ECONOMICS AND THE ENVIRONMENT

THE IMPLEMENTATION CHALLENGE OF THE WATER FRAMEWORK DIRECTIVE

A GUIDANCE DOCUMENT

Foreword

The EU Member States, Norway and the European Commission have jointly developed a common strategy for supporting the implementation of the Directive 2000/60/EC establishing a framework for Community action in the field of water policy (the Water Framework Directive). The main aim of this strategy is to allow a coherent and harmonious implementation of this Directive. Focus is on methodological questions related to a common understanding of the technical and scientific implications of the Water Framework Directive.

One of the main short-term objectives of the strategy is the development of non-legally binding and practical guidance documents on various technical issues of the Directive. These guidance documents are targeted to those experts who are directly or indirectly implementing the Water Framework Directive in river basins. The structure, presentation and terminology is therefore adapted to the needs of these experts and formal, legalistic language is avoided wherever possible.

In the context of the above-mentioned strategy, an informal working group (named Wateco) dedicated to the economic issues of the Water Framework Directive has been set up in December 2000. France and the Commission have the responsibility of the secretariat and animation of this working group (short-named *WATECO*) that is composed of economists and technical experts from governmental and non-governmental organisations.

The present guidance document is the outcome of this working group. It contains the synthesis of the output of the *WATECO* group activities and discussions that have taken place since December 2000. It builds on the input and feedback from a wide range of experts and stakeholders that have been involved throughout the process of guidance development through meetings, workshops, conferences or electronic communication media, without binding them in any way to its content.

"We, the water directors of the European Union, Norway, Switzerland and the countries applying for accession to the European Union, have examined and endorsed this guidance during our informal meeting under the Spanish Presidency in Valencia (June 2002). We would like to thank the participants of the Working Group and, in particular, the leaders, France and the Commission for preparing this high quality document.
We strongly believe that this and other guidance documents developed under the Common Implementation Strategy will play a key role in the process of implementing the Water Framework Directive.
For all experts involved in its implementation, this guidance document is a *living document* that will need continuous input and improvements as application and experience build up in all countries of the European Union and beyond. However, we agree that this document will be made publicly available in its current form in order to present it to a wider public as a basis for carrying forward ongoing implementation work.
We also commit ourselves to assess and decide upon the necessity for reviewing this document trough practical experience, following the pilot testing exercises in 2003 and the first results of 2004 initial status."
The water directors

Executive Summary

A GUIDANCE DOCUMENT: WHAT FOR?

This non-legally binding document aims at **guiding experts and stakeholders in the implementation of the economic elements of the Water Framework Directive**, with specific focus on its 2004 requirements. You will find this guidance useful if you are developing national strategies for implementing the Directive or if you are involved in the preparation of river basin management plans. It will help you to:

- Understand the economic analysis and its expected results;
- Undertake the economic analysis;
- Lead and manage experts that will develop the economic analysis;
- Use the results of the economic analysis for aiding decision making and supporting the development of river basin management plans;
- Report on the economic analysis to the European Commission as required by the Directive.

The document has been **developed by an informal European working group of experts and stakeholder**s in the context of the common strategy agreed by Member States and the Commission for supporting the implementation of the Water Framework Directive. It builds on:

- The expertise and experience of members of the working group;
- The results of pilot studies carried out in selected river basins throughout Europe;
- Regular interactions with other working groups and technical expertise;
- Input and feedback from a wide range of experts and stakeholders that participated in a series of workshops and conferences.

INTEGRATING ECONOMICS INTO WATER MANAGEMENT AND POLICY

With high environmental concerns and limited financial resources in many parts of Europe, economics is increasingly called for to support the development of sustainable water management and policy decision-making.

In the European Community, **the Water Framework Directive clearly integrates economics into water management and policy making**. The Directive calls for the application of economic principles (e.g. the ***polluter pays principle***), approaches and tools (e.g. **cost-effectiveness analysis**) and for the consideration of economic instruments (e.g. **water pricing**) for achieving its environmental objectives, i.e. good water status for all waters, in the most effective manner. Although scattered along the Directive's text, the different elements of the economic analysis should be well integrated in the policy decision and management cycle and aid decision-making.

IF YOU ARE LOOKING FOR GUIDANCE ON HOW TO…

If you are looking for guidance on how to deal with…

- **The economic analysis of water uses -** What is the economic significance of water in your river basin district? What are the key economic drivers influencing pressures and water uses? How will these economic drivers evolve over time, and how will they influence pressures? How will water demand and supply evolve over time, and which problems it is likely to cause?
- **The economic assessment of potential measures for reaching good water status -**What is the least-costly set of measures that will ensure good water status? How much will it cost to reach good water status? What is the likely economic impact of proposed measures on key economic sectors/water uses? How to determine whether the costs of achieving good water status are considered to be disproportionate so that derogation and the setting of lower environmental objectives may be appropriate?
- **The assessment of the recovery of the costs of water services -** How much do current water services cost? Who pays these costs, and what is the current cost-recovery level? Which impact are proposed programmes of measures likely to have on cost-recovery?

Then, this document will provide useful methodological guidance and a range of approaches and tools on what to do, how to do it, and when to do it in the context of the implementation of the Water Framework Directive and the preparation of integrated river basin management plans. The guidance proposes a three-step approach for providing a coherent and logical framework to the economic analysis required for meeting the Directive's requirements that integrates economic and technical issues, expertise and tools in:

- **Step 1 - Characterising the river basin** in terms of the economics of water uses, trends in water supply and demand and current levels of recovery of the costs of water services;
- **Step 2** - Identifying water bodies or group of water bodies not achieving the environmental objective of the Directive (i.**e. identifying gaps or risks of failure** in achieving objectives); and
- **Step 3** - Supporting the development of the **programme of measures** to be integrated in river basin management plans **through cost-effectiveness analysis** and justifying from an economic point of view possible (time, objective) derogation.

BEFORE STARTING THE ECONOMIC ANALYSIS

Three elements are seen as key to undertaking the economic analysis: **information and knowledge**, **capacity** and **integration with the decision making process**. In general terms, you will need to address the following questions before starting the economic analysis:

- How to organise and manage the *economic analysis* project?
- Who should get involved in carrying out the economic analysis? How should the economic analysis be integrated with other disciplines and expertise? At which stages of the Water Framework Directive implementation process?
- Which information is available today, and what additional information is needed for carrying out the economic assessment necessary to assist decision-making?
- Which output and indicators should be produced by the analysis for taking decisions, and for informing about and reporting on these decisions?

- Which financial and human resources are required and available for undertaking the economic analysis?

Two activities are seen as key in preparing the economic analysis *per se*:

- A **feasibility study** – Its main purpose is to assess whether the proposed economic approach can be made operational under current situations, to evaluate the consistency of the overall approach to be developed and to identify key constraints and problems likely to be faced when undertaking the economic analysis; and
- A **critical path analysis** – its main purpose is to identify what needs to be done by when to fill the most important gaps in the economic analysis and to logically link the economic analysis with other activities required for the development of river basin management plans and for implementing the Directive.

AND FOR 2004!

The Water Framework Directive specifies a series of reporting dates for key tasks and activities aimed at the development and implementation of river basin management plans. And 2004 is the first major deadline aimed at characterising river basin districts as referred to primarily in Article 5 and relevant annexes of the Directive. Therefore, 2004 is also the first milestone for the economic analysis that requires for each river basin district to:

- Undertake the **economic analysis of water uses** – the main objective is to assess how important water is for the economy and socio-economic development of the river basin district. The analysis needs to pave the way for the identification of significant water uses to be reported to the public by 2007 and the following cost-effectiveness analysis by initiating investigations of likely tradeoffs between socio-economic development and water protection;
- Investigate the dynamics of the river basin and providing economic input into the **development of a baseline scenario** – The economic analysis will assess forecasts in key economic drivers likely to influence pressures and thus water status. Focus is likely to be on changes in general socio-economic variables, key sector policies, economic growth of main economic sectors and investments in the water sector;
- Assess **current levels of recovery of the costs of water services**, in accordance to Article 9 of the Water Framework Directive – The main elements to be investigated include the status of water services, the extent of the recovery of the costs (financial, environmental and resource costs) of these services, the institutional set-up for cost-recovery and the contribution of key water uses to the costs of water services;
- Prepare for the **cost-effectiveness analysis** – It is suggested that data are collated on costs for the key measures that will be considered in the development of the river basin management plans. A range of costs should be collected, along with parameters influencing these costs. Emphasis will be on costs that are non-site specific and on basic measures; and
- Propose activities for **enhancing the information and knowledge base** - Practical steps and measures will be identified for filling key economic-related information and knowledge gaps, both identified during the characterisation of the river basin and likely to arise when undertaking the cost-effectiveness analysis.

MANAGING THE PROCESS RIGHT!

Ensuring the economic analysis adequately support decision-making towards achieving good water status will require a well-managed process. A series of principles for developing the economic analysis process can be identified:

- **Integration** – Economics is only one of the parameters that inform decision-making and needs to be integrated with other expertise and analyses in supporting the development of river basin management plans. Integration needs to start as early as possible, for example for the characterisation of river basins where pressures, impacts and the economic importance of pressures/uses need to be analysed jointly;
- **Proportionate** – Efforts and more detailed economic analyses should be concentrated to significant water management issues, areas with conflicts between uses and where the integration between environment, economic and social issues is problematic. Overall, where it can help in taking better decisions;
- **Policy-relevant** – the analysis should ensure it aids decision making, i.e. supporting decisions, informing possible policy choices or justifying these choices to policy makers and to the public/stakeholders;
- **Iterative and gradual** – The analysis should start with existing information and knowledge. A systematic identification of gaps in information and knowledge that needs to be filled for better decisions will lead to regular updates of the analysis itself.
- **Participatory** – To integrate stakeholders into the economic analysis can prove very useful as it brings expertise and information, it provides opportunities to discuss and validate key assumptions and it increases the ownership and acceptance of the results of the economic analysis; and
- **Transparent** – The economic analysis should systematically report on information, assumptions and approaches used for obtaining results. This ensures the analysis can be easily updated as new information and methods are developed. It is also a pre-requisite to enhanced information, consultation and participation of the public/stakeholders.

FURTHER DEVELOPMENT NEEDED…

Overall, using the present guidance will help developing practical experience, will increase the knowledge base and will develop capacity in the integration of economics into water management and policy.

Selected issues can already be identified as requiring further investigation:

- On **environmental and resource costs** - How to operationalise methods for assessing environmental costs that would be of direct use for developing river basin management plans?
- On **uncertainty** - Which approaches can be proposed to water managers for integrating uncertainty into decision making?
- On **effectiveness** – How to assess the effectiveness of individual measures or combination of measures?
- On **indirect economic impact** – which methods can be used for assessing the indirect economic impact on key economic sectors of potential measures?
- On **pricing** – Which approach for supporting the development of incentive pricing and reporting on cost-recovery for 2010?

Most of these issues will need to be tackled jointly by economists and technical experts, the emphasis being on practical and operational approaches that can be applied by practitioners dealing with the development of integrated river basin management plans.

A continuation of the collaborative efforts that have led to the present guidance will be instrumental in moving forward and ensuring progress is made for an effective implementation of the Water Framework Directive.

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Introduction - A Guidance Document: What For?

This document aims at guiding experts and stakeholders in the implementation of the Directive 2000/60/EC establishing a framework for Community action in the field of water policy (the Water Framework Directive – 'the Directive'). It focuses on the implementation of its economic elements in the broader context of the development of integrated river basin management plans as required by the Directive.

TO WHOM IS THE GUIDANCE DOCUMENT ADDRESSED?

We believe the guidance will help you in *doing the job,* whether you are:

- Undertaking the economic analysis yourself;
- Leading and managing experts undertaking the economic analysis;
- Using the results of the economic analysis for aiding decision making and supporting the development of river basin management plans; or
- Reporting on the economic analysis to the European Commission as required by the Directive.

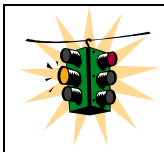
WHAT CAN YOU FIND IN THIS GUIDANCE DOCUMENT?

- **The role of economics in the Water Framework Directive.** What are the key economic elements of the Water Framework Directive? Where in the Directive are these elements made explicit or referred to? How do these elements fit with the Directive's overall river basin planning process?

- **Planning the economic analysis.** How should the process of conducting the economic analysis be planned and organised? When and how should economic expertise be integrated with non-economic expertise? How can adequate financial and human resources be allocated to the economic analysis? Which role could stakeholders and the public play in the economic analysis? How to deal with limited information and expertise? How can external consultants and advisers be used to provide external support? Which elements of the analysis should be undertaken by 2004?

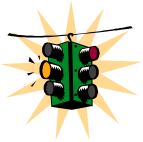
- **Methodologies for undertaking the economic analysis.** What methodology should be used to integrate economics in the preparation of river basin management plans? How can cost-effective measures be selected to build a programme of measures? How can costs and cost-recovery levels be assessed? When is it necessary to assess benefits? How and when can economics be used to support the justification for derogation?

- **Reporting the results of the economic analysis**. How should the different results of the economic analysis be reported? Which results of the economic analysis should be reported by 2004? Which indicators and variables should be computed to inform and consult the public?



Look out! The methodology from this Guidance Document must be adapted to national and regional/local circumstances

The Guidance Document proposes an overall methodological approach. Because of the diversity of circumstances within the European Union, the way to deal with the logical approach and address specific issues will vary from one river basin to the next. This proposed methodology may therefore need to be tailored to specific circumstances.



Look out! What you will not find in this guidance document

The guidance document focuses on the economic analysis required for supporting the development of River Basin Management Plans, with specific attention to the 2004 requirements of the Directive. The guidance does not focus on:

- How to develop incentive pricing policies according to Article 9;
- How to develop and implement other economic and fiscal instruments as mentioned in Annex VI;
- How to develop an economic analysis for supporting the development of penalties that provide incentive according to Article 23.

…AND WHERE?

The role of economics in the Water Framework Directive

Section 2 – Which role for economics in the Directive? **Annex I** – The economic elements of the Water Framework Directive, original legal text; **Annex II** – Glossary Also: **Section 3** – Roadmap to implementing the Directive's economic elements

Planning the economic analysis

Section 5 – Ensuring coherency with the overall implementation process; **Section 4** – 2004: the first milestone for the economic analysis; **Annex III** – Illustrative terms of reference for *scoping* activities and *stakeholder analysis*;
Also: **Section 3** – Roadmap to implementing the Directive's economic elements; **Annex I** – The joint activities and working groups of the Common Implementation Strategy; **Annex I** – Lists and contacts of the WATECO group

Methodologies for undertaking the economic analysis

Section 3 – Roadmap to implementing the Directive's economic elements; **Annex IV.I** – Information sheets and **Annex IV.II**. Analysis for derogation;
Also: **Annex IV.III** – List of references; **Annex I** – Relevant references and guidance from other working groups of the Common Implementation Strategy

Reporting the results of the economic analysis

Section 5 – Ensuring coherency with the overall implementation process; **Section 4** – 2004: the first milestone for the economic analysis **Annex III** – Key summary and reporting tables

Section 1 –Implementing the Directive: Setting the Scene

This Section introduces you to the overall context for the implementation of the Water Framework Directive and informs you of the initiatives that led to the production of this Guidance Document.

DECEMBER 2000: A MILESTONE FOR WATER POLICY

A Long Negotiation Process

December 22, 2000, will remain a milestone in the history of water policies in Europe: on that date, the Water Framework Directive (or the Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy) was published in the Official Journal of the European Communities and thereby entered into force!

This Directive is the result of a process of more than five years of discussions and negotiations between a wide range of experts, stakeholders and policy makers. This process has stressed the widespread agreement on key principles of modern water management that form today the foundation of the Water Framework Directive.

NEW CHALLENGES IN EU WATER POLICY

What is the Purpose of the Directive?

The Directive establishes a framework for the protection of all water bodies (including inland surface waters, transitional waters, coastal waters and groundwater) which:

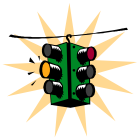
- Prevents further deterioration of, protects and enhances the status of water resources;
- Promotes a sustainable water use based on long-term protection of water resources;
- Aims at enhancing protection and improvement of the aquatic environment through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of the priority hazardous substances;
- Ensures the progressive reduction of pollution of groundwater and prevents its further pollution; and
- Contributes to mitigating the effects of floods and droughts.

... and what is the key objective?

Overall, the Directive aims at achieving *good water status* for all waters by 2015.

What Are the Key Actions that Member States Need to Take?

- To identify the individual river basins lying within their national territory and assign them to individual River Basin Districts (RBDs), and identify competent authorities by 2003 (*Article 3, Article 24*);
- To characterise river basin districts in terms of pressures, impacts and economics of water uses, including a register of protected areas lying within the river basin district, by 2004 (*Article 5, Article 6, Annex II, Annex III*);
- To carry out the inter-calibration of the ecological status classification systems by 2006 (*Article 2(22); Annex V*);
- To make operational the monitoring of water status by 2006 (*Article 8*);
- Based on sound monitoring and on the analysis of the characteristics of the river basin, to identify by 2009 a programme of measures for achieving the environmental objectives of the Water Framework Directive cost-effectively (*Article 11, Annex III*);
- To produce and publish River Basin Management Plans (RBMPs) for each RBD including the designation of heavily modified water bodies, by 2009 (*Article 13, Article 4.3*);
- To implement water pricing policies that enhance the sustainability of water resources by 2010 (*Article 9*);
- To make the measures of the programme operational by 2012 (*Article 11*); and
- To implement the programmes of measures and achieve the environmental objectives by 2015 (*Article 4*).



Look Out!
Member States may not always reach good water status for all water bodies of a river basin district by 2015, for reasons of technical feasibility, disproportionate costs or natural conditions. Under such conditions that will be made explicit in the RBMPs, the Water Framework Directive offers the possibility to Member States to engage in two further six- year cycles of planning and implementation of measures.

Developing the Right Process – Information, Consultation and Participation

Article 14 of the Directive specifies that Member States shall encourage the active involvement of all interested parties in the implementation of the Directive and development of river basin management plans. Also, Member States will inform and consult the public, including users, in particular for:

- The timetable and work programme for the production of river basin management plans and the role of consultation at the latest by 2006;
- The overview of the significant water management issues in the river basin at the latest by 2007; and
- The draft river basin management plan, at the latest by 2008.

Integration: a key concept underlying the Water Framework Directive

The central concept to the Water Framework Directive is the concept of *integration* that is seen as key to the management of water protection within the river basin district:

Integration of environmental objectives, combining quality, ecological and quantity objectives for protecting highly valuable aquatic ecosystems and ensuring a general good status of other waters;

Integration of all water resources, combining fresh surface water and groundwater bodies, wetlands, transitional and coastal water resources **at the river basin scale**;

Integration of all water uses, functions, values and impacts into a common policy framework, i.e. investigating water for the environment, water for health and human consumption, water for economic sectors, transport, leisure, water as a social good, investigating both point-source and diffuse pollution, etc;

Integration of disciplines, analyses and expertise, combining hydrology, hydraulics, ecology, chemistry, soil sciences, technology engineering and economics to assess current pressures and impacts on water resources and identify measures for achieving the environmental objectives of the Directive in the most cost-effective manner;

Integration of water legislation into a common and coherent framework. The requirements of some old water legislation (e.g. the Fishwater Directive) have been reformulated in the Water Framework Directive to meet modern ecological thinking. After a transitional period, these old Directives will be repealed. Other pieces of legislation (e.g. the Nitrates Directive and the Urban Wastewater Treatment Directive) must be co-ordinated in river basin management plans where they form the basis of the programmes of measures;

Integration of a wide range of measures, including pricing and economic and financial instruments, in a common management approach for achieving the environmental objectives of the Directive. Programmes of measures are defined in **River Basin Management Plans** developed for each river basin district;

Integration of stakeholders and the civil society in decision-making, by promoting transparency and information to the public, and by offering a unique opportunity for involving stakeholders in the development of river basin management plans;

Integration of different decision-making levels that influence water resources and water status, be local, regional or national, for an effective management of all waters; and

Integration of water management from different Member States, for river basins shared by several countries, existing and/or future Member States of the European Union.

WHAT IS BEING DONE TO SUPPORT IMPLEMENTATION?

Activities to support the implementation of the Water Framework Directive are under way both in Member States and in countries candidate for accession to the European Union. Examples of activities include consultation of the public, development of national guidance, pilot activities for testing specific elements of the Directive or the overall planning process, discussions on the institutional framework or launching of research programmes dedicated to the Water Framework Directive.

May 2001 – Sweden: Member States, Norway and the European Commission Agree on a Common Implementation Strategy

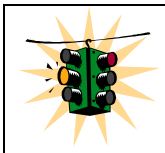
The main objective of this strategy is to provide support to the implementation of the Water Framework Directive by developing coherent and common understanding and guidance on key elements of this Directive. Key principles in this common strategy include sharing information and experiences, developing common methodologies and approaches, involving experts from candidate countries and involving stakeholders from the water community.

In the context of this common implementation strategy, a series of working groups and joint activities have been launched for the development and testing of non-legally binding guidance (see *Annex I*). A strategic co-ordination group oversees these working groups and reports directly to the water directors of the European Union and Commission that play the role of the overall decision body for the Common Implementation Strategy.

The WATECO Working Group

A working group has been created for dealing specifically with economic issues. The main short-term objective of this working group named *WATECO* (for *WATer and ECOnomics*) was the development of a non-legally binding and practical guidance for supporting the implementation of the economic elements of the Water Framework Directive with emphasis on its 2004 requirements. The members of *WATECO* are economists, technical experts and stakeholders from European Union Member States and from a limited number of candidate countries to the European Union.

To ensure an adequate input and feedback during the guidance development phase from a wider audience, and to evaluate earlier versions of the guidance document, the *WATECO* group has organised several discussions and feedback events such as meetings, workshops and conferences.



Look out! You can contact the experts involved in the *WATECO* activities

The list of *WATECO* members with full contact details can be found in *Annex I.* If you need input into your own activities, contact a member from *WATECO* in your country. If you want more information on specific scoping and testing pilot studies, you can also contact directly the persons in charge of carrying out these studies.

Developing the Guidance Document: An Interactive Process

Within a very short time period, a large number of experts and stakeholders have been involved at varying degrees in the development of this Guidance Document. The process for their involvement has included the following activities:

- **Regular meetings** of around 40 experts and stakeholder members of *WATECO*;

Organisation of **two workshops** to present and discuss the activities and preliminary output of *WATECO*

- With a larger number of **stakeholders** (May 2001 - Bruxelles, Belgium);

- With experts from **candidate countries** (November 2001 - Szentendre, Hungary).

- A series of **scoping and testing pilot studies** to assess the feasibility of the overall economic approach (e.g. in terms of information and expertise requirements) and of specific elements of this approach (see *Annex V*).
  - ***In national river basins*** in the United Kingdom, Germany, Spain, Portugal, Sweden, Greece and France;
  - ***In the international basin of the Scheldt River*** as part of a collaborative effort between the Netherlands, France and the three Belgium regions of Wallonia, Flanders and Bruxelles.

- Regular **interactions with experts from other working groups of the Common Implementation Strategy**, mainly those dealing with the assessment of pressures and impacts, designation of heavily modified water bodies and river basin planning. For example, key to many of the above-mentioned pilot studies has been the involvement of non-*WATECO* experts and the integration between economic and technical expertise, e.g. for testing the feasibility of applying cost-effectiveness methods.

Two events for discussing and evaluating draft versions of the Guidance Document:

- A **conference** (March 2002 – Lille, France) to present and discuss the preliminary output of the *WATECO* group (draft guidance document, results of scoping and testing activities) to a wide range of **experts and stakeholders;** and
- A **workshop with a small group of water managers** (April 2002 – Bruxelles, Belgium) that are leading the development of river basin management plans in their respective countries, in order to evaluate expectations from water managers *vis-à-vis* the economic analysis and adapt the guidance to ensure a better integration of the output of the economic analysis into the decision making process.

Section 2 – Which Role for Economics in the Directive?

This section outlines the economic elements of the Water Framework Directive. It aims at: (i) providing an understanding of the role of economics in water policy making; (ii) critically reviewing the references to economics and economic requirements in the Water Framework Directive; and (iii) integrating these into the decision making process aimed at developing river basin management plans.

WHICH ROLE FOR ECONOMICS IN WATER POLICY?

With increasing scarcity of both water resources and financial resources allocated to the water sector, economic analysis and expertise is increasingly called for supporting water management and policy decisions. Overall, a sound economic analysis can help in:

- Understanding the **economic issues and tradeoffs at stake** in a river basin – restoring water quality can impact on economic sectors that can have significant role and importance in the local, regional and national economy (be it in terms of overall economic output, trade or employment). Also, different economic sectors are often competing for the same (good quality) water resources;
- Assessing the **least-costly way** for the economy or for specific economic sectors **achieving well-defined environmental objectives** for water resources. Clearly, this ensures best use of limited financial resources allocated to the water sector;
- Assessing the **economic impact of proposed programmes of measures** aimed at improving water status (i.e. who are the *losers*, who are the *gainers*). In some cases, this assessment may stress the need for developing specific accompanying measures that would (partially) compensate *losers*, and thus facilitate the implementation of proposed measures;
- Assessing regions or water bodies where **environmental objectives need to be made less stringent to account for economic and social impacts** in a search for overall sustainability; and
- Supporting the **development of economic and financial instruments** (e.g. water prices or supplementary measures such as pollution charges or environmental taxes), that may be effective in reaching environmental objectives.

Overall, the economic analysis is a **process of providing valuable information to aid decision-making** and should be an essential part of the overall approach for supporting decisions. The economic analysis is also a source of information of interest to stakeholders and the public in the context of information and consultation activities. For example, discussing significant water management issues in a river basin is likely to require information on who pollutes, who uses, which environmental impact occurs, but also on what it costs, who pays, who gains and who suffers from the current situation.

THE ECONOMIC ELEMENTS OF THE WATER FRAMEWORK DIRECTIVE

The Water Framework Directive clearly integrates economics into water management and water policy decision-making. To achieve its environmental objectives and promote integrated river basin management, the Directive calls for the application of economic principles (for example, the *polluter-pays principle*), economic approaches and tools (e.g. cost-effectiveness analysis) and instruments (e.g. water pricing). *Table 1* summarises the key functions of the economic analysis that are referred to in the Water Framework Directive text (see *Table 2*).

Table 1 – Different functions of the economic analysis in the Water Framework Directive

- To carry out an *economic analysis of water uses* in each River Basin District
- To assess *trends* in water supply, water demand and investments
- To identify areas designated for the protection of *economically significant aquatic species*
- To designate heavily modified water bodies based on the assessment of changes to such water bodies and of the *impact* (including economic impact) on existing uses and *costs* of alternatives for providing the same beneficial objective
- To assess current levels of *cost-recovery*
- To support the selection of a programme of measures for each river basin district on the basis of *cost-effectiveness* criteria
- To assess the potential role of *pricing* in these programmes of measures – implications on cost-recovery
- To estimate the need for potential (time and objective) derogation from the Directive's environmental objectives based on *assessment of costs and benefits* and *costs* of alternatives for providing the same beneficial objective
- To assess possible derogation resulting from new activities and modifications, based on assessment of *costs and benefits* and costs of alternatives for providing the same beneficial objective
- To evaluate the *costs* of process and control measures to identify *cost-effective* way to control priority substances

Integrating Economics into Environmental Policy: The Novelty of the Water Framework Directive

Costs, discount rate, prices, taxes… The use of economic terms in the water sector in Europe has increased over recent years – and not only on the part of economists. Economic issues affect all people – as consumers who pay for water supply and sewerage services; as taxpayers for supporting heavy investments in the water sector; and increasingly as human beings eager to protect water resources for themselves and for future generations.

Since the 1970s, advocating the *polluter-pays principle* in water policy has become the norm rather than the exception, although the level of application of this principle remains highly heterogeneous. Furthermore, the focus was on financial aspects rather than on economic costs. It is only in the early 1990s (not long before the Directive's negotiations were initiated) that attention started switching to the economic value of water.

This led to the production of many academic studies and analyses, but with limited emphasis placed on creating a link between empirical research and policy-making. With the Water Framework Directive, it is the first time in EU environmental policy that economic principles, tools and instruments are explicitly integrated into a piece of legislation, thus opening up an unique opportunity of making that link a reality.

Table 2 – Overview of the Economic Elements in the WFD

Reference	Summary Provisions
Preambles 11, 12, 31, 36, 38 and 43	• That the **polluter should pay** • Take into account the **economic** and social development of the Community • Lower objectives justified if **unreasonably expensive** to achieve good status • Carry out an **economic analysis of water uses** • Use **economic instruments** as part of the **programmes of measures** • Apply the **principle of cost recovery of water services (including environmental and resource costs)** in accordance with the **polluter pays principle** • Identifying **cost-effective** combination of measures for reducing pollution of priority substances
Article 2: Definitions 38 and 39	Definition of water services – Definition of water use
Article 4: Environmental objectives *Designation of Heavily Modified Water Bodies (4.3)* - *Environmental objectives and derogations (4.4, 4.5 and 4.7)*	An economic justification can be provided for designating Heavily Modified Water Bodies (*'….for reasons of technical feasibility and* ***disproportionate costs****…. '*). Possible economic justification for derogation: • Time derogation if … *completing the improvements within the time scale would be* ***disproportionately expensive****…* • Objectives derogation if … *the achievement of these objectives would be infeasible or disproportionately expensive…* and there are no *other means which are a significantly better environmental option not entailing* ***disproportionate costs*** • Derogation for new modification or sustainable economic activity, if benefits of this activity outweigh benefits from good water status and there are *no other means which are significantly better environmental option not entailing* ***disproportionate cost***
Article 5: Characteristics of the river basin district, review of the environmental impact of human activity and economic analysis of water use *Annex III: Economic Analysis*	As part of the analysis of the River Basin characteristics, an **economic analysis of water uses** must be conducted. According to specifications in Annex III, *the economic analysis shall contain enough information in sufficient detail to*: • Make the relevant calculations necessary for taking into account **cost recovery of water services**, *taking account of long term forecasts of supply and demand for water in the RBD and, where necessary;* *a) Estimates of the volume, prices and costs associated with water services* b) *Estimates of relevant investment including forecasts of such investments* • Make judgements about the most **cost effective combination of measures** in respect of water uses to be included in the programme of measures under Article 11 based on estimates of the potential costs of such measures.
Article 6: register of protected area & Annex IV: Protected areas	Designation of areas for the protection of **economically significant aquatic species**.
Article 9: Recovery of costs for water services	Take account of the principle of **recovery of the costs of water services**, including **environmental and resource costs**, according to the ***polluter pays principle*** *Member states shall ensure by 2010* • *that* ***water pricing policies*** *provide adequate incentives for users to use water resource efficiently, and thereby contribute to the environmental objectives of this Directive »* • *An adequate contribution of the different water uses, disaggregated into at least industry, households and agriculture, to the recovery of the costs of water services…* Possibility to account for social, environmental and **economic effects** in defining pricing policy
Articles 11: Programme of measures & Annex VI: Lists of measures to be included within the programme of measures	Establishment of programme of measures with references to the analysis performed based on Article 5 (thus, the **economic analysis** of water use according to Annex III) and including as basic measure (b) **measures deemed appropriate for the purposes of Article 9** (i.e. recovery of costs for water services) Annex VI – part B (iii) mentions ***economic or fiscal instruments***
Article 13: River Basin Management Plans & Annex VII: River basin management plans	The river basin management plan shall cover: 6. a **summary of the economic analysis of water use** as required by Article 5 and Annex III
Article 16 "Priority Substances"	Use of **cost-effectiveness criteria** for identifying best combination of product and process controls for controlling priority substances
Article 23 "Penalties"	Defining penalties may build on economic input, as these penalties have to be *…effective, proportionate and dissuasive…*

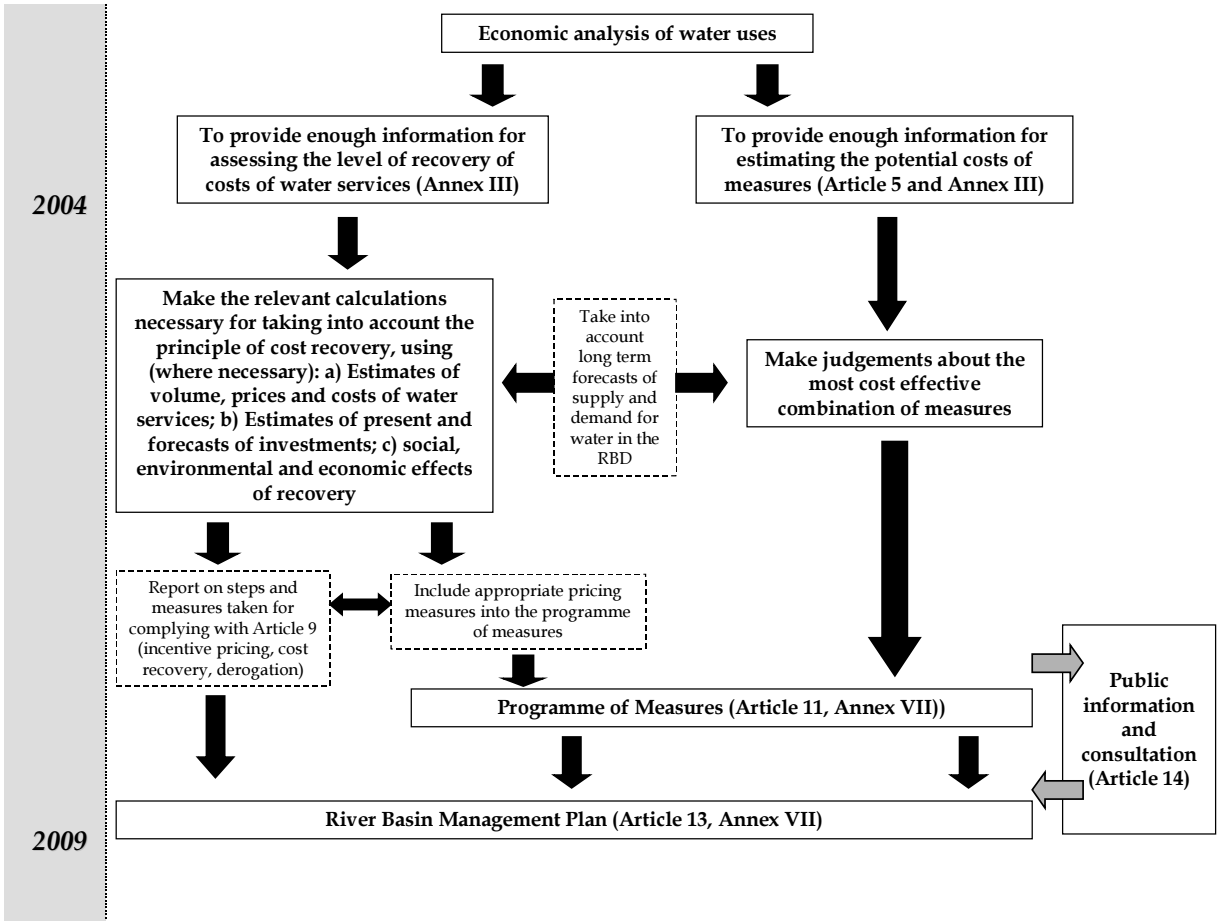
Note: the text in *italics* is the exact wording of the Directive. An exhaustive list of economic references in the Directive is given in *Annex II* and can be used as support to this section.

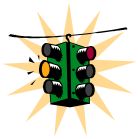
WHICH ECONOMIC ANALYSIS FOR SUPPORTING IMPLEMENTATION?

The Water Framework Directive includes a specific Annex dealing with the economic analysis, i.e. Annex III. However, the comparison between the economic elements of the Directive reviewed above and the content of Annex III shows that not all components of the economic analysis required to support the implementation of the economic elements of the Directive are specifically spelt out in Annex III.

A difference is made between the ***explicit*** and ***implicit*** functions of the economic analysis, the term *explicit* referring to the economic components that are specifically outlined in Article 5 and Annex III (see *Figure 1*), and the term *Implicit* referring to references made to economic issues in other parts of the Directive text that will also require some economic analysis which has not been mentioned in Article 5 and Annex III (see *Figure 2*).

Figure 1 – The *Explicit* Economic Functions of the Economic Analysis





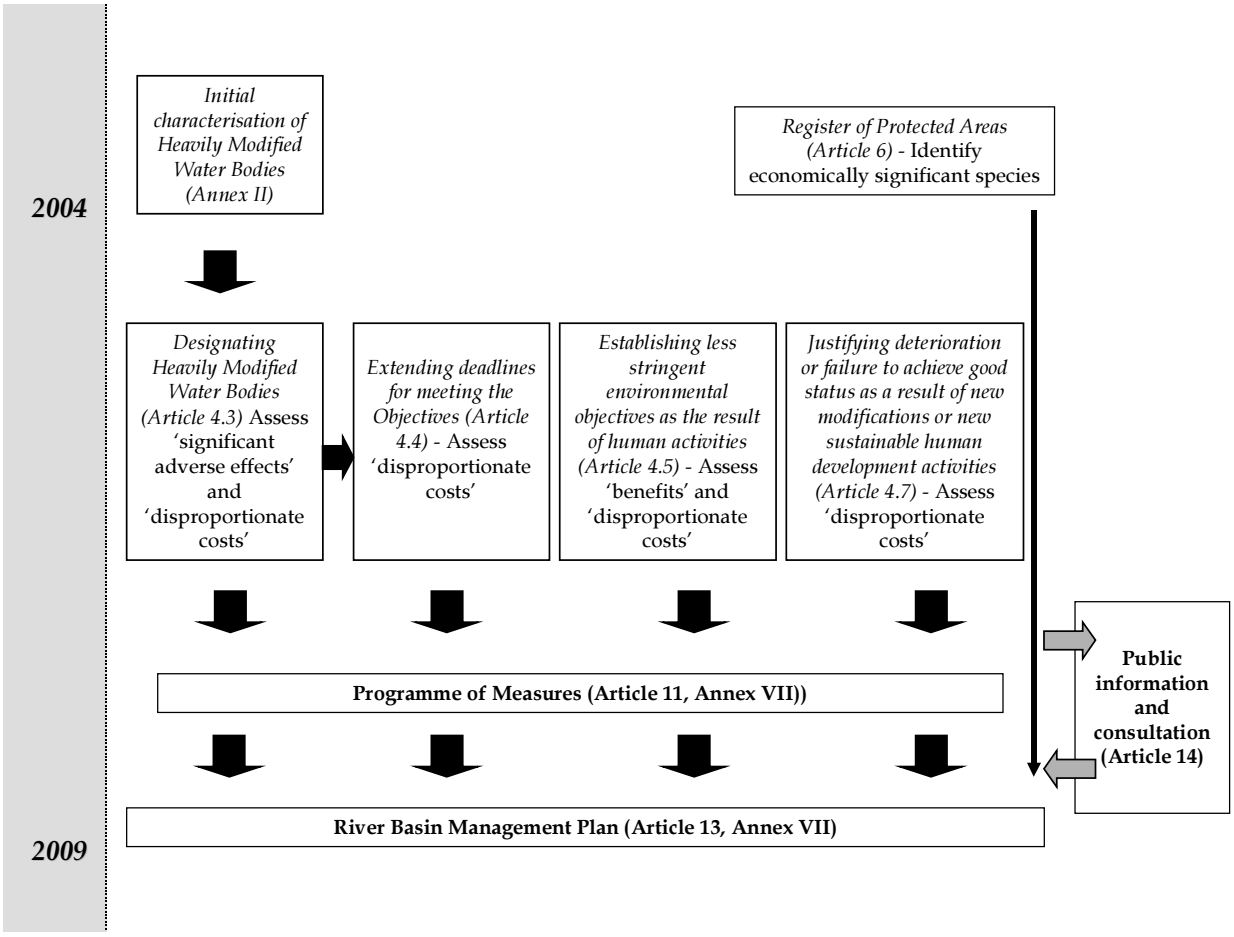
Look Out!

Annex III indicates that the economic analysis conducted by 2004 should support the assessment of the most cost-effective combination of measures to be included in the Programme of Measures (Article 11). Such cost-effectiveness analysis requires an identification of environmental objectives for each water body, an assessment of possible measures to meet these objectives, an estimate of their costs and of their impact on the status of water bodies.

- ***The economic analysis to be carried out by 2004 should pave the way for carrying out the cost-effectiveness analysis for the preparation of the programme of measures. Testing the cost-effectiveness of proposed measures will be carried out during the phase 2004-2009.***

- ***The economic analysis undertaken by 2004 being the basis for output to be delivered at a later stage, it is important to ensure the information collected and analysis performed for 2004 already account for following requirements, such as the overview of significant water management issues (by 2007) or the development of integrated river basin management plans (by 2009). This may have implications, for example, on the spatial scale at which variables are computed (river basin district scale for the 2004 reporting versus more disaggregated scale for the overview of significant water management issues).***

Figure 2 – The *Implicit* Economic Functions of the Economic Analysis



HOW CAN THIS GUIDANCE DOCUMENT HELP YOU?

This guidance document will help you to make the economic analysis a reality and to:

- Know when to establish 'knowledge links' with other disciplines for the preparation of the economic analysis and the programme of measures (*Section 3* and *Section 5*);
- Understand which information will be needed for carrying out the analysis and to fill the gaps once they have been identified (*Section 3* and *Section 5*);
- Estimate costs on the basis of common definitions (*Annexes II.II* (Glossary) and *IV.I* (Estimating costs and benefits)), and in particular to identify methods for estimating environmental and resource costs;
- Understand how to evaluate the role of pricing as an economic instrument (*Annex IV.I* (Pricing as an Economic Instrument)), but not how to develop these (*Section 3*);
- Provide some common tools for estimation of disproportionate costs (*Annex IV.I* (Disproportionate costs));
- Understand the timing requirements for submitting requests for derogation (*Section 3* and *Section 5*).

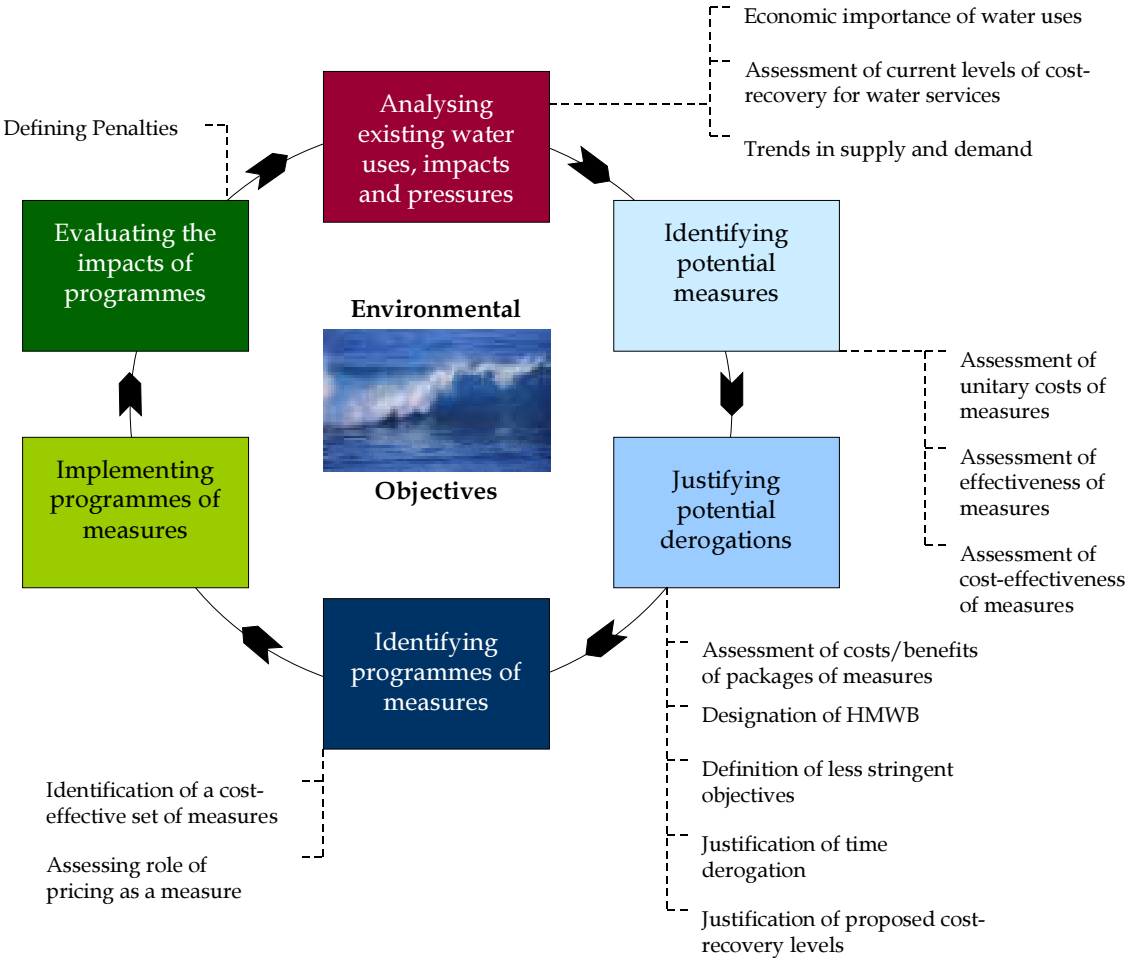
Dealing with economic issues and analyses: which tasks for the European Commission?

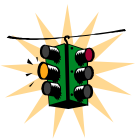
The economic analysis for supporting the development of river basin management plans and the assessment and development of pricing policies is clearly the responsibility of Member States. But the European Commission is mentioned at a few places in the Water Framework Directive in relation to economic analysis. More specifically:

- In the context of the submission of proposals of controls for priority substances (Article 16), the Commission *shall identify the appropriate **cost-effective** and proportionate level and combination of product and process controls for both point and diffuse sources…*;
- It shall also **publish a report** based (Article 18) on the summary reports submitted by Member States on the analysis required under Article 5 (Article 15), i.e. **including the economic analysis of water uses and subsequent analyses referred to in Annex III**;
- A Commission statement was added to the Directive's text at the time of adoption, stressing that *the Commission in his report will, with the assistance of the Member States, include a **cost-benefit study.***

Although scattered along the Directive's text, the different economic elements should be well integrated in the policy decision and management cycle (see *Figure 3*) to ensure it effectively aids and informs decision-making.

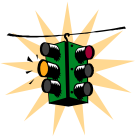
Figure 3 – Economic Elements are Linked and Must be Integrated





Look Out! There is no straight line on the economic analysis path…

Figure 3 illustrates in a simple manner the role economics can play in developing and implementing river basin management plans. In practice, however, the distinction between different tasks and the chronological order in which tasks take place is more complicated. For example, designating heavily modified water bodies requires looking simultaneously at environmental objectives, pressures and impacts, and measures for improving environmental quality.



Look Out! Economics is only there to inform decision makers

Bear in mind: whether it is based on cost-effectiveness, cost-benefit assessment or any other economic method, the economic analysis does not *take the decision*! Similarly to other disciplines and expertise, it helps in taking better decisions by accounting for their economic dimensions and impact. Thus, it is important to ensure the economic analysis and its output is well integrated with other analyses and expertise aimed at supporting policy and management decisions.

Section 3 – Roadmap to Implementing the Directive's Economic Analysis

This Section lays out the key steps that you should consider going through to carry out the economic analysis to aid decision making for developing river basin management plans. This is only a roadmap: each Member State will need to find its own way based on local circumstances.

To support the development of river basin management plans, a three step economic analysis is proposed in this section. This 3-step approach aims at providing a coherent framework to the different functions of the economic analysis required for the Water Framework Directive and identified in Section 2. It clearly integrates economic and technical issues, expertise and tools in:

- **Step 1 - Characterising the river basin** in terms of the economics of water uses, trends in water supply and demand and current levels of recovery of the costs of water services;
- **Step 2** - Identifying water bodies or group of water bodies not achieving the environmental objective of the Directive (i.**e. identifying gaps or risks of failure** in achieving objectives); and
- **Step 3** - Supporting the development of the **programme of measures** to be integrated in river basin management plans **through cost-effectiveness analysis** and justifying from an economic point of view possible (time, objective) derogation.

The objective of this Section is to set out these steps you might want to follow to carry out the economic analysis in a logical way. Section 4 will summarise what needs to be done to meet the 2004 requirements of the Water Framework Directive.

For each step, you find in this Section:	
Objective	The objective of the Step, also pointing out to the outputs to be produced in that Step.
Process	Each Step has been broken down in sub-steps and key actions. This section distinguishes between actions to be undertaken by economists, those dealt with by technical experts (in *green*) and those undertaken jointly (in *violet*)..
Methodological Scope	For each step, there is a range of options for conducting the analysis, ranging from what is practical in the short-term to what is required by the Directive and what would constitute an economic best practice. The latter might not always be achievable due to data or human resource limitations or because of too-high supplementary costs (see *Annex III*)
References in this Guidance document	Links with other documents in the guidance that give you more in-depth description and illustration of what actually needs to be done.
Links with other tasks	Links with other tasks with which coordination is required for the development of integrated river basin management plans.
Likely information requirements	List of information (non-exhaustive, non-compulsory) likely to be required for the activities described in the process, from both the economic analysis and from other tasks (in *green*). Overall, only the information that is required for the specific purpose of the economic analysis and for supporting management decision should be gathered – data should not be gathered for the sake of gathering data.

OVERALL APPROACH

In accordance to the specifications of the Water Framework Directive, the overall objectives of the three-step approach are:

- To aid decision making in selecting programmes of measures for achieving the environmental objectives of the Directive – an economic appraisal is made to rank measures and identify those that are the most cost-effective in achieving these objectives; and
- To ensure transparency in the real costs of water management interventions and help making informed decisions on the recovery of these costs for providing incentives to achieve the environmental objectives of the Directive.

The graph and the timing charts on the right hand-side focus on the logical flow of the three step approach that should be followed to implement the economic aspects of the Water Framework Directive whilst respecting the Directive's own deadlines. In particular, the figure presents for each step its objectives, the type of analysis to be carried out, what the economic analysis feeds into and key deadlines. Although presented linearly, the analysis is iterative in nature: initial analysis will be based on existing information, but will be upgraded as new information and knowledge is obtained. This figure includes two areas where economic issues are at stake but that are more difficult to position in time and within this logical framework:

- The identification and designation of heavily modified water bodies (Article 4.3 of the Directive, see *Annex IV.II*); and
- The assessment and justification of objective derogation because of new morphological modification, over-abstraction of aquifers or new sustainable economic activities (Article 4.7 of the Directive, see *Annex IV.II*).

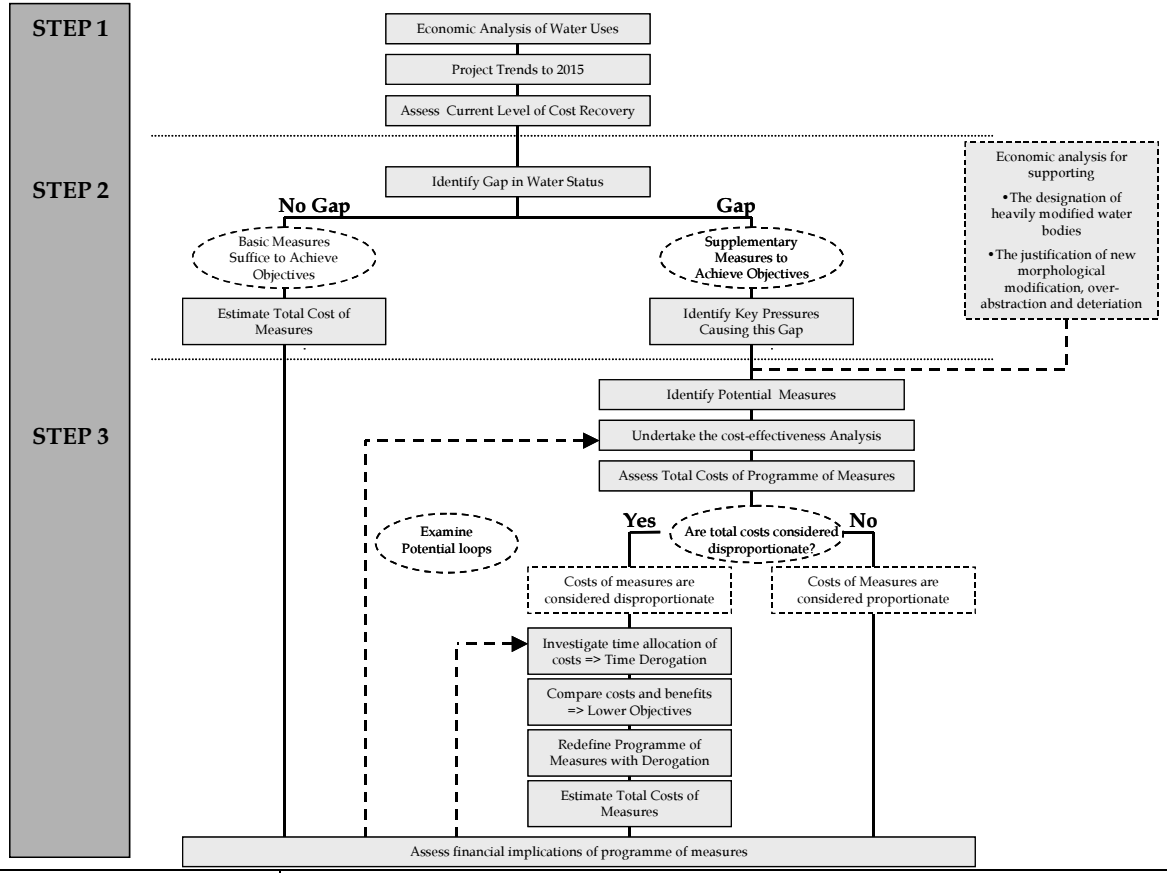
Although required in the Directive for 2008 as part of the draft river basin management plan put for consultation to the public, the designation of heavily modified water bodies and the justification for derogation resulting from new modifications and sustainable economic activities will be needed when developing the programme of measures. Thus, additional input from the economic analysis on these matters is likely to be required earlier on the basis of costs and benefits assessment.

Overall, it is important to stress that the deadlines for implementation are influenced by several drivers: (i) the Directive's own deadlines: these have been discussed in *Section 2*; (ii) logical steps for the analysis: this is what this *Section 3* focuses on (see also the critical path analysis presented in *Section 6*); (iii) interaction with other fields of competencies and with the consultation and participation process: see more on this in *Section 5*.

Before engaging in the 3-step approach, make sure to know where you are going!

Conducting a ***feasibility study*** (see *Section 5*) is recommended to assess whether the proposed approach can be made operational under actual conditions. It is important to do this assessment for future data requirements, as collecting (or creating) additional data can be long and resource-intensive. This feasibility study may include nation-wide and region-wide elements to assess the scale at which activities could best be performed.

A BIRD'S VIEW TO THE THREE-STEP APPROACH



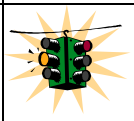
Objective	*The Three Steps*	*Feed Into*	*Timing*
To characterise River Basins		• Economic Analysis of Water Uses • Identification of protected areas	***By 2004***

To identify significant water management issues and risk of non-compliance		• Preparatory documents for RBMP • Interim Overview of Significant Water Management Issues	***By 2006*** ***By 2007***
To help identify a cost-effective programme of measures		• Draft RBMP	***By 2008***
To assess cost-recovery and incentive pricing and their economic impact		• River Basin Management Plan • Adequate pricing and cost-recovery	***By 2009*** ***By 2010***

Is that it?

No, most of the steps of the economic analysis will need to be repeated at later stages as further management cycles are required and proposed. Furthermore, the Directive sets out very clear timeframes for each of these repetitions, timed slightly differently from this first iteration. Thus, be careful to respect future deadlines! The different interim evaluations specified by the Directive will be key in updating information and assumptions made doing the earlier analyses and will ensure better information is obtained for aiding decision-making.

STEP 1 – CHARACTERISING RIVER BASINS

Objectives		Look Out!
To prepare an economic analysis of water use in order to analyse: ➢ Current water uses and their economic importance ➢ Future trends in key economic *drivers* up to 2015 ➢ Current cost-recovery levels of water services		This step will require a high level of coordination with other experts and stakeholders to build a common knowledge and representation of the River Basin.

Process	Look out!
STEP 1.1 – ASSESSING THE ECONOMIC SIGNIFICANCE OF WATER USES	
➢ Identify human pressures on water bodies ➢ Localise water uses in the river basin district ➢ Identify water uses and services by socio-economic sector (agriculture, industry, households and recreation) ➢ Assess the relative socio-economic importance of water uses ➢ Identify areas designated for the protection of economically significant aquatic species	***Potential indicators of importance:*** ➢ ***Income, employment…*** ➢ ***Volumes of water demands*** ➢ ***Expression of economic and social preferences, via public consultation***
STEP 1.2 – PROJECTING TRENDS IN KEY INDICATORS AND DRIVERS UP TO 2015	
➢ Assess trends of key hydrological and socio-economic factors/*drivers* that are likely to affect pressures (demography, climate, sector policies, e.g. common agricultural policy, technological development…) ➢ Identify proposed measures and planned investments for implementing existing water legislation ➢ Forecast changes in pressures based on changes in economic and physical drivers and proposed water-related measures ➢ Construct a *Business As Usual* scenario for pressuresConduct a sensitivity analysis on the baseline scenario and identify optimistic and pessimistic scenarios	***Ensure coherence with projections and trends used for other river basins for national and EU policies and climate change*** ***The business as usual scenario may first build on certain changes and thus need to be updated beyond 2004 in order to integrate changes in uncertain parameters***
STEP 1.3 – ASSESSING CURRENT COST-RECOVERY	
➢ Estimate costs of water services, including financial, environmental and resource costs ➢ Estimate the price/tariff currently paid by the users ➢ Assess the extent of cost recovery by water service and sector ➢ Assess the contribution to cost recovery from key water uses ➢ If felt necessary, initiate review of incentive pricing properties of existing tariffs	***This is needed to evaluate the effort needed to meet the 2010 deadline. Principles for allocating costs of water services to categories of water users will need to be defined in a coherent manner***
Key Outputs…	**… Feed into**
Key indicators of economic significance of water uses Baseline scenario and trends up to 2015 Current extent of cost-recovery Areas designated for the protection of economically significant aquatic species	Economic Analysis of water uses by 2004 Register of Protected Areas

Methodological Scope
➢ At the minimum, the economic role of water uses should be identified at the River Basin District (RBD) level, which is also the level of reporting to the Commission. However, this may be of little use for follow-up analyses and consultation required for developing river basin management plans that are likely to require lower disaggregation for economic information and indicators (e.g. sub-regions of the basin or sub-economic sectors). ➢ Initiating the integration of economic and technical information for developing an adequate integrated information base will be key to the activities aimed at characterising RBDs. ➢ If initiated at this stage, consultation would focus on seeking views on key issues and concerns in the RBD and on informing about the appraisal process.

References in this Guidance document	Links with other Tasks
Annex IV.I: *Estimating costs, Reporting on Cost-recovery, Baseline scenario, Pricing as an Economic Instrument* ***Section 4***	Determination of Pressures and Impacts Characterisation of water bodies (e.g. transitional and coastal waters) Development of geo-referenced databases Overall River Basin Planning

Likely information requirements	Look out!
Step 1.1	
➢ Water abstractions and discharges by socio-economic categories and localisation ➢ Economic importance of main water uses: turnover, employment, income, number of beneficiaries ➢ Information (for example, quantity, prices or turnover, depending on availability) for characterising economically significant aquatic species	***Key is to collect information that is relevant to water management issues in the river basin and to key economic sectors likely to be affected by the Directive Implementation. Combining biophysical and economic information will require agreement on common spatial scale of analysis and reporting.***
Step 1.2	
➢ Prospective analyses of likely development of key economic sectors/economic drivers influencing significant pressures ➢ General information on population growth, economic growth, sector growth patterns, future policies and forecasts of the impact of climate change ➢ Studies on existing and projected water balance ➢ Inventory of existing measures (and costs) for complying with existing water legislation ➢ Identification of technological developments in the water sector	***A good understanding of regional planning issues will also be required for this step.*** ***Risk assessment is key: try to specify the degree of confidence when forecasting data***
Step 1.3	
➢ Estimation of financial costs (broken down in operating, maintenance and capital costs) ➢ Evaluation of tax transfers, administrative costs and any other costs ➢ Evaluation of environmental and resource costs as required ➢ Extent of financial and environmental cost-recovery ➢ If activities initiated for reviewing incentive pricing: current pricing structure and price elasticity, affordability criteria	***Assessing incentive pricing properties of existing tariffs might be difficult in practice: it should be done so as to inform the future introduction of incentives in tariffs by 2009.*** ***Affordability is seen as key in some countries (e.g. candidate countries to the European Union).***

Illustration - Assessing the economic significance of water uses

The pilot projects undertaken in the context of developing this guidance have illustrated the diversity of economic indicators that can be computed for assessing the economic significance of water uses.

- In the **Corfu** case study (see *Annex V.II*), tourism represents a key water use sector. Its economic importance was illustrated with absolute and relative (as compared to national values) values for mean annual employment (direct and indirect) and total number of nights spent by tourists in the island during the year;
- For the characterisation of the Scheldt estuary, undertaken as part of the **Scheldt** case study (see *Annex V.II*), the analysis concentrated mainly on navigation and harbour economic activities (leading to deepening and maintenance of the shipping channel) and economic land use in the area (agriculture, industry or harbour development leading to in-poldering and construction of dikes); and
- In addition to urban development and linked water services, the **Cidacos** case study (see *Annex V.II*) emphasised agricultural water use with the view to assess the indirect economic impact potential measures aimed at improving water status would have on the agricultural sector.

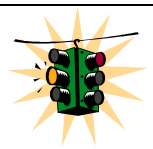
Water services, water uses and cost-recovery

The Water Framework Directive requires Member States to take account of the principle of recovery of the costs (including environmental and resource costs, see Article 9.1) of water services, also taking into account the *polluter pays principle*.

The assessment of cost recovery is relevant to water services (according to Article 2.(38)) but not to the wider circle of water uses (according to Article 2.(39)). However, the different water uses shall deliver an adequate contribution to the recovery of the costs of water services (Article 9.1), stressing the need to link water uses and services developed for mitigating the negative environmental impact of these uses.

Further issues on water services to be included in the analysis (based on transparency, effectiveness and proportionality criteria) and related implications are further developed in *Annex II.III*.

STEP 2 – IDENTIFYING SIGNIFICANT WATER MANAGEMENT ISSUES

Objectives		Look Out!
➢ To identify the gaps between the water status resulting from the baseline scenario and the Directive's objectives (good water status) ➢ To identify significant water management issues in each River Basin ➢ To pave the way for the preparation of a programme of measures to address these issues		Here, the economic analysis will use a high level of input from more technical analysis. However, sufficient economic elements should be provided to organise meaningful stakeholder consultation.

Process	Look out!
STEP 2.1 – WILL THERE BE GAPS IN WATER STATUS BY 2015?	
➢ Translate the forecast analysis of pressures and investments in the water sector into a forecast of impact ➢ To assess the gap between the Directive's objectives with respect to water status and the water status achieved with the baseline scenario and optimistic and pessimistic variations o If *gap* in water status ➢ ***Go to Step 2.2.a*** o If *no gap* in water status ➢ ***Go to Step 2.2.b***	***Assessing the gap in water status is equivalent of the more rigorous assessing risk of non-compliance.***
STEP 2.2.a – WHAT TO DO WHEN A "GAP" HAS BEEN IDENTIFIED?	
➢ *Gap*: identify water bodies where there is a gap ➢ Define the main drivers of pressures (particularly, in terms of socio-economic groups) in order to facilitate the selection of appropriate measures in Step 3 ➢ Start identifying main options/measures likely to be investigated in subsequent steps as guide ➢ Evaluate how socio-economic groups may be affected by main options/measures measures taken to reduce the gap	***Public consultation is clearly specified in this Step. It will be important to have preliminary assessments of cost and socio-economic impacts to provide a basis for consultation.***
STEP 2.2.b – WHAT TO DO WHEN "NO GAP" HAS BEEN IDENTIFIED?	
➢ *No gap*: measures for complying with existing water legislation are sufficient to meet the Directive's objectives ➢ In the preparatory documents, propose to confirm those objectives and the programme of measures required by existing water legislation ➢ If considered necessary, estimate the costs of these basic measures and provide a first assessment of the impact of these measures on socio-economic sectors and cost-recovery ➢ Go to ***Step 3.4***	***In Step 3, it might be necessary to reconfirm the costs of these basic measures and their cost-recovery impact in order to incorporate them in the final River Basin Management Plan***
Key Outputs…	**… Feed into**
➢ Total costs of basic measures if *no gap* is identified ➢ Identification of water bodies where gap is identified ➢ Identification of the key sectors causing the gap and that might be affected and initial estimation of costs of additional measures for reaching good water status	➢ Preparatory documents for the RBMP by 2006 ➢ Interim Overview of Significant Management Issues by 2007

Methodological Scope
➢ Once gaps or risks of non-compliance have been identified for specific water bodies within a river basin, more detailed analysis might need to be carried out at the level of the concerned water bodies. For example, to obtain a better hand on pressures and their impact on the status of these specific water bodies. ➢ The assessment of the gap will require a good understanding of the hydrological cycle and relationships between, on one side, pressures and measures and, on the other side, impacts. The scale at which this assessment is required will be influenced by the identification of water bodies where gaps occur in the concerned river basin.

References in this Guidance document	Links with Other Tasks
Annex IV.I: *Estimating costs* *Reporting for cost-recovery* ***Section 4***	Determination of Pressures and Impacts Overall River Basin Management

Information requirements	Look out!
Step 2.1	
➢ Methods and tools for transforming trends in pressures into trends in water status ➢ Potential role of environmental modelling	***Information for this Sub-Step will mostly come from other competencies at river basin level, such as from the experts in charge of determining pressures and impacts***
Step 2.2.a	
➢ Identification of additional measures, including new investments, sector policies, economic instruments ➢ Initial estimation of the costs of these additional measures ➢ Preliminary (qualitative) assessment of socio-economic impacts on specific target groups	***Economic analysis may play a role in the identification of key drivers for pressures. And socio-economic indicators are likely to be of interest to stakeholders and the public in the context of consultation.***
Step 2.2.b	
➢ Costs of basic measures ➢ Estimation of the impact of basic measures on socio-economic groups	*See for example reports of specific European water directives (e.g. Urban Waste Water Treatment Directive)*

Is that it?

Article 14 specifies that preparatory documents for the River Basin Management Plan will need to be produced three years before each future RBMP for adequate information and consultation of key stakeholders and the public. This requirement applies to the interim overview of the significant water management issues required for 2007 (and at least two years before each future plan in following planning cycles). Thus, ensuring results of the analysis respond to the demand for information from stakeholders and the public will be key to the type of information to be delivered and to the reporting format.

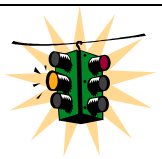
Illustrations - Using simulation models for assessing the gap in water status and supporting the cost-effectiveness analysis

Computer-based simulation models can prove useful for assessing the impact of pressures on water status and investigating the effectiveness/likely environmental impact of different measures:

- A mathematical hydrodynamic model was used in the **Alsace** case study (see *Annex V.II*) for investigating problems of salt (NaCl) intrusion into the groundwater aquifer. The model helped quantify the impact of planned measures on water quality, showing these measures would not be sufficient for achieving good water status;
- A simple mass balance model was developed for assessing the effectiveness of measures in the **Cidacos** case study (see *Annex V.II*). This model integrates sub-models for specific river reaches, and provided input into the cost-effectiveness analysis of measures targeting various economic sectors (agriculture, household, etc) and environmental issues (water quality, water quantity and over-abstraction).

Clearly, models should be used with caution, i.e. the user must understand the assumptions and information used for building and calibrating the model, and uncertainties in model prediction. However, properly developed and handled in interaction with stakeholders, they can provide effective platforms for analysis, understanding and discussion aimed at supporting decision.

STEP 3 – IDENTIFYING MEASURES AND ECONOMIC IMPACT

Objective		Look Out!
➢ To provide an economic input into the definition of the programme of measures and help ranking possible measures based on cost-effectiveness criteria ➢ To provide economic support to the assessment of derogation ➢ To assess the potential impacts and financial implications of the programme		This step is the key economic input into the preparation of the RBMP (*Article 13*). It is important efforts are targeted to areas and issues required for aiding decision making.

Process	Look out!
STEP 3.1 – EVALUATING THE COSTS AND EFFECTIVENESS OF POTENTIAL MEASURES	
➢ Identify potential measures to achieve the Directive's objectives, including basic and supplementary measures ➢ Estimate the costs of each measure ➢ Estimate the effectiveness (environmental impact) of each measure	***Given potential interaction between measures, it is important to assess the effectiveness of basic measures and integrate them into the cost-effectiveness analysis.***
STEP 3.2 – CONSTRUCTING A COST-EFFECTIVE PROGRAMME OF MEASURES	
➢ Assess and rank cost-effectiveness of measures ➢ Select the most cost-effective programme of measures that can reach environmental objectives ➢ Calculate range for the total discounted costs of this programme ➢ Undertake a sensitivity analysis to assess robustness of results	***Uncertainty on costs, effectiveness and time-lagged effects of measures needs to be considered in the cost-effectiveness analysis.***
STEP 3.3. – EVALUATING WHETHER COSTS ARE DISPROPORTIONATE	
➢ If total costs are judged to be proportionate ➢ Go to ***Step 3.4*** ➢ If the total costs of the proposed programme are judged to be disproportionate, estimate whether a derogation might be needed from an economic point of view and on which basis: 1. Compare total costs to financial resources – if costs can be reduced or better managed over longer time horizon, propose time derogation; 2. Assess total costs and benefits (including water-related environmental benefits) – if total costs disproportionate as compared to benefits, propose less stringent environmental objectives – account for socio-economic and distributional implications if considered necessary ➢ Redefine programme of measures accordingly and propose water bodies for derogation ➢ Calculate total discounted costs of revised programme	***How to "judge" whether costs are disproportionate is not developed here, as it encompasses many complex decisional, institutional and socio-economic elements. Judgement needs to be made prior the analysis to decide whether to embark into the analysis or not. Estimating the need for derogation will be resource intensive and will require co-ordination with other experts and consultation of key stakeholders and the public.*** ***➢ Plan it well and start early!***
STEP 3.4 – ASSESSING THE FINANCIAL IMPLICATIONS OF PROGRAMME OF MEASURES	
➢ Assess socio-economic and distributional impact of the selected programme ➢ Assess financial and budgetary implications of the selected programme, establish alternative financial plans ➢ Identify accompanying (financial, technical, institutional) measures for implementing the selected programme ➢ Assess potential impact on cost-recovery and incentive pricing	***This analysis will feed into the definition of pricing policies by 2010. It may also require loops to earlier steps of the cost-effectiveness analysis, e.g. if resulting price changes are likely to change pressures and thus the cost-effectiveness analysis***

Key Outputs…	… Feed into
➢ Estimation of Total Costs of Programme of Measures ➢ Economic justification for possible derogation ➢ Financial and budgetary implications of selected programme ➢ Assessment of cost-recovery levels with proposed measures	Programme of measures and River Basin Management Plan

References in this Guidance document	Links with Other Tasks
Annex IV.I: *Scale issues,* *Estimating costs,* *Cost-effectiveness analysis,* *Cost and benefit assessment,* *Pricing as an Economic Instrument,* *Disproportionate costs*	Definition of programme of measures Estimation of the effectiveness of measures Justification of derogation

Information requirements	Look Out!
Step 3.1	
➢ Costs of potential measures, e.g.: investing to increase available supplies, demand management, wetland restoration, limiting abstractions with permits ➢ Effectiveness of potential measures	***If demand management and pricing measures are used, the effectiveness of the programme of measures might need to be revisited to account for elasticity issues.***
Step 3.2	
➢ Compile information gathered in Step 3.1.	
Step 3.3	
➢ Costs are proportionate: compile total costs of programme ➢ To assess whether costs are disproportionate: o Estimate financial resources available o Estimate costs and environmental benefits which relate to the water body level	***The economic analysis can only formulate recommendations: estimating the need for derogation will ultimately remain a political decision.***
Step 3.4	
➢ Forecasts of prices by 2010 based on ongoing tariff policies ➢ Allocation of costs by water uses ➢ Information on price elasticity (effectiveness)	

Methodological Scope
➢ The cost-effectiveness analysis is best performed at the river basin scale. Undertaking the analysis at lower scale requires an adequate integration between analyses undertaken for sub-units of the river basin. ➢ Specific care needs to be given to the choice of the effectiveness indicator. Indeed, different effectiveness indicators may lead to a different outcome for the ranking of measures. Furthermore, specific attention may be required as the effectiveness of measures can often be assessed (qualitatively) for a few environmental indicators only, and not for the range of environmental issues encompassed in the definition of water status. ➢ Care is to be given to the assessment of the different costs considered in the cost-effectiveness analysis. Often, information may not be available for specific cost types. Thus, it is important to remember the cost-effectiveness analysis is only partial and to stress the possible uncertainty existing with the ranking of measures obtained.

SELECTED ISSUES FOR CONCLUDING SECTION 3

Methodological Scope for the economic analysis	
Scale	Even though reporting in the RBMP is at the river basin district level, different types of analysis should be conducted at different scales: • Cost-effectiveness analysis should best be conducted at the *river basin level*; • In some cases, it may be more practical to undertake the analysis for *sub-basins*. However, the hydrological integrity of the basin needs to be kept, starting for example with the most up-stream sub-basin and working downwards; • Derogations can be justified (based on the assessment of costs and benefits) at the *water body level*; • Reporting on cost-recovery should be done by *socio-economic sector* (water use) or sub-sector.
Integration	Already said before, but worth repeating…. Integration between economists and other experts from the start, i.e. from the characterisation of the river basin, is key to the usefulness and effectiveness of the economic analysis in supporting decisions.
Uncertainty	Uncertainty on costs, effectiveness and time-lagged effects of measures needs to be dealt with throughout the economic analysis process, and more generally throughout the process of identifying measures and developing the river basin management plan. Sources for uncertainty are highly diverse according to situations and river basins, but will exist with regards to the assessment of pressures, impacts, baseline, costs or effectiveness. It is important that key areas of uncertainty and key assumptions made for the analysis are clearly spelt out and reported along the results of the analysis. Thus, comparison between analyses undertaken in different river basins and regular updates of the analysis will always be possible.
Sensitivity analysis	Sensitivity analysis is required for assessing the robustness of the results of the analysis (i.e. whether results are modified or not) if some parameters vary within certain acceptable limits. Sensitivity is seen as key to the development of the baseline scenario and the cost-effectiveness analysis.
Information	The collection of economic-related information should be well thought through and targeted. Apart for the specific reporting and analytical requirements of the Water Framework Directive, it is important to ensure data collection is targeted to where it is useful for supporting the decision making process, be it for the decision itself or for informing and consulting the public on this decision.
An iterative process	Although the right information may not be available today, it is important to start the analysis and develop it in iterations. Thus, as important as the results of the analysis for the different steps is the assessment of the most significant information gaps and the development of activities aimed at filling these gaps.

Illustrations - Selecting the "right" scale for the analysis?

The scoping and testing projects undertaken to support the development of this guidance document illustrate the importance of selecting the 'right' scale for the economic analysis:

- The economic significance of water uses can be assessed at scales that account for the hydrological functioning of the river basin, socio-economic characteristics of economic sectors, land planning and land use. Identifying homogenous units for these criteria was performed in the **Rhône-Méditterranée-Corse** case study (see *Annexes IV.I* and *V.II*). These units are often recognised by stakeholders and the public, and thus particularly important for consultation and participation. The combination of economic and biophysical information for identifying management units to which the economic analysis should concentrate was also stressed in the analysis of groundwater issues in the **Scheldt** case study (see *Annexes IV.I* and *V.II*);
- The forecast of water demand in **England and Wales**[1], undertaken by the Environment Agency, showed the importance of adopting a disaggregated approach to demand forecasting, in order to identify the key drivers of demand and in particular, the key sectors having an impact on demand. Such disaggregation is required to introduce sufficient confidence into the supply-demand balance assessments that are key to establishing a baseline water use estimation;
- The **Cidacos** case study (see *Annexes IV.I* and *V.II*) showed the importance of undertaking the cost-effectiveness analysis at the river basin scale, accounting for the hydrological functioning of the river basin. As an illustration, undertaking cost-effectiveness analyses independently for three different river reaches led to total costs estimates for the selected programme of measures that were significantly higher than the estimated costs obtained for a cost-effectiveness analysis undertaken for the three river reaches in combination;
- Activities undertaken in the **Ribble**, **Cidacos** and **Daugava**[2] (see *Annexes IV.I* and *V.II*) case studies investigated measures of relevance to different spatial scales and decision-making levels. They stressed the need for consistent approaches and feedback between scales and levels.

1 –Environment Agency. August 2001. *A scenario approach to water demand forecasting*.

2 – Ilona Kirhensteine. 2002 (forthcoming). *Developing river basin management plans in the Daugava river basin (Latvia)*. Proceedings of the Lille III Conference. (see also *Annexes IV.I* and *V.II*).

Section 4 – 2004: The First Milestone for the Economic Analysis

This Section brings together the economic analyses Member States should undertake by 2004 to be on track for complying with the requirements of the Water Framework Directive.

The Water Framework Directive specifies a series of reporting dates (see *Section 1 - Introduction*) for key tasks and activities aimed at the development of river basin management plans. And 2004 is the first major deadline directly following the designation of the river basin districts and competent authorities (required for 2003). The overall objective of the 2004 deadline is a description or characterisation of the river basins as referred to primarily in Article 5 of the Directive and relevant Annexes.

Thus, 2004 is also the first milestone for the economic analysis and for economists involved in the development of river basin management plans. The present section provides a synthesis of the economic analysis required for 2004:

- To comply with the main reporting obligations of the Directive for 2004, and identify reporting requirements to the European Commission; and
- To ensure adequate economic input into the initial steps of preparing the cost-effectiveness analysis of measures and thus support the development of river basin management plans.

This section does not repeat the elements of the process required for developing the economic analysis as described in the previous and following sections (see ***Section 3*** and ***Section 5***). The focus is on the main economic elements to be investigated, i.e.:

- Undertaking **the economic analyses of water uses** (*Article 5*);
- Investigating the dynamics in the river basin **– development of the baseline scenario** (*Article 5, Annex III*);
- Assessing current levels of **cost-recovery of water services** (*Annex III, Article 9*);
- Preparing for the **cost-effectiveness analysis** (*Annex III*); and
- Proposing activities for **enhancing the information and knowledge base** (*Annex III*).

It is important to ensure that the economic analyses described below are integrated with other technical analyses such as the analysis of pressures and impacts. This will ensure a common description and characterisation of the river basin is obtained, basis for the identification of the programme of measures and the development of the river basin management plan.

For many elements of the analysis proposed below (e.g. extent of recovery of environmental costs), information will not be directly available for undertaking a robust analysis by 2004. However, undertaking the analysis with existing data and information will allow Member States to identify practical steps to be followed after 2004 for improving the information and knowledge base. This will ensure that the analysis developed in following the steps effectively supports decision-making and complies in time with the requirements of the Water Framework Directive.

In addition to these economic analyses, economic input may be required in analyses and activities which timing is less well defined in the Directive. For example, the designation of heavily modified water bodies will require early economic input. This has not been specified here and will be dealt with in the respective guidance on the identification and designation of heavily modified water bodies (see *Annex IV.II*) and in the overall guidance on best practices in river basin planning.

UNDERTAKING THE ECONOMIC ANALYSES OF WATER USES

The primary objective of the economic analysis of water uses is (i) to assess **how important water is for the economy and socio-economic development of the river basin**, and (ii) to **pave the way for the assessment of significant water uses and analysis of disproportionate costs.**

(i) The **economic analysis of water uses** is used to construct the general economic profile of the river basin and of its key water uses and significant pressures in terms of:

- Economic analysis of water uses, e.g. collating information for significant water uses on gross income, turnover, number of beneficiaries, agricultural and industrial area or employment, etc as considered relevant;

- Stressing the importance of water for economic and regional development and the evidence of this importance provided in existing economic strategies and plans; and

- Areas designated for the protection of *economically significant aquatic species*, as input into the register of protected areas required under *Article 7* and *Annex IV* of the Directive.

These general economic indicators will be computed at the **scale of the river basin or river basin district**. For economically significant aquatic species, further desegregation according to location within the river basin may be provided consistently with the maps prepared for *Article 7*. This analysis is mainly based on easily available statistics and information. Specific approaches may be used to transform existing information (often available for administrative regions or water service areas) to the scale of the river basin or river basin district.

(ii) In parallel, the economic analysis of water uses needs **to pave the way for the assessment of the significant water uses** to be reported to the public by 2007 and related understanding of the likely tradeoffs and conflicts between socio-economic development, environment and water protection that can be fed into the public information and participation process regarding the development of river basin management plans.

The indicators computed are similar to the ones listed above, complemented with variables and indicators that are specific to the significant water uses identified for the river basin considered, e.g. cropping pattern for specific irrigated schemes that impose high pressures on water resources, turnover and main products of industrial sub-sectors that are highly polluting rivers, etc. However, the computation scale or desegregation level is the **area linked to a given significant pressure or to specific economic sectors/sub-sectors**

Overall, the analysis should remain proportionate and not entail extensive collection of new data, i.e. dealing primarily with clear conflicts/water management issues based on information of relevance to significant water uses. The spatial scale or region at which the analysis should be undertaken will be defined by both the analysis of pressures and impacts developed for the characterisation of the river basin, and the outcome of the participation process and stakeholders input/request for specific further desegregation.

INVESTIGATING THE DYNAMICS IN THE RIVER BASIN DEVELOPMENT OF THE BASELINE SCENARIO

Feeding into the **identification of significant water management issues** for 2007, the analysis needs to complement the characterisation of the river basin today by an assessment of its future likely trends and baseline scenarios. This assessment is the basis for analysing the gap between likely water status and good water status (**risk of non-compliance**) and for undertaking the subsequent **cost-effectiveness analysis of measures**.

Being a joint activity between different expertise and disciplines (see *Section 3*), the specific role of the economic analysis in the development of baseline scenarios and the analysis of the dynamics of the river basin is the assessment of forecasts in **key (non-water related) policy and economic drivers** likely to influence pressures and thus water status.

Focus is likely to be on foreseen trends in (non-exhaustive list):

- General socio-economic indicators and variables (e.g. population growth);
- Key sector policies that influence the significant water uses identified in the river basin investigated (e.g. agricultural policy);
- Production or turnover of main economic sectors/significant water uses in the river basin;
- Land planning and its effects on the spatial allocation of pressures and economic sectors;
- Implementation of existing water sector regulation and directives; or
- Implementation of environmental policies likely to affect water (e.g. *NATURA* 2000).

Some of these forecasts will be developed jointly with technical experts (see for example the implementation of water sector directives and other environmental legislation). Complemented by analysis of changes in the hydrological cycle, e.g. for accounting for climate change, it will feed into an overall assessment of changes in key pressures, including water demand, and resulting impact on water status as key input into the identification of

significant water management issues for 2007.

It is important to stress that **some analyses can be organised at the national or European scale** as all river basins of a given country or of Europe will face similar changes (this is for example the case for changes in EU policies such as the Common Agricultural Policy). Other analyses such as changes in production and turnover of significant water uses and economic sectors will need to be developed **at the scale of the river basin or for parts of the river basin** according to the scale at which related pressures take place.

ASSESSING CURRENT LEVELS OF COST-RECOVERY OF WATER SERVICES

The assessment of the current levels of cost-recovery of water services is the **basis for the implementation of Article 9 of the Water Framework Directive and for ensuring transparency** on costs, prices, subsidies, cross-subsidies, etc. As such, this analysis is less directly linked to the identification of the programme of measures and the development of integrated river basin plans. But it will be called for when assessing the financial implications of the chosen programme. Key elements to be investigated may include:

- Status of key water services (e.g. number of persons connected/using the service);
- Costs of water services (Financial costs, Environmental and resource costs);
- Institutional set-up for cost-recovery (prices and tariff structure, subsidies, cross-subsidy);
- Resulting extent of cost-recovery levels (for financial costs, for environmental and resource costs);
- Extent of contribution of key water uses to the costs of water services (link with pollution and use information collected for the analysis of pressures and impacts); and
- Complementary information whenever relevant (e.g. affordability for key water users).

The basic **scale of analysis is linked to the water service area** or combined water service area when services are combined. However, this will be very dependent from the structure of the water service sector and related information base.

PREPARING FOR THE COST-EFFECTIVENESS ANALYSIS

Although referred to in Annex III of the Directive in the context of the 2004 deadline, it will not be possible to perform the cost-effectiveness analysis in 2004 as environmental objectives and potential measures will not be identified yet. **To ensure the cost-effectiveness analysis can be performed** at a later stage, and **because of the limited cost-information available today in a coherent format** in most countries/river basins, it is proposed to develop a cost-database for a wide range of measures likely to be investigated:

- This database should not focus solely on cost information of infrastructure (the easiest to collect). Measures such as wetland restoration, demand management measures, new pricing, voluntary agreements, etc should be included. A key first step will be to provide

an initial specification of the sort of measures that might be included in river basin management plans;

- A range of costs should be collated (minimum, average, maximum) as opposed to single average values. Key parameters influencing costs should be identified to facilitate extrapolation of figures to specific sites/conditions;

- Costs to be collected should include all costs that are non site-specific, e.g. limited to financial costs of the measures or specific environmental costs (e.g. air-related), and also indirect economic costs whenever considered relevant; and

- Wider economic benefits that are non-site specific may also be added to the database whenever considered relevant. This information would facilitate follow-up disproportionate cost analysis and support to derogation.

The information should be **collected for individual measures or units of measures**, thus at a spatial or desegregation scale depending on the scale at which the measure is applied or implemented. Such efforts may be best co-ordinated at the national or European scale, especially for measures linked to policies and programmes that have a more regional or national focus.

PROPOSING ACTIVITIES FOR ENHANCING THE INFORMATION AND KNOWLEDGE BASE

Along with results of the different components of the economic analysis, it will be important to **systematically report** on:

- **Information, assumptions and approaches** used for computing key indicators. It is important that this is made transparent (i) to ensure easy updating/upgrading of results as new information is made available and (ii) to facilitate comparisons between results obtained in different river basins or sub-basins (especially in transboundary river basins).

Practical steps and measures will be identified and proposed for **filling key information and knowledge gaps:**

- Identified during the first analysis aimed at **characterising the river basin in economic terms** - for ensuring key indicators (e.g. cost-recovery levels) can be **further improved and refined**; and

- **Likely to arise when developing integrated river basin management plans –** for ensuring the **cost-effectiveness analysis can be performed at a later stage**. This indeed requires **undertaking the *feasibility study*** (see *Section 5*) for the entire economic analysis process (which information to be collected, at which scale, which data collection or computation method, which periodicity, etc).

Although it is too early to specify the main focus of such activities, as they will be based on both general and local assessments of information and knowledge needs, likely candidates that will require further work combining economic and technical expertise include:

- The assessment of water-related environmental costs (benefits) and the development/strengthening of environmental costs databases;

- Methods for assessing the direct economic impact of range of measures for key economic sectors (e.g. industrial sub-sectors, agricultural sub-sectors);

- Methods for assessing the effectiveness of measures or combination of measures.

The costs of activities proposed for enhancing the information and knowledge base will be assessed and reported. Feedback to research programmes may also be developed to ensure research needs are tackled in a timely manner.

DOING AND REPORTING THE ECONOMIC ANALYSIS FOR 2004 – A SUMMARY

The following table summarises the different economic analyses and activities to be performed by 2004. It stresses reporting obligation to the European Commission defined in the Water Framework Directive. Clearly, these reporting obligations will need to be complemented by, integrated with, existing regional or national reporting obligations. Further reporting requirements may also arise from the participatory process developed by Member States for developing river basin management plans.

Title	Addressing	Likely elements of the analysis	Reporting to the European Commission in the management plan of the river basin district	Feeding into
Undertaking the economic analysis of water uses	**What is the economic importance of key water uses in the river basin?**	• The economic importance of the main water uses is analysed for the river basin district. Relevant economic indicators are computed. • Further analysis is performed for lower disaggregation levels according to scale of significant pressures (jointly with pressures and impacts analysis) • Areas designated for the protection of *economically significant aquatic species* are investigated.	• Economic analysis of water uses at the river basin district scale	**Characterisation of the river basin** **Overview of significant water management issues** **Register of protected areas**
Investigating the dynamics of the river basin – developing the baseline scenario	**How will key policy and economic drivers evolve up to 2015?**	• Forecast in key economic drivers are investigated (different scale of analysis for different drivers) • The impact of these forecasts on key pressures is estimated (at the scale of significant water management issues, at the scale of the district)	• Trends in key economic and policy drivers at the river basin district scale	**Overview of significant water management issues/ water status gap/risk of non-compliance**
Assessing current levels of cost-recovery	**What are current levels of recovery of costs of water services?**	• Collection of information on costs, prices, subsidies (water services, combined services, regional areas, etc) as seen appropriate • Analysis of information and assessment of the extent of (financial, environmental and resource) cost recovery • Description of the institutional mechanisms in place for cost recovery	• Financial cost-recovery • Environmental and resource cost recovery • Institutional mechanism for cost-recovery	**Implementation of Article 9** **Financial implications of the selected programme of measures**

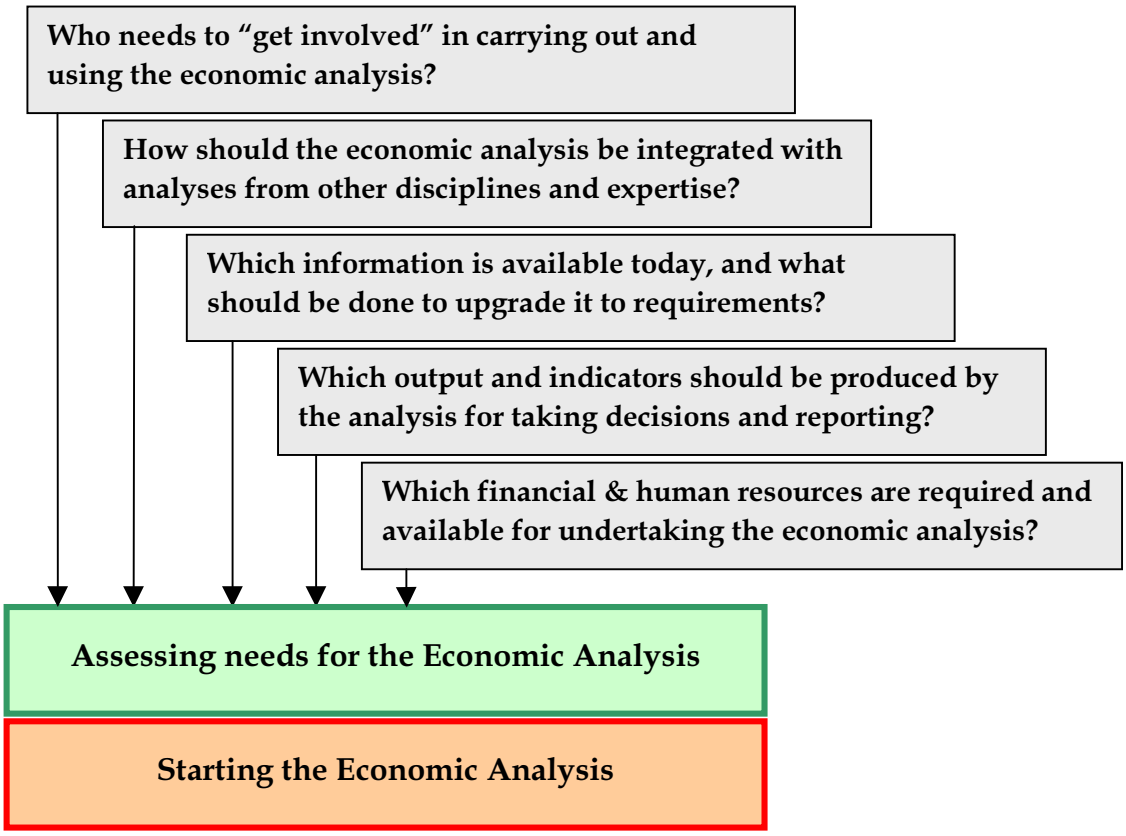
Title	Addressing	Likely elements of the analysis	Reporting to the European Commission in the management plan of the river basin district	Feeding into
Assessing current levels of cost-recovery (continued)	**Which contribution to the costs of water services from key water uses?**	• Analysis of the extent key water uses contribute to the recovery of costs of water services (linking with information on pressures and impacts)	• Contribution from key water uses (agriculture, householdes, industry) to the recovery of the costs of water services	
Preparing for the cost-effectiveness analysis	**What are costs of potential measures that will feed into the cost-effectiveness analysis?**	• Existing cost information is collected for a range of measures. A database easily accessible is developed.		**Selection of the programme of measures, cost-effectiveness analysis**
Proposing activities for enhancing the information and knowledge base	**What are current information and knowledge gaps that need to be filled for taking decision?**	• Key assumptions and information sources, computation methods and uncertainty are made transparent for all elements of the analysis • Identification of key information and knowledge missing for developing the economic analysis for the programme of measures and development of the integrated river basin plan • Proposed data collection activities for filling gaps • Assessment of the costs of data collection	• Key assumptions and information sources, computation methods and uncertainty are made transparent for all elements of the analysis • Identification of key information missing for developing economic analysis for integrated river basin plans • Proposed data collection activities and related costs	**Refining the economic analysis of water uses, ensuring the cost-effectiveness analysis can be performed and aid decision making**

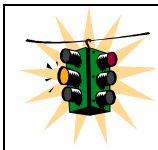
Section 5 – Making the economic analysis operational and ensuring Coherency with the Overall Implementation Process

This Section brings attention to key issues related to developing the economic analysis and the need to ensure coherency and integration with the process of preparing River Basin Management Plans.

Before starting the economic analysis itself (see *Section 3*), it is important to ensure that you have defined the right process for undertaking this analysis. You will need to carefully review a series of issues so that you can deliver what is expected from the economic analysis so it aids decision-making. Some of these issues are rather straightforward; others will need further elaboration and discussions with experts, water managers or stakeholders. Overall, most of what is described in this section will need to be co-ordinated with other experts and disciplines involved in the development of river basin management plans.

ISSUES TO FOCUS ON INCLUDE…





Look out! Before starting the economic analysis, make sure:

- That you know who is going to use the information you produce, for which purpose, and what are the expectations *vis-à-vis* the economic analysis.
- That you have enough financial and human resources for undertaking the required economic analysis and meet expectations.

WHO NEEDS TO GET INVOLVED IN CARRYING OUT AND USING THE ECONOMIC ANALYSIS?

Assessing "who needs to get involved" requires addressing some of the following questions:

- Who will be responsible for the economic analysis?
- Who will undertake the economic analysis?
- Who will provide input into the economic analysis?
- Who will control the quality of the economic analysis?
- Who will use the results of the economic analysis?
- Who will pay for the economic analysis?

Answers to these "*Who*" questions are likely to include a wide range of organisations, stakeholders and individuals according to questions. For example, experts from the Ministry of Environment or other ministries (land planning, economic affairs, agriculture, etc), experts from river basin agencies or regional authorities, managers in charge of developing river basin management plans, ministry heads of water departments, researchers and consultants, economists and non-economists, the public and a wide range of stakeholders that have developed expertise in specific fields (see *Table 1*) and are involved in water management.

Developing a *stakeholder analysis* with possible involvement of key stakeholders can be an appropriate step for finding answers to these questions (see *Annex III.II*). It also helps in identifying key steps in the analytical process when involvement or input from specific stakeholders is required (different "*Who*" for different steps).

Information, consultation and participation is a requirement of the Directive – it will also make implementation more effective

Article 14 promotes the *active participation of all interested parties* in the development of River Basin Management Plans, and requires Member States to *inform and consult the public*. Stakeholder participation is important as it can fulfil many functions:

- Developing a process agreed by all will increase the legitimacy of its outcome;
- Stakeholders can be a useful source of information and have expertise of direct use for the economic analysis (see *Table 1*);
- Surveys of the public can be useful to understand how people value improvements in the environment and quality of our waters, and how far they are ready to pay for environmental improvements.
- Public involvement and the network of partners developed through participation can be useful to develop a sense of ownership over the River Basin Management Plans and may increase the effectiveness of measures taken to meet the Directive's objectives.

The Directive only specifies key dates for consultation, but rightly does not specify dates for the participation process, as this will depend on local institutions and socio-economic set-up. However, it will be important to start the participation process early (eg. as part of the characterisation of the river basin before 2004) to improve its effectiveness.

Table 1 – Key Stakeholders can be a Very Important Source of Information and expertise

Key Stakeholders	Where they can help with information and expertise
Water Service Suppliers	➢ Characterising water services, ➢ Assessing costs & recovery of financial costs, ➢ Developing trends in water service investments
Experts from Ministries (agriculture, transport, planning, finance…) -	➢ Characterising water uses and their economic importance ➢ Assessing changes in key national and regional policies and drivers for the trend analysis ➢ Defining coherent methodologies for assessing key variables at Member State level
Environmental NGOs	➢ Identifying key environmental issues ➢ Assessing environmental impacts and costs ➢ Developing methodologies for estimating environmental costs and benefits
Economic sectors (farmers, industrialists, etc)	➢ Assessing trends in economic sectors ➢ Identifying possible measures and assess their costs ➢ Providing input into the assessment of disproportionate costs
Researchers/Experts	➢ Assessing key policies/drivers for the trend analysis ➢ Assessing impact of such policies on pressures ➢ Assessing impact of climate change ➢ Assessing the impact of pressures on water status (e.g. via modelling) ➢ Assessing effectiveness of measures ➢ Assessing environmental and resource costs
Stakeholders/civil society/public	➢ Assessing changes in key policies/drivers for the trend analysis ➢ Assessing (local, regional, national) priorities *vis-à-vis* water quality improvements, ➢ Providing input into the assessment of disproportionate costs and analysis aimed at explaining derogation ➢ Providing input into the assessments of socio-economic impacts and costs

Illustrations - Building on the knowledge from stakeholders and the public for undertaking the economic analysis

There are different approaches for integrating stakeholders' and public concerns and knowledge into the economic analysis.

- Questionnaire surveys and stakeholder focus groups have been used for investigating the economic values placed on a wetland surrounding Kalloni Bay on the Island of **Lesvbos**[1] in Greece (see *Annex IV.I*);
- Public fora followed by individual interviews (around 1,500) have been organised by the French Water Agency **Artois-Picardie**[2] in 1999/2000. The main objectives were the identification of key water management issues in the river basin (as part of the assessment of a baseline scenario), the identification of the main potential costs linked to future water policy and the ranking of possible future policy options;
- A stakeholder analysis was performed in two research projects in **France**[3 and 4] as the preliminary step of the economic analysis in a watershed to map actors, the main interest at stake and existing conflicts over water use. The knowledge and information obtained from stakeholders proved useful in identifying specific water management issues and potential measures of direct relevance for a follow-up cost-effectiveness analysis but that had not been envisaged by experts;
- From the scoping activity in the **Ribble** case study (see *Annex V.II*), key issues of relevance for implementing the consultation and participation were identified. Overall, it is essential to: (i) focus on why, when, where and how stakeholders should be consulted and involved; (ii) to relate the consultation process to the specific decision-making contexts and processes in the WFD (be it national, regional or local); (iii) To take account of the boundaries these different decision making levels place on the consultation; (iv) to take account of resource constraints, both for the authorities and stakeholders, to carrying our the consultation process; and
- Input from stakeholders was collected in the **Cidacos** (see *Annex V.II*) case study for discussing whether costs estimated as a result of the cost-effectiveness analysis could be considered as disproportionate. Along similar lines, a panel of experts was used in the **Scheldt** (see *Annexes IV.I* and *V.II*) case study to assess whether the costs of measures for reaching the ecological objectives in the Scheldt estuary were disproportionate or not.

1 –.Skourtos, M.S., Kontogianni, A., Langford I.H., Bateman I.J and S. Georgiou. 2000. *Integrating stakeholder analysis in non-market valuation of environmental assets*. CSERGE Working Paper GEC 2000-22, United Kingdom.

2 –. Agence de l'Eau Artois-Picardie. 2001. Un débat public sur l'Eau.

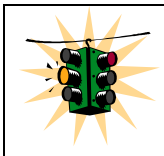
3 – Garin, P., Rinaudo J.D. and J. Rulhman. 2001. Linking expert evaluation with public consultation to design water policy at the watershed level. Proceedings of the World Water Congress, 15-19 October 2001. IWA, Berlin.

4 - Rinaudo, J.D. and P. Garin. 2002. Participation du public et planification de la gestion de l'eau: nouveaux enjeux et éléments de méthode. Actes de la Conférence Directive Cadre et eaux souterraines, 13 et 14 Mars 2002. SHF, Paris.

HOW SHOULD THE ECONOMIC ANALYSIS BE INTEGRATED WITH ANALYSES FROM OTHER DISCIPLINES AND EXPERTISE?

Up until recently, economic analyses, if at all developed, are often undertaken in isolation from other analyses and expertise. By contrast, the Water Framework Directive requires that economics be integrated with other disciplines and expertise for developing River Basin Management Plans. This means the economic analysis will build on key inputs from other disciplines and expertise, as shown in the Table below.

Key Inputs from the Economic Analysis	Steps	Key inputs from other Disciplines
➢ Economic analysis of water uses ➢ Assess trends and baseline scenario ➢ Assess cost-recovery levels	*Step 1* Characterising River Basins	➢ Assess key pressures and impacts (*Annex II*) ➢ Analyse point source and diffuse pollutions ➢ Investigate future trends in key pressures
➢ If no gap, estimate total costs of basic measures of baseline	*Step 2* Identifying Significant Water Management Issues	➢ Assess the impact of trends in pressures on water status ➢ Assess environmental objectives and physico-chemical, hydromorphological and biological indicators ➢ Assess gap in water status ➢ Identifying key pressures causing this gap
➢ Identify potential measures and assess their costs ➢ Cost-effectiveness analysis ➢ Economic input into the justification of derogation ➢ Assess cost-recovery levels ➢ Economic/financial impact of proposed programme of measures	*Step 3* Identifying Measures and Economic Impact	➢ Identify potential measures and assess their technical feasibility ➢ Assess the effectiveness of individual measures/combined measures ➢ Assess the remaining environmental impact



Look out! Designating heavily modified water bodies and justifying derogation

The designation of heavily modified water bodies or the justifications of derogation from the Directive's objectives are areas where the interaction between technical/biophysical and economic expertise are key to the analysis. For example, the designation of heavily modified water bodies requires (see *Annex IV.II*):

- An assessment of the impact on existing uses of returning to natural conditions; and
- The comparison between the existing modification and alternatives for providing the same beneficial objectives in terms of their technical feasibility, their environmental impact and their economic impact (investigating the costs of different alternatives versus the existing modification)

What does "integrating economics with other disciplines" mean in practice?

- **Understanding each other!!**
- **Agreeing on common definitions;**
- **Agreeing on a common representation (i.e. characterisation) of the river basin investigated**, i.e. the spatial structure of the river basin, the key spatial units (either based on hydrological or economic variables) and the level at which biophysical and economic indicators will be computed and can be compared;
- **Developing a common baseline scenario for the river basin**, i.e. how will the river basin and its key pressures evolve up to 2015 taking account of policies and measures already planned. The development of the baseline will require economic expertise (e.g. analysis of changes in macro-economic/sectoral policies, trends in investments, trends in water demand) and technical/biophysical expertise (e.g. changes in key pressures and land-use, impact on water status of changes in pressures and planned investment). See for example the **Oise** case study (see *Annexes IV.I* and *V.II*) that deals with the development of baseline scenario;
- **Undertaking the appraisal of measures jointly,** e.g. the cost-effectiveness analysis as illustrated by the **Scheldt**, the **Cidacos**, the **Ribble** (see *Annexes IV.I* and *V.II*) or the **Daugava**[1] (see *Annex IV.I*) case studies, or the disproportionate cost analysis and the assessment of possible objective derogation as illustrated by the **Scheldt** or the **Alsace** (see *Annexes IV.I* and *V.II*) case studies;
- **Developing common information and databases** that are geo-referenced (use of Geographic Information Systems) – This is rather new for most economists that rarely integrate spatial dimensions into their analysis and databases. See for example the **Corfu** case study (see *Annex V.II*) that has integrated biophysical and economic data into a common Geographic Information System.

1 – Ilona Kirhensteine. 2002 (forthcoming). *Developing river basin management plans in the Daugava river basin (Latvia)*. Proceedings of the Lille III Conference.

The economics Guidance Document should be linked with other Guidance Documents produced by working groups of the Common Implementation Strategy

Several working groups created in the context of the Common Implementation Strategy are developing or have developed guidance documents for supporting experts in European Union Member States and candidate countries in their implementation tasks. It is important that these guidance are used in a coherent and co-ordinated manner. Of particular relevance to the economic analysis and its integration with other disciplines and expertise are:

- The guidance on ***Best practices in river basin planning*** that provides the overall framework for developing integrated river basin management plans;

- The guidance on ***Information, consultation and participation of the public and stakeholders*** (as a sub-component of the previous guidance) that provides methodological and illustrative elements of direct use for involving stakeholders and ensuring the economic analysis produces pertinent results for information and consultation of the public;

- The guidance of the ***Analysis of pressures and impacts*** that needs to link with the present guidance document for producing by 2004 a joint and coherent characterisation of the river basin as required by Article 5 of the Water Framework Directive; and

- The guidance on the ***Identification and designation of Heavily Modified Water Bodies*** where technical, biophysical and economic expertise and analyses are combined for designating heavily modified water bodies.

See *Annex I* for a list of Working Groups and Guidance Documents.

WHICH INFORMATION IS AVAILABLE TODAY, AND WHAT SHOULD BE DONE TO UPGRADE IT TO REQUIREMENTS?

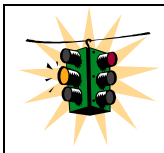
The availability of economic information is key to the usefulness of the economic analysis in the characterisation of river basins and the development of River Basin Management Plans.

Checklist for assessing existing information, its quality and existing gaps

- Which information is available?
- Who has collected the information?
- Who has the information? (organisation, person)
- Is it accessible? To everybody, to selected experts/government departments?
- At which costs?
- At which spatial scale is the information available?
- For which year(s) or period?
- What is the quality of the information?
- What are the levels of confidence attached to the available information?

Although the Water Framework Directive provides clear deadlines for reporting, the economic analysis remains an iterative process with constant improvements in the information base, methodology and expertise. If the "right" information (i.e. the required variable at the required spatial and temporal scales with an "acceptable" uncertainty) is not available today for supporting decision, proxies or benchmark values should be used to provide first rough answers. However, as important as undertaking the analysis itself are:

- To be transparent and clearly report on the quality and uncertainty of the information used and on the assumptions made for doing the analysis; and
- To identify key data gaps and plan activities for collecting missing information and improving the analysis. For example, the economic analysis of water uses delivered for 2004 will likely need to be updated and upgraded at a later stage for supporting a robust cost-effectiveness analysis for defining the programme of measure.



Look out! Information for the economic analysis may be difficult to access due to confidentiality requirements

The area of water services is becoming increasingly competitive with large water service providers competing across borders. Information about water demand and investments might be considered commercially sensitive and will therefore risk not being provided, even though they represent key input for the economic analysis.

- ***Early in the process, it is important to identify who is holding exclusive commercial information and whether confidentiality issues are at stake. The identification of aggregation levels/scales where confidentiality is not an issue anymore but where information is still relevant for water management will be key to discussions with relevant stakeholders. Also, the signing of non-disclosure agreements may help lifting confidentiality constraints.***

However, accessing publicly owned information may also be a difficult task requiring specific agreements with organisations or individuals.

Illustrations - Which information for the economic analysis? From existing constraints to filling the gaps

Case studies undertaken in the different countries for supporting the development of the present guidance have shown that the availability of economic-information is likely to represent a short-term constraint for undertaking the economic analysis. This is particularly true for environmental and resource costs information (e.g. not available at all in the **Corfu** (see *Annex V.II*) and **Vouga** (see *Annex V.II*) case studies), but it is also valid for more general cost information that remains incomplete, piecemeal and unevenly spread in space and time.

Of importance, however, is to carefully review existing information sources prior to launching any new data collection (as this may prove costly). The **Middle-Rhein** case study (see *Annex V.II*), for example, illustrated that information required for assessing cost-recovery is available with existing statistics in the pilot area considered. Similarly, effectiveness information for measures aimed at reducing water demand for households and industry was collected for the **Scheldt** case study (see *Annex V.II*) from relevant water supplier, industry and environmental NGOs.

In many cases, different elements of economic information are not available at spatial scales of relevance to water management. Most economic information linked to water services in the **Vouga** case study (see *Annex V.II*) is available for different administrative units (municipal, regional). Thus, consistent criteria must be developed to partition municipal and regional values into river basin/sub-basins values. Moreover, as stressed for example by the **Daugava** case study[1], it may be difficult and time-consuming to collect information available with a wide range of private and public organisations.

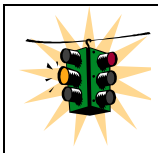
The **Corfu** case study (see *Annex V.II*) illustrated how a Geographic Information System could be developed to combine biophysical, climatic, land use and economic information. In addition to their presentation and analytical capabilities, such systems may help allocating values obtained for administrative units into information of relevance for water/river basin units.

1 – Ilona Kirhensteine. 2002 (forthcoming). *Developing river basin management plans in the Daugava river basin (Latvia)*. Proceedings of the Lille III Conference.

WHICH FINANCIAL AND HUMAN RESOURCES ARE REQUIRED AND AVAILABLE FOR UNDERTAKING THE ECONOMIC ANALYSIS?

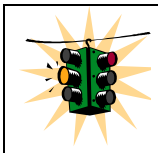
Collecting information, analysing it, involving stakeholders, integrating experts and disciplines, producing reports and providing input into information and consultation activities is likely to require money and people, both resources being scarce in many water administrations of both European Union Member States and candidate countries.

Ensuring that available resources match required ones is key to avoid false expectations and disappointments. If resources are not there, it is important to clearly assess and agree on priorities with other experts, stakeholders and organisations involved in/responsible for the development of river basin management plans and the implementation of the Water Framework Directive.



Look out! Conducting the economic analysis can be costly

Do not underestimate the resources required for developing the right process for the economic analysis, i.e. assessing the demand for economic input into the decision-making process and information/consultation activities. However, financial resources for developing the economic analysis will remain minimal as compared to those required for implementing measures for achieving the environmental objectives of the Directive!



Look out! Capacity-building will be key to ensuring success

Applied and practical economic expertise is rare, both in European Union Member States and in candidate countries! Thus, capacity-building activities may be required very early in the Water Framework Directive implementation process for ensuring timely delivery of the economic analysis requirements of the Directive.

WHICH OUTPUT AND INDICATORS SHOULD BE PRODUCED BY THE ECONOMIC ANALYSIS FOR TAKING DECISIONS AND REPORTING?

The Water Framework Directive has specific reporting obligations with regards to the economic analysis. Most of these obligations refer to computed indicators at the scale of the river basin or river basin district. The assessment of the demand from policy makers and the public (i.e. which information ad output do you want from the economic analysis) is likely to yield complementary reporting requirements in terms of the type of indicators and the spatial and temporal scale at which these indicators need to be computed.

Component of the economic analysis	Reporting requirements defined in the Water Framework Directive	Possible interest from water managers, policy makers, stakeholders and the public
Characterisation and trend analysis	. Economic importance of water uses (RB) . Trends in key drivers and pressures, e.g. water supply and water demand (RB) . When required: trends in investments (RB)	. Current economic importance and likely trends of key economic sectors and policy driver in the river basin (RB, SRB, SES, SWU)
Economic analysis for selecting measures	. Total costs of cost-effective set of measures (RB) . Benefits and costs of alternatives measures in case of derogation (WB, possibly SRB)	. Benefits (economic, social, environmental) of proposed measures (RB/SRB/ES/SES) . Budgetary requirements (RB) . Impact on specific economic and social groups (SES, specific users)
Assessing cost-recovery and pricing	. Cost-recovery for water services (RB) . Contribution of water uses (agriculture, industry, households) to cost-recovery (RB/ES) . Social, economic and environmental impact for justifying proposed cost-recovery (RB/ES)	. Cost-recovery for key sub-sectors (e.g. a specific polluting industrial sector or sub-agricultural sector) (SRB, SES) . Current and proposed role of pricing as incentive (SES, specific users)
Key assumptions and information use	. Quality and uncertainties of information used and assumptions made (RB) . Proposed data collection (and related costs) for filling key information gaps (RB, possibly national proposals)	

Scale issues for reporting: RB = river basin; SRB = sub-river basin or coherent group of water bodies; ES = economic sector; SES = sub-economic sector; WB = specific water body; SWU = significant water use

Assessing the feasibility of the economic analysis: a pre-requisite to the economic analysis for increasing chances of success?

The objectives of a ***feasibility study*** are to prepare the economic analysis through:

- Assessing whether the proposed economic approach can be made operational;
- Evaluating the consistency of the proposed approach with other activities and processes developed for supporting the development of river basin management plans;
- Identifying key steps that need to be followed for removing constraints and problems likely to be faced when undertaking the economic analysis

Key issues investigated during the activity include (list non-exhaustive):

1. Information and knowledge

- What are the information and knowledge requirements for undertaking the economic analysis?
- Which output (e.g. indicators computed at specific spatial scales) is expected from the economic analysis and for which purpose (taking a decision, informing, reporting, etc)?
- Which information and knowledge is currently available and accessible?
- How is economic and technical information integrated?
- What are the current gaps in information and knowledge for undertaking the analysis?
- What are possible means (short-term, long-term) for reducing these gaps?

2. Resources required for undertaking the economic analysis

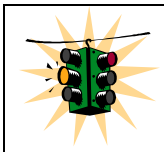
- Which human and financial resources are required for undertaking the economic analysis within the required timeframe?
- Which are the human and financial resources effectively available?
- What are the gaps in human and financial resources?
- What are possible means (short-term, long-term) for overcoming these gaps?

3. Information and consultation of the public, participation of stakeholders

- Which consultation and participation means are required for undertaking the economic analysis and disseminating its results?
- What are the existing information, consultation and participation means?
- What are the gaps in information, consultation and participation means?
- What are possible options (short-term, long-term) for overtaking existing constraints?

This assessment should be based on reviews of existing reports, documents and information/databases and on interviews with key experts, stakeholders and decisions makers. It can focus on a single representative river basin or have a more national focus. Workshops for sharing results of this assessment with a wider audience can prove useful in validating the results, identifying other solutions for removing constraints and announcing the forthcoming economic analysis.

Examples of Terms of Reference for a feasibility study are presented in Annex III.



Look out! The *feasibility study* should be a shared activity

Although proposed here in relation to the economic analysis, economists and non-economists should be undertaking this assessment jointly for the entire appraisal system aimed at developing integrated River Basin Management Plans.

Section 6 – Conclusion: What lies ahead?

As a way of conclusion, this section looks at what remains to be done for implementing the Directive and by when, both by Member States in each River Basin and in a cooperative manner, at the European level.

A CRITICAL PATH ANALYSIS TO DETERMINE KEY LANDMARKS

2004 is the next key date for the implementation of the economic elements of the Directive. It may feel that it is a long time away, but it really is already tomorrow. When looking at what needs to be done by then and walking backwards, one might quickly realise that some of the steps should have really been initiated… the day before yesterday!

A big task lies ahead: start early!

To make sure they meet the Directive's deadlines, Member States and candidate countries may want to carry out a "critical path analysis", to identify what needs to be done by when and to logically link the economic analysis with other activities required for the River Basin Management Plans.

Figure 1 lays out a generic framework for such critical path analysis. The time needed for gathering information and consulting the public would of course depend on local circumstances, on the availability of information and on existing institutional structures. Therefore, each country would need to tailor this framework to its needs.

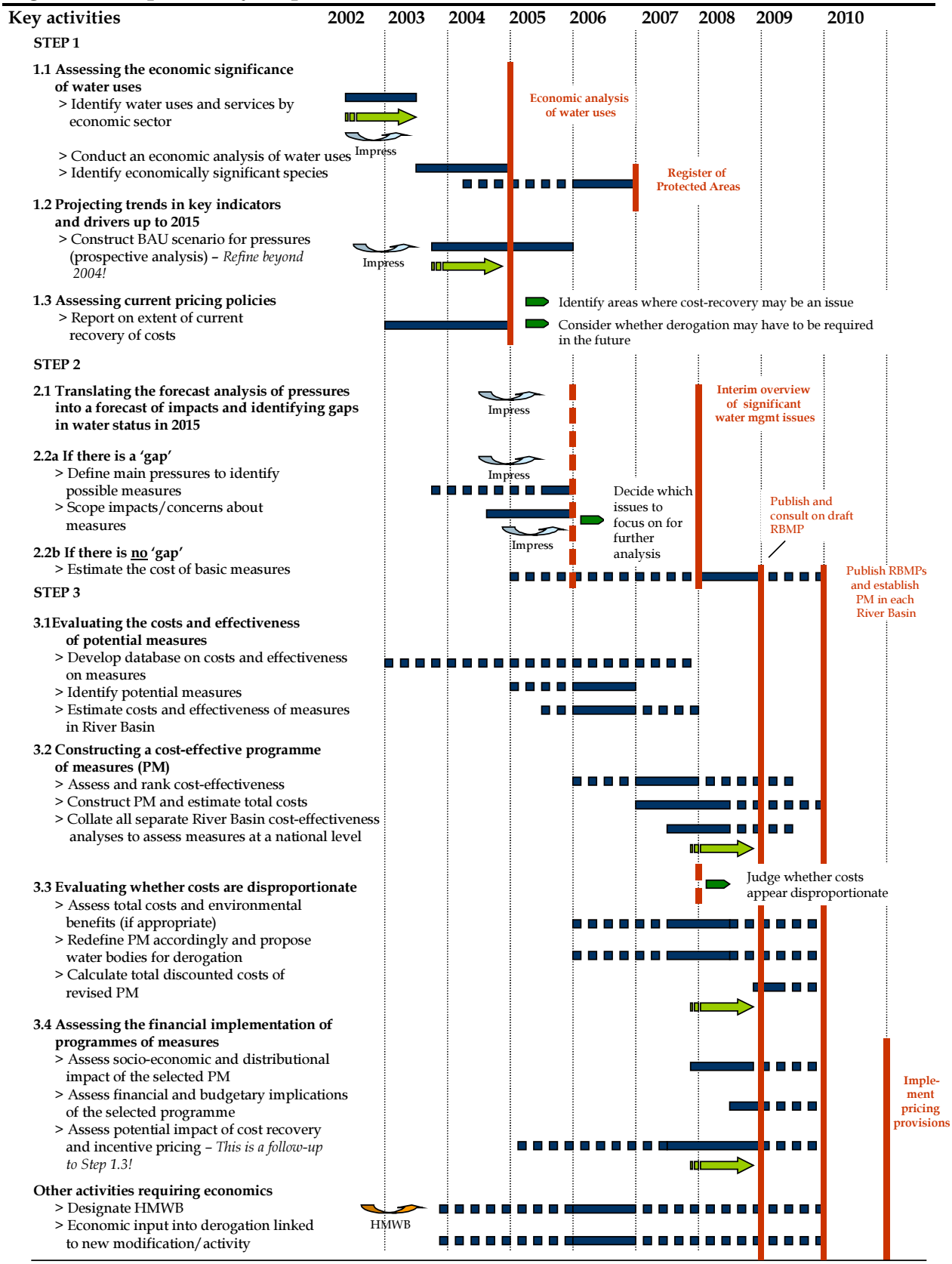
Figure 1 highlights a number of important points about the Directive's timing:

- To meet the 2004 requirements, significant economic analysis will have to take place. Some of this analysis feeds into each other: for example, the prospective analysis of pressures needs to be completed by 2004 to enable the determination of the *business as usual* scenarios and identify water bodies where risk of non-compliance is likely to occur. This co-ordination with experts in charge of determining impacts and pressures will be crucial and planning ahead the scheduling of those tasks will allow avoiding any undue delays;

- Deadlines for the completion of the economics tasks required by the Directive are skewed towards the end the River Basin Management Plan (RBMP) period (2009). However, long lead times are required to complete these tasks and a number of important activities must be carried out well in advance to achieve those ultimate deadlines; and

- For some types of analysis (such as the *business as usual*, cost-effectiveness and disproportionate costs analyses), it might be preferable to first carry out a simple analysis, followed by a more in-depth analysis in the most contentious cases. This means that the simplest analyses might need to be carried out early on, which raises again timing issues.

Figure 1 – Proposed Key Steps of the Critical Path



KEY ISSUES REMAIN TO BE EXPLORED…

The preparation of this guidance document has highlighted some outstanding issues that will need to be further examined in the years leading up to the river basin management plans. Although the application of the guidance and the carrying out of the economic analysis by 2004 will help develop a practical knowledge base, some methodological issues are likely to require more time for in-depth research and analysis integrating technical and economic expertise. Selected issues can already be identified as requiring further methodological development, for example:

- How to assess **environmental and resource costs**: how can methods for assessing environmental costs (developed at an academic level) be made operational in the context of the development of river basin management plans?

- How to deal with **uncertainty:** which approaches can be proposed to water managers for integrating uncertainty into decision making, and for developing adequate communication on uncertainty towards the public and stakeholders?

- How to assess the **effectiveness** of measures or combination of measures: clearly, this issue departs from the scope of pure economics. But it will need to be solved to ensure cost-effectiveness analysis can be performed.

- How to assess the **direct and indirect economic impact** of a range of measures on key economic sectors? (e.g. industrial and agricultural economic sectors/sub-sectors)

…AND BEFORE YOU JUMP, REMEMBER: YOU ARE NOT ALONE!

Overall, using the present guidance will help developing practical experience, will increase the knowledge base and will develop capacity in the integration of economics into water management and policy. As much work lies ahead, the process that has been launched at the European level will not end with the production of this guidance. Continuing this collaborative effort will be instrumental in moving forward and ensuring progress is made for an effective implementation of the Water Framework Directive.

Such collaborative efforts will include:

- Providing **support to the use of the guidance** and implementation process and collating feedback and lessons from this process;

- Ensuring **integration** between economics and other expertise (working groups) through specific joint activities for integrated testing of guidance in pilot river basins; and

- Making operational specific economic **methodologies and approaches** (e.g. development of databases on water-related environmental costs/benefits).

Collaborating at European level to ensure integration with other expertise

Further cooperation with other areas of expertise remains essential for addressing a number of issues:

- How can economic information be used in order to take part in the process of identifying the need for **derogation**?

- What is the role of economics in the designation of **Heavily Modified Water Bodies** and how should the process of designation be carried out?

- What information on **pressures** is required for the economic analysis and how should the *Business as Usual* scenario be built by combining technical and economic expertise?

Integration with other expertise will be fostered at the European level through integrated testing of the guidance documents produced by the various working groups set up through the Common Strategy.

Integrated testing of guidance in pilot river basins

A specific working group of the Common Implementation Strategy (see *Annex I*) has been established for undertaking an integrated testing of all guidance documents in pilot river basins. The aim is to ensure coherence amongst guidance documents and their cross-applicability. A series of pilot river basins have been proposed by Member States and testing activities are presently being launched. Pilot projects will also be developed in candidate countries to the European Union with support from the European Commission.

Collaborating at European level to develop methodological tools and databases

On all of those issues, Member States might wish to collaborate in order to join their forces. Methodological developments are likely to be costly and information can be usefully shared and transferred in order to avoid duplication. In parallel with the implementation of the Directive at Member States level, activities are likely to continue at the European level in order to develop methodologies and shared databases.

Developing common databases on key data for the analysis

To develop common databases is likely to be instrumental in speeding up the process of data collection, providing some points of reference for the analysis and reducing the costs of carrying out full studies. It might be useful, for example, to develop databases on the costs and effectiveness of measures before 2004, as basis for undertaking the cost-effectiveness analysis by 2008. It would be necessary to identify the types of measures to be examined and what sort of cost data could already be collected. This data would need to be updated as information from monitoring systems start coming in from 2006 onwards. Similar efforts may be launched for developing environmental costs/benefits databases.

And finally…

Improving and updating this guidance document might be required at a future stage, after the 2004 deadlines have been met and new information and experience has been gained. This possibility will be examined depending on lessons collated from the use of the guidance and from the information that will have emerged.