European Regional Document

Europe, Water and the World

A Word of Thanks

I would like here to take the opportunity to thank all the European Regional document's authors and all those who contributed to its chapters. I would also like to say a special thank you to the writing committee, whose work behind the scenes made the production of this document possible. They worked hard to organize the flow of information and help the authors and contributors express the extremely important points they needed to make. Thank you therefore to

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Preface

The preparation of this document, destined to be Europe's contribution to the Fourth World Water Forum, was a challenging and energising process. Indeed, those involved found the very process of finding and defining key issues valuable in itself, as it further emphasised the importance of exchange and collaboration when addressing water issues.

As the first step in producing this document, a European regional committee, an operational committee and a writers' group were formed during the 2005 Stockholm Water Week. This was done in order to ensure that the text represented as broad a range of stakeholders as possible, both geographically and in terms of the types of stakeholders involved. Annex A briefly describes the preparation process, while Annex B provides the complete list of actors involved in the document's preparation. The Mexican secretariat also asked the Committee to provide suggestions for the content of the Forum's proposed Ministerial Declaration. This proposal is based on the Regional Document and can be found in Annex C.

Throughout the whole process, efforts have been made to make the content of this document as representative of Europe as possible, both geographically and in terms of the perspectives of the different stakeholders it represents.

It must be remembered, however, that this document does not constitute a broad European consensus on the issues described. Not everyone agrees on every point, though the authors and contributors do agree on the content in general. This approach was felt to be the best way of producing the most useful document possible, as seeking consensus on detailed subjects carries with it the risk of losing or diluting the focus of the issues being addressed.

Our committee therefore addressed priorities and strategic developments in Europe, while in the process acknowledging:

- that the value of water is largely underestimated, and
- that the challenges we face are enormous, for instance in the field of climate change effects, the Millennium Development Goals, emerging threats, legislation, aging infrastructure, etc.

Importantly, we also bore in mind that the water-related knowledge available is currently scattered across a fragmented sector and that there is immense and

unexploited potential for the development of efficient and competitive new solutions.

We would like to express our deep gratitude to all those who contributed to this document and to thank everyone who was involved in its preparation for their dedication and enthusiasm. We are convinced that, with the group we have gathered, we have laid the foundations for future cooperation on water in Europe and in the world.

The European Regional Committee

1 | Europe: an Introduction

Europe and water

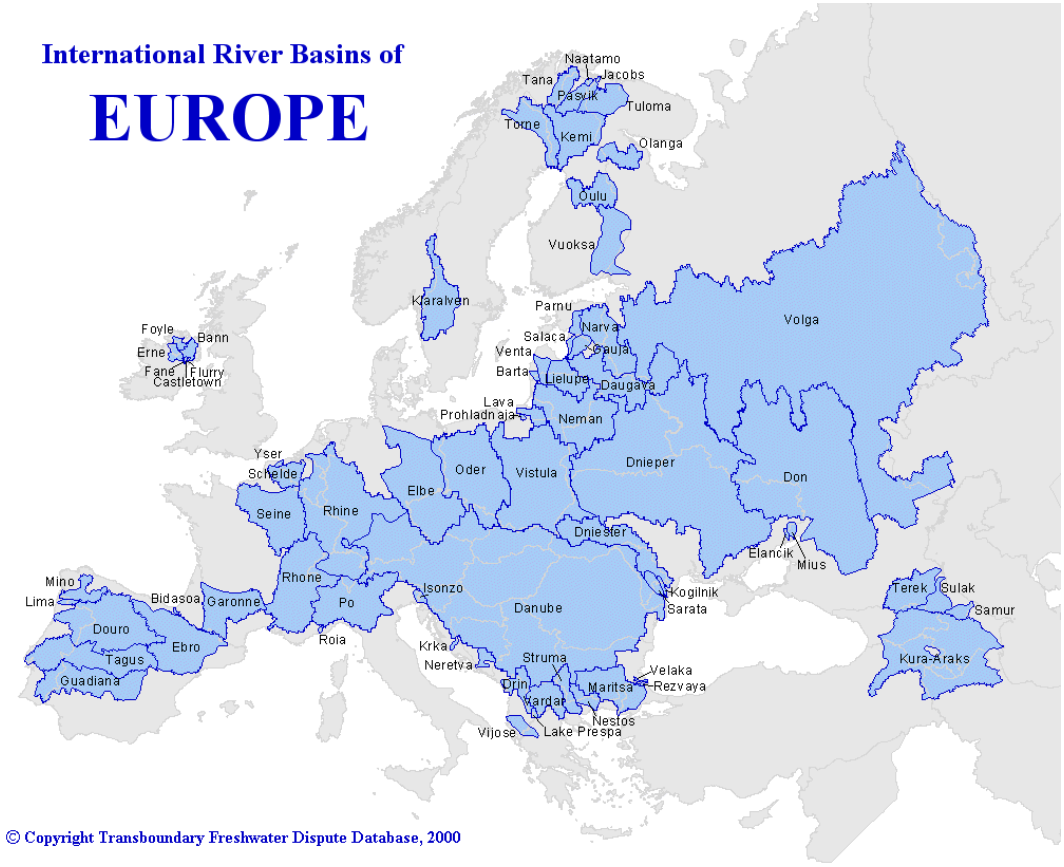
Europe faces a variety of water-related challenges, and the continent as a whole is rapidly going to have to address the issues of changing climatic conditions, population increases and increased water usage. These challenges are made more complex by the fact that different areas of the region have reached different stages of economic development.

Europe, as a continent, contains 46 countries, and many differences are apparent across it: rich versus poor, developed versus developing, regions suffering drought versus those facing flooding, clean versus unsafe drinking water, and optimal versus non-existent sanitation. And, many countries experience these different extremes within their own borders. Generally speaking, however, the northwest of Europe has too much water, the south of Europe has too little water, and the east of Europe has insufficient drinking water and sanitation. All this means that, in reality, those living on the continent are faced with a host of challenges.

Sometimes people talk about "Europe" when they really mean the "European Union". However, when preparing for the Fourth World Water Forum, we have noticed how important it is to make this distinction and to see the differences within "our" continent. Therefore, in this document, we have tried to always make the distinction between the two very clear. When we talk about "Europe", we mean the 46 countries of the European continent (the geographical Europe). When we talk about the "European Union" or the "EU" we mean the European Union which is composed of twenty-five Member States.

This European document embraces the entire European continent. And, it is important to remember that this region contains more than 4000 river basins. Because the natural watersheds of these basins rarely coincide with national and political borders, cross-border cooperation has always been an integral part of the water issues Europe faces. Moreover, some river basins in Europe (such as the Volga) are vast, and several Russian rivers even flow into the Arctic. The Danube basin is the next biggest,

and the river connects eight countries in central and south-eastern Europe, the Balkans and the Black Sea (Germany, Austria, Slovakia, Hungary, Yugoslavia, Bulgaria, Romania, and Russia). However, it is the Rhine river basin and, in the last decade, the Elbe basin, that have so far seen the most cross-border cooperation, mainly as a result of efforts to establish measures to prevent flooding.



Although many differences are obvious throughout different areas of Europe, the continent as a whole also has a lot a lot of things in common. Water is a challenge everywhere, and we are learning about the growing risks we face with regard to water availability and quality, for instance. Plus, we must realize that we have no option but to deal with the challenges and worrying trends apparent, using actions designed for both the short and the medium term. The sustainable use of water is a good example, as it is a problem faced by almost all countries and all regions. In addition, we must also be aware that pressures imposed by Europe's high population density, and

growing populations in some countries, as well as the growth of irrigated agriculture, often exacerbate water challenges, especially as a result of migration.

Access to safe drinking water and proper sanitation are also pressing issues. In fact, an estimated 41 million people in Europe do not have access to safe drinking water, while 85 million people lack access to basic sanitation–something which contributes to the spread of waterborne diseases such as hepatitis A and typhoid fever, and those that cause diarrhoea. Agriculture is also an issue which must be addressed, as it is probably the biggest user of water anywhere in the world—and the one which has the biggest impacts (both negative and positive).

With regard to addressing these problems, a great deal of progress has been made in developing a legal framework, promoting good governance, defining and assigning responsibilities, and increasing efficiency and improved sustainability. However, much more needs to be done in many areas, such as financing water infrastructure, improving maintenance, developing innovative solutions, organising multi-stakeholder participation schemes and involving local decision makers and civil society.

Europe and the world

The provision of clean water and sanitation is a key priority for both European and bilateral aid programmes. The development aid provided to address related issues—such as food production or institutional development—has for many years been used to tackle water issues. So, taken together, European programmes have been targeting water issues for decades. However, the European Union Water Initiative, borne of the Johannesburg conference in 2002 but implemented in 2004, explicitly addresses water issues. The €500 million in funding allocated to the Water Facility doubled the budget of the 9th European Development Fund (EDF) for water and sanitation (€475 million). Based on calls for proposals, new projects are being implemented and the Water Facility is contributing to the Nile Basin Initiative (€18 million) and to the African Water Facility (€20 million).

To provide aid or, in the case of the European Investment Bank and the European Bank for Reconstruction and Development, loans for development, the EU and the individual governments within it cooperate with the United Nations and other international organisations. And, local governments and other entities, such as WaterAid, also cooperate in many local and global initiatives. Moreover, civil society organisations such as NGOs and education institutes often form global networks, resulting in the worldwide sharing of much-needed knowledge and in awareness-raising, at all levels, of the importance of water. Finally, in addition to this, private

companies cooperate with each other in many countries while multinationals span the globe, spreading technology, knowledge and innovation.

However, international cooperation and development initiatives remain modest and difficult to implement, mainly for reasons relating to political governance, local implementation and, frequently, the complexity of the cultural and social contexts within which they must operate. What this means is that development efforts dealing with water, as well as those dealing with other human priorities, must overcome some of the most intractable and controversial issues we face. European stakeholders are now beginning to come to terms with their own fragmentation, and private companies, civil society organisations, governments and research institutes are starting to merge their aims and recognize their mutual dependence. As a result, it is anticipated that better orchestration and innovation will yield solutions for the whole world, as well as for Europe.

The main chapters in this document

The chapters contained in this document consider both the challenges faced by Europe as a region and the potential solutions available to overcome them. Each will be the focus of a European-led topic session at the World Water Forum. However, it should be remembered that the intention is not to give a comprehensive picture of the European water situation, but rather to focus on key topics crucial to Europe's future and relevant to other regions.

Chapter 2. Integrated Water Resource Management (IWRM)
The development of European policy on water recognizes the need for the long-term protection of aquatic environments and water resources. Thus, an integrated water resources management (IWRM) approach has evolved over time. This means that, for example, there is now a focus on river basin management, consultation and coordination with all water users, and the use of the "polluter pays" principle. These principles are all enshrined in the EU Water Framework Directive (WFD), which today forms the basis of much of the water management undertaken in Europe. Though the Directive has had to accommodate the political realities of EU Member States, and thus constitutes a compromise in some ways (as it focuses heavily on water quality and ecology), it is an attempt to accommodate the needs of all water users. Importantly, however, it seems that the objectives set by the Directive can be met, though this will be costly and may take more time than originally envisaged in the case of some countries. Still, the Directive remains a remarkable piece of water legislation on its own right, since it is the first time in history that 25 countries have committed themselves to jointly managing all their freshwater resources on a basin scale, in an integrated way.

Moreover, though the IWRM approach embodied in the WFD cannot simply be exported to the rest of the world, its principles could be. Such universally applicable principles include the need to secure public participation, form river basin councils, make river basin plans, set time-bound measurable targets, establish appropriate monitoring and enforcement systems, and introduce cost-recovery mechanisms.

Chapter 3. Innovations in Risk Management in Europe

This chapter outlines possible ways of anticipating and minimising the risks posed by floods and droughts, which are increasing. It also makes clear that the last few years have seen a shift Europe's attitude to the threat of flooding. As a result, it has been recognized that engineering solutions such as dykes are not 100% effective, and that people should not rely on them and ignore the threat of flooding, which can cause financial, environmental, and human losses on a huge scale.

Rather than simply trying to keep it out therefore, efforts are now being made to accommodate water through spatial planning, modelling and simulation. And, early-warning systems are also being developed to improve local responses to future threats. The role of education and increased awareness is also being stressed, to make people more aware of the risks that they and their property face and to build support for the preventative measures that need to be taken. It is also envisaged that public support for risk-mitigation measures will be further strengthened by efforts to include people in their development.

Chapter 4. Sanitation: a Challenge for the European Region

Rapid urbanisation and population growth have created colossal sanitation challenges in cities and communities in many parts of Europe, not just in the world as a whole. The stark reality is that as much as 85% of the polluted urban wastewater produced today is discharged without treatment. Globally, the situation is not encouraging, and the Millennium Development Goals are becoming more difficult to achieve.

Efforts to combat pollution from sanitation have already helped to raise hygiene standards and protect ecosystems. They have also increased economic prosperity, brought jobs to the water industry and secured tourism revenues. The benefits extend to rural or coastal dwellers living downstream from large urban centres, whose environment and livelihoods are affected by polluted waters.

The Europe Union has reversed trends in degradation, largely through an EU legislative approach which required wastewater treatment systems for all urban communities of 2000 inhabitants or more. Compliance with the EU's Urban Waste Water Treatment Directive will take more time, but radical improvements have been

achieved already. The EU Directives promote multi-stakeholder participation at the basin level, and is resulting in dialogue between downstream polluted populations and upstream polluters.

However, in several of the lower income countries of Eastern Europe, the estimated costs of the investments required for sanitation are unlikely to be met without international assistance. Applying less capital intensive decentralized ecological sanitation technologies could also provide an option. The case studies presented in Chapter 4 describe “best practice” with regard to ecological sanitation technologies in Western and Eastern Europe, and outline the benefits they provide, particularly for rural and semi-urban areas.

Chapter 5. Innovative Technologies and their Implementation at the Local Level

The production of innovative new technologies and their appropriate deployment are key to resolving a large number of water issues—ranging from the prevention of pollution, to the more efficient use of water by industry and others. Different innovators from different sectors need to work together to form partnerships, as this will radically improve both the speed and success of technical innovation. The main lesson is that solutions are best developed by pooling skills and focussing on producing solutions to specific problems. In fact, great potential exists for the production of innovative technologies driven by scientific progress and the pooling of resources from different industries. However, much more can also be achieved by increasing our knowledge, and improving the dissemination and exploitation of already available technologies.

A major review of the role of innovation is being coordinated by the European Water Supply and Sanitation Platform (WSSTP). As a forum for exchange between a broad range of entities, the WSSTP has issued a vision document and will be producing case studies under its Implementation Plan.

Chapter 6. Access for All: the Need for Solidarity among Water Users

This chapter calls for actions to be undertaken out of a sense of one’s duty to help fellow human beings, based on a general notion of fairness and justice, and considering that water is a human right. Generally defined as “solidarity” this notion requires people throughout the world to work together. It requires us to forge links between those communities with water and those without, to make decision makers accountable to users, and to involve water users in the planning processes that affect them. In addition, the cost of water provision must be shared fairly between rich and poor, through the principle of solidarity.

Successful solidarity mechanisms already exist in Europe. These range from solutions imposed via general taxation, the use of higher tariffs for richer (or urban) areas and

businesses, and “safety-net” schemes used to provide water-cost subsidies to the poor. Examples of solidarity mechanisms at the European level are EU-financed investments in new Member States and the funding for overseas development provided by EuropeAid and the European Water Initiative. However, many other examples are provided by different water-focused charities, citizens’ initiatives and commercial companies.

2 | Integrated Water Resources Management (IWRM)

SUMMARY

The introduction of IWRM in Europe started in the 1970s and culminated in the current European Water Framework Directive (WFD). This allowed common objectives to be established for the water policies of all the EU's Member States. As a result, and for the first time in history, 25 countries are committed to jointly managing all their freshwater resources on a basin scale, in an integrated way.

The WFD includes many of the important elements of IWRM, such as holistic management on a river-basin scale, public participation and consultation, cost recovery, and use of the "polluter pays" principle. Its other strengths are that (1) it is mandatory (non-compliance is punishable by law and with fines), (2) it sets time-bound, measurable targets, and (3) it allows for transboundary water management. The Directive's weak points are its strong focus on water quality and the environment. However, steps are being taken to include other elements of IWRM, such as the need to consider floods and droughts.

Although it would not be feasible—or desirable—to "export" the Directive wholesale to other countries, its key IWRM ingredients will be useful to countries outside the EU. Lessons can also be learned from the European trend of involving local-level authorities more in planning for IWRM.

Introduction

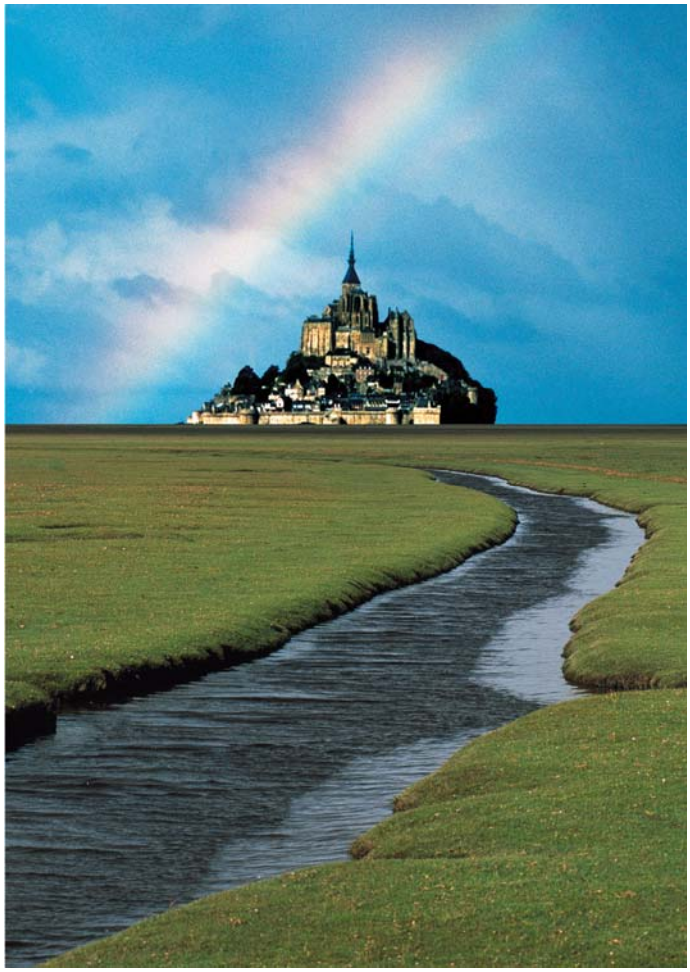
This chapter presents IWRM developments in Europe. No attempt is made to define IWRM here, however, since this has already been done elsewhere, e.g. during the previous World Water Fora. Plus, the Johannesburg Plan of Implementation and CSD 13[1] both specifically address IWRM. This chapter therefore aims instead to consider the nature of IWRM in the European context. At the same time, it will also consider the tools which have been developed, the lessons which have been learned, and how the

[1] The 13th session of the Commission on Sustainable Development http://www.un.org/esa/sustdev/csd/csd13/csd13.htm.

wealth of experience and expertise gathered could be used to inspire other countries and regions.

However one defines IWRM, it is generally acknowledged that an IWRM approach is essential to achieving the Millennium Development Goals (MDGs). In fact, such an approach is needed not only for the goals that pertain directly to water and the environment, but also for all the others (on education, health, hunger, poverty, etc.).

Through the bilateral aid provided by its Member States, and through the multilateral financing provided by the EU and its institutions, Europe is a key provider of aid for development in the water sector. It has also expressed its strong commitment to the MDGs, and this chapter shows how some of the IWRM framework concepts and tools developed in Europe can be adapted to foster peace and development in developing countries.



A brief history of IWRM in Europe

Basically, IWRM is a concept, a way of thinking. The way in which this concept is applied in practice is specific to a particular problem, culture and situation. This is particularly relevant to Europe, with its variety of cultures, development stages and problems. All countries have their own specific emphasis when addressing IWRM. Thus, the highly developed and humid northwest of Europe focuses on the environmental and ecological aspects of IWRM, and water shortages are not really an issue. In the dryer Mediterranean region, however, drought is an important issue, and is often considered in association with falling groundwater tables. Still, in this area, drinking water provision and sanitation are generally adequate. The situation is

different in the Central and Eastern European countries, however, where many people have no access to clean water or sanitation and where there are major environmental problems. The diverse set of situations seen in Europe is sometimes called the "European Paradox".

Given the different conditions that need to be addressed, it is not surprising that IWRM has developed differently in different European countries. The first steps were taken long before IWRM became an international concept at the International Conference on Water and the Environment in Dublin in 1992. These steps included the integrated assessment of the diverse functions of water, the inclusion of ecological issues in water management, and the institutional changes needed to enable such an integrated approach. Examples of action taken at this early stage are the establishment of the French Water Agencies in 1964 (see text box) and the inclusion of water quality maintenance in the remit of the Netherlands' Waterboards in the 1980s. Long before that, in 1926, Spain had already established its Hydrographic Confederations. International river commissions were also established—an example is

Creation of the French Water Agencies

The French Water Agencies were legally established by a law put into effect on December 16, 1964. This was France's first major piece of legislation on water. This framework law introduced water management in relation to the natural (hydrological) environment. Specifically, it divided the country into six main drainage basins, each with a consultative body (the basin committee) and an executive body (the water agency). The law triggered the introduction of an innovative system of charges, at rates set by the basin committees. This setup was designed first to "facilitate operations in the common interest of the entire basin" (in other words to help control water pollution), and second to "facilitate general access to a resource available in sufficient quantity and quality for use by all while protecting that heritage".

The idea of creating these water agencies originated in a debate in the Senate that arose as a result of a new awareness that water-related problems can only be solved on the scale of the geographical unit, in this case the river basin. The idea was to foster dialogue, promote a comprehensive outlook on a basin-wide scale and, of course, obtain funding for the projects needed.

The agencies were also given the means necessary to provide incentives. These take the form of charges paid by users and polluters in relation to the water volume used and the degree of pollution caused. Each agency then distributes subsidies to aid projects dealing with purification, treatment, conservation, recycling, good water management or facility development.

the 1950 International Commission for the Protection of the Rhine (IRC) against pollution, which was incorporated into international law in 1963.

The European Union's involvement in water legislation and management began in 1975, with the formulation of standards for those rivers and lakes used for drinking water abstraction. This was followed by many more directives (30), mainly concerned with pollution. Until the end of the 1990s, however, EU water policy was characterized by a tremendous number of sectoral texts and a lack of overall vision. This made the European regulations complex, difficult to understand and, therefore, not very inspiring.

In 1995 a fundamental rethink started which included an open consultation process involving all interested parties. The result was a widespread consensus that, while considerable progress had been made in tackling individual issues, the EU water policy was fragmented, in terms of both its objectives and the means available to achieve them. In response to this, the European Commission proposed the Water Framework Directive (WFD). Initial discussions, based on a draft of the WFD, considered the full scope of IWRM and addressed all three of the basic issues that relate to water: too much, too little and too dirty. However, the need to be politically realistic has reduced the scope of the WFD, so that it now mainly emphasises water quality and ecology. Despite this, important elements of IWRM remain, and it is possible for the WFD to evolve further towards full IWRM.

Ultimately, this process led to the Water Framework Directive of 23 October 2000 (2000/60/EC). The European Framework Directive has allowed common objectives to be established for the water policies of all the EU's Member States. It also helps us to capitalize on their experiences. So, with the addition of several Eastern European and Mediterranean countries to the European Union in 2004, and with another four countries currently preparing to enter the EU, what this means is that for the first time in history 25 (+4) countries are committed to jointly managing all their freshwater resources on a basin scale.

The essence and innovative aspects of the Water Framework Directive (WFD)

The WFD will not be described in detail here, since all necessary information can be found on the EU website listed at the end of this chapter. Instead, here we will try to highlight some of the key points and principles that make the WFD a uniquely innovative piece of legislation.

The preamble to the Directive proposes that Member States should address the following:

- the need for integrated water policy;
- the use of a river basin approach;
- the principles of precaution and preventive action;
- the need for remedial measures at source to address environmental threats;
- the use of the polluter-pays principle and the recovery of costs linked to water use (“including environmental and resource costs”);
- the need for decisions to be made “as close as possible to the locations where water is affected or used”;
- the need for a “combined approach” to controlling pollution at source “through the setting of emission limit values and of environmental quality standards”; and
- involvement of the public as a condition for success.

The European Water Framework Directive (WFD) recognises that rivers, lakes, groundwater and coastal waters are interdependent, and so takes a holistic approach when setting “good status” objectives for water bodies.

The Directive next proposes an overall approach (with a precise timetable), methods, and the progressive development of the tools needed. At this stage, we need to bear in mind that in Europe, the Community Directives are imposed on the Member States, which must both transcribe them into their national laws and apply them within

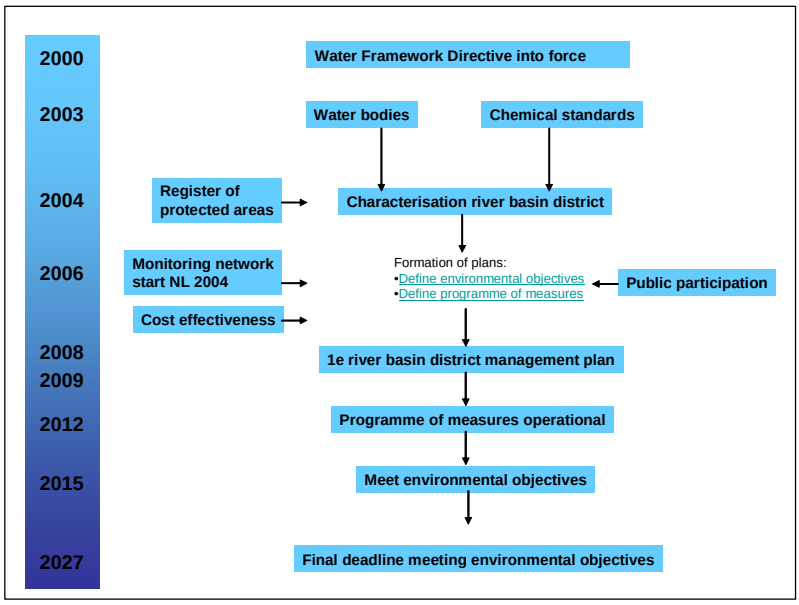
prescribed times. If they do not, they face the risk of being prosecuted by the European Commission at the Court of Justice of the Union and incurring very heavy fines. The WFD is therefore a legally binding document which obliges countries to produce results according to a precise timetable. The international approach taken makes it a unique tool for transboundary water management.

An obligation to obtain results

The Directive obliges all Member States to achieve the "good status" objective for their water bodies before 2015 (although exemptions may be applied to some water bodies). The results obtained will be evaluated and made public and the European Commission will be able to prosecute any Member States which fail to achieve this objective.

A precise timetable for implementation

"Management Plans", which define the objectives to be achieved, and the "Programs of Measures", which define the necessary actions, must be formulated for each area. The Directive sets out a precise timetable for the implementation of these plans and programs as well as for the achievement of the specified environmental objectives (see figure).

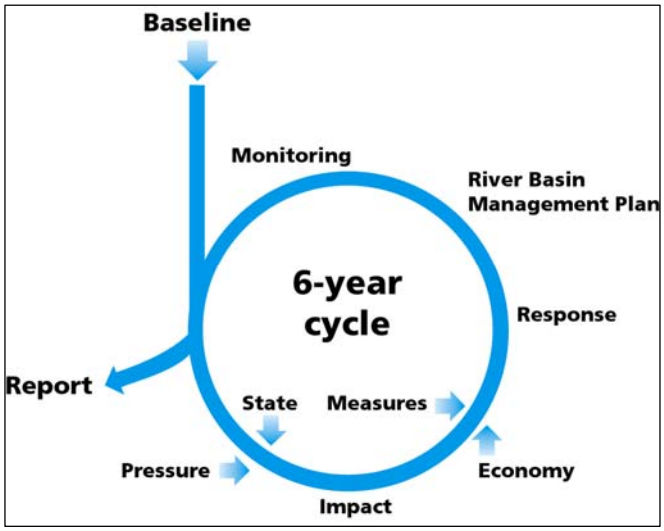


A relevant scale: the river basin

The Framework Directive also requires the establishment of hydrological districts in large basins. It recognizes that the search for better water resources management must involve an integrated and holistic approach, organized at the relevant levels: river basins, lakes and aquifers—whether local, national or transboundary. The Directive strengthens transboundary basin management by introducing the concept of "International Basin Districts", within which the Member States concerned will have to comply with the same obligations as are imposed for the strictly national basins.

A holistic approach

The Directive concerns all water environments (rivers, lakes, groundwater, coastal waters, etc.) and recognises the holistic nature of water resources: ground, surface and coastal waters are interdependent and the "good status" objectives must be achieved for all. The Directive introduces a socioeconomic approach, which requires water uses to be identified first (recreational activities, drinking water supply, irrigation, industry, etc.) after which the economic impact of these uses can be assessed. Thus, the EU water policy is now an integrated policy, which affects and involves the development policies of other sectors. The Directive requires the establishment of a common frame of reference for assessment, allowing realistic analyses to be made of the situations and strategies of the Member States. It also guarantees transparency.



In order to develop this frame of reference, the Directive first requires the identification of "water bodies". Quality indicators and reference values are then defined for each type of water body. This allows comparisons to be made between countries. Inter-calibration procedures are also being developed, in order to calibrate the data provided by the Member States.

Local action: EU cooperation in Georgia

In accordance with the Partnership and Co-operation Agreement between Georgia and the EU in 1999, Georgia has taken important steps to harmonize its water and environment legislation and management with European Community requirements. This has included the review and revision of existing water legislation and the provision of clear-cut mechanisms for financing water resources management.

Another action has been the setting up of a policy and institutional framework for transboundary river management in the Kura-Aras basin. This involves Armenia, Azerbaijan, Georgia, Iran, and Turkey. Besides the transboundary issue, attention is also being paid to the way in which decentralized basin councils can be used to increase both the effectiveness of water management and participation.

Local Actions: LA1017, LA1018 and LA1019
www.worldwaterforum4.org.mx/home/local.asp?lan

Transparency of costs and the polluter pays principle

Ensuring transparency and the application of the "polluter pays" principle are essential provisions of the Directive. Thus the Directive requires a report to be made concerning the recovery of the costs of services linked to water uses. This should analyse three questions at the level of a river basin:

1. Do the current prices charged cover the costs of the service (i.e. the operating and renewal costs)?
2. Does the implementation of the polluter-pays principle allow polluters to be charged fees equivalent to the cost of the environmental damage they cause?
3. How are the charges shared between the different economic sectors (households, industry, farming, etc.)?

The Directive doesn't only require Member States to consider traditional investment and operating costs in their economic calculations. It also introduces newer approaches—such as the calculation of opportunity costs associated with the various ways resources are used and the calculation of the cost of damage caused to the environment. The Directive includes a transparency requirement (who pays what and why?), but does not insist on complete cost recovery. For social, economic and environmental reasons, subsidies or common-cause mechanisms and financial transfers are allowed to continue.

Strengthening basin committees through public consultation: a participatory working method

The Directive clearly stipulates that water stakeholders must actively participate in all the steps involved in formulating management plans. The prerequisite to real transparency is the effective participation of the public, through planned consultations throughout the whole process. Participation does not simply assert itself. Rather, it has to be built based on previous information gleaned about water

Councils for Water Management in Poland

Polish implementation of the Water Framework Directive, with regard to public participation and the formulation of Management Plans, led to the creation of advisory bodies at the regional level, in the form of eight Regional Councils for Water Management.

The Regional Councils are made up of 30 members. These include the Directors of the Regional Water Management Boards (RZGW), representatives of local government and economic, agricultural, fishing and social organizations, as well as users in the regions concerned. They give advice on matters related to water management in each river basin area.

The first Regional Council was created for the Lower Oder and Western Costal Rivers. Additional Councils were then developed in Poland's other river basins.

management and on the stakes involved in the particular project. This implies the involvement of local contacts able to relay information, such as local authorities, users' associations, and environmental protection groups. Consultations with the general public are also required during the different steps of the process.

The WFD reasserts the role of the basin committees which contain the representatives of local authorities, users' associations and governmental administrations. By entrusting these committees both with the role of dealing with information and with the role of consulting the general public, the Directive aims to increase public understanding of the actions taken by these committees.

Photo credit: International Office for Water.

IWRM and the WFD: initial experiences

Opinions differ as to how far the WFD can really be considered to represent IWRM. At present, the WFD ignores the development aspects of water. That is, it ignores the fact that water can be a significant driver of social and economic development. In addition, no specific attention is paid to such important aspects of IWRM as demand management, water-use efficiency, poverty and gender issues. With its strong focus on the "ecological status of waters" and its high implementation cost, the WFD could be viewed as "good practice" tailored to the situations found in industrialized countries, such as those highly developed countries found in some parts of Europe. It might thus be considered to be “IWRM for the North”–relevant to countries where water is abundant and water infrastructure is already in place.

From reading the formal legal text of the WFD alone, one might conclude that it actually only deals with water quality. However, from an operational point of view it is clear that, as everything is related at the basin level, the actual implementation of the Directive will have to be concerned with more than just issues of water quality and conservation of the environment. Instead, in its Management Plans and Programs of Measures, it will have to take into account all aspects of water and land management (i.e. agriculture, navigation, flood and drought prevention, hydropower production, etc.).

Local action: New Water Culture—a new water management approach in Catalonia, Spain

After many years of trying to increase supplies by transferring water from other basins, the Great Barcelona Region (population 4.5 million) decided to prepare an alternative plan. This involved using the actual resources available and implementing measures to improve water-use efficiency and manage demand. At the same time water quality in the area’s aquifers and rivers was improved. These combined measures will allow demand to be met (even with the increase in the population that is expected), and will improve environmental quality in the area.

Local Action: LA0355 (http://www.worldwaterforum4.org.mx/home/local.asp?lan)

But, the WFD does include most of the important elements of IWRM, such as management on a river-basin scale, public participation, cost recovery, etc. It is expected that the present Directive with its focus on water quality and ecology will evolve slowly into a more comprehensive water directive which will include aspects such as flooding and water shortages. The first steps towards this more comprehensive approach are already being taken. An example is the European Action Program on Flood Risk Management which is being developed with strong links to the WFD.

The preamble of the WFD states that “further integration of protection and sustainable management of water into other Community policy areas such as energy, transport, agriculture, fisheries, regional policy and tourism is necessary. This Directive should provide a basis for continued dialogue and for the development of strategies towards a further integration of policy areas.” This illustrates that the WFD makes provision for a more holistic, IWRM-type approach in the future.

Innovative approaches to harmonizing spatial development and IWRM: floating greenhouses

Horticulture is an important economic sector in the western lower parts of the Netherlands. For improved water management, space needs to be reserved in this area to create more buffering capacity instead of using more classical approaches such as increased pumping and higher dikes. At the same time environmental concerns require the process-chains used in horticulture to be closed. All this can be realized through the development of floating greenhouses. A feasibility study has been carried out and a pilot floating greenhouse has been constructed. Multiple use of space means that the floating greenhouses will reduce the pressure on the water system. Moreover, the large amounts of energy consumed by greenhouses can be decreased by storing energy in the water below the greenhouse.

GWP Toolbox case #185

The EU has also initiated a large number of research and development (R&D) programs designed to support the implementation of the WFD. These range from programs involving hard science (such as geographical information systems (GIS) and flood/drought forecasting systems) to programs that address social issues (such as improving public participation). Special programs have also been set up to disseminate the results obtained. These use a range of media, including web-portals (see list of web-sites at the end of this chapter).

So, an important question to ask ourselves is “what lessons have been learned from Europe’s experiences with IWRM and the WFD”? This will be discussed in several sessions at the World Water Forum in Mexico, particularly **session FT2.14 *(“Implementation of the WFD: status, challenges and prospects”)*** and **session FT2.41 *(“IWRM in the North”)***. Moreover, several “local actions” considered at the Forum will also deal with the implementation of the WFD, e.g. LA0748 (WFD Upper Vistula Basin). Some initial conclusions and the lessons learned are discussed below, however.

- It seems that the objectives of the WFD can be met—though at substantial additional cost to the countries involved and most probably with some delay. Not all countries are on track to meet the WFD and some problems and scientific questions remain, such as “how can ecological quality be monitored?” and “how can chemical data be linked to ecological quality?”

- The involvement of the general public in the implementation of the WDF is a major issue:

  - It appears that the use of specialists in communication and public enquiries will be required in order to (1) reach the maximum number of people effectively, (2) ensure greater participation, and (3) define the most suitable methods of communication, most of which still remain to be tested.

  - In particular, it is necessary to use language which is suitable for the target audience, especially the general public. It is therefore vital to avoid technical or bureaucratic terms, which would be inaccessible to the majority of a country’s people. The language should be clear, simple, and easy for everyone to understand. Documents should be designed to have the maximum impact and be visually appealing—containing many pictures, for example.

  - The cost of public

Spain: Managing water demand in the Upper Guadiana Basin

For centuries the Upper Guadiana Basin has been irrigated with groundwater. In the 1980s the area irrigated increased more than four-fold in 10 years. This increase resulted in the water table dropping more than 20 meters, which had a severe impact on several wetlands: the flooded surface area of the Tablas de Daimiel National Park, for instance, declined from about 6,000 ha to less than 1,000 ha. Several remedial measures were introduced, including new regulations restricting aquifer abstraction and economic incentives to encourage farmers to improve irrigation efficiency and plant alternative crops.

Between 1995 and 2000 the water table level recovered by more than 10 meters. The changes in irrigation in the Basin forced managers to try to balance economic growth (which implied a high consumption of irrigation water) with wetlands conservation. The use of administrative tools helped control and reduce the impact of over-exploitation of the aquifer. However, although water use was reduced, many jobs were lost in agriculture and small industries. The most important lesson learned from this case is that:

Good water management needs to consider the whole hydrological cycle - surface and underground waters cannot be managed separately or independently of the ecosystems on which they depend.

GWP Toolbox case #18

consultations should also be considered, as should the need to allow significant budgets to cover the new obligations associated with public participation.

- It seems that original approaches, based on the organization of local events or on the use of local communication support networks, are sometimes more effective in mobilizing the public than is the use of the media for broad dissemination. For example, media costs may be high and the response may sometimes be disappointing. Local authorities and NGOs may be very useful mediums for relaying information.

- Many of the local actions that will be presented at the Forum in Mexico address public participation. Examples include LA0745 (RhineNet), LA1467 (stakeholder involvement in the Danube) and LA1321 (stakeholder involvement and decentralized sanitation).

- Social learning may play a useful role in river basin management. The concept refers to learning which develops and sustains the capacity of different authorities, experts, interest groups and members of the general public to manage their river basins effectively. Collective action and the resolution of conflicts require that people recognize their interdependence and their differences and learn to deal with them constructively. The different groups need to learn and increase their awareness about their biophysical environment and about the complexity of social interactions.

- Large transboundary rivers, lakes and aquifers will require specific attention, particularly when countries neighbouring the EU are involved. It is therefore proposed that action should be taken to:

  - Strengthen the action taken by existing international bodies (international commissions, bilateral cooperation, etc.) and promote a clear definition of the roles and commitments of each country;

  - Support the creation of new International Commissions and, in basins shared with neighbouring non-EU countries (i.e. EU candidate countries, Balkan countries and the Newly Independent States), strengthen cooperation through European Commission-supported projects designed to implement the WFD principles in these basins; and

  - Modify or complement existing international water treaties or agreements to ensure they comply with the new concepts of IWRM.

- Agriculture also requires specific attention. The areas in which agriculture has a significant impact on water should be identified, and the measures necessary for

restoring these areas prioritized. Joint financing mechanisms need to be mobilized for these priority zones/measures, and the option of providing financial compensation to farmers who change their behaviour should be considered.

Considering the impacts of water use in agriculture is an important element of an IWRM approach. Photo credit: International Office for Water.

The role of Europe in international cooperation

Enormous efforts have been made to address water resources management in Europe. However, the WFD as a whole cannot necessarily be "exported" to developing countries, which face severe competition for scarce and polluted water resources as a result of their quest for economic and social development. Conditions in those countries are simply too different from those in the EU. Introducing a WFD-type package without prior cross-sector balancing would be like issuing a blank cheque.

This said, although the WFD itself is not universal, its key elements are. Thus, securing public participation, forming river basin councils, making river basin plans, setting time-bound measurable targets, establishing appropriate monitoring and enforcement systems, and introducing cost-recovery mechanisms are all needed. The important thing, therefore, is to “export” the *process* of establishing an IWRM framework—as the final form of such a framework will vary from country to country.

Central to the international water agenda at this point in time is the challenge of achieving the MDGs (all of which strongly depend on water) and the target set by the World Summit on Sustainable Development (WSSD) in Johannesburg in 2002: to develop "IWRM and Water Efficiency Plans by 2005". In many cases, progress has been made towards this target, even if it has not yet been met. And, even where the target has been met, these Plans sometimes still need to be implemented. Europe is playing a key role in working towards these agendas through the European Water Initiative (EUWI) and the European Water Facility for African, Caribbean and Pacific (ACP) countries.

The EUWI was launched at the WSSD in Johannesburg in September 2002. Its central objectives are:

- The reinforcement of political commitment towards action and innovation-oriented partnership.
- The promotion of improved water governance, capacity building and awareness.
- The improved efficiency and effectiveness of water management, through multi-stakeholder dialogue and co-ordination.
- Strengthened co-operation, through promoting basin approaches in national and transboundary waters.
- The identification of additional financial resources and mechanisms to ensure sustainable financing.

In addition to the overall objective of reinforcing the political will to act to improve water resource management, EUWI also aims:

- To promote better water governance arrangements and to build the institutional capacities needed to do this;
- To improve both co-ordination between European co-operation programmes and the efficiency with which assistance is provided.

The EU has established a Steering Group to support EUWI’s implementation. It has also established a multi-stakeholder forum designed to promote the Initiative and guide efforts to fulfil the objectives related to strategic partnerships. The Initiative has now established a number of regional and thematic components, each with a working group.

The European Water Initiative in Africa, for example, aims to help countries achieve EUWI's objectives while taking into account the specific conditions found on the continent—where most resources are located in transboundary river and lake basins. Thus an approach specific to Africa was developed which links, in a consistent manner, planning on the scale of transboundary river basins with national planning in each of the riparian countries.

European support for IWRM plans in Africa

In 1999, Burkina Faso started to develop a national IWRM plan—a process that included:

- The development of the national IWRM Action Plan
- Capacity building
- The introduction of IWRM principles in a sub-basin
- The passing of a water management law.

The four-year process of developing this IWRM Strategic Plan required a budget of US$6.5 million. The country has already started implementing the Plan. A national Framework Water Law (2001) and some of the required bylaws were enacted during the process of developing the Plan. Some key institutions recommended in the IWRM Plan, such as the National Council for Water, and the Permanent Secretariat of the National IWRM Plan (SPPAGIRE), are now in place. Substantial funding was later secured from Sweden and Denmark to implement some of the Plan's components. European funding facilitated the planning of IWRM, and later its implementation, allowing Burkina Faso to play an innovative role and thus accumulate experience of IWRM that was unparalleled in Africa at that time.

At the regional level, and since the Volta Basin is shared between six West African countries (Benin, Burkina Faso, Ivory Coast, Ghana, Mali and Togo), the Water Ministers of these six countries created the Volta Basin Technical Committee (VBTC) as the first step towards the birth of a Basin Authority.

Their commitment convinced the Council of African Ministers in Charge of Water (AMCOW) to choose the Volta Basin as one of the five pilot basins involved in the European Water Initiative. In support, the European Commission has mobilized €1.25 million from the ACP–European Development Fund for the creation of the basin organization. Implementation of the actions identified as necessary will start in the first half of 2006.

Because some of its basic principles are universal, both developing countries and developed countries outside Europe can draw inspiration from the WFD and the lessons learned from its implementation. However, these principles should of course be shaped by context and time.

The EUWI and the EU Water Facility are not the only mechanisms of cooperation between Europe and the South. In fact, most assistance is provided either through EU Member States' bilateral cooperation programs or through other multilateral EU initiatives. Some countries (e.g. France, the Netherlands and Denmark) have included IWRM as a specific focus in their bilateral cooperation programs.

Conclusions and lessons learned

- In Europe unprecedented efforts are being made to manage freshwater resources in a consistent, ambitious, and integrated way. The introduction of IWRM in Europe started in the 1970s and has culminated in the current European Water Framework Directive (WFD).

- The strengths of the WFD are its holistic basin approach, the fact that it ensures that costs are transparent, its use of payments based on the polluter-pays principle, its emphasis on public participation, and the fact that it is mandatory and has a precise timetable for implementation.

- The weak points of the WFD are its focus on water quality and the environment, though steps are gradually being taken to consider the other elements of IWRM, such as the need to consider floods and droughts.

- While water management in Western Europe is well developed, many people in Central and Eastern Europe, as well as people in parts of southern Europe, have no access to clean water or sanitation. Achieving the water-related MDGs in Eastern Europe will be difficult. It will require solidarity to be developed at the level of the European continent.

- The WFD is in line with, and even goes beyond, the Johannesburg Plan of Implementation and the demands that CSD13 sets with regard to the 2005 IWRM target. However, the WFD is based on a transboundary river basin approach, while CSD13 is still limited to enhancing cooperation between riparian states.

- While planning for IWRM is often done at the national or river basin level, in many cases it needs to be implemented at the local level. In Europe, local authorities (e.g. municipalities) are playing a larger role in terms of organizing both public involvement and the necessary water-related services. These local authorities have the ability to choose freely the most appropriate management structure from the range of options available.

- Europe acknowledges that the frequency and severity of floods and droughts is likely to increase. This calls for comprehensive action programs, at both the national and basin level. These should include flood and drought risk-management plans, coordinated efforts, and the raising of public awareness.

Information sources

Water Framework Directive (WFD)
General web site: www.europa.eu.int/comm/environment/water

The links to the official WFD implementation web sites of the EU Member States are given below. On these sites one can often access detailed information on water management in specific countries.

Country	**Web address**
Austria	www.lebensministerium.at/wasser/
Belgium	directive-eau.wallonie.be/ www.ciwvlaanderen.be www.ibgebim.be/francais/contenu/content.asp?ref=2102
Cyprus	www.moa.gov.cy/moa/wdd/wdd.nsf/union_gr/union_gr?OpenDocument
Czech Republic	www.env.cz www.mze.cz
Denmark	www.mst.dk/vand/06000000.htm
Estonia	www.envir.ee
Finland	www.ymparisto.fi/
France	www.eaufrance.fr/
Germany	www.bmu.de/gewaesserschutz wasserblick.net/
Greece	www.minenv.gr/welcome_gr.html
Hungary	euvki.hu
Ireland	www.wfdireland.ie/

Italy	
Latvia	www.lvgma.gov.lv
Lithuania	
Luxembourg	www.waasser.lu/gestion_de_leau/gestion.html
Malta	www.mra.org.mt/wfd_introduction.shtml
Netherlands	www.kaderrichtlijnwater.nl www.waterland.net
Poland	www.bgw.gov.pl/wfd/
Portugal	dqa.inag.pt/
Slovakia	
Slovenia	www.gov.si/mop/podrocja/uradzaokolje_sektorvode/porocila/wfd/
Spain	
Sweden	www.vattenportalen.se/
United Kingdom	www.defra.gov.uk/environment/water/wfd/index.htm

The WFD and International River Basin Commissions

The International River Basin Commissions play an important role in coordinating the implementation of the WFD in the EU Member States. Below are some of the most active River Basin Commissions in Europe.

River Basin Commission	**Web address**
Danube	www.icpdr.org
Elbe River	www.ikse.de
Meuse	www.meuse-maas.be
Odra River	www.mkoo.pl
Rhine River	www.iksr.de
Scheldt	www.isc-cie.com

European Water Initiative (EUWI)

General web site (with extensive list of links to related organizations, networks, programs, etc.): www.euwi.net

ACP-EU Water Facility:
www.europa.eu.int/comm/europeaid/projects/water/index_en.htm

Supporting organizations, information sites and miscellaneous

CEMR - Council of European Municipalities and Regions: www.ccre.org

Global Water Partnership: www.gwpforum.org, in particular its European-related activities such as

- Regional Partnership for Central & Eastern Europe: GWP CEE
- Regional Partnership for the Mediterranean: GWP MED

- Northern Water Network (European partners): www.northernwater.net

International Network of Basin Organizations (INBO): www.inbo-news.org

International Office for Water (IOWater): www.iowater.org

TwinBasin: www.twinbasin.org

IWRM.NET: www.oieau.org/eranet

UN - Economic Commission for Europe: www.unece.org/env/water/welcome.html, in particular

- Convention on the protection and use of transboundary watercourses and international lakes
- Working Group on Integrated Water Resources Management

WFD-related R&D projects such as:

- Harmoni-CA: www.harmoni-ca.info
- Portal on consolidated IWRM experience: www.Wise-rtd.info/wise.cgi
- Harmoni-CA Toolbox: www.harmoni-ca.info/toolbox/index.php
- HarmoniCOP: www.harmonicop.info

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3 | Innovations in Risk Management in Europe

SUMMARY

In Europe, floods droughts and storms—and the costs associated with them—are increasing rapidly. What is more, the frequency and intensity of such extreme events are expected to rise further in the future. In response, European countries and the EU have made substantial investments in real-time monitoring, scenario modelling, flood forecasting and data collection—to increase preparedness and provide early warning. Innovative and comprehensive risk-management policies and new water-management and spatial-planning measures are also being developed.

Recent shifts in thinking have led to a diverse range of stakeholders being consulted. These include local communities—through a bottom-up approach which makes optimal use of specific local conditions and local ideas—as well as politicians, technical experts, local/municipal authorities, water boards, and civil society organizations. The benefits of such a multi-stakeholder approach have included greater public support and risk awareness. With regard to floods, there has also been a shift away from only considering protection measures towards integrated flood risk management. 'Flood accommodation', which includes measures to make room for floodwaters, store them or evacuate them, for example, has now become part of national policy in the Netherlands.

New forms of public–private finance are also being developed. And, capacity building and information sharing, within Europe and beyond, have become important elements of the risk-management agenda. In summary, Europe is building new solidarities to address the increasing risks it faces.

Introduction

This chapter considers developments in Europe's policies on water-related risks, and provides a number of cases which illustrate the management of flood risks (riverine, urban and coastal) and drought risks. Cases are also used to illustrate coping tools such as early warning systems, groundwater management, and monitoring. Most of

these cases will be presented at WWF-4; here a reference to the relevant WWF-4 session is provided in bold italics for each case. Conclusions and a list of links to relevant web sites are also provided at the end of this chapter.

This chapter builds on the conceptual framework presented in the WWF-4 Risk Management Baseline Document for Thematic Area No. 5 and the cross-cutting thematic document WWF-4 Capacity Building and Social Learning (www.worldwaterforum4.org.mx/uploads/TBL_DOCS_50_33.pdf and www.worldwaterforum4.org.mx/uploads/TBLDOCTOSB_15_48.pdf, respectively).

Impacts of flooding and drought in Europe

Between 1998 and 2002, Europe suffered over 100 major floods, including the catastrophic floods along the Danube and Elbe rivers in 2002. Severe flooding due to excessive and freak rainfall was also seen in Central Western Europe (Switzerland, Germany, Austria, and southern France) and Eastern Europe (Rumania and Bulgaria) during the summer of 2005. In fact, since 1998 floods have caused some 700 fatalities, the displacement of about half a million people and at least €25 billion in insured economic losses[2].

By the same token, in 2003 Western and Southern Europe faced an exceptionally long and rain-free heat wave which killed thousands of people, most of them elderly. While in 2005 an unusually hot, dry summer in Southern Europe caused a drought that affected agriculture and urban water supplies in Italy and Spain, leading to political debate on the feasibility of Spain's current development policies.

An enormous amount of assets are placed at risk by flooding and drought. For example, more than 10 million people live in areas at risk of extreme flooding along the Rhine—which means that floods there could cause up to €165 billion worth of damage. Plus, the total value of economic assets located within 500 metres of Europe's coastline, including beaches, agricultural land and industrial facilities, stands at between €500 and €1,000 billion (http://www.eurosion.org)—an estimate which doesn't take into account the possible effects on groundwater quantity and quality.

Floods and droughts can also have severe environmental consequences—for example wastewater treatment plants can be inundated and factories holding large quantities of toxic chemicals can be affected. They can also destroy wetland areas and reduce biodiversity.

[2] European Environment Agency: http://reports.eea.eu.int/environmental_issue_report_2004_35/en/accidents_032004.pdf.

Policy and strategy responses

Countries have taken protective measures at the national and river-basin levels to reduce water-related risks. Finland, for example, was the first European country to develop a strategy designed to allow it to adapt to climate change, sections of which consider water resources and water services (http://www.mmm.fi/sopeutumisstrategia).

But rivers and coastal processes do not recognize administrative or political borders. To improve the level of protection provided, concerted and coordinated action is required at the level of the European Union (EU). Recognizing this, the EU has begun to address the issues of flood mitigation and coastal protection.

Floods

The recent disastrous floods in Europe, and the expected increase in the frequency and severity of such events, prompted the European Commission (EC) to propose, in 2004, the development and implementation of a flood prevention, protection and mitigation Action Programme coordinated among Member States. The Commission is proposing three distinct but closely linked 'action packages' on the following:

- Information and research—facilitating the exchange of experience and knowledge and increasing awareness by, for example, forging stronger links between research, policy and public awareness.
- EU funding—providing targeted approaches to allow the best use of funding tools.
- A legal instrument (i.e. a Directive)—which would develop flood risk maps and flood risk management plans at river-basin level.

The development of the legal instrument will take into account the principles of flexibility and subsidiarity, and risk-management plans will be developed in consultation with stakeholders. Developing such flood risk management plans is an aspect of integrated river basin management, and will be strongly linked with the Water Framework Directive (WFD) (http://europa.eu.int/comm/environment/water/flood_risk/index.htm).

*The forthcoming session 'Broadening perspectives in the face of increasing risks' (**FT5.15**) will present the results of applied research and discuss relevant new concepts, such as adaptive management in Europe.*

Flood forecasting and early warning

Positive action is also being taken by the Joint Research Centre of the European Commission (JRC), which is developing the early-warning European Flood Alert System (EFAS). This will provide flood simulations across Europe, giving about 3 to 10 days' warning. The main aim is to be able to inform the National Hydrological Services several days before a flood occurs. The EFAS should also provide the EC with information that can be usefully used to prepare and manage the aid provided during a flood crisis. The system is intended to complement, not replace, national flood-forecasting systems.

A major part of the research is being done on Ensemble Flood Forecasting, using weather forecast ensembles. At present the system is in the development and testing phase, and the JRC is collaborating closely with relevant institutions in the Member States and two meteorological services (the European Centre for Medium-Range Weather Forecasts and Germany's Deutscher Wetterdienst—DWD). A prototype of EFAS for the Elbe and Danube catchments is expected to be tested and ready by the end of 2006. Finalization of EFAS at the pan-European scale should occur around 2008/9 (http://www.jrc.cec.eu.int/).

Coastal protection

Threatened by the impacts of the expected rise in sea level and the expected increase in storms, many of Europe's coastal zones and its major coastal cities face the deterioration of their environmental, socio-economic and cultural resources. Since 1996, the EC has been working to identify and promote measures to remedy such deterioration and to improve the overall flood-risk situation in coastal zones. This led to a 2002 EU Recommendation on Integrated Coastal Zone Management.

Droughts

Droughts mainly affect the Mediterranean region, and some climate forecasters feel that, due to global warming, the arid Sahara climate will shift further north, possibly encroaching on Southern Europe. The situation is aggravated by an increase in groundwater-dependent irrigated agriculture in areas of Southern Europe such as Spain's 'meseta' (high central plateau) region. Responses to these predictions are being considered at the national levels, but not at the level of the European Commission.

Cooperation beyond Europe

Water-related risks are increasing worldwide, and many countries are taking adaptive measures. Europe realises that it can both offer its expertise to countries elsewhere in the world and learn from them. An example is the emerging cooperation between Japan, Europe and the USA regarding space-based early-warning technology.

Another example is Europe's cooperation with the USA in the aftermath of hurricane Katrina (*session 'Katrina', **FT 5.05***). But, cooperation and experience-sharing is still limited between continents. To foster more cooperation and exchanges of experience, several European countries (the Netherlands, Germany, UK, France, etc.) as well as the European Commission are actively pursuing closer working relations.

The European Commission and many European countries also have a long history of providing development assistance to vulnerable countries, and emergency aid and other forms of assistance to disaster-stricken countries (*session 'Partnership building at community level', **FT 5.04***).

Case studies: local initiatives and projects

Numerous initiatives and projects are underway to cope with flood-related risks at the basin, country and local levels. These risk-management initiatives have the following in common:

- **They emphasise a shift from a protection-oriented strategy** (which only involves downstream structural works) to integrated flood risk management. As well as taking into account structural protection and hydraulic works, this approach seeks to regulate upstream flow (through dynamic slow-down and retention measures, floodplain restoration and overflow areas), improve early-warning systems and flood forecasting, and implement appropriate spatial planning (by allowing sufficient space for water storage, etc.).

- **They involve multiple players in flood risk management.** Such involvement ranges from multi-stakeholder planning (through dialogues among local/municipal authorities, water boards, civil society organizations, etc. in risk areas) to the provision of new forms of compensation by insurance companies and the recently established UN solidarity fund for disaster victims.

- **They seek to make the public more aware of the risks of flooding**.

A few of these initiatives and projects are highlighted in the following case studies. However, it should be remembered that these studies do not provide a complete overview of all the risk-management projects in Europe.

Riverine flood management

The Topic Session 'Dialoguing between technical and political' will present and discuss initiatives that bring political and technical stakeholders together. The session

*will highlight the 'Freude am Fluss' concept and the Loire Flood Management approach (**FT5.01**).*

Flooding on the River Elbe, August 2002.

‘Freude am Fluss’: Developing sustainable flood-protection plans in dialogue with local stakeholders

The idea for the ‘Freude am Fluss’ concept arose from the realisation that flood-protection measures designed at the national level receive little support at the local (municipal) level. Generally, local communities disapprove of the top-down decisions taken with regard to the repositioning of dikes, and construction of spillways, etc. Although there is general acceptance that such measures have to be taken to maintain safety, local communities don’t want such structures to be built in their neighbourhood—the so-called ‘not in my backyard’ (NIMBY) attitude.

The ‘Freude am Fluss’ concept aims to reverse this attitude and encourage a ‘please in my backyard’ (PIMBY) attitude. After analyzing the reasons underlying the local NIMBY attitude within the three participating countries—France, Germany and the Netherlands—the ‘Freud am Fluss’ project partners came to the following conclusions:

- Local stakeholders have access to different amounts of information, which can easily lead to misunderstandings and conflicts later in the decision-making process.
- Local stakeholders feel that they are not really involved in the decision-making process because they are excluded from the design and planning process.
- Top-down plans often bypass local ideas of alternative land-use and economic opportunities. Therefore, local communities feel that most measures designed using a top-down approach are a ‘lose–lose’ situation (as they are forced give up land and get nothing in return).

To address these flaws in the process of sustainable flood protection, the project developed a special communication and cooperation strategy in which local communities play a key role. This bottom-up approach makes optimal use of specific local conditions and local ideas while simultaneously achieving the required national flood-protection levels. The ‘Freude am Fluss’ approach ensures that local communities consider themselves to be partners and stakeholders from the very beginning of the development of the flood-protection strategy, instead of viewing themselves as ‘victims’ of top-down policies.

The approach was discussed during the first European Solidarity Week on Water (Strasbourg, October 2005) and proved relevant to many European countries, including Romania, Hungary and Poland. The concept is also being discussed with interest in China, and may also help in the efforts being made to address recurrent transboundary flooding of the Maritza/Meric river—which flows from Bulgaria and forms the boundary between Turkey and Greece.

For more information contact Prof. T. Smits (a.smits@science.ru.nl) or see www.freudeamfluss.nl.

‘Plan Loire Grandeur Nature’: an integrated approach to flood management

The ‘Plan Loire Grandeur Nature’ (PLGN) is an integrated initiative which protects people and assets at risk from flooding while preserving and enhancing the water resources and environmental heritage of the Loire valley. It addresses three priority topics: (1) security against flood risk, (2) improvement of water resources management in the landscape, and (3) protecting ‘wealth’ in the form of natural assets.

Specific activities under the PLGN’s three priority topics include:

- The provision of security against the risk of flooding—through flood mapping, land-use control, flood warning, and planning measures.
- The improvement of water resources management in the landscape—by protecting water resources along the river basin which are at risk from low flows and changes in water quality during the summer.
- The protection of natural assets—by restoring the natural aquatic environment by addressing fish migration and the important role played by the estuary.

The PLGN is supported by the French government and several stakeholders, including the local authorities and the authorities concerned with riparian zones. Its two main challenges are (1) the need to manage flood risk in an integrated way, and (2) the need to gather together and involve the numerous actors along the river, each of whom has various interests.

To meet these challenges the PLGN has brought together various partners, each of whom have signed contracts or protocols. It has also formed a multidisciplinary team to lead the Plan and help the PLGN’s works managers undertake their duties. The local PLGN institution, which draws together the relevant local authorities in the basin, is a major actor in the plan.

The PLGN’s approach of simultaneously considering social, economic and environmental assets has proved so successful that similar initiatives are being introduced in the Rhône, Seine and Garonne valleys. Through international cooperation, the Plan is also acting as a model for other countries.

For more information see http://www.centre.environnement.gouv.fr/plgn.htm.

Mathematical models and the flood of August 8 2002 in the Czech Republic

On August 8 2002, a disastrous flood occurred in the Bohemia region of the Czech Republic. This badly affected all the main rivers and all the cities located on those rivers. A flood of such a size was estimated to occur only once every 800 years, and in most cities water levels were the highest ever observed. The flood also affected the capital city Prague, the country's largest city. However, thanks to the DHI Water & Environment software tools Mike11 and Mike21C, which were applied before, during and after the floods, valuable information was available in advance with regard to flood prevention, crisis management and flood-damage avoidance.

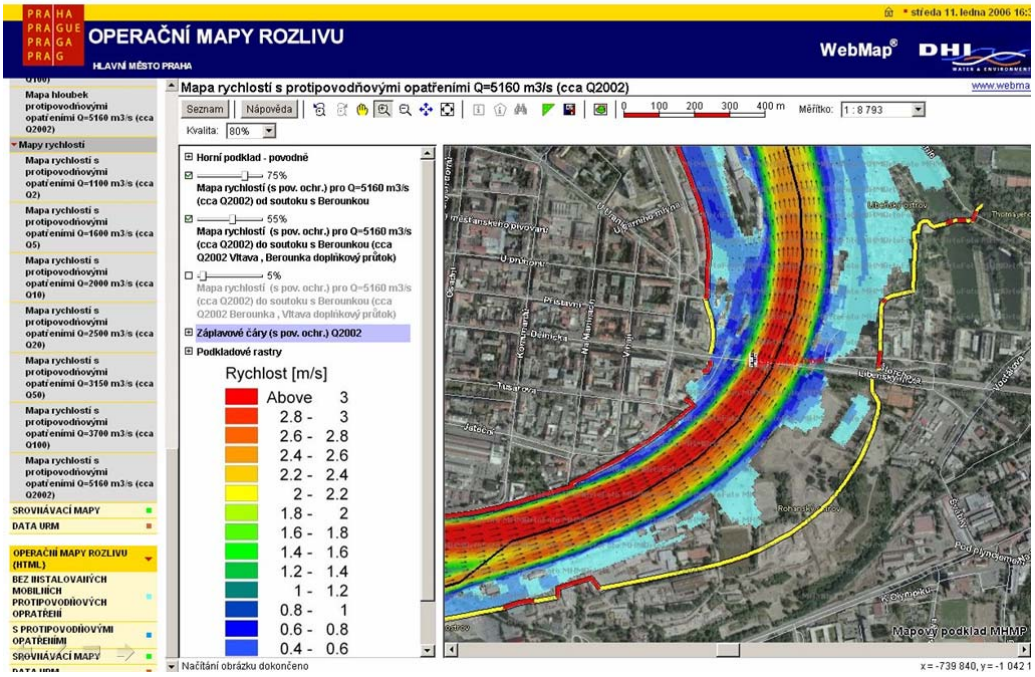
Applications using mathematical models focus on determining the flow characteristics (water levels, water depths and velocity distribution) of both statistically generated floods and real floods. The results are then used to delimit flood zones and analyse what flood-protection measures are necessary throughout the whole river basin. This helps to address the problems associated with growing populations, continuing urbanization and economic growth in areas at risk of flooding.

Because there is the potential for both economic and cultural damage, it is necessary to designate areas at risk as flood plains or areas which may be exposed to floods under special circumstances and to adequately regulate their use. It is impossible to do this without using powerful and well-tested hydroinformatics tools such as digital terrain models, hydrodynamic models and geographical information systems (GIS), which support the decision-support system (DSS) tools used by decision makers concerned with flood risk and flood protection in the Czech Republic. Such tools must be tested and verified against real, catastrophic, flood situations.

For more information contact Palle Lindgaard Jorgensen (plj@dhi.dk) or see http://www.dhi.cz/references.php.

Prague Operational Flood Maps

Velocities: scenario barriers in action



Urban floods

*The following case studies from Germany and the Netherlands will be presented during the topic session on Urban Floods (**FT5.22**).*

Lessons from Germany and the Netherlands: reducing the probability of floods leads to increased vulnerability

Flood risk is usually described as a function of the probability of floods (return period) and the effect of a flood (the damage caused). Current policies and measures concerning flood risk management are predominantly based on managing the probabilities of floods (a process largely dominated by engineers) and not on reducing the impacts of floods. However, the efforts made to reduce the likelihood of flooding are largely offset (1) by the rapid growth of urban areas in flood-prone areas and (2) by the increased levels of investment which occur in these areas.

So, by only focusing on reducing the probability of floods, these policies fail to reduce the flood vulnerability of urban environments, and may even provide the wrong kind of investment incentives. In urban areas with a high social and economic value, focusing on reducing the effects of floods may provide important opportunities for flood risk reduction.

Traditionally, the flood management policies in Europe concentrated on flood defence, and were dominated by the construction of dikes. However, flooding in the Netherlands and Germany in the 1990s raised intense debate on the future direction of these countries' flood-management policies. It was realised that 100% safety cannot be guaranteed; furthermore, one cannot continue to raise the height of dikes indefinitely. In the Netherlands this insight produced a new 'triple-step' policy concept. In order of priority, this stated that (1) excess water has to be accommodated in the region; (2) if this is unfeasible it should be stored; and (3) as a last resort, it should be safely evacuated when necessary. In other words, flood accommodation is now part of the country's official flood management policy. The immediate implications of this are the need for more space for water, and the subsequent search for land-use solutions in a densely populated country.

In urban areas of the Netherlands, this policy has already resulted in creative, small-scale water accommodation and retention solutions related to the management of excess rainfall. However, the question of how to deal with major floods in urban areas has still not received much attention: the emphasis is on finding space for flood waters in rural areas, in order to protect the urban areas. Nevertheless, these experiences are providing valuable lessons for the development of urban flood management strategies based on an integrated approach that enhances the resilience of the entire system.

Also relevant is initiative 'C22', an action supported by the EU which brings together more than 50 experts in the field of urban flood management from more than 12 European countries (http://www.waterland.net/C22).

For more information contact Chris Zevenbergen (c.zevenbergen@duravermeerdiensten.nl)

Early warning

*The following project is of importance for the topic session on early warning (**FT5.07**).*

The PREDICT initiative: predicting the future and learning from the past

The PREDICT initiative uses powerful satellite-based early-warning systems to predict heavy showers that may cause flooding. The forecasts provide a lead-time of several hours and are so accurate that schools can be warned if children need to be kept inside.

PREDICT recognizes that local authorities need to be able to base their flood policy on prevention, warnings, post-crisis analysis and feedback from past experience. It helps them to anticipate and manage flood crises by improving their knowledge about what happens just before flooding, by facilitating real-time monitoring of actual floods and by analysing what happens when the flood waters have subsided.

Developed by BRL, EADS Astrium and Météo France, PREDICT offers a simple integrated solution for flood management through the following:

- Predictions for better on-the-spot risk management.
- Optimized cooperation between community authorities and State authorities.
- Analysis of crisis impact and consequences.
- State-of-the-art flood forecasting technologies.

PREDICT was successfully tested in those cities in the south of France affected by flooding in September 2005. The initiative is to be developed internationally.

For more information contact BRL Participations: Alix Roumagnac (alix.roumagnac@brl.fr) or Karine Moreau (karine.moreau@brl.fr).

Coastal protection

*The following case will be presented in the topic session on coastal zones (**FT5.08**).*

New challenges for the Dutch coast © Photograph by Simon Warner

Coastal protection in the Netherlands

For centuries the Dutch have been renowned for their coastal defences, and currently more than 3500 km of primary water defences protect the Dutch coast and hinterland. Since the disastrous flooding of 1953, flood hazards have been reduced considerably. However, although Dutch dunes and dikes have never been as strong as they are now, the following new challenges have to be faced:

- Though flood probability has been reduced, vulnerability to flooding has increased significantly because populations and economic assets have increased in flood-prone areas. Strong flood defences have diminished risk awareness.
- The fight against coastal erosion is continuous—in 2005 alone, 12.6 million cubic metres of sand had to be added to Dutch beaches.
- Due to rising sea levels and a possible increase in storm frequency and intensity, eight so-called 'weak links' in the Dutch coastal defences have been identified which could allow flooding in the next 20 years.

So, although the country has strong coastal defences, higher risks, higher levels of vulnerability, low awareness of risk and the complexities of spatial planning all call for new approaches, local action and international cooperation. Sand replenishment and long-term reinforcement of the country's dunes and dikes continues. However, there is a growing awareness of the one-sidedness of this approach. New risk management thinking pays more attention to the consequences of flooding. This might lead to the country being better prepared for future risks (through evacuation plans) and proactive policy (spatial planning). At the same time, both approaches call for the involvement of many more stakeholders, including the general public. Combining flood safety targets with the issues of water quality, and ecological, spatial, recreational and agricultural interests therefore remains a challenge.

The 2002 EU Recommendation on Integrated Coastal Zone Management has had an EU-wide impact. The Netherlands has actively participated in many projects and research networks that seek to find alternative ways of practically dealing with aspects of flood risk management, or of formulating and demonstrating innovative strategies designed to implement sustainable coastal management. Five low-lying North Sea countries have agreed to undertake new approaches for coastal risk management and will benefit strongly from European cooperation. They have combined their efforts to form the 'Safecoast project' (www.safecoast.org), which deals with coastal defence scenarios for 2050 designed to deal with climate change and future spatial development.

For more information contact Niels Roode, National Institute for Coastal and Marine Management (RIKZ), Ministry for Transport, Public Works and Water Management; email: njroode@rikz.rws.minvenw.nl.

Drought management

*The following case can be used to provide inputs appropriate to the session on droughts (**FT 5.11**)*

Free-range pigs in the Alentejo-Guadiana River Basin (Portugal) suffering the after-effects of a period of severe drought.

Over the last few decades different strategies have also been developed to combat the droughts that appear almost every 10 years in southern Europe. These drought management policies do the following:

- Raise awareness, through campaigns, of the correct way to use groundwater reserves
- Raise awareness, through campaigns, of the need to reduce domestic water use during the summer months
- Increase water prices during periods of drought
- Construct water reservoirs—such as the Alqueva Dam (Portugal).

The experiences gained in developing and implementing drought management plans highlight the successes and challenges associated with efforts to cope with droughts that affect societies with different vulnerabilities. Based on these experiences and the current methods used to evaluate risks, the MEDROPLAN project has developed guidelines for drought management in Mediterranean countries which can also be applied to other regions.

Drought management: the MEDROPLAN project

The guidelines developed by the MEDROPLAN project aim to minimize the impacts of drought using a risk-management approach. This takes into account the physical and socio-economic characteristics of the countries in question and responds to the actual situations faced by institutional and civil stakeholders.

Project achievements:

- Improved understanding of drought: its causes and its social, economic, and environmental effects
- A methodological framework for a risk-based approach to drought management
- The incorporation of relevant science into drought management—through education, awareness-raising, and outreach
- An analysis, based on stakeholders' knowledge of drought management, of the current know-how, technology, information, and expertise available
- Advanced training courses and workshops for institutional resource managers focused on urban and irrigation water management
- Collaboration in the creation of a Drought Preparedness Network for Mediterranean countries.
- Publication of its Drought Management Guidelines in six languages (final result of MEDROPLAN, in preparation).

For more information contact Dunixi Gabina, Mediterranean Agronomic Institute of Zaragoza, Spain (iamz@iamz.ciheam.org) and Ana Iglesias, Universidad Politécnica de Madrid, Spain (ana.iglesias@upm.es). See also www.iamz.ciheam.org/medroplan

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Groundwater management

*The following can be used to provide inputs appropriate to the session on groundwater (**FT5.09**).*

Managing threats to groundwater and wetlands in Spain

In semi-arid regions, such as Spain, the intensive development of groundwater for irrigation has benefited farmers in many ways, by enhancing revenues for example. It has also provided related social benefits, as it has triggered growth in agriculture-related industry and service sectors. In fact, in semi-arid areas, groundwater resources have proven to be invaluable, particularly during periods of drought. However, the consequences of uncontrolled groundwater use are now becoming increasingly evident. A good example is the Guadiana River Basin, which has large groundwater reservoirs in the La Mancha region. There, intensive pumping for irrigation has led to the loss or degradation of approximately 25% of the 115 wetlands that constitute UNESCO's Mancha Humeda Biosphere Reserve (including RAMSAR sites such as Las Tablas de Daimiel National Park). This conflict, between social and economic development on the one hand and environmental values on the other, is the main cause of the region's current conflicts over water resources.

For the affected wetlands to recover, the different institutions involved in the management of water and natural resources in the area will have to unify their objectives. And, this must be done without the need for large-scale economic investments and while avoiding conflict with local farmers. A part of this work is being done through the EC supported NeWater project, which seeks to:

- Improve the participatory practices already undertaken in the Upper Guadiana Basin.
- Ensure that the Upper Guadiana Basin's water management framework can cope with uncertainties.
- Provide new methods of evaluating buffering capacity—the Upper Guadiana's aquifers have in the past provided a significant amount of buffering capacity, especially during droughts.
- Assess the adaptive capacity of the system and evaluate the benefits of groundwater irrigation in relation to the environmental impacts of intensive pumping.
- Identify key drivers of future change in order to determine a series of plausible risk-management scenarios.

The Guadiana Basin is not an isolated case. As shown during the meeting of high-level international water decision-makers that took place prior to the International Symposium on Groundwater Sustainability (Alicante, Spain, 24-27 January 2006), most water managers in arid and semi-arid regions worldwide have failed to pay enough attention to groundwater. A determined push towards bottom-up user associations appears to be the most plausible way forward if adequate groundwater management is to be achieved in semi-arid areas.

For more information contact María Máñez (mmanez@usf.uos.de), University of Osnabrück and Ramón Llamas and Pedro Martínez-Santos (pemartin@geo.ucm.es), Complutense University of Madrid. See also www.newater.info/everyone/1025/1052

Monitoring
*The following can be used to provide inputs appropriate to the session on information systems (**FT513**).*

The collection and exchange of reliable data on water availability and water quality, as well as on precipitation, storms, run off, evaporation, droughts and floods, are of vital importance to risk management. The monitoring of policies and the effects of measures taken is also important. Yet, monitoring and data collection is often weak—a point raised by the 2003 'Camdessus Panel of Experts' and emphasized by the 2002 World Summit on Sustainable Development and the Thirteenth Session of the Commission on Sustainable Development (New York, 2005).

This said, numerous monitoring activities are underway in Europe. Under Italian leadership, the European Union Water Initiative (EUWI) has launched a Monitoring and Reporting (MR) System, which links water-related incidents to the achievement of the Millennium Development Goals.

For more information contact Umberto Triulzi (triulzi@ipalmo.com).

Conclusions and lessons learned

- Hydro-meteorological hazards are on the increase in Europe. The costs of water-related disasters (floods, droughts and storms) are increasing rapidly. Forecasts predict that the frequency and intensity of extreme events will increase further.

- Concern over these developments has led countries and the European Union to invest substantially in real-time monitoring, scenario modelling and data-collection activities to increase preparedness and provide early warning.

- The European Union and individual European countries are now developing innovative and comprehensive risk-management policies and measures related to water management and spatial planning. These are characterized by dialogues amongst multiple stakeholders (both political and technical). New policies, legislation, capacity, technologies, and structural measures are now being developed.

- The multi-stakeholder approach has provided multiple benefits, including increased public support and greater risk awareness. New forms of public–private finance are also being developed.

- With regard to technological and non-technological innovations, capacity building and information sharing (in Europe and beyond) are important elements of the risk-management agenda in Europe.

Information sources

Drought preparedness and mitigation planning (the MEDROPLAN approach)
http://www.iamz.ciheam.org/medroplan

EU COST Action C22 on Urban Flood Management
http://www.waterland.net/C22

EU Integrated Coastal Zone Management
Coastal Zone Policy http://europa.eu.int/comm/environment/iczm/home.htm
Project Safecoast (the Netherlands, Germany, Belgium, Denmark and the UK)
http://www.safecoast.org

EU Integrated Flood Risk Management
http://europa.eu.int/comm/environment/water/flood_risk/index.htm

EU Water Framework Directive (WFD) - Integrated river basin management for Europe
http://europa.eu.int/comm/environment/water/water-framework/index_en.html

European Environment Agency: Mapping the impacts of recent natural disasters and technological accidents in Europe
http://reports.eea.eu.int/environmental_issue_report_2004_35/en/accidents_032004.pdf

European Spatial Planning Adapting to Climate Events
http://www.espace-project.org

Finland's National Strategy for Adaptation to Climate Change
http://www.mmm.fi/sopeutumisstrategia/

Freude am Fluss Project
http://www.freudeamfluss.nl

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4 | Sanitation: a Challenge for the European Region

SUMMARY

Access to sanitation varies greatly within Europe, and the continent still fails to treat more than 50% of its urban water pollution despite the EU's Urban Waste Water Treatment Directive. Yet urban pollution control saves lives, protects ecosystems, delivers economic growth, creates jobs and reduces pollution-related costs—particularly in rural and coastal communities downstream from large urban centres.

When the effects of pollution on people and countries' natural heritage are taken into account, the costs of not treating pollution can be much higher than the costs of wastewater treatment. Plus, financing urban wastewater treatment has been shown to be economically feasible, if there is strong political commitment.

At the local level, public-awareness campaigns have helped to reduce pollution at source, and low-cost ecological sanitation (ecosan) technologies have proved successful in low-income areas that are not served by centralised sewerage systems. Such opportunities need to be expanded upon. And, if sanitation and wastewater systems are to contribute to improving environmental sustainability and human development inside and outside Europe, the whole of civil society needs to have a say in the decision-making involved and financial support needs to be increased.

Wastewater: a global challenge

The uncontrolled discharge of municipal wastewater (including industrial waste and polluted stormwater) affects many people's health and causes major economic losses. The practice damages water ecosystems and pollutes the oceans, which results in the contamination of water supplies and resources. This leads to the mass killing of fish and falls in tourism, and generates water- and food-borne diseases, resulting in further loss of income and increased health-care and drinking-water treatment costs.

Today, the world's water ecosystems have to cope with about 6.5 billion domestic polluters. Industrial pollution has also increased considerably, as has the amount of polluted urban stormwater. All this has resulted in unprecedented human-induced

pressure on water resources and the environment. In fact, 85% of the polluted urban wastewater currently produced is discharged without treatment. And, unless much greater attention is paid to this global challenge, the world will not achieve the Millennium Development Goals (MDGs), or more specifically MDG7: “ensure environmental sustainability”.

Lack of urban wastewater treatment widens the gap between the urban rich and rural poor

In 1950, less than 30% of the world’s population lived in urban environments. By March 2006, this figure will probably exceed 50%. And, between 1950 and 2005, the number of cities worldwide containing more than 10 million people increased by a factor of 30. Moreover, half of the global population now lives in coastal areas, where all untreated polluted water ultimately ends up. Lack of urban wastewater treatment therefore adds to the burden of the poorer rural, peri-urban and coastal populations who have to deal with polluted water.

In fact, domestic “greywater” contains most domestic chemicals and 60% of the organic matter produced by households. This, coupled with stormwaters and industrial discharges, directly threatens a large number of water supplies, notably those currently being developed to fulfil the world’s commitment to meet target 10 of MDG7: “halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation”. So, treating all urban water pollution would directly improve the sustainability of water ecosystems, fish stocks and existing drinking water supplies. In practice, developing new urban water supplies should be systematically associated with investments in comprehensive urban wastewater treatment. Importantly, this applies to the EU and the Eastern Europe, Caucasus and Central Asia (EECCA) region, as well as to the developing countries benefiting from EU overseas development assistance.

The EU’s urban wastewater treatment legislation—a breakthrough

An understanding of the benefits of treatment has resulted in the EU having what is probably now the most advanced legislation worldwide on wastewater. The 1991 performance-based "Urban Waste Water Treatment Directive”, decreed (1) that all settlements of more than 2000 inhabitants should have wastewater treatment systems in place, and (2) that, before 2005, all urban discharges into areas sensitive to eutrophication should have any nitrogen and phosphorous removed from them. It was estimated that this Directive would require around €200 billion to be invested in the 12 EU Member States.

Importantly, the Directive led national governments, local authorities and industries to place more emphasis on reducing pollution. It has also resulted in progress being made in sanitation technologies and practices, including the better integration of treatment plants into the environment, better control of rainwater pollution, and the improvement of existing networks and flood management.

Benefits can certainly outweigh costs

As a result of the Directive, from 1991 onward, the EU invested more capital in urban wastewater pollution control. Locally, this led to considerable benefits in terms of people's health, tourism and the recovery of water bodies. The major works undertaken also created employment, particularly in the services and companies that sprang up to operate the new infrastructure. In fact, the wastewater sector now provides about 6 to 8 permanent jobs for every 10 000 people served.

Crucially, the investments made did not exceed 1% of the total amount of capital investments made by the EU (i.e. about 0.15% of the EU's GDP). Putting this in perspective, capital investments in the tourism sector were three times higher over the same period. Moreover, health spending accounted for about 14% of EU GDP, while, by contrast, sanitation expenses (including capital investments) represented less than 0.5% of EU GDP. So, financing urban wastewater treatment is economically feasible, though it would call for strong political commitment.

In fact, recent global cost–benefit analyses of the sanitation sector[3] have concluded that the capital investments made would deliver benefits worth between 4 and 11 times the investment and operating costs incurred, depending on the system targeted and the local constraints. And, according to a recent study of French coastal resorts, it was estimated that gains of about €1 billion in tourism would repay, within two years, the investment needed to meet future EU bathing-water standards. This illustrates that when the effects of pollution on people and natural resources are taken into account, the costs of not treating pollution are actually much higher than the costs of wastewater treatment.

And, ways forward do exist. Multi-stakeholder governance and public participation at basin level, for example, allow for efficient dialogue and mediation between rural and urban dwellers, rich and poor users, and upstream polluters and those affected downstream. Over the last 30 years for instance, this approach, coupled with a polluter-pays policy, has been used to increase the number of fish species permanently settled in the River Seine in Paris from 3 to 28. Prevention at source and

[3] By the World Health Organisation (2004) and the Commission for Sustainable Development (2005).

awareness-raising campaigns have also been used to slash the cadmium content of Paris sewerage to one-tenth of previous levels—greatly improving the Seine estuary's shellfish economy. Plus, the investments needed never exceeded 0.15% of the Seine watershed's GDP. What is more, the cost of water supply and wastewater treatment in all of France represents less than 0.7% of the country's GDP.

Wastewater treatment in Europe needs to be given greater priority

Paradoxically, most European politicians and decision-makers seem to ignore the benefits derived from capital investments in wastewater treatment, which they generally consider too expensive or otherwise undesirable (the "not in my backyard" attitude). So, despite the Urban Waste Water Treatment Directive, Europe still fails to treat more than 50% of its urban water pollution. And, while investments in urban wastewater works did actually amount to the €200 billion anticipated for the Directive, a significant part of this was spent on rehabilitating or improving existing infrastructure. In 2002, with Europe containing 25 Member States, it was estimated that another €200 billion will be needed to achieve the full treatment of Europe's urban water pollution.

In September 2000, the European Council adopted the **EU Water Framework Directive (200/60/EC).** This regulation covers all previous water directives including that on urban wastewater treatment, and sets a new environmental target: ensuring the "good ecological status of water bodies" (including groundwater). Member States must assess and define what this "good status" should be, and must implement the Directive by 2015. Public participation, polluter-pays and economic valuation of water ecosystems are the recommended tools.

However, initial evaluations of Europe's main water bodies show that most are seriously damaged. Consequently, many Member States doubt that they will be able to meet the Directive's requirements—as this would require further increases in water tariffs and/or more public funding for wastewater investments. What this means is that, except in a few severely polluted regions, most European citizens, politicians and the media, do not seem to perceive the serious consequences of continuing with the present "business-as-usual" scenario.

Plus, it has to be recognized that some large cities in the European Union, and the majority of cities in the EECCA region, still lack any wastewater-treatment plants. Action must be taken to address the fact that lack of wastewater treatment and sanitation in upstream urban and rural settlements creates costs and causes poverty downstream.

The need for additional support for low-income countries in the European region

Conventional wastewater treatment involves considerable investment and maintenance costs. About 80% of the total spent on wastewater management is spent on the collection and transportation of wastewater (sewerage), while wastewater treatment actually only accounts for about 20% of the total spent. Additional costs are also incurred in maintaining sewer pipes. Such maintenance is needed to prevent the infiltration of rainwater or groundwater (which increases the amount of wastewater that has to be treated) or leakage (which pollutes the soil and groundwater). So, sustainable financial mechanisms are needed to pay both for the initial investment and the maintenance costs that will follow.

The OECD estimates that improving and maintaining the existing urban drinking-water supply and sanitation systems in Georgia (Caucasus) would require 3-5% of public expenditure budgets, if user charges were increased to the "affordability limit"[4]. This amount does not include the costs of urban wastewater treatment or of supplying water to the 50% of the population that lives in the country's rural areas.

To attain these goals, it is not unrealistic to assume that Georgia may have to spend as much as 10% of its state budget on water and sanitation. Of course this is not possible. So, in the case of Georgia, low-cost technologies such as decentralized wastewater treatment and sanitation are required, particularly for rural areas. A considerable share of the initial development costs would also have to be met by external development aid. For an overview of estimated costs of water supply and sanitation for EECCA countries see the OECD publication "Meeting the Millennium Development Goal Drinking Water and Sanitation Target in the EECCA region, a goal within reach?", available at www.oecd.org/document/33/0,2340,en_2649_34291_35221537_1_1_1_1,00.html

Affordable sanitation: financing mechanisms that do not burden the poorest

For the poorest regions in Europe, we have to ask (1) how can we finance access to safe and affordable sanitation and wastewater treatment for rural areas? And, (2) how can we reduce the cost of sanitation and wastewater treatment for rural areas?

[4] The "affordability limit" in this case assumes that no one would pay more than 2.5% of their income, apart from the poorest 5% of the population for whom an assistance scheme would need to be put in place. This limit is deliberately low, since about half Georgia's population lives below the national poverty line. The figure also takes into account a widespread culture of non-payment, which involves about 70% of households.

With real income levels in some rural EECCA regions as low as US$15 per month, it is essential that financial solidarity mechanisms are put in place to ensure that wastewater systems do not further burden the poorest. In most developed countries, these mechanisms ensure that low-income families either receive financial support or pay lower-than-market rates for the first cubic meters of wastewater. For more information see Chapter 6 on solidarity.

When developing tariff systems, it will be essential to involve stakeholders. It must also be remembered that general statistics don't give a true picture of the real impact that tariff increases will have on a population. For example, the average income for citizens in Armenia's capital city is about US$75 per month. However, a great number of families on the outskirts of the city and in surrounding villages actually live on less than US$15 per month. Female-headed households in particular are often among the poorest, and cannot be expected to pay US$1–2 per cubic meter of wastewater (a common rate in most EU countries). It will therefore be essential to involve the private sector in any debate on tariff-setting. This is particularly true of international companies, which can share their knowledge of the best practices from other regions.

In most Eastern European countries the public sector has been restructured, and decentralisation and privatisation have been important features of this. The privatisation of public utilities in particular has witnessed a growing number of Western European and US companies buying into the utilities market. As a result, western models have been used when restructuring of many parts of the economy. Unfortunately, this has often been done without taking into account the situation on the ground—resulting in citizens being unhappy with increased tariffs which haven't actually improved service quality or availability. Addressing this means ensuring better public participation and providing more support to local public water authorities.

Reducing costs: decentralized sanitation systems for semi-urban and rural areas

Decentralised sanitation systems provide various benefits. For example, the sewer systems used can be less extensive than those of centralized systems, so lowering the investment and operation costs of the whole system. They can also be established in steps, one unit after the other, according to available funds and the changing needs of settlements and villages.

Conventional decentralized wastewater systems such as pit-toilets and septic tanks are already widely used worldwide, particularly in rural and peri-urban areas. However, these systems are designed to be emptied by tankers, which pump the settled sludge/wastewater and then transport it to central wastewater treatment plants.

This is expensive, and in many regions no regular tanker service is available—which would result in overflow or leakage and the pollution of groundwater with harmful pathogens. For both these reasons these conventional systems are inappropriate for low-income regions such as those in EECCA.

Using decentralized sanitation systems like this dry urine-diverting 'ecosan' toilet in the Ukraine can provide low-cost options for preventing disease and improving people's quality of life in rural areas. By-products can even be used as fertilizers, so improving people's incomes.

In fact, in both the US and the European Union, pollution from decentralized wastewater systems at the household level causes problems, especially in rural and suburban areas. The EU Commission therefore recommends the use of extensive decentralized wastewater-treatment systems for small communities (500 to 5000 inhabitants). These are easy to operate and maintain (see http://www.wecf.de/cms/articles/2005/11/eu_pubs_copy.php).

Ecological sanitation is a recently developed approach which is based on the use of decentralized systems, and the separation at source and appropriate reuse of the

different waste materials. Typically, in the case of household wastewater, most of the soluble nutrients are carried in urine. Greywater actually contains only small amounts of nutrients, even though a much larger volume is produced in comparison to urine. Finally faeces, the volumes of which are about 10 times smaller than those of urine, contain nutrients, a high organic load and the largest amount of pathogens.

Ecological sanitation therefore seeks to separate the three different types of wastes, and treat them as close to the source as possible. Urine can be collected separately in specially designed toilets. Because it naturally contains few pathogens, it can then be reused as a restricted fertiliser after it has been stored for a few months. Faeces are treated, according to local needs, by composting, vermicomposting, desiccation or burning. Finally, the greywater produced by several households or even entire villages can be treated in specially constructed wetlands, soil-filters or lagoons. Or, if space is in short supply, membrane bio-reactors can be used.

Extra benefits of ecological sanitation: avoiding pollution and loss of nutrients

Using centralized sewage systems means that the nutrients contained in wastewater are lost when, potentially, they could be used productively in agriculture. Even the best biological treatment plants discharge about 10% of the nitrogen they receive into aquatic environments, as well as more than 5% of the phosphorus and more than 90% of the potassium. This also causes environmental problems.

Plus, while those nutrients that are not released into the aquatic environment are partly captured in the sewage sludge, this often can’t be used for agriculture because it is contaminated with heavy metals and organic compounds such as polychlorinated biphenyls. Large amounts of sewage sludge are therefore disposed of in landfills or incinerated—wasting the nutrients and creating additional costs. Other pollutants (like pharmaceuticals and artificial hormones) are mostly not removed by the wastewater treatment processes. They are also therefore discharged into the receiving waters, where they can result in sterility of aquatic life and where they pose a real threat to people by entering drinking-water sources. All these problems are largely overcome by ecological sanitation.

Cooperation beyond Europe

Providing access to sanitation is a challenge worldwide. Many countries have programmes which aim to increase access to sanitation and the coverage of urban wastewater treatment. And, Europe realises that it can both offer its expertise to

countries outside its borders and learn from them. Examples of such exchanges are offered by the co-operation that is emerging in the fields of ecological sanitation and decentralized wastewater systems (see the case studies below). Plus, European water utilities have also developed funding mechanisms to support and invest in projects in low-income countries—through, for example, the new French law which allows local water agencies to contribute to overseas development.

Notable also are the EU Water Initiative (EUWI) and the EU Water Facility (EUWF): a water partnership programme and a water fund developed to support co-operation between Europe and developing countries and countries in transition. Finally, the EcoSanRes network has been formed by financial, scientific and civil society organisations, all of whom are working together on decentralized ecological sanitation and wastewater systems projects worldwide. In fact, the EU already devotes about 45% of its total overseas development assistance to water supply and sanitation, and various Member States are committed to doubling their bilateral water-supply and sanitation assistance by 2009 in order to implement MDG7/10.

Policy and strategy responses: Europe and EECCA

Steps forward have also been made in the arenas of policy and strategy. In December 2005, for example, the World Health Organisation updated its guidelines for the safe use of wastewater, excreta and greywater. These guidelines provide useful data and information on the best practices for governments, and consider how to develop legislation that will allow the wider use of decentralized low-cost sanitation systems (see http://www.who.int/water_sanitation_health/wastewater/gsuww/en/index.html).

The 1992 Helsinki “Convention on the Protection and Use of Transboundary Watercourses and International Lakes” is also important, particularly for the EECCA region. It aims to strengthen national measures for the protection and ecologically sound management of transboundary surface waters and groundwater. And, to this end, it obliges Parties to prevent, control and reduce water pollution from point and non-point sources (see http://www.unece.org/env/water/).

Last but not least, we must mention the EECCA Environmental Strategy Process, which focuses on the issue of financing water and sanitation. This brings key insights and makes important recommendations for the EECCA region (http://www.oecd.org).

Case studies: local initiatives and projects

The case studies presented here focus on some experiences gained with new decentralized technologies and participatory processes.

Innovative ecological sanitation in Sweden's Greater Stockholm Area

The "Gerbers" collective housing project is located near Stockholm, on a 3.2-ha site on a lake near a nature reserve. About 80 people live in Gerbers, and in each apartment, the collective housing organisation EKBO has installed a urine-diverting system which uses only 0.1 litres of water per flush. Faeces are collected by gravity, falling into 140-litre plastic bins in the cellar. These are kept under negative pressure by a ventilation system which removes all odours, and are emptied approximately twice a year (by the respective apartment's owner) into a composting site 200 metres from the building. The urine tank is emptied 2-3 times a year, when the urine is transported to a farm and used as a fertilizer after it has been stored for 6 months for the purposes of sanitization. Each toilet cost US$300, and urine collection costs US$500 per apartment.

Overseas visitors examining the buried urine tank in front of a house with ecosan toilets (Greater Stockholm area, Sweden)

For more information see www.ekbo.se, www.wost-man-ecology.se, and

Eco-toilets for low-income rural areas, Romania

In rural Romania, 80% of the population is not connected to a central water supply. Most people get their drinking water from shallow, private wells, which can easily become contaminated with agricultural chemicals or with the bacteria in faeces which leaks from nearby pit-latrines.

The NGOs WECF and Medium & Sanitas, in co-operation with the University of Technology Hamburg (TUHH), selected the village of Garla Mare (south-west Romania) as the location for a pilot project to address these issues. The village was chosen based on the high levels of pollution found in drinking-water wells, some of which contained more than 500 mg of nitrate per litre, while others contained up to 240 000 faeces-borne coliform bacteria per 100 ml.

The village, which has around 3000 residents, is poor and has a very high level of unemployment. Most people cannot afford chemical fertilisers, and there is no central water supply or sewage system. Instead, drinking water is supplied by 15- to 25-m deep wells. Ninety-five percent of the villagers have a pit latrine in their yard, and these are usually unsealed and never emptied.

The project was implemented at a local primary school which has approximately 200 pupils (aged 6-10 years), and no hand-washing facilities nor any access to safe drinking water. The schoolyard contained an old unused well. The school's pit latrines, which smelled badly, were located approximately 15 m from this.

The project therefore installed four double-vault urine-diverting toilets, three waterless urinals and constructed a small wetland. In all, the toilet facility cost around €6300. Three handbasins were also installed and towels and soap were supplied—wastewater from this was fed into a gravel–sand bed. In addition, workshops and easy-to-understand posters were used to educate children and teachers in the use of the facilities.

The project shows how sanitation in rural areas with no connection to sewerage systems or a central water supply can be improved for considerably less than installing centralised wastewater treatment facilities.

For more information contact Margriet Samwel, Women in Europe for a Common Future (margriet.samwel@wecf.org) and Claudia Wendland, University of Technology Hamburg (c.wendland@tuhh.de). See also www.tu-harburg.de/aww/english/index

China–Sweden Erdos Eco-Town Project, Inner Mongolia

In collaboration with the Sida-funded EcoSanRes Programme, the City of Dong Sheng in the Erdos Municipal District, Inner Mongolia, China, is working to show that it is possible to build and operate an urban centre using sustainable approaches to sanitation, water use, and solid-waste disposal. A new town of one- to five-storey buildings (including shopping facilities) is being built, in what is the first major attempt to build an entire town along these principles. The town will accommodate 7000 people, and the first 700 apartments have already been sold. The project makes use of urine-diversion, dry collection toilets, greywater recycling and solid-waste sorting and collection, and will be completed by 2007. Benefits include on-site treatment of greywater, solid-waste recycling, and appropriate management structures to support the processes.

New apartment buildings in Inner Mongolia. These form a small part of the first attempt to build an entire town reliant on sustainable eco-sanitation. The depression in the foreground is the new town's holding pond—part of its sanitation system.

For more information contact Arno Rosemarin, EcoSanRes (arno.rosemarin@sei.se). See also www.ecosanres.org/

Ukraine ecological sanitation projects: cooperation with Germany, the Netherlands and France

With support from Women in Europe for a Common Future (WECF), the University of Technology Hamburg (TUHH) and the French Fondation Ensemble, MAMA-86 is providing ecological sanitation toilets to schools and households in Ukraine.

The first school toilet block was built in the village of Gozhuli, providing six toilets and urinals for 250 children. The lessons learned from this pilot project were then applied when installing ecological sanitation toilets in a school in the village of Bobryk.

At both locations, the new toilets provide considerable advantages over the pit latrines formerly used–not least because the children no longer have to go outside during extremely cold winter weather. The fact that the toilets are within the schools also means that the girls using them now suffer less harassment. MAMA-86 has already prepared designs for a toilet block for Stefanovska village school, which will provide toilet facilities for 300 children. Several toilets will also be installed in individual households in Stefanovska, based on experience gained from the installation of two ecological toilets in households in the village of Vorothka.

All these projects are managed by local women's organisations which are part of the MAMA-86 network of 17 groups across the country. Local people's involvement, education and capacity building are key aspects of these sanitation pilot projects, as is cooperation with local business and local authorities. The first projects have already led to a great demand from school directors. However, the lack of legislation on ecological sanitation in the Ukraine does represent an obstacle to upscaling.

For more information contact Anna Tsvetkova, MAMA-86 Ukraine, (atsvet@mama-86.kiev.ua). See also http://www.mama-86.org.ua/main/news_e.htm.

Children at a school in the Ukraine inspecting their newly installed ecological sanitation toilets. Previously, pit latrines were the only option available to these children.

Conclusions and lessons learned

- Urban wastewater pollution is a growing threat to sustainable development and achievement of the Millennium Development Goals (MDGs), as 85% of the world's urban pollution is discharged without treatment. Strengthening urban pollution control will directly improve environmental sustainability (MDG7) and human development.

- Europe does not treat more than 50% of the urban pollution it produces. Efforts are therefore needed to ensure the ecological health of European water bodies is sustained.

- Investments in water supplies should be systematically linked to wastewater-treatment investments.

- Urban pollution control saves lives, protects ecosystems, delivers economic growth, creates jobs and reduces costs, particularly in the case of rural or coastal dwellers living downstream from large urban centres.

- When the effects of pollution on people and countries' natural heritage are taken into account, the costs of not treating pollution can be much higher than the costs of wastewater treatment.

- Financing urban wastewater treatment is economically feasible, but calls for strong political commitment. National and international financial support must be increased to allow less-developed regions to address pollution-control challenges. The overseas development assistance dedicated to urban wastewater control should be increased, particularly in the case of EECCA and ACP countries.

- Since 1991, the EU has increased the amount of funding dedicated to urban wastewater pollution controls that benefit people's health, tourism and the recovery of water bodies. Though these investments do not exceed 1% of the total amount of capital invested by the EU, they are generally considered to be too expensive, as most European decision-makers and voters seem to ignore the benefits they bring.

- Locally produced, decentralized sanitation or prevention-at-source systems (e.g. ecological toilets and soil-filters) can contribute to economic development and reduce the amounts that need to be invested to introduce and maintain sanitation systems.

- Multi-stakeholder governance and public participation at the basin level allow for efficient dialogues and mediation between all stakeholders.

- For progress to be made, civil society (including women and minority groups) must be included in decision-making concerning sanitation and wastewater systems.

- At the local level, public-awareness campaigns have helped to reduce pollution at source, so resulting in reduced treatment costs, the recovery of natural heritages, and social acceptance of sustainable wastewater tariffs. These campaigns therefore need to be extended.

- Financial solidarity pays over time: once all water polluters contribute to the full costs of controlling pollution, equitable wastewater tariffs end up covering most capital investment needed. The development of a fair tariff structure should involve all stakeholders and should allow both cost recovery and the cross-subsidizing of the poorest populations.

Information sources

EcoSanRes (ecological sanitation research): an international environment and development programme on ecological sanitation comprising a network of 20 organisations.
http://www.ecosanres.org/

Women in Europe for a Common Future (WECF): a network of 70 citizens' organisations in 30 European countries implementing local sanitation solutions.
http://www.wecf.org

International Water Association (IWA) Specialist group on 'Ecological Sanitation'
This group focuses on sanitation systems permitting nutrient reuse, mainly by source separation.
http://www.tu-harburg.de/susan/

Organisation for Economic Cooperation and Development (OECD), "Meeting the Millennium Development Goal Drinking Water and Sanitation Target in the EECCA region, a goal within reach?"
http://www.oecd.org/document/33/0,2340,en_2649_34291_35221537_1_1_1_1,00.html

World Health Organisation (WHO) - Guidelines for the safe use of wastewater, excreta and greywater http://www.who.int/water_sanitation_health/wastewater/en/

EU Water Initiative (EUWI): a partnership programme for support and financing of cooperation projects between the European Union and partners in the rest of the world.
http://www.euwi.net

Dry Toilet Club, Finland
http://www.drytoilet.org/dt06.html

Water Supply and Sanitation Collaborative Council
http://www.wsscc.org

Women for Water, Water for Women: global network of women's organisations working on water and sanitation
www.wfwfw.org

GTZ German Development Cooperation, office for ecological sanitation
http://www.gtz.de/en/themen/umwelt-infrastruktur/wasser/8524.htm

WASTE, Advisors on Urban Environment and Development, Netherlands
http://www.ecosan.nl/

Toillettes du Monde, Ecological Sanitation and Solidarity, France
http://www.tdm.asso.fr/

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5 | Innovative Technologies and their Implementation at the Local Level

SUMMARY

Innovative technology is needed to respond to four major challenges faced by Europe: increasing water scarcity, urbanization, extreme climatic events, and the need to develop rural areas. Meeting these challenges will require appropriate integrated solutions that use a systems approach, as well as real-time monitoring systems, models and management tools. So, future R&D efforts will focus on developing these, as well as advanced treatment technologies, and technologies to produce energy and products from wastewater. Advances in water-saving technology, pollution control at source, asset management, and risk assessment and management tools are also priorities.

Advances will also require multi-stakeholder collaborations, as these rapidly develop solutions, reduce risks and result in market-ready technologies that satisfy customer demands. Examples abound of recent—very successful—technology-development collaborations between the public and private sector. Schemes like the European Water Supply and Sanitation Technology Platform (WSSTP) have also brought together a range of collaborators—from regulators and research institutes, to funders, businesses, and national-government and international institutions.

Experience has shown that the most effective schemes are those with the widest level of stakeholder support, strong institutional leadership, clear ownership, and effective financing mechanisms. However, challenges still remain—in terms of bringing together partners from different organisations, financing new systems, and promoting the uptake of new technologies.

Introduction

This chapter addresses the specific challenges associated with innovative technologies and their implementation at the local level. It draws on case studies of innovative technologies that have been selected because of their relevance to other countries and regions and their potential to benefit them.

Europe's main technology-related challenges

Over the last 18 months, the European Water Supply and Sanitation Technology Platform (WSSTP) has examined the challenges associated with innovative technology. This platform is one of the most extensive consultations on water research needs ever undertaken in Europe, and involves industry, governments, consumers and specialist research organisations.

The remit of the WSSTP and its various stakeholders is to improve the competitiveness of the water sector (as per the so-called "Lisbon objectives" defined by the European Union) and contribute to the Millennium Development Goals. So far the WSSTP has produced a "Vision to 2030", which has been broken down into shorter deadlines for the most urgent goals, and a "Strategic Research Agenda", for which work on an Implementation Plan is on-going.

The following four water-related challenges, some of which are technological and some more organisational, have been identified by WSSTP:

1. Increasing water stress—which arises from excessive quantitative or qualitative demands on scarce water resources.

2. Urbanization—which creates acute conflicts between water users. This problem is increasing due to population and migration trends. Systemic solutions are needed to redress complex problems using both institutional and technological innovations.

3. Extreme events—the frequency and severity of which are linked to climate change. In addition, pressure for action has increased because of greater public awareness of the toll taken on vulnerable people outside Europe.

4. The needs of rural and underdeveloped areas—which are affected by the unfavourable conditions occurring there.

Appropriate integrated solutions that make use of innovative technology are essential if we are to address these escalating challenges, which have so far proved intractable due to their complex nature. Specific solutions (which will be incorporated into the Implementation Plan) fall under the following six categories:

- Integrated Water Resource management (IWRM)
- Better management of demand and supply
- Improvement of water quality and security
- Reduction of negative environmental impacts

- Development of novel approaches to the design, construction and operation of water infrastructure assets
- Establishment of an enabling framework.

Use of innovative technology is a key aspect of the solutions developed under each category. It will contribute to:

- Monitoring, and the use of advanced sensor and communication technology—examples of such include on-line monitoring techniques for trace pollutants and micro-organisms, early-warning systems, and modelling and simulation techniques

- The development of advanced treatment technologies, for removing targeted compounds and micro-organisms from all types of water

- The development of technologies to produce energy and fit-for-market products from wastewater, water saving, closed loops and less-polluting appliances and practices.

The development of innovative technology to clean up water-based effluents from industry is currently an important priority in Europe. Photo credit: Hulshof Royal Dutch Tanneries.

What could Europe's experience offer other regions?

Europe has had to develop solutions in the unusual context of its fragmented national and regional institutions. It differs from other developed regions insofar as it is a smaller territory which is composed of 25 Member States that are characterized by their dense and highly urbanized populations, and which have a long industrial and agricultural heritage. Compared to other regions of the world, Europe is largely spared water-related humanitarian crises or catastrophes. But, its historical links to non-European regions are strong. Such links remain visible in the form of companies (both European and global) which impart their industrial innovation and know-how, as well as in the role played by European bi-lateral and global multilateral programmes, and in the work of non-governmental organisations.

Within Europe, the main water needs are similar to those of other advanced industrial societies such as the US. That is, the region needs to modernise infrastructure, remediate damaged environments (especially soils and areas containing waste) and respond to the major pressures created by trends in household numbers and population growth, urbanisation, migration and transport. In fact, water demand is growing and new solutions are needed to cope with trends in consumer society, and agricultural and industrial development. In Europe, enlargement has added an extra 100 million citizens, most of whom live in countries which have problematic industrial legacies and less modern infrastructure.

However, a great deal of expertise has been developed both in Europe and in other regions of the world. And, though it is academic to distinguish between European and non-European expertise, Europe is defined by the combination of technical know-how and knowledge available regarding the development of effective institutions and instruments for implementation. Indeed, Europe has been compelled to innovate with regard to both technology and implementation—which makes use of institutional frameworks that include legislation, standards and effective regulation.

Today's Europe contains diverse sources of innovation—from private-sector firms to public or quasi-public institutes. And, innovation is being scaled up to address more universal needs and meet more global demands, because frontiers have been crossed to reach the critical market sizes required for the inception, optimal development and implementation of innovative technologies. Because of this, European collaboration has long been recognized as effective in terms of its research capacity, the finance available and market deployment.

Other central issues that need to be considered when considering innovative technology are:

- The information available and the take-up of technological solutions—this would include both their dissemination and their migration from a particular niche into the mainstream
- The fact that knowledge, skills, training, etc. may be scattered across sectors and countries
- The need to make progress on a legislative framework for operators and suppliers, as this will harmonise procedures, standards, systems, and reduce obstacles to trade (as occurs in certification for example)
- The need to implement environmental legislation and undertake monitoring to ensure its proper implementation
- The issue of procurement, both public and private
- The issue of finance and the funding mechanisms available.

Addressing the need for innovative technology: why is it important for Europe's future?

Innovative technology is essential for competitiveness and sustainable economic activity. It is also necessary if we are to resist trends in water scarcity and quality, remediate parts of the environment, and enable human expansion without further environmental deterioration. Innovation is also the source of employment and wealth.

However, innovative technology requires an appropriate context—one which rewards the source of innovation and ensures that the gains made as a result of it benefit the innovating actors. However, encouraging innovation, through patent protection and sanctions for counterfeiting, for example, may conflict with another fundamental condition for successful innovation: dissemination. Thus, in the context of development goals, the issue becomes even more complex.

There is obvious tension between efforts to improve competitiveness and the willingness of Europe and other world regions to address the most urgent and humanitarian water issues of the Millennium Development Goals (MDGs). No-one is pretending that the increases in trade and exports that will result from innovation will lead directly to the achievement of the MDGs; however, it should be remembered that these increases are the catalysts for medium- to long-term development. In addition, the relevance of European solutions to other regions must be assessed in the light of each technology and the specific issue addressed.

In Europe, innovative technology is crucial for the future. It needs to be managed in a way that sustains European competitiveness, employment and other fundamental values, such as quality of life and health. In fact, innovative technology fundamentally

defines quality of life in industrial society, and is already playing a major role in this sense in developing societies.

Actions addressing the need for innovation: what's worked and what hasn't and why?

Traditionally, innovation and research in Europe has been tackled at a national level, using publicly funded initiatives that have rarely been coordinated with private and industrial innovation and research. However, steps are being taken in the right direction. Today numerous national, regional and local government initiatives are in progress, as are a growing number of European-funded projects.

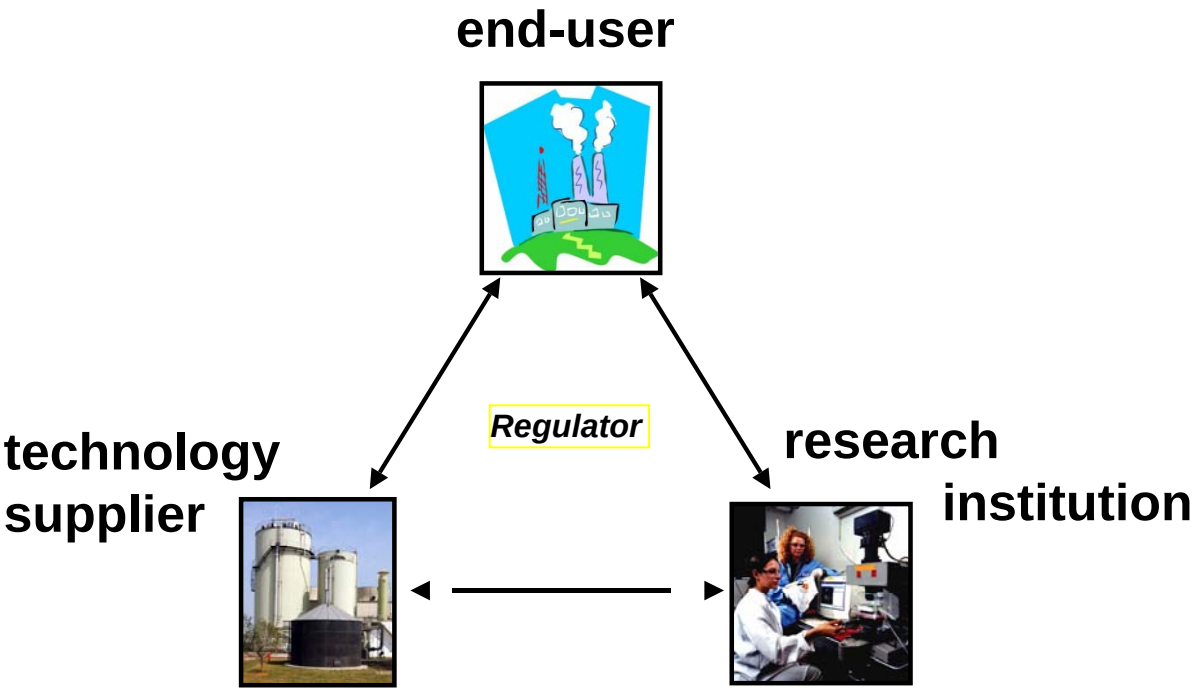
In this respect, it should be recognized that approaches to innovation and technology research are bound to cover a wide range of long-term, short-term and more or less intense uses of resources. Increasingly, it is being recognized that the most effective schemes are those with the widest level of stakeholder support, strong institutional leadership, clear ownership, adapted technological solutions and effective financing mechanisms.

The WSSTP is a good example of different public and private sector parties collaborating to achieve a defined objective: the identification of the key challenges that will face the water sector up to the year 2030 and the formulation of a research agenda that will address them.

The range of parties involved is extremely broad—from regulatory institutions and research institutes, to funding organisations, private companies, publicly funded institutes, and national government and international institutions. In terms of its organization, the WSSTP is divided into thematic working groups which focus their expertise on addressing a specific topic, though the diversity of parties involved is still largely preserved within each working group.

Importantly, the platform is unique in that it meets the needs of interested water-sector parties at a number of different levels: (1) the policy making (regulatory and government) level, (2) the market and industry level and (3) the technical (research) level.

The innovative environment



The European Water Supply and Sanitation Technology Platform (WSSTP) brought together representatives from the industrial and marketing sectors, research institutes, regulatory agencies and government departments. The platform has created fertile ground for collaboration to develop new technologies. Source: WSSTP.

The platform provides a focal point for dialogue and acts as a catalyst for exchanges between entities that have, until now, mostly operated independently. It also serves as a source of information and as a potential showcase (when case studies are developed under the Implementation Plan) for European technology. It therefore constitutes a powerful lever for the export of European technology.

Funded by the European Commission, the WSSTP was originally set up to develop a Strategic Research Agenda for the EU's Seventh Framework Programme for research and development ('FP7'). But, while the platform is dedicated to this, it is focussed to evolve into a structural Water Technology Platform. For this and other initiatives the European water sector could consider the foundation of a European Water Partnership.

The most promising tools and solutions available: their limitations and the regions that might benefit

The most promising tools and solutions available are those which focus on systems solutions that are cost-effective and rapidly taken up, and that exploit proven technologies. In this regard, the conclusions drawn by the WSSTP have recurring themes, such as the need to use systems approaches coupled with innovative technologies—including real-time monitoring systems, real-time models, and management tools that reflect the whole water cycle. Key European initiatives in this direction include the Water Information System for Europe (WISE), which was developed under the Water Framework Directive.

Such a broad approach is needed because the thrust of European policy is based on the water cycle and the management of river basins. This focus defines policy making and regulation in many areas—from the agro-environment and regional spatial planning to waste management, soil protection, and urban and civil protection and security.

System solutions emphasize the following:

- **Integrated and transparent management of water resources and the balancing of demand and supply**. This requires reductions in water usage, the re-use of water, closed loops, and the exploitation of alternative water sources such as brackish groundwater, seawater and treated wastewater.

- **The adaptation of water quality to suit its purpose**, be it human consumption, leisure activities, or industry and agriculture. The innovative technologies used here include advanced ground-based and remote sensing, sensors for key parameters (trace pollutants and micro-organisms) and interactive systems to manage processes.

- **The ability to meet the water quality demands set by individual processes,** through the use of modelling, simulation, and predictive and process-control tools, and the selection of appropriate technologies. Examples of available technologies include surface spreading of water (artificial recharge using basins), injection, induced recharge (river bank filtration), and aquifer storage and recovery (ASR).

- **The use of novel methods in the design and operation of water infrastructure**. This entails the use of small-scale, decentralised systems, which incorporate technology to locate and eliminate leakages. Examples of

such include non-disruptive methods of installing and replacing assets and intelligent pipes with pollutant sensors.

- **The reduction of water-based emissions from agriculture, industry and downstream treatment plants**, which would include capitalising on wastewater and using sludge as a source of energy.

- **The use of less-polluting appliances and practices**, which control pollution at its source.

More details on the WSSTP Strategic Research Agenda are available at http://www.wsstp.org.

The innovative technology required to deliver the necessary solutions is categorised according to medium-term (5-10 years), and long-term (10-20 years) timescales. Medium-term solutions include processes that deal with natural organic matter, and techniques such as membrane-based pre-treatment of wastewater and nano-filtration and reverse osmosis for the purposes of treatment/disposal.

Technologies with longer term development horizons include:

- High-performance biological degradation and fixation processes. These use genetically modified micro-organisms, and lead to better degradation of priority compounds and better sorption of persistent pollutants.

- New integrated membrane systems, featuring catalytic and fouling-resistant membranes, as well as inorganic membranes compatible with oxidising agents.

- Engineered biological membranes, which use synthetic carrier materials and feature very high hydrophilicity, water fluxes, fouling resistance and selectivity for different chemical and microbial contaminants.

The solutions being developed are universally applicable and relevant to most regions. However their complexity, in terms of both conception and implementation, might render them unsuitable for societies with weaker administrative capacities or poor levels of governance, such as many developing countries.

Moreover, major institutional and organisational challenges exist with regard to the system-wide coordination and organisation of participants from different professions and institutions, as well as with regard to financing the new systems and replacing traditional methods with the new alternatives.

Summary: Overarching R&D priorities

- Integrated solutions
- Monitoring, sensor and communication technology
- Advanced treatment technology
- Technologies to produce energy and products from wastewater
- Water saving technology and pollution control at source
- Asset management
- Risk assessment & management tools
- Generating an enabling framework

Innovative technologies and their implementation at the local level: what are the knowledge gaps?

Managing knowledge in the context of innovation is a formidable challenge worldwide. In Europe, fragmentation of knowledge and duplication of efforts are problems which have worsened as a result of both language and national barriers. Resistance to innovative solutions also plays a part in the difficulties faced. Information about new solutions needs to be disseminated and proactive campaigns need to be run, in order to (1) market new solutions and accelerate the adoption of new technologies or methods, and (2) reduce the opportunity cost of retaining old solutions.

Resolving the impasse on innovation: who needs to do what

Business and industry have a much longer tradition of innovation than the public sector. Recently, however, different players (ranging from large system integrators, to small innovative firms, research institutes, universities, governments, and financiers) have merged their innovation efforts. Innovation prospers from integrating multi-disciplinary skills and from drawing on different research ideas, and there may be conditions where global links are more appropriate than European partnerships.

Case studies and local initiatives

Treating tannery wastewater

A good example of stakeholders pooling their resources is offered by the case of a number of different partners in the Netherlands working together to deal with the waste produced by tanneries. This resulted in technologies for the anaerobic treatment of tannery waste ('BIOPAQ'), a technology for the biological removal of sulphides and heavy metals ('THIOPAQ') and a new process for the energy-efficient removal of nitrogen ('ANAMMOX'). The remarkable results produced by this practical project are now rapidly yielding benefits.

This approach to technology development contrasts with conventional approaches, which typically involve a linear process of research. This usually includes developing a small-scale demonstration facility and gathering test results, followed by the marketing of the technological solutions, and so on.

In this example, the early integration of such stakeholders as the local water authority, the technology suppliers, the main operators, and the client/technology users eliminated many obstacles and resulted in a successful technology product. The main benefits of the approach are:

- Economical project development coupled with the development of real applications as a result of deploying technological solutions and expertise.
- The integration of customer needs from the start of the project, which helps to ensure that the solutions developed are market-oriented and commercially attractive. Specifically, the solution developed won't fail because the technology produced is unsuitable or because there is a weak commercial response.
- Compliance with regulations, as a result of the participation of the water authority.

The case study demonstrates a number of key benefits and useful lessons which could be applied in other domains. Specific benefits include:

- Speed—the rapid development of solutions by-passed traditional R&D routes
- Coherency—via a holistic and life-cycle oriented approach to a specific issue
- Market readiness and a low risk of market rejection
- The focused application of the technology—by confronting a specific challenge
- Stakeholder consensus—as a result of the stakeholders cooperating to achieve a common goal
- Risk and technology ownership—partners contribute equally but the ownership of the intellectual property generated is agreed from the start.

For more information contact Tom Vereijken, Paques B.V. Balk (t.vereijken@eucetsa.com) or Eef Leeuw, Waterstromen (e.leeuw@waterstromen.nl).

In the Netherlands, collaboration between water services, local industry, and a technology development company has resulted in the development and use of new effluent treatment methods based on biotechnology. Photo credit: Hulshof Royal Dutch Tanneries.

Multi-stakeholder cooperation: the Lettinga Associates Foundation

The Lettinga Associates Foundation, based in the Netherlands, is renowned for its work on granular anaerobic technology. The Foundation is a good example of the fact that real breakthroughs in the development of technologies are made when different partners work together to find applied technology solutions.

In the 1980s, the anaerobic treatment of industrial wastewater was mainly limited to applied and fundamental research. Dr G. Lettinga, eight consultants, and two companies decided to pool their expertise and finances in a broad cooperative effort. Although this did boost the application of anaerobic technology in the nineties, cooperation was limited mainly due to competition.

Ultimately, therefore, the three biggest stakeholders and the University broke with convention and formed the Foundation. The approach taken was based on non-competitive research, and helped to create an awareness of anaerobic technology and its proper application, as well as business interest. Today the Foundation has produced a range of innovations in the fields of anaerobic treatment, bio-energy (recovery), reuse, and decentralised sanitation.

This example again highlights the importance of multi-stakeholder cooperation schemes for innovation, as the approach taken proved to be more beneficial to eco-innovation than a broad scheme of cooperation.

For more information contact Jules van Lier, Lettinga Associates Foundation (Jules.vanLier@wur.nl)

Promoting the development of new technology

One of the first initiatives to demonstrate that business and the needs of the environment can be complementary was the Dutch government's funding program Economy, Ecology, Technology (EET). Three elements were vital in order for any application to the program to be successful: (1) multi-stakeholder cooperation for four years; (2) a concrete problem which the application would address; (3) a full-scale solution at the end of the four-year period.

The overwhelming number of applicants was an indication of the great potential for eco-innovation. At the end of the program, many new full-scale solutions were demonstrated which had export potential and provided the basis for new innovations. Two examples are:

- A new technology for the biological de-colourisation of textile effluents. This will replace conventional physical/chemical treatments which produce highly toxic wastes.
- A high-rate, thermophilic treatment of paper mill wastewater in a closed loop scheme. This allows paper mills to reuse treated wastewater, which significantly reduces the costs associated with water and energy use, as well as the discharge taxes businesses have to pay.

For more information contact: Ivo Demmers, Netherlands Water Partnership (I.Demmers@nwp.nl)

Conclusions and lessons learned

- Within Europe, the main challenges associated with the need for innovative technologies are:
  - Increasing water stress
  - Urbanization, which creates acute conflicts between water users
  - Extreme events, the frequency and severity of which are being attributed to climate change
  - Rural and underdeveloped areas, which are affected by unfavourable conditions.
- Appropriate integrated solutions using innovative technology are essential.
- Today Europe contains many different sources of innovation, from private sector firms to public or quasi-public institutes.

- Recently different players have begun to work together to innovate; these range from large system integrators and small innovative firms to research institutes, universities, governments, and financiers.

- The most effective schemes are those with the widest level of stakeholder support, strong institutional leadership, clear ownership, adapted technological solutions and effective financing mechanisms.

- The European Water Supply and Sanitation Technology Platform (WSSTP), is an example of different public and private sector parties collaborating in pursuit of a defined objective.

- System approaches, coupled with the use of innovative technology (such as real-time monitoring systems, models and management tools), reflect the whole water cycle.

- System solutions emphasize the following:

    - Integrated and transparent management of water resources and the balancing of demand and supply
    - Efforts to adapt water quality to suit different purposes
    - The use of novel methods when designing and operating water infrastructure
    - The reduction of water-based effluents
    - Pollution control at source.

- The key benefits of multi-stakeholder cooperation are:

    - Speed
    - Coherency
    - Market-readiness
    - Focussed technology application
    - Stakeholder consensus
    - Reduced risk and clear technology ownership.

Information sources

Water Supply and Sanitation Technology Platform: Strategic Research Agenda: http://www.wsstp.org

Keynote lecture at WSSTP Stakeholders Event, Budapest, October 2005 by Dr. A. Tilche, European Commission - DG Research - I.2: http://www.watersupport.nl/wsstp/presentation_Andrea_Tilche.ppt

Water Information System for Europe (WISE): http://wise2.jrc.it/wfdview/php/index.php

Economy, Ecology, Technology (EET) Programme information: Ivo Demmers, Netherlands Water Partnership (I.Demmers@nwp.nl) or helpdesk +31 384 553 480

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6 | Access for All: the Need for Solidarity* among Water Users

SUMMARY

In Europe, 41 million people do not have access to safe drinking water and 85 million lack access to basic sanitation. But, access to water is a basic human right. So, the burden of provision must be shared fairly among people, regions and even countries, through the principle of "solidarity"—actions based on people's belief that they have a duty to help their fellow human beings. Solidarity mechanisms involve all players in society including governments, local authorities, civil society groups, private companies and multilateral institutions.

Many successful solidarity mechanisms already exist in Europe. Within countries, fair distribution of services and costs is brought about by general taxation, higher tariffs for richer (or urban) areas and businesses, and 'safety-net' schemes to provide water-cost subsidies to the poor. Between countries, solidarity mechanisms already in place include EU-financed investments in new Member States and the funding for overseas development provided by EuropeAid and the European Water Initiative. Other examples include the work of water-focused charities, donations of funds and expertise through the twinning of towns, and donations of time, money and expertise by European water companies and their employees.

Although national and local governments are responsible for developing water and sanitation systems, international solidarity actions should support and add to these initiatives.

The European context

Worldwide, 1.6 billion people lack access to safe water, and 2.4 billion lack access to basic sanitation[5], figures the world aims to halve by 2015 by means of the Millennium Development Goals (MDGs). Closer to home, and despite the wealth of technology

*The term "solidarity" is used to describe the notion of actions that are undertaken out of a sense of duty to help one's fellow human beings, based on a general notion of fairness and justice. Note also that this chapter does not look at such actions in the context of natural disasters.

[5] WHO/UNICEF Joint Monitoring Programme.

and expertise available in Western Europe, 41 million people in Europe do not have access to safe drinking water and 85 million lack access to basic sanitation. As a result, more than 13 500 children die in Europe every year due to poor water conditions[6].

Part of the reason for this paradox[7] is the fact that the situation in the countries that used to be part of the former Soviet Union is more critical than many statistics show. Much of the infrastructure built during the Soviet regime is now falling into disrepair, and there is barely enough money available to cover operational costs, let alone repair and maintenance. The result is that many people are only supplied with water for part of the day (see Figure 1).

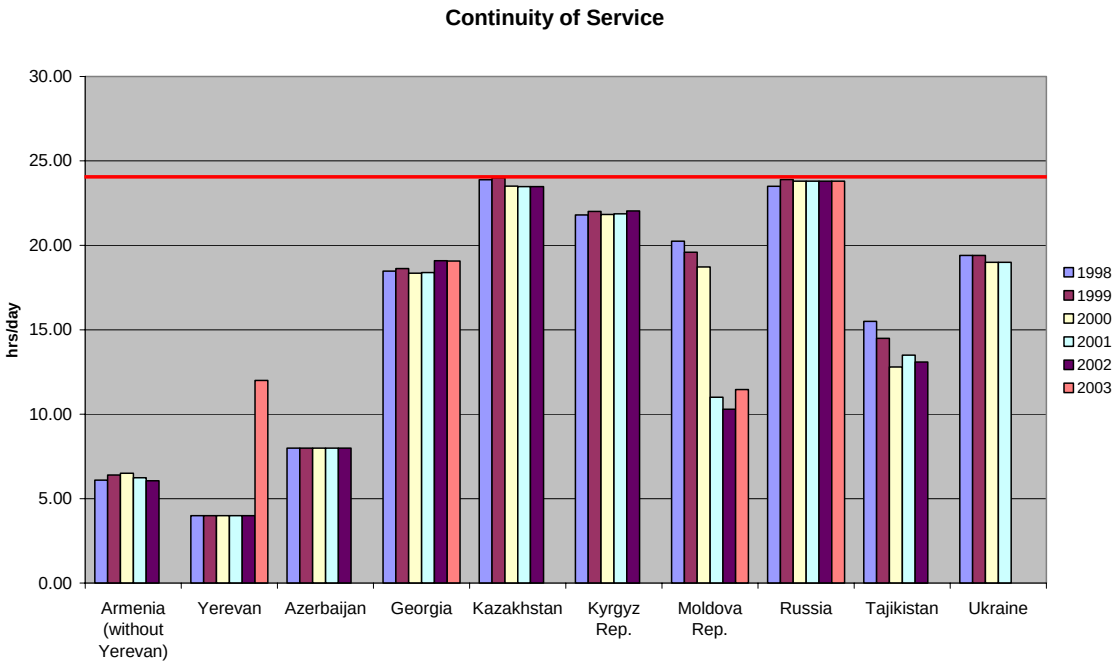

Figure 1. Continuity of water supply (average hours' supply per day). Source: EAP Task Force Water Utility Performance Indicator Database.

The situation is so severe that, in some cases, the only way to ensure a safe water supply for all is to back-track, abandoning the dysfunctional infrastructure and turning to more basic solutions. In Georgia, for example, where 50% of the population lives below the poverty line and 17% in extreme poverty, a study by the Organisation for

[6] WHO Regional Office for Europe, http://www.euro.who.int/watsan/Issues/20050712_1.
[7] Raymond Jost (2005) Solidarity and Water Management: The European Paradox. Solidarité Eau Europe.

Economic Co-operation and Development (OECD) concluded that the MDGs' water targets can only be achieved if existing urban infrastructure is scaled back—resulting in about 5% of the urban population being served through municipal stand pipes instead of in-house connections[8].

So, there is an urgent need both to provide new access and to ensure the sustainability of existing infrastructure. This chapter argues that, if we do not wish to see the gap between rich and poor widen even further, we must develop mechanisms for solidarity to ensure (1) that water resources are better managed (so ensuring access to water and sanitation for all), and (2) that the basic needs of food, health, education, housing and security are met both within Europe and in the rest of the world.

Why is solidarity needed?

Infrastructure is expensive to install. So it represents a long-term investment, the price of which may need to be carried by two or three generations of users. Plus, the maintenance and provision of sustainable services incurs on-going costs, and expertise is needed to effectively manage them. Disparities between countries, in terms of their financial and management capacities, lead to disparities in water and sanitation coverage. Inconsistencies can also exist within a country (even those where water and sanitation coverage is considered to be close to 100%), as rural areas are often less well-served. And, the huge investment required to comply with national regulations can be too large for local water-users to afford. Moreover, where infrastructure is in place, the poor can find themselves caught in a downward spiral of unpaid bills and increasing debt, facing the risk of losing essential services such as their water supply.

Yet the right to water has been recognised by the UN[9], giving rise to the principle that the cost of water must not be a barrier to providing access to water. Thus, this cost must be shared fairly between rich and poor, through the principle of solidarity.[10] It is this principle that underlies the call for actions in water and sanitation, which can be implemented on different levels, ranging from the national to the global.

Solutions do exist, as the work presented during the *European Water Solidarity Week*

[8] OECD (2005).
[9] In 2002, the United Nations Committee on Economic, Social and Cultural Rights (UN ECOSOC) agreed on a "General Comment" to their International Covenant recognising water as a human right. Forty-two European countries are signatories to this International Covenant.
[10] Gentilini, M. in preface to Smets (2005), Le Droit à l'Eau dans les Législations Nationales.

French water engineers using their paid leave to rehabilitate water supply capacities in Gumri, Armenia. This capacity building work is a good example of solidarity between individuals, companies, not-for-profit agencies and local water authorities. Photo credit: Guillaume Aubourg, pS-Eau.

(Strasbourg, 15-21 October 2005) confirms[11]. Indeed, arrangements reflecting the solidarity principle have already developed in different countries in different ways, and they clearly give added value to people in both the North and the South since such voluntary actions would not otherwise occur.

These approaches must be recognised and promoted in more countries and communities. Plus, within Europe, water-management partners must continue to develop innovative forms of solidarity among people and among local authorities, drawing on alternative and decentralised forms of financing and mobilising water users, elected representatives and decision makers. This would make a significant contribution to achieving the Millennium Development Goals in water and sanitation, both within Europe and beyond.

Implementing solidarity systems in water and sanitation

Key to the success of solidarity schemes is the role played by local authorities, who provide or oversee the provision of water and sanitation to their constituents[12]. The different types of solidarity mechanisms explored below all rely on strong local commitment and responsibility.

[11] Report on European Water Solidarity Week, http://www.s-e-e.org/

[12] CEMR (2005) Declaration by the European Local and Regional Authorities; GRAE (2003) Accès à l'eau et à l'assainissement: pas d'initiative locale sans décentralisation des décisions et des financements.

Local management of water and sanitation services means that the providers are closer to the users. Providers can also better identify what technologies are appropriate locally and understand and respond to users' needs and people's ability to pay. Finally, they can also deal better with environmental constraints and identify and implement economical mechanisms for reaching the poor and covering costs in a sustainable manner. However, the funds and expertise needed to manage and maintain effective and efficient water and sanitation service are often lacking at the local level. Solidarity mechanisms, which share experience and knowledge at a local level, can provide both the financial and the capacity-building solutions needed to address people's water needs.

In Brazil, supported by their employers, the employees of a French water company are using their paid leave to provide the poor with access to clean water. Photo credit: Aquassistance, France.

Country level – sharing the financial burden

Solidarity between local users within a catchment or basin area

Tariff systems can be used to spread the costs of infrastructure and operations equally among users. Water authorities, for example, frequently apply the same water rates to everybody in the area they supply. This means that individual water users whose water or sanitation services are more costly than the average (because their homes are far from the rest of the community for instance) do not pay more than their neighbours. But, distinctions can be drawn between domestic and professional use, ensuring that large consumers (such as industry and agriculture) pay more per cubic meter than small consumers. Such systems do need to be carefully thought through however. Even seemingly simple systems such as charging according to the quantity of water consumed can penalise the poor, who often have large or extended families.

Solidarity between populations in different areas

Where water is managed by local authorities, the averaging effect of water rates can only be applied locally. However, it's also possible to apply the solidarity principle on a larger geographical scale if national and local authorities work together to share responsibility and pool their financial capacities. This can help to even out costs between rural and urban areas or between cities with good infrastructure and those whose infrastructure needs upgrading. These systems can be set in place at the national or regional level by, for example, imposing discretional levies on water bills according to location, consumption volume, etc. Both national and local authorities have a vital role to play in setting up such systems to ensure fair service distribution.

Solidarity within a country—an example

France is divided into six "river basin territories", each containing 4 to 18 million people whose needs are served by numerous independent water authorities. When one local water authority needs to finance new water infrastructure, it is heavily subsidised by all the water users in its "basin territory". But, users in large rich cities (e.g. Paris) pay 2.8 times more than those in municipalities with low populations (10 000 inhabitants). Furthermore, users in poorer municipalities (with less than 400 inhabitants) aren't charged these levies (about 20% of the national population). Basically, this means that users from the wealthiest part of the Seine Normandy basin (60% of the basin population) actually subsidize the water investments which benefit those users living in the poorest parts of the basin (40% of the total population).

Solidarity between citizens through the public budget

In any country, the main "solidarity system" is the system of taxation, which provides

the national government with a budget to provide services and infrastructure to its citizens. It is important to ensure that the appropriate financial resources and political authority are then granted at a local level, to ensure that local authorities can provide water and sanitation services.

Solidarity with people in critical situations

Sometimes, though infrastructure is sufficient, some people in an area can't afford to pay for water services. Solidarity schemes can be used to help these individuals. Such schemes can be managed either by social administrations or they can be managed and financed by water operators, whether public or private, via solidarity funds.

"Safety net" solidarity schemes

The UK's Anglian Water Trust Fund was set up to help those "in conditions of need, poverty, hardship or distress", and aims to significantly and sustainably improve "the quality of life throughout the Anglian Water region". The trust fund provides grants to help individuals and families in need whose water and sewerage charges are in arrears. Grants have also been made to voluntary sector organisations, to develop financial advice services and education projects. Over the past ten years, the Fund has provided a total of £12.2 million (€17.9 million) in grants to people in great need. Inspired by this initiative, the EOS Foundation was set up in March 2004 in the UK. Six UK water companies contribute to this fund, which also offers grants to pay the water debts of those in need.

For more information see www.awtf.org.uk and www.eosfoundation.org.uk.

In Hungary, the municipality of Budapest, social welfare bodies, NGOs and public service utilities have joined forces to set up a similar fund (the "Network Foundation"). Again, this provides financial aid to poor water users and helps them to manage their finances better.

For more information see www.vizmuvek.com.

These examples highlight the importance of local commitment. Those who are closest to the user and can listen to their needs and must have the power and capacities necessary to offer financial aid, alleviate poverty and bring water and sanitation to all.

Between countries – sharing expertise and experience, and providing funding

Institutional solidarity within Europe and beyond

While Europe remains committed to stepping up the support it provides to extremely poor regions of the world, as shown by the call to double aid to Africa, co-operation within Europe is also being recognized as a way of addressing the urgent and severe water needs of people in many European countries. So, at the level of the European Union, solidarity is being shown through the funding of huge investment programs in the new Member States (via “cohesion funds”) and in potential future Member States (via ISPA funds). These are designed to help water authorities in these countries to quickly build the water infrastructure that will allow them to comply with water-related EU regulations.

When used to finance water projects, bilateral and multilateral official development assistance (ODA) constitute another kind of cross-border solidarity. In fact, Europe as a whole is by far the largest provider of ODA in the water sector, contributing US$1.5 billion per year on average between 2001 and 2004. As well as providing multilateral funding at the country level, the European Union also targets funds directly at local players such as local authorities and NGOs through the EuropeAid Cooperation Office. This provides another source of funds for water and sanitation projects. The European Water Initiative (EUWI), launched at the World Summit on Sustainable Development in Johannesburg, emphasises water-sector co-operation between the European Commission, EU Member States and partner countries. As one output of the EUWI, the European Water Facility has made €500 million available specifically for water and sanitation projects in African, Caribbean and Pacific (ACP) countries.

Through the work carried out under the framework of the Environmental Action Programme Task Force, the OECD highlights the need for capacity building to improve governance and simultaneously supports government authorities and utilities in the European region. This includes the provision of support for legal and institutional reforms as well as the provision of assistance to improve the financial situation of the water sector.

Solidarity through co-operation between local authorities

Decentralised actions also provide a source of funding for water and sanitation projects. This can be in the form of local-level co-operation between local authorities, which is provided with the support of local constituents. The long-standing practice of “twinning” towns in different countries has, for instance, led to the building of ties of solidarity across borders. The system means that local authorities in developed countries can support the authority they are twinned with, by providing funding and

training and by sharing experience.

But, twinning isn't the only way forward. European networks of local authorities also exist, such as the Council of European Municipalities and Regions. These could be developed to provide an arena for experience-sharing, training and reflection. These types of solidarity mechanism have been the subject of specific study[13] and will be the focus of a session at the 4th World Water Forum, Mexico. This session ("Solidarity and decentralised forms of North/South and South/South funding") will discuss the characteristics and advantages of such initiatives.

France: legislation promoting solidarity between countries

In France the "Santini-Oudin Law", a landmark piece of legislation passed on 9 February 2005, permits water agencies and the public local authorities responsible for water and sanitation to dedicate up to 1% of their water and sanitation budgets to international development projects. Potentially, this represents up to €100 million per year in funding for water and sanitation projects. However, the added value of this form of solidarity lies not just in the funding it generates, but also in the fact that it is based on the "twinning" model. So, the water agencies and local authorities do not only give money. They can also get involved in the projects directly, share experience, and build capacities and ties of solidarity between water users in France and those in developing countries.

The potential for such solidarity actions is clear. In 2005, the six French basin agencies committed approximately €4.5 million in grants and €1.2 million in technical assistance to 22 projects operated by French NGOs and local governments in Africa, Asia, Latin America and Eastern Europe. The Paris area public water and wastewater services (SEDIF, SIAAP, City of Paris, serving about 8.3 million inhabitants) committed about €1.2 million in grants to water projects in developing countries in 2005; this solidarity with regard to water and sanitation projects represented less than €0.4/user (or €0.006/m^3): about 0.2% of their total tariffs. Following the passing of the Santini-Oudin Law, this form of decentralised co-operation is expanding and a public questionnaire revealed in September 2005 that about 76% of the Seine Normandy water users (18 million) would agree to a 1% increase in their bills to contribute to MDG water projects in poor countries.

[13]PS-Eau (2005) Solidarity financing. When water users in the North finance access to water and sanitation for users in the South.

Using only a very small fraction of the funds raised by charging water users, French water suppliers are able to support overseas development projects like this one in Niger, by providing both funds and expertise. Photo credit: Aquassistance.

Italian examples of solidarity

In Italy, the local government of the Emilia-Romagna region is taking action on three levels to initiate solidarity while raising awareness of the importance of using water carefully.

First, on World Water Day 2002, they launched an initiative to encourage people to save water. The €160 000 saved was then given to the region's decentralised co-operation department to fund the water-related aspects of their international development projects.

Second, they ran a pilot-study in Bologna to test the effectiveness of water-saving devices by distributing them to all residents. The resulting savings (around €30 000) were again given to the decentralised co-operation department.

Third, and finally, the region’s local government is assessing how it can best make use of changes in Italian legislation which came into effect in 2005 and which allow local authorities to modify the way water charges are calculated. The local authorities wish to take advantage of this to encourage water companies to encourage their customers to save water.

For more information see www.ermesambiente.it and www.regione.emilia-romagna.it/wcm/cooperazionedecentrata/index.htm.

Through its decentralised co-operation actions, the Emilia Romagna region in Italy has helped Eritrea's Gash Barka region to build and rehabilitate water points for domestic and agricultural use. Villagers now have access to a reliable source of safe water. Photo credit: Regione Emilia-Romagna Italy, Decentralised Cooperation Department.

Solidarity instigated by civil society

Local-level solidarity can also take the form of water-focused charities and associations which raise funds specifically for local-level water and sanitation projects. These actions build on the ties of solidarity between water users.

WaterAid: a charity promoting solidarity

WaterAid is a UK charity which works to provide people in developing countries with access to water and sanitation. Part of its work involves raising awareness among water users in the North, by collaborating with water companies who send water users information with their water bill.

In poor countries in the South, the charity helps different actors at the district level work together. In this way it brings together local government (the planners, service providers and regulators) and NGOs and private-sector service providers. It also ensures that local communities are involved and play their part in both operation and maintenance and in the monitoring of services and the provision of feedback to service providers. Often the role the charity plays centres around facilitating interaction at the district level and challenging national governments and donors to be more responsive. Their lobbying work also has a significant impact on the international development policies of the UK Government, by drawing attention to the need for more funding for water and sanitation.

For more information see www.wateraid.org.

Eau Vive: an NGO catalysing solidarity

Eau Vive is an international development NGO which works in the West African countries of Senegal, Mali, Burkina Faso, Niger and Togo. Its approach to development projects recognizes that no one person or organisation alone can provide access to basic services such as water and sanitation. So, for over 27 years the organisation has been promoting and developing different types of financial and project-intervention mechanisms based around the solidarity principle.

Eau Vive initiates and facilitates partnerships between donors and the actors who undertake the projects. It does this by pooling funds from the multilateral sector (European Union, etc.), the bilateral sector (e.g. the French, British, and Canadian overseas development agencies), and the private sector in Europe, Africa, and North America (companies, foundations, etc.).

Since local funding is crucial to ensuring the relevance and sustainability of water and sanitation services, the international funds raised are used to complement local funds which local actors (local authorities, civil society organisations or community-based organisations) collect to undertake projects. As a result, over time, some projects end up being entirely funded by the local actors. Eau Vive also arranges visits between donors and local actors and organises technical exchange visits, which allows people to meet and learn from one another and builds a feeling of solidarity that goes beyond that associated simply with the giving of financial aid.

For more information see www.eau-vive.org.

Solidarity supported by water sector players

Action instigated by civil society can often be supported by actors in the water sector itself who can share their experience and expertise, as well as make financial contributions.

Solidarity shown by water sector players

Aquassistance was created in 1994 by employees of the company Lyonnaise des Eaux. They volunteer their skills in water and the environment to people who don't have access to water. Members of the association give up their time—using paid holiday leave—to go and carry out projects, which the company subsidises, in developing countries.

As a result, between 1997 and 2002 Aquassistance provided technical assistance to the water management service (Vodokanal) of Tchervonograd, a city in the Ukraine. By providing the equipment, expertise and the support needed to put in place communication and monitoring structures, the project has ensured that water-treatment installations were replaced and that users were provided with a 24-hour supply of water.

For more information see http://aquassistance.blogspirit.com.

Another example of different water sector stakeholders working together to show their solidarity is provided by the Dutch NGO Aqua for All Foundation, an initiative created in 2002 by various water sector professionals.

Dedicated to providing sustainable water supplies and sanitation to the poor in rural and peri-urban areas, the Foundation mainly works through partnerships that bring together different areas of competence. The Foundation does not implement projects itself. Instead, it works closely with other NGOs and Dutch water companies wishing to donate money, time and expertise. It also works with the public sector, banks, the private sector, and research centres, etc. It finds that donor companies are very keen to contribute their expertise, as this is an effective way of motivating their staff, by making them feel good about themselves, their skills and their company.

For more information see www.aquaforall.nl/index.asp?v1=uk/welcome.html.

These local-level actions don't only provide much-needed funding. They also provide for the other key aspects of solidarity: experience sharing and capacity building. In this way they reinforce the legitimacy of local authorities and their capacity to manage water and sanitation services and meet the demands of the users.

Conclusions and lessons learned

- Inequalities exist with regard to people's access to safe water and basic sanitation. This is not only true in countries outside Europe. Within Europe, countries with excellent water coverage are found right next to countries in which millions of people are denied this basic right.

- Addressing inequalities in access to water and sanitation requires us to show solidarity with our fellow human beings, whether it be those within our country or abroad.

- Many solidarity mechanisms already exist within Europe at the multilateral, national and local levels. These successful examples of solidarity between water users and public authorities can be replicated and developed further to help reduce inequalities.

- Work undertaken to ensure that water and sanitation are available for all must recognise

    - the legitimacy of local authorities (e.g. municipalities, villages, local authority groups, and regions)
    - their capacity to manage their water and sanitation services
    - their ability to collaborate with different stakeholders (e.g. government, NGOs, civil society, and the private sector), both within Europe and in developing countries outside the region.

- Solidarity actions can

    - be instigated by national and local authorities through the provision of a regulatory framework and tariff systems that ensure the fair distribution of services and costs
    - provide a safety-net for those caught in a downward spiral of debt
    - provide, directly at the local level, the funding required to implement water and sanitation projects
    - promote local skills and knowledge and build local capacities through the sharing of experience and know-how.

- It must be clearly understood that no one solidarity mechanism provides a stand-alone solution. Only through the use of a combination of all the solidarity mechanism discussed here can we hope to achieve sustainable access to water and sanitation for all.

- The prime responsibility for putting water and sanitation systems in place lies with national and local government. The role of international solidarity actions is to support and add to these initiatives, both in terms of funding and capacity building.

Information sources

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United Nations Committee on Economic, Social and Cultural Rights (UN ECOSOC) (2002), General Comment No. 15, The right to water (arts. 11 and 12 of the International Covenant on Economic, Social and Cultural Rights).

For more information on solidarity in water and sanitation please visit the sites given for the individual examples or contact:

Programme Solidarité Eau (pS-Eau): www.pseau.org

Solidarité Eau Europe (SEE): www.s-e-e.org

Académie de l'Eau: www.academie-eau.org/sommaire.php3

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7 | Conclusions

On Europe's main challenges

Hydro-meteorological risks are increasing on the European continent, and the financial and human costs of water-related disasters (floods, droughts and storms) are rising. To reverse trends and reduce water-related social, economic and environmental vulnerabilities, we need comprehensive action programmes at the basin level. But these won't be effective without the political will needed to implement actions at the national, regional and local levels. These should include flood and drought risk-management plans, much wider coordination efforts, and efforts to raise public awareness.

Inequalities also exist with regard to people's access to safe water and basic sanitation. Within the European continent, countries with excellent water standards are found in close proximity to countries in which millions are denied this basic right. In fact, an estimated 41 million people in Europe do not have access to safe drinking water, while 85 million lack access to basic sanitation. Countries within the European Union mostly enjoy high standards. However, achieving the water-related MDGs in Eastern Europe remains a major task, and will require the development of international initiatives and solidarity actions at the level of the European continent.

Urban water pollution is a major threat. Within the European Union, more than 50% of urban water pollution is not treated. Efforts are therefore needed to ensure that the ecological health of Europe's water resources is sustained. Any work undertaken to improve water and sanitation is complex and requires concerted efforts by different stakeholders (such as governments, NGOs, knowledge institutes, and the private sector) both within Europe and in countries outside the region. Treating wastewater at source is evidently the most economical option and the option which is most beneficial to society, especially when external factors—such as the impact of pollution on people and on the natural heritage of a country—are considered.

Although people within the European Union do, generally, benefit from much higher standards of water and sanitation than the rest of the continent, the challenges that the European continent as a whole faces are fundamentally the same. These are:

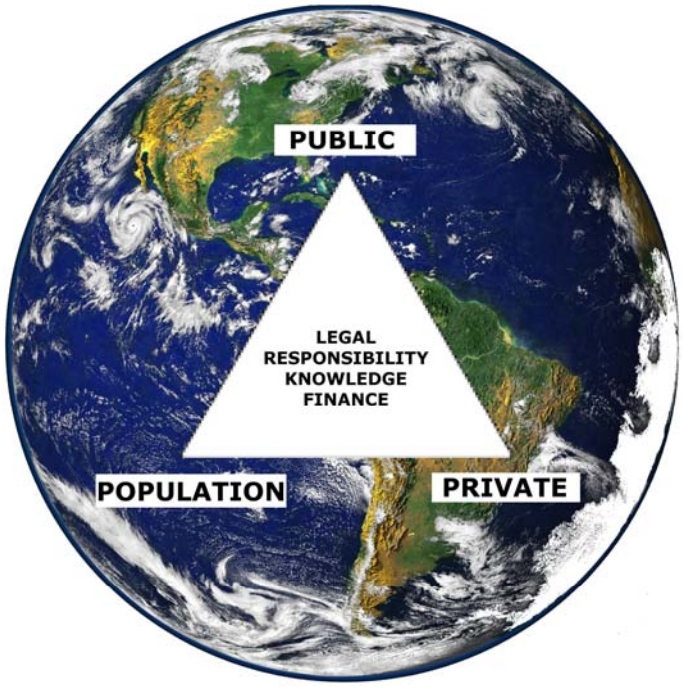
- Increasing water stress – in terms of water availability and quality
- Urbanization and irrigation, which create acute conflicts between water users
- Pollution of rivers and water resources by wastewater

- Extreme events, the frequency and severity of which are being attributed to climate change
- Unfavourable conditions in rural and underdeveloped areas.

Great as they may seem, these challenges are far from unique to the European continent. Indeed, we are recognizing their global character and their impact, on a much larger scale, in other regions. The similarity of these challenges remains the most convincing reason to seek solutions by improving the exchange of information, skills and resources, and by increasing both our understanding and our solidarity.

The way forward

Water must be placed very high on different governments' lists of priorities. On any continent, good water governance is the first prerequisite for sustained economic development and healthy populations. Furthermore, all other stakeholders need to be involved, in order to allow local and global water challenges to be solved. Such collaboration on the part of local and central governments, private enterprise, and civil society is sometimes called a Public–Private–Population Partnership (PPPP):



Our comprehensive overview of European experiences teaches us that in order to face our water challenges, we must

- Foster a solid legal framework which allows the proper enforcement of legislation, and which attributes value to water
- Clearly define responsibilities (in terms of mandates and leadership)
- Exploit existing knowledge and encourage institutional as well as technological innovation
- Organise adequate sources of finance to construct, operate and maintain water infrastructure
- Promote water so that decision-makers, especially those in central and local government, see it as one of their top priorities.

A solid legal framework

A solid legal framework clearly describes the responsibilities of local and central governments in the area of water, and allows water regulations and rules to be enforced. It also creates an environment in which transparent and fair contracts can be drawn up between the public and the private sectors. Last but not least it fosters better recognition of the intrinsic value of water and develops mechanisms that recognize the value of water as a finite resource.

Clearly defined responsibilities

Key to any successful efforts to address the water challenges we face are the roles played by local authorities, which provide or oversee the provision of water, sanitation and water security to their constituents. It is essential that their responsibilities and duties are clearly defined and known by local people.

Local management of water means that the providers are close to the users, and so better know their situation and needs. This means that local authorities are best placed to decide what technologies are most appropriate and how costs should be recovered.

Local authorities are the initiators and focus of the broad mechanisms of stakeholder co-operation that involve authorities, civil society groups, education institutes and the private sector and which are necessary to solve local and national water issues.

Adapted knowledge with appropriate technology

Key knowledge is often lacking at the local level. However, knowledge of governance can be spread by fostering solidarity with other local governments, through projects that “twin” municipalities for example, or by forming a network that links municipalities and regions. Importantly, the technology used has to be appropriate to local needs. So, in some areas advanced technology can be used (such as satellite-based flood

forecasting) while in other areas simpler technologies may be more appropriate—it might be best to use hand-operated pumps in certain remote areas for example.

Adequate financing
When possible, local sources of finance should be used. However, when the funds needed to build, manage and maintain water services and water security are lacking at the local level, solidarity mechanisms are needed. Such solidarity mechanisms can operate at the national level, for example between poor and rich regions, or between people who can afford to pay their water bills and those who can't. But, they can also operate internationally. Examples of such international solidarity mechanisms are the exchange of knowledge and funding efforts organized by civil society groups and those projects financed or paid for by official development assistance.

Future European co-operation

In Europe, a strategy is needed to create the conditions discussed above in our vision of the way forward. Such a strategy would harness a significant range of the expertise, technology, and resources available among users and other actors, including companies, governments, regulators, public entities, NGOs, research institutes, and consumer organisations. This would then be used to tackle issues in a coordinated manner. One option for achieving this is the creation of a partnership for water, which would concentrate know-how and provide a forum for exchange. Such a partnership could not only address matters of policy, but also issues of implementation and the application of solutions.

Creating the conditions necessary to successfully implement specific objectives (such as installing wastewater infrastructure) requires input from all the actors involved. If interested parties focus on specific issues or technologies, the current level of fragmentation and the information gaps we face can be reduced. This is important because, with the clear identification of ownership, and the use of adapted technological solutions and effective financing mechanisms, the problems that have been identified could be tackled and successful approaches could be replicated.

A water partnership initiative could also assume responsibility for the continuity of the European Union Water Supply and Sanitation Technology Platform. This would ensure that a valuable network of experts and stakeholders is available to provide the important input needed to develop suitable strategic research agendas and implementation plans, and initiate pilot projects for Europe, water and the world.

8 | Annexes

Annex A

European preparatory process for the 4th World Water Forum in Mexico

The organisers of the 4th World Water Forum, which will be held in Mexico in March 2006, asked all the regions involved to make their own specific contributions to the Forum. In order to ensure that Europe provided a well-rounded contribution, the WWF4 secretariat recommended that it implement a structured preparatory process.

Responding to this, a WWF4 European Regional Committee was set up in August 2005, on a voluntary basis. The Netherlands Water Partnership was asked to coordinate the European preparatory process. Many organisations that play an active role in the water sector in Europe participated and co-operated in order to produce a joint European representation for delivery at the Forum. Annex B provides an overview of the organisations who, by working together and combining their strengths, made it possible for Europe to provide its contribution to the Forum. This contribution can be divided into three major inputs: (1) the Regional Document, (2) the Ministerial Declaration, and (3) the European Sessions.

Regional Document

The European Regional Committee worked together on a Regional Document that focuses on five topics: integrated water resources management, risk management, sanitation, innovative technology, and water solidarity. To ensure the document retains its strong focus on the main issues throughout, the committee addressed key strategic developments in Europe, rather than seeking to achieve consensus on particular subjects.

Ministerial Declaration

The committee was asked by the Mexican secretariat to suggest appropriate content for the Forum's proposed Ministerial Declaration. The committee proposed five statements for the Ministerial Declaration, and the Mexican government has used these to prepare their draft declaration. The committee was also asked to describe how internationally agreed water and sanitation policies are being implemented in Europe. The committee has submitted the document given in Annex C, which demonstrates that European practice is consistent with the internationally agreed policies such as those expressed in the final declaration of the 13th UN Commission for Sustainable Development. This document might be annexed to the Ministerial Declaration, if the Ministers agree to this in Mexico.

European Sessions

The European Regional Committee is coordinating the European main session where the European challenges and initiatives on water will be presented, together with the

Regional Document. The committee has played an active role in the selection of sessions that will be held during the Forum.

Annex B

Contributors to the European Preparatory Process for the 4th World Water Forum

The contributions made by numerous organizations, listed below, made possible the European representation at the Fourth World Water Forum. The European preparatory process was coordinated by the Netherlands Water Partnership.

ASTEE, the French Water Association
Austrian Development Agency (ADA)
Austrian Ministry of Agriculture, Forestry, Environment and Water Management
Bosnia and Herzegovina Water Works Association
Budapest Water Works
Complutense University of Madrid, Spain
Cooperative Programme on Water and Climate
Danish Water Forum (DWF)
Drainage and Irrigation District “Riviera Berica”
European Committee of Environmental Technology Suppliers Associations (Eucetsa)
Eureau, European Union of National Associations of Water Suppliers and Waste Water Services
EUROPE - INBO
European Commission
European Environmental Bureau
European Investment Bank
European Union Water Initiative Secretariat (EUWI-Secretariat)
European Water Supply and Sanitation Technology Platform (WSSTP)
French Coordination Team WWF4
French Water Academy
Global Water Partnership
Government of Finland
Global Water Partnership Central and Eastern Europe
Global Water Partnership Mediterranean
International Network of Basin Organisations
International Office for Water
International Secretariat for Water
International Water Association (IWA)

Ministerio de Medio Ambiente, Spain
Netherlands Water Partnership (NWP)
Northern Water Network (NoWNet)
Organisation for Economic Co-operation and Development (OECD)
Programme Solidarité Eau
Seine-Normandy Water Agency
Solidarity Water Europe
Springs Foundation
Stockholm International Water Institute (SIWI)
Suez
Technical University of Kavala, Greece
Technische Universität Hamburg - Harburg (TUHH)
University of Osnabruck
Waste
Water Scarcity Group
Woman in Europe (WECF)
Women for Water, Water for Women (WfWfW)
World Water Council

Annex C

Mexico World Water Forum — January 16, 2006
European Regional Coordinating Committee

European annex to the WWF4 Ministerial Declaration

Implementation in Europe of international Water & Sanitation policies

We, the various European stakeholders who have worked together to prepare the Mexico World Water Forum, are pleased to present some European experiences and actions that are consistent with the globally agreed water and sanitation policies.

IWRM

In Europe there is an unprecedented will to manage freshwater resources in a consistent and ambitious integrated way. This applies throughout the 25 Member States of the European Union and the 4 candidate countries to accession to the Union. The European Union Water Framework Directive goes beyond the Johannesburg Plan of Implementation and the demands of CSD13 regarding the 2005 IWRM target[i]. Its objective for 2015, i.e. the same timeframe as the MDGs, is the long term protection of aquatic environments and water resources to secure drinking water supply for the population and meet economic needs in a sustainable manner. It is a results-based program with a precise timetable[ii].

In looking for efficiency the European Union Water Framework Directive systematically focuses on river basin territories.[iii] It requires “management plans” and “programs of measures” by 2009 in all river basins, including transboundary “International Basin Districts”. Whereas the CSD13 decided to enhance the cooperation between riparian States[iv], this European initiative makes it compulsory throughout 29 countries.

In Europe, International Commissions for the Protection of Transboundary River Basins like ICPR International Commission for the Protection of Rhine, International Commission for the Protection of Danube River and others have taken the important

roles of harmonizing peacefully the needs and demands to the available resources.

Participation of all stakeholders

As provided for in paragraph A.d.xi of the CSD13 Decision, the European Union Water Framework Directive clearly stipulates that all water stakeholders must participate actively in all stages of the formulation of the management plan and requires consultation with the general public at the different steps of the process.

As provided for in paragraph A.a.iv of the CSD13 Decision, "Participation and Transparency" are an important principle of the European "Guidelines for good water governance providing access to safe drinking water and sanitation" that echo the European Council's Resolution 9696/02 *"to apply a real integrated approach in which all actors cooperate as partners and transparent information is available to all stakeholders."*

Competing demands

While CSD13 decided to improve "*national coordination efforts to address water and sanitation, to manage competing demands for water, including those for agricultural production"* [v], the European Union Water Framework Directive introduces a socio-economic approach and requires the identification of water uses in all the river basins.

Cost recovery

While CSD13 decided to view cost recovery of water services as contributing to the sustainability of service provision[vi], the European Union Water Framework Directive, with its will to get results in a sustainable manner, requires reports on the recovery of costs of services linked to water uses. This European Union Water Framework Directive also supports the "polluter-pays" principle as provided for in the WWF3 Ministerial Declaration[vii].

Water governance / local water authorities

While CSD13 emphasised that "*Governments have the primary role in promoting improved access to safe drinking water, basic sanitation, sustainable and secure*

tenure, and adequate shelter, through improved governance at all levels and appropriate enabling environments and regulatory frameworks, adopting a pro-poor approach and with the active involvement of all stakeholders";[viii] and decided to improve *"water governance through strengthening of institutional and regulatory reforms, capacity development and innovation"* [ix]; and while the WWF3 Ministerial Declaration declared that "*Empowerment of local authorities and communities should be promoted by governments"* [x] and took note of the "Financing Water for All" report of the World Panel on Financing Water Infrastructure, that recommended that country governments provide appropriate frameworks to their local governments, the European views about the roles and contributions of the various stakeholders have been clarified in the European "Guidelines for good water governance providing access to safe drinking water and sanitation"[xi]. These guidelines describe carefully the complementary roles of:

- the two main categories of Public Authorities being, those which are responsible for policy, planning and regulatory functions, usually at the state level, and those which are responsible for organising service delivery, usually local governments or local water boards;
- the members of civil society, including users, employees and non-profit service providers and associations;
- the water operators and the other service providers, public or private;
- the financial institutions.

In the recent declaration of the Council of European Municipalities and Regions[xii], the European local and regional governments view themselves as playing an "*essential role in most European countries in the implementation of the right to access drinking water and satisfactory sanitation"* and that they ask to *be "able to choose freely between different management methods (government operated, government agency, management delegated to private or public operators or to an association)".*

In the European "Guidelines for good water governance providing access to safe drinking water and sanitation" the "*choice of the most appropriate management structure from the range available*" is also viewed as a prerogative of the Public Authorities responsible for organising service delivery.

Access to water and sanitation

While CSD13 decided to *sustain and accelerate progress toward the water access goal*[xiii] *… facilitating access to water for all*[12]*:*

- during the "Water Solidarity" meetings that took place in Strasbourg in October 2005 - including those held by the Council of Europe - it was acknowledged that Continental Europe has its own part to play in contributing to the Millennium Development Goals for access to drinking water & sanitation, since millions Europeans still lack access to

safe drinking water or are not connected to tap water with systems.

- all governmental parties to the European Protocol on Water and Health[xiv] that entered into force in 2005 "*shall pursue the aims of: (a) Access to drinking water for everyone;(b) Provision of sanitation for everyone within a framework of integrated water-management systems aimed at sustainable use of water resources, ambient water quality which does not endanger human health, and protection of water ecosystems."*

- the Declaration of the European local and regional governments adopted in December 2005 by the Council of European Municipalities and Regions commits them in particular "*to ensure on their own territory, and within their competences, a management of water and sanitation services which allows an access for all to water and sanitation in sufficient quantity and quality, and at a reasonable price in order to fulfil these most fundamental needs."*

.- the European "Guidelines for good water governance providing access to safe drinking water and sanitation" allocate the "*duty to implement the right of access to essential services in drinking water and sanitation for all*"[11] to the Public Authorities responsible for organising service delivery, usually local governments or local water boards.

In order that everybody can enjoy satisfactory access to water and sanitation services and can contribute to their cost in an affordable way, the European Report to the Mexico World Water Forum stresses the need to clearly identify the public authority that is responsible for providing those services to the whole population, its detailed obligations and, if different, the public authority that is responsible for setting the price structure that is affordable to all individuals.

Solidarity and pro-poor policies

While CSD13 decided that cost recovery objectives should *not become a barrier to access to safe water by poor people*[xv] and recommended *targeted subsidies for the poor*, such policies are implemented in some parts of Europe:

- in the UK, some water companies set up funds dedicated to financing the water bills of the very poor people, awarding grants to those water-users who cannot afford to pay their bills on an individual basis.

- in France, dedicated solidarity funds are organised at the district level to finance the water bills of the very poor people on an individual basis. These funds are financed by the operators and governments but managed by ad hoc district public authorities.

Our European Report to the Mexico World Water Forum describes several solidarity

schemes that are used across Europe to facilitate the management of water systems and their affordability. They may combine:

- *Geographical solidarity schemes that alleviate costs to whole populations in certain areas by having them subsidised by other users;*

- *Social solidarity schemes that facilitate access to targeted individuals, for example to the un-served, the poor or the very poor users;*

- *Tariffs policies that allow certain categories of local users to be subsidised by others.*

Risk management

While CSD13 decided to support "*developing preventive and preparedness measures, as well as risk mitigation and disaster reduction, including early warning systems*"[xvi], European countries are used to the experience of floods and droughts, some of them being catastrophic, and have developed many preventive measures. Innovative measures include: bottom-up dialogues between local and national governments ("Freude am Fluss" joint approach of Germany, France and the Netherlands), flood-risk management in lieu of flood-probability management, satellite-based early-warning systems, drought mitigation planning and monitoring tools.

The recent flood disasters and the expected increase in frequency and severity of floods in Europe led the European Commission to propose developing and implementing a coordinated flood protection, prevention and mitigation Action Programme with Member States. The Action Programme includes packages for information and research, funding and legal instruments such as flood risk maps development and flood risk management plans for river basins. Guiding principles of the Action Programme are its strong linkage to the European Framework Directive, the principle of flexibility and and subsidiarity, and that plans will be developed in a consultation process with stakeholders.

Sanitation

While access to basic sanitation was added to the Millennium Development Goals by decision in Johannesburg, in Europe more than half of water infrastructure investment concerns sanitation, including sewage collection and treating waste water. This is due to the European Union Urban Waste Water Directive and Bathing Water Directive with which all EU countries, as well as the new Member States to the European Union, have to comply. These new Members States are heavily subsidised by the European Union in order that they can meet the obligations of the Urban Waste Water Directive

as soon as possible.

Sanitation policies in Europe encompass sewer networks in dense areas and "*on-site sanitation infrastructure, especially in rural areas"* as provided for in paragraph B.j.viii of CSD13 Decision. Research and pilots are being conducted on several alternative options for on-site schemes.

International Cooperation

Numerous European countries, inside as well as outside the EU have international cooperation programmes and initiatives.

As expressed by the European Union (EU) to the UN Commission on Sustainable Development, "*the EU collectively provides around € 1.4 billion annually to water and sanitation, which makes it the world's largest donor in this field.*" [xvii]

Various cooperation mechanisms are used including multilateral aid, bilateral funding by member states and decentralised cooperation by local governments.

"*The EU Water Initiative (EUWI) was launched at WSSD to contribute to the achievement of the Millennium Development Goals (MDGs) and WSSD targets on water and sanitation, within the context of an integrated approach to water resources management. The EUWI aims to harmonize EU assistance in water and sanitation through closer cooperation and alignment of practices in support of country-led priorities.*

In March 2004 the EU established the ACP(African, Caribbean and Pacific c)-EU Water Facility worth up to € 500 million, a major achievement of the EUWI and a response to the need to catalyse additional funding for water and sanitation in Africa, Caribbean and Pacific countries.

The combination of the Water Initiative, to improve the efficiency of EU bilateral programmes in water and sanitation, and the Water Facility, to bring new finance to the sector, is expected to generate substantial progress toward achievement of the MDGs." [17]

References

[i] CSD13 Decision para A.d about "preparing nationally-owned IWRM and water-efficiency plans"
[ii] Cf CSD13 Decision para A.d.v "enhancing the sustainability of ecosystems that provide essential resources and services for human well being and economic activity in water-related decision-making "
[iii] CSD13 Decision para A.d.x
[iv] CSD13 Decision para A.f
[v] CSD13 Decision para D.t.ii
[vi] CSD13 Decision para A.a.vi and B.j.iv
[vii] WWF3 Ministerial Declaration - Message from the Lake Biwa and Yodo River Basin – 2003 – para 5
[viii] CSD13 Decision para 2.e
[ix] CSD13 Decision para A.d.i
[x] WWF3 Ministerial Declaration - Message from the Lake Biwa and Yodo River Basin – 2003 – para 1
[xi] Guidelines for good water governance http://www.euwi.net/file_upload/Flo_tmpphpSuDj2z.pdf Annexe E
[xii] CEMR Dec2005 http://afccre.ecritel.net/cms_file.asp?id=802
[xiii] CSD13 Decision para A.a
[xiv] Protocol on Water and Health http://www.unece.org/env/water/
[xv] CSD13 Decision para A.a.vi,vii B.j.iv
[xvi] CSD13 Decision para B.d.viii
[xvii] From commitments to actions. Views of the European Union for CSD13 http://europa.eu.int/comm/external_relations/env/brochure3.pdf