead to differences in the property rights to the research results.

A distinction must be made between the purely informal announcements and dissemination of research results, and the exploitation and application of research “products”. Models, databases, technical innovations etc. should continue to be used or further developed after the completion of a research project. In order to ensure that this is the case, some countries have established regulations aimed at an exploitation of these

research results (see for example the practical example from UK England). Whether the results are actually utilised can only be determined if the exploitation of the research results is monitored by the funding institution for a period of several years after completion of the research project. This involves additional effort but in the ideal case does permit more extensive information to be obtained about the impact of the funding scheme.

Practical Example – Dissemination of programme results

France – Programmes: Evaluation et Prévention de Risques – EPR, Risque Inondation – RIO, Risque, Décision et Territoire - RDT:

Dissemination of results
Activities for communicating the results of the research programme aim to bring the results to the attention of potential users and a broader range of interested stakeholders in a form that they can assimilate. Several methods are used:

- reports, books, published papers and articles
- the research programme website (in some cases)
- the department website (part of the Ministry's website)
- the department newsletter
- the media
- workshops and seminars
- informal mechanisms

Papers and articles that have been written and submitted during the course of the programme can be funded by the Ministry of Ecology and Sustainable Development (MEDD). When the programme has been completed , published papers related to projects financed in the programme framework are no longer funded by the Ministry .
Some books and brochures have been published in the programmes.

Example : EPR: «Gestion du risque d'inondation et changement social dans le delta du Rhône: les catastrophes de 1856 et 1993-1994 » (Flood risk management and social change in the Rhone delta: disasters of 1856 and 1993-1994) published in 2006.
EPR : Book on the « final seminar »: conclusions obtained at round tables.

There are also other scientific published papers by researchers which are not overseen and not specifically funded by the Ministry.

Conclusions

- The establishment of an Internet platform is recommended for larger programmes. Internet platforms can be used in a number of ways and provide information both about the programme as well as the research results obtained.

- E-mail newsletters can actively convey information to selected target groups.

- Conferences, workshops etc. represent the central element in disseminating information with the participation of potential users of the research results.

- A general summary of the research results, for instance by a synthesis report on the programme level, provides support for a transfer of findings to policy and practical applications.

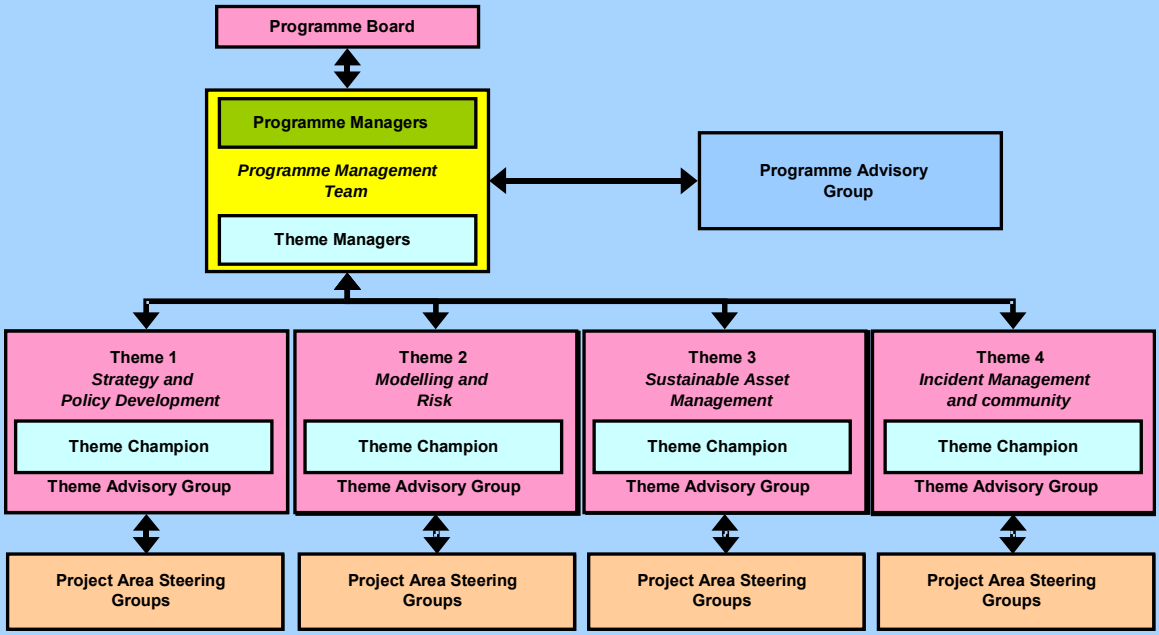
- The impact of a funding programme is based on the extent to which the research results and products are utilised or further developed. To get this information after a programme ends, ongoing monitoring is necessary. Such monitoring over a period of years involves a great investment of time and money. However, the findings may then be used for the development of subsequent funding measures.

4.11 Programme management structures

The previous Chapters 4.1 to 4.10 have each dealt with different aspects of the design and management of flood research programmes. In doing so, it became more and more apparent in the subprocesses that various actors, organisations and bodies play a part in the overarching structures and processes established for the overall project management. This is particularly the case with larger research programmes. In the following, different approaches for overarching management structures will be presented once again for selected flood research programmes.

Practical Example – Programme management structure

UK England - Joint Defra / Environment Agency Flood and Coastal Erosion Risk Management R&D Programme



Roles and Responsibilities
The Joint Programme Board (JPB) is responsible for the overall ownership of the objectives of the Joint Programme. It ensures that the appropriate monitoring and management activities are carried out to achieve the strategic plan.

Under the direction of the Programme Board, the Joint Programme Management Team (JPMT) is responsible for the day-to-day running of the programme. Led by the Programme Managers, the JPMT secure and allocate resources amongst the projects, manage links between projects, support project managers, and resolve disputes.

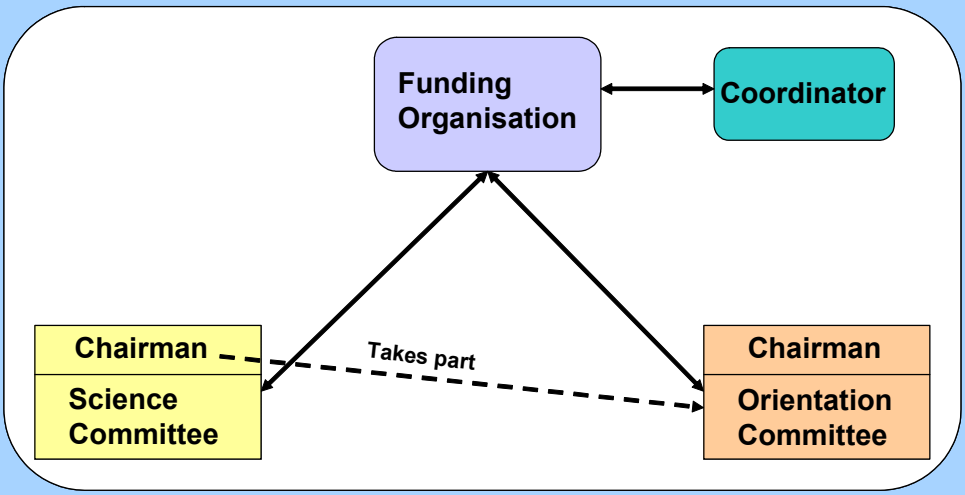
The core Programme Management Team meet every 6 - 8 weeks to monitor progress against the theme work plans and share information. Every quarter the Theme Champions join the group to contribute to programme development and provide input from liaison with external stakeholders.

A Programme Advisory Group supports the Programme Managers in the technical aspects of development of the Joint Programme. As well as providing peer review of the annual programme, this group provides high-level user links to industry.

As well as the Theme Managers responsible for the overall direction of the theme's work plan, each individual research project will have a Defra or Environment Agency project officer who will be involved in the project from conception to post project evaluation. The style will be light touch but in accordance with Defra and Environment Agency standard science procurement practice.

Practical Example – Programme management structure

France – Programmes: Evaluation et Prévention de Risques – EPR, Risque Inondation – RIO, Risque, Décision et Territoire - RDT:



Funding Organisation
- Programme owner
- Programme steering
- Programme manager
- Ensures good links between the two committees
- Scientific secretarial work
- Shares logistic tasks with coordinator

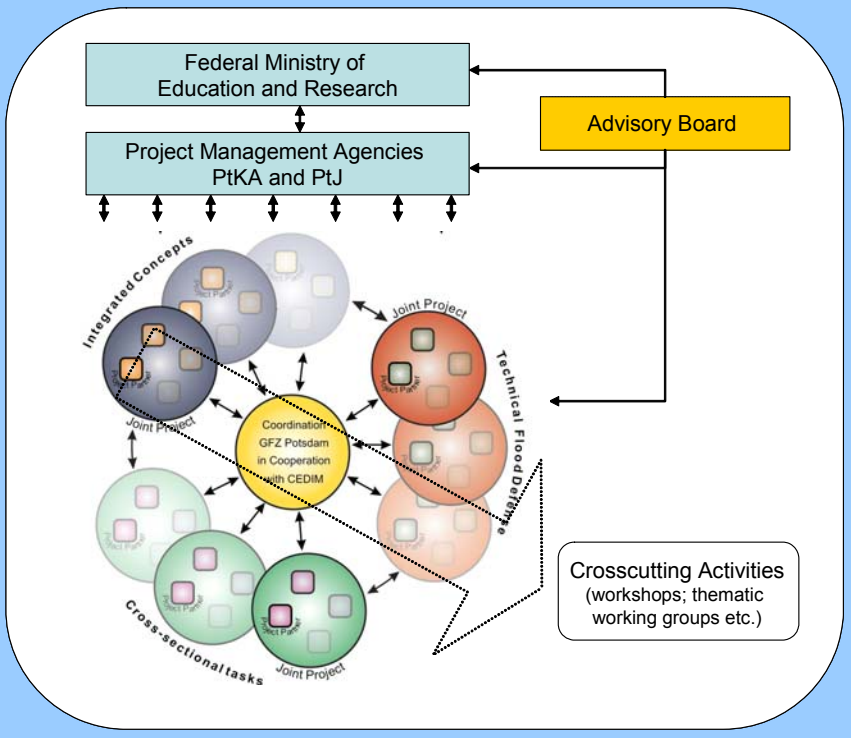
Coordinator
- Supports programme manager with logistic tasks
- Supports dissemination and communication
- Links with users and stakeholders
- Organisation of workshops
- Support with programme management

Science Committee
- Programme design: Translation of Orientation Committee expectations into scientific objectives
- Scientific evaluation and monitoring of projects
- Proposes programme activities, evaluation, dissemination and communication with the support of the coordinator

Orientation Committee
- Programme design: Expression of expectations from users and policy makers
- Evaluation of projects: Definition of priority projects
- Monitoring of projects

Practical Example – Programme management structure

Germany – Programme Risk Management of Extreme Flood Events (RIMAX)



Federal Ministry of Education and Research
- Strategic programme development
- Programme owner
- Allocation of budget
- Decision on project funding
- Programme steering (decision level)
- Takes part in important programme events
- Advice from advisory board

Project Management Agencies
- Organisation of proposal evaluation and project selection processes
- Programme management
- Administrative tasks (notification, payments, monitoring expenditure of funds, ….)
- Advice for research projects
- Visits to research projects
- Monitoring of interim and final reports

Advisory Board
- Programme evaluation
- Advice for programme owner and programme manager
- Advice for research projects

Coordination Bureau
- Networking of research projects
- Coordination with different external groups and initiatives concerning flood risk management in Germany
- Support for ERA-Net CRUE
- Implementation and maintenance of the programme Internet site
- Organisation of conferences, workshops etc.
- Summary and dissemination of programme results

Joint Projects
- Collaborative research projects consisting of different research teams/organisations
- Implementation of research

The given examples make it once again clear that the activities and responsibilities of programme management are very different and in the case of more complex programmes may be distributed on different levels. For the reasons already discussed, no conclusions can be drawn or recommendations made with respect to management structures. Nevertheless, it does become apparent that in particular the following goals are pursued by establishing these structures:

- Achieving the programme objectives
- Linking the research work to policy and practical applications
- Monitoring, evaluating and steering the research work
- Networking and exchange between the research projects
- Transfer of research results to policy and practical applications

5 Conclusions and recommendations

A major objective of ERA-NET CRUE is to create a joint research agenda for flood research and to put the cooperation between the participating countries on a permanent footing. Relevant conclusions from the previous chapters and recommendations are summarised here to help CRUE members and future partners to draw up common funding activities. Further conclusions can be found at the end of each of the preceding chapters. The information and practical examples given before can be viewed as a toolbox, which the partner countries can employ in future cooperative ventures.

5.1 Conclusions

Framework conditions

- Although the geographical and climatic conditions are different for the various European countries there are a large number of common features and similar problems (like flooding in medium and large river basins, flash floods etc.) which can be jointly solved by coordinating the flood research programmes.

- Flood research programmes have been developed in the context of different political goals and strategies. The different demands that are thus made on the research projects and programmes should therefore be taken into consideration for joint funding initiatives involving several European partners.

- The implementation of new EU directives causes European countries to initiate a large number of projects in applied research. To avoid redundancies and isolated national solutions in this area, it is imperative that the EU member states coordinate their research programmes. As a result, the CRUE partners aim to support the implementation of the EU Flood Directive currently under preparation by conducting joint funding activities and coordinated research programmes.

Identification of research needs

- Even today, climate change is an important driving force for flood research and will continue to gain importance in future.

- Flood research is a crucial element when it comes to developing climate change adaptation strategies within the context of the European Climate Change Programme. The European countries can therefore assist the development of cross-border strategies and joint solutions by coordinating their flood research.

- The CRUISE database developed in CRUE provides a fast, simple and comprehensive overview of completed and current flood research programmes in Europe and the projects funded by these programme and can be used to make a survey of the state of the art in preparing for new funding programmes.

- An analysis of flood events and the current situation in flood risk management helps to reveal gaps and problems (this presumes that the lessons learnt from the event are carefully documented). Furthermore, the development of objectives and visions of the future can identify potential for innovations.

- Expert consultation is a core element of the identification of research needs.

- Within the framework of strategic studies to identify research needs, it is possible to selectively deploy scientific methods such as scenario planning, Delphi techniques and foresight processes.

- Participation, integration of different groups / practitioners and stakeholders in the definition of research needs helps to meet the needs of those affected by floods and to reflect societal changes.

Definition of programme content and scope

- Programmes in the field of flood risk management are in many cases embedded in higher-level programmes whose strategic objectives must be taken into consideration in shaping the programme.

- Since as a rule various government departments with their various special responsibilities are involved, an efficient exchange of information is of primary importance.

Funding instruments and target groups

- In all the programmes, very high priority is given to the inclusion in the research work of partners involved in practical water management activities and other stakeholders. The most intensive form of involvement is achieved in transdisciplinary collaborative projects in which practitioners or stakeholders are included as project partners in the research projects.

Publication of programmes

- It is common practice to publish flood research programmes on the websites of the funding bodies. Targets groups can be actively addressed by e-mail and newsletters.

Call for proposals and call for tenders

- Several calls within a programme have the advantage of a periodic staggering and openness of the programme with at the same time the option of selecting projects by competition.

- Due to the shorter selection process, the one-step procedure with the submission of complete proposals or tenders can be recommended in the case of limited calls where only a small number of applicants is to be expected.

- In the case of a large number of applicants, a two-stage procedure with a preliminary selection process on the basis of pre-proposals or expressions of interest reduces the work load on the candidates and reviewers. However, the selection process is then more time-consuming.

Proposal evaluation

- The involvement of various external reviewers (experts who are not part of the funding institution) means that a broader range of expertise and different expert opinions can be included in the evaluation. This provides support and objectivisation for the selection process.

- The choice of reviewers should reflect the topics of the programme of the call and also be related to the project proposals submitted.

- Depending on the closeness to application and the political and social significance of the topics, it may also be beneficial to include experts involved in practical flood risk management in the evaluation process as well as various social groups and institutions.

- A meeting of the reviewers is recommended since the joint discussions and formation of opinions can be used to rectify misjudgements and supply any further information required by the individual reviewers.

- The grading or assignment of points for the evaluation of individual criteria enables a transparent scaling of the overall assessment and is of assistance in ranking the projects. However, the option of presenting a verbal argumentative explanation should always be included. Since grading and the assignment of points vary among individuals these aspects should always be included in a discussion by the reviewers before the final evaluation is made.

- In making a choice between several project proposals, in addition to the criteria-related evaluation, consideration should also always be given to strategic aspects and issues of funding policy (redundancies, missing topics etc.).

Programme steering

- In the case of larger and more complex programmes, it is appropriate to set up advisory bodies with external experts in order to place the programme steering on the broadest possible basis with respect to science, practice and policy.

- Steering large programmes is labour-intensive, time-consuming and requires extensive scientific expertise. It may therefore be beneficial if the funding institution transfers selected tasks to an experienced scientific organisation.

- An interim evaluation of a programme may be useful if the programme is to be reoriented or if, for example, the programme is to be continued by further calls.

- An ex post evaluation can be used to assess whether the goals have been achieved and whether the programme has had a practical impact. Furthermore, the findings and conclusions of an evaluation form an important starting point for the development of follow-on programmes.

- The evaluation can be performed internally by staff from the funding institution or externally by commissioning a proven and competent organisation. Transferring this function to a third party has the advantage that the evaluation can then be performed in an independent and largely objective manner. As many experts as possible should be consulted in the evaluation.

- Research findings and programmes are generally evaluated on the basis of the underlying objectives. Furthermore, other criteria must be additionally used for an evaluation of political relevance such as strategic significance, potential improvement of the course of the programme and the management of decision and implementation processes, business and economic benefits, participation of the general public etc.

Promotion and dissemination of programmes and programme results

- The establishment of an Internet platform is recommended for larger programmes. Internet platforms can be used in a number of ways and provide information both about the programme as well as the research results obtained.

- E-mail newsletters can actively convey information to selected target groups.

- Conferences, workshops etc. represent the central element in disseminating information with the participation of potential users of the research results.

- A general summary of the research results, for instance by a synthesis report on the programme level, provides support for a transfer of findings to policy and practical applications.

5.2 Recommendations

➢ It is expected that the **EU Floods Directive** currently under preparation, and the present activities related to the development of adjustment strategies regarding **climate change**, will result in a EU-wide need to conduct applied research on flooding. In order to avoid redundancies between the research activities in different countries and achieve cross-border solutions to the greatest extent possible, **it is strategically crucial that the CRUE partner countries and others coordinate their flood research**.

- The funding organisations should always **utilise the knowledge of experts** from flood management, the scientific community and relevant social groups in order **to identify research needs**. Information transfer can be conducted individually and in a variety of ways, such as at meetings or in workshops.

- It is recommended that the **CRUISE database**, developed as part of CRUE, be used for investigating current and completed research activities. This database contains Europe-wide information on current and recently completed research projects and programmes. Depending on the objectives and content of a particular research programme, research needs can be identified using strategic studies based on scientific methods.

- **Collaborative projects** are strongly recommended when it comes to international, EU-wide collaboration on flood research. These should involve researchers or research institutes from the various European countries. Other activities can, however, also be taken into consideration. These include exchanging scientists or staging joint events with a view to sharing information or networking research groups and facilities.

- **Joint calls of the European funding organisations** at regular intervals should be **a key element** of a joint research agenda. Common research questions can be answered internationally by means of themed calls. This results in EU-wide competition among research institutes on the one hand, and cross-border cooperation in the form of collaborative projects on the other.

- **External experts** should be **involved in assessing and selecting project proposa**ls. The assessment criteria should be set in advance and communicated to the assessors. The assessor can evaluate a project proposal on the basis of verbal arguments or by awarding points or grades. As far as possible, this should be done separately for each of the assessment criteria, as well as for the project proposal as a whole. With a view to supporting the opinion-making process and avoiding erroneous assessments, the assessors should **meet after submitting a written evaluation** in order to arrive at a final assessment of a given project proposal.

  Aspects to be taken into account can include strategic points such as the relevance or redundancy of certain project proposals in addition to purely criteria-related factors.

- If several research projects are initiated in the course of an international call, it is recommended that the forms of organisations and procedures for **common management of the funding activity** at the international level are binding, as is the case for programme management at the national level. Key tasks such as the information transfer between the projects, the provision of online information and communication, the organisation of conferences and workshops, the monitoring of a project's progress and the evaluation of all funding activities should, if possible, be carried out by a single source.

- Depending on the scope and duration of the international funding activities, **external experts in advisory boards** or comparable committees can provide support when it comes to **evaluation and monitoring** tasks. An evaluation can be used for the realignment of current research activities or for the launch of new projects.

- **Practitioners and potential users should be involved** as much as possible in the research activities in order to ensure that the findings will be relevant and usable in the long term. This involvement can take the form of informal events and workshops, of supporting committees, or of direct input in the research projects, for example as a collaborative partner.

- In order for the **research findings** to be applied at a later date, they must be **evaluated and summarised in a target group-orientated manner**. It should also be possible to download the main research findings via internet (e.g. from the CRUE website). Conferences and other sector-specific events also represent an important aspect of communicating information.

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CRUE
FLOODING ERA-NET

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Project Contract No: ERAC-CT-2004-515742
Project Website: www.crue-eranet.net