

SESSION III b

LEGAL AND INSTITUTIONAL ARRANGEMENTS

The Aarhus Convention: a new instrument promoting environmental democracy

Jeremy Wates and Ljiljana Stancic¹

United Nations Economic Commission for Europe, Secretariat of the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, 8-14 Avenue de la Paix, Palais des Nations, 1211 Geneva, Switzerland

e-mail: public.participation@unece.org, web site: <http://www.unece.org/env/pp/>

Introduction

In recent decades, traditional systems of representative democracy have been increasingly supplemented by measures promoting participatory democracy. This has especially been the case in the environmental sphere, where the interests of the public are recognized to have a particular legitimacy. Involving the public has been recognized to improve the quality of decision-making as well as tending to strengthen public belief in the credibility of the decision-making process and its outcome. It is also increasingly seen as a question of rights: the notion that the public is entitled to see its views reflected in the decisions of public authorities on an ongoing basis – rather than its role being limited to the occasional trip to the ballot box at election time – has gained ground.

The emergence of participatory democracy is reflected in a host of national measures, of both legislative and non-legislative character. It is also reflected to a more modest extent in global and regional declarations and instruments. Perhaps the most far-reaching example of the latter is the UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters.

Aarhus: a new international law on citizens' environmental rights

The Convention was adopted on 25 June 1998 in the Danish city of Aarhus – hence its more common name, the Aarhus Convention – at the Fourth Ministerial Conference in the “Environment for Europe” process. It has been signed by 39 countries and the European Community.

The Aarhus Convention is a new kind of environmental agreement. It links environmental rights and human rights. It acknowledges that we owe an obligation to future generations. It establishes that sustainable development can be achieved only through the involvement of all stakeholders. It links government accountability and environmental protection. It goes to the heart of the relationship between people and governments. The Convention is therefore not only an environmental agreement; it is also a Convention about government accountability, transparency and responsiveness.

Tracing the development of the Convention

The origin of the Convention can be traced back to Principle 10 of the Rio Declaration on Environment and Development, which stresses the importance of public access to environmental information and opportunities for the public to participate in decision-making processes and to have effective access to administrative and judicial proceedings.

Within the UNECE region, Principle 10 was taken up and further developed, initially through the preparation of a set of non-binding Guidelines on Access to Environmental Information and Public Participation in Environmental Decision-making (Sofia Guidelines), which have been endorsed by UNECE Environment Ministers in October 1995. At the same time as endorsing the Guidelines, the Ministers acknowledged the need for further work in this area and agreed to consider the possibility of developing a legally binding convention. In January 1996, the Committee on Environmental Policy decided to proceed with the preparation of a convention and after ten negotiation meetings, a draft was ready to be presented for adoption to the Ministers at the Ministerial Conference in Aarhus.

¹ This paper was not presented during the Conference. It is an additional contribution by the Aarhus Convention's secretariat on the theme “Challenges to water management and framework for its modernization: legal and institutional arrangements”.

The Convention entered into force on 30 October 2001 and, as of end of November 2002, 22 countries have become Parties to the Convention, most of these being from Central and Eastern Europe or the Commonwealth of Independent States². Several Western European countries, as well as the European Union itself, are actively working towards ratification. The first meeting of the Parties took place on 21-23 October 2002 in Lucca, Italy.

The role of NGOs

A unique feature of the Aarhus Convention processes has been the unprecedented level of NGO involvement. During the Convention negotiations, environmental NGOs – also known as environmental citizens' organizations or ECOs – were not only represented in the plenary sessions of the Working Group but also in virtually every drafting committee and in the small advisory group which assisted the Secretariat in the preparation of the first draft. Thus the involvement of ECOs began at an early stage and continued right throughout the process. Within each of these fora, at the discretion of the Chair, the ECO delegation was allowed to intervene on more or less the same basis as governmental delegations, and in practice availed of this opportunity extensively. Other bodies, notably the Regional Environmental Center for Central and Eastern Europe, also played an active role.

The participation of ECOs unquestionably increased the relevance of the text and ensured that many of the real concerns of the public were known to the officials. ECOs were in a sense recognized as the principal "clients" of the Convention – whether regarded as the sub-set of the public likely to make most active use of the rights which the Convention would confer, or as the stakeholder group most likely to make use of them on behalf of the wider public. Many important elements in the text were introduced as a result of proposals by the ECO coalition, even if not always in the form initially proposed.

The contribution made by the ECOs to the drafting process was acknowledged at the Aarhus conference by several Environment Ministers and senior UN officials, as well as in the Resolution of the Signatories which accompanied the adoption of the Convention. The Resolution went on to recommend that NGOs should be allowed to participate not only in the activities of the Meeting of the Signatories to the Convention but also in the preparation of instruments on environmental protection in other international fora.

The content of the Convention

As its title suggests, the Convention contains three broad themes: access to information, public participation and access to justice. However, before describing these, it is worth referring to a number of important general features of the Convention.

General features

Rights-based approach: The Convention adopts a rights-based approach. Article 1, setting out the objective of the Convention, requires Parties to guarantee rights of access to information, public participation in decision-making and access to justice in environmental matters. It also refers to the goal of protecting the right of every person of present and future generations to live in an environment adequate to health and well-being, which represents a significant step forward in international law.

A "floor", not a "ceiling": The Convention establishes minimum standards to be achieved but does not prevent any Party from adopting measures which go further in the direction of providing access to information, public participation or access to justice.

Non-discrimination: The Convention prohibits discrimination on the basis of citizenship, nationality or domicile against persons seeking to exercise their rights under the Convention.

Definition of public authorities: The main thrust of the obligations contained in the Convention is towards public authorities, which are defined so as to cover governmental bodies from all sectors and at all levels

² The 22 countries are Albania, Armenia, Azerbaijan, Belarus, Denmark, Estonia, France, the Former Yugoslav Republic of Macedonia, Georgia, Hungary, Italy, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Malta, Republic of Moldova, Poland, Romania, Tajikistan, Turkmenistan and Ukraine.

(national, regional, local, etc), and bodies performing public administrative functions. Bodies acting in a judicial or legislative capacity are excluded.

Inclusion of EU institutions: The definition of “public authority” also covers the institutions of regional economic integration organizations which become a Party to the Convention.

International bodies: Apart from the special case of regional economic integration organizations such as the EU, the Convention contains a more general requirement on Parties to promote the application of its principles within the framework of international bodies in matters relating to the environment. While the wording is not particularly strong, the inclusion of this provision shows some recognition of the need to prevent any loss of transparency and public accountability as decision-making moves onto an international level.

Non-compliance mechanism: The Meeting of the Parties to the Convention was required to establish, on a consensus basis, optional arrangements for reviewing compliance with the provisions of the Convention. Although the wording is not particularly strong (due mainly to opposition during the negotiations from countries which subsequently did not sign the Convention in Aarhus), this provision was given emphasis in the Resolution³ which accompanied the adoption of the Convention. The first Meeting of the Parties elected the Compliance Committee consisting of eight members serving in their personal capacity. The composition of the Committee reflects the geographical distribution of Parties and Signatories to the Convention. The compliance arrangements include a possibility for communications to be brought before the Committee by one of more members of the public concerning a Party’s compliance with the Convention.

Non-UNECE countries: Finally, the Convention is open to accession by non-UNECE countries, subject to the approval of the Meeting of the Parties.

Access to information

The information pillar covers both the reactive aspect of information, i.e. the obligation on public authorities to respond to public requests for information, and the active aspect dealing with other obligations relating to information, such as collection, updating, public dissemination and so on.

Right to information on request (Art. 4): Any environmental information held by a public authority must be provided when requested by a member of the public, unless it can be shown to fall within a finite list of exempt categories. The right of access extends to any person, without his or her having to prove or even state an interest. The scope of information covered is quite broad, encompassing a non-exhaustive list of elements of the environment (air, water, soil etc.) The definition of environmental information covers information in any material form (written, visual, aural, electronic, etc.). There is a qualified requirement on public authorities to provide it in the form specified by the requester.

The information must be provided as soon as possible, and in general at the latest within one month after submission of the request, unless the volume and complexity of information justify an extension of this period up to two months after the request. Public authorities may impose a charge for supplying information provided the charge does not exceed a “reasonable” amount.

Public authorities may withhold information where disclosure would adversely affect various interests, e.g. national defence, international relations, public security, the course of justice, commercial confidentiality, intellectual property rights, personal privacy, the confidentiality of the proceedings of public authorities; or where the information requested has been supplied voluntarily or consists of internal communications or material in the course of completion. There are however some restrictions on these exemptions, e.g. the commercial confidentiality exemption may not be invoked to withhold information on emissions which is relevant for the protection of the environment. To prevent abuse of the exemptions by over-secretive public authorities, the Convention stipulates that most of the aforementioned exemptions are to be interpreted in a restrictive way, and in all cases may only be applied when the public interest served by disclosure has been taken into account. Refusals, and the reasons for them, are to be issued in writing where requested. A similar time limit applies as for the supply of information: one month from the date of the request, with provision for extending this by a further month where the complexity of the information justifies this.

³ ECE/CEP/43/Add.1/Rev.

Active information duties on Parties (art. 5): These include quite general obligations on public authorities to be in possession of up to date environmental information which is relevant to their functions, and to make information “effectively accessible” to the public by providing information on the type and scope of information held and the process by which it can be obtained. Parties are required to “progressively” make environmental information publicly available in electronic databases, which can easily be accessed through public telecommunications networks, i.e. the Internet. The Convention requires Parties to take steps to progressively establish pollutant release and transfer registers (PRTRs). These registers have proven to be a highly effective and relatively low cost means of gathering environmental information from the private sector and putting it into the public domain, thereby exerting a downward pressure on levels of pollution.

The task force on PRTRs established by the Meeting of the Signatories and the PRTR working group developed a draft text on the PRTR protocol. A new working group, established under the Meeting of the Parties, is in charge of finalising the text of the protocol in time for adoption and signature at the Fifth Ministerial Conference “Environment for Europe” (Kiev, May 2003).

Public participation

The Convention sets out minimum requirements for public participation in various categories of environmental decision-making.

Specific projects or activities: Article 6 of the Convention establishes certain public participation requirements for decision-making on whether to license or permit certain types of activity listed in Annex I to the Convention. This list includes inter alia energy production and mining, various industrial productions, large intensive agriculture, large infrastructure projects. The requirements also apply, albeit in a slightly more ambivalent form, to decision-making on other activities which may have a significant effect on the environment. Activities serving national defence purposes may be exempted. Parties are required to apply the provisions of the article to decision-making on the deliberate release of genetically modified organisms (GMOs) to the environment “to the extent feasible and appropriate”. Furthermore, the issue of GMOs is given emphasis in both the preamble and the accompanying Resolution. The first Meeting of the Parties adopted a decision and guidelines on access to information, public participation and access to justice with respect to genetically modified organisms. The decision committed Parties to adopting the guidelines and establishing a new working group on GMOs to explore and develop options for a legally binding approach to the issue.

The public participation requirements include timely and effective notification of the public concerned; reasonable timeframes for participation, including provision for participation at an early stage; a right for the public concerned to inspect information which is relevant to the decision-making free of charge; an obligation on the decision-making body to take due account of the outcome of the public participation; and prompt public notification of the decision, with the text of the decision and the reasons and considerations on which it is based being made publicly accessible. The “public concerned” is defined as “the public affected or likely to be affected by, or having an interest in, the environmental decision-making”, and explicitly includes NGOs promoting environmental protection and meeting any requirements under national law.

Programmes, plans and policies: Article 7 requires Parties to make “appropriate practical and/or other provisions for the public to participate during the preparation of plans and programmes relating to the environment”. It can be argued that the term “relating to the environment” is quite broad, covering not just plans or programmes prepared by an environment ministry, but also sectoral plans (transport, energy, tourism, etc.) where these have significant environmental implications. The Convention is less prescriptive with respect to public participation in decision-making on plans or programmes than in the case of projects or activities. Decision-making on policies relating to the environment is also covered by the Convention, albeit in a less prescriptive form.

General rules and regulations: Article 8 applies to public participation during the preparation by public authorities of executive regulations and other generally applicable legally binding rules that may have a significant effect on the environment. Although the Convention does not apply to bodies acting in a legislative capacity, this article clearly would apply to the executive stage of preparing rules and regulations even if they are later to be adopted by parliament.

Access to justice

The Convention (art. 9) aims to provide access to justice in three contexts:

- Review procedures with respect to information requests;
- Review procedures with respect to specific (project-type) decisions which are subject to public participation requirements;
- Challenges to breaches of environmental law in general.

Thus the inclusion of an “access to justice” pillar not only underpins the first two pillars; it also points the way to empowering citizens and NGOs to assist in the enforcement of the law.

Access to information appeals: A person whose request for information has not been dealt with to their satisfaction must be provided with access to a review procedure before a court of law or another independent and impartial body established by law (the latter option being included to accommodate those countries which have a well-functioning office of Ombudsperson). The Convention attempts to ensure a low threshold for such appeals by requiring that where review before a court of law is provided for (which can involve high costs), there is also access to an expeditious review procedure which is free of charge or inexpensive. Final decisions must be binding on the public authority holding the information, and the reasons must be stated in writing where information is refused.

Public participation appeals: The Convention provides for a right to seek a review in connection with decision-making on projects or activities covered by Article 6. The review may address either the substantive or the procedural legality of a decision, or both. The scope of persons entitled to pursue such an appeal is similar to, but slightly narrower than, the “public concerned”, involving a requirement to have a “sufficient interest” or maintain impairment of a right (though the text also states that these requirements are to be interpreted in a manner which is consistent with “the objective of giving the public concerned wide access to justice”).

General violations of environmental law: The Convention requires Parties to provide access to administrative or judicial procedures to challenge acts and omissions by private persons and public authorities which breach laws relating to the environment. Such access is to be provided to members of the public “where they meet the criteria, if any, laid down in ... national law” – in other words, the issue of standing is primarily to be determined at national level, as is the question of whether the procedures are judicial or administrative.

Other access to justice requirements: The procedures in each of the three contexts referred to above are required to be “fair, equitable, timely and not prohibitively expensive”. Decisions must be given or recorded in writing, and in the case of court decisions, made publicly accessible. Assistance mechanisms to remove or reduce financial and other barriers to access to justice are to be considered.

Relevance of the Convention in a global context

The Aarhus Convention is widely accepted to be the leading example of implementation of principle 10 of the Rio Declaration on Environment and Development. Although it is a regional instrument, its global significance is widely recognised. The United Nations Secretary-General Kofi Annan has described it as “the most ambitious venture in environmental democracy undertaken under the auspices of the United Nations [whose] adoption was a remarkable step forward in the development of international law”. Mary Robinson, former UN High Commissioner for Human Rights, has stated that the Convention is “a remarkable achievement not only in terms of protection of the environment, but also in terms of the promotion and protection of human rights”.

The global relevance of the Convention is further enhanced by the fact that it is open for accession not only by UNECE Member States but also by other States which are members of the United Nations.

Thus the Convention may be of interest to States outside the UNECE region in a number of ways: as an instrument to which such States might eventually accede, as an inspiration for developing a similar instrument in other regions or as a model for development of national legislative frameworks.

Relevance to the Water Convention and its Protocol on Water and Health

At its seventh session (25-28 September 2000), the Committee on Environmental Policy identified the topics covered by the Aarhus Convention as cross-cutting in nature, having implications and relevance for other environmental conventions and protocols. More specifically, several articles of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) and its Protocol on Water and Health are directly linked to the provisions of the Aarhus Convention. The Protocol specifically takes note of the Aarhus Convention in its preamble and includes a reference to the Aarhus principles in Article 5. In addition, it employs the same broad definitions of “public” and “public authority” as the Aarhus Convention.

The First Meeting of the Parties to the Aarhus Convention unanimously adopted the “Lucca Declaration”, in which it recognised the need for further cooperation between the bodies of the Aarhus Convention and those of other multilateral environmental agreements in order to promote the principles of the Convention in all areas of environmental policy.

The linkages between the main themes of the Aarhus Convention and the relevant provisions of the Water Convention and its Protocol can be briefly described as follows.

Public information

Article 11 of the Water Convention requires the Riparian Parties to establish and implement joint programmes for monitoring the conditions of transboundary waters, including floods and ice drifts, as well as transboundary impact. Furthermore, the Parties are required to carry out joint or coordinated assessments of the conditions of transboundary waters and make the results available to the public in accordance with the provisions set out in Article 16 of the Convention.

Article 16 of the Convention sets out the requirement to ensure that information on the conditions of transboundary waters, measures taken or planned to be taken to prevent, control and reduce transboundary impact, and the effectiveness of those measures, is made available to the public.

The Water and Health Protocol’s Article 10, which deals with public information, is based to a large extent on the Aarhus Convention. It includes the same exemptions for the disclosure of information and the public interest test. In addition, this article requires Parties to ensure that public authorities, in response to a request for information relevant to the implementation of the Protocol, make such information available within a reasonable time to the public.

Similarly, Article 8 of the Water Convention includes a general provision on the protection of information related to industrial and commercial secrecy, including intellectual property, or national security, which corresponds to the provisions contained in Article 4 of the Aarhus Convention with respect to grounds for refusal to disclose information upon request.

Article 8 of the Protocol on Water and Health requires public authorities to disseminate all information they hold to members of the public who may be affected and that could help the public to prevent or mitigate harm in case of an imminent threat to public health from water-related disease. This article draws directly from the provisions of the Aarhus Convention.

Public participation

Article 4 of the Protocol on Water and Health contains a paragraph that requires Parties to take all appropriate action to create legal, administrative and economic frameworks which are stable and enabling and within which the public, private and voluntary sectors can each make its contribution to improving water management for the purpose of preventing, controlling and reducing water-related disease.

Article 6 of the Protocol requires Parties to establish periodically revised national and/or local targets and target dates for the standards and levels of performance that need to be achieved or maintained for a high level of protection against water-related disease. In establishing these targets, Parties are required to provide for public participation.

Access to justice

Article 9 of the Protocol requires Parties to take steps designed to enhance the awareness of all sectors of the public regarding, inter alia, the rights and entitlements to water and corresponding obligations under private and public law of natural and legal persons and institutions, whether in the public sector or the private sector.

Compliance mechanism

The Protocol's Article 15 on compliance includes a provision requiring appropriate public involvement, but does not contain an arrangement of receiving communications from the public. Such a provision was established pursuant to the Decision on Review of Compliance, adopted at the First Meeting of the Parties to the Aarhus Convention.

The same decision provides for enhancement of synergies between the Aarhus Convention compliance procedure and compliance procedures under other agreements. Consequently, the Compliance Committee may be requested by the Meeting of the Parties to the Aarhus Convention to communicate as appropriate with the relevant bodies of those agreements and report back to the Meeting, including with recommendations as appropriate.

Implications of the application of the Aarhus Convention to water-related issues

The provisions of the Aarhus Convention are relevant for decision-making in the context of water management and related issues. While, as outlined in the previous paragraphs, the Water Convention and its Protocol on Water and Health have a number of provisions dealing with access to information, public participation and access to justice, the equivalent provisions in the Aarhus Convention generally go further and are more detailed. In cases where States are Parties to both conventions, the requirements of the Aarhus Convention may in many cases be more relevant in determining the procedures which should apply. For example, whereas Articles 11 and 16 of the Water Convention require that certain information be made available to the public, the Aarhus Convention (notably Articles 4, 5 and 9) set out the terms of availability of such information (e.g. time limits, costs, exemptions, possibilities for appeals, etc.). Similarly, when cooperating and assisting each other in the implementation of national and local plans in pursuance of Article 11, subparagraph (b) of the Protocol on Water and Health, Parties are required to consider how they can best help to promote preparation of water-management plans in transboundary, national and/or local contexts, and of schemes for improving water supply and sanitation. In case the relevant Parties are also Parties to the Aarhus Convention, they would also be required to provide public participation during the preparation of these plans in accordance with Article 7 of the Aarhus Convention.

Implications of the Aarhus Convention for international environmental decision-making

The Aarhus Convention requires Parties to promote its principles in international decision-making processes concerning environmental issues (Article 3, paragraph 7). This includes decision-making on both procedural and substantive issues within the framework of international organizations. Working groups negotiating international legal instruments relevant to the environment fall under this category and the provisions of the Aarhus Convention were explicitly taken into account by the negotiating parties to the Protocol on Water and Health. As many of the Parties to the Water Convention are, or will soon become, Parties to the Aarhus Convention, it might be expected that these Parties will promote the application of the Aarhus Convention principles within the processes and bodies established under the Water Convention and its Protocol. Further work in this general area, including a possibility for developing guidelines on public participation in international forums, will be undertaken within the framework of the Aarhus Convention, and other convention bodies will be invited to participate in that work.

Specific activities and relevant case studies***Case Study in Public Participation in Decision Making on Water Supply, Jarva County, Paide town and municipality, Estonia***

This case study was presented at the Workshop on Good Practices in Public Participation at the Local Level, organized under the auspices of the Aarhus Convention (Newcastle, United Kingdom, April 2000). It showcases how the requirements of Article 7 of the Aarhus Convention were met by the public authorities in the Estonian town of Paide. The local government presented different options for providing water to the public and organized public hearings and media events to enable the public to participate in decision-making on this issue. In addition, the government used the Internet as forum for communication and thus improved the effectiveness of public participation. The public demanded additional research to be carried out, the result of which showed that the water layer under Paide was not suitable to supply the town. As a result of this exercise, the local government was able to select the most suitable option to resolve the issue of water supply.

Case Study in Innovative Approaches to the Use of Electronic Information Tools to Implement the Aarhus Convention, Environmental Information Service (ENFO), Ireland

This case study is part of the compendium of good practices in the use of electronic information tools, prepared by the Regional Environmental Center for Central and Eastern Europe for the Aarhus Convention's Electronic Tools Task Force in March 2001. Established in September 1990, ENFO is the Environmental Information Centre of the Irish Department of the Environment and Local Government and one of the world's largest public access information centres. It provides information divided into ten subject areas, one of which deals directly with water pollution. Recently, an ENFO request for information on monitoring models for water quality in rivers and lakes was forwarded to UNEP-Infoterra web site, and replies were received from forty countries throughout the world. This case study implements Article 4, paragraph 1b of the Aarhus Convention, which requests public authorities to make environmental information available to the public in response to a request for environmental information. The compendium is a tool of promoting more effective implementation of the Aarhus Convention at the regional and national levels.

Creating networks within and outside the UN family for enhanced cooperation: use, management and protection of internationally shared aquifers in the Mediterranean region

Mohammed Al-Eryani

United Nations Economic and Social Commission for Western Asia, P.O. Box 11-8575, Beirut, Lebanon
e-mail: aleryani@un.org, web site: <http://www.escwa.org.lb>

Bo Libert

United Nations Economic Commission for Europe, 8-14 Avenue de la Paix, Palais des Nations, 1211 Geneva, Switzerland
e-mail: bo.libert@unece.org, web site: <http://www.unece.org/env/welcome.html>

Stephen M. Donkor

United Nations Economic Commission for Africa, P.O. Box 3001, Addis Ababa, Ethiopia
e-mail: donkor@un.org, web site: <http://www.uneca.org/>

Branko Bosnjakovic

EST Consultancy – Environmentally Sustainable Transition, Chateau de Tannay, 1295 Tannay, Switzerland
e-mail: branko.bosnjakovic@bluewin.ch

Background

With growing water scarcity and/ or quality deterioration in many countries of the Mediterranean region, the contribution and role of shared groundwater aquifers in meeting the growing water demands is likely to increase in significance, thereby increasing competition over these fragile resources. Technical cooperation and cooperative arrangements to jointly develop, manage and protect shared aquifers will become a necessity to optimise the utilization of such aquifers, and defuse any potential user conflict.

The Ministerial Declaration of The Hague (World Water Forum, March 2000) on Water Security in the 21st century identified management of international shared water resources, to promote peaceful cooperation and develop synergies between different users through cooperation between adjacent states, as a main challenge to achieve water security. In this context internationally shared aquifers represent a substantial and secure supply for many socio-economic uses that are critical for national and regional water security in the Mediterranean region. That is why the three regional commissions, the United Nations Economic and Social Commission for Western Asia – ESCWA, the United Nations Economic Commission for Europe – UNECE – and the United Nations Economic Commission for Africa – ECA, have been actively implementing various activities aiming to improve the management of internationally shared groundwater resources. On the other hand, improved management of these shared resources will also support the implementation of the UN World Water Assessment Programme.

While sustainable utilization, management and protection of internationally shared groundwater resources is a topic which attracts wide attention, this is not sufficiently reflected in the available instruments at global and regional levels. This gap represents a major constraint to sustainable utilization, management and protection of internationally shared groundwater resources.

The Mediterranean countries are facing common challenges and development constraints related to water scarcity and resource degradation, and many are becoming increasingly dependent on internationally shared water resources. As much as 80% of the water resources in the Mediterranean region depend on shared water. In this case there is the need and scope for inter-regional cooperation and coordination in between and among the countries in the three regions.

Groundwater constitutes more than 60% of the total available freshwater resources in the ESCWA region and is the major source of water for the North African member states of ECA. A considerable number of the aquifers in the regions are shared between two or more countries. This calls for the development of tools and guidelines for cooperation to mobilize and manage shared groundwater resources, both aquifers directly connected to surface waters as well as non-connected ones.

A considerable number of member states in the ESCWA, UNECE and ECA regions are littoral Mediterranean countries and several others are located within the Mediterranean basin. The Mediterranean region includes the North African countries within ECA, several Near Eastern countries within ESCWA, and within UNECE several EU Members States, countries in transition and others. Egypt is member of both ECA and ESCWA.

This is the reasoning behind the inter-regional Mediterranean initiative taken by the three UN Regional Commissions. Within the framework of this initiative, joint activities will be developed to enhance the development of guidelines and instruments for a sustainable use of internationally shared groundwater aquifers.

A substantial experience with the management tools for monitoring, assessment and management of internationally shared groundwaters is already available at the regional level, especially within UNECE. These include frameworks and implementing mechanisms of the UNECE Convention on the Protection and Use of Transboundary Waters and International Lakes, the Convention on Environmental Impact Assessment in the Transboundary Context, and a number of non-binding guidelines, e.g. on monitoring and assessment of transboundary groundwaters.¹

The development of appropriate improved management tools and corresponding capacity building packages for shared groundwater management in the Mediterranean region under the present initiative is expected to complement ongoing activities. The initiative will be implemented in cooperation and in support of the Internationally Shared Aquifer Resources Management Programme initiated by UNESCO, IAH (International Association of Hydrogeologists), FAO and UNECE.

Within the Mediterranean region the present initiative is expected to be complementary to ongoing and planned activities under the Mediterranean Action Plan (Barcelona Convention) as well as the EU supported Short and Medium-term Priority Environmental Action Programme (SMAP). It should be noted that SMAP does not include all the countries in the Mediterranean region.

The UNECE, ESCWA, ECA Interregional Mediterranean Initiative can provide a useful medium to build critical mass, whereby projects can be identified for additional funding. Furthermore, the experiences, and methodology to be gained from the individual projects can also be transferred to other regions within the three UN Regional Commissions. It is expected that the inter-regional Mediterranean initiative will result in strengthening or creating networks of practitioners within, and outside the UN family for enhanced cooperation in support of existing economic and political declarations and agreements.

Development of the initiative

In June 2000, the three Regional Advisors from ECA, ESCWA and UNECE, together with the Chief of ESCWA Natural Resources Section and the representative of UNESCO met in Sharm El-Sheikh, during the ESCWA-CEDARE (Centre for Environment and Development for the Arab Region and Europe) organized Expert Group Meeting on the legal aspects of the management of shared water resources, to identify specific area of cooperation in the water / environment field.

The Expert Group Meeting reaffirmed that the Mediterranean countries are facing common environmental problems and resulting development constraints related to water scarcity and resource degradation, and many are becoming increasingly dependent on internationally shared water resources, in particular groundwaters. Substantial experience exists with monitoring, assessment and management of groundwaters at regional level, especially within UNECE and ESCWA experience with shared aquifers mapping and assessment.

Based on these experiences, and experiences of other organizations, the protection and management of shared international groundwater aquifers was identified as the most appropriate area of cooperation, especially given the heightened interest in these resources in the three regions and the potential gains from exchange of experiences in the three Commissions and UNESCO. Interest in shared aquifers arises from their growing importance for water supply and increasing concern for their quality deterioration.

Accordingly, a draft joint proposal for the above initiative was prepared by ESCWA, UNECE, ECA Regional Advisors on Water Resources and Environmental Management, and water experts of ESCWA Natural Resources Section.

¹ UNECE, 2000. Guidelines on Monitoring and Assessment of Transboundary Groundwaters. UNECE Task Force on Monitoring and Assessment under the Convention on the Protection and Use of Transboundary Watercourses and International Lakes. Available at the web site of the International Water Assessment Centre (IWAC) at <http://www.iwac-riza.org>.

The initiative aims at developing tools and mechanisms for sustainable utilization, management and protection of internationally shared groundwater resources in the Mediterranean Region with ESCWA as lead organisation. The initiative has been approved by the regional commissions for implementation in cooperation with interested donors.

Since the meeting in Sharm El-Sheikh, the following activities have been undertaken:

- The proposed project was officially approved by the Executive Secretaries of the three regional commissions, with ESCWA being designated as the leading agency for this project;
- Contacts were made with several international organizations, UNEP MAP – Mediterranean Marine Pollution Monitoring and Research Programme (MEDPOL), Short and Medium-term Priority Environmental Action Programme supported by EU, and the Internationally Shared Aquifer Resources Management Programme which is managed by UNESCO, IAH, FAO and UNECE, to ensure that the proposed project does not duplicate existing activities. All contacts were positive;
- An Informal Consultative Meeting was organized in Beirut on 10-11 April 2001, during which the project partners were briefed on UNECE preparatory activities and the efforts in identifying potential funding sources. ESCWA also briefed the participants on the steps taken in implementing the recommendations of Sharm El-Sheikh meeting, which are of relevance to the proposed project. Other issues discussed included alternative funding source apart from EC funding (GEF and UNEP) as well as the availability of seed money from UNESCO and United Nations University for helping in preparation stage;
- In a subsequent side meeting, which was organized during the Conference on Hydrological Challenges in Transboundary Water Resources (Koblenz, 25-27 September 2001), a Working Session with UNECE, UNESCO and FAO representatives was especially held to coordinate the programmes of the various agencies in shared groundwater resources. UNESCO, which is currently engaged in the Internationally Shared (Transboundary) Aquifer Resource Management Programme (ISARM/TARM Programme), renewed its interest in the proposed ESCWA-UNECE-ECA project and its readiness to financially support the project preparation;
- In January 2002, consultations were made with UNESCO Regional Bureau for Science in Europe regarding the launching phase of the proposed project. It was agreed that the project management structure would include the three UN Regional Commissions and UNESCO International Hydrological Programme (IHP). There will be a Steering Committee, with members to be nominated by each of these agencies, in order to coordinate and harmonize any sub-project, procedures and results. The Ministerial Round Table held in UNESCO headquarters on 24 October 2001 adopted an initiative on Rebuilding Scientific Cooperation in South Eastern Europe. The initiative recognizes the need for launching collaborative projects in some strategic fields, among which “water and sustainable development” was selected. It is now expected that for each of these fields, an ad hoc Working Group be convened with the aim of elaborating major regional cooperative projects to be submitted to potential donors. Following the discussions during the European Meeting of IHP National Committees held in Berlin on 19 February 2002, it was agreed that one of these projects could be dedicated to Sustainable Utilisation, Management and Protection of Internationally Shared Groundwater Resources in South-Eastern European Countries. Croatian Waters has proposed to take up the responsibility, and was given the task to convene in June 2002 a specific Working Group Meeting dedicated to the discussion and elaboration of a cooperative research project proposal on this subject. At present the project proposal is being elaborated;
- In January 2002, a consultant was engaged to carry out a reconnaissance desk-survey of the major internationally shared aquifers within the Mediterranean region. The survey was commissioned by ESCWA in collaboration with UNESCO. This included review of aquifer nomenclature, distribution and key features. A hydrogeological review report was prepared and it will contribute to the subsequent preparation of a detailed proposal for the interregional project;
- On 27-28 February 2002 a consultative meeting of 10 Regional Experts was held in Beirut under the auspices of ESCWA and with financial support from UNESCO-IHP/ISARM to achieve three objectives: a) supplement and strengthen the findings of the above mentioned reconnaissance desk-survey; b) review some of the national/regional experiences associated with shared aquifers’ study and management; and c) discuss the way ahead in the finalization of a draft proposal for the above mentioned planned project. While the detailed shape of the project will be discussed and finalized with ESCWA, it was proposed that the project should consider focusing on two of the following pilot aquifers (one in East Mediterranean and one in West Mediterranean):

- In Syria - Lebanon: the Anti-Lebanon Cenemonian - Jurassic limestone aquifer;
- In Morocco - Algeria: the Wajda aquifer;
- In Turkey - Syria: the Ras El-Ein (Eocene) aquifer.

Competent authorities in Lebanon, Syria, Algeria, Morocco, and Turkey are to be approached by ESCWA, UNECE and ECA, to gain their approval for selection of pilot aquifers.

A project application was elaborated by ESCWA, UNECE and ECA during the spring and summer of 2002 to the UN Development Account. The project proposal includes three areas of activities:

- Comparative analysis of existing instruments for shared groundwater management;
- Evaluation and adaptation of existing water visions, forecasts to shared aquifers and development of database on shared aquifers in the Mediterranean region; and
- Case studies in support of establishment of joint arrangements for management of internationally shared aquifers in the Mediterranean region.

Beneficiaries of the project will include the national and local water authorities as well as individual water users in the Mediterranean region.

The envisaged partner organizations shall include: The International Network on Water, Environment and Health of UNU, UNESCO, FAO, CEDARE and UNEP-MAP and other international and regional organizations.

With ESCWA as the lead agency, the project will be supervised by the three regional commissions and UNESCO. Participating countries will be represented by one or more lead country in each of the three regions. Funding has not been approved yet.

Concluding Remarks

The planned project on “Sustainable Utilization, Management and Protection of Internationally Shared Groundwater Resources in the Mediterranean Region” addresses the issue of internationally shared aquifers. An issue which is gaining an increasing importance for many Member countries in the three regions of ESCWA, UNECE and ECA.

Given the varied experiences of countries in the region in the management of shared aquifers, the project will certainly provide an opportunity not only to enhance regional cooperation through the creation of networks within and outside the UN family but also to exchange and reinforce relevant experiences and best practices.

Joint Transboundary Water Commission (TWC) - Slovak-Hungarian Water Quality Working Group

Milan Matuska

Ministry of the Environment of the Slovak Republic, Namestie L. Stura 1, 81235 Bratislava, Slovak Republic
e-mail: matuska.milan@enviro.gov.sk, web site: <http://www.enviro.sk>

Jarmila Makovinska

Water Research Institute, Nábrežie arm. gen. L. Svobodu 5, 812 49 Bratislava, Slovak Republic
e-mail: Jarmila_Makovinska@vuvh.sk, web site: <http://www.vuvh.sk>

György Simonfai

Ministry of the Environment and Water of Hungary; Fő utca 44-50, 1011 Budapest, Hungary
e-mail: simonfai@mail.ktm.hu

Ferenc László

Water Resources Research Centre (VITUKI), Kvassay út 1, 1095 Budapest, Hungary
e-mail: laszloferenc@vituki.hu, web site: <http://www.vituki.hu/>

Historical review

The first agreement on transboundary waters signed between Hungary and Czechoslovakia in 1937 did not even mention water-quality issues, and the second one of 1954 failed to address them in sufficient detail.

The agreement, which is currently in force, was signed in 1976 and entered into force in 1978. It was regarded as an advanced one and has met the interests of both Parties. The part of the agreement on water pollution control contains provisions on the following topics:

- Maintaining the transboundary rivers in clean condition;
- Regular water-quality monitoring of transboundary rivers and assessment of the results;
- Joint efforts to control pollution accidents.

As regards the latter, it should be noted that this was the first international legal instrument in Central Europe, which – in the event of a pollution accident – obliged the State on whose territory the accident occurred to notify the event without delay, via its competent authority, to the counterpart authority of the other State, and to introduce prompt measures to mitigate the consequences and to prevent recurrence.

Within the Water Pollution Control Subcommittee (hereinafter: Subcommittee), established under the agreement, both Parties have adopted a “policy of small steps”, raised gradually the level of cooperation, expanded the number of parameters to be monitored and improved the analytical techniques applied. The following step of development was introduced by the resolutions adopted at the 36th and 42nd sessions of the Transboundary Water Commission (TWC), in 1975 and 1981, that also acknowledged the changes made so far. Successive improvements within the Subcommittee include the following matters:

- Increase of the number of monitoring stations;
- Increase of the number of water-quality parameters;
- Refinement of the assessment methods;
- Introduction of the assessment of changes in water quality over time; and
- Modification of the set of limit values applied in connection with the emergency measures taken at times of pollution accidents.

Requesting both official opinions in the authorization procedure for waste-water discharges that directly affect transboundary waters has become routine practice during the past eight years. The opinions are recorded in the minutes of the Subcommittee. New Regulations containing recent amendments have been approved at the 55th TWC session in 1995, while an updated version was adopted at the 60th TWC session in 1998.

The only change prompted by the disintegration of Czechoslovakia in 1993 concerned the name of the Commission, which continued its activities henceforth as the Slovak-Hungarian Transboundary Water Commission.

The agreement formulated 20 years ago as the basis for cooperation has obviously become obsolete as regards water-pollution control. Therefore, the meeting of the Plenipotentiaries in October 1999 decided to start working on the modernization of the agreement.

Review of the Water Quality Subcommittee's activities

The Subcommittee on water quality started functioning in 1963, so the review covers a time span of nearly four decades. The Subcommittee was named the "Working Group" or "Working Committee" up to 1976. Subcommittee's sessions are normally held twice a year. The primary subject of the spring session is the review of water quality over the preceding year (including also any pollution accidents), whereas the autumn session is primarily devoted to issues of methodological developments and other improvements.

The expansion of the Subcommittee's activities is illustrated in Table 1, which shows the streams, the number of the water-quality parameters monitored, the number of samples taken and the set of limit values (criteria) applied. Three periods can be distinguished:

- The period from 1963 to 1975 was characterized by an extremely low sampling frequency (1-4 samples/year), furthermore due to the lack of applicable limit values, the results were assessed verbally, using ad hoc adjectives, like good, acceptable, poor, etc., to describe water quality. The number of parameters was 11;
- During the 1977-1990 period, permanent sampling stations were agreed upon, the sampling frequency was raised to 12 samples/year, a 4-class system of assessment was introduced together with the relevant value of the measurement data (normally the arithmetic mean of the three poorest data of 12 samples), tabulation thereof and a supplementary verbal assessment. The number of parameters was raised to 17;
- In 1991, statistical interpretation of the measurement data and a more sensitive 6-class system of assessment were introduced. In the assessment report the tables contain the key statistical parameters of the past two years (or 24 data), like minimum, mean, maximum, the 90% and sometimes the 10% percentile values, accompanied by the class ranking. A detailed verbal assessment by components or family of components is attached. The number of parameters monitored has increased to 34 during this period.

Beyond the basic tasks of the Water Quality Working Group (WQWG) and due to the debate on the construction of the Gabčíkovo Water Scheme (GWS), the Joint Transboundary Water Commission (TWC) decided to launch a Joint Extended Slovak-Hungarian Monitoring Programme in 1989, aimed at providing information on changes in the water regime, especially in water quality. At present, there are twelve-year monitoring data processed available, providing information about the trends in the water-quality regime in relevant area.

As it was decided by the Plenipotentiaries of the TWC from Hungary and Slovakia, a specific and comprehensive report based on joint extensive monitoring "Trends and Dynamics of Water Quality Changes of the Danube River and its Tributaries (1989 - 2000)" was elaborated in March 2002. This report is available at present for restricted use, but after official approval by the Plenipotentiaries, a wide publishing is envisaged.

Table 1. Sampling sites, sampling frequency, method of assessment, classification system, number of measured components between 1963-2001

Year 19-20-	Danube (Bratislava)	Danube (Rajka)	Danube (Medve)	Danube (Sturovo)	Danube (Szob, left bank)	Danube (Szob, middle)	Danube (Szob, right bank)	Mosoni-Danube	Seepage canal	Ipel/Ipoly (Ipolytarnóc)	Ipel/Ipoly (Letekés)	Sajó	Bódva	Szartos canal	Hernád	Bodrog	Ronyva	Tisza	Method of assessment	Classification system	Number of measured components
63	1	1				1				1		2	2			2			Verbal		11
64-67	1	1				1				4		4	4			4			Verbal		11
68-69	2	2				2				4		4	4			4			Verbal		11
70	3		3	3						4		4	4			4			Verbal		11
71-75	3		3	3		3				4		4	4			4			Verbal		11
76-77			12			12				12	12	12	12			12			Verbal+Table	I-IV	17
78-81			12			12				12	12	12	12			12			Verbal+Table	I-IV	17
82-90					12	12	12			12	12	12	12			12	12	12	Verbal+Table	I-IV	17
91					12	12	12			12	12	12	12			12	12	12	Verbal+Table	I-VI	34
92-98					12	12	12			12	12	12	12			12	12	6	Verbal+Table	I-VI	34
99-01					12	12	12	12	12	12	12	12	12			12	12	6	Verbal+Table	I-VI	34

The latest results of the measurements that have been evaluated during the recent 75th session of the WQWG, held on 8-12 April 2002, are illustrated in the Tables 2 to 4. Table 2 shows the tabulated assessment of the monitoring data from the sampling station Mevedov-Vámosszabadi on the Danube. Table 3 shows the class ranking of water quality at various sampling stations by components, while Table 4 gives the same class ranking by families of parameters.

The Subcommittee has devoted special attention to assessing the variations in water quality over time. From the records of the past ten years it is concluded that the data on organic industrial pollutants and the biological parameters indicate deterioration in the Danube and the Ipeľ/Ipoly. As regards the transboundary rivers in eastern Slovakia, all component groups show improvement except for the biological parameters, in particular the coliform count. It can be further observed that:

- The pH has shifted – however slightly – towards the alkaline range for the Rivers Bódva, Szartos, Bodrog and Ronyva;
- The ammonium concentrations have considerably improved at all stations;
- The vast majority of the other parameters monitored also indicated improvement.

The improvement observed in the various parameters is attributable to the hydro-meteorological conditions (suspended solids, total iron, manganese), to the economic recession and/or to the improvement in wastewater treatment.

Table 2. Evaluation of the measured results

River: Danube - Sampling site: Medve Year: 2000-2001								
Parameter	Unit	Minimum	Mean	Maximum	Percentile		Number of measurements	Class
					90%	10%		
General physical and inorganic chemical parameters								
Water temperature	°C	3.1	11.7	21.0	20.1		24	II
pH	-	7.9	8.2	8.5	8.4	7.9	24	II
Dissolved oxygen	mgO ₂ .l ⁻¹	7.7	9.9	11.7	11.4	8.1	24	I
DO saturation	%	77	90	111	97	82	24	II
Conductivity	µS.cm ⁻¹	290	371	466	450		24	II
Total dissolved solids	mg.l ⁻¹	133	250	345	313		24	II
Suspended solids	mg.l ⁻¹	8	25	54	41		24	III
Hardness (CaO)	mg.l ⁻¹	85	109	138	131		24	I
Chloride	mg.l ⁻¹	11.9	17.4	27.7	24.5		24	I
Sulphate	mg.l ⁻¹	25.1	32.7	43.1	37.5		24	I
Iron (total)	mg.l ⁻¹	0.11	0.47	2.00	1.01		24	III
Manganese	mg.l ⁻¹	0.02	0.06	0.24	0.08		24	II
Ammonium	mgN.l ⁻¹	0.03	0.09	0.22	0.16		24	II
Nitrite	mgN.l ⁻¹	0.01	0.02	0.05	0.04		24	IV
Nitrate	mgN.l ⁻¹	0.92	1.99	3.35	3.09		24	III
Total nitrogen	mgN.l ⁻¹	1.23	3.08	4.89	4.12		24	-
Orthophosphate	mgP.l ⁻¹	0.01	0.05	0.10	0.08		24	III
Total phosphorus	mgP.l ⁻¹	0.05	0.10	0.20	0.13		24	II
General organic parameters								
COD _{Mn}	mgO ₂ .l ⁻¹	2.3	3.3	5.1	4.6		24	I
COD _{Cr}	mgO ₂ .l ⁻¹	6.9	10.0	15.8	13.2		24	I
BOD ₅	mgO ₂ .l ⁻¹	1.2	1.7	2.6	2.2		24	II
Organic nitrogen	mg.l ⁻¹	0.24	0.97	2.18	1.44		24	III
Inorganic micropollutants								
Mercury	µg.l ⁻¹	<0.03	0.10	0.32	0.11		24	II
Cadmium	µg.l ⁻¹	<0.02	0.08	0.28	0.20		24	I
Lead	µg.l ⁻¹	0.6	1.0	1.9	1.20		24	I
Copper	µg.l ⁻¹	1.4	3.7	20.5	4.4		24	I
Chromium	µg.l ⁻¹	0.5	1.2	3.1	1.7		24	I
Zinc	mg.l ⁻¹	<0.001	0.022	0.050	0.035		24	I
Organic micropollutants								
ANA detergents	mg.l ⁻¹	0.01	0.04	0.13	0.05		24	II
Phenols	mg.l ⁻¹	0.002	0.003	0.005	0.004		24	II
Oils	mg.l ⁻¹	0.02	0.03	0.21	0.05		24	II
Biological parameters								
Saprobity index	-	1.96	2.25	2.41	2.34		24	III
Chlorophyll-a	mg.m ⁻³	1.0	15.0	90.2	35.4		24	III
Coliform-bacteria	i.ml ⁻¹	8	31	255	49		24	IV

Table 3. Summary table of water-quality classes of the specific parameters in the monitored rivers in 2000-2001

Parameter	Unit	River, sampling sites													
		Danube, Medve	Danube, Szob (left bank)	Danube, Szob (middle)	Danube, Szob (right bank)	Mosoni-Danube	Seepage canal	Ipe/Ipoly (1)	Ipe/Ipoly (2)	Sajó	Bódva	Szartoscanal	Hernád,	Bodrog	Ronyva canal
General physical and inorganic chemical parameters															
Water temperature	°C	II	II	II	II	I	I	II	II	II	II	II	II	II	II
pH	-	II	II	II	II	II	II	II	II	II	II	I	II	I	I
Dissolved oxygen	mgO ₂ .l ⁻¹	I	I	I	I	II	II	II	II	I	I	II	II	II	I
DO saturation	%	II	II	II	II	II	II	III	II	II	I	II	II	II	II
Conductivity	µS.cm ⁻¹	II	II	II	II	II	II	II	II	II	II	III	II	I	II
Total dissolved solids	mg.l ⁻¹	II	II	II	II	II	I	II	II	II	II	III	II	I	II
Suspended solids	mg.l ⁻¹	III	III	III	III	III	I	IV	IV	III	III	III	IV	II	III
Hardness (CaO)	mg.l ⁻¹	I	I	I	I	I	I	I	II	II	II	III	II	I	I
Chloride	mg.l ⁻¹	I	I	I	I	I	I	I	I	I	I	III	I	I	I
Sulphate	mg.l ⁻¹	I	II	I	I	I	I	II	II	II	II	III	II	I	II
Iron (total)	mg.l ⁻¹	III	III	II	II	II	I	III	III	II	II	II	III	II	I
Manganese	mg.l ⁻¹	II	III	II	II	III	II	IV	III	III	III	III	III	III	III
Ammonium	mgN.l ⁻¹	II	III	II	II	II	I	IV	III	III	III	III	IV	III	III
Nitrite	mgN.l ⁻¹	IV	IV	IV	IV	IV	III	V	IV	IV	V	V	V	IV	IV
Nitrate	mgN.l ⁻¹	III	III	II	III	III	II	III	III	III	IV	IV	III	II	II
Total nitrogen	mgN.l ⁻¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Orthophosphate	mgP.l ⁻¹	III	III	III	III	III	II	V	IV	III	III	II	IV	III	IV
Total phosphorus	mgP.l ⁻¹	II	III	III	III	II	II	IV	IV	III	III	II	IV	III	III
General organic parameters															
COD _{Mn}	mgO ₂ .l ⁻¹	I	II	I	II	I	I	II	II	I	II	I	I	I	II
COD _{Cr}	mgO ₂ .l ⁻¹	I	II	II	II	I	I	III	III	II	III	II	II	II	II
BOD ₅	mgO ₂ .l ⁻¹	II	III	II	II	II	I	III	III	III	II	II	III	II	II
Organic nitrogen	mg.l ⁻¹	III	I	I	I	III	III	II	II	-	-	-	-	-	-
Inorganic micropollutants															
Mercury	µg.l ⁻¹	II	III	III	II	II	III	II	III	I	I	III	I	I	II
Cadmium	µg.l ⁻¹	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Lead	µg.l ⁻¹	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Copper	µg.l ⁻¹	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Chromium	µg.l ⁻¹	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Zinc	mg.l ⁻¹	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Organic micropollutants															
ANA detergents	mg.l ⁻¹	II	II	II	II	II	II	II	II	II	II	II	II	II	II
Phenols	mg.l ⁻¹	II	II	II	II	II	II	II	II	II	II	II	II	II	II
Oils	mg.l ⁻¹	II	III	III	III	II	II	IV	III	II	II	III	III	II	II
Biological parameters															
Saprobity index	-	III	III	III	III	III	III	III	III	III	III	III	III	III	III
Chlorophyll-a	mg.m ⁻³	III	III	III	III	II	II	II	IV	I	II	I	II	I	I
Coliform-bacteria	i.ml ⁻¹	IV	V	V	V	IV	IV	V	IV	V	V	V	V	V	V

Table 4. Summary table of the water quality classes of the groups of water-quality components in the monitored rivers in 2000-2001

River	Sampling site	Water quality class				
		General parameters		Indicators of industrial pollution		Biological parameters
		physical, chemical	organic	inorganic	organic	
Danube	Medve	IV	III	II	II	IV
Danube	Szob (left bank)	IV	III	III	III	V
Danube	Szob (middle)	IV	II	III	II	V
Danube	Szob (right bank)	IV	II	II	III	V
Mosoni-Danube	Border section	IV	III	II	II	IV
Seepage canal	Upstream of confluence	III	III	III	II	IV
Ipel/Ipoly	Ipolytarnóc	VI	III	II	IV	VI
Ipel/Ipoly	Letkés	IV	III	III	III	IV
Sajó	Sajópüspöki	IV	III	I	II	V
Bódva	Hídvégárdó	V	III	I	II	V
Szartos canal	Tornyosnémeti	VI	II	III	III	VI
Hernád	Tornyosnémeti	VI	III	I	III	VI
Bodrog	Streda nad Bodrogom	IV	II	I	II	VI
Ronyva canal	Sátoraljaújhely	IV	II	II	II	VI

Pollution accidents

Pollution accidents have figured regularly on the sessions' agendas since 1963. Recurring pollutant waves before 1990 from eastern Slovakia have caused severe problems and losses in Hungary. These have not only limited industrial water intakes, but also jeopardised surface water intakes for domestic purposes. Besides industrial effluent discharges, diffuse, non-point pollutants, like fertiliser leached by run-off, have often caused concern. With regard to pollution accidents, the situation changed radically in the recent years. Their number decreased and their consequences (the impact on water users) became less severe. For instance, except for a single oil spill caused by a pipe burst on the Ipel/Ipoly River, no pollution accident has occurred on this river in eastern Slovakia in 2001.

Accidental pollution affects both environment and population. The former suffers often significantly, especially aquatic biota, as species decrease dramatically or in some cases are eliminated. The population is under psychological pressure and suffers economic losses because of the necessity to take expensive remediation measures and of the decrease of value of impacted area, especially areas that are used by the tourist industry of the country.

Recognizing the importance of this issue, the WQWG undertook, with the official support by the Plenipotentiaries of both Hungary and Slovakia, a partial programme focused on preventive measures for accidental spills and their consequences for transboundary rivers. Depending on the character of the transboundary river, there are two kinds of emergency plans:

- Harmonized emergency plans for watercourses crossing the territorial borders (annex 1);
- Joint emergency plans for watercourses forming the territorial borders (annex 2).

The basic differences are:

- If the watercourse crosses the borders, each country is responsible for the development of its own emergency plan. The structure is jointly agreed. The emergency warning directed to the downstream country should be adjusted according to the time needed for preparatory steps to start with preventive measures in the downstream country;
- If the watercourse is at least partially identical with the State borders, i.e. common for both countries, the emergency plan will be developed jointly according to a structure agreed at the meetings of the specialists nominated by the WQWG Chairmen.

Two years ago, a harmonized emergency plan for the Bodrog River (upper part of the Tisza River basin) was developed. Nowadays, a joint emergency plan for the Ipel/Ipoly River is under preparation – its final version will be completed in 2003.

Conclusion

Activities performed in the framework of the Slovak - Hungarian Transboundary Commission and of the Water Quality Working Group (WQWG) focus on problems which are generally defined by the bilateral agreement between the two countries. In addition, the working programme of the WQWG deals with specific questions of the region. More progress was achieved on some of them because of the existence of common pressure and joint efforts. Others might be resolved successfully in the future having a good basis in the results achieved by the joint bilateral body.

Annex I

Content of a harmonized emergency plan for border crossing rivers

1. Problems analysis and identification

- 1.1. Introduction
- 1.2. Definitions and terminology
- 1.3. Emergency situation solution and consequences disposal
- 1.4. Emergency plan use

2. Harmonized emergency plan

- 2.1. Characterization of the area and its determination
 - 2.1.1. Concise characterization of the river basin
 - 2.1.2. Determination of the relevant part of the river basin
 - 2.1.3. Characterization of the natural conditions related to protection of waters against accidental spills
 - 2.1.4. Organization responsible for the river basin
- 2.2. Emergency pollution of transboundary watercourses
 - 2.2.1. Water quality characterization of watercourses in the river basin
 - 2.2.2. Potential accidental spills to transboundary watercourse
 - 2.2.3. Incidence of harmful/dangerous substances in the river basin
 - 2.2.4. Inventory of the harmful/dangerous substances and their potential concentration in the cross border profile
- 2.3. Establishment of early emergency system
 - 2.3.1. Organization aspects and communication
 - 2.3.2. Water quality monitoring in the area
 - 2.3.3. Emergency activities performance
 - 2.3.4. Improvement of efficiency of emergency action in cross border profile

Annexes:

1. List of profiles of water-quality monitoring, emergency profiles proper for action and localities of emergency stores
2. Map of relevant drinking water supply sources, scale 1:200 000
3. Map of potential non-point and point pollution sources supported by agreed information, scale 1:200 000

Annex II

Content of a joint emergency plan for rivers that form the border

1. Problems analysis and identification

Chapter is identical with Harmonized Emergency Plan

2. Joint emergency plan

2.1. Characterization of the area and its determination

Sub chapter is identical with Emergency Plan Harmonized

2.2. Emergency pollution of transboundary watercourse

2.2.1. Potential accidental spills in common stretch of the watercourse and their characterization

2.2.1.1. In the relevant national stretch of the transboundary watercourse (in the upstream part)

2.2.1.2. In the tributaries basins of the common stretch of transboundary watercourse including main water stream

2.2.2. Analysis of potential sources of accidental spills

2.2.2.1. In the relevant national stretch of the transboundary watercourse (in the upstream part)

2.2.2.2. In the tributaries basins of the common stretch of transboundary watercourse including main water stream

2.2.3. Potential concentration in the common stretch of the transboundary watercourse

2.3. Solution of emergency situation

2.3.1. Organizational aspects and communication as tools in solution of emergency situation

2.3.2. Common actions

Annexes:

1. List of profiles of water-quality monitoring, emergency profiles proper for action and localities of emergency stores
2. Map of relevant drinking water supply sources, scale 1:200 000
3. Map of potential non-point and point pollution sources supported by agreed information, scale 1:200 000

Developing transboundary cooperation on the Zapadnaya Dvina/Daugava River basin

Evgey Zybin

Ministry of Natural Resources of the Russian Federation, Bolshaya Gruzinskaya, 4/6, 123995 Moscow, Russian Federation
e-mail: tgws@elnet.msk.ru

The 1992 UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (hereinafter referred to as UNECE Water Convention) requires the Parties to enter into agreements, where these do not exist, or update existing ones to achieve the purposes of the Convention. From the very beginning, the Russian Federation entered into consultations with all neighbouring countries to prepare such agreements. Indeed, after the adoption of the Convention in 1992, new bilateral agreements with Estonia, Kazakhstan, Mongolia and Ukraine were drawn up and entered into force. An agreement on transboundary water management with Belarus has also been completed, and it will be signed in Minsk in May 2002. Consultations are conducted to prepare bilateral agreements with Azerbaijan and China, and to draw up two multilateral agreements: one between Belarus, Latvia and the Russian Federation on the Zapadnaya Dvina/Daugava River basin, and the other one between Belarus, Lithuania and the Russian Federation on the River Neman (see Figure 1). In this context, we particularly appreciate the assistance of Sweden and the Legal Advisory System, established under the UNECE Water Convention, to prepare the above multilateral agreements on the Daugava and Neman basins.



Figure 1. Daugava and Neman Rivers

Cooperation on the Zapadnaya Dvina/Daugava River basin

The Zapadnaya Dvina/Daugava River is one of the rivers in the drainage area of the Baltic Sea with a total length of 1,005 km. It flows from the Russian Federation (325 km) into Belarus (328 km) and Latvia (352 km).

One important current task of the three riparian countries is the preparation of a joint report on the environmental situation in the Zapadnaya Dvina/Daugava River basin that will form the basis for cooperation on water-quality management and the use of water resources in the entire river basin. The report also provides the substantiation for the drawing up of an intergovernmental agreement among the three riparian States, the identification of critical situations in the river basin and the establishment of priorities for investment projects to improve the ecological situation in the basin.

To this end, the report will provide the following information: geography of the river basin, point and diffuse pollution sources and their development, and changes in water-quantity and water-quality conditions over the last 10 years. It will contain information on normative documents, such as laws and regulations regarding water-quality monitoring and measurements of water-quantity characteristics. It will also describe

the structure and functions of State institutions, methods of data management and reporting, and laboratory equipment. Finally, it will include proposals for joint transboundary water-quality management.

To prepare and sign an intergovernmental agreement on cooperation on the use and the protection of water resources of the Zapadnaya Dvina/Daugava River basin, intensive discussions took place at two workshops in Sigulda, Latvia, in 1999 and 2001. The current draft consists of 17 articles and is based on the principles of equality, territorial integrity and mutual benefit.

To achieve the purpose of the agreement, the Parties have obligations, including the development and implementation of joint measures and projects on the use, protection and rehabilitation of water resources; scientific cooperation on methods of assessment and classification of water quality and sources of pollution; and data exchange on a regular basis.

A particular article of the draft agreement, related to responsibility and compensation for losses or damage, was intensively discussed, as it contains crucial provisions to restore damaged water ecosystems. Moreover, the article “Amendments” is important, according to which new articles and provisions can be added by consensus.

The draft agreement will also provide for the establishment of a joint body – a trilateral commission – and describes its tasks based on the provisions of the UNECE Water Convention.

Conclusion

The commission that will be created after the adoption of the agreement on the Zapadnaya Dvina/Daugava River basin will start its work under more favorable conditions as compared to other commissions, which have been created before. This is mostly due to the excellent documentation, which was already prepared or will be soon available, including:

- The report on the water environment in the Zapadnaya Dvina/Daugava River basin;
- The report of the TACIS project “Water management of the Zapadnaya Dvina/Daugava River basin, Vitebsk region – Belarus”.

These documents will allow the commission to start its activity and evaluate priorities from the very beginning. Moreover, workshops in the framework of TACIS projects gave us a good opportunity to identify experts and institutions in Belarus, Latvia and the Russian Federation that could participate in the work of the future joint commission. This experience is very valuable and may be used when preparing agreements and setting up commissions in other river basins.

The discharge rule of Lake Saimaa and River Vuoksi: issues for transboundary cooperation

Markku Ollila

Finnish Environment Institute (SYKE), Mechelininkatu 34 a, 00260 Helsinki, Finland
e-mail: markku.ollila@ymparisto.fi, web site: <http://www.ymparisto.fi/syke/syke.html>

Introduction

Bilateral cooperation between Finland and the Russian Federation on the protection and use of transboundary waters started very early. It is based on the 1994 agreement concerning frontier watercourses, which entered into force on 6 May 1995¹. The agreement is very comprehensive and covers all aspects of water management: hydropower production, water regulation, water pollution control, timber floating, fishing and drainage.

The joint Finnish-Russian Commission on the Utilization of Frontier Waters was established in 1965. The Commission's task is to deal with the matters specified in the agreement, to supervise compliance with the agreement and monitor the state of the transboundary waters. The Commission has wide powers; a unanimous decision of the Commission is binding to both Parties.

According to the agreement, authorities of both States are obliged to give to the Commission such information and explanations which are required, and assist the Commission in carrying out its as stipulated by the agreement.

Water resources of Lake Saimaa and River Vuoksi² and their use

The Vuoksi watercourse is the largest of the border watercourses between Finland and the Russian Federation. Its catchment area is 69,500 square kilometres, of which 77% is within the boundaries of Finland and 23% inside the Russian Federation (Figure 1). Lake Saimaa (4,460 square kilometres) is the main lake in the basin, from where the River Vuoksi runs into Lake Ladoga in the Russian Federation. From there, the waters drain into the Gulf of Finland through the River Neva.

In its natural state, the discharge of the River Vuoksi at the border has been 1,170 m³ per second at its maximum, 220 m³ per second at its minimum, and 596 m³ per second on the average. During the observation period of over 150 years, the water level fluctuation range in the Lake Saimaa has been 3.3 m and the average annual fluctuation 0.7 m.

The water resources of Lake Saimaa are important to various forms of utilization. A considerable number of wood processing plants, cities, villages and holiday homes are located on the shores of Lake Saimaa. Fishing, water transport and timber floating play a notable role in the use of the Saimaa watercourse. It is also an important area for boating and other recreational use.

The River Vuoksi has four major hydropower plants: Tainionkoski and Imatra in Finland, and Svetogorsk and Lesogorsk in the Russian Federation. In both countries, industrial waste waters are emitted into the river. Especially in the Russian Federation, the waters of the Vuoksi River are also utilized by industry to a great extent. Small-scale fishing for domestic use is also practiced. Some shore areas are used for housing, farming and recreational purposes or are important for nature protection.

¹ Agreement between the Republic of Finland and the Union of Soviet Socialist Republics concerning frontier water courses, done at Helsinki on 24 April 1964.

² There are different spellings used. In official UN translations of the mentioned agreements, the river is referred to as River Vuoksa.



Figure 1. The Vuoksi River drainage basin

Floods and hydropower

From the Finnish point of view, the key problem has been the flooding of the Lake Saimaa. Very low water levels cause problems as well. For the hydropower plants on the River Vuoksi the natural flow regime during the year is not so favourable, because discharges are at highest during spring and early summer, when the energy demand is normally the lowest.

From the Russian viewpoint, it would also be favourable to improve the energy production capability of the River Vuoksi power plants. Additionally, the shores of the River Vuoksi inside this country are quite flat, which means that flood-flows cause damage to them. Correspondingly, small flow volumes can have negative effect on fishing and water transport.

On the basis of these needs, several plans were made in Finland since the 1930s to regulate Lake Saimaa. Some of the plans aimed mainly to reduce floods and to increase the minimum water levels and some to improve the energy production of the River Vuoksi power plants. In 1948, the former Soviet Union also suggested the regulation of the lake to improve energy production. However, no permanent regulation plans were implemented, because they were considered either too one-sided or the overall benefits were not sufficient.

Final solution in the Commission: alleviation of exceptional situations

The plan on the discharges from Lake Saimaa and River Vuoksi was under preparation in the Commission for a very long time, eighteen years. Originally in 1973 the Soviet part of the Commission proposed that the minimum flow be increased and the difference between summer and winter discharges be changed in such a way that the winter discharge would be increased. The Finnish part, however, did not aim at greater advantages but strived to reduce the maximum floods and to increase the low flows.

Finally, after investigation of several regulation alternatives, an agreement, the discharge rule of Lake Saimaa and River Vuoksi³, entered into force in 1991. Its main purpose is to prevent flood peaks in the Lake Saimaa and, on the other hand, to prevent damage caused by exceptionally low water levels. Regulation of the water level is not continuous, because when there is no threat of flooding or low water levels and the water level remains in the so-called middle-zone (mean water level ± 50 cm), normal discharges and natural water levels are resumed. If the forecasts predict that the water level will rise above the normal zone, discharge volumes will be increased. Correspondingly, low water levels are prevented by reducing the discharge.

The role of the Commission in the implementation of the rule

The implementation of the discharges is discussed and agreed on by the representatives of both countries in the Commission. The discharge rule contains guidelines and procedures for different circumstances and it is in practice possible to get the discharges changed very quickly. In implementing the discharges, the downstream effects are always considered.

In general, the prevention of floods and low water levels in the Lake Saimaa area has negative effects on the River Vuoksi downstream. Primarily, these consist of energy loss due to excessive discharge volumes at Finnish and Russian power plants and flood damage to the shores on the Russian side. Any damage occurring on the basis of changed discharges on the Russian side is paid for by Finland. This sets restrictions on the use of excessive discharge volumes. Preventive actions are also restricted by the fact that the endangered Saimaa seal makes its nest in snow caves on top of the ice. Thus, in winter, the change in the water level of Lake Saimaa must not be so big as to destroy the nests. On the other hand, in some years the discharge rule may be beneficial to power production or may reduce flood damage on the shores of the Vuoksi River, if flood forecasting and discharge decisions are made successfully.

After each period of changed discharges, a report is made on its effects and the matter is discussed in the Commission. If the Commission comes to the conclusion that the changed discharges have caused damage to the Russian side, the Finnish Government will compensate for these. On the basis of the discharge rule, flood peaks have been lowered in Lake Saimaa in 1992, 1994, 1995 and 1998, and low water level has

³ Agreement between the Government of the Republic of Finland and the Government of the Union of Soviet Socialist Republics on the rules of regulating the Lake Saimaa and the Vuoksa River, done at Helsinki on 26 October 1989.

been raised in 2000 (Figure 2). On average, the changed discharges have lasted for four months and the flood peaks have been reduced or low water levels raised by 10 cm. Highly exceptional water situations have not occurred during this decade, so the variations in the discharges have not been great either (Figure 3).

Since the discharge rule came into effect, discharges have been determined by the rule during approximately 15% of the time and natural discharges and natural water levels have prevailed during 85% of the time.

The ultimate aim of the discharge rule is to bring about the best possible outcome from the point of view of both countries. The goals, which various forms of water use set on water levels and discharges, are diverging and it is the task of the Commission to reconcile these varying interests within the scope of the discharge rule.

The application of the discharge rule has been successful. The discharge rule, in comparison with the earlier practice, brings about increased benefits due to smaller floods. At the same time, the loss of energy production caused by excessive discharges is decreased. The discharge volumes can be changed more rapidly and more flexibly than before. The changes in the discharge can also be kept as minimal as possible.

The discharge rule of Lake Saimaa and River Vuoksi is an exceptional solution. Firstly, the rule does not aim to bring advantage to any specific form of water use. The sole objective is to minimize the damage and disadvantages from floods or periods of low water levels. Secondly, the rule is a compromise between constant regulation and full natural condition, because a so-called normal situation, during which the water level is not regulated, prevails most of the time.

Solving the flood problems of Lake Saimaa was a complex process in the work of the Joint Finnish-Russian Commission on the Utilization of Frontier Waters. Though the objectives of the two Parties were originally quite different, a mutually satisfactory solution was reached by the Commission. A significant contributory factor was the by then almost 30 years of common history of cooperation in the Commission.

New ideas and challenges on the Vuoksi river: the VIVATVUOKSIA – EU Tacis project

A new phase of the Finnish-Russian transboundary cooperation started in November 2001, when the EU-Tacis project VIVATVUOKSIA was launched. The project will end in April 2003, and the total costs are 387,000 euros. The initiator of the project was the joint Finnish-Russian Commission.

The aim of the project is to promote and develop sustainable and multiple use of the River Vuoksi and its shores. The main activities are:

- Development of hydrological monitoring;
- Building up of a hydrological model for the River Vuoksi basin on the Russian side;
- Determination of the flood-prone areas, study of the water level fluctuations and drawing up a summary of the impact evaluation methodology;
- Study of the use of land and water on the riverside areas;
- Drawing up principles for building, other land use and water use on the riverside areas.

The work done in the joint Commission formed a good basis for this project. The project broadens cooperation in the Vuoksi watercourse to new spheres of water and land use and nature protection. It involves local authorities and citizens and strives to improve information dissemination and communication between various parties. It is clear, that the project will, as well, give new ideas and challenges for the cooperation in the joint Finnish-Russian Commission on the Utilization of Frontier Waters.

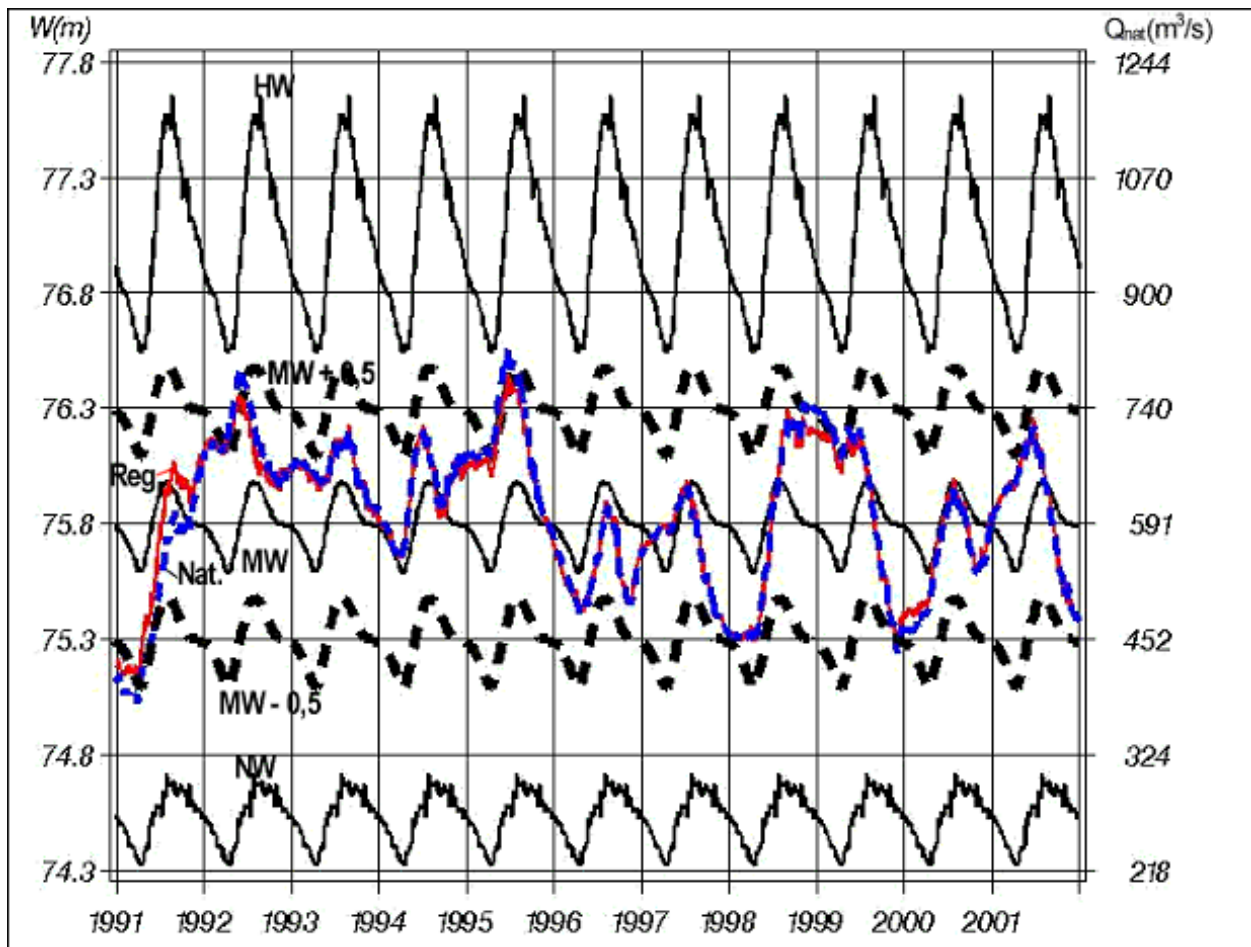


Figure 2. Natural and regulated water levels of Lake Saimaa during the term of the discharge rule

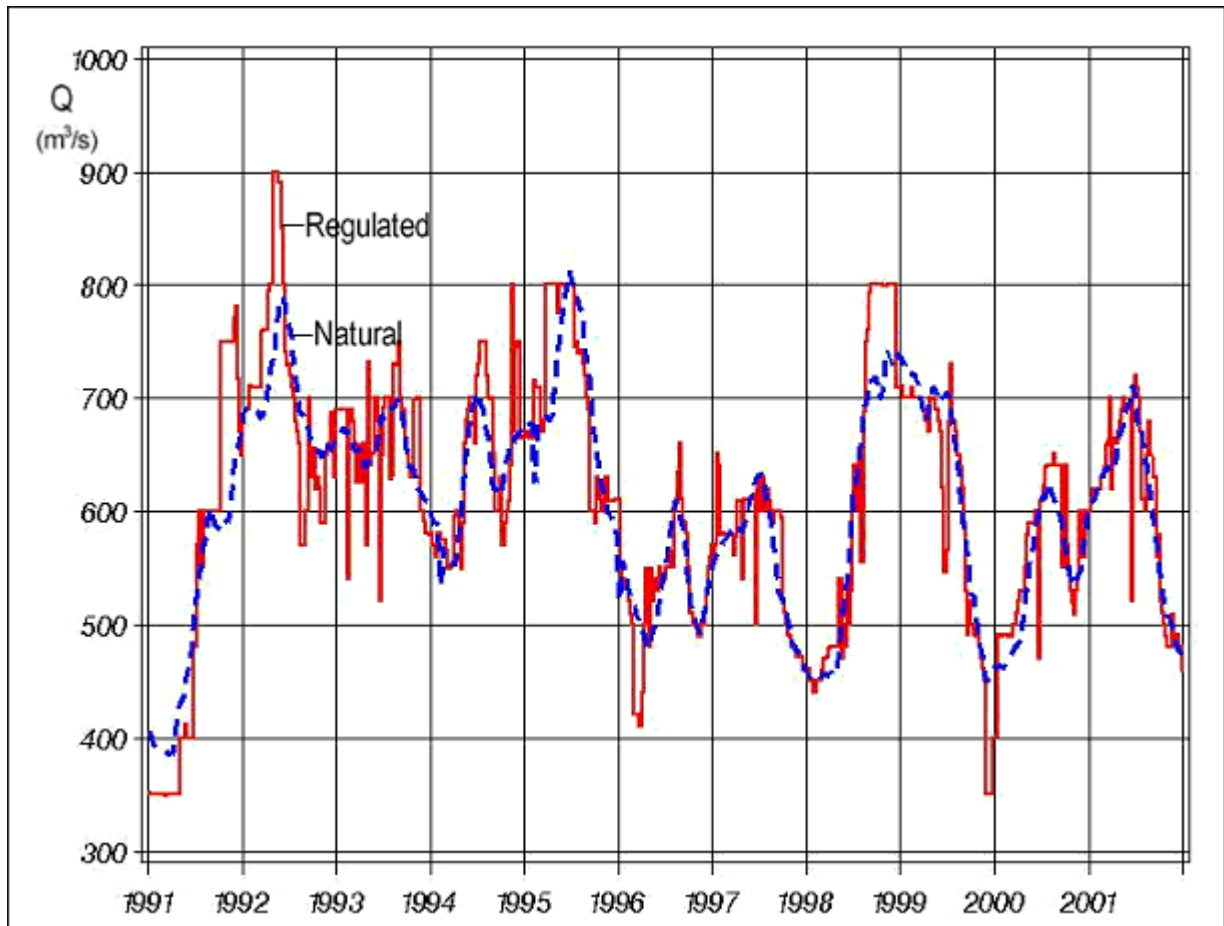


Figure 3. Natural and regulated discharges of Lake Saimaa during the term of the discharge rule

Cooperation in the Meuse River basin

Sander Bastings

Ministry of Transport, Public Works and Water Management, Directorate-General for Public Works and Water Management (Rijkswaterstaat), Postbus 25, 6200 MA, Maastricht, Netherlands
e-mail: a.j.t.bastings@dlb.rws.minvenw.nl, web site: <http://www.rijkswaterstaat.nl>

Introduction

The Meuse River is an important source of prosperity for the regions it flows through *en route* to the North Sea. The importance of the Meuse River for shipping, industry and water supply has considerably increased during the last century. The increasing awareness during the past decades of the needs for a healthy and stable river system, combined with the great floods of 1993 and 1995, have made clear that there are requirements for long-term and reliable cooperation between the countries through which the Meuse River flows. Only international cooperation can assure that the river will continue to be a source of prosperity for future generations.



Figure 1. The Meuse River basin

The Meuse River from source to outlet

The Meuse is a transboundary river, rising in northern France approximately 500 metres above sea level on the Langres Plateau. From there, the river flows for a length of about 900 kilometres through France, Belgium and the Netherlands. Its catchment area of about 32,000 km² has approximately the size of the Netherlands, and is spread over five countries and three language zones. About 9,000 km² of the total catchment area is located in France, a few square kilometres in Luxembourg, 13,000 km² in Belgium, 4,000 km² in Germany and 6,000 km² in the Netherlands.

The Meuse River has a highly variable discharge over the course of the year. The water levels can also vary enormously: generally speaking, water levels are at their lowest just after the summer and at their highest in the months of January and February. Maximum and minimum discharges can differ by a factor of up to 120. The average discharge in the river at the city of Maastricht is approximately 230 m³/s, but the discharge has been known to drop as low as 25 m³/s during periods of low flow, and during floods, such as in 1993, the flow rate exceeded 3,000 m³/s.

Through recent findings concerning global climate changes, there is a considerable uncertainty over the changing flow characteristics of the river. There is a possibility that the already considerable discharge fluctuations could, in the future, increase even further. Previous studies on the Meuse River indicate an increase in the discharge at the end of winter and the beginning of spring and a decrease in the discharge at the end of the summer and the beginning of the autumn.

France

The upper reach of the Meuse River in France is approximately 450 kilometres long. The river flows predominantly through a long and narrow valley in porous terrain with a limestone bed. The nature of the terrain causes a significant portion of the excess rainfall-runoff to be delayed on its way to the river. This area makes an important contribution to the discharge of the Meuse River during periods of low precipitation. The most important tributary of the Meuse River in France is the Chiers.

The construction of weirs made French sections of the Meuse River navigable.

Belgium

The middle reach of the Meuse River in Belgium flows through the Ardennes Plateau. It is approximately 150 kilometres long and is characterized by an impervious rocky base and steep slopes. The excess rainfall-runoff is quickly transported to the river via numerous small streams and creeks. The larger tributaries, in particular the Sambre and the Ourthe, also make significant contributions during periods of high discharge. However, during periods of low flow, this area makes only a minor contribution to the river discharge.

The Meuse River within Belgium has been fully canalised and is navigable for ships from 1,350 to 2,000 tons. Within Belgium, the river level drops from 100 m to 45 m above sea level. 15 mostly modern weirs with sluices overcome this difference of 55 meters. At all weirs, channels with smaller step weirs have been built to facilitate the upstream migration of fish. At the weirs downstream of Namur, hydroelectric power stations have been built and have an output of more than 250 million kWh per annum. The construction of more hydroelectric power stations at weirs upstream of Namur is currently planned.

The Netherlands

For the first 150 kilometres from its inflow point to the Netherlands up to the town of Boxmeer, the river flows through a low, sloping landscape. In the region between Maastricht and Maasbracht, the river forms the border between Belgium and the Netherlands. This 50-kilometre length of the Meuse River has been given the very fitting name of the Common Border Meuse (Grens Maas). Due to a gradient of 0.5 meters per kilometre, the Common Meuse is the fastest flowing and most natural river of the Netherlands.

For the next 150 kilometres, downstream of the town of Boxmeer to the mouth of the river, the Meuse has the character of a lowlands river. The surrounding land has been protected for centuries against flooding by the construction of dykes and in the first half of the previous century, the river was canalised and straightened to facilitate shipping.

The most important tributary is the River Rur, the largest part of its catchment area lies in Germany. The construction of two large weirs has enabled discharge regulation of this river. Thus the River Rur is able to assist in decreasing the discharge in the Meuse during floods and increasing the discharge during periods of low flow.

With the exception of the Grens Maas, the Meuse River within the Netherlands has been made navigable for ships of up to 3,000 tons through the construction of no fewer than seven weirs with sluices. And for

the Grens Maas, the Juliana Canal has been constructed parallel to the river to facilitate shipping. A number of weirs have been equipped with a side passage made up of smaller step-weirs to facilitate the upstream migration of fish. More of these weirs are planned for construction at other locations in the near future. Hydroelectric power plants have been constructed at two weirs and studies are planned for the construction of more power plants at other weirs.

Dutch policy

For many years it was thought that flooding of the Meuse River was reasonably under control; the effects of high water levels appeared limited to nuisance flooding. Attention had shifted to other issues such as water quality and the drying effects on the land caused by the lowered water table. Negotiations were carried out with Belgium to find an optimum way of sharing the Meuse River water during periods of low flow and hence alleviate problems brought on by water shortages in the canals. The sharing of the Meuse River water between Belgium and the Netherlands is an issue, which is still being dealt with. However, the floods of December 1993 and January 1995 have shown that the dikes are not as reliable as previously thought. These flood events have shown what can go wrong and have shown that again priority has to be given to flood problems.

Drastic measures were necessary. The Delta Plan for Major Rivers was drawn up. In 1995, levees and dikes were constructed along the undiked section of the Meuse River and the already existing plan for dike reinforcement along the Meuse and Rhine Rivers was quickly carried out. The so-called Boertien Commission specified plans along the undiked section of the Meuse River to be protected against flooding with a return period of up to 250 years. For example, the main channel is to be widened and deepened at the required locations. Belgium will be involved in this project for sections of the Grens Maas. These plans have a number of desired outcomes: protection against flooding in combination with large-scale nature development, the extraction of minerals and the facilitation of shipping. The plans are now in the execution phase, which is expected to be completed in 2015.

These floods have brought about a change in policy. They have illustrated the fact that continually raising the dikes is not the final solution to this problem. The forces of Mother Nature are not always controllable and a flexible system must be developed, which will ultimately give more space to the river. The 21st Century Water Management Commission has developed a plan that will increase short-term protection against flooding and at the same time maintain safety on a long-term basis taking into account possible future climate changes. It can be argued that for water management, a strategy should be set up to “contain”, “store” and then eventually, “discharge”, and this strategy should be applied right down to the smallest waterway. This three-phase strategy can also be of benefit, because it will mean that the tributaries will supply a greater volume of water to the Meuse during dry periods. Considering the possible future climate changes, this is important to help meeting the growing future water demand.

International policy

Guidelines for the use of Meuse River water by Belgium and the Netherlands have been laid down in a number of treaties dating back to the 19th century. Meetings between the two countries have been periodically held. The meetings mainly focused on the maintenance of the river and the adjoining infrastructure. The Convention on the Protection and Use of Transboundary Watercourses and International Lakes, drawn up in 1992 under the auspices of the United Nations Economic Commission for Europe, was an important instrument for further international cooperation. The Meuse River countries also ratified this Convention, which entered into force in 1996. The essence of this Convention is to ensure that rivers and lakes located in more than one country are protected against pollution, and that joint bodies, such as international river commissions, are set up for the preservation of these waters. In the spirit of this Convention, the Agreement on the Protection of the Meuse River was signed in 1994¹. Following this agreement, the International Commission for the Protection of the Meuse (ICPM) was established. As

¹ Signed 26 April 1994 at Charleville-Mézières by France, Netherlands, the Brussels Capital Region and the Walloon Region. Signed 17 January 1995 at Antwerp by the Flemish Region.

support for the Commission, the secretariat was set up and based in Liege, Belgium². The presidency alternates between the three countries every two years.

The Commission holds a plenary meeting every year. Three working groups carry out projects: Water Quality, Emissions and Cross-border Waterways Cooperation. The working groups are supported by a number of sub-groups and specialist groups, such as groups dealing with the river data network, ecology, improvement of conditions for fish, and the warning and alarm system. The Commission also works alongside other international organizations involved in the Meuse River basin, such as the “Commissions for Cross-border Waterways” for the management of the small border crossing waterways.

The water quality is monitored from the upper reaches to the mouth of the river using a river data network. A breakdown of the river system as well as the point and non-point pollution sources are presented in Figure 2. For water supply it is important that the Meuse River Warning and Alarm System can detect water pollution that exceeds acceptable levels.



Figure 2. The river system

In 1999, the Commission set up the Action Programme for the Meuse River for the period 1998 to 2003. The main objectives of this programme include a reduction in waste-water discharge, prevention of harmful contamination, protection of the river bed and the comparison and exchange of information between Governmental bodies. During the Ministers’ conference at the end of 2001, new incentive was given to the water policy group of each sub-basin to form an integrated water management system. At this conference, Germany and Luxembourg also expressed interest to join the Commission.

After the flood events of 1993 and 1995, the environmental Ministers of the riparian countries of the Rhine and Meuse stated in their Arles Declaration of February 1995 that measures must be undertaken, as soon as possible, to reduce the risk of future flooding. National and international efforts directed to increase protection against flooding were manifested in the Action Plan against Meuse River Flooding in 1998. The main aim of this plan was to reduce flood damage. Important measures included the augmentation of flow capacity, infiltration improvement, installation of retention basins, designation of emergency overflow areas and the use of open spaces for excess water, greater community awareness of flooding and a reliable flood warning system.

² For details in French and Dutch see <http://www.cipm-icbm.be>

With the aid of the IRMA programme (Inter-regional Rhine-Meuse Activities), the European Union offered a framework for subsidizing flood protection projects. One of the conditions worth noting is that the subsidies will not be granted for measures, which include increasing the heights of the dikes. Other alternatives are explored, before dike heightening measures are proposed.

Sharing of the Meuse River water between Belgium and the Netherlands

Different social groups can view a long, hot summer in very different ways. From a recreational viewpoint it can be highly valued, from political and social viewpoints it can often be associated with riots and other forms of civil unrest and in the field of water management, water shortages can pose problems for shipping. As far as it is known, no research has been carried out to determine whether dry weather periods have played a role in the negotiations over the sharing of water between the two countries. Events of the distant past have shown, however, that negotiations between the two countries are not only difficult, but also time-consuming. The more recent past however, has shown us that this does not always need to be so. This gives us some hope for the future.

Historical background

The history of the use and sharing of the Meuse River water is strongly linked to the development of shipping and the efforts to achieve a shipping connection between the Rhine and Meuse Rivers and the Scheldt estuary. The first, vain attempt was made at the beginning of the 17th century. For the development of his empire, Napoleon began to construct the Canal du Nord between Venlo (on the Meuse River) and Antwerp (on the Scheldt estuary). For the supply of water, the supply canal from the Meuse River just north of Maastricht to Lozen was constructed and completed in 1809. After the annexation of Holland by France in 1810, the need for the canal was greatly diminished and work was halted. After the fall of Napoleon in 1815, Belgium and Holland were united as the Kingdom of the Netherlands under King Willem I. During his reign, the Zuid-Willemsvaart Canal was constructed in 1825 between Maastricht and 's-Hertogenbosch from which use was made of the supply canal. The Belgian uprising of 1830 meant that only a very limited amount of shipping was possible. After the signing of the Peace Treaty of 1839, Belgium and the Netherlands became sovereign States and shipping was able to recommence.

The construction of the Bocholt-Herentals Canal in 1845 (as a sub-section of the Kempense Canal) gave Belgium a shipping connection between Antwerp and the Zuid-Willemsvaart Canal. This was followed in 1850 by the construction of the Liege-Maastricht Canal. This made the important transport connection between the growing industrial cities of Liege and Maastricht a reality.

The Treaty of 1863

The extension of the canal system caused a considerable increase in water requirements. In order to improve the water supply, a treaty³ was agreed in 1863 that provided for:

- The construction of a new inlet culvert at Maastricht (completed in 1873 and still in use);
- The Netherlands were required to supply up to 10 m³/s to the Zuid-Willemsvaart Canal and Belgium had to supply 2 m³/s at Lozen for Dutch use;
- An improvement of the Meuse River as a navigation route between the Belgian-Dutch border and Venlo.

In order to make the river more navigable, a joint commission proposed in 1912 a plan, which provided for the construction of 14 weirs, 10 of which would be located on the Grens Maas. The negotiations were broken off at the onset of the First World War.

Political relations turned sour after the war. The Netherlands had been able to preserve its neutrality and at the end of the war had given the retreating German army free passage over the Grens Maas; it had also granted political asylum for the German Kaiser. Belgium had suffered considerably under German

³ Treaty of 12 May 1863 concerning the abstraction of water from the Meuse River.

occupation and felt insulted. As a result, the negotiations over the canalisation of the Meuse River went awry and eventually both countries chose to deal with the problems independently on their own territory.

The Netherlands began the canalisation of the Meuse River with the construction of the Juliana Canal parallel to the Grens Maas. Belgium responded by building the Albert Canal between Liege and Antwerp. The Netherlands believed that this constituted a violation of the Treaty of 1863 on the basis of the fact that Belgium could extract water from the Meuse in a way not permitted by the treaty's provisions. The Netherlands took the matter to the International Court of Justice, but the eventual ruling in 1937 did not much change the situation. It was not in fact a violation of the treaty; the Netherlands were required to continually supply 10 m³/s to the Zuid-Willemsvaart Canal and furthermore had to ensure that the water supply to the Juliana Canal did not cause the Grens Maas to fall dry. Before the ruling from the International Court of Justice, however, pumping stations were built at the sluices on the Juliana Canal to ensure that shipping would not be hindered by low flows in the Meuse. After lengthy negotiations, an agreement was reached in 1961 to improve the navigation routes between the Albert Canal and the Meuse River at Ternaaien. This was to be achieved by constructing a new sluice to go alongside the two small existing sluices.

The development of the draft Meuse Treaty of 1975 as part of the water treaties

The principles of international law require regular negotiations and discussions before use can be made of international rivers and their waters. The negotiations, which started in 1963, resulted in 1975 in three draft treaties. In one of these treaties, the Netherlands was granted a more favourable distribution of the Meuse River water, and in the other two, Belgium was granted an improvement of the shipping routes on the Westerschelde.

In the draft treaty for the Meuse River, a minimum discharge, throughout the year, of 50 m³/s at Monsin (Liege) was guaranteed to Belgium. However, this was to be achieved through the construction in the Ardennes Mountains of a number of reservoirs with a total volume of 240 million m³. These plans have since met with opposition in Belgium and need to be reviewed. Attempts to build a reservoir on French territory have also been unsuccessful.

It became clear that due to ecological and town planning constraints, it would be impossible for Belgium to construct any more reservoirs. Furthermore, it was recognized that there are limits to the use of natural resources and the stipulation of a minimum discharge of 50 m³/s under all weather conditions was clearly unsustainable.

The reason why these treaties were not ratified by the Parliaments of both countries was due to the Belgian problems with the construction of more reservoirs. The Netherlands was then unwilling to proceed, because it did not want the treaties to be handled separately. In addition, the federalisation of Belgium in 1980 and the creation of two autonomous regions, Flanders and Walloon, also delayed progress.

The Meuse Discharge Treaty of 1995

After the federalisation of Belgium, negotiations between the Netherlands and the Flanders Region – now the most important partner in the water sharing process – could again begin. In 1995, this resulted in the Meuse Discharge Treaty⁴, which was brought into effect in 1996. The main specifications of the agreements are:

- During periods of low flow, the water will be equally divided between the two countries;
- Flanders was to increase the water supply to the Zuid-Willemsvaart at Lozen;
- Cooperation in the research and development of the Common Meuse.

For the implementation of the agreement, the Ministers of both countries set up the Meuse River Discharge Regulation Team. In the agreement, the division of the water is dependent on the Meuse discharge at Monsin (Liege). After consultation with the Netherlands, Flanders increased the discharge in the Zuid-Willemsvaart Canal from 5 to 10 m³/s by augmenting the culverts at the sluices at Bocholt and Lozen. Flanders installed turbines in the new culverts for the generation of energy, thus yielding an extra benefit. The water flows

⁴ Treaty between the Flanders Region of Belgium and the Kingdom of the Netherlands concerning the discharge of the water of the Meuse River.

through the Zuid-Willemsvaart Canal to the Netherlands under a natural grade. The cost of construction of the culverts is to be borne by the Netherlands and the costs of installation of the turbines by Flanders.



Figure 3. Canals and the Treaty of 1995

Discharge [m ³ /s]	Days a year	Grens Maas [m ³ /s]	Flanders/ Netherlands
115	113	55	30
100	92	50	25
90	66	40	25
80	53	30	25
70	41	20	25
60	33	10	25
50	20	10	20
40	9	10	15
30	2	10	10
20	0	6,7	6,7

Table 1. Water distribution

Through the sharing of water between the Dutch and Flemish canals, an economy plan is imposed that limits the water use as the discharge in the Meuse at Monsin decreases.

To limit water consumption, pumping installations will be needed. In the Netherlands, the required pumping stations are already in place.

Flanders will have to install pumping stations and power generating turbines at the six sluices on the Albert Canal. These turbines will be activated at the appropriate times to alleviate water overload. The planning phase for this is now complete and the realization is to begin later in 2002. The pumping installations are expected to be operational by the year 2005.

For the practical application of this plan, a common information system is being developed that makes use of flow meters at a number of locations along the Meuse River and its canals. The information system is expected to be ready later in 2002 and will supply water managers in both countries with details to assist them in the carrying out of the operation.

For the development of the Grens Maas, as part of the flood protection works, provisions will be made for the development of a more natural river system. Alongside the existing regular consultations, it is planned to devise a joint management system for the Grens Maas.

Conclusions

The Discharge Treaty represents an important step forward to share water between the two countries and to develop a more natural river system. Consultations between the two countries have proceeded in a friendly way and problems have always been handled through sensible negotiation and with a good appreciation of the position of the other Party. There is hope for the future.