Elements of Good Practice in Integrated River Basin Management

A Practical Resource for implementing the EU Water Framework Directive

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Key issues, lessons learned and ‘good practice’ examples from the WWF/EC ‘Water Seminar Series’ 2000/2001

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About this document

This *Practical Resource* document is the result of three **open, transparent and participatory seminars** — comprising the 'Water Seminar Series' — which brought together hundreds of 'water stakeholders' to discuss approaches and tools for **implementation** of the European Union Water Framework Directive (WFD). This challenging new legislation entered into force at the end of 2000 and sets out the basis for **sustainable use of water resources** across Europe. It will affect **everyone involved directly or indirectly with water resource management and use** in both Member States and EU-Candidate countries alike.

The seminars focused on **three key issues** for WFD implementation:

- Water and agriculture
- The role of wetlands in river basin management
- Good practice in river basin planning

This document presents the **principal outputs** of the 'Water Seminar Series', with a focus on **integrated river basin management**, the central requirement of the WFD. It is not intended to be a comprehensive guide to all aspects of WFD implementation, but rather to provide **clear, concise and practical information** on the issues listed above. This information has been developed with a range of potential users in mind, but especially:

- Those involved with **water planning and management at regional and local levels**, including land-use planners, water supply and treatment companies, and regional/local authorities

- 'Stakeholder' groups and individuals with an interest in how a given river basin is managed, for example: **Community associations, farmers' groups, and environmental organisations**

This *Practical Resource* document is divided into five chapters. The three introductory chapters provide **background information** about the 'Water Seminar Series', the **requirements of the WFD**, and the recently-agreed WFD **Common Implementation Strategy**. Chapters 4 & 5 present the main seminar outputs, respectively:

- Horizontal issues or **'cross-cutting principles'** that need to be considered at every stage of WFD implementation, in order to ensure effective integrated river basin management

- **Lessons learned** and **examples of 'good practice'** for specific WFD requirements

It is hoped these will help stimulate and guide practical action towards early and effective WFD implementation. Additional sources of information are provided throughout the text.

The outputs from the 'Water Seminar Series' **reflect the contributions of more than 300 'water stakeholders' from all parts of Europe**, who participated in the three meetings. A **Synthesis Note** and full **Proceedings** for each Seminar, are available from the following website:

http://www.panda.org/europe/freshwater/seminars/seminars.html

A draft of this Practical Resource document, was discussed at a **'validation workshop'** held near Brussels in August 2001. The final document incorporates extensive comments on a revised draft that was circulated to participants after the workshop. For a full list of contributors, see Appendix IV.

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Foreword

The *Directive of the European Parliament and of the Council 2000/60/EC Establishing a Framework for Community Action in the Field of Water Policy*, generally referred to as the EU Water Framework Directive (WFD), entered into force on 22 December 2000, and represents a hugely important step towards sustainable use of water resources in Europe.

Primarily through the development and implementation of River Basin Management Plans, the WFD requires Member States to take whatever measures may be necessary to achieve the environmental objective of 'good status' for **all** EU waters by 2015.

The Directive's provisions are complex and far-reaching, and it has been widely recognised that implementation will be greatly assisted by the preparation of guidelines on a range of technical issues. This challenge has been taken up in the framework of the Common Implementation Strategy for the WFD developed jointly by the Member States and the European Commission and agreed in May 2001.

As a contribution to the WFD implementation process in general, and to the Common Implementation Strategy in particular, this document draws together the outcomes of *Implementing the EU Water Framework Directive: A seminar series on water*, organised by WWF with support from the European Commission (DG Environment and TAIEX[1]). This 'Water Seminar Series' consisted of three major technical meetings (held in Brussels in 2000 and 2001), each attended by about 120 invited participants chosen to be representative of a broad range of water-related sectors from all parts of Europe. The seminars dealt with key issues for WFD implementation, namely:

- Water and agriculture
- The role of wetlands in river basin management
- Good practice in river basin planning

The distillation contained in this Practical Resource document, of key issues, 'lessons learned' and 'good practice' examples, as derived from the 'Water Seminar Series', should prove to be of value for all those involved with implementing the WFD. Indeed, there can be no doubt or complacency about the efforts required — at all levels — to ensure that its challenging objectives are met. Environmental protection Directives, especially those dealing with water, have been among the most poorly implemented bodies of EU legislation to date. However, nothing short of complete and timely implementation of the WFD will be sufficient to safeguard water resources — and the ecosystems that sustain them — for future generations of Europeans.

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[1] Technical Assistance Information Exchange Office.

Chapter 1
Background to the 'Water Seminar Series'

In October 1999, WWF's European Freshwater Programme (see Box 1.1) submitted a project proposal entitled *Implementing the EU Water Framework Directive: A seminar series on water* to the European Commission[2]. This initiative was successful and enabled the go-ahead for a series of three technical meetings held between February 2000 and May 2001, each dealing with a specific key issue for implementation of the WFD:

- **Water and agriculture** — Building on existing practices and knowledge of how to assess and reconcile water and agriculture interests at the river basin level.

- **The role of wetlands in integrated river basin management** — Tools and approaches for integrating the benefits offered by naturally functioning wetlands into overall management of water at a river basin level.

- **Good practice in river basin planning** — Focusing on sharing experience of existing approaches and tools for river basin management planning, as relevant to WFD implementation.

The three objectives of the 'Water Seminar Series' were:

- To provide information and opportunities for debate on the WFD, addressing the need for greater transparency and public awareness during the final stages of its development and during its implementation.

- To facilitate the sharing of experiences and expertise and the identification of 'good practice' for implementing key elements of the WFD, by involving a broad range of 'water stakeholders' from different economic sectors and regions of Europe.

- To contribute to the development of the present document, providing practical information to assist river basin managers and others in meeting the objectives of the Directive.

With an emphasis on openness, transparency and a participatory approach, the seminars proved to be effective fora for exchanges of views, experience and expertise. A particularly significant event was the adoption of the final WFD text, following completion of the conciliation process between the European Parliament and Council, in September 2000. This meant that the third seminar, on *Good practice in river basin planning* (May 2001), took place in the context of actual entry into force of the WFD (on 22 December 2000), and so was able to focus even more concretely on implementation.

More than 300 individual 'water stakeholders' participated in the 'Water Seminar Series' overall, with representation from the governmental, non-governmental and business sectors of both EU Member States and EU-Candidate countries. Among the bodies represented were environment, water, agriculture and forestry ministries/government agencies, the water supply industry, water management and research institutes, farmers' associations, environmental non-governmental organisations (NGOs) and EU institutions, including the European Commission.

The European Commission (DG Environment) not only co-financed the 'Water Seminar Series' project, but was also closely involved with the technical preparation and follow-up of each seminar, as part of its own efforts to facilitate WFD implementation.

A *Synthesis Note* (in English, French, German and Spanish) and full *Proceedings* have been produced for each seminar.[3] The three *Synthesis Notes* provided the basis for this *Practical Resource* document, a draft of which was also discussed at a small 'validation workshop' held in August 2001.

[2] Through the funding opportunities for 'ad hoc' proposals mechanism operated by DG Environment.

The main purpose of the present document is to draw together the key issues, 'lessons learned' and 'good practice' examples of integrated river basin management that emerged from the 'Water Seminar Series'. Of course, these correspond to the main themes addressed by the three seminars (i.e. agriculture and wetlands; the role of wetlands in river basin management; and good practice in river basin planning) and do not cover every aspect of the WFD in detail. In fact, certain elements of the Directive (e.g. scientific characterisation of water bodies, water pricing issues) were not specifically included in the seminar series agenda.

This publication is intended for all those involved with implementing the WFD, especially river basin planners and managers. However, it is hoped that the summary of the WFD's provisions, the introduction to the Common Implementation Strategy for the WFD, and the highlighting of practical steps for its application, will prove useful to other stakeholders at a range of levels.

The Camargue, France. WWF-Canon/Roger Leguen

[3] These are available in pdf format through the following WWF EFP website: http://www.panda.org/europe/freshwater/seminars/seminars.html

Box 1.1

WWF's European Freshwater Programme and WFD implementation

WWF established a European Freshwater Programme (EFP) in 1998. The EFP has developed a series of activities *"to conserve and restore the functions and integrity of freshwater ecosystems for the benefit of all life"*, and includes the promotion of Integrated River Basin Management (IRBM) as one of its priorities. The WWF EFP consists of a coordination unit and a team of 33 freshwater officers in 18 countries.

The EFP team worked with other non-governmental organisations (NGOs) and stakeholders to influence development of the WFD text during the long period of negotiations leading to its adoption by the European Parliament and Council of Environment Ministers in September 2000. In parallel, and especially during 2001, WWF has also been working to facilitate the WFD implementation process.

As far back as October 1998, WWF and the European Environment Bureau (EEB) co-organised a workshop on *Water Framework Directive Implications and Challenges for the Environment*. Approximately 50 people, representing national and European NGOs, met to discuss progress on the WFD text, identifying several major areas of concern.

Further to the outcomes of this workshop, WWF's continuing work emphasised the need for:

- Increasing public/stakeholder awareness about the existence, purpose and scope of the draft WFD
- Developing further collaborative action by the European Commission, Member States and NGOs, including the preparation of non-statutory guidance on WFD implementation
- Building capacity for integrated water management and river basin planning in most European countries.

While recognising important regional differences, WWF sees the WFD as the best available tool to ensure sustainable use of water and wetlands across Europe, thus forming a vital contribution to the achievement of its own conservation targets and goals in the region. This is why many of the EFP's activities are directed towards supporting full and effective implementation of the WFD[4].

[4] A paper entitled *WWF's activities across Europe to assist the implementation of the WFD and IRBM* is available through the EFP web site http://www.panda.org/europe/freshwater

Chapter 2
The EU Water Framework Directive

A sustainable future for water in Europe?

The EU Water Framework Directive (WFD) is a **bold and forward-looking** instrument that will have **far-reaching consequences** for the future management of water and aquatic ecosystems throughout Europe. If implemented in a complete and timely manner, the WFD has the potential to be the **EU's first 'sustainable development' Directive**. Thus, it obliges European countries to establish integrated river basin management, which depends crucially on reconciling all natural processes and human activities that influence the water cycle in a given river basin.

The central feature of the WFD, around which all its other elements are arranged, is the use of **river basins as the basic unit for all water planning and management actions.** This recognises that water respects physical and hydrological boundaries, but not political and administrative limits.

Mainly through the development and implementation of **River Basin Management Plans**, the WFDs overall environmental objective is the achievement of **'good status'** for all of Europe's surface- and ground-waters within a 15-year period. As a consequence, WFD implementation will involve a vast range of **stakeholders**, ranging from individual consumers, major water-using sectors such as agriculture and industry, and secondary uses like water-based recreation, to water supply/treatment companies, scientists, nature conservationists and the authorities involved in planning land and water use at local, regional, national and international levels.

The **specific benefits derived from implementing** the WFD are expected to include:

- Improved ecological quality of European freshwater and coastal water ecosystems
- Biodiversity gains (through better management of aquatic and wetland habitats/species)
- Improved sustainability of water use (through more efficient water resource use and management)
- Reduction of water pollution
- Mitigation of the effects of floods and drought
- Improved efficiency and effectiveness of water policy, with better targeting and reduced costs.

What does the WFD say?

The WFD represents a fundamental reform of EU water legislation in both environmental and administrative terms, making **integrated river basin planning and management** compulsory for Member States, as well as for EU-Candidate countries **from the date of their accession** to the EU. Set against the overarching theme of sustainable water resource use, the WFD's principal **environmental objectives** (set out in Article 4) are:

- To prevent deterioration in status of **all** Community waters (i.e. both surface- and groundwaters, including coastal waters, throughout the EU)
- To ensure achievement and maintenance of **'good status'**[5] for all Community waters by 2015.

As its name implies, the WFD establishes a 'Framework', providing for a common approach, and common objectives, principles, definitions and basic measures. However, the specific actions required to achieve 'good status' are the responsibility of the competent authorities in the Member States (whether at national, regional, local, or river basin level (see Box 2.1)).

The WFD, which must be transposed into national law (by the end of 2003 at the latest), sets out a series of tasks, each with a **strict final deadline** (see Box 2.2), for achieving the ultimate objective of 'good status'. However, these tasks are **NOT arranged in a sequence of consecutive steps**, where each task must be completed before the next can begin. On the contrary, the challenging timeframe means that **several tasks will have to be worked on simultaneously**. Furthermore, while the deadlines set out in the WFD text can be considered as the **'minimum requirements' for legal and administrative compliance**, meeting them will not guarantee better water management at the river basin level or the ultimate achievement of **'good status'**. Really effective implementation will require a timetable based on 'good practice' (see Chapters 4 & 5) rather than 'administrative compliance'. This means working on each WFD task at the **earliest practicable time**, taking into account the circumstances applying to each river basin.

Box 2.1

Results count!

The WFD requires active management measures to deliver clear environmental objectives. Although establishing effective measures necessitates a degree of administration and planning, priority must be given to implementing action on the ground at river basin (or sub-basin) level. Thus, while meeting the WFD's process obligations is important, the overriding obligation is to achieve results. Over time, this distinction should be reviewed regularly by Member States, River Basin District (RBD) authorities and stakeholders, to ensure that WFD implementation remains results-focused and does not stagnate due to over-emphasis on administrative processes. The final deadlines for transposition into national law and achievement of 'good status' mean that the timetable is tight and the need for action is urgent.

[5] The different 'status' categories used in the Directive (high, good, moderate etc.) are simply measures of the degree of deviation of a given water body from its original, natural condition, i.e. without human impacts. A Working Group on 'reference conditions for inland surface waters' has been set up under the WFD Common Implementation Strategy (see Chapter 3) to develop technical guidance on classification of inland water status and identification of reference conditions.

Box 2.2

WFD tasks with 'minimum compliance' deadlines

End 2003:
WFD transposed into national legislation / River Basin Districts identified

↓

End 2004:
Analyses of pressures/impacts and economic use completed

↓

End 2006:
Monitoring programmes operational

↓

End 2006:
Public consultation on River Basin Management Plan (RBMP) components under way

↓

End 2009:
RBMPs published

↓

End 2010:
Pricing policies in place

↓

End 2012:
Programme of measures operational

↓

End 2015:
Environmental objectives achieved

As stressed in the text, this is not a 'good practice' timetable for WFD implementation but an indication of the final deadlines for legal compliance. In order to achieve effective river basin management, following the 'good practice' advice identified by the 'Water Seminar Series', work on different tasks should be initiated as early as possible and be carried out in parallel.

For example, by applying the principle of using existing information wherever possible, it should be feasible, in many cases, to identify key pressures and impacts rapidly, thereby enabling a 'head start' on developing appropriate measures for the RBMP. This may be imperfect at first, but actual application will provide information that can be used to improve the plans. Furthermore, as well as helping to meet statutory deadlines, such an approach may also help to manage the financial costs of implementation.

The official text of the Water Framework Directive

The text of the WFD[6] (reference number 2000/60/EC) was published in the Official Journal of the European Communities (OJ N° L 327) on 22 December 2000, following completion in September 2000 of the conciliation process to resolve differences of view between the European Parliament and the Council of Ministers.

WFD 'Key Tasks' for integrated river basin planning and management

From the point of view of those responsible for river basin planning and management, the 'Key Tasks' for implementing the WFD (each of which is developed in detail in Chapter 5) are as follows:

- **Setting up of River Basin Districts as the fundamental unit for applying and coordinating the Directive's provisions:** WFD Article 3 requires that, by 2003 at the latest:
  - All river basins and coastal waters must be assigned to a River Basin District (RBD) and the competent authority for each RDB identified
  - In the case of river basins shared by two or more Member States, International RBDs must be established
  - If a river basin extends beyond Community territory, the relevant Member State(s) must seek to establish appropriate coordination with the non-Member State(s) concerned.
- **Identifying and agreeing key water management issues**: This is derived mainly from the provisions of Articles 4, 5, 6 and 14:
  - Article 4 sets out the WFD's environmental objectives for surface- and ground-water bodies, including 'heavily modified waters'. This provides the context for identifying key water management issues
  - Article 5 requires that surface- and groundwaters within each RBD must be characterised in accordance with the procedure set out in Annex II of the WFD and by 2004 at the latest. The steps required for each RBD include a review of the environmental impacts arising from human activities. Article 5 also obliges Member States to carry out an economic analysis of water use in each RBD
  - Article 6 requires that a register of protected areas within each RBD, be established (including 'Natura 2000' sites under the Birds and Habitats Directives, as well as protection zones for drinking water supplies). This is a complementary step to the characterisation of RBDs, helping to identify those parts of the RBD that are especially sensitive to human activities and in need of special management approaches
  - Article 14 deals with public participation issues and is summarised below (see p. 12) and discussed in detail in Chapter 4.
- **Designing Programmes of Measures and developing River Basin Management Plans for their implementation**: Article 11 requires Members States to establish by 2009 a Programme of Measures for each RBD, composed of both *basic* and *supplementary* measures for achieving and/or maintaining 'good status':
  - 'Basic' measures are compulsory and represent the minimum steps required to achieve 'good status'. They include the measures required by 11 existing EU water-related Direc-

[6] The WFD text — in English, French, German and Spanish — may be downloaded in html format, in any of the 11 Community languages, through the European Union's 'Eur–Lex' legislation database: http://europa.eu.int/eurlex/en/lif/reg/en_300L0060.html or in pdf format from the following WWF website: http://www.panda.org/europe/freshwater/initiatives/wfd.html

tives (*inter alia* the Bathing Waters Directive, Drinking Water Directive, Urban Waste Water Directive, Nitrates Directive, Birds Directive and Habitats Directive)[7]

– 'Supplementary' measures are those needed in addition to basic measures if 'good status' is to be achieved; for example, wetland restoration and rehabilitation

– The economic analysis carried out as part of the 'Key Task' *Identifying and agreeing key water management issues* (see above) should be used to establish the most cost-effective combination of management measures to achieve 'good status' in the RBD, and to apply the principle of cost recovery for water services in the development of water pricing policies (as required by Article 9, see also pp. 12 and 54)

– Every Member State must ensure that a River Basin Management Plan (RBMP) is produced for each RBD wholly within its territory (Article 13). This effectively provides the delivery mechanism for the Programme of Measures to achieve 'good status'. In the case of transboundary river basins, the Member States concerned must work jointly, with the aim of producing a single International RBMP. If a single plan is not produced, each Member State is responsible for preparing a RBMP for at least the portion of the RBD that lies in its territory. Annex VII sets out the elements that must be covered by each RBMP (see p. 55 of this document for a summary)

– The first RBMPs must be published at the latest by 2009 and be submitted to the European Commission within three months of their publication. The Programmes of Measures included in these RBMPs must be fully operational by 2012, at which time a progress report on implementation must be submitted to the European Commission. The RBMPs have to be reviewed in 2015 and every six years thereafter.

♦ **Establishing and maintaining appropriate monitoring networks**: Article 8 requires Member States to put in place monitoring programmes "in order to establish a coherent and comprehensive overview of water status within each River Basin District". Such monitoring must cover both surface- and ground-water, and has to be operational by 2006. Three types of monitoring are required: 'surveillance', 'operational' and 'investigative', as detailed in WFD Annex V. Additional monitoring is needed for the protected areas (for habitats/species or drinking water abstraction) identified under Annex VI (see Appendix I of this publication for a summary).

The Schinias wetlands, Greece. WWF-Greece

[7] Unfortunately, EU water quality legislation to date has been poorly implemented, as demonstrated, for example, by the decision of the European Commissioners in July 2001 to take infringement actions against ten Member States for shortcomings under one or more of the following Directives: Urban Waste Water; Drinking Water; Bathing Waters; Dangerous Substances in Water; and Sewage Sludge.

Amongst the Directive's other key elements, which, though not covered in detail by the 'Water Seminar Series', must form an integral part of implementation are:

- **Identification and protection of water bodies used for drinking water abstraction**, with the aim of reducing the level of purification treatment required prior to supply for human consumption, and ensuring that the requirements of the Drinking Water Directive (80/778/EEC as amended by Directive 98/83/EC) are met — see WFD Article 7.

- **Introduction of water pricing policies that provide adequate incentives for efficient use of water** taking into account the principle of 'cost recovery' for water services[8], including environmental and resource costs (to be completed by 2010 — see Article 9).

- **Control of all pollutant emissions and discharges into surface waters** using a 'combined approach', based not only on the overall quantity of a given pollutant that is emitted or discharged, but also on its concentration in the receiving aquatic environment (this to be secured by 2012 -– see Article 10).

- **Specific controls for certain higher risk pollutants** on a priority basis, with progressive reduction, phasing out, and/or cessation of emissions, for the substances identified as priorities (first phase-outs or cessations expected within 20 years of adoption of relevant proposals by EU decision-making bodies — see Article 16).

The provisions of many of the WFD's 26 Articles are developed in much more detail in its 11 Annexes. While some of the Annexes are highly complex, a general understanding is essential for those involved in practical application of the Directive. To assist with this, and to make the present publication as complete as possible, a summary of the WFD Annexes can be found in Appendix I, see p. 53[9].

Article 14 provisions on 'participation'

Article 14 confers a general obligation on Member States **"to encourage the active involvement of all interested parties in the implementation of this Directive..."**. In addition, there are specific obligations to publish and make available for comment during a period of at least six months:

- A timetable, work programme and statement of planned consultation measures, at least three years ahead of the RBMP (i.e. by December 2006 at the latest).

- An interim overview of the significant water management issues identified for the river basin, at least two years ahead of the RBMP (i.e. by December 2007 at the latest).

- Draft copies of the RBMP, at least one year before implementation begins (i.e. by December 2008 at the latest).

[8] The actual cost of supplying and treating water may or may not be a significant component of the price of water to the consumer. This currently varies widely within and between Member States, taking into account factors such as the extent of privatisation, formal price regulation, projected investment requirements for reaching statutory requirements, and type of water use (e.g. agricultural, industrial, or domestic).

[9] Further information on WFD provisions, including several WWF position papers on key issues, can be obtained by visiting the relevant section of the WWF European Freshwater Programme website: http://www.panda.org/europe/freshwater/initiatives/wfd.html

Article 4 provisions for 'heavily modified waters' and derogations/extensions

In addition to setting out the environmental objectives for surface- and ground-water bodies in general, Article 4 specifically enables designation of **'artificial'** and **'heavily modified water bodies'**, for which different objectives are defined, namely the achievement of **'good ecological potential'** and **'good surface water chemical status'**.

Furthermore, provided that certain strict conditions are met, Article 4 permits certain derogations and time extensions for the 'Key Tasks' outlined above (see Box 2.3).

Although these additional Article 4 provisions were not considered directly by the 'Water Seminar Series', and are consequently not covered in any detail by this publication, they may have significant implications for river basin managers and so are referred to here for possible follow-up.

Box 2.3

Achieving the objectives of the WFD: Extensions and Derogations

Article 4 provides for a limited range of exceptions for meeting the WFD's overall environmental objectives, with regard to both the need for achieving 'good status' and the time frame to be applied. Through the WFD CIS, the European Commission and Member States are working to develop guidance for a common understanding and application of all Article 4 provisions.

Less stringent environmental objectives may be set for specific bodies of water that are "so affected by human activity....or their natural condition is such" that achievement of good status would not be feasible or would be disproportionately expensive. Several strict conditions must be respected for such an exemption to be permissible. This is also the case for **temporary deterioration** in status, which is not considered a breach of the Directive providing that certain conditions are met in full.

Deadline extensions. "Provided that no deterioration occurs" (Article 4.4), the **deadlines for reaching good status may be extended** either where the scale of improvements needed is so great that the time limit of 15 years would be exceeded; or where completing the necessary improvements within 15 years "would be disproportionately expensive"; or where natural conditions preclude "timely improvement". All extensions must be set out and justified in RBMPs and are limited to a maximum of two updates (i.e. a period of 12 years) after the first RBMP is published.

Chapter 3
Ensuring effective and coherent implementation:
The Common Implementation Strategy for the Water Framework Directive

In order to assist WFD implementation, the EU Member States and the European Commission have developed the Water Framework Directive 'Common Implementation Strategy' (WFD CIS), which was agreed in May 2001[10].

The CIS is based on the following elements (see section 2.3 of the official text[11]):

- The necessity to **share information** between Member States and the European Commission
- The need to **inform and involve the public and to raise public awareness** about the key elements of the WFD and issues linked to its implementation
- The need to ensure **coherence** between the implementation of the WFD and **other sectoral and structural policies**
- The need to ensure **coherence** between the implementation of the WFD, **other water Directives, and process and product oriented Directives**
- The need to **integrate activities** on different horizontal ('cross-cutting') issues for the effective development of river basin management plans and WFD implementation
- The necessity for **capacity building** in Member States for effective implementation of the WFD
- The need to involve **stakeholders and civil society** in implementation of the WFD
- The need to promote a **common attitude** towards EU-Candidate countries of Central and Eastern Europe with regard to their involvement (especially for shared international river basin districts)
- The need to establish **working groups** and develop **informal guidance** on key aspects of the WFD.

The WFD CIS is built around four 'Key Activities' (see WFD CIS document section 2.4):

- Sharing of information
- Management of information and data
- Development of guidance on technical issues
- Application, testing and validation of guidance.

Within the 'Key Activity' on development of techni-

[10] During the third water seminar, *Good practice in river basin planning*, the European Commission drew participants' attention to this "new approach to implementation of environmental legislation at European level". An informal meeting of EU Water Directors (plus the Norwegian Water Director), held in Paris in October 2000, decided to develop the WFD CIS. Following a period of intensive joint work by the Member States and the European Commission, the WFD CIS was agreed at a further Water Directors' meeting, held in Sweden in May 2001. At that time, the WFD CIS was also discussed with EU-Candidate countries, who have been invited to join its further development and application.

[11] The full text of the WFD CIS is available from the homepage of DG Environment: http://www.europa.eu.int/comm/environment/index_en.htm or as a pdf file through the home page of the WWF European Freshwater Programme: http://www.panda.org/europe/freshwater

cal guidance for specific WFD implementation issues, 10 Working Groups, under the leadership of one or more Member States, have been established (see Box 3.1). Of particular relevance to the topics highlighted by the 'Water Seminar Series' are the Working Groups on 'Analysis of pressures and impacts', and 'Best practice in river basin planning'. Technical guidance is expected to emerge from the CIS process from 2002 onwards.

In particular, the Working Group on 'Best practice in river basin planning' will focus on preparation of technical guidelines for river basin planning, covering four aspects:

- Designation of RBDs (guidance provisionally planned for end 2002)
- Overall planning process (for end 2002)
- Public participation (for end 2002)
- Comprehensive 'handbook' for preparing RBMPs, drawing on outputs from all the other WFD CIS Working Groups (for 2006).

It is hoped that many of the key issues identified during the 'Water Seminar Series' and presented in this *Practical Resource* will be taken forward by the Working Group on 'Best practice in river basin management' as it begins preparation of guidance.

The WFD CIS has been welcomed by environmental NGOs and other stakeholders, who have been invited to join its further development and application, as a courageous and holistic approach, which will help to ensure timely and effective WFD implementation. Being a joint initiative of the European Commission and the Member States[12], it is seen as contrasting with the approach to implementation of other EU environmental protection legislation, where the focus has tended to be on disciplinary measures for failure to meet deadlines and objectives.

[12] The WFD CIS is not the only activity that Member States are developing to assist with WFD implementation. For example, some countries are preparing national documentation, as is the case in Germany, where a draft 'Guide to the implementation of the EU Water Framework Directive' has been produced under the auspices of the Working Group of the Federal States on Water Problems (see http://www.lawa.de). In the UK, two government consultation papers on implementation of the WFD have been issued; one covering England and Wales, and the other dealing with Scotland. These can be found at: http://www.defra.gov.uk/environment/consult/waterframe/index.htm and http://www.scotland.gov.uk/consultations/environment/ffsw-00.asp

Box 3.1

List of WFD Common Implementation Strategy Working Groups

Action	Lead
Analysis of pressures and impacts	UK, Germany
Reference conditions inland surface waters	Sweden
Typology, classification of transitional, coastal waters	UK, Spain, European Environment Agency (EEA)
Heavily modified water bodies	Germany, UK
Geographical Information Systems	EC-Joint Research Centre (JRC)
Intercalibration	JRC
Monitoring	Italy, EEA
Economic analysis	France, European Commission
Tools on assessment, classification of Groundwater	Austria
Best practice in river basin planning	Spain

Reduced water level in Lake Koroneia, Greece. WWF/Ch. Paschoudis

Chapter 4
Cross-cutting principles for effective integrated river basin management

The 'Water Seminar Series' highlighted **five general principles** that can be described as 'cross cutting' because **they apply globally to all aspects of the process for implementing the WFD**:

- **Integration**
- **Scale**
- **Timing**
- **Participation**
- **Capacity**

As a matter of **'good practice'**, river basin planners and managers need to build these cross-cutting principles into **all components** of their work, to ensure that the **coordination and coherence required for effective results** is actually achieved. Examples of how the five principles can be applied in practice are provided in Chapter 5.

The Loire River in Auvergne, France. WWF-Canon/Hartmut Jungius

Integration

At present, Europe's water resources are being used unsustainably, due in large part to fragmentation of roles, responsibilities and interests. **Better overall coordination at the river basin level** is a pre-requisite for implementing the WFD effectively. This, in turn, needs more **integration at the operational level**, especially:

- Among **bodies involved directly with water management** (e.g. those responsible for water storage and supply, and treatment of waste water)
- Between water managers and **other sectors**, such as land-use planning, agriculture, industry and tourism/recreation
- Linkage of surface- and ground-water management (at present often dealt with separately)
- Linkage of 'inland' and coastal waters, for example by applying the approach and principles of Integrated Coastal Zone Management (ICZM)[13].

In the case of **international river basins**, integration calls for:

- Establishing cooperation (where not already in place) between countries and seeking complementarity between WFD implementation and any existing bilateral or multilateral agreements that affect water management.

At EU level, the 'Water Seminar Series' stressed the need for:

- Administrative and political action to increase coherence between EU legislative, policy and financial instruments (i.e. to remove or minimise obstacles to more sustainable water management and to maximise opportunities for positive synergy) — this point is further developed in Box 4.1.

Box 4.1

Integration of policy and financial instruments at EU level

At the EU level, integration implies the need for **coherence between the major policy and financial instruments** that are the **driving forces behind current land- and water-use practices** within the territory of the Member States and, increasingly, in EU Candidate countries. This was a common thread throughout the 'Water Seminar Series'. For example, presentations showed the clear need to **review and reform** elements of the Common Agricultural Policy (CAP) if the environmental objectives of the WFD are to be met.

In the meantime, **much better use could be made of existing elements**, some of which — e.g. measures under the Rural Development Regulation — are optional and not adequately taken up by Member States. Gaps in coherence between EU policies and financial instruments were also highlighted by a paper on policy aspects of the 'Wise Use of Floodplains EU LIFE project'[14], presented at the second Seminar. This showed that the **obstacles to sustainable water management posed by the CAP, Structural Funds and Cohesion Fund** (and their counterpart mechanisms for EU-Candidate countries, i.e. SAPARD and ISPA) significantly outweigh the opportunities provided.

[13] See the following European Commission website: http://www.europa.eu.int/comm/environment/iczm

[14] For further information see http://www.floodplains.org

Scale

The importance of scale has already been partially highlighted under the heading of integration (some integration needs to happen at **river basin scale**, e.g. between flood management, water supply and environmental protection measures; some at **national scale**, e.g. between water resource legislation and environmental protection legislation; and some at **European scale**, e.g. between WFD, Common Agricultural Policy (CAP) and Structural Funds). However, **adapting planning and management activities to the appropriate scale** is a principle that applies to all aspects of WFD implementation. The 'Water Seminar Series' particularly recognised:

- The great variation in the size of river basins within and between countries, meaning that **approaches suitable for one location are not automatically transferable elsewhere**
- The need to **coordinate 'top–down' and 'bottom–up' approaches** (i.e. to ensure that many physically separate actions at local scale are sufficiently coordinated to reach, in combination, the objective of 'good status' at river basin scale).

Small-scale — the Branlin River, south of Paris, France. Cécile Ardouin/WWF-France

Large-scale — the Allier River, France. WWF-Canon/Hartmut Jungius

Timing

The deadlines for achieving the objectives of the WFD are extremely challenging (see pp. 8-9). It is therefore better to **begin implementation 'early and imperfectly'** than to wait for 'perfect conditions' (e.g. when all possible data have been collected and analysed). Consequently, the deadlines in the WFD text must not be seen as a step-by-step timetable for implementation. Results-oriented 'good practice' will require many elements to be running simultaneously. Furthermore:

- Timing of preparatory work by Member States should recognise that achievement of WFD deadlines and 'good practice' approaches will require immediate action. Primary or secondary legislative changes may be necessary, the appropriate organisational arrangements may not be in place, and the required skills and resources may not be available or adequately developed.

- Time can be saved by **using existing structures, processes and tools** wherever possible. However, this should be subject to the outcomes of a review, checking the suitability and capacity of these structures for delivering WFD requirements. In many cases, a certain degree of adaptation will be needed.

- Monitoring and planning are tools to facilitate management actions in the WFD context. However, management action should not be delayed until all possible planning and monitoring has been completed. For example, if monitoring is not operational until the final deadline of 2006, there will be a severe 'bottleneck' in preparing an effective Programme of Measures by the corresponding final deadline of 2009.

- It is especially important that strategies for public participation and stakeholder involvement are developed and implemented from the beginning, though recognising that different groups will need to be engaged at different stages of the process (see below).

- Timing of related initiatives (e.g. land-use planning policy, capital investment in infrastructure) may impact significantly on the timetable for achieving WFD objectives if the links are not considered at an early stage.

Fast-flowing river in Sweden. Ola Jennersten

Participation

This cross-cutting principle — which is the only one specifically covered by the provisions of a WFD Article (Article 14, see Chapter 2, p. 12) — had a particularly high profile during the third Seminar, emerging frequently as a key issue during debate. This is despite the fact that only a limited part of the seminar agenda was intentionally devoted to participation, and reflects stakeholders' concerns over implementation of Article 14.

Given social, political and legislative[15] trends at EU, Member State and regional levels, **it is highly unlikely that any RBMP can be implemented successfully if it does not meet with broad public acceptance** and, in particular, if it is not supported by **key stakeholder groups**[16] within a river basin, including local residents and sectoral land/water users.

WFD Article 14, though entitled *Public information and consultation* refers to **'information', 'consultation' AND 'participation'**. It is essential to recognise that **these three terms are fundamentally different** and should never be used interchangeably.

While provision of information — if carried out in

Box 4.2

Benefits of public and stakeholder participation for achieving WFD objectives

- There is a better chance that the **key water management issues** at the river basin level are correctly identified and agreed upon
- The **knowledge, experience, aspirations and concerns of local communities** are built into the River Basin Management Plans and Programme of Measures from the beginning
- The Programme of Measures is more likely to be politically and culturally **realistic and acceptable**
- Any potential **conflicts can be minimised or avoided altogether**
- **Implementation costs are likely to be lower** when existing stakeholder knowledge and know-how is applied to avoid potentially costly errors and/or duplication of information[17]
- There is a better chance that both **regulatory and voluntary approaches will be enforceable** if they have been developed in partnership with stakeholders (this point is closely linked with lower costs and improved conflict resolution/avoidance).

[15] Notably the 1998 'Århus' Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters.

[16] For the purposes of this publication, a distinction is made between 'public' and 'stakeholder' participation, to stress the differing mechanisms and approaches that are likely to be needed for (a) the general population living within an RBD, and (b) those individuals and organisations with a specific interest in water resource management.

[17] In a 1994 World Bank study, 42 participatory projects were compared with projects that did not have a specific participation component. While the initial costs of the participatory approach were found to be greater (e.g. more project design and supervision time needed), these were offset by benefits such as: increased uptake of services, decreased operational costs, increaed rate of return, and increased incomes for stakeholders. For details, see: http://www2.essex.ac.uk/ces/CommParticipation/ComPartPrinciplesnmethods.htm

an **open and timely** fashion — is an important **preparatory step**, actual participation implies a **dynamic, interactive process**. This relies on **building trust and confidence** that public/stakeholder views will be accommodated and **have a real influence** on development of RBMPs.

Similarly, 'consultation' may be conducted in a manner that provides **little or no opportunity for those consulted to have real involvement/influence in planning or decision-making processes**. Some of the **key benefits** to WFD implementation that can be derived from genuine participatory approaches are summarised in Box 4.2.

The WFD final deadlines require **public consultation** on the RBMP process to have been initiated by 2006. However, this is not a 'good practice' deadline and **early provision of transparent and accessible information**, together with **genuine opportunities for participation** in planning and decision-making mechanisms, increase the chances of ultimate success in achieving 'good water status'.

Therefore, **participation of stakeholders and the wider public should be prioritised from the start**, with carefully planned actions to demonstrate **early results for building and maintaining interest and commitment** (see also 'lessons learned' under 'Key Task 3' in Chapter 5).

In conclusion, public and stakeholder participation should be:

- Included in river basin planning and management from the beginning
- Adapted to the appropriate scale (i.e. the approach at RBD level will need to be different from that used to engage communities at the local level) and target group(s)
- Managed carefully, so that the capacity to meet commitments made is not exceeded
- Supported by adequate human and financial resources
- In the case of international RBDs, it will be important to ensure public and stakeholder participation from all countries.

Further participation 'conclusions' from the 'Water Seminar Series' are presented in Box 4.3.

The Bug River, Poland. Wictor Wolkow

Box 4.3

More participation 'conclusions' from the 'Water Seminar Series'[18]

- **A number of fundamental questions are not answered explicitly by the WFD text**, for example: 'What is the purpose of public participation?', and 'how should public participation be achieved in practice?' If implementation of Article 14 is not to be seen as superficial (i.e. consultation without any real engagement with stakeholders), it is essential that these questions are asked at the earliest stages of RBMP preparation and that technical guidance on participation be prepared in the framework of the WFD CIS. At the time of writing, a *Drafting Group on Public Participation had been set up by the Working Group on 'best practice in river basin planning'*.

- It is important to recognise that different components of 'the public' will have their own views, needs, priorities and expectations. In order to be successful, **information, consultation and participation processes need to be tailored for particular target groups**. These may include: the 'general public', NGOs, sectoral stakeholder groups within a river basin or sub-basin (e.g. farmers' associations), and local residents/water customers. Special interest groups might be expected to participate at a more **strategic level**, e.g. through representation in river basin advisory committees, whereas local communities are more likely to seek and value participation at the **field/action programme level** (link with cross-cutting principle of **'scale'**).

- Intelligent targeting of interest groups can also help to **reduce the danger of 'consultation fatigue'** where stakeholders feel overwhelmed by information and perceived bureaucracy. On the contrary, there should be tangible and demonstrable benefits for participants, beginning as early as possible, and running throughout the process to ensure continued engagement.

- Working with interest groups also raises issues of **legitimate representation**. In the interests of openness and democracy it is important that 'umbrella groups' clearly set out and justify the extent to which they are representative of a particular constituency.

- Participation does not just happen. On the contrary, it must be actively encouraged and **river basin authorities must be prepared to devote time to careful planning and to invest meaningful financial and human resources**. Such investment has the potential to be extremely cost-effective in terms of the benefits derived for WFD implementation.

- **Expectations must be managed carefully**. It is essential not to promise (or appear to promise) more than can be delivered. Otherwise, public interest and support will at best evaporate, or, at worst, be transformed into active hostility. In this respect, it is particularly important to distinguish between consultation and involvement at the planning phase, and consultation and involvement at the decision-making and implementation stages. It is also important to maintain a regular flow of 'deliverables'.

- **Expectations on all sides must be as clear as possible at the beginning**.

For additional discussion of public participation in the context of the WFD, see the paper *WWF's preliminary comments on Public Participation in the context of the Water Framework Directive and Integrated River Basin Management* downloadable in pdf format from the WWF European Freshwater Programme website: http://www.panda.org/europe/freshwater/initiatives/wfd.html

[18] For further details and specific examples, see especially the papers by M. Cals, J. Cuff, R. Hauser, and C. Woolhouse in the *Proceedings* of Seminar 3.

Capacity

Given the complex and challenging nature of the WFD, it is vitally important that capacity for actual implementation is maximised among all relevant actors. General elements of a capacity-building programme might include raising public awareness (e.g. to help secure broad support for the river basin management objectives), informal transfer of 'know how' (e.g. through exchange of experience between river basin managers), and formal training (e.g. in specialised monitoring techniques). However, the precise needs will vary from country to country and from river basin to river basin, *inter alia* according to differing socio-economic conditions, or the precise water management issues identified. The 'Water Seminar Series' highlighted:

- The need to build capacity (starting with awareness raising) among economic sectors and NGOs, as well as among officials, planners and administrators
- The special needs among the EU-Candidate countries of Central and Eastern Europe
- The need to enhance sharing of information and experience between countries, regions and river basins, with the internet providing valuable new opportunities
- The need to allocate adequate human and financial resources for capacity building activities in each RBD as part of overall WFD implementation.

The Odra River, Poland.

Special considerations for EU-Candidate countries

The five 'cross-cutting principles' for WFD implementation apply both to Member States and to EU-Candidate countries. However, they raise special considerations for the latter group. To ensure these considerations are taken into account, EU-Candidate countries need to be involved from the beginning in all preparatory activities and pilot testing for implementation of the WFD, notably those underway as part of the WFD CIS. Such involvement should not be limited to government experts but should also include stakeholders from these countries.

- **Integration**: The intensive work currently underway to meet the necessary policy and legislative requirements for becoming a Member State (the *acquis communautaire*) offers opportunities for integrated approaches between different sectors, for example between environment and agriculture. Specific issues related to transboundary integration/cooperation between Member States, EU-Candidate countries, and 'third countries' (e.g. Belarus, Russia, Ukraine, certain independent States of the former Yugoslavia) are highlighted in Chapter 5 (see p. 33).

- **Scale**: There are several extremely large river basins in Central and Eastern Europe, and **some** relatively intact river systems and wetlands when compared to the situation in Western Europe. This places a particular responsibility and resource burden on countries in the region, since special planning approaches (perhaps based on sub-basins) are needed to deal with large, transboundary river basins. Maintenance of existing large areas of semi-natural freshwater ecosystems also requires significant efforts, which have to be set against the context of rapid economic and institutional/legislative change and the need to tackle environmental 'hot spots' (e.g. severely polluted industrial sites) inherited from the past.

- **Timing**: Since the provisions of the WFD (including deadlines for compliance) will apply to EU-Candidate countries from the date of their accession, it is equally essential that implementation should begin as early as possible.

- **Participation**: In many of the EU-Candidate countries, there is not a strong tradition of public or stakeholder participation and even greater human and financial efforts may be needed to implement this element of the WFD effectively.

- **Capacity**: The countries of Central and Eastern Europe have strong technical and scientific traditions and a great deal of expertise to share. However, owing to the harsh economic conditions of recent years, a lack of investment means that the current capacity for mobilising this expertise is limited, as are access to 'state-of the-art' equipment and professional development opportunities. WFD implementation will therefore require special capacity building efforts, including financial support and training in governmental, NGO and commercial/economic sectors.

Chapter 5
Four 'Key Tasks' for implementing the WFD: Lessons learned and 'good practice' examples from the 'Water Seminar Series'

This Chapter develops in more detail four of the 'Key Tasks' required for meeting the objectives of the WFD:

Key Task 1:

'Set up River Basin Districts and appropriate organisational arrangements'.

Key Task 2:

'Identify and agree key water management issues'.

Key Task 3:

'Design Programmes of Measures and develop River Basin Management Plans'.

Key Task 4:

'Establish and maintain appropriate monitoring networks'.

The Chapter summarises the principal conclusions and lessons learned from the seminar presentations and discussions. It also takes into account any additional 'follow-up' inputs received from seminar participants. Under each 'Key Task', the **principal requirements of the WFD** are recalled using bullet points (for more detail, see Chapter 2). This is then followed by the main **seminar lessons learned**, with general text accompanied by boxed illustrations of specific **approaches**, **tools**, and '**good practice' examples** from different regions of Europe.

It must be stressed that only those 'Key Tasks' dealt with directly by the 'Water Seminar Series' are included here. Other prominent aspects of the WFD, such as the precise definition of environmental objectives, detailed characterisation of water bodies, or water pricing policies, did not form part of the seminar series agenda and are therefore excluded.

Each 'Key Task' must be carried out with constant and close attention to the **five cross-cutting principles** (*Integration, Scale, Timing, Participation, Capacity*) discussed in Chapter 4.

Floodplain grasslands in Slovakia. DAPHNE

WFD Key Task 1: 'Set up River Basin Districts and appropriate organisational arrangements'

WFD principal requirements

- Identify river basins
- Assign to River Basin Districts (or International RBD where relevant)
- Ensure appropriate administrative arrangements and identify competent authority
- Ensure coordination of WFD requirements for the whole RBD.

WFD Article 3 'Coordination of administrative arrangements within River Basin Districts'. See also provisions of WFD Annex I, Information required for the list of competent authorities, summarised on p. 53.

Towards implementation — selected questions for river basin managers[19]

- What is the process for getting agreement on RBD boundaries?
- Have groundwater and coastal waters been taken into account when defining RBD boundaries?
- Are there artificial connections between river basins that have to be taken into account when setting up RBDs?
- Who are the main stakeholders to be involved in setting up the RBD boundaries and authority? What process will be used to identify, inform and engage these stakeholders?
- Are there stakeholders outside the RBD boundary who nevertheless need to be involved (e.g. in the case of groundwater and coastal waters)?
- Are existing structures being used to best effect in setting up political, administrative and technical arrangements for the RBD? Are responsibilities clearly defined? What could be improved organisationally to meet WFD requirements?
- How can the necessary human and financial resources be mobilised to make RBD arrangements on paper effective in practice?
- Is the administrative structure at sub-basin level clear and transparent enough for the stakeholders who should be involved?

[19] Not all of these questions were addressed in detail by the 'Water Seminar Series', though they were flagged as key issues at the 'validation workshop' held near Brussels in August 2001.

Seminar 'lessons learned'

1. Identify river basins

- Groundwater and coastal waters must be assigned to the relevant river basin. This should be done at an early stage because of the additional technical complexities involved (in comparison with allocation of surface waters), such as delimitation of groundwater bodies.

2. Assign river basins to River Basin Districts

- There is a need for coordination between countries to ensure that **shared rivers** are allocated to the **same international RBDs** (e.g. France, Belgium and The Netherlands should allocate the transboundary river Escaut/ Scheldt/Schelde to the same international RBD).

- If the RBD is to be divided into sub-basins for operational purposes, the boundaries of the sub-basins, and/or the connections between them, must be clearly defined and taken into account in developing the RBMP.

3. Ensure appropriate administrative arrangements are established and identify competent authority

- There is a wide range of administrative approaches to river basin planning within Europe[20]. The WFD does not specify precisely the approach to be used, so governments are free to select the most appropriate mechanism for a given RBD. However, whichever arrangements are adopted, it must be certain that the institutional structure is capable of (a) delivering an effective[21] River Basin Management Plan **at RBD level**, and (b) ensuring its implementation **at RBD level**. This will clearly require continuous and effective coordination between sub-basins and the RBD authority.

- As a result, transboundary cooperation will often be required at one or more of the following levels:
  - Between regional governments within Member States
  - Between Member States
  - Between Member States and EU-Candidate countries
  - Between EU-Candidate countries
  - Between Member States and/or EU-Candidate countries and 'third' countries (see below for further discussion).

- The RBD authority should have a clear mandate, strong leadership and some key management principles for its operations. Without a clear, committed and result-oriented direction from the very beginning, there is a risk of inertia developing around internal systems and bureaucracy. The WFD represents a new paradigm in European water management and the RBD authorities must be ready to meet this challenge.

- **Existing structures, particularly those that have proved their effectiveness, should be used wherever possible to avoid duplication of effort and unnecessary expenditure.** However, it is important to recognise that existing structures may also need significant adaptation before they are capable of fulfilling WFD requirements.

- The RBD authority should have a clear and accessible entry/liaison point for public and stakeholder participation.

- Across Europe, there are many bilateral and multilateral intergovernmental and interregional cooperation mechanisms for water resource management. Box 5.1.1 provides examples of different approaches. Mechanisms should be developed to coordinate implementation of relevant agreements with the WFD.

[20] See paper by E. Mostert in Seminar 3 *Proceedings*

[21] i.e. A plan which, if implemented in full, will meet the WFD's environmental objectives.

Box 5.1.1

Examples of approaches to transboundary cooperation in River Basin Management Planning

In the case of two of Europe's largest river systems, the Danube and the Rhine, inter-governmental river basin Commissions have been established to coordinate policy and action within a common framework. The International Commission for the Protection of the Danube River, includes an Expert Group on River Basin Management. This Expert Group will be responsible for taking forward elements of the technical work required under the WFD, for example identification of the Danube RBD, coordinating analysis of the RBD characteristics, identifying pressures and impacts, and developing mapping and reporting procedures. However, given the scale of the challenges, it will be some time before the effectiveness of the ICPDR (and the International Danube River Protection Convention which it coordinates) can be assessed.

The International Commission for the Rivers Rhine and Meuse is longer established and has a series of impressive success stories to its credit. Recently, political consensus was achieved on a programme for the long-term management of the Rhine (the so-called 'Rhine 2020' programme). A shorter-term 'Action Plan' (running to 2005) has also been adopted under the programme. This process is being driven by the need for cost-effective flood management (including significant flood risk reduction) but, through taking an approach that works with nature — for example, restoration of floodplain wetlands — incorporates major biodiversity gains. The forecast financial investment from 1998 to 2020 is 18.7 billion Euros. For further information see the Seminar 2 *Proceedings* papers by T. Buijse and E. Wenger.

In other cases, specific agreements have been reached on a bilateral or trilateral basis. This is the case, for example, in the Prespa Basin, where a transboundary protected area has been established jointly by the governments of Albania, Greece and The Former Yugoslav Republic of Macedonia following an initiative of Greek NGOs (see paper by M. Malakou in *Proceedings* of Seminar 2). This will lead to development of a common vision and strategy in conjunction with stakeholders, and preparation of a Strategic Action Plan, trilateral management committee and trilateral monitoring scheme.

4. Identification of relevant stakeholders

As with all Key Tasks of WFD implementation, **public and stakeholder participation should be considered from the beginning**. Many solutions to water resource problems will be strategic in nature, requiring a 'whole river basin' (rather than local, or sub-basin) approach. The most important players at this strategic level of dialogue will be those that can really contribute to delivering solutions (e.g. water companies, wastewater treatment companies, environmental regulators), those that have technical expertise and are 'representative' of a particular consitituency (e.g. NGOs, research community) and those that pay for action (consumers). Thus, it is important to:

- Assess current and potential **roles, 'representativeness' and responsibilities** of stakeholders in the water cycle, and in the RBMP decision-making process
- Ensure that an appropriate structure and adequate resources are in place for developing stakeholder participation.

See also Chapter 4 for a discussion of participation as a cross-cutting principle.

5. Special considerations for EU-Candidate countries

The EU enlargement process, including support from relevant EU financial instruments such as 'Phare', will facilitate ever closer cooperation between Member States and EU-Candidate countries. Transboundary cooperation with other, so-called 'third' countries may be difficult owing to differing policy and legislative frameworks, financial problems, and strict controls of movements across the future external border of the EU (due to the creation of a common EU immigration and visa regime for all EU external borders).

Lake Peipsi, shared by Estonia and the Russian Federation, illustrates some of these issues (see paper in Seminar 3 *Proceedings* by G. Roll). EU financial instruments are not always well adapted for implementing environmental projects in EU-Candidate countries, where small municipalities lack the capacity to draft sound project proposals, or to find counterpart funding. The Lake Peipsi case study also concluded that, in 'future EU external border regions' the EU's 'Tacis' funding mechanism for work with countries of the former Soviet Union, should be better targeted to assist WFD implementation.

Challenges of coordinating funding for management of transboundary waters on the EU external borders (Tacis funding in Russia and other countries of the former Soviet Union; Phare, SAPARD and ISPA in the EU-Candidate countries), need to be overcome. A 'soft law' instrument, the UN/ECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki, 1992) is also relevant, but does not substitute the formal agreements sought between countries under the WFD.

The Vistula River, Poland. Ireneusz Chojnacki

WFD Key Task 2: 'Identify and agree key water management issues'

WFD principal requirements

- Analyse characteristics of each RBD (see p. 53-54 of this document for a summary of WFD Annex II provisions on RBD characterisation)
- Review impacts of human activities on surface waters and groundwater in each RBD
- Make economic analysis of water use within each RBD
- Make register of protected areas in each RBD
- Identify waters used for drinking water abstraction within each RBD
- Establish environmental objectives
- Identify key water management issues.

WFD Article 4 'Environmental Objectives'; Article 5 'Characteristics of the River Basin District, Review of the environmental impact of human activity and Economic Analysis of water use'; Article 6 'Register of Protected Areas'; Article 7 'Waters used for the abstraction of drinking water'. See also WFD Annex II (on characterisation of water bodies, reference conditions, identification of pressures, assessment of impact), Annex III *Economic Analysis*, Annex IV *Protected Areas*, Annex V (on status and monitoring for both surface- and ground-waters). The provisions of these Annexes are summarised in Appendix 1 of this *Practical Resource* document.

Towards implementation — selected questions for river basin managers

- What are the existing sources of relevant information at different scales (e.g. RBD, sub-basin, town, village, farm)?
- Can key water management issues already be identified on the basis of this information?
- What steps are needed to improve coordination of the current data gathering, storage and analysis capacity?
- What steps are needed to identify possible additional water management issues?
- What are the 'root causes' underlying these water management issues? How will these root causes evolve up to 2015? What will be the likely impact on the current key water management issues?
- What information is available on the main economic uses of water in the river basin? Is demand for these uses being met and managed sustainably?
- Which stakeholders have a particular role or interest in key water management issues for the RBD? Which have relevant expertise and information? Is there a communications/outreach strategy in place for engaging these stakeholders?
- How will the key issues be agreed or 'validated' with stakeholders?
- Have wetlands[22] (applying a broad definition of the term) been fully integrated into the process of water body identification and characterisation?
- Is the role of wetlands in the RBD and in key water management issues understood?

Seminar 'lessons learned'

1. Identify key characteristics of river basin

- Wetlands can contribute significantly to meeting the objectives of the WFD since they have a strong influence on water quality and quantity and play important roles in river basin functioning (see Box 5.2.1). The identification process for all surface-water and ground-water bodies within each RBD therefore needs to include wetlands and consequently there is a need for systematic wetland inventories. However, there are significant gaps in the current status of knowledge about Europe's wetlands, and it will be important to take measures to fill these gaps as part of WFD implementation.

- The analysis of key water management issues must take account of variability in supply and demand over time (e.g. droughts). This is particularly important for southern and eastern Europe.

- Adequate links with past and ongoing research initiatives should be established and/or strengthened to ensure that no important sources of information and technical data are overlooked.

The Firtina River, Turkey. Mehmet Altug

[22] According to the definition of 'wetland' established by the 'Ramsar' Convention on Wetlands and accepted by more than 125 governments throughout the world, including all EU Member States, 'wetlands' include: freshwater systems such as rivers, streams, lakes, ponds, marshes, and peatlands, as well as brackish or saline systems such as coastal lagoons, estuaries, shallow coastal waters and salt marshes.

Box 5.2.1

The role of wetlands in achieving 'good water status'

Wetlands are central components of the hydrological cycle, performing economically and environmentally valuable functions to regulate water quality and quantity and therefore contribute to reaching and maintaining 'good status'. However, available information indicates that 50% or more of Europe's original wetland resource has been lost (see the paper presented in Seminar 2 by Mike Moser). The sustainable management of wetlands (including restoration and rehabilitation where necessary) should therefore be a key element of river basin management plans. Among the specific functions and values of wetlands are:

- Groundwater recharge/discharge (wetlands are important areas for water to flow into or out from aquifers)
- Attenuation of flood peaks (wetlands delay runoff and store water which, following wetland drainage, then flows into streams and rivers much more quickly, increasing the risk of downstream flooding)
- Retention of nutrients (wetlands have a capacity, within limits, to act as natural 'filters' by storing nutrients in trapped sediment — see below — or in growth of aquatic vegetation. This helps to reduce eutrophication of water bodies)
- Sediment trapping (may help reduce nutrient enrichment of lakes and rivers, as well as limit human-induced increases in the suspended sediment load of naturally clear water bodies)
- Shoreline stabilisation (absorption and dissipation of wind or wave energy: can reduce erosion)
- High bioproductivity (e.g. due to regular inputs of nutrient-rich sediments)
- High biodiversity values (e.g. habitat for rare and/or highly specialised species)
- Provision of drinking water
- Provision of water for agriculture
- Provision of food supplies (especially fish)
- Provision of building materials (e.g. reeds)
- Provision of multiple recreational opportunities (e.g. swimming, boating, fishing, nature watching).

2. Review the impacts of human activities on all water bodies in the RBD

- Wetlands should be included as part of the waters for which impacts are assessed. Full account should be taken of the functions and values of wetlands within the RBD and the impacts of human activities on wetlands (see Box 5.2.2). Given the scarcity of information on wetlands in many countries, this may require significant data compilation work.

- Because agriculture is the dominant land use in terms of surface area in the EU as a whole[23], it has a significant influence on water quality and quantity (see Box 5.2.3). Indeed, the extent, type and intensity of agricultural land use may crucially affect whether the environmental objectives of the WFD can be met within the stipulated time frame. Gathering and assessing information on the impacts of agriculture should therefore be a top priority[24].

- The **root causes** or 'driving forces' behind the impacts/pressures identified (e.g. water policy versus CAP, water policy versus Regional Policy) should be analysed. Opportunities for influencing root causes in ways which will assist WFD implementation, and ensure that the Programme of Measures can deliver WFD objectives within the required time frame, should be sought. This may involve identification of thresholds or targets for socio-economic factors that need to be pursued through appropriate sectoral policies and instruments, but also in the overall context of river basin planning. River basin planners may also undertake a dynamic analysis (perhaps using models) taking into account trends/evolution in root causes and the likely effects of these on the impacts identified (see Appendix II.4).

- It is important to ensure that both surface- **and** ground-water bodies **and their interactions** are taken into account when reviewing the impact of human activities within an RBD.

- In the context of the EU Accession process and transition to market economies, the challenge is to safeguard the last-remaining, large, semi-natural river and wetland complexes in Central and Eastern Europe (e.g. the Danube Delta shared by Romania and Ukraine, or Biebrza in Poland). At this time of very rapid change, it is also crucial to seek opportunities for restoration and rehabilitation. Some of the special considerations for the region are summarised in Appendix II.1.

[23] See the following section of the European Environment Agency web site for information on agriculture and the environment: http://themes.eea.eu.int/sectors_and_activities/agriculture

[24] Agriculture and water was singled-out as the theme of one of the three 'Water Seminars' for the reasons given above. However, as shown in Box 5.2.2, agriculture is by no means the only economic sector which has major adverse impacts on water and wetlands.

Box 5.2.2

Key factors causing wetland loss and degradation

Agriculture	Drainage Dyke construction Fertiliser and pesticide use Water abstraction for irrigation Landscape simplification
Forestry	Conversion of meadows Replacement of natural and semi-natural riparian forests with intensive plantations
Transport	Navigation channels Road and railway construction Drainage and dyking Landscape fragmentation
Energy	Hydro-electric power dams Electricty lines Power stations Mining (see extractive industries below)
Tourism & recreation	Floodplain development Leisure navigation Localised damage to habitats due to pressure of use
Urban & industrial development	Construction of dams and dykes to protect infrastructure Drainage of land for new development Waste disposal/pollution Ground- and surface-water abstraction
Extractive industries	Gravel extraction Toxic mining waste
Climate change	Erosion due to sea level rise Changing rainfall patterns

Source: Seminar 2 *Proceedings*, paper by J. Madgwick and T. Jones.

Box 5.2.3

Impacts of agricultural practices on aquatic ecosystems

Agriculture[25] is a major water user in the EU, accounting on average for about 30% of total water abstraction across the 15 Member States. However, the figures for individual Member States vary widely from north to south, rising to 80% in the case of Greece and Spain due to the extent of irrigation. There is also considerable variation within countries, according to local differences in land use, climate and rock/soil types. Agriculture also has significant impacts on the **quality** of both ground and surface waters due, for example, to runoff of fertilisers and pesticides which may find their way into streams and rivers, or into underground aquifers.

Principal adverse impacts of agriculture practices on water systems:

Impacts on water quantity

- **Surface water and groundwater depletion**, due to over-abstraction for irrigated agriculture, may lead to loss or degradation of wetland ecosystems and threaten drinking water supplies as well as the longer-term sustainability of agriculture.
- **Reduced groundwater recharge and increased downstream flood risk** are just two of the impacts from extensive drainage and water course regulation to increase availability of agricultural land.
- **Significantly altered evaporation patterns** due, for example, to drainage of surface water or change in vegetation cover, which may influence rainfall.

Impacts on water quality

- **Eutrophication** of surface waters and groundwater due to diffuse runoff from phosphate-rich fertilisers. Increased nutrient levels encourage algal growth, resulting in oxygen depletion and lower light penetration in the water column. This has adverse impacts on the functioning of aquatic ecosystems and may endanger human health if a toxic algal 'bloom' occurs.
- **Nitrate pollution** of surface and groundwater, again resulting from diffuse fertiliser runoff, promotes eutrophication, particularly in estuaries, and may exceed the thresholds for human consumption set by the Drinking Water Directive (80/778/EEC, revised as 98/83/EEC) which forms an integral part of the WFD.
- **Salinisation** (excess accumulation of salts in the soil profile) and **sodisation** (a process that causes swelling of clay particles and reduced infiltration capacity) due to transport of salts by irrigation water in naturally arid or semi-arid regions. This results either in land becoming too saline to support crops, or in the need for consumption of even greater quantities of water to 'flush' salts from the soil.
- **Toxic pollution** of surface and groundwater due to runoff of pesticide residues. The maximum permitted concentration — in other words, the minimum environmental standard to be met by Member States — is set by the Plant Protection Products Directive (91/414/EEC, as extended by

[25] 'Agriculture' is not a single stakeholder, but covers a diversity of very different stakeholders, for example, ranging from farmers, to supermarkets, to manufacturers of plant protection products.

Directive 97/57/EEC) and by the Drinking Water Directive, implementation of which forms an integral component of the WFD.

- **Point-source pollution** of surface water and/or groundwater bodies, including accidental spillages of agricultural chemicals and slurry.

- **Increased runoff**. There is increasing evidence that changes in land use (e.g. conversion to winter-sown cereals) can increase runoff and exacerbate flooding. This is due *inter alia* to the removal of permanent vegetation cover and the compaction of soil by machinery.

- **Increased sediment loads** resulting from soil erosion (in turn due to poor cultivation practices and/or over-grazing), and runoff into water courses and lakes. Greater turbidity may damage fish stocks, while shallow aquatic ecosystems suffer from accelerated infilling and vegetation development.

- **Increased microbe loads** resulting from the bacteria and viruses present in organic material such as manure.

Impacts on aquatic ecosystems

- **Direct loss of habitats and species** due to simplification of landscape and hydrology (e.g. by regulation of water courses and drainage of wetlands).

- **Indirect effects** due to the impacts of fertilisers, pesticides and herbicides (e.g. loss of aquatic vegetation or fish resulting from eutrophication).

These impacts have been greatest in areas where agricultural land use has been most intensive, particularly within existing EU Member States, but also in parts of most EU-Candidate countries. Some areas of Central, Eastern, Mediterranean and northernmost Europe remain relatively unaffected. It will be important to ensure that future agricultural development in these regions remains compatible with delivering WFD environmental objectives.

It is also important to remember that **future patterns of agriculture and water use** are liable to both **influence, and be strongly influenced by, climate change**. Plans to further irrigate semi-arid areas in the south of the EU through the development of costly and high-impact water infrastructure may not only increase salinisation and sodisation, leading to desertification (see Seminar 1 Proceedings paper by E. Sequeira), but also be impracticable if the capacity of the donor river basin or water body has not been adequately established.

The positive role of agriculture

As has been demonstrated, agriculture is a major influence on the management of water resources across Europe. However, it would be wrong to suggest that these influences are all negative. The seminar series showed several examples of farmers working together with water managers to achieve an appropriate balance between agricultural land use and the need to use water resources sustainably.

See Boxes 5.2.4 and 5.3.1, and Appendices II.1, II.3, II.5, II.7 and II.8 for further information.

3. Carry out economic analysis of water uses

- Include wetlands (e.g. economic value of services provided by wetlands, socio-economic benefits, see Box 5.2.1). Wetlands are an integral component of the water cycle and the natural functioning of aquatic ecosystems provides economically important goods and services relating to water quality (e.g. nutrient retention) and quantity (e.g. groundwater recharge; attenuation of flood peaks). The economic analysis of water use in each RBD should therefore incorporate the economic value of services provided by wetlands and/or a way of estimating their socio-economic benefits.

- Ensure that economic impact and pressure analyses are integrated as far as possible, so that the economic and environmental consequences of specific pressures can be dealt with together when identifying key water management issues.

4. Establish the environmental objectives for all water bodies

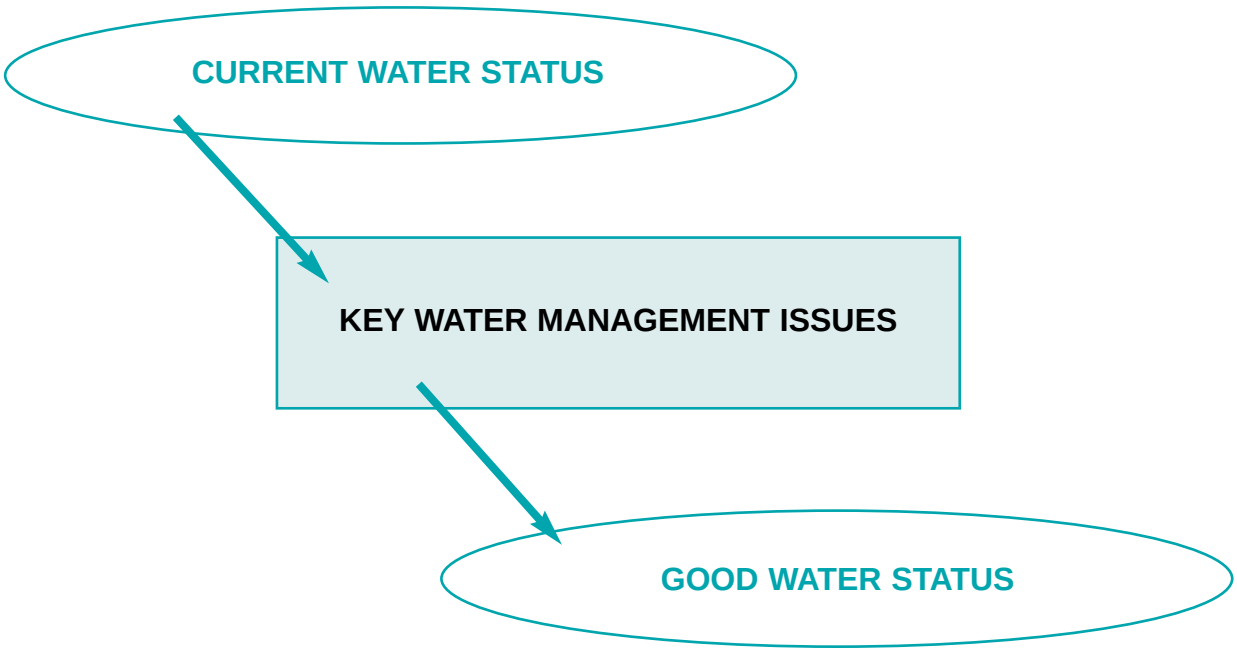
- While some of the existing groundwater and surface water status characterisation parameters can serve as a 'proxy' for *good wetland status*, it would be much more preferable to define 'good status' for wetlands, with corresponding guidelines, standards and indicators. This issue needs further development in the framework of the WFD CIS.

5. Identify the key water management issues

- Based on the results of the steps outlined above, the key water management issues **and the scale (geographical/hydrological) at which they need to be tackled** should be identified.

6. Ensure involvement of stakeholders

- Stakeholders have a crucial role to play in this process by providing information, expertise, validation etc. However, it must be recognised that stakeholders have a much greater role than simply being sources of information.



'Key Water Management Issues' are those factors that need to be addressed by River Basin Management Plans in order to move from the 'current status' of a water body to the 'good status' required by the Water Framework Directive. Even if the current status is good, there will still be key water management issues for maintaining that status.

Box 5.2.4

Economic analysis of nutrient retention by floodplain meadows — a wetland rehabilitation project in the Slovak Republic

The Morava River is one of the main tributaries of the Danube, extending for some 328 km. Its lower reaches pass through Austrian (right bank) and Slovak (left bank) territory, with the former 'iron curtain' having provided some incidental protection from intensive land use. Nevertheless, of the original 160 km^2 of floodplain on the Slovak side, only about 25% remains, with much of this being under arable agriculture.

Indeed, GIS analysis of historical maps showed that the area of arable land in the functional floodplain had doubled between 1920 and 1999, leading to a corresponding 50% reduction in semi-natural meadows. It was already known that this had led to serious declines in flora and fauna, but it was also suspected that the nutrient abatement value of the floodplain meadows (through cutting and removal of hay 'fertilised' by Morava floodwater) had been impaired.

Research presented by J. Seffer in Seminar 2 demonstrated that traditional meadow management[26] in the lower Morava floodplains had an indicative nitrogen retention value of 434 tonnes per year, due to the removal of nitrogen incorporated into plant growth. This is equivalent to the yearly nitrogen production of 216,000 people. The monetary value of the natural nutrient removal by the floodplains is therefore equal to the operating cost of a wastewater treatment plant for a city of 216,000 citizens — approximately 700,000 Euros per year. Moreover, the initial cost of building such a treatment plant would be around 7 million Euros. These conclusions provided a powerful economic argument in favour of meadow restoration, with proposals being developed for restoration of 140 ha of former arable land. Cumulative cost-benefit analyses show an operating profit within three to six years, depending on whether an optimistic or pessimistic scenario is modelled. The overall economic investment required is far below that for conventional water treatment.

In addition, ongoing restoration of the Morava meadows is providing multiple benefits for biodiversity conservation (enhancing the status of habitats and species which have declined across Europe because of conversion of hay meadows to intensive pasture or arable land), flood storage (re-establishment of a more natural flood regime) and tourism/recreation (using the attractiveness of the wetland landscape to attract visitors for hiking, cycling etc). Farmers producing hay from the Morava meadows find a ready market across the border in Austria, where the demand for organic products is not currently satisfied by domestic production.

Source: Seminar 2 *Proceedings*, paper by J.Seffer.

[26] i.e. cutting and removal of a hay crop in summer, followed by late summer/autumn grazing, without the use of chemical fertilisers.

WFD Key Task 3: ‘Design Programmes of Measures and develop River Basin Management Plans’

WFD principal requirements

- Establish the Programme of Measures needed for each RBD to meet the WFD’s environmental objectives. Include compulsory ‘basic’ measures (as set out in Article 11) and optional ‘supplementary’ measures (such as those listed in part B of WFD Annex VI *Lists of Measures to be included within the Programmes of Measures*).

- Review and update the Programme of Measures by the end of 2015 at the latest and every six years thereafter.

- Produce a River Basin Management Plan (RBMP) for each River Basin District (RBD) including the information detailed in WFD Annex VII *River Basin Management Plans* (with the option to supplement RBMPs using more detailed programmes or plans for sub-basins or sectors).

- Publish RBMPs by end of 2009 at the latest, review by end of 2015 and update every six years thereafter.

WFD Article 13 ‘River Basin Management Plans’. WFD Article 11 ‘Programme of measures’. See also WFD Annexes VI *List of Measures to be included in the Programme of Measures* and VII *River Basin Management Plans* — summarised on p. 55.

Towards implementation — selected questions for river basin managers

- Which actions can be implemented immediately, on the basis of **existing** knowledge and know-how?

- Have all relevant existing processes, programmes, plans and structures been identified? How can these best be used to deliver WFD requirements? For example, what opportunities are there for adapting existing flood protection measures to help meet the objective of ‘good status’?

- Have interactions with stakeholders and the wider public been appropriately planned — and human and financial resources allocated — to ensure their effective participation in the development of the Programme of Measures and RBMP?

- Has a range of alternative measures been systematically proposed and assessed for each water management issue, taking into account technical feasibility, cost-effectiveness and the possible impact of the proposed measures on sectors other than water management?

- Are roles and responsibilities for implementing and enforcing (when necessary) agreed measures clearly defined and communicated?

- Have issues that need to be addressed beyond the RBD boundaries (e.g. agricultural policy,

climate change) been identified and communicated to the most appropriate bodies?

- Do the RBMP and Programme of Measures take into account uncertainties over long-term factors such as climate change?
- What capacity building measures are required to ensure that planners and managers within the RBD remain up-to-date with evolving 'good practice' approaches and tools?

Seminar 'lessons learned'

1. Establish Programmes of Measures

- It is better to start early and imperfectly, building on what already exists, and seeking to follow a 'good practice' approach to ensure compliance with WFD final deadlines and the achievement of 'good status'.
- There is a need for some early demonstrations ('easy wins') of the positive effects of good planning, particularly to maintain the faith of stakeholders in the process.
- While a range of possible measures should be investigated and analysed systematically, it is important to identify what can realistically be addressed at RBD level and what should be tackled elsewhere, e.g. through changes to sectoral policies.
- Groundwater, coastal waters and wetlands must be covered systematically by the Programme of Measures and the RBMP.
- If Programmes of Measures are developed for sub-basins for practical reasons of scale, coherence and coordination of measures at RBD level must be ensured.
- Measures that need a medium- to long-term approach should be identified and clearly separated from those which could be successful in the shorter term. This will help prioritisation of resources and allocation of responsibilities.
- In view of the economically and ecologically valuable services provided by wetlands and the contribution that these can make to meeting WFD objectives, wetland conservation and rehabilitation/ restoration (see Box 5.3.2) should be systematically considered when designing the Programme of Measures.
- As for other Key Tasks, the unique knowledge and perspectives of stakeholders should be built into designing the Programme of Measures from the earliest possible stages. This will also help to test the likely socio-economic impacts and acceptability of proposed measures.
- Both socio-economic and environmental parameters (e.g. the likely impact of planned measures on the status of water bodies) should be built into the assessment of options for the identification of the most cost-effective set of measures (e.g. using multi-criteria analysis).
- The Programme of Measures should be coordinated with other water and land-use planning processes and funding mechanisms. This may have significant financial benefits, in addition to improving effectiveness of WFD implementation.

Box 5.3.1

Measures for integrating agricultural practices and sustainable water management

The Seminar on 'Water and Agriculture' recognised that there are many possible measures that can be taken at national, sub-national or river basin level to minimise the adverse impact of agriculture on groundwater and surface water. However, it was also recognised that the most important step — further reform of the Common Agricultural Policy (CAP) to favour sustainable rural development rather than provision of production-based payments and subsidies — must be taken at EU level; also recognising that some agricultural commodities are external to the CAP and/or greatly influenced by markets. The Structural and Cohesion Funds and equivalent pre-Accession measures also support intensive farming methods (e.g. via funding of major water infrastructure for irrigation).

Legislative, institutional and administrative instruments

- **Designations under EU legislation**, e.g. Environmentally Sensitive Areas, Nitrate Vulnerable Zones, Natura 2000 sites.

- **Implementation of the new EU Strategic Environmental Assessment Directive** (2001/42/EC) which sets a minimum assessment framework for preparation of plans in a range of sectors, including water management.

- **National and local protected area designations** for:
  – Protection of drinking water supplies
  – Conservation of landscapes, habitats and/or species.

- **Mandatory codes of good agricultural practice** such as required under the Nitrates Directive for reducing the quantity of fertilisers leached from farmland.

- Whole **farm nutrient management plans** (either on their own) or as part of farm 'water auditing', contribute not only to achieving environmental objectives but also to reducing farm costs by cutting the quantities of chemical inputs, notably fertilisers, used.

- The use of **cross compliance** introduced under the **'Agenda 2000' reform of the CAP** enables Member States to attach environmental conditions to payments under the CAP. This can be used to ensure that certain environmental standards are met, contributing to the achievement of good status.

- Agenda 2000 also introduced the **Rural Development Regulation** (RDR) which states that "a prominent role should be given to agri-environmental instruments to support the sustainable development of rural areas and to respond to society's increasing demand for environmental services". For the period 2000–2006, the RDR will account for about 10% of annual CAP spending. Member States have discretion in selecting which of the **Rural Development Measures** set out by the RDR they wish to apply. Thus, while several are especially relevant for WFD implementation, their actual use may depend largely on political will and level of awareness among decision makers. The RDR also lays great stress on the socio-economic importance of diversifying income opportunities among farmers, as a means of supporting greater stability for rural communities. Member States should be encouraged to apply the full range of options available to maximise synergy between environmental and socio-economic aspects of the RDR.

- Use of **Leader+** and **Interreg** initiatives under the Structural Funds. Leader+ aims to encourage innovative actions for sustainable rural development, including those related to natural and cultural heritage, through investment of 2.2 billion Euros over six years. Interreg supports cross-border, transnational and interregional cooperation for sustainable development, with a budget approaching 5 billion Euros for the period 2000–2006.

Voluntary agreements

- Voluntary codes of good agricultural practice can help to reduce soil erosion and runoff of fertilisers and biocides, and help avoid drainage or infilling of landscape features that play an important role in regulating water quantity and quality (e.g. small marshes, streams and ponds). BUT to be successful, these codes of practice must be designed with farmers' involvement to ensure that they are readily understood and voluntarily supported by farm owners/managers and farmers' associations (see Appendix II.5 for example from Lower Saxony, Germany).

- Voluntary agreements are more successful if they incorporate clear socio-economic benefits, for all those involved, beyond compliance with environmental legislation (see Appendices II.5 and II.8).

- Furthermore, regulators, consumers, retailers and NGOs are all important driving forces for the initiation and successful application of codes of practice. This means that education/training and awareness raising — as they relate to such codes — should be given high priority. For example, in the UK, the Scottish Wild Rivers project[27] and the Westcountry Rivers Trust[28] have achieved a tremendous amount by demonstrating to farmers that minimising fertiliser and pesticide use can save them money as well as help maintain aquatic ecosystems.

Economic or fiscal instruments

- Water pricing that reflects the true cost of providing water for agricultural use would enhance the adoption of more efficient, less polluting practices, thereby reducing water wastage and pollution, as well as overall pressure on water resources.

- Payments to encourage low-impact farming methods in sites designated at EU level, e.g. Natura 2000 sites.

- Financial measures to encourage low impact farming methods in the wider countryside — for example the German and UK Governments have recently stressed the importance of transferring more CAP funding towards sustainabale rural development.

- The paper presented by A. Garrido in Seminar 1 discussed options for applying economic instruments for management of water resources in the irrigated agriculture sector of Mediterranean EU Member States. Four different categories of economic instruments were analysed:

  – Pricing policies (very few examples in the region)
  – Water trading (i.e. allowing irrigators to buy or sell water rights)
  – Water rights adjustments (i.e. amending the volume of water that each farmer is permitted)
  – Financial incentives to adopt more efficient technology/infrastructure (proven to be the most widely supported option by most analysts).

  It was concluded that a balanced mix of different instruments is not only desirable, but necessary to help each individual instrument achieve its potential.

[27] See http://www.wwf-uk.org/rivers/page1.htm

[28] See http://www.wrt.org.uk

Box 5.3.2

Wetland restoration, rehabilitation and creation

Wetland **restoration** is the re-establishment of wetland areas that have been lost due to (for example) infilling or drainage. In order for wetland restoration projects to be truly valuable for river basin management, it is essential that the focus is on ecological restoration (i.e. restoring the natural functioning of the wetland) rather than on restoration of surface area alone. **Rehabilitation** refers to the process of improving the functioning of a wetland that has become impaired as a result of human impacts (e.g. reducing nutrient levels to tackle problems of eutrophication).

In some cases, for example to provide 'green' treatment of waste water, artificial wetlands are constructed or **created** in areas which have always been dry (at least in historical times). For examples of wetland restoration projects, see the websites of WWF's EFP (http://www.panda.org/europe/freshwater/initiatives.html) and the European Centre for River Restoration (http://www.ecrr.org/)

The Integrated Rhine Programme (IRP) of the German Federal Land of Baden-Württemberg contributes to the 1998 'Flood Action Plan' agreed by the International Rhine Commission. River regulation projects in the 19th and 20th centuries led to the loss of 90% of the functional Rhine floodplains between Basel (Swiss/German/French border) and Karlsruhe. This caused higher and more rapid flood peaks in the main Rhine channel, and a significantly increased flood risk for some 95 towns and municipalities in Baden-Württemberg. It is calculated that the cost of a major flood event in the region could exceed 12 billion DEM. At the same time, the loss of floodplains resulted in severe loss of aquatic and wetland biodiversity. The IRP aims to restore sustainable flood protection through the creation of flood storage areas (designed to be as ecologically beneficial as possible) and restoration of floodplain wetlands (with an emphasis on reconnecting the links between the river and the wetlands, as well as between areas of high ecological value). Thus, the restoration project will have multiple benefits, helping to reduce the risk to life and property (including the likely financial cost of future flood events), and making significant contributions to the conservation of floodplain habitats and species.

Source: Seminar 2 *Proceedings*, paper by E. Rosport.

2. Prepare and publish RBMPs

- The River Basin Management Plans required by the WFD are strategic in nature but action-oriented and focused on attaining environmental objective of 'good status'. It is essential that the difference between 'planning' and actual 'management' is emphasised throughout the process; plans are of little value if they merely gather dust once they have been published.

- In many parts of Europe, river basin planning is not a new approach. As with other 'Key Tasks' the emphasis should be firmly on bringing together existing structures to deliver the requirements of the WFD. Examples of some ongoing initiatives are given in Appendix II.6.

- RBMPs can and should provide the basis for increased coherence of sectoral policy (e.g. cross compliance[29] in agriculture) and structural policies (e.g. prioritising allocation of funds for infrastructure projects that will help meet WFD objectives).

[29] See Box 5.3.1 for further information on cross compliance.

- While RBMPs might demonstrate the need for changes in sectoral policies, it is important to recognise that such policy changes might have to be undertaken at national or EU levels and so be beyond the direct control or influence of actors within the RBD.

- Existing EU financial instruments (from agri-environmental funding, to ISPA, Phare and Leader+) should be used wherever possible for implementing RBMPs — this is particularly true for the EU-Candidate countries of Central and Eastern Europe, where the WFD can be used as a rationale for cost-effective use of scarce resources.

- It is crucial to ensure that RBMPs are used as a means for promoting opportunities for sustainable water management offered as part of sectoral policies (e.g. cross compliance in agriculture) and structural policies (e.g. allocation of funds to initiatives that contribute to meeting WFD objectives).

Little ringed plover, a typical breeding bird of riverine shingle banks. Wedkarski Swiat

WFD Key Task 4: ‘Establish and maintain appropriate monitoring networks’

WFD principal requirements

- Establish monitoring programmes/networks needed for a coherent and comprehensive overview of water status including wetlands within each RBD
- Cover both surface-water and ground-water bodies, as well as coastal waters
- Include ‘surveillance’, ‘operational’ and ‘investigative’ components
- Additional monitoring for protected areas.

WFD Article 8 ‘Monitoring of surface water status, groundwater status and protected areas. See also WFD Annex V (dealing with water body status, monitoring etc.) — summarised on pp. 54-55.

Towards implementation — selected questions for river basin managers

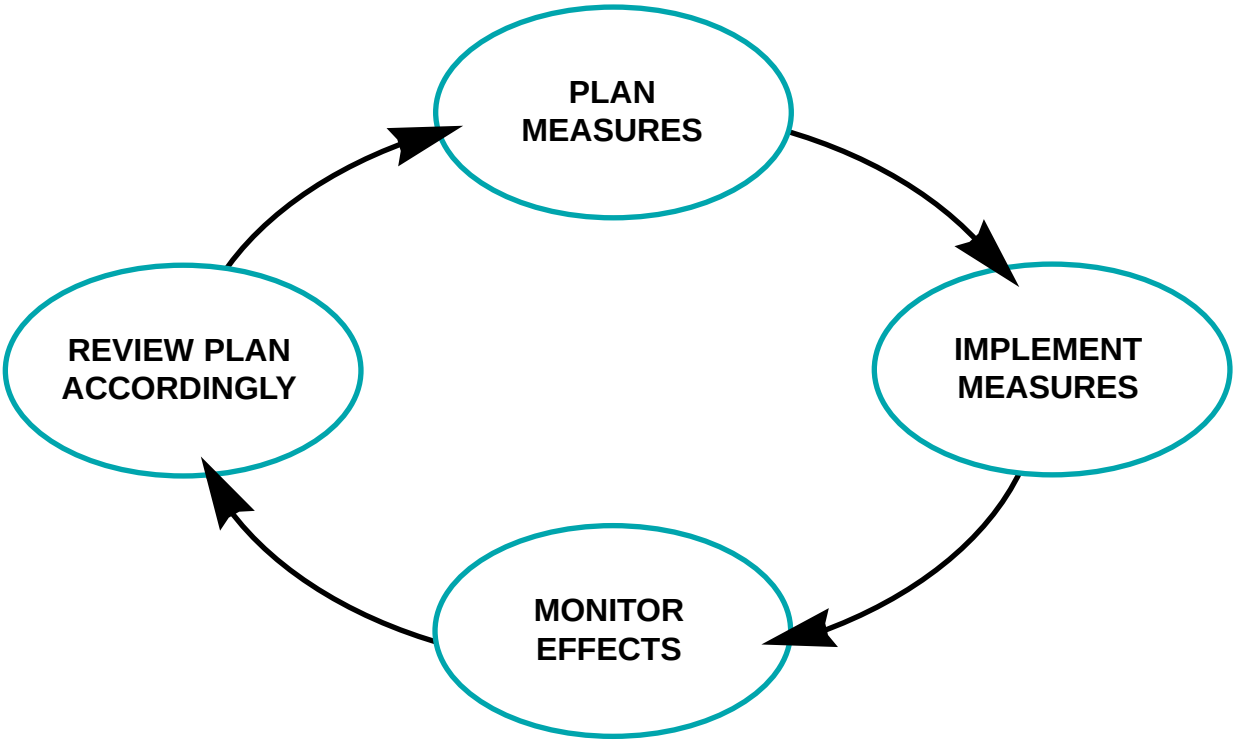
- Is existing monitoring adequate for meeting the purpose of WFD Article 8 *Monitoring of surface water status, groundwater status and protected areas*? How representative is the existing monitoring network of the RBD as a whole?
- Is there adequate monitoring at sub-basin level?
- Are wetlands and groundwater being adequately monitored and integrated into an overall monitoring framework?
- Are the impacts of agriculture, especially diffuse pollution, being adequately monitored and integrated into the overall monitoring framework?
- What mechanisms exist for coordinating different sources of relevant monitoring data? How can they best be used? What changes are needed?
- Are monitoring parameters/standards/criteria compatible/comparable across boundaries (whether between sub-basins within one country, or across international boundaries)?
- Has the use of data from monitoring been considered to identify the underlying **pressures** (‘root causes’), and consequent quality and quantity **impacts**?
- Does the monitoring system serve as an **early warning mechanism** for detecting negative changes in water quality or quantity? (i.e. is a problem identified in time to implement a solution before environmental or socio-economic damage occurs?)
- Have adequate resources for monitoring been allocated?
- What are the capacity-building requirements to ensure that monitoring in the RBD evolves in line with changing technology and ‘good practice’?

Seminar 'lessons learned'

Establish monitoring programmes/networks needed for a coherent and comprehensive overview of water status including wetlands within each RBD

Effective monitoring is an essential component of 'good practice' in river basin planning and management, and a central element of measuring progress in WFD implementation:

- Work on establishing monitoring networks (including evaluation of existing monitoring) must be carried out at an early stage of WFD implementation.
- Monitoring data for wetlands are extremely variable across Europe, with little or no coordinated data available in some countries. Steps should be taken to correct this deficit if necessary.
- Steps should be taken to establish the level and type of monitoring needed for maintaining an overview of changes in pressures and impacts, which may reflect shifts of root causes.
- Existing data — held by different governmental and non-governmental bodies (e.g. water supply companies, environmental agencies, conservation NGOs, local municipalities) — should be sought out and used as much as possible. It is important to ensure that data set 'links', are in place to provide the integration and/or aggregation of information needed for effective river basin planning and management.



Monitoring enables river basin managers to assess the effectiveness of the Programme of Measures implemented and to adjust those measures accordingly. It is important to see planning, management and monitoring as part of a continuous cycle.

Chapter 6
Conclusions

The 'Water Seminar Series' confirmed the wide-ranging interest and commitment shown at all levels by the European water 'community' for effective implementation of the Water Framework Directive. This is recognised as a significant challenge in view of the complexities involved in establishing integrated river basin management and achieving the environmental objectives of the Directive.

What has been learnt from the process of case-study presentations, discussions and other interactions can be summarised as follows:

- Integration, scale, timing, participation and capacity are fundamental cross-cutting principles for effective integrated river basin planning. They need to be considered systematically at every stage leading to the adoption and implementation of river basin management plans.

- The existence and enormous importance of these cross-cutting principles are not theoretical; they have been demonstrated through real-life situations and 'validated' by consensus between the wide range of experts and stakeholders mobilised for the 'Water Seminar Series'.

- A particular challenge remains; namely, reconciling WFD 'minimum compliance' deadlines, with the 'good practice' approaches that need to be followed for ensuring the development of effective and integrated river basin management plans capable of delivering the environmental objectives of the WFD. A first attempt has been made in this document to highlight some key areas where special attention to this issue is needed.

- The findings set out in this publication need to be taken further, building on the 'Water Seminar Series' process and 'lessons learned'. This will be especially important in the context of the Common Implementation Strategy (CIS) developed by the Member States and the European Commission and the guidance documents to be developed by the various CIS working groups. National implementation strategies and guidance developed by stakeholders or NGOs will also make an important contribution.

Implementing the WFD will always remain a challenging and complex task. However, the many initiatives launched so far, at a range of different levels, promise much for the future of water management across Europe.

The Vistula River, Poland. Ireneusz Chojnacki

Appendix I
Provisions of the WFD Annexes

The WFD has **11 Annexes setting out in much greater detail the steps required under each of the Directive's Articles**. The Annexes are complex and highly technical in places, with **numerous cross-references** between Annexes, to corresponding WFD Articles, and to other relevant Community legislation. Thus, while implementation of the WFD depends crucially on full understanding and interpretation of the Annexes, they may be difficult for non-expert stakeholders to use. It is hoped that the following summary will prove valuable.

Annex I *Information required for the list of competent authorities*, sets out the information required from Member States for the list of competent authorities for each RBD, stressing that, where possible, data on RBD boundaries and principal rivers should be provided using Geographical Information System (GIS) software.

Annex II (together with Annex V — see below) forms the technical and scientific basis of the WFD. It is untitled, but deals with water body characterisation and related issues.

For surface water bodies, Annex II requires:

- Characterisation of all surface water bodies through allocation of each individual water body to one of the following categories: (a) rivers, (b) lakes, (c) transitional waters, (d) coastal waters, (e) artificial surface water bodies, (f) heavily modified surface water bodies.

- Differentiation of water body types within each of the categories above, using either of two typologies. These are set out in this Annex.

- Establishment of "type-specific reference conditions for surface water body types", using hydrological, physical, chemical and biological parameters to describe the expected condition of the relevant water body type under 'high ecological status' (as defined in Annex V). This basically means describing in scientific terms what the water body would be like under 'natural' conditions, with no human impacts.

- Identification of significant human pressures on surface water bodies within each RBD, including *inter alia*: (a) urban, industrial and agricultural point source and diffuse pollution — particularly substances listed in Annex VIII; (b) water abstraction for urban, industrial, agricultural and other uses; (c) water flow regulation, including transfers and diversions; (d) morphological alteration of water bodies. Land use patterns must also be described.

- Assessment of the susceptibility of surface water bodies to the pressures identified; i.e. the likelihood that, due to human impacts, the water body will fail to qualify as having 'good status' by 2015.

For groundwater bodies, Annex II requires:

- Initial characterisation of all groundwater bodies "to assess their uses and the degree to which they are at risk of failing to meet the [environmental] objectives for each groundwater body" (Annex II sets out elements to be included in this 'initial' characterisation).

- Further characterisation of those groundwater bodies identified as being 'at risk' to help identify appropriate actions to include in the Programme of Measures.

- Review of the impact of human activity, but **only** for groundwaters that either cross boundaries between Member States, or have been identified as being at risk. This should include,

where relevant, the location of water abstraction and discharge points (together with information on quantity and quality of water abstracted), and information on land use in the groundwater recharge catchment (including pollution inputs and flow alterations such as water diversion, damming and drainage).

> **Note**: The establishment of common principles and practical guidance for implementing elements of this Annex fall under the remits of WFD CIS Working Groups on *'Analysis of pressures and impacts'; 'Reference conditions for inland surface waters'; 'Typology of transitional, coastal waters'; 'Geographical Information Systems'; 'Intercallibration';* and *'Tools on assessment, classification of groundwater'*.

Annex III *Economic analysis*, states that the economic analysis required by Article 5 "shall contain enough information in sufficient detail" for (a) applying the principle of recovery of costs of water services (taking into account long-term forecasts of supply and demand in the relevant RBD); and (b) judging the most cost-effective measures relating to water use (to be included in the programme of measures for the RBD).

> **Note**: The establishment of common principles and practical guidance for implementing the provisions of this Annex fall under the remit of the WFD CIS Working Group on *'Best practice in river basin planning'.*

Annex IV *Protected Areas*, lists five types of Protected Areas to be included in the register for each RBD established by Article 6. It also requires Member States to map the location of each Protected Area and to identify the relevant Community or national legislation under which it has been designated.

Annex V (untitled) is lengthy and complex. Basically, it sets out the criteria to be used for assessing **surface water 'ecological status'** and **groundwater 'quantitative status'**, together with the corresponding **monitoring programmes and reporting procedures** required.

For surface water bodies Annex V covers:

- The scientific/technical parameters, definitions and standards to be used for the classification of ecological status ('high', 'good' or 'moderate') for each of the surface water body types identified in Annex II (including high, good or moderate ecological **potential** for artificial or heavily modified water bodies).
- Design of 'surveillance monitoring programmes' (to be used in combination with the impact assessment procedure in Annex II) for developing the monitoring components of RBMPs.
- Design of 'operational monitoring' for (a) establishing the status of water bodies at risk of failing to meet the WFD environmental objective of 'good status'; and (b) assessing the effectiveness of the Programme of Measures in improving the ecological status of such water bodies.
- Design of 'investigative monitoring'.
- Frequency of monitoring.
- Additional monitoring for protected areas (both drinking water abstraction points and protected areas for habitats and species).
- Presentation and reporting of ecological status and monitoring information.

For groundwater bodies Annex V covers:

- Definition of 'good quantitative status' (based on groundwater level).
- Design of groundwater level monitoring network.
- Definition of 'good chemical status' (based on concentrations of pollutants and conductivity).
- Design of chemical status monitoring network, including 'surveillance' and 'operational' monitoring components. Surveillance monitoring should be carried out (a) to supplement the impact assessment procedure required by Annex II; and (b) to provide the information needed for assessing long-term trends due to natural or

human-induced changes. Operational monitoring should establish the chemical status of all groundwater bodies at risk of failing to meet the WFD objective of 'good status' and establish the presence of any human-induced upward trend in pollutant concentrations.

- Frequency of quantitative and qualitative monitoring.
- Basis for identification of trends in pollutants.
- Interpretation, presentation and reporting of information on groundwater status.

> **Note**: The establishment of common principles and practical guidance for implementing elements of this Annex fall under the remit of the WFD CIS Working Groups on *'Heavily modified waters'; 'Intercalibration'; 'Monitoring'* and *'Tools on Assessment, classification of groundwater'.*

Annex VI *Lists of measures to be included in the Programme of Measures*, sets out the elements to be included in the Programmes of Measures required by Article 11 and which form the basis for implementation of RBMPs. These include:

- The compulsory measures required by 11 EU Directives already in force at the time of the WFD's publication in the Official Journal (e.g. Bathing Waters, Birds, Drinking Water, Habitats, Nitrates, and Urban Waste Water Directives).
- A non-exhaustive list of 'supplementary' measures covering *inter alia* legislative, administrative, and economic/fiscal instruments, emission and abstraction controls, codes of good practice, recreation and restoration of wetlands, demand management measures, and water efficiency/re-use measures.

> **Note**: The establishment of common principles and practical guidance for implementing the provisions of this Annex fall under the remit of the WFD CIS Working Group on *'Best practice in river basin planning'*.

Annex VII *River Basin Management Plans*, establishes the mandatory elements for RBMPs. These include:

- A general description of RBD characteristics (as required by Article 5 and Annex II).
- A summary of significant pressures and impacts from human activities in each RBD.
- Identification and mapping of protected areas as required by Article 6 and Annex IV.
- A map of the monitoring networks required by Article 8 and Annex V, together with mapping of selected monitoring data.
- A list of the environmental objectives established under Article 4 for surface waters, groundwaters and protected areas (including identification and justification of instances where derogations and deadline extensions have been permitted).
- A summary of the economic analysis of water use required by Article 5 and Annex III.
- A summary of the Programme of Measures adopted under Article 11. The summary must cover *inter alia*: steps taken to apply the principle of cost recovery for water services; controls on water abstraction and impoundment; controls on point source discharges; identification of authorised direct discharges to groundwater; measures taken for priority substances; measures taken to prevent or reduce accidental pollution; measures taken to improve status of water bodies unlikely to achieve 'good status' by 2015.
- A register of any more detailed programmes and management plans within the RBD, e.g. those for an individual sub-basin or a specific sector.
- A summary of public information and consultation measures taken.
- A list of competent authorities and contact points for obtaining additional information.

> **Note**: The establishment of common principles and practical guidance for implementing the provisions of this Annex fall under the remit of the WFD CIS Working Group on *'Economic analysis'.*

Updates of each RBMP must *inter alia* summarise any changes since publication of the previous version; assess progress made towards achieving the WFD's environmental objectives; summarise and explain any measures foreseen in the previous RBMP that have not yet been implemented.

Annex VIII *Indicative list of the main pollutants*, lists 12 categories of "main pollutants", which should be given particular attention when undertaking the impact assessment procedure set out in Annex II.

Annex IX *Emission limit values and environmental quality standards*, lists those EU Directives that set emission limit values and environmental quality standards for the purposes of the WFD, notably the provisions of Article 16.10.

Annex X *Priority substances*, lists "priority substances" within the meaning of Article 16, which requires the European Parliament and the Council to adopt EC proposals for both the selection of the priority substances and the specific measures against pollution to progressively reduce, phase out or cease (depending on the substance in question) emissions of such substances into the environment.

Annex XI consists of two maps: one showing the ecoregions *for rivers and lakes* to be used in conjunction with Annex II; the other showing the corresponding *ecoregions for transitional waters and coastal waters.*

Appendix II
Additional practical examples

The following boxes provide additional practical examples illustrating the 'cross cutting principles', 'lessons learned' and elements of 'good practice' derived from the 'Water Seminar Series. They are cross-referenced in the text of Chapter 5.

Appendix II.1

Impacts of agriculture in Central and Eastern Europe

The 'Danube Integrated Environmental Study' quoted in the Seminar 1 paper by H. Kieft and D. Znaor reported agriculture as being responsible for:

- 50% of the nitrogen loading and
- 53% of the phosphorous loading in the Danube River basin.

In addition, agriculture was found to account for significant inputs of pesticides, heavy metals (cadmium, copper, zinc), bacteria and viruses.

Another study calculated that a 25% reduction in nutrient loading from 1989–1991 levels would be required to meet environmental quality criteria for the Danube, and even greater reductions if eutrophication of the Black Sea was to be halted. Kieft & Znaor pointed out that economic pressures have led to a collapse in the use of agrochemicals in much of the Danube basin and that current levels of usage approximate those identified as being more environmentally sustainable. However, the official agricultural policies of most countries in the region currently foresee future intensification, with increased fertiliser and biocide inputs.

Source: Seminar 1 *Proceedings*, paper by H. Kieft and D. Znaor.

Appendix II.2

Wetland inventories

Information on European wetlands is surprisingly fragmented. Given the vital role of wetlands in water regulation, as well as in provision of numerous other services, completion of a wetland inventory for each RBD should be given high priority. There are currently no agreed guidelines at global or Pan-European level for the preparation of wetland inventories, although a methodology for Mediterranean wetlands has been established (largely through EC funding support) by the 'MedWet' initiative under the 'Ramsar' Convention on Wetlands. A number of European countries have established national or sub-national wetland inventories using widely differing methodologies. In the case of shared RBDs, it will be important that a common approach is used by the Member States (and any non-Member States) concerned.

Source: Seminar 2 *Proceedings*, paper by M. Moser.

Appendix II.3

Identifying the significance of agricultural impacts — The Broads, UK

Modelling was used to relate past and current data on land use and nutrient levels in one of the principal sub-basins of The Broads. Eutrophication due to phosphorous enrichment is a key concern in this internationally important complex of river valley wetlands in eastern England. Analysis suggested that the spreading onto fields of slurry from intensive poultry farming was the most important source of phosphorous enrichment in the upper catchment. Further downstream, sewage effluent from human settlements was a more prevalent cause. Here, the model indicated, an increasing rural population, without access to the more sophisticated sewage treatment plants serving nearby urban areas, was responsible for a growing share of phosphorous loading.

This example shows how the results derived from data collection and modelling can help: (a) to identify the relative significance of various human impacts in different parts of a river basin; and (b) to develop appropriate management measures. In the case of The Broads, this might include, for example, the targeting of expenditure on costly phosphorous stripping at sewage treatment plants, or more stringent controls/guidelines on the disposal of agricultural waste.

Source: Seminar 1 *Proceedings*, paper by G. Phillips and P. Johnes.

Tablas de Damiel, Spain. WWF-Spain

Appendix II.4

The use of agricultural policy modelling to investigate the root causes of wetland degradation in the Tablas de Daimiel, Spain

Under natural conditions, the internationally important wetland complex 'Las Tablas de Daimiel' (in the Spanish Autonomous Region of Castilla–La Mancha) was maintained through discharge of groundwater from a major ground-water body, 'Aquifer 23'. In 1987, the Hydrographic Confederation of the Guadiana Basin, acting on the basis of Spain's then new Water Act, provisionally declared Aquifer 23 to be overexploited due to the rapid expansion of irrigation — supported by the EU Common Agricultural Policy (CAP) — for crops such as sugar beet and maize. From 1991 onwards, restrictions on use of the aquifer were introduced, but these were not effective for a variety of reasons (e.g. unregistered and/or unmetered boreholes, resistance of farmers). Subsequently, the agri-environment Regulation 2078/92 under the CAP was used to introduce a compensation scheme, offering farmers payments for switching to less water-intensive crops[30]. The total cost of the scheme is estimated to be around 100 million Euros.

In view of this very high sum being paid out as compensation, modelling was used to identify the environmental impacts (in terms of water consumption) and the financial costs of other possible options, taking into account various theoretical directions of future agriculture policy.

All the agricultural policy options simulated (e.g. use of cross-compliance — see Box 5.3.1 in Chapter 5) were found to be cheaper than the option being implemented through the agri-environment compensation scheme, while some of them produced better or similar results in terms of water saving. This suggested a certain wastage of public resources in maintaining the *status quo*. On the other hand, all of the alternative scenarios modelled led to a loss of farm incomes (though the magnitude varied from farm to farm). This clearly demonstrated the value of modelling as an analytical tool in helping to define the Programme of Measures for a given RBMP.

Source: Seminar 1 *Proceedings*, paper by J.M. Sumpsi.

[30] It was noted during the seminar discussions that agri-environment programmes should really be used in a much more positive way. They are intended to promote agricultural practices that add real environmental value, above the level of minimum compliance with EU environmental legislation. This was not the case in the example of Daimiel.

Appendix II.5

Voluntary Agreements for water protection Weser-Ems, Lower Saxony, Germany

This case study focused on a rural region of north-west Germany, which forms part of one of the most intensive meat-producing areas in the world. The large-scale import of nutrients into the agricultural system led to severe nitrate pollution of groundwater used to supply drinking water. Since buying land was not a feasible option for achieving more sustainable land use, one drinking water company entered into voluntary agreements with farmers, based around:

- Improved farm nutrient management practices
- A gradual conversion to organic production
- Parallel work to identify and develop profitable markets for the new organic produce

Monitoring of groundwater beneath a trial area of organic arable fields showed that nitrate levels fell from 125 mg/l in 1993 to 18 mg/l in 1997. The trial area is now part of a 100 ha certified organic farm. Initially, only the part of the farm closest to the water source was converted to organic production. Due to the commercial success of the operation, the approach was extended to the whole farm. The farmer concerned emphasised how important the possibility of a phased transition from intensive to organic methods had been in securing his commitment to the voluntary agreement. He also commended the value of professional business support provided to him through the project, enabling him to base decisions on firm economic forecasts.

Source: Seminar 1 *Proceedings*, paper by K. Lanz, H. Seul and G. Peek.

Göksu Delta, Turkey. Sunay Demircan

Appendix II.6

Ongoing international River Basin Management initiatives

The 'Water Seminar Series' stressed that river basin planning is not something new. On the contrary, there are numerous national, regional and international river basin initiatives already under way in Europe (and elsewhere around the world). Given the tight timetable for WFD implementation, it will be essential that this wealth of existing experience is fully utilised. At international level, some of the most relevant initiatives and processes include:

- The work of transboundary river Commissions such as those for the Danube and Rhine (see http://www.icpdr.org and http://www.iksr.org/icpr/index.htm)
- Follow-up to the recent report of the World Commission on Dams (see http://www.dams.org)
- The World Water Vision launched by the World Water Council at the Second World Water Forum in March 2000 (see http://www.worldwatercouncil.org/vision.htm)
- The River Basin Initiative of the Convention on Biological Diversity and the 'Ramsar' Convention on Wetlands (see http://www.ramsar.org/w.n.rbi_progress1.htm)
- The Ramsar Convention guidelines on 'integrating wetland conservation and wise use into river basin management' available in English, French and Spanish (see http://www.ramsar.org/key_guidelines_index.htm).

Appendix II.7

Groundwater nitrate reduction - Groundwater protection measures in Styria, Austria

As a result of changes in agricultural land use during the 1980s (switch from conventional 'mixed' land use with crop rotation to intensive pig rearing), parts of the Austrian Province of Styria experienced significant water quality problems. This reflected a nationwide problem, with up to 73% of Austrian groundwater being classified as 'in need of restoration' and unfit to be used directly for human consumption. The designation of 'water protection areas' in one area of Styria, where strict controls on agricultural land use were applied, led to a substantial reduction of groundwater nitrate levels. The establishment and enforcement of regulations (tested and 'fine tuned' over a period of several years) within the water protection area, together with intensive awareness-raising work with all potential 'polluters', were identified as key ingredients of the approach used, as was a commitment respecting the need of farmers to operate profitable businesses. However, it was also noted that the costs of the programme were partly paid for by consumers. Given that the passing on of costs to the consumer (either directly through higher water bills, or indirectly through increased taxation) is not in accordance with the 'polluter pays' principle, the limitations of this approach need to be recognised.

Source: Seminar 1 *Proceedings*, paper by G. Suette.

Appendix II.8

Production of organic beef as a river basin management tool Vindel River, Sweden

The decline of traditional grazing practices in northern Sweden has led to the abandonment of riverine meadows , with widespread colonisation of bushes leading to the disappearance of wet grassland and degradation of biodiversity. In 1997, WWF started a rural development project to reverse the negative trends in one area of the Vindel meadows. By encouraging and supporting the production of high quality beef raised with low artificial inputs and grazed largely on 'natural' pastures, the project has succeeded in maintaining or restoring 75ha of meadows. Support for continuation of the project until at least 2006 has been sought through the EU Structural Funds. Elements important to the project's success were identified as follows:

- Bottom-up approach during planning and rapid implementation giving fast, visible results
- Strong market for 'green', regionally-produced quality products
- Regional interest in cultural and biological conservation has engaged people
- Cooperation at a range of levels: EC, Member State, Municipality, local farmers.

Source: Seminar 1 *Proceedings*, paper by O. Jennersten.

Appendix III
Acronyms and abbreviations

The use of acronyms and abbreviations has intentionally been kept to a minimum in this document. Those that appear are listed below:

CAP	Common Agricultural Policy of the European Union
CIS	the Common Implementation Strategy for the Water Framework Directive being developed jointly by the Member States and the European Commission
DG	Directorate General of the European Commission
EC	European Commission
EEA	European Environment Agency
EEB	European Environment Bureau
EFP	WWF European Freshwater Programme
EU	European Union
ISPA	Instrument for Structural Policies for Pre-Accession (the EU financial instrument for infrastructure projects in Candidate countries)
JRC	Joint Research Centre of the European Commission, based in Ispra, Italy
LIFE	The EC financial instrument for the environment
NGO	Non-Governmental Organisation
RBD	River Basin District
RBMP	River Basin Management Plan
SAPARD	Special Action for Pre-Accession Measures for Agriculture and Rural Development (the EU financial instrument to support agriculture and rural development in Candidate countries)
UN/ECE	United Nations Economic Commission for Europe
WFD	Water Framework Directive (reference number 2000/60/EC)
WWF	World Wide Fund For Nature

Appendix IV
Contributors

While space limitations preclude a listing of all participants, the outputs from the 'Water Seminar Series' reflect the contributions of more than 300 'water stakeholders' from across Europe (both EU Member States and EU-Candidate countries), who attended the three meetings and whose names and affiliations[31] can be found in the corresponding *Proceedings* volumes[32]. However, the following is a complete list of presenters (and co-authors) of seminar papers (reproduced in full in the *Proceedings*):

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[31] This listing is provided purely as a means of acknowledging contributors to the 'Water Seminar Series' and to demonstrate the broad range of participation. It does not imply endorsement of the published seminar outputs, including this *Practical Resource* document by any particular individual, organisation, agency or company.

[32] http://www.panda.org/europe/freshwater/seminars/seminars.html

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Further acknowledgements can be found in Appendix V.

Appendix V
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[34] This was a single position, staffed consecutively by the four individuals listed.

[35] As a resource for possible follow-up, particularly at national or regional levels, a complete list of members of the WWF European Freshwater Team can be found at: http://www.panda.org/europe/freshwater/contactinfo.html

Appendix VI
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The following web sites are recommended as sources of additional information covering many of the issues raised in this document:

- Convention on Wetlands (Ramsar, 1971) guidelines on 'integrating wetland conservation and wise use into river basin management' available in English, French and Spanish:

  http://www.ramsar.org/key_guidelines_index.htm

- European Commission, DG Agriculture, agriculture and environment pages:

  http://europa.eu.int/comm/agriculture/envir/index_en.htm

- European Commission, DG Environment, site index:

  http://www.europa.eu.int/comm/environment/index_en.htm

- European Environmental Bureau (EEB) Position Paper on 'Making the EU Water Framework Directive Work: Ten Actions for Implementing a Better European Water Policy' (downloadable in pdf format):

  http://www.eeb.org/publication/general.htm

- European Union of National Associations of Water Suppliers and Waste Water Services:

  http://users.skynet.be/eureau/

- International Commission for the Protection of the Danube River:
  http://www.icpdr.org

- International Commission for the Protection of the Rhine:
  http://www.iksr.org/icpr/index.htm

- River Basin Initiative of the Convention on Biological Diversity and the 'Ramsar' Convention on Wetlands:
  http://www.ramsar.org/w.n.rbi_progress1.htm

- United Nations Economic Commission for Europe, water pages:
  http://www.unece.org/env/water/

- World Commission on Dams:
  http://www.dams.org

- World Water Vision launched by the World Water Council at the Second World Water Forum in March 2000:
  http://www.worldwatercouncil.org/vision.htm

- WWF, European Freshwater Programme:
  http://www.panda.org/europe/freshwater

This *Practical Resource* document results from a series of **open, transparent and participatory seminars** — comprising the 'Water Seminar Series' — which brought together hundreds of 'water stakeholders' to discuss approaches and tools for **implementation** of the European Union Water Framework Directive (WFD). This challenging new legislation entered into force at the end of 2000 and sets out the basis for **sustainable use of water resources** across Europe. It will affect **everyone involved directly or indirectly with water resource management and use** in both Member States and EU-Candidate countries alike.

The seminars focused on **three key issues**, which the organisers, WWF and the European Commission (EC), had identified as needing special attention when implementing the WFD:

- Water and Agriculture
- The Role of Wetlands in River Basin Management
- Good Practice in River Basin Planning

Who should read this document?

- Those involved with water planning and management at regional and local levels, including land-use planners, water supply and treatment companies, and local authorities.
- 'Stakeholder' groups with an interest in how an individual river basin is managed, for example: Community associations, farmers, environmentalists.