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Policy and legal reforms and implementation of investment projects related to the ICPDR Joint Action Program 2001-2005

REPORTING PERIOD 2001-2003

International Commission for the Protection of the Danube River

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LIST OF ABBREVIATIONS

EG	Expert Group
B&H	Bosnia-Herzegovina
BOD_5	Biochemical Oxygen Demand in 5 days
CNC	Czech National Council
COD	Chemical Oxygen Demand
CPC	Country Program Coordinator
DRPC	Danube River Protection Convention
DPRP	Danube Pollution Reduction Programme
DRB	Danube River Basin
DRBPRP	Danube River Basin Pollution Reduction Programme
WFD	Water Framework Directive
DWQM	Danube Water-Quality Model
EC	European Commission
EIA	Environmental Impact Assessment
EMIS/EG	Emission Expert Group
EPA	Environmental Protection Agency
EU	European Union
GEF	Global Environment Facility
ICPDR	International Commission for the Protection of the Danube River
IPPC	Integrated Pollution Prevention and Control
ISPA	Instrument for Structural Policies for Pre-Accession
JAP	Joint Action Program of the ICPDR, 2001- 2005
MAFF	Ministry of Agriculture, Forestry and Food
ME	Ministry of the Environment
MESP	Ministry of Environment and Spatial Planning
MI	Ministry of the Interior
MOE	Ministry of Environment
MOEW	Ministry of Environment and Waters
N	Nitrogen (all forms)
N/A	Not Available (i.e. missing data)
NEAP	National Environmental Action Programme
NEPP	National Environmental Protection Program
P	Phosphorus (all forms)
PE	Population Equivalent = load of one person into waste water
PHARE	European Union Programme for Development
RBM	River Basin Management
SIA	Significant Impact Areas
UNDP	United Nations Development Programme
UWWTD	Urban Waste Water Treatment Directive
WWTP	Waste Water Treatment Plant

1 INTRODUCTION

This Report addresses the status of implementation of the ICPDR Joint Action Programme (JAP), with particular attention to the introduction of policy and legal reforms and implementation of investment projects in the municipal, industrial and agricultural sectors for pollution control and nutrient reduction in the Danube basin.
Thus, the report summarizes the achievements that have been realized through the work of the countries under the JAP for the first period of reporting to JAP implementation - **until 31 December 2003.** This report is also presenting estimates of projects under implementation, in pipeline, or in preparation, for the whole period of JAP, reporting period until December 2005.

In assessing the implementation of JAP tasks, the report considers the transfer of EU water related directives (Nitrates Directive, Urban Waste Water Directive, IPPC Directive, Water Framework Directive, etc) into national policies, regulations, and compliance mechanisms. The estimated cost for reforms concerning institutional and legal measures and direct investments that have been carried out to respond to JAP tasks, is also diiscussed. If the national commitments do not yet include obligations towards EU directives, the assessment of JAP implementation is based on the National Environmental Action Plan of the respective country.

The implementation of investment projects, taking into account **municipal**, **industrial** and **agro-industrial** projects, measures for **wetland** restoration**,** agricultural reforms and **land use** planning is analysed. Thisincludes:

- project implemented in the past five years taking into account type of project (technical description), investment cost, financing modalities and achieved results in terms of compliance with EU directives and pollution reduction (BOD, COD, N and P)
- projects under implementation or in pipeline, which are well prepared and do not need any further technical or financial support, taking into account same description as above, indicating expected results
- projects in preparation, which need further technical and financial support; these projects shall be described as above, indicating the needs for technical and financial support for project preparation and/or project implementation and the expected results (for municipal projects, the results of the before-going “Development of an Operational Framework for the Prioritisation of Projects” will be taken into account and updated).

The compiled information provide a clear picture of the results achieved by the individual Danube countries, the policy and legal reforms under preparation, the gaps to be filled and the investment projects, which need further technical and financial support. The results may also be used as a baseline for evaluating subsequent progress at the national and regional levels.

The JAP 2001-2005 reflects the general strategy for the implementation of the DRPC for the respective period. It deals i.a. with pollution from point and diffuse sources, wetland and floodplain restoration, priority substances, water quality standards, prevention of accidental pollution, floods prevention and control and river basin management. Important successes of Danube countries in implementing the JAP include: Trans-national Monitoring Network (TNMN) operational with 79 sampling stations, Analytical Quality Control (AQC) programme to ensure quality and comparability of data, Emissions Inventories updated for point and diffuse sources of pollution, AEWS operational and upgraded, Action Plan for Sustainable Flood Protection in the Danube River Basin developed, Accident prevention system in place, Habitat and species protection areas defined and measures to restore and protect wetlands and floodplains under implementation.

The Report is based on the compilation of national contributions submitted by national experts, appointed by the Heads of Delegations in the DRB countries. It includes a thorough revision and assessment of policy objectives, priorities and strategies as well as water related legislation and practices in line with the ICPDR JAP; the identification of main deficiencies and necessary steps to be taken regarding policy, legal and regulatory reform, and finally the estimates on the cost for reforms concerning institutional and legal measures and direct investments that have been carried out to respond to new water related regulations linked with JAP tasks.

The DABLAS database developed in 2002 was expanded to include projects from sectors other than municipal. Data submission on the investments projects was made on the Internet and the database was automatically updated; the further development of the database was intended to allow more flexible and interactive updating and tracking.

The structure of the Country Report follows the structure of the national reports, which are structured as follows:

(1) Policy objectives
(2) Status of legislation dealing with water management (in force, in progress, main deficiencies)
(3) Main barriers to policy and legal reforms to water-related policy and legal reform and JAP implementation
(4) Proposed actions and measures in relation to JP
(5) Estimated cost for reforms concerning institutional and legal measures to respond to JAP and new water related regulations.

2 JOINT ACTION PROGRAM

2.1 Background

Since 1992 the European Community (PHARE and TACIS programs) and the UNDP/GEF (Danube Pollution Reduction Program-1997 to 1999) have supported the efforts of the Danube countries to develop the necessary mechanisms for effective implementation of the DRPC. The Danube Environmental Program Investments 1992 –2000 has included 27 million USD from the EU Phare/Tacis, and 12.4 million USD were provided by the UNDP/GEF.

This support has enabled the elaboration of a regional Strategic Action Plan (SAP) based on national contributions and the development of a Transboundary Analysis Report (TAR) to define causes and effects of transboundary pollution within the DRB and on the Black Sea.

The Strategic Action Plan provides guidance concerning policies and strategies in developing and supporting the implementation measures for pollution reduction and sustainable management of water resources enhancing the enforcement of the DRPC.

According to the Strategic Action Plan, the main problems in the Danube River Basin that affect water quality use are: (i) high loads of nutrients and eutrophication, (ii) contamination with hazardous substances, including oils, (iii) microbiological contamination, (iv) contamination with substances causing heterotrophic growth and oxygen-depletion; and (v) competition for available water.

The SAP outlined regional policies and strategies for pollution reduction and environmental protection in response to the Danube River Protection

The objectives and target of the SAP considered (i) the development of national policies, regulations and actions, (ii) the development of coherent approaches to pollution reduction and transboundary cooperation, (iii) reinforcing of coordination of interventions in relation to sub basin area, (iv) encouraging transboundary cooperation for pollution reduction in Significant Impact Areas.

The Transboundary Analysis Report (TAR) provide a scientific analysis of the root causes of environmental pollution in the DRB, identifying causes and effects of pollution with particular attention to transboundary issues and nutrient transport to the Black Sea. TAR defined priorities for control and management strategies at the regional and national levels. Based on the National Review Reports more than 500 hot spots, in three sectors (municipal, industrial and agricultural) have been identified and ranked.

In the frame of the Danube Pollution Reduction Program 1999 (DPRP), based on the results of the Transboundary Analysis, an investment portfolio has been developed with particular attention to nutrient reduction. All the measures, projects and programs proposed to reduce emissions from both point and non-point sources of pollution will improve water quality, considering a reduction of 50 % in Chemical Oxygen Demand (COD) emissions and 70 % in Biological Oxygen Demand (BOD) emissions and other toxic elements, and thus reduce transboundary effects within the Danube River Basin. Once implemented, these measures would further substantially contribute to reducing nutrient transport (Phosphorus by 27 % and Nitrogen by 14 %) to the Black Sea to further improve, over time, environmental status indicators of Black Sea ecosystems of the western shelf. A total of 421 projects for 5.66 billion USD, primarily addressing hot spots have been identified for municipal, industrial and agricultural projects.

Responding to the DRPC requirements, and based on the DPRP results, the ICPDR developed a first Joint Action Programme (JAP) for the years 2001 - 2005, which was adopted at the ICPDR Plenary Session in November 2000. The ICPDR Joint Action Programme 2001-2005 reflects the general strategy for the implementation of the DRPC for the respective period. The general objectives of the ICPDR Joint Action Program 2001-2005 are harmonized with the three main objectives of the Contracting Parties, laid down in Article 2 of the DRPC:

- shall strive at achieving the goals of a sustainable and equitable water management, ...
- shall make all efforts to control the hazards originating from accidents ...and

- shall endeavour to contribute to reducing the pollution loads of the Black Sea from sources in the catchment area".

The JAP deals i.a. with pollution from point and non-point sources, wetland and floodplain restoration, reduction and control of priority substances, water quality standards, prevention of accidental pollution, floods prevention and control and river basin management. Particular attention is given to both structural/investment and non structural/policy reforms measures that address nutrient reduction and protection of transboundary waters and ecosystems:

- Coordinating and developing the River Basin Management Plan for the Danube River Basin in implementing the EU Water Framework Directive;
- Maintaining and updating emission inventories and implementing proposed measures for pollution reduction from point sources and non point sources;
- Restoring wetlands and floodplains to improve flood control, to increase nutrient absorption capacities and to rehabilitate habitats and biodiversity;
- Operating and further developing the Transnational Monitoring Network (TNMN) to assess the ecological and chemical quality status of rivers, including establishing respective water quality standards;
- Developing and introducing recommendations on BAT and BEP to assure prevention and/or reduction of hazardous and dangerous substances;
- Operating and upgrading the Accidental Emergency Warning System (AEWS), considering its use also for flood warnings, establishing classified inventories of accidental risk spots and developing preventive measures.

The Joint Action Program 2001 – 2005 is directed to

- the improvement of the water ecological and chemical status,
- the prevention of accidental pollution events and
- the minimization of the impacts of floods.

The implementation of the Joint Action Program will - in addition to the main objectives

- improve the standard of life,
- enhance economic development,
- contribute to the accession process to the European Union,
- restore the biodiversity, and
- strengthen the cooperation amongst the Contracting Parties.

In the frame of the ICPDR Joint Action Programme, 243 committed investment projects and strategic measures have been identified out of which 156 are in the municipal sector and only 44 in the industrial sector. This reflects the situation in most transition countries where industries are not operational or using mostly outdated technologies. Most of these projects, listed generally as “hot spots” or point sources of emission, are representing national priorities and taking equally into account the obligation to mitigate transboundary effects. Particular attention was also given to the identification of sites for wetland restoration, which play an important role not only as natural habitats but also for flood protection and as nutrient sinks.

The total investment foreseen in the JAP period 2001-2005 to respond to priority needs is estimated to be about 4.404 billion €, with 245 priority point source projects mainly being:

- Municipal waste water collection and treatment plants: 3.702 billion €
- Industrial waste water treatment: 0.267 billion €
- Agricultural projects and land use: 0.113 billion €
- Rehabilitation of wetlands: 0.323 billion €

From the total amount of investment of 4.4 billion € for point sources reduction, 3.54 billion € are earmarked as national contributions.

The structure of the identified investment requirements by sector is as follows:

Table 1. Investments per sectors, 2001-2005.

	Municipal	**Industrial**	**Agricultural**	**Wetlands**	**Total**
No of Projects	157	44	21	23	245
MEUR	3,702	267	113	323	4,404
(%)-Structure	84%	6%	3%	7%	100

Table 2. Projects and investments per country in the DRB

	DE	**AT**	**CZ**	**SK**	**HU**	**SI**	**HR**	**BA**	**CS**	**BG**	**RO**	**MD**	**UA**	**TOT**
No of Proj.	11	4	12	20	24	24	11	12	40	21	25	31	10	245
MEUR	231	264	147	118	687	384	433	176	785	125	493	493	67	4,404
(%)	5	6	3	3	16	9	10	4	18	3	11	11	1	100

The ICPDR is asked to report on the implementation of the Joint Action Program for the period 2001 to 2003 in 2004, and for the period 2001 to 2005 in 2006.

3 ASSESSMENT OF RESULTS

3.1 Policy Objectives

Danube countries face substantial challenges in establishing and strengthening the policy and institutional framework required for functioning market-based and democratic societies. Today, progress can be reported with all Danube countries in redesigning policies, programs and regulations, in establishing appropriate incentive structures, redefining partnerships with stakeholders, and strengthening financial sustainability of environmental services. Following a challenging and demanding period of transition, all DRB countries have in the last years developed a comprehensive hierarchic system of short, medium and long-term environmental policy objectives, strategies and principles which reflect the political context of each country, key country-specific environmental problems and the sector priorities on national and regional levels.

Still the key challenge Danube countries face in the policy field is to identify the most effective ways of transposing EU environmental directives. Country's choice on how to achieve compliance with EU directives will have a significant influence on compliance costs.

In all DRB countries the legal framework for environmental management of water resources and ecosystems consists of a hierarchic system of decrees, laws, directives, ordinances, regulations and standards on different administrative levels. In addition to the WFD, there has been a high level of transposition of the EU Directives into the national legislations of the DB countries. The Urban Wastewater Treatment and IPPC Directives are considered as the most challenging areas for compliance. This is reflected in the negotiated derogation periods and agreed long transition periods.

All DRB countries currently have a more or less comprehensive system of environmental and water sector-related policies and strategies, which usually reflects:

- the capability of the country to contribute to the solution of transboundary problems;
- the significance and evidence of country-specific environmental problems;
- the significance and evidence of environment-related health hazards;
- the economic development and potential of the country.

Despite the diversity of problems, interests and priorities across the basin, the Danube countries share certain values and principles relating to the environment and the conservation of natural resources.

The key principles for water management and water pollution that have formed the basis for the revision of legal and institutional arrangements adopted by Danube countries include:

- Consider water as a finite and vulnerable resource, a social and economic good
- Use of the integrated river basin management approach
- Implement precautionary principle
- Introduction and use of BAT, BAP and BEP
- Control of pollution at the source and creation of cleaner production centres
- Apply polluter pays principle and the beneficiary pays principle
- Implement principle of shared responsibilities, respectively the principle of subsidiarity
- Use market based instruments
- Implement good international practices in managing environmental expenditures
- Strengthen international partnership and transboundary cooperation

Long-term objectives of water policies in the DRB countries mainly focus on:

- Preservation of a sound environment for the future generations;
- Protection of biological diversity;
- Protection of drinking water resources.

The status of water-related policy and programmes in the DRB countries can be assessed in general terms as follows:

Table 3. Status of water-related policy, programmes and National Environmental Action Plans in the DRB countries

Country	Explicitly formulated policy objectives for water management and pollution control	Programmes especially dealing with water management and pollution control	Programmes especially dealing with WFD implementation
DE	Appropriate system of policy objectives completely in line with the requirements of the relevant EU Directives	Action Programs Environmental Statute Book	Strategy for WFD implementation
AT	Appropriate system of policy objectives completely in line with the requirements of the relevant EU Directives Austrian Water Protection Policy Water Right Act	Action Programme to control diffuse pollution Austrian Programme of Environmental Friendly Agriculture	Strategy for WFD implementation
CZ	Appropriate system of policy objectives	Program for adequate implementation of municipal WWTPs	The State Environmental Policy 2004 – 2010 Resolution 339, 2004
SK	Satisfactory system of policy objectives in the Strategy for National Environmental Action Program, 1993; National Strategy for Sustainable Development, 2000 and Water Management policy	National Environmental Action Program Codex of Good Agricultural Practices State Water Protection Plan Action Plan for the protection of biological and landscape diversity	Strategy for WFD implementation Inter sectoral Strategic Group Coordinating office Working Groups
HU	Appropriate system of policy objectives	National Environmental Program National waste water collection and treatment programs National agro-environmental protection program Other programmes (lake, oxbow lake, low land, etc.)	Strategy for WFD implementation
SI	Satisfactory system of policy objectives	National Environmental Action Plan, 1999 New Environmental Action Plan in preparation Operative program for wastewater collection and treatment	Strategy for WFD implementation
HR	Satisfactory system of policy objectives in the current legislation: National Strategy for Environmental Protection, 2002 State Water Protection Plan, 1999 Environmental protection Plan Nature Protection Act, 1999 Water Act, 1995	State Water Protection Plan Strategy and Action Plan	Strategy for WFD implementation
BA	Limited number of policy objectives	EU CARDS Program USAID, WB, GEF programmes National Environmental Action Plan, 2003	New Water Law in line with WFD, expected 2005

Country	Explicitly formulated policy objectives for water management and pollution control	Programmes especially dealing with water management and pollution control	Programmes especially dealing with WFD implementation
CS	Insufficient system of policy objectives and focussed programs	No explicit programmes	Harmonisation with EU legislation
BG	Satisfactory system of policy objectives	Environmental Strategy to implement ISPA objectives Program for UWWT Directive implementation National Strategy for Management and development of the water sector until 2015 Programme for construction of municipal WWTPs	Strategy for WFD implementation
RO	Satisfactory system of policy objectives	National Environmental Action Plan Strategy for environmental protection Strategy for water resources management Series of nutrient-related programmes to be carried out during the forthcoming period Action program for reduction of pollution due to dangerous substances	Strategy for WFD implementation
MD	Reduced policy objectives. National Strategy for sustainable development, 2000 Concept of the Environmental Policy, 2001	National Water resources management Strategy, 2003 Water Supply and Sewage program, 2002 National Action Plan on Health and Environment, 1995	Strategy for WFD implementation
UA	Under the revision system of policy objectives within the frame of the update version of the Sustainable Development Strategy	Program of the Development of Water Economy Governmental Action Plan	Water Code of Ukraine harmonized with EU Directives (expecting approval)

3.2 Status of Legislation Dealing with Water Management

Countries in the DRB have increasingly recognized that developing and implementing regulation (at the national, regional and local level) is a precondition for effectively responding to a range of key challenges. Further assistance and efforts are still needed to building institutional capacity at central and local government level to address the broad challenges of legal reforms.
The water legislation was amended, or is under revision, according to the EU Directives in most of the countries. The water sector-related policies and strategies reflect:

- country's commitment to respond to EU requirements and international agreements obligations
- the need to incorporate general principles for sustainable development, environmental, economic and social concerns into the national development strategies
- capability of the country to contribute to the solution of transboundary problems
- the significance and evidence of country-specific environmental problems.

A fundamental objective of regulatory reforms in the Danube countries is to foster high quality regulation that will improve the efficiency of national economies and environmental actions, and will eliminate the substantial compliance costs generated by low quality regulations. By helping countries to revise their legal and institutional arrangement, the ICPDR has contributed to long-term economic prosperity and increased opportunities for investments to reduce pollution and protect natural resources.

The following section summarizes the policy and legislation achievements in the countries.

In general terms, the 13 DRB countries can be categorized and characterized as follows: **Germany** and **Austria** have substantially reformed their regulatory regimes to assure the functioning of their democracies and market-based economies, with all legislation in compliance with the "highest environmental standards". Significant efforts are also required for EU member states for reaching an acceptable level of implementation.

The **German** water management and protection policy is in compliance with EU water policy, aiming at achieving of good water status for all waters by 2015. With the elimination of biological and chemical pollutions from municipal and industrial sources the most important conditions for further continuous improvements of the water ecology are already met. The responsibilities for preparation and implementation of the Flood Action Plans belong to the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Bavarian State Ministry of the Environment, Public Health and Consumer Protection, and the Ministry of the Environment and Traffic Baden-Württemberg.

The core of water legislation in **Austria** is the Water Right Act, which was revised in 2003 to accommodate the EU Directives principles. Austria is currently engaged in developing an Ordinance defining water quality objectives for rivers as well as for lakes and an Ordinance for the management of the Austrian Water Data Register. Primary goal of water policy is to ensure sustainable water management through a prudent human interference into waters. Main principles are: (i) minimizing impacts on water quantity and quality via a stringent system of permits and control, (ii) protection of population and its living pace and goods against floods, and (iii) public awareness on the value of water and for it rational use. The WFD implementation is regarded as an important supporting tool to achieve the primary goal of water policy in Austria. In response to the disastrous floods 2002 activities for the protection against floods are intensified taking into account developments on the international level. Federal Ministry of Agriculture & Forestry Environment and Water Management is the competent authorities responsible for preparation and implementation of the Flood Action Plans.

The experience of the new Member States having joined EU in May 2004 is an important information for other Danube countries.

In March 2004, the **Czech** Ministry of Environment prepared the updated State Environmental Policy for 2004 – 2010. Considerable attention is paid to wetland ecosystems, to rehabilitation of aquatic biotopes, to effective and sustainable protection of surface and ground water bodies, to harmful contaminants, to integrated water protection and management. Through river basin management plans, measures to protect wetlands and floodplains shall be implemented. The use of wetlands and water resources should be sustainable in view of economic pressures and global changes, and this includes principles referring to landscape and environmentally sound agricultural practice, wetland and floodplain uniqueness, restoration, remediation and rehabilitation of damaged wetlands areas. Both the Ministry of Environment and Ministry of Agriculture are the competent authorities responsible for preparation and implementation of the Flood Action Plans.

Slovenia has developed appropriate legislative tools that outline the objectives and strategies for environmental regulation and water management. The lately approved Environmental Protection Act (May 2004) primarily focuses on pollution from point sources and is consistent with EU environmental requirements. The 1999 National Environmental Action Programme (NEAP) established a more balanced relationship between the environment and economic sectors and introduced a system of economic incentives to encourage manufacturers and consumers to use resources in a more "environmentally successful" manner. The Water Act considers the whole water policy such as protection of water, water use, management of water and protection of water depending ecosystems. The Ministry of Environment Spatial Planning and Energy is the competent authorities responsible for preparation and implementation of the Flood Action Plans.

The National Environmental Programme of **Hungary** includes substantial provisions and measures for the conservation and management of surface and groundwater resources. Some of the key targets and approved policy directions are: regulation development to encourage sustainable and economical water use; improvement of water quality for the main water bodies (Danube and Tisza Rivers, Lake Balaton); gradual increase (to a level of 65%) of the number of settlements with sewers; at least biological treatment of wastewater from sewers; nitrate and phosphorous load reductions for highly protected and sensitive waters. By 2003 the Hungarian legislation on water quality protection was fully harmonized with the EU regulations, including the appropriate institutional set-up. The Ministry of Environment and Water and the National

Directorate for Environment, Nature and Water are the competent authorities responsible for preparation and implementation of the Flood Action Plans.

The implementation of the **Slovak** water management and protection policy is in compliance with EU water policy, i.e the WFD, aiming at achieving of good water status for all waters by 2015. The legislative tools for achieving policy objectives have been prepared. All EC directives have been transposed into the national law system. The transposition was finished in 2004 through an updated version of the Water Act (no. 364/2004). Main priority in relevant sectors (urban wastewater, industrial wastewater, land use, wetlands) is the implementation of EC directives' requirements (urban and industrial wastewater during the transition periods), namely reduction of nutrients and priority substances and creation of effective water management that will be able to promote sustainable water use based on long - term protection of available resources. The Ministry of Environment is the competent authority responsible for preparation and implementation of the Flood Action Plans.

The need to implement a unified policy on the environment and the use of natural resources, which integrates environmental requirements into the process of national economic reform, along with the political desire for European integration, has resulted in the review of the existing environmental legislation in **Moldova**. The current priorities for water management include the strengthening of institutional and management capability through improvement of economic mechanisms for environmental protection and the use of natural resources, setting internal environmental performance targets and controls, self-monitoring, review of current legislation in line with European Union legislation, and the adjustment or elaboration on a case-by-case basis of implementation mechanisms. The Ministry of Ecology and Natural Resources is the competent authority responsible for preparation and implementation of the Flood Action Plans.

Bosnia and Herzegovina is faced with major challenges in the environmental and water management area. Among specific objectives for environment is the development of an environmental framework in Bosnia and Herzegovina based on the Acquis. The most important issues in the environment sector will be identified in the Environmental Action Plan, which is being developed with World Bank support. The EU is supporting a Water Institutional Strengthening Programme, which is complemented by two Memoranda of Understanding (2000, 2004) between both Entities and the EC. The responsibility for preparation and implementation of the Flood Action Plans is with Federal Ministry of Agriculture, Water Management and Forestry Environment and the Ministry of Agriculture, Forestry Environment and Water Management. The proposed schedule for approximation with EU indicates a new Water Law and a Law on Environment, compatible with the Acquis, to enter into force by January 2005.

Since the WFD was adopted, numerous and diverse activities were initiated in **Serbia & Mo**ntenegro to further implement the Directive. The water management is faced with serious tasks that require, above all: (i) the creation of a system of stable financing for water management, (ii) the reorganization of water management sector, and (iii) the revision of water legislation and related regulations, in compliance with requirements of European legislation. In the Republic of Serbia, the responsibility for preparation and implementation of the Flood Action Plans is with the Ministry of Agriculture, Forestry and Water Management and the Directorate for Water.

The remaining accession countries Romania, Bulgaria, Croatia as well as those non-accession countries are experiencing the historic opportunity of European integration, which is the most important driver of reforms but brings great challenges at the same time:

The adoption in 1999 of the Strategy for the Integrated Water Management marked the beginning of the reforms in the water sector in **Bulgaria** in line with the WFD and assumed obligations under international instruments. Several other programs such as Environmental Strategy to implement the ISPA objectives, the Program for the UWWT Directive implementation or the National Strategy for Management and Development of the Water Sector until 2015 complete the picture of on going efforts in Bulgaria towards complying with EU legislation. The Ministry of Environment and Water is responsible for preparation and implementation of the Flood Action Plans.

In **Croatia**, the current basic environmental and water legislation and regulations (such as the Water Act, Water Management Financing Act, State Water Protection Plan) will be revised to meet the EU directives requirements within the frame of two CARDS projects expected to start at the end of 2004. The Ministry of Agriculture, Forestry and Water Management, Water Management Directorate is responsible for preparation and implementation of the Flood Action Plans.

Romania just closed Chapter 22 on harmonization of environmental legislation with EU requirements. Basic water legislation (Water Law) and implementing regulations, standards and ordinances regulations have already been fully harmonized with the EU directives. The Ministry of Environment and Water Management is responsible for preparation and implementation of the Flood Action Plans.

Ukraine has not yet updated the environmental policy act (the Principal Direction, 1998). The update version of the Sustainable Development Strategy, however, has been recently submitted for approval by the Parliament. The Program of the Development of Water Economy is in force but still specific legislation on water management is missing. The current Governmental Action Plan is a comprehensive document, which integrates economic, social and environmental concerns. Efforts are currently undertaken to finalize in 2005 the revision of the Protocol on the Protection of the Black Sea Marine Environment against Pollution from Land-Based Sources, in line with WFD principles. The Water Code of Ukraine harmonized with EU Directives is submitted as well for approval. The Ministry for Environmental protection of Ukraine and the Ukrainian State Committee of Water Management are responsible for preparation and implementation of the Flood Action Plans.

The status of water-related legislation in the DRB countries is presented in the Table 4.

Table 4. Status of water related legislation in the DRB countries` and proposed measure

Country	Main existing legal provisions for water management and pollution control	Proposed measures regarding water management and pollution control
DE	Fully appropriate legislation The Water Resources Policy Act, Fertilizer Act, Fertilizer Ordinance, etc.	Implementation and ordinances for enforcement
AT	Fully appropriate legislation Water act, and Acts on the adoption of EU Directives UUWT, IPPC, etc.	Implementation and ordinances for enforcement
CZ	Complete set of legislation, such as: State Environmental Policy, 2004 Act on Environmental Protection, 1992 Water Act, 2002 Act on Agriculture, etc.	Remaining Directives to be implemented Enforcement of legislation Ownership transfer in agricultural sector Clarification of competencies among all parties
SK	Appropriate legislation fully harmonized with EU Water Act, 2004- Natura Protection Act, 2003 Environmental Protection Act, 1999 GD No 491/2002 Coll. MO 249/2003 Act No on IPPC No 245/2003 Coll.	Implementation of updated legislation Finalize harmonization of legislation under the competencies of local authorities Increase share of population connected to sewage and wastewater treatment plants Increase water quality for drinking water Implement Program of measures against flooding
HU	Appropriate legislation fully harmonized with EU directives Act LIII of 1995 on the General Rules of the Protection of the Environment Act LVII of 1995 on Water Management Nature Protection Act Government Decree No. 221/2004. (VII. 21.) on certain rules of river basin management Government Decree No. 220/2004. (VII. 21.) on the rules of the protection of the quality of surface waters Government Decree No. 219/2004. (VII. 21.) on the protection of groundwater	Improve the institutional structures and clarify responsibilities Implement the adopted legislation Ministerial decree on the observation and monitoring of ground waters Ministerial decree on the observation and monitoring of surface waters
SI	Environmental Law, 2004; Water Act, 2002; Nature Conservation Act, 2002; IPPC; UWWT	Regulations for enforcement and compliance
HR	Law on Environmental protection, 1999; Nature Protection Act; Water Act; Water Management Financing Act	Compliance and enforcement plans Water quality standards by water classes; Standards on hazardous substances;

Country	Main existing legal provisions for water management and pollution control	Proposed measures regarding water management and pollution control
		Effluent standards: maximum allowed concentration of hazardous substances
BA	Explicit legal provisions in the Water Laws (RS, 2002 and F BiH, 2003)	New Water Law, expected 2005 New Environmental Law, expected 2005
CS	Legislation not fully satisfactory. Law on water and Law on water management financing under preparation Law on Environmental Protection, 1991 (Serbia) and 1996 (Montenegrin)	Harmonization with EU water and environmental legislation Involvement in transboundary cooperation within the frame of international conventions
BG	Explicit policy objectives and appropriate legislation in place Environmental protection Act Water Law, amended 2003	Implementation rules for complying with EU legislation
RO	Explicit policy objectives and appropriate legislation in place Environmental Protection Law Water Law Environmental protection strategy Law 645/2002 on IPPC Law 462/2001 on regime of natural protected areas and conservation of habitats Drinking Water Law 458/2002 Law 5/1991 wetlands and floodplain restoration	Implementation rules for complying with EU legislation Ministerial Order concerning the National Water Monitoring System Governmental Decision concerning the type and size of the sanitary protected areas Ministerial Order concerning the public participation in the water management decision making
MD	Law on Biological Security Law on Environmental Protection Law on payment for environmental pollution Water Code Ecological Funds	Revision of system of standards, including water quality standards, emission standards, and effluent standards Strengthening capacity building Restructuring institutional arrangements
UA	The specific legislation on water management is under revision The Law on the State Program of Protection and Rehabilitation of the Environment of the Black and Azov Seas The Law on the State Program of the Development of Water Industry The Law on Fish, other Alive Water Resources and Food Products from Them The Law on Drinking Water and Drinking Water Supply	Water Code, harmonized with EU Directives expecting approval

3.3 Main Barriers to Policy and Legal Reforms in implementing JAP

Regulatory challenges facing Danube Countries are significant. Progress is slow in some countries but the governments are gradually adopting modern regulatory and policies instruments to improve the quality of the regulatory environment and management practices to send a clear signal to the foreign and national financing institutions on their needs for investments.

Enforcement and compliance are considered as the main barriers to the effective implementation of the ICPDR JAP. The difference between high regulatory standards and compliance capacity of the regulated bodies, without having designed flexible compliance schedules prevent authorities from effectively enforcing their regulatory instruments. Lack of a unifying concept on policies instruments choice and implementation

across various levels of government still exist in some countries (e.g Moldova, Ukraine, Serbia & Montenegro) where decentralization and democratisation of structures has not yet taken place. In some countries, problems with decentralization are associated with absence of subsidiarity principle approach (clarifying of competencies by all authorities – in government, in regions, districts and municipalities).

Additionally, costs for fulfilment of EU directives requirements will increase of water services prices. Implementation of Directive 76/464/EEC requires education of state water administration concerning new permits for discharging of wastewaters. Sometimes, weak enforcement is associated with ineffective penalties system or with inconsistencies between the current structure/content of the laws, and the conflicts and overlapped provisions in various other laws.

Other barriers impeding the implementation are linked to the insufficient capacity building, lack of access to water and environmental relevant information, absence of public participation mechanisms in the environmental decision-making process. High investment needs, sometimes more demanding national legislation than that at the EU, administrative burdens, and insufficient co-operation between governmental institutions can complete the barriers picture.

Based on the information provided by the national contributions, the main barriers to policy and legal reform can be categorized as outlined below.

The assessment for the particular DRB countries (*** = "high relevance"; * = "low relevance) has to be considered as provisional and should in the first place serve for a formalized identification of country-specific areas for improvement.

(1) Historical issues

- Outdated legal and administrative structures
- Inappropriate business structures / methods
- Inappropriate industrial and agricultural structures and practices
- Unsolved ownership situation - public and private sectors
- Insufficient awareness of population (wastage of water, etc)

Provisional assessment of the relevance of historical issues for the particular DRB country:

AT	BA	BG	HR	CZ	DE	HU	MD	RO	CS	SK	SI	UA
	***	*	**	*	*		*	***	*	*		***

(2) Economic issues

- Deteriorated economic capacities
- Decreased industrial and agricultural production
- Decreased livestock farming
- Inadequate status of privatisation
- Inappropriate public infrastructure (waste water collection systems, WWTP)

Provisional assessment of the relevance of economic issues in the particular DRB country:

AT	BA	BG	HR	CZ	DE	HU	MD	RO	CS	SK	SI	UA	AT
	***	**	**			*	***	**	***	*	*	***	

(3) Financial issues

- Lack of domestic public funds for environmental issues
- Lack of international funds at favourable terms
- Lack of adequate funding mechanisms
- Lack of adequate funding tools (incentives, charges)

Provisional assessment of the relevance of financial issues in the particular DRB country:

AT	BA	BG	HR	CZ	DE	HU	MD	RO	CS	SK	SI	UA	AT
	***	*	**			*	***	*	***	*		***	

(4) Institutional / administrative issues

- Inadequate personnel capability and qualification
- Inadequate technical equipment
- Inadequate structure of administration
- Inadequate allocation of responsibilities (gaps, overlaps, not defined)
- Lack of adequate vertical and horizontal coordination
- Lack of adequate cooperation within public administration
- Lack of adequate cooperation between public administration and private sector
- Lack of adequate tools for enforcement of legislation
- Lack of private sector participation (investment, management)

Provisional assessment of the relevance of institutional issues in the particular DRB country:

AT	BA	BG	HR	CZ	DE	HU	MD	RO	CS	SK	SI	UA
	***	*	**			*	***	*	***	*		***

(5) Participatory issues

- Lack of public awareness (regarding environmental issues)
- Lack of adequate awareness of decision makers (regarding environmental issues)
- Lack of public interest in solving environmental deficiencies / problems
- Lack of organizational capability (inadequate representation of NGOs)
- Lack of private sector participation (investment, management)

Provisional assessment of the relevance of participatory issues in the particular DRB country:

AT	BA	BG	HR	CZ	DE	HU	MD	RO	CS	SK	SI	UA
	**	**	**			*	***	**	***	*		***

(6) Natural / environmental issues

- Degradation of ecosystem
- Loss of adequate biodiversity
- Inadequately high concentration of nutrients in agricultural areas
- Uncontrolled flood risk
- Inadequate utilization of water resources
- Uncontrolled discharge of waste water (in the past / ongoing)
- Insufficient monitoring capacities
- Inadequate agricultural practices (in the past / ongoing)
- Inadequate utilization of fertilizers, pesticides, etc. (in the past / ongoing)

Provisional assessment of the relevance of natural issues in the particular DRB country:

AT	BA	BG	HR	CZ	DE	HU	MD	RO	CS	SK	SI	UA
*	***	**	**	*	*	*	***	**	***	*	*	***

3.4 Proposed actions and measures in response to JAP

In a number of countries, numerous laws and regulations were adopted a long time ago, have been frequently amended during the previous years of transition and need a fundamental revision. In others, the relevant legislation is currently in the phase of substantial reform and modernization. Due to the complexity of this task it can be anticipated that the completion of the ongoing reform process will take several years before the relevant legislation has reached an acceptable level of compliance with international requirements.

Still, in some non-accession countries, the current environmental and water-related legislation cannot be considered as adequate regarding sound and sustainable environmental management of water resources and ecosystems. The current essential deficits and problems can be summarized as follows:

- the environmental and water-related legislation is still based to a certain extent on historical structures, with the consequence that the various changes, adjustments and modifications have led to critical inconsistencies;
- the practical applicability and effectiveness of the recent established new environmental and water - related legislation is not yet been proven is some countries;
- the impossibility to enforce the relatively sophisticated systems of environmental and water-related legislation, due to critical social and economic issues in some countries.

In response to these common deficiencies, the needs for improvement regarding the water sector-related legislation in the DRB countries can be summarized as follows:

- restructuring and adjustment of relevant legislation to the requirements of modern environment-oriented market economy;
- streamlining, simplification and elimination of inconsistent components, basically resulting from ad-hoc changes during the previous transition period;
- ensuring utmost compatibility of interacting legislation on the various administrative levels;
- specification of efficient implementing regulations and enforcement mechanisms; elimination of all kinds of unjustified exemptions;
- further harmonization of national legislation with EU regulations and standards.

The need for improvement of water-related legislation in the particular DRB countries is assessed in Table 4.

3.5 Estimated cost for reforms concerning institutional and legal measures to respond to JAP and new water related regulations.

All DRB countries consider the harmonization of national environment and water-related legislation with the EU legislation as the most essential prerequisite for long-term sustainable water management in their countries.

The 4 recent new Danube member states have fully transposed their regulatory frameworks in line with EU environmental requirements, but realising actual compliance will require significant time and financial resources. Among the Danube River Basin countries, the total environmental costs range from 2,723 MEUR for Slovenia to 10,000 MEUR for Hungary and the Czech Republic. The second tier of accession countries, Bulgaria and Romania, require even more to achieve compliance: 11,000 MEUR and 17,000 MEUR, respectively.

Table 5. Estimated total environmental costs to meet EU standards

Country	Population	Total environmental costs to meet EU standards (MEUR)
Bulgaria	8.2 million	11,000
Czech Republic	10.4 million	10,000
Hungary	10 million	10,000
Romania	22.4 million	17,700
Slovakia	5.4 million	4,005
Slovenia	1.99 million	2,723

The Urban Wastewater Treatment Directive is expected to be the most expensive water quality requirement to implement, accounting for 8% (Slovenia) to over 45% (Romania) of the total estimated environmental compliance investment. The new member states have been granted transitional periods for implementing the UWWT, as much as 10 years beyond the 2005 deadline stipulated in the directive.

Shorter transition periods were reached for complying with the IPPC Directive, the most significant challenge facing the industrial sector. Industrial restructuring has been underway in the region for several years, but meeting the IPPC Directive requirements by the 2007 deadline will be a major challenge for many Danube enterprises. Estimated costs complying with the IPPC Directive among the Danube River Basin countries ranges from 50 MEUR for Slovenia to 3,725 MEUR in the Czech Republic:

In the agricultural sector, the Nitrates Directive is the most relevant EU environmental legislation. Agricultural nitrate pollution is generally much lower in lower Danube countries than in intensely farmed portions of western EU countries, primarily because the lower Danube countries agricultural sector is still recovering from the break-up of former communal farms. However, many intensive animal husbandry operations throughout these countries are faced with significant financial burdens for improving manure storage and handling facilities.

The new member states did not receive transition periods for nature conservation compliance. The Birds and Habitats directives are usually not considered as investment-heavy legislation, but balancing conservation efforts with infrastructure improvements is paramount. For example, many transportation projects in the region threaten potential Natura 2000 sites. There is an agreed need to accelerate the process of identifying areas to be protected.

The high cost of achieving EU environmental compliance is a formidable challenge for the new member states, **Bulgaria** and **Romania**, and several Balkan countries that have negotiated Stabilisation and Association Agreements (SAAs) with the EU to bring their countries closer to EU standards.
Since the beginning of accession negotiations, the EU has stressed that at least 90% of the cost of environmental compliance must be borne from countries' own sources, representing 2-3% of GDP for many years to come.

The reforms should concern institutional and legal measures. For **Czech Republic**, for the water sector, it will be required for 5 years period 1,130 – 1,500 MEUR, and for 10 years period 2,260 – 3,000 MEUR.

Values related to the direct investments within the Morava River, which have to be carried out, to respond to new water related regulations are estimated to reach a total amount of 200 – 250 MEUR for period of 5 years. Cost assessment for implementation of the WFD is about 10 MEUR for years 2003 – 2015, of which for years 2004 – 2006 is presupposed amount 2.6 MEUR. State budget is the main source of finance. No additional institutions are requested. In the 1992–2002 period, the State Environmental Fund of the Czech Republic spent 1.1 billion € and supported the various environmental and water related investments, of which construction or reconstruction of 1,115 waste water treatment plants and sewer systems and 1,295 projects to decrease the burden on nature and the landscape.

For some countries (**Moldova, Croatia, B&H and Serbia and Montenegro**), the time frame for the approximation of national legislation to EU legislation is determined by the currently not fully satisfactory status of water sector legislation and the economic capability and potential of the particular country. For these countries the approximation process has to be considered as a medium to long-term task.

Moldova is committed to implement the WFD and the ICPDR JAP. A detailed revision of needs in terms of legislation to respond to WFD is not yet done. The needed investment for JAP implementation is: 296.7

MEUR for municipal wastewater treatment plants, including sewerage systems, 111.2 MEUR for industrial wastewater treatment plants, and 85.0 MEUR for restoring and protecting the wetlands.

For **Bosnia**, the financial allocation for 2002-2004 is 25,6 MEUR. From **Slovene** EcoFund 0,211 MEUR were spent on wastewater treatment and 1,875 MEUR for wastewater collection systems as part of the NEAP priorities only in 2002.

Romania is the recipient of funding from the EU-ISPA Programme that provides support for the transport and environment sectors, with an annual allocation of 208-270 MEUR for the period 2000-06.
The two first Danube EU member countries **Germany** and **Austria** have significantly achieved high standards of emission reduction and water pollution control. In 1997 and 1998 Germany invested more then 2.88 billion € for pollution reduction measures to respond to EU Water Directives and in particular the Nitrate Directive. Current investment in the water sector in the German part of the Danube River Basin is at the level of about 1.8 billion € per year of which 1.5 billion € is spent for communal wastewater treatment facilities (including 3rd stage for nutrient removal). From 1993 to 1999 Austria invested about 936 MEUR per year for municipal wastewater treatment including nutrient removal facilities. Concerning the ongoing projects indicated in the ICPDR JAP, further investments of 234 MEUR for Germany and 264 MEUR for Austria are foreseen for the period from 2001 to 2005.
As minimising floods impacts is one of the main tasks of the JAP, estimates of the financial resources for implementation of the Action Programme for Sustainable Flood Protection in the Danube River Basin show the following sources:

- National budgets and other national sources
- Stakeholders contribution
- EU funds, including new cohesion funds

Relevant projects on flood action planning and implementation could financially be supported from programmes and funds of European Union, such as: Common Agriculture Policy, European Regional Development Fund, INTERREG IIIB CADSES, Special Action Programme for Agriculture and Rural Development (SAPARD), LIFE, PHARE Cross Border Co-operation (CBC), or TACIS. The European Commission has made a proposal for European Regional Development Fund 2007-2013 (COM (2004) 495 final) and has proposed to simplify the funding of external assistance (COM (2004) 626 final).

Table 6 shows a schedule for the envisaged approximation of the national legislation to the EU legislation (regarding selected EU Directives which are directly or indirectly related to the JAP tasks).

Table 6: Planned Schedule for Approximation of National Legislation to EU Legislation

Country	**2000/60 EC** Water Framework Directive	**EC 91/271/EC** on urban waste water treatment, amended as 98/15/EC 1998	**EC 91/676/EC** Nitrates Directive on the protection of waters against pollution caused by nitrates from agricultural sources	**EC 80/68/EC** on the protection of ground water	**96/61/EC** IPPC Directive on integrated Pollution Prevention and Control	**EC 98/83/EC** on the quality of water for human consumption and household needs	**EC 76/464/EC** on dangerous substances	**EC 73/404/EC** on biodegradability of detergents	**EC 78/659/EC** on the quality of fresh water needing protection or improvement in order to support fish life
DE	2005	Full compliance	Full compliance	Full compliance	Full compliance	Full compliance	Full compliance	Full compliance	Full compliance
AT	2005	Full compliance	Full compliance	Full compliance	Full compliance	Full compliance	Full compliance	Full compliance	Full compliance
CZ	2005	2010	2006	2007	2007	01.01.2003	2008	2003	
SK	2005	2010	2008	2005	2011	2008	2006	2000	2004
HU	2005	2010	2008	2005	2015	2008	30.09.05		
SI	2005	2008	2008	2007	2012	2008	30.09.05		
HR	2005	--	--	--		--	--	--	--
BA	--	--	--	--		--	--	--	--
CS	--	--	--	--		--	--	--	--
BG	2005	2015			2012				
RO	2005	2022	2014		2015	2022	2015		2010
MD	--	--	--	--		--	--	--	--
UA	--	2010	2003	2003			2005		

4 TASKS OF THE JOINT ACTION PROGRAM

The general objectives of the Joint Action Programme of the ICPDR are in line with the three main objectives defined in Article 2 of the DRPC: *"The Contracting Parties shall strive at achieving the goals of a sustainable and equitable water management, ...shall make all efforts to control the hazards originating from accidents ...and shall endeavour to contribute to reducing the pollution loads of the Black Sea from sources in the catchment area".*

There are 14 main tasks specified in the JAP (Table 7).

Table 7 Joint Action Program tasks

Nr.	Tasks	Measures
1	Reduction of Pollution from Point Sources - Municipal Discharges - Industrial Discharges - Agricultural Discharges	Emission inventories Recommendations on BAT in priority sectors Investments
2	Reduction of Pollution from Non-Point Sources	Emission inventories Program of measures Investments
3	Wetland and floodplain restoration	Investments
4	Continuing the basin-wide co-operation in the field of monitoring	TNMN
5	Improving the scope of the TNMN, in order to get it in line with the EC Water Frame Directive and to enable its timely operation	TNMN Analytical Quality Control (AQC)
6	List of Priority Substances	List of priority substances Monitoring priority substances Recommendations on BAT and BEP to reduce priority substances
7	Water Quality Standards	Water Quality Standards Reporting
8	Prevention of accidental pollution events and maintenance of the accidental emergency warning system	Inventory of accident risk spots al pollution exist, till the end of 2001 Development of Recommendations for risk reduction of accidental pollution at the identified sites, till 2002 Maintaining and improving the existing AEW system, and considering its use also for related purposes (e.g. flood warnings)
9	Reduction of pollution from inland navigation	Cooperation
10	Product controls	Accomplishing of a voluntary agreement by the Detergent Industry either towards ICPDR or to the Danube Basin States, in order to put only phosphate-free detergents for household and industrial use to the market in the Danube Basin, till the end of 2002
11	Minimising the impacts of floods	Action Programmes for sustainable Flood Prevention for selected parts of the Basin
12	Water Balance	Harmonised methodology for establishing domestic water balances for DRB
13	River Basin Management	RBMP for Danube river basin
14	Reporting on the Implementation of the Joint Action Programme for the Danube River Basin	Reporting 2004 Reporting 2006

4.1 Reduction of Pollution from Point Sources

4.1.1 Issues in need of special attention

The ICPDR has prepared inventories for point source emissions for the reference years 1997, 2000 and 2002. These include municipal sources (2000 only existing waste water treatment plants; 2002 untreated and treated municipal sources), industrial and agro-industrial point sources (only 2002). The inventory for the reference year 2002 includes 987 municipal, 306 industrial and 62 agro-industrial point sources.

From the ICPDR inventory it results that the total organic pollution from point sources into the river system of the Danube in 2000 was about 420 kt/a BOD (COD data for Serbia and Montenegro were not available). The point source discharges of nutrients were 125 kt/a (N) and 20.1 kt/a (P) according to the ICPDR inventory for 2000. The total nutrient point discharge into the Danube was about 134.2 kt/a nitrogen and 22.7 kt/a phosphorus in the year 2000. A comparison of the significant point source emissions assessed through screening of inventories illustrates that only few point sources are responsible for about half of the point discharges into the Danube River system. From this it can be concluded that reduction of emissions (organic substances and nutrients) from these sources would lead to a remarkable reduction of the total point source pollution.

The most significant problems with regard to the situation of wastewater treatment on municipal level in the lower Danube countries are

- Missing wastewater collection and treatment facilities,
- Generally poor condition of the facilities,
- Outdated and unreliable treatment technology,
- Insufficient maintenance of technical schemes,
- Insufficient financial resources for building, reconstruction and extension.

The degree of industrial development and the importance and amount of the pollution caused by the industrial sector varies within every single country. Practically all industrial branches are represented: chemical, electrical, engineering works, metallurgical and galvanic, textile, sugar, papermaking and pulp-mills, wood-making industry, etc. Still, in some cases industrial wastewater is discharged without any or with insufficient treatment into the public sewer network. This causes vast problems at the wastewater treatment plants so that their purification capacity is not sufficient or completely obstructed.

On the agricultural point sources of pollution, the pig and cattle farms are identified as point sources. These hot spots are in general relatively easy to eliminate by the treatment of the liquid manure.

Table 8 includes specific point source discharges of COD, BOD, total nitrogen and phosphorus from municipal wastewater treatments (WWTPs), direct industrial discharges, and agricultural point discharges in the sub-catchments of the Danube. Ns, PsINV - results of the ICPDR point source inventory for 2000; Ns, PsCALC – results obtained in 2004 of the MONERIS application for 2000.

Table 8. Point sources of pollution

Sub-catchment	CODs	BODs	Ns $_{inv}$	Ps $_{inv}$	Ns $_{calc}$	Ps $_{calc}$
	g/(Inh·d)	g/(Inh·d)	g/(Inh·d)	g/(Inh·d)	g/(Inh·d)	g/(Inh·d)
01 Upper Danube	9.5	1.2	3.5	0.2	3.8	0.3
02 Inn	20.2	3.9	3.9	0.4	3.6	0.5
03 Austrian Danube	11.8	1.4	2.8	0.2	3.4	0.3
04 Morava	10.8	1.8	3.5	0.4	4.9	0.5
05 Vah-Hron	26.0	9.1	7.1	0.6	4.2	0.4
06 Pannonian Central Danube	35.8	18.8	5.3	0.6	6.7	1.0
07 Drava-Mura	44.2	12.5	5.2	0.8	4.1	0.7
08 Sava	52.3	28.6	4.0	1.0	4.8	1.2
09 Tisza	14.4	8.3	2.7	0.5	3.5	0.5
10 Banat-Eastern Serbia	17.8	68.5	12.4	2.7	10.4	2.4
11 Velika Morava	n.a.	24.9	3.3	1.1	3.3	1.1
12 Mizia-Dobrudzha	64.6	30.2	6.4	1.6	6.7	1.5
13 Muntenia	17.3	10.0	4.1	0.7	4.5	0.9
14 Prut-Siret	15.1	5.9	2.1	0.2	2.4	0.3
15 Delta-Liman	15.6	8.4	4.3	0.5	3.7	0.6
Total DRBD	23.9	14.0	4.2	0.7	4.5	0.8

Figure 1 shows the difference in the present state of the specific nutrient point source discharges within the Danube countries. For nitrogen it is shown that the lowest point N discharges are in Germany with 4 g/(Inh.·d) per connected inhabitant followed by Austria, Ukraine and Moldova. It is likely that the low N discharges for the latter two countries are due to inconsistent data for the population connected to waste water treatment plants, or to low nitrogen discharges from the point sources in the inventory.

The present level of N elimination in the WWTPs of Ukraine and Moldava is much lower than in Germany and Austria. For some countries the specific N discharges are higher than the assumed N emission per inhabitant of 12 g/(Inh.·d). This is due to the present low level of nitrogen removal in most of the WWTPs of these countries and the additional fact that the point source database includes industrial discharges emitted into the river indirectly (via sewer system) and directly (industrial point sources).

Figure 1. Inhabitant specific N discharges from point sources in the Danube countries for the period 1998 to 2000 according to modelling results (Behrendt et al. 2004)

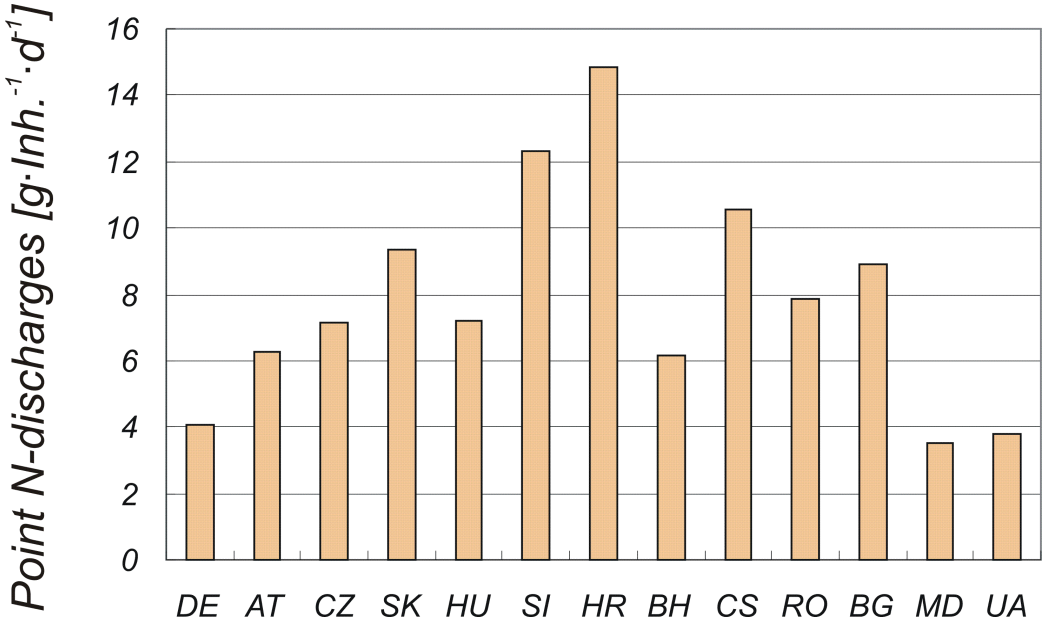
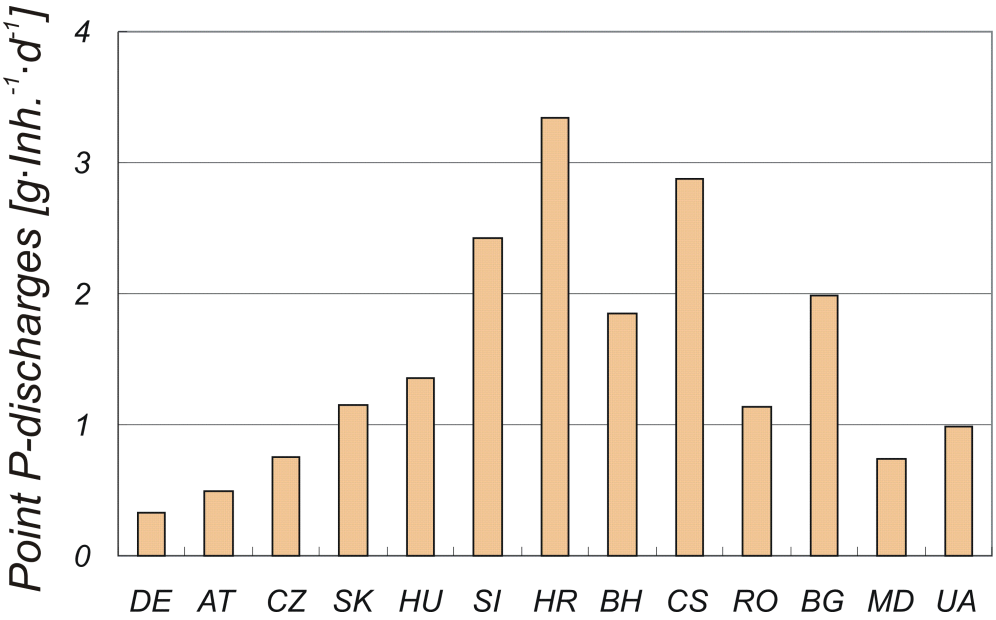


Figure 2 Inhabitant specific P discharges from point sources in the Danube countries for the period 1998 to 2000 according to modelling results (Behrendt et al. (2004)



The picture for phosphorus (Figure 2) is similar to that for nitrogen (Figure 1). The differences between the countries are much larger due to the fact that the specific P point discharges reflect, not only the state of the P elimination in waste water treatment plants, but also the existing use of phosphorus in detergents, and discharges from direct industrial sources.

In respect to nitrogen it has to be stated that the nitrogen discharges, which can be influenced by management, are actually in the same size for point and for diffuse sources. This means that nitrogen removal at point sources (treatment plants) will play an important role in nitrogen management, as diffuse sources from agriculture in the eastern Danube countries probably tend to increase with economic growth.

The development of sewer systems in response to the EU UWWD might lead to an increase of nutrient discharges to the rivers if the waste water is treated without nutrient (N and P) removal as for sensitive areas.

In respect to phosphorus point sources still play a decisive role. P-free detergents, P-removal at municipal and industrial waste water treatment plants and the avoidance of agricultural point sources are important measures in order to keep emissions of easily available dissolved P-compounds low.

Within the frame of Joint Action Program, both structural/investment and legal/policy reforms projects that address pollution reduction are being introduced for the period 2001 – 2005. According to the JAP, the total investment required for the 245 priority point source projects for all 13 DRB countries amounts to about 4,404 MEUR.

Table 9 Estimates of JAP expected reduction per sector and total projects JAP 2001-2005

Expected Nutrient Reduction in the Danube River Basin point sources					
	Municipal	**Industrial**	**Agricultural**	**Wetlands**	**Total point sources**
No of Projects	157	44	21	23	245
N (t/y)	33 300	3 400	6 700	15 100	58 500
P (t/y)	5 500	3 700	1 100	1 800	12 100
BOD (t/y)	221 000	39 700	9 500	5 900	276 100
COD (t/y)	398 900	78 700	15 000	32 400	525 000

4.1.2 Municipal Discharges

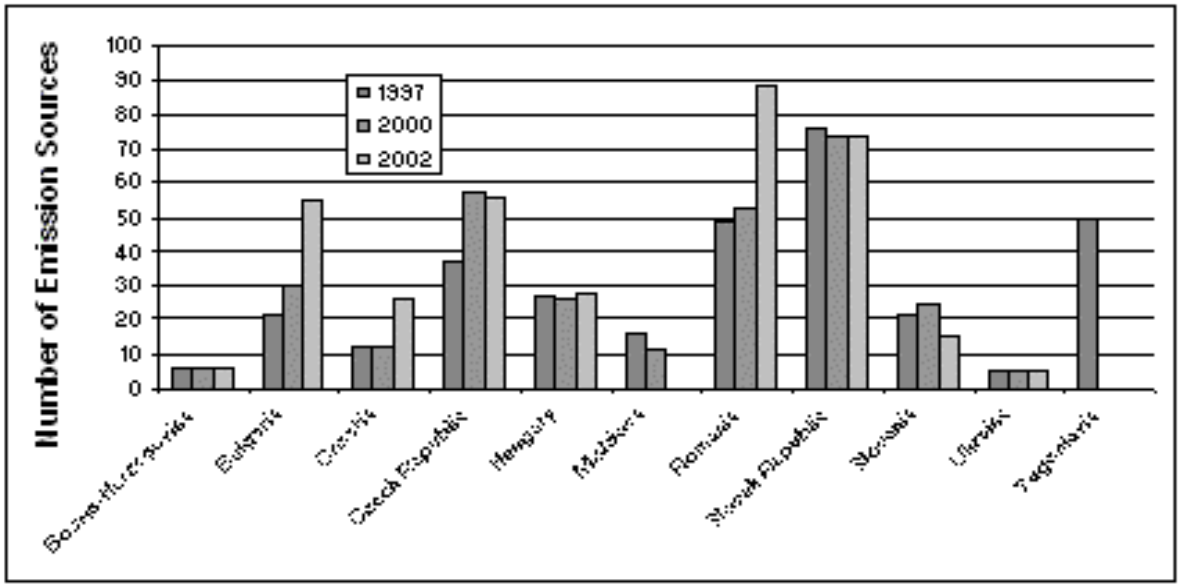
4.1.2.1 Emission inventories

In 1999, the inadequate management of municipal wastewater (improper collection of wastewater, insufficient capacities of treatment facilities and inadequate control of individual wastewater treatment) has been identified as one of the core problems in the DRB. Recent estimates show improvements in the share of population connected to public sewerage system and wastewater treatment plants in comparison with the situation in 1999. In 2002, in **Slovakia**, 84 % of population were connected to the public water supply networks while 55,34% were connected to the public sewerage. At the end of 1998, over 93% of the total population of **Germany** were connected to the pubic sewage system.

According to the article 3.2.1. of the JAP, *"Contracting Parties have agreed to implement the proposed measures, under the assumption that the financial resources are available during the implementation period* of the JAP, i.e. till 2005".

Annex 1 of the JAP lists the planned measures for the reduction of pollution load from municipal waste water discharges: COD - more than 214 kt per year, total-nitrogen - more than 36 kt per year, and total-phosphorus - more than 5.2 kt per year.

Figure 3 Number of point sources reported, 1997, 2000 and 2002



Regulation of point sources is achieved through emission limits and best practices. The Danube countries use a number of methods to tackle the task of controlling emissions from point sources:

- Preparing emissions inventories of municipal point sources. Based on these inventories, the reduction of water pollution that can be achieved by implementing the various measures and the amount of investment needed and other costs involved are calculated.
- The elaboration of Best Available Techniques (BAT) for municipal wastewater discharges, including the setting up of a timetable for their step-by-step implementation.
- The elaboration of the common principles regarding the minimum monitoring required for wastewater discharges.

In recent years, EU environmental policy has evolved from a traditional, command-and-control approach towards a more integrated and flexible approach. At EU level, there are now at least three different instruments to tackle pollution caused by point sources:

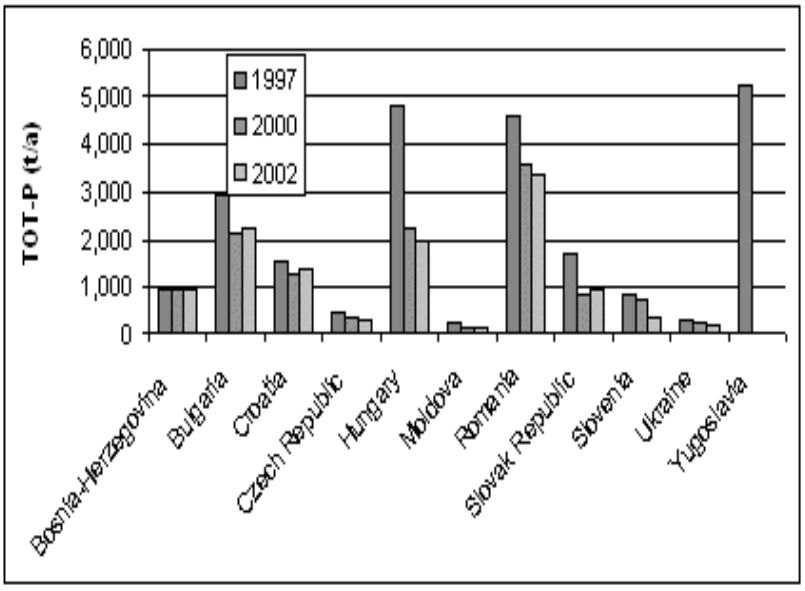
- Prescriptive legislation containing minimum rules to be applied uniformly across the EU

- Flexible legislation imposing additional site-specific or national rules, which will vary from one installation to another within the Union (e.g. the IPPC Directive).
- Voluntary and/or market-based instruments setting the basic rules for operators who want to exploit market opportunities (e.g. introduction of phosphate free detergent, EMAS regulation and a future emissions trading scheme).

The quality standards provide the framework for both minimum emission limit values and additional BAT-based conditions. If the use of BAT is not enough to meet a quality standard, then more drastic measures must be taken.

The EMIS inventory developed in the ICPDR has expanded in scope to collect data from all settlements having more than 10,000 inh. Therefore, the municipal emission inventories include all municipal sources with more than 10,000 PE (wastewater treatment plants, irrespective of the type of treatment, as well the municipal sources without treatment, discharging into the riverine environment. Discharges of substances from the ICPDR List of priority substances were also considered.

Figure 4 Tot-P from municipal point sources



A review of reporting on point sources of pollution in 1997, 2000 and 2002, for municipal sources, shows that the reduction of BOD, COD, N and P loads in the discharges is quite considerable Figure 3 indicates tot –P reduction along the 3 reporting periods. For municipal discharges, 160,408 t/a BOD, 131,585 t/a COD, 2,240 t/a TOT-N, and 6,575 TOT-P t/a have been reduced in the period 1997-2002. The first graph shows the number of sources reported in the years 1997, 2000 and 2002. Yugoslavia (Serbia & Montenegro) reported only few sources (Figure 3).

Objectives for water pollution reduction are usually incorporated as sub-components of higher objectives. However, most countries have established a system of priorities for pollution reduction, usually defining the sequence of construction, extension, or improvement of treatment standards for WWTPs, which are usually

- differentiated by sector (municipal / industrial/ agricultural);
- classified by plant capacity (small / medium / large) and treatment standards;
- differentiated by sensitivity of area (vulnerable areas / significant impact areas).

4.1.2.2 UWWT Directive: deadlines, reporting obligations and transitional periods

The most relevant EU legislation related to controlling point sources pollution is the Urban Waste Water Treatment Directive (Council Directive 91/271/EEC concerning urban waste water treatment), which requires Member States to collect and treat urban wastewater discharged from agglomerations over a certain size by 30 June 1993.

The general objective of the Directive is to protect the environment from the adverse effects of discharges of urban wastewater and of wastewater from industrial sectors of agro-food industry. Specific objectives refer to:

- Waste water collection and treatment in all agglomerations above 2 000 p.e.
- Appropriate waste water treatment in all agglomerations below 2 000 p.e., if collected
- Biological treatment (secondary) as standard requirement
- More stringent treatment (tertiary) in sensitive areas and their relevant catchment areas

The Directive also requires Member States to:

- provide prior regulation or specific authorization for all discharges of urban waste water and industrial waste water from the particular sectors mentioned in the Directive, as well as for all discharges of industrial waste water into urban waste water systems;
- ensure that by 31/12/2000 the industrial waste water from the mentioned sectors shall before discharge respect the established conditions for all discharges from plants representing 4.000 population equivalent or more;
- provide before 31/12/1998 general rules or registration or authorization for the sustainable disposal of sludge arising from waste water treatment and, by the same date, to phase out any dumping or discharge of sewage sludge into surface waters;
- ensure that the urban waste water discharges and their effects are monitored;
- publish situation reports every two years and establish implementation programmes.

The sensitive areas must be designated according to one or more of the following criteria:

- water bodies which are found to be eutrophic (eutrophication is an enrichment of water by nutrients, especially compounds of nitrogen and/or phosphorus, causing an accelerated growth of algae and higher forms of plant life) or which in the near future may become eutrophic if protecting action is not taken;
- surface freshwaters intended for the abstraction of drinking waters and which could contain more than 50 mg/l of nitrates if action is not taken;
- areas where further treatment is necessary to fulfil other Council Directives.

Sensitive areas require more stringent treatment e.g. the removal of nitrogen and/or phosphorus, microbiological treatment. The **Czech Republic** and **Slovakia** identified their entire territory as sensitive or applied Article 5.8. **Hungary** and **Slovenia** identified parts of their territory as sensitive. **Austria** has identified their entire territory as sensitive or applied Article 5.8. For **Germany** only Danube river basin is not identified as sensitive. **Romania** confirms that the entire territory is a sensitive area according to the provision of Chapter 22 on "Environmental protection". This is going to be legally reflected in the expected update of the Governmental Decision 188/2002 in March 2005.

The progress with respect to wastewater treatment varies widely. Each Danube accession country made estimates of the cost of implementing the more demanding directives, particularly the Urban Wastewater Treatment Directive (UWWT) and Integrated Pollution prevention and Control (IPPC).

Table 10: Estimated compliance costs for UWWT and IPPC Directives Directive

Danube country	Population 2000, mil inh	Estimated cost for UWWT (MEUR)	Estimated cost for IPPC (MEUR)
Bulgaria	8,2	2,056 (65%)	3,261 (300-400 facilities)
Czech Republic	10,4	1,164 (74.9%)	3,725 (1,088 facilities)
Hungary	10	1,678 (60% sewage and 22% treatment)	1,761 (970 facilities)
Romania	22,4	1,385 (sewage)	806 (2,900 facilities)
Slovakia	5,4	499 (54.7%)	1596 (540 facilities)
Slovenia	1,99	914 (sewage)	50 (108 facilities)

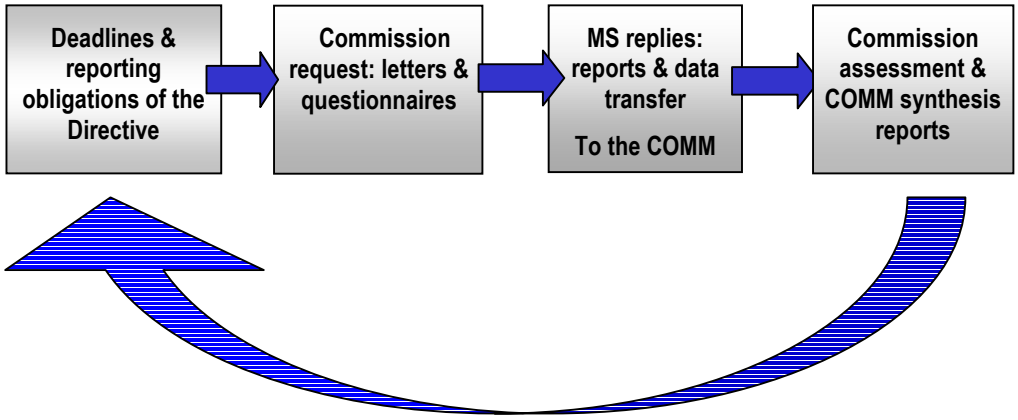
4.1.2.3 Tasks for future reporting on municipal discharges

Harmonization of the reporting requirements under the Urban Waste Water Directive and the Water Framework Directive

On going developments at the EC level need to be considered in the future reporting obligations of the ICPDR on pollution sources. A EU working group (2D – 'Reporting') is looking at the various reporting requirements of the WFD as to create an efficient information system, to ensure a coherent reporting system and to allow access to information. In addition to the WFD, the Directive on the standardization of reports i.e. a Reporting Framework Directive needs to be taken into account. The EC considers that uniform reporting would be possible from 2009 after the report format and the reporting periods had been adapted to the Water Framework Directive (three-yearly reporting requirement).

In order to have more homogeneous status on the UWWTD implementation all over the EU-25 and to simplify the reporting exercise, the Commission has the intention to set up a unified reporting cycle for the UWWTD under all articles under which reporting is required (Figure 5).

Figure 5 Simplified structure of the interaction between the Commission and MS during the process of the reporting while implementing the Directive 91/271/EEC



New challenges: transitional periods for the new MS and streamlining of reporting process for all Danube countries

The ICPDR EMIS EG will prepare a proposal on the harmonization of the reporting requirements in line with the WFD and other directives ensuring as much consistency as possible between these reporting obligations and emission inventories of the ICPDR. There is a need to create the unified system for reporting: (a) with the same reference years, (b) the same deadlines to report data and information, and (c) to have a unique computerized reporting form for all UWWT Directive requirements. This deadline should be considered when reporting obligations under DRPC of the Danube countries (MS, accession countries and non accession countries) will be reviewed.

A standardized reporting system is a key element to reduce the reporting burden for Danube countries under this directive but also under other closely related directives (e.g. WFD). The overall goal is complementary reporting system, which provides the ICPDR and other data users with the required information for the different purposes via a minimized and clearly ruled data exchange process with the Danube countries.

In addition, as the ICPDR database is a model of the situation from wastewater generation to the discharge point, including information on various parameters, such as wastewater treatment plants, discharge points and water bodies, it is necessary to establish a link between wastewater discharge points and the river catchment areas (district, sub-basins) of the Water Framework Directive. Thus, the database can be used for other reporting requirements, pressures and impact assessments, etc.

Specifically, on municipal emission discharges, the updates of templates for the municipal emission inventories will consider:

According to the Annex I of the UWWT Directive, reporting refer to the size of the agglomeration but not to the capacity of the treatment plant. Therefore, as Population equivalents (p.e.) mentioned in Tables 1 and 2 (Annex I) refer to the size of the agglomeration, but not the capacity of UWWT, this should be clarified and agreed in the update of the emission inventories of the DRB.

The load of those existing settlements or single houses which are equipped with individual systems and treat the wastewater in a nearby treatment plant need to be included into the size of the agglomeration, they belong to. Evaluation of data in sensitive areas, the production and use of sludge, and the input of industrial wastewater into the wastewater treatment plants will also be well thought-out.

4.1.2.4 Implementation of JAP national investment programs: municipal sector

The Urban Waste Water Treatment Directive requires the construction of wastewater treatment infrastructure. It is expected by all countries to be the most expensive, with a total investment cost of around 15 billion €, and an average per capita cost of 235 €.

Funding instruments for accession countries are: Phare, Sapard and ISPA. Funding instruments for Member States include Structural Funds and Cohesion Funds. There are also others like Life, Interegg, etc.

Extensive municipal wastewater development is under implementation throughout the basin. In many of the upper Danube countries, tertiary upgrades (nutrient removal) have been made or are planned. At the same time, sewerage coverage and baseline wastewater treatment (primary and secondary/biological) are increasing in the middle and lower Danube countries. Nutrient removal technologies are expanding in the region, in response to the Urban Wastewater Treatment Directive, and the overall wastewater flow will continue to increase for a number of years (Table 10).

The first selection of priority projects at a regional scale carried out by the ICPDR within the frame of EU DABLAS project was carried out in 2002. The revision of lists of national projects of the Joint Action Programme and selection of municipal priority projects has shown that among the 158 projects, 45 are fully funded with a total of 622 MEUR. The investment need for the remaining 113 projects is 2,567 MEUR, of which 2,121 MEUR are not yet secured. Among the 11 Danube River Basin countries (excluding Austria and Germany), approximately 625 MEUR were invested by 2002 in 45 municipal wastewater projects, achieving reductions of 7,246 tons N/year and 1,259 tons P/year, which represent 19% for N and 11% for P of the total expected nutrient reductions (Table 11). These completed projects are situated in the four recent EU: Czech Republic, Hungary, Slovakia, and Slovenia. Roughly 2,500 MEUR are estimated to realise more than 100 other municipal projects throughout the basin.

The projects differ in size from >1,000,000 population equivalent (Belgrade, Bucharest, Budapest, Sarajevo, Zagreb) to ca. 10,000 PE. Project preparedness is also highly variable, ranging from projects that are missing <10% of the total investment demand, to projects that have outdated or non-existent plans and no funding secured.

Table 11. Emission reduction in selected Danube countries, DABLAS 2002

Country	Total Projects	Total Investments (MEUR)	Red. BOD (t/a)	Red. COD (t/a)	Red. Tot-N(t/a)	Red. Tot-P(t/a)
CZ	14	156.0	170	106	856	47
HU	9	142.3	9,231	20,126	1,802	442
SK	7	41.6	1,143	1,650	295	61
SI	15	282.7	25,265	42,461	4,293	709
Total Sum	45	622.6	35,809	64,343	7,246	1,259

Considering the 2004 results of the EU DABLAS II project, a total of 191 municipal projects (33 more than the assessment made in 2002) are to be realised (completed, in pipe line or in need of Technical Assistance) in the 11 Danube countries (without Germany and Austria).

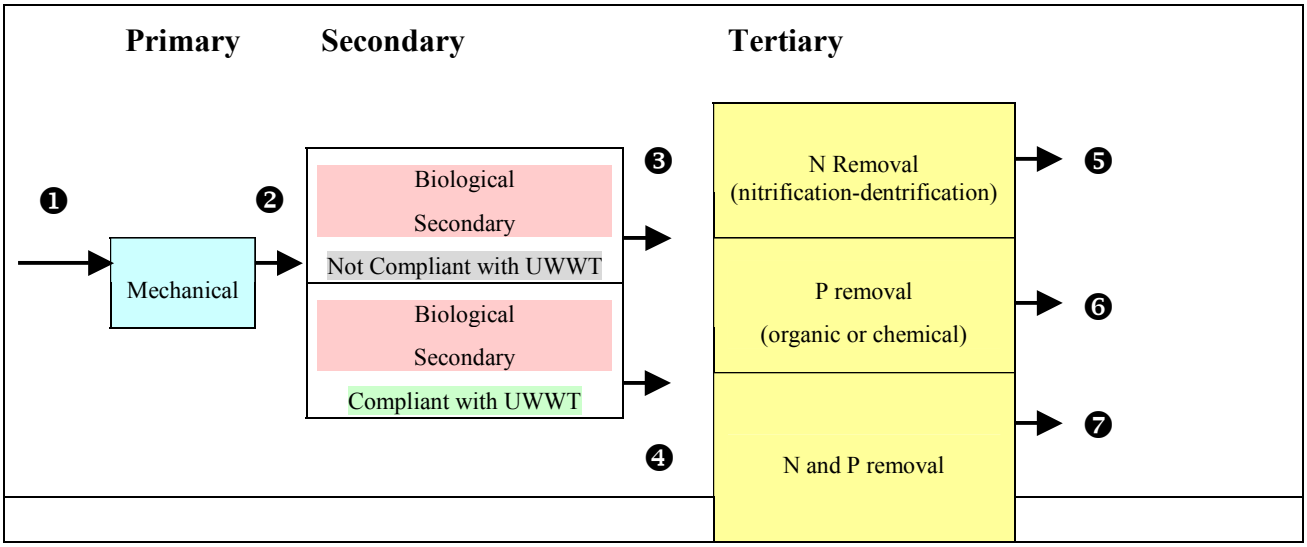
A total of 19 projects are completed until December 2003, for a total of 205.8 MEUR. The breakdown of funding sources is presented in the Table 12.

Through December 2005, a number of 50 projects are to be completed, and again there are predominantly located in the new Member States (Table 13). In addition 3 more projects are expected top be realised, in **Bulgaria** (2) and **Ukraine** (1) provided that more than 90% of funds will be available.

Pollution reduction data were unavailable for some municipal sector investments, and for many projects, the data were unreliable. In addition, pollution reduction was not fully represented in many cases, particularly for projects involving capacity extensions. Indirect pollution reduction benefits are attained as more sources are connected to the municipal sewerage network and fewer rely on septic systems. For these reasons, an empirical approach was used to estimate pollution reduction for the municipal sector projects.

The following approach was applied for estimating empirical emission reductions from the municipal projects. Firstly, representative concentrations were set for different wastewater treatment stages (see Figure 6)

Figure 6 Methodology to estimate pollution reduction for the municipal projects



Parameter		Concentration (mg/l)						
		❶	❷	❸	❹	❺	❻	❼
BOD		250	175	125	25	20	15	10
COD		500	350	250	125	100	75	50
Tot-N	<100,000 pe	50	45	45	40	15	30	15
	>100,000 pe	50	45	45	40	10	30	10
Tot-P	<100,000 pe	12	11	11	11	8	2	2
	>100,000 pe	12	11	11	11	8	1	1

Each project was then assigned a "project type" based on the project description and measures indicated on the project form:

New: New WWTP, in compliance with the UWWT Directive.

Ren: Renovation/rehabilitation of an existing, non-compliant WWTP

Ext: Extension of treatment capacity.

Upg: Upgrade to tertiary treatment (N and/or P removal)

According to the first period of reporting to the JAP, by December 2003, the total achieved reduction of pollution load for municipal wastewater treatment plants is: 13,850 t/a BOD; 29,700 t/a COD; 4,915 t/a Tot-N and 977 t/a Tot-P (Table 15).

Table 12 Municipal wastewater treatment plants completed by 2003

Municipal Sector (projects completed by 2003: Interim Report on JAP implementation)						
Country	No. of Projects	Total Investment MEUR	Breakdown of Funding Sources, %			
			National	EU	IFIs	Missing Funds
Czech Republic	5	40.6	69.9		23.7	6.4
Hungary	8	57.7	82.7	8.9	3.4	0.0
Slovakia	3	34.4	100			0.0
Slovenia	3	73.0	20.5	20.5	58.9	0.0
Totals:	**19**	**205.8**				

The completed projects by 2003 were carried out in the four recent EU accession countries, Czech Republic, Hungary, Slovakia, and Slovenia, and total investment costs range from 40.6 MEUR in the Czech Republic (5 projects) to 73 MEUR in Slovenia for completion of 3 projects.

Slovenia accounts for more than 35% of the total investment costs, followed by **Hungary**. National funding accounts for significant (**Hungary**) or in totality (**Slovenia**) proportion of the investments.

Table 13 Municipal wastewater treatment plants completed by 2005

Municipal Sector (projects planned for completion by 2005: Final Report on JAP implementation)						
Country	No. of Projects	Total Investment MEUR	Breakdown of Funding Sources, %			
			National	EU	IFIs	Missing Funds
Bulgaria	2	7.8	0	0	0	100
Czech Republic	16	169.8	46.1	9.2	40.8	3.9
Hungary	9	34	89.2	16.4	0	0
Slovakia	10	81.7	80.3	16.7	3	0
Slovenia	12	172.5	30.8	37.9	25.7	5.5
Ukraine	1	0.5	7	0	0	93
Totals:	**50**	**498.2**				

The total number of completed and proposed municipal wastewater treatment plants and related investments having N and P removal reported are presented in the Table 14.

Regulatory demands regarding implementation of tertiary treatment are variable among the DRB countries, depending primarily on how the sensitivity of surface water resources have been classified in national legislation. The majority of the projects in the countries have tertiary treatment technology, as a result of legislative transposition during the EU accession period. N removal is more prevalent than P removal among the municipal projects. **All projects completed by 2003 do have tertiary treatment technology** (Table 14).

Considering the pollution reduction (BOD, COD, Total N, Total P) expected through the 354 DABLAS 2004 investments, approx. 5% of the reduction has been achieved by projects completed by 2003. The rate increases to 10-15% by 2005; however, it is questionable whether all projects planned for completion by 2005 will actually be realised by that time. This means that 85-90% of the expected pollution reduction will be carried out through projects completed after 2005.

Table 14. Municipal projects with N and P removal, completed by 2003

Municipal Sector: Projects Completed by 2003					
Project	**Location**	**Tertiary Treatment**		**Emission Reduction (t/a)**	
		N	**P**	**N**	**P**
1. CZ-M-03-0	HODONIN	No	Yes	139	11
2. CZ-M-04-0	PROSTEJOV	No	Yes	222	18
3. CZ-M-05-0	PREROV	No	Yes	202	16
4. CZ-M-08-0	VYSKOV	No	Yes	64	5
5. CZ-M-13-0	Hranice	No	Yes	41	3
6. HU-M-02-2	Budapest South Pest	Yes	Yes	803	257
7. HU-M-07-1	Szolnok	Yes	Yes	307	88
8. HU-M-09-1	Székesfehérvár	Yes	No	562	52
9. HU-M-10-1	Tatabanya	Yes	No	207	17
10. HU-M-11-1	Dunaújváros	Yes	No	137	11
11. HU-M-13-1	Szekszárd	Yes	Yes	255	81
12. HU-M-14-1	Salgótarján	Yes	Yes	140	44
13. HU-M-17-1	Baja	Yes	Yes	222	69
14. SI-M-01-1	Maribor WWTP	Yes	Yes	485	139
15. SI-M-04-1	Celje	Yes	Yes	217	62
16. SI-M-09-1	Kranjska Gora	Yes	Yes	23	7
17. SK-M-01-1	Košice	Yes	No	803	80
18. SK-M-10-1	Rožňava	Yes	No	37	3
19. SK-M-12-1	Banská Štiavnica	Yes	Yes	49	14
			Totals:	**4915**	**977**
Emission reductions based on empirical calculations.					

Table 15. Municipal projects completed by 2003 and achieved pollution reduction

Nr.	Country	Total projects	Fully financed projects	Total cost MEUR	Sec funds MEUR	Funding gap	PE of WWTP	Red BOD t/a	Red COD t/a	Red Tot-N t/a	Red Tot-P t/a
1	Czech Republic	5	5	40.6	40.6	0.0	363,000	415	1474	668	53
2	Hungary	8	8	57.7	57.7	0.0	1,347,019	5062	11486	2633	619
3	Slovakia	3	3	34.4	34.4	0.0	408,600	3396	6889	889	97
4	Slovenia	3	3	73.0	73.0	0.0	284,100	4977	9851	725	208
Total Sum		**19**	**19**	**205.7**	**205.8**	**0**	**2,402,719**	**13,850**	**29,700**	**4,915**	**977**

From the national reports on the JAP implementation, Austria and Germany reported:
In **Austria**, between 1959 and 1999 investment in wastewater treatment plants and sewerage totalled to about 25.000 MEUR (price level 2000). Financial promotion by the State had an important role in fostering wastewater treatment and in-plant water protection measures of communities and industry. The annual BOD-load of the total wastewater is reduced by 95 %, the annual COD-load by 91 %, and the nutrient loads of P by 83 % and of N by 68 % (2001).

In the years 2001-2003 on average 950 MEUR per year were invested in measures for wastewater collection and wastewater purification, summing up to 2.858 Mio EURO.

The estimated investment costs of measures, which AT listed for 11 defined wastewater treatment systems as part of the JAP 2001-2005 were 370 MEUR. However; investments between 2001 and 2003, dedicated only for measures to enlarge wastewater purification plant capacities amount to approximately 270 MEUR.

Apart from the ongoing upgrading of large urban wastewater treatment plants (e.g. Vienna, Graz and Linz) for improving treatment efficiency and for N-removal a number of smaller wastewater treatment plants (size > 15.000 PEQ) are in erection in line with national provisions and in implementing the EU-Urban Wastewater Directive.

By investments in enlargements of the canalisation the degree to which population is linked to central wastewater treatment plants has been slightly raised. These investments theoretically do not all result in a reduction of pollution loads because for a part former decentralised wastewater treatment facilities become substituted by central systems ensuring thereby a higher degree of performance security.

A balance of the results achieved versus the measures envisaged in the JAP will be presented in the final report on the implementation of the JAP 2001-2005 in 2006.

Germany has significantly achieved high standards of emission reduction und water pollution control. Current investment in the water sector in the German part of the Danube River Basin is at the level of about 1,8 billion € per year of which 1,5 billion € is spend for communal wastewater treatment facilities (including 3rd stage for nutrient removal). With this investment Germany responds to EU Water Directives and in particular the Urban Waste Water Directive. Concerning the ongoing projects indicated in the ICPDR JAP, further investments of 234 MEUR for Germany are foreseen for the period from 2001 to 2005. Specifically, Germany reported 3 municipal wastewater plants (Leutkirch, ZV Starnberger See and ZV Chiemsee) completed by 2003, with a cost of 46.5 MEUR. All three plants fulfil requirements of the EU Urban Wastewater Directive 91/271/EEC after completed upgrade.

4.1.3 Industrial Discharges

In addition to the commitment of *"Contracting Parties that have agreed to implement the proposed measures, under the assumption that the financial resources are available during the implementation period* of the JAP, i.e. till 2005", article 3.2.2. of the JAP requested that " *Recommendations on Best Available Techniques in the industrial sectors Chemical, Food, Chemical Pulping and Papermaking Industry to be translated into the relevant administrative languages used within the Danube States and made available by ICPDR (Danubis), at latest by June 2002*

Regulation of industrial point sources is achieved through emission limits and best practices: emissions inventories of industrial point sources and elaboration of Best Available Techniques (BAT) for industrial wastewater discharges, including the setting up of a timetable for their step-by-step implementation.

The EMIS inventory developed in the ICPDR cover as well all direct industrial discharges, which are bigger than 2 ton/a, COD or 1 ton/a BOD are reported according to EPER. Additionally, reporting to the ICPDR List of priority substances is included. For industrial discharges, according to the reporting of industrial discharges, 26,877 t/a BOD; 29,534 t/a COD; 3, 437 t/a TOT-N; and 1,575 TOT-P t/a have been reduced in the period 1997-2002.
The framework piece of legislation is 96/61/EC IPPC (Integrated Pollution Prevention Control) Directive. Pollution coming from point industrial units is partly addressed by the IPPC, and partly by a number of specialised directives covering specific sectors. The IPPC Directive takes an integrated approach, which means

that authorities need to consider as well the transboundary effects, to take into account the costs, as well as the advantages, of pollution prevention and control, and make sure that they are up to date with the latest developments in best available techniques. This important obligation has lead to the establishment of the EU-wide exchange of information on BAT and the Seville Process.
The closure of many heavily polluting industrial activities has contributed to a decrease of industrial pollution. Meeting the requirements of the IPPC Directive by the deadline of 2007, is one of the more demanding parts of EU environmental legislation, and requires high investment for technology and clean production processes. Activities listed in Annex I of the Directive are required to obtain IPPC licence, i.e. one licence dealing with emissions to all media. Directive applies an integrated approach to a wide range of activities. The existing links WFD/IPPC need to be clarified as well as reporting obligations towards European Pollutant Emission Register (Decision 2000/479) and E-PRTR (New proposal COM (2004) 634 of 7.10.2004). The key components of the expected new Directive on priority substances are:

- Environmental Quality Standards,
- Pollution control,
- Priority hazardous substance identification
- Analysis, monitoring and reporting
- Repeal existing daughter Directives

At the EC level, revision takes place on the obligations under Art 16 WFD on strategy against pollution, Art 11 on the programme measures for river basin specific pollutants 2009/2012 and the preparation of new instruments on 33 priority substances and certain other pollutants. Apart of a proposal for a Directive, the Commission is preparing a communication on the "Strategy against chemical pollution of surface water ".

Again, the ICPDR while preparing the Emission control concept paper, the reporting obligations to DRPC will be analysed as to avoid duplication of reporting on the existing WFD, future E-PRTR, taking into account that the format of reporting is determined by general WFD framework and the different status reporting obligations of Danube countries.

Several Danube countries have already been granted a longer transition period for the IPPC Directive, justified by relatively high investments required for outdated equipment.

In **Czech Republic**, the Act on IPPC came into force on 1 January 2003, and progress has been made with the establishing of an IPPC Agency. Implementation of IPPC Directive in **Hungary** had challenged the country's environmental administration, as the permitting system is revised. Effort is still required to transform the **Slovakia**'s infrastructure to comply with the EU Drinking Water and UWWT Directives. With regard to IPPC, Slovakia still has to introduce integrated permits and strengthen IPPC permitting capacity. Slovenia requested an extension to 2015 for implementation of the Urban Waste Water Treatment Directive to provide adequate collection and treatment of waste waters in the 135 agglomerations with p.e.> 2,000. A four-year transition period has been granted so that 15 facilities can meet the requirements of the IPPC Directive. Integrated permitting under IPPC came into force in January 2003 in **Romania,** which has time until 2015 to achieve compliance for all facilities.

In terms of COD-load the industrial share reported by **Austria** comprises about 273.000 t/a, i.e. approximately 50 % of the total COD-load transported to central urban wastewater treatment facilities. Directly discharging industry accounts for about 237.000 t COD/a. Approximately 90 % of this COD-load undergoes tertiary treatment, the remainder biological purification, which altogether results in a treatment efficiency of 85 % reduction of pollution expressed in terms of COD.

The State Program of Development of Water Industry was approved by the Parliament of **Ukraine** and has a status of the law. The program is aimed at the implementation of the national policy regarding the improvement of qualitative water supply to the population and industrial sectors, creation of the opportunities for sustainable functioning of water industry. Program identifies the source of the financial resources to be provided for implementation of the measures (total payments for special usage of water resources and payments collected from water transport and hydro energy entities for water bodies exploitation). The only problem is that all these payments are not able to cover expenditures needed for projected measures implementation. Ministry of Environmental Protection and State Committee on Water Management are responsible for the implementation of the Program.

4.1.3.1 Introduction of Best Available Techniques

ICPDR has identified the industrial sectors Chemical Industry, Food Industry, Chemical Pulping Industry and Papermaking Industry being amongst the main industrial polluters in the Danube River Basin. The industrial discharges of these industries shall comply with the 'best available techniques (BAT)' defined in the DRPC. In each of these priority industrial sectors, ICPDR has developed 'Recommendations on Best available Techniques' including timetables for their implementation. The 'best available techniques reference notes (BREF-Notes)' published by the European Commission in the framework of Directive 96/61/EEC (IPPC-Directive) have been considered in these Recommendations:

- Recommendation concerning the Treatment of Municipal Waste Waters
- Guidelines for Monitoring of Waste Water Discharges
- Recommendation on Best Available Techniques in the Chemical Industry
- Recommendation on Best Available Techniques in the Food Industry
- Recommendation on Best Available Techniques in the Chemical Pulping Industry
- Recommendation on Best Available Techniques in the Paper Making Industry

These Recommendations translated (EU financial support) into the different administrative languages existing in the Danube River Basin have been distributed to the administrative authorities, to industry, and to the interested public. The Danube countries are regularly reporting on the implementation of BAT at the specific industrial sector.

Czech Republic reported for 20 enterprises (9 papermaking, 6 food industry, and 5 chemical) the state of technological procedures for pollution reduction according to the ICPDR recommendations for best available techniques in papermaking, food and chemical industries.

In **Austria**, the ICPDR-BAT-recommendations are covered by the branch-specific Ordinances for the limitation of emissions from the respective industries in combination with the General Wastewater Emission Ordinance.

Preparation of the pollution reduction programs has started in **Hungary**, in compliance with the IPPC directive. Financing needs of this program until end of 2007 are about 1,8 billion €.

Introduction of BAT (cleaner technologies integrated into the production process as well as end-of-pipe solutions) in selected enterprises of the Danube countries (Romania, Slovakia, Hungary, Bulgaria and Croatia) represented the essence of the implementation of the UNIDO TEST integrated approach at enterprise level. The selection of the enterprises was done based on the ICPDR hot spots list and reporting to industrial emission discharges. The UNDP/GEF Danube Pollution Reduction Programme has identified in 1999, through its Transboundary Analysis (TDA) 130 major manufacturing enterprises (hot spots) within the Danube River Basin of which a significant number of these are contributing to transboundary pollution in the form of nutrients and/or persistent organic pollutants. It was considered that industry is responsible for most of the direct and indirect discharges of hazardous substances into the Danube Basin. Depending on the type of industry, the effluent might contain heavy metals (smelting, electroplating, chlorine production, tanneries, metal processing, etc.), organic micro-pollutants (pulp and paper, chemical, pharmaceuticals, etc.) or oil products and solvents (machine production, oil refineries, etc.). The outcomes of the TEST project provided evidence on the potential of achieving (i) significant reduction of transboundary pollution/nutrients into the Danube River and Black Sea, and (ii) enhancing institutional capacity in the country to assist other polluting plants contributing to transboundary/nutrient pollution in the Danube River and Black Sea.

4.1.3.2 Implementation of JAP national investment programs: industrial sector

Annex 2 of the JAP includes planned measures for the reduction of industrial wastewater discharges, incl. agricultural (point) sources for the period 2001-2005.

In **Austria**, the investments concerned upgrading and optimisation measures for wastewater collecting systems and wastewater treatment of the following industrial plants are presented in the Table 16.

Table 16 Industrial wastewater treatment plants completed by 2003 in Austria

Nr.	Name of Location	Remarks to load reductions	Estimated Investment Costs for load reduction MEUR
1	MoDo Hallein, Pulp and Paper	Biological WWT plant, reduction of around 6,000 t BOD p.a.	33
2	Steirische TKV	Extension of biological WWTP, reduction of around 1 t BOD p.a. and 11 t COD p.a.	2.1
3	Salinen Austria GmbH	Sewage sludge diversion and treatment, settling out of 38,000 t NaCl p.a.	8.2
4	Mayr-Melnhof Karton GmbH	WWTP, reduction of 27 t BOD p.a. and 193 t COB p.a.	5.5
5	Rauch Fruchtsäfte GmbH	WWTP, reduction of 48 t BOD p.a. and 1,164 t COB p.a.	2.4
6	Schlempetrocknungs-GmbH	WWTP, 60,000 m³ wastewater p.a., reduction of 5,140 t BOD p.a.	2.7
7	AMI Agrolinz Melamine International	Stripper for ammonia-production, 6,500 m³ wastewater p.a., reduction of 46 t COD p.a.	1.7
8	Burgenländische TKV	Biological wastewater pre-treatment, additional reduction of 600 t COD p.a.	1.7

In **Germany**, two wastewater treatment plants were completed before 31 December 2003: Esso Ingolstadt, and Nitrochemie Aschau. The total costs were 0.6 MEUR, respectively 7.5 MEUR. The reduction of tot N t/year is 20 t/year, respectively 55 t/year.

Slovakia reported 6 industrial projects completed by 31 December 2003, with an investment of 12 MEUR. The reduction achieved for these investments are 224 BOD t/a and 1,504 COD t/a. Until 2005, 14 projects shall be completed for an investment of 62.1 MEUR in: **Bosnia and Herzegovina** 1 project, **Croatia** 2 projects, **Hungary** 2 projects and **Slovakia** 9 projects (Table 17).

Table 17 Funding structures for investments in industrial wastewater treatment plants by 2005

Nr.	Country	Total projects	Investments in industrial wastewater treatment plants MEUR	National funds %	EU funds %	IFs %	Missing funds %
1	BA	1	0.1	100	0.0	0.0	0.0
2	HR	2	2.2	18.2	0.0	0.0	81.8
3	HU	2	41.0	100	0.0	0.0	0.0
4	SK	9	18.8	100	0.0	0.0	0.0
Total Sum		**14**	**62.1**				

Hungary accounts for more than 66% of the total investment costs in industrial wastewater treatment plants, followed by **Slovakia**. National funding accounts in totality for investments in **Bosnia and Herzegovi**na, **Hungary, and Slovakia.**

Table 18 Reduction of pollution loads in industrial wastewater treatment plants by 2005

Nr.	Country	Investments in industrial wastewater treatment plants (MEUR)	Expected reduction BOD t/a	Expected reduction COD t/a	Expected reduction N t/a	Expected reduction P t/a
1	BA	0.1				
2	HR	2.2	2,297	2,777	0.0	
3	HU	41.0	893	1,588	92	
4	SK	18.8	2,091	8,030	0.0	
Total Sum		**62.1**	**5,281**	**12,395**	**92**	

4.1.4 Point Discharges from Agriculture

4.1.4.1 Agro- industrial emission inventories

According to the Article 3.2.3. of JAP, the following actions are proposed:

- *Establishing of an inventory of point discharges from agriculture*
- *Establishing of a recommendation on the reduction of point discharges from agriculture before 2004.*

The EMIS inventory 2002 developed in the ICPDR has collected data from all agricultural discharges: all emissions from agricultural sources (farms) with more than 2000 pigs, more than 30 000 chicken, more than 2000 dairy cows, and more than 1000 sheep. Food industry sources were reported under the industrial inventory. Additionally, reporting to the ICPDR List of priority substances is included.

A number of 63 locations were identified in the emission inventories, 2002.

4.1.4.2 Recommendation on BAT at Agro-industrial Point Sources

Annex 2 of the JAP lists the planned measures for the reduction of pollution loads from industrial discharges and includes also some agricultural point discharges.

Agricultural development will have to be based on best available techniques and best available practice in regard to nutrient release to the waters.

The ICPDR has developed in line with Article 7 of the DRPC a Recommendation on BAT at Agro-industrial Units including (i) technical in-plant measures for the reduction of wastewater volume and abatement of pollution load, (ii) reduction of pollution load by end-of-pipe measures, and (iii) environmental management improvement actions. The Contracting Parties will implement the recommendation from January 2006 and report each 2 years from 2007.

The recommendation also includes a provision that all agro-industrial units be required to prepare a Manure Management Plan, when applying for a permit to discharge and in addition to BAT relating to (i) pollution abatement at source and (ii) waste water treatment. Danube Countries will implement the provisions of this document at the national level starting with 1st of January 2006.

4.1.4.3 Implementation of JAP national investment programs: agro-industrial sector

Slovenia reported 1 agro-industrial project completed by 31 December 2003. The investment cost is 3.5 MEUR. The total projects to be completed until 2005 are presented in Table 19.

Table 19 Investments in agro-industrial wastewater treatment plants by 2005

Nr.	Country	Total projects	Investments in industrial wastewater treatment plants MEUR	National funds %	EU funds %	IFs %	Missing funds %
1	Moldova	1	0.3	0	100	0	0
2	Slovenia	1	3.5	100	0	0	0
Total Sum		**2**	**3.8**	0	0	0	0

Table 20 Estimated reductions until 2005 from agro-industrial projects

Nr.	Country	Investments in industrial wastewater treatment plants MEUR	Expected reduction BOD t/a	Expected reduction COD t/a	Expected reduction N t/a
1	Moldova	0.3	n.a.	n.a.	n.a.
2	Slovenia	3.5	1	9	1
Total Sum		**3.8**	**1**	**9**	**1**

4.2 Reduction of Pollution from Non-Point Sources

According to Article 3.4 of the JAP, the following actions are agreed:

- *"Finalize the Inventory of Diffuse Sources of Nitrogen and Phosphorus and propose further measures for their reduction" and*

- *"Set up an Inventory of the programmes of measures undertaken in the States of the Danube River Basin".*

4.2.1 Inventory of Diffuse Sources of Nitrogen and Phosphorus and propose further measures for their reduction

The estimation of the nutrient emissions into surface water of Danube river basins, by point sources and various diffuse emissions has been calculated using a harmonized inventory for point and diffuse sources of pollution based on the model MONERIS (MOdelling Nutrient Emissions in RIver Systems). Whereas point emissions from waste water treatment plants and industrial sources are directly discharged into the rivers, diffuse emissions into the surface waters reflect the sum of different pathways. Seven pathways (Figure 7) are considered: point sources; atmospheric deposition; erosion; surface runoff; groundwater; tile drainage; urban surface water runoff. The model allows estimation of nutrient emissions to the surface water on a very large geographical scale and provides quantification of nutrient emissions to the surface water at the catchments level (rather than administrative units), in order to optimally support the river basin approach. Figure 8 gives an overview of the pathways and main processes used in the model.

Along the pathway from the source to emission into the river, manifold processes of transformation, retention and loss govern substances. To quantify and forecast the nutrient inputs in relation to their source requires knowledge of these transformation and retention processes. The use of a GIS allows a regional differentiated quantification of nutrient emissions into river systems. The EU research project daNUbs is currently verifying these. Recent estimates of daNUbs project on the situation in the Western Black Sea coastal (WBSC) area shows that it has improved significantly since the late eighties and early nineties. Reduced nutrient inputs led to:

- reduced eutrophication (algae production),
- regeneration of zoo-benthos and
- regeneration of phytoplankton.

The improvement is caused by reduced nutrient inputs by Danube River.

- Transported phosphorus loads are reduced to about 50 % as compared to the situation around 1990.
- Phosphorus is the limiting nutrient now for algae growth which seems to be the main reason for improvement of marine ecology in the WBSC.

The present level of the diffuse nitrogen emissions into the Danube river system is about 1.8 times higher than in the 1950s. This is mainly due to the change of the point source discharges. The increase from the 1950s to the end of the 1980s is approximately a factor 5 and the decrease within the 1990s is about 20 %. This is due to a decrease in the number of industrial discharges in the lower Danube countries after the political changes and substantial improvement of wastewater treatment especially in Germany and Austria.

For total N-emissions, it was found that the present state is a factor of 1.8 higher than in the 1950s but about 23 % lower than in the late 1980s.

Figure 7 Diffuse nutrient pollution by pathways for the total Danube river systems (1998-2000)

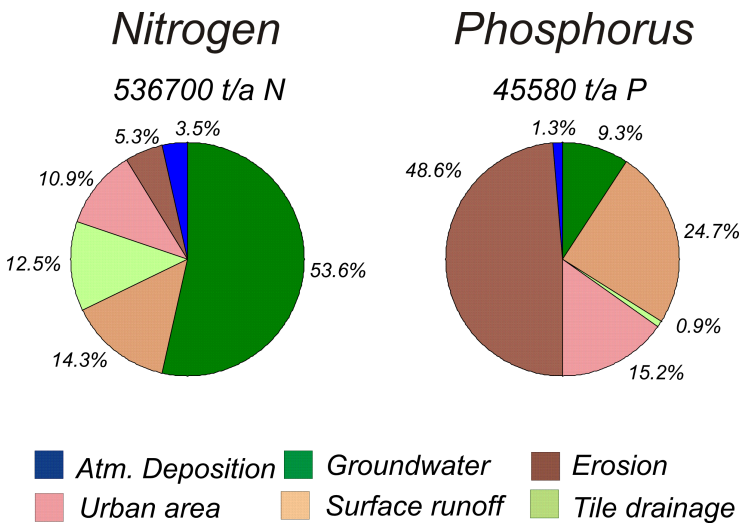
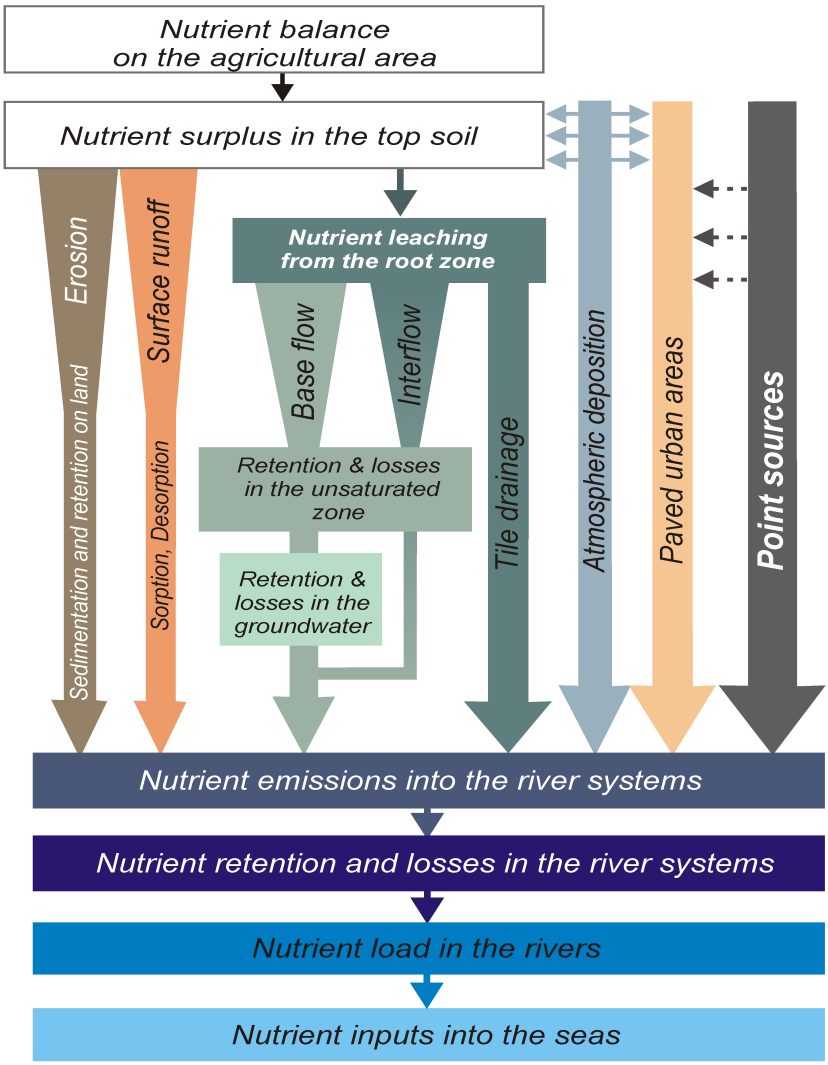


Figure 8. Pathways and processes used in MONERIS



In many Danube countries, the increasing importance of non-point sources is connected with decreasing pollution from point sources, due to the reducing of economical activity. The current relatively low discharges of N and P to the Black Sea are to a certain degree a result of the economic crisis in the lower Danube countries resulting in (i) a dramatic decrease of the application of mineral fertilizers, (ii) the closure of large animal farms (agricultural point sources) and, (iii) the closure of nutrient discharging industries (e.g. fertilizer industry). However, the main risk for not reaching good ecological status in respect to eutrophication is the recovery of the economic situation in the future, which potentially results in increasing nutrient loads to the Black Sea (e.g. agriculture, fertiliser industry).

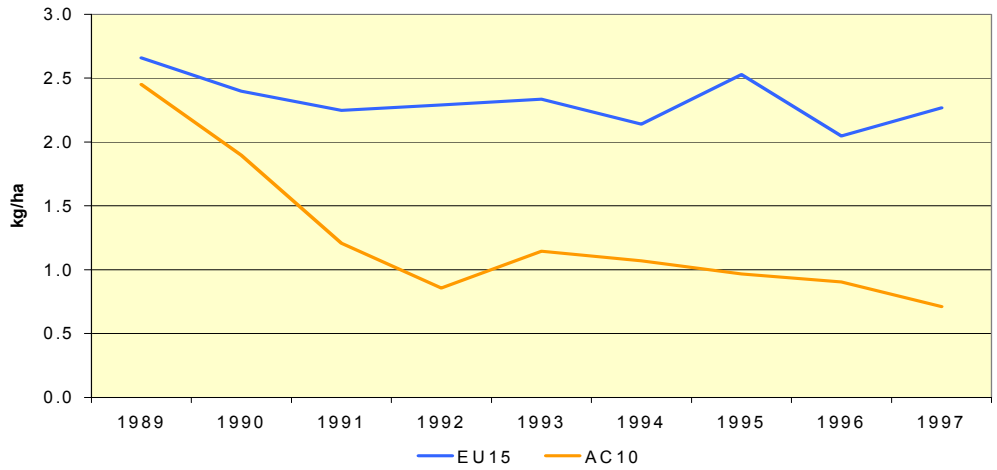
The total pollution from nitrates and acidification is significant, less for phosphorus, and is diverse in different regions of the DRB. The inputs are dependent on population density, percentage of treated wastewater disposal, intensity and way of farming and the level of atmospheric deposition. The Nitrates Directive requires development and application of codes of good agricultural practices, identification of zones vulnerable to nitrate pollution, and implementation of special action programmes in these zones.

With regard to agricultural policies it is worth mentioning that the current low use of agricultural pesticides in the countries of the DRB presents a unique opportunity to develop and promote more sustainable agricultural systems before farmers become dependent again upon the use of agro-chemical inputs. There is concern that with EU enlargement and the expansion of the Common Agricultural Policy (CAP) into the DRB countries joining the EU there is a risk of increasing fertilizers and pesticide use due to (i) increasing areas cultivated with cereals and oilseeds due to the availability of EU direct payments for farmers growing these crops in the new Member States, (ii) increased intensification of crop production, including the greater use of mineral fertilizers and pesticides, particularly in the more favourable areas with better growing conditions, and (iii) a reduction in mixed cropping and an increase in large-scale cereal monocultures in some areas dependent upon agro-chemicals for crop protection.

Reliable data on pesticide use in the CEE region are not available for the decades leading up to 1990. Data from the FAOSTAT database show a strong decline in pesticide use in the CEE countries to about 40% of 1989 levels compared to a relatively small decrease in EU Member States during the same period (Figure 9).

An additional source of information on pesticide use within the Danube countries is the report “Inventory of Agricultural Pesticide Use in the DRB Countries”. The data collected presents a picture of the situation at the national level for eight countries (CZ, SK, HU, HR, BA, CS, MD and UA). An analysis has shown that 29 priority chemicals are used in the Danube River Basin in pesticide products. Of these only three priority pesticides are authorized for use in all of the DRB countries, while seven priority pesticides are not authorized in any of the countries.

Figure 9. Pesticide Consumption in CEE countries and the EU151 Source: Data from the FAOSTAT database of the UN Food and Agriculture Organization.



[1] The graph expresses mean consumption of pesticides (active ingredients classed as insecticides, herbicides, fungicides and others) per unit area agricultural land.

Although pesticide use is currently relatively low in the DRB countries the risks of pesticide pollution remains:

- Priority pesticides, as well as other pesticides, are frequently detected in surface water and groundwater in the DRB and pose a serious hazard to the environment and human health.
- Seven priority pesticides are not authorized in the Danube countries; some of them continue to be of concern because of the existence of old stockpiles and residues in soils and sediments.
- The uncontrolled and illegal trade of pesticide products lead to the use of banned pesticides (e.g. DDT) by farmers.

An overall estimation of pesticide use in the Danube catchment is not possible.

Large data limitations, however, impeded a realistic simulation of reality. Therefore, it expected that future MONERIS calculation would be based on an updated and complete set of data, distributed among river basins identified as in the overview map of the Danube RBM Plan.

The selection of the most appropriate policy instruments to control diffuse pollution coming from agricultural activities, including pesticide pollution for the DRB countries will depend upon the establishment of a clear policy strategy for controlling pollution, together with clear policy objectives in line with DRPC and JAP. There are many factors that are forcing much of agricultural sector to rethink the use of pesticides, as well as many opportunities to promote new management approaches to pesticide use by farmers and policy-makers: Pesticide use reduction, compulsory training, and financial incentives for pollution control.

In response to this concern, the UNDP GEF DRP have assisted the DRB countries in providing guidance on the development of policies and legal and institutional instruments for the agricultural sector to assure reduction of nutrients and harmful substances with particular attention to the use of fertilizers and pesticides. Within this frame, for Danube River Basin countries, inventories of agricultural pesticide use and of fertilizer and manure use have been completed.

4.2.2 Set up an Inventory of the programmes of measures undertaken in the States of the Danube River Basin

The selection of the most appropriate policy instruments to control diffuse pollution coming from agricultural activities, including nutrient and pesticide pollution of the DRB countries will depend also upon the establishment of a clear policy strategy for controlling pollution, together with clear policy objectives in line with DRPC and JAP.

To ensure significant nutrient loads reduction from diffuse sources of pollution, the Danube countries have identified measures that address policy and legislation-related actions, institutional strengthening and capacity building, raising public awareness and strengthening public participation in nutrient reduction initiatives.

The Danube countries have introduced various legal, financial and economic measures to control diffuse pollution. To facilitate the understanding of progress of implementing policy and regulatory measures at national level to the JAP requirements, various country measures to control diffuse pollution are presented below:

In accordance with EU-regulation 1257/99 **Austria** has elaborated the programme-planning document "Rural Development". A precondition for participation in the different subsidy-programmes is the fulfilment of minimum demands regarding environment, hygienic and animal protection and the integration of "good agricultural practice". The main part of this programme-planning document is the agro-environmental programme "ÖPUL". Austria applies ÖPUL not only in certain sensitive areas but as horizontal approach in the whole agricultural area. To promote progressive environmental practices in regions with intensive agricultural land use, various regional subsidy programmes against nitrates were included into the nation-wide programme "ÖPUL 2000". ÖPUL was carried out each year in the reporting time frame, with in terms of the number of farmers slightly decreasing participation as the number of farmers is steadily decreasing; however, participation in terms of agricultural area has a slight increasing tendency, resulting in slightly increasing

expenditures for the programme. In 2003 around 135.000 farmers (74 % of the total number of farmers) responsible for an agricultural area of 2,3 Mio ha (88 % of the total agricultural area) participated in ÖPUL.

The measures of ÖPUL go beyond the legal regulations and include e.g.

- restriction of animal density to 2 LSU per ha, a provision which in principle has to be accepted by all farmers participating in ÖPUL
- tightened restrictions for the application of fertilizer on grassland and arable land
- organic farming which has been actively introduced by 10 % of the farmers thereby essentially abstaining from the use of mineral fertilisers and pesticides
- establishment of a winter coverage on arable land accepted by most farmers with arable land.
- special measures aiming for the prevention of erosion such as the undersowing of crops by grass.

A special part for water protection measures was introduced in ÖPUL in 2000 providing financial support for a predefined set of measures, first to mention the establishment of more special winter plant coverage to allow biological retention of Nitrogen residuals, record of precise Nitrogen-balances for differently cultivated areas and implementation of N-minimum investigations. The regional programmes and some co-operative agreements were negotiated between the Federal Government, the Länder, farmers associations and water suppliers. As a result, a first success of the preventive water protection programmes can be seen: the concentration of nitrate in groundwater is decreasing.

The main principles of the Austrian water protection programs in the framework of ÖPUL 2000 include: (i) interdisciplinary co-operation between representatives of water management and agriculture, (ii) the practicability of the measures, (iii) a fair financial compensation of the services of the farmers, (iv) appropriate conditions for farmers with high intensities of livestock, (v) an additional control of the farmers not participating in the programme, (vi) comprehensive public information and consultation, and (vii) permanent direct contact to the concerned communities and involved farmers through information, guidance and educational campaigns.
The local Sanitation Programmes emerging from the respective provisions of the Water Act were executed on a pilot scale and the farmer advising system continued
The National Nitrate Action Programme emerging from the EU-Nitrate-Directive applied on the whole territory of Austria was tightened particularly in regard to the following core-elements

- the minimum requirement for storage capacity for manure was enlarged to a minimum of 6 months
- the time frame where manure is not allowed to spread was raised from a period of 2 to 4 months (depending on the type of land and of manure)
- the requirement for nutrient application in line with the specific plant needs was introduced
- the nutrient application in areas inclined and around water bodies was bound on limitations.

The arable area is more than 66% of the total territory of **Hungary** and forests cover a further 19%. In Hungary, the main portion of diffuse pollution comes from agriculture. The most important pollutants are nitrogen and phosphorus, and out of the total inputs in the Danube Basin, about 60% of N and 40% of P originate from diffuse sources. The investigation of the sources and pathways of nitrogen has shown that on river basin level, the importance of agriculture for N emissions into surface waters is evident: about half of the input is from agriculture. The main existing national programs in connection with the reduction of diffuse pollution refer to the reduction of nutrient pollution, agro-environmental practices and environmental program of site remediation.

The government in **Romania** has introduced BAP, including erosion control and clean manure handling and Low Input Sustainable Agriculture (LISA) as to achieve an effective integration of ecological techniques, with lowest possible input levels. It is expected that in future the content of nutrients will continue to decrease.

Efforts are already taken in Romania to implement the following measures: (i) elaboration or improvement of national laws, regulations and normative regarding agricultural production in line with environmental requirements, (ii) organization of an informational and monitoring system concerning agricultural activities, (iii) organization of pilot demonstration farms, (iv) organisation of training courses, seminars and workshops for farmers, (v) development of the dry farming and irrigation within the areas affected by droughts, (vi) develop animal husbandry outside of villages and rural settlements, etc.

The most important non-point sources that affect **Slovenian** surface and ground waters are: agriculture, dispersed settlement and atmospheric depositions (mostly caused by transport & traffic). According to NEAP complex measures to reduce this are implemented or in preparation. Slovenia has introduced the Code of Good Agricultural Practice. Some measures are: (i) since January the 1st 2003 the limit value for annual input of organic nitrogen disposed with animal manure is limited to 170 kg/ha, (ii) the whole Slovenian territory is claimed to be vulnerable area, (iii) annual input of phosphorus is limited to 120 kg per/ha while annual input of phosphorus is limited to 300 kg/ha, and each individual farm has to have a fertilisation plan made by Agricultural Advisory Office. Slovenian agricultural environmental program for period (2001-2006) was adopted in 2001 as a part of agricultural reform in Slovenia. The program is oriented to nature friendly methods of farming, so the harvest and food are safe for consumers. The program is divided to 3 groups of measures, such as: direct payment for reduction of agricultural negative impacts on environment (integrated production, reduction of agricultural load, ecological farming), preservation of nature goods, biotic variety, fertility and traditional cultural region, and protection of protective areas, and education of farmers, employees, public institutions, and informing of public about the importance of agricultural environmental measures.

For **Czech Republic**, the main part of diffuse pollution comes from agriculture, atmospheric depositions and soil erosion. The increasing importance of non-point sources is connected with the decrease of pollution from point sources. The share on the total pollution is essential in nitrates and acidification, less in phosphorus, and is diverse in different regions of the Czech Republic, in dependence on population density, percentage of treated wastewaters disposal, intensity and farming practices and the level of atmospheric deposition.

Recent results of research on demarcation of vulnerable regions threatened by nitrates in compliance with the Council Directive 91/676 EEC show, that the area of surface and ground waters afflicted by nitrate pollution occupies 42,5 % of the total agricultural land, which represents 36% of the whole Czech Republic territory. For vulnerable regions special action programmes comprising measures for nitrate pollution reduction from the agricultural sources are under implementation.

The main source of diffuse pollution influencing water quality in **Slovakia** is agriculture. Studies have indicated that agriculture can contribute as much as 40% of the nitrate pollution of water bodies. The following three factors were found to be the major causes of agriculturally related diffuse pollution: (i) high, and often unnecessary, applications of mineral and organic fertilisers to the soil (especially before 1989), (ii) water erosion on arable land caused not only by unsuitable soil type and topography, but also by inappropriate choice of crops, plant rotation and soil cultivation, and (iii) incorrect crop choice and rotation in the vicinity of potable water sources. Three codes which embrace the current legislation have been produced by the Ministry of Soil Management (Agriculture) of the SR: Code of Soil Protection (1996), Code of Good Application of Fertilizers (2000), and Code of Good Agricultural Practice for the Protection of Water Resources (2002).

The economic transition process has caused significant reduction of industrial and agricultural production, thus temporarily reducing production-related pollution loads as well in **Croatia**.

Within the frame of the project "Protection of Waters from Pollution caused by nitrates from agricultural sources", financed by the Regional Environmental Approximation Programme (REAP), with the help of data from the National Water Monitoring System of the **Bulgarian** Ministry for Environment and Water, for 450 sampling points for surface and ground waters, the following results were achieved: (i) the polluted, threatened and vulnerable water sites were identified in relation to the impact of nitrates from agricultural sources through the use of nitrogen fertilizers and growing of animals, (ii) measures were identified for limitation and elimination of water pollution caused by nitrates from agricultural sources, and (iii) and rules for good agricultural practice were elaborated and published (part of the rules concern the facilities for appropriate storage of farm manure).

Agricultural activities cause serious pollution of water bodies with agro-chemicals (pesticides, herbicides and artificial fertilisers), nutrients and microbiological compounds in **Ukraine**. The agricultural sector is one of the largest consumers of water resources for farming purposes, irrigation, amelioration facilities, food processing and fisheries. Therefore agricultural policy oriented on best available technologies and practices of environmentally friendly food production is an important factor of prevention of pollution of water ecosystem. State Committee for Fisheries (branch of the Ministry of Agricultural Policy) has the responsibility of

the development of policy and regulations in the field of fish farming and fisheries as well as for monitoring and control of compliance with quality criteria of water bodies designated for fisheries purposes. The development and keeping updated land survey data and Land Cadastre, assessment of soil quality and pollution, and state control of use and protection of lands (i.e., implementation of measures for land protection against erosion, landslides, high water tables, formation of wetlands, secondary salinization, pollution, littering, prevention of construction and other activities with high potential risk of deterioration of ecological conditions of lands, etc. represent the responsibility of the State Committee of Land Resources of Ukraine.

4.2.3 Implementation of JAP national investment programs: land use sector

Ukraine reported a project on Improvement of land quality, minimization of land erosion and soil wash-out in Lower Danube Area started in 2002 and expected to be completed by 2005. The total investment cost is 3.4 MEUR, not yet secured.

In **Austria,** a total of 614 MEUR was spent 2003 for the promotion of environmentally benign production methods and partially to compensate income losses by reduced harvests and additional expenditures.

The tools within the CAP need to be investigated in support of WFD implementation, in particular for the development of program of measures. Specific measures like the introduction of Code of Good Farming Practice to control diffuse pollution, standards on fertilisation, environmental friendly investments (i.a. reduction of emissions) are to be considered in accordance with WFD requirements.

4.3 Wetland and floodplain restoration

4.3.1 Addressing the nutrient retention

Wetlands, in particular floodplains connected to rivers, act as nutrient filters and a significant proportion of the projected N and P removal in the Danube River Basin are assigned to this sector in the JAP (Table 21). According to the article 3.3. of the JAP, *"Contracting Parties have agreed to implement the proposed measures, during the implementation period* of the JAP, i.e. till 2005".

Table 21 Expected nutrient reduction from wetlands as planned by the JAP

Expected Nutrient Reduction in the Danube River Basin				
Sector	**Nitrogen**		**Phosphorus**	
	tons/year	%	tons/year	%
Wetlands	29,872	36,8	2,989	14,7

A precise quantification of N/P uptake by wetlands depends on many varying factors associated with the complex functioning of the ecosystems, and, thus, N and P reduction achieved through wetland restoration efforts can only be estimated in approximate terms. A WWF study for UNDP/GEF PRP (1999) concludes that a total of nearly 300,000 ha of potential wetland area restoration represent an approximate reduction of ca. 30,000 tons N and 3,000 tons P per year:

Table 22 Expected nutrient reductions from wetlands

Expected Nutrient Reduction in the Danube River Basin		
Potential Area for Restoration, ha min - max	**Nitrogen, t/a min – max**	**Phosphorus, t/a min – max**
214,045 – 298,693	21,405 – 29,869	2,140 – 2,987
Source: Report on "Evaluation of floodplain areas in the Danube River Basin", February 1999, WWF		

The updated assessment has found that among the 13 DRB countries, a total of 67 wetland restoration projects have been or are being implemented and/or are in the planning stage. These projects encompass

more than 250,000 ha, which represent an estimated potential nutrient reduction of ca. 25,000 tons N and 2,500 tons P per year (Table 25).

The estimated nutrient reduction for the wetlands sector is quite comparable to the WWF estimations made in 1999, particularly considering that wetland restoration projects in **Croatia** are not yet included in the above compilation, and further data are being collected for the **Ukraine** projects. The one wetlands restoration project in the Ukraine has an estimated budget of 10 MEUR, but project details were unavailable.

There were four other wetlands projects identified for the Ukraine, but as these projects included creation of artificial wetlands for treatment of municipal wastewater, they were not included under the wetlands sector.

As more information is made available for these four Ukraine projects, the data will be included under the municipal sector - it might make an interesting case study for innovative wastewater treatment.

Several wetlands projects in Austria and Germany, and a few in Slovakia and Slovenia were completed by 2003. There are a number of projects planned for implementation by 2005 in Austria, Germany, Hungary, Slovakia, and one in Bosnia & Herzegovina.

It has to be stressed that these wetland restoration projects have different relevance for nutrient reduction and nutrient uptake is not always their (main) objective. In some cases, the nutrient reduction effect of restoration works can go much beyond the indicated project area (e.g. removal of a barrier that disconnected the wetland), while in other cases the nutrient load of the river or the specific project effect and therefore also the reduction effect is rather small. This is why in this inventory an effort was made to attribute three relevance levels for nutrient reduction to each project.

The summing up of the nutrient reduction potential was difficult because the national information provided for some of the projects was unclear and insufficient. For example, some projects actually do not relate to nutrient removal while others refer to the same sites (overlap).

Among the 67 identified projects, cost estimations were available for 58 (190,000 ha, 19,000 tons N and 1,900 tons P annual reduction). The total estimated cost for the 58 projects is 140 million EUR, with **Germany** and **Austria** representing 16% of the total wetlands area but 68% of the total estimated costs (95.8 million EUR). In addition to the fact that cost levels are considerably higher in AT and DE than in many of the Central and Eastern European countries, there are several other possible explanations for the high proportion of total cost associated with the Austrian and German projects. For example, land acquisition might be included in the project costs for AT and DE but not the other countries. A high percentage of the AT and DE projects have been completed or implementation has started, whereas only a few projects in the central and lower Danube countries have been implemented. Thus, it is also possible that the costs indicated for some of the central and lower Danube projects are under-estimated.

Compared to nutrient uptake attained through municipal wastewater treatment investments, the cost efficiency of the wetlands restoration efforts is quite high. Considering that 191 municipal projects (excluding AT and DE) are estimated to achieve N 9,070 tons/year and P 44,400 tons/year, respectively for a total investment of 3475 MEUR, in the wetland sector projects nearly 20,000 tons N and 2,000 P tons per year reduction will cost only 140 MEUR.

It is important to note that unlike the other sectors, wetlands are not sources of pollution, but rather have an inherent capability to uptake nutrients. As a direct or indirect consequence of wetland restoration, considerable amounts of nutrient can potentially be taken up by wetland flora. Wetlands restoration, therefore, should not be considered as a comparable substitute compared to point and non-point source pollution reduction efforts.

Besides nutrient removal, municipal wastewater treatment projects achieve many other societal and environmental benefits, such as improved sanitation and decreased organic matter loading (BOD). But solely considering nutrient reduction, wetlands restoration is clearly an efficient measure. Realisation of investment projects in the wetlands sector will not only greatly contribute to reducing nutrient levels in the Danube River Basin but also significantly improve flood protection, biodiversity, groundwater supply, and biomass production (timber, hay, fish, etc.).

At the level of Danube countries many actions to protect wetlands are happening.

While the global "Ramsar Convention on Wetlands" with its basic principles, guidelines and recommendations delivers a certain technical and strategic background, for **Austria** and probably most other EU-member states it is more the European Natura 2000 network and its instrument that provide the legal and financial basis for effective wetland- and floodplain restoration.

In a cooperation network between representatives of water management and nature conservation administrative and technical service units of the Länder and of the Federal level as well as of NGOS it was possible to create a series of best-practice river restoration projects in Austria, which are funded by the EC LIFE-Nature Programme. Project applications for funding was submitted to the European Commission either by official bodies (Länder, Municipalities, Communities) or private bodies (NGO, interested private association). Co-financing from EC amounts up to 50 % of the total project costs. The restoration-projects usually run for 4 – 7 years.

Generally a set of measures and purposes is aimed for, hereby addressing water management and river structure, forest management, land-use, nature conservation, public awareness raising and possibly also tourism. Also the maintenance and/or improvement of the situation of species of wild animals and plants and their habitats, according to the Habitats Directive (92/43/EWG) and Birds Directive (97/49/EG) may be intended. New partnerships, once established throughout LIFE projects, mostly create benefits for other water management projects.

By 2003, on rivers Danube, March/Morava and Drau/Drava three major wetland and floodplain restoration projects were finalized. On the rivers Danube, Lech, Mur and Lafnitz six major restoration projects were started.

All these projects were planned in coordination between Water Management and Nature Conservation and are co-financed by the European Commission throughout the LIFE-Nature Programme.

The network of wetlands accounts for a considerable part of the national ecological corridor system in **Hungary**. The water habitats have been restricted to small areas due to the flood control. The quality of these habitats and the quality network of wetlands have deteriorated significantly in the past decades due to drying out, eutrophication, constructions, reservoirs, dyke systems etc. For the protection of these sensitive ecosystems 21 areas are part of the Ramsar Convention.

Programmes have been launched for the protection of certain plant and animal species proposed in Annex II of the EU Habitat Protection Directive, coordinated by national park directorates. These programmes include the assessment of populations, monitoring in certain cases, development of protection programmes, definition of the conditions of protection and implementation. In addition to nature conservation and floristic research, vegetation research has also been encouraged which, in addition to its scientific importance, also contributed to substantiate the designation of Natura 2000 areas. On the basis of the requirements of the Birds Protection Directive, a proposal has been made for the identification of special birds protection areas forming part of the Natura 2000 network and the development of a strategy and action plan required for their preservation. To implement the requirements of Habitat Directive the Hungarian Act LXXVI/2004 on Nature Protection was modified in second half of year 2004. Also, in the same time came into force the Government Decree No. 275/2004 on the Nature Protection Areas of European importance. The anticipated expenditures likely to be incurred in managing Natura 2000 sites in Hungary are cca. 15 MEUR/ year. (Consisting of cca. 11 MEUR investment costs of restoration projects, 3 MEUR/year for incremental operational and management costs and cca. 1 MEUR/year for compensations and institutional developments and monitoring)

The **Ukrainian** State Program on the National Environmental Network Development for years 2000-2015 is aiming at implementing the requirements of the Pan-European Biological and Landscape Diversity (1995) in respect of the issue of the development of a Pan-European Environmental Network as an integral spatial system. Lands of Water Fund, wetlands, and water protecting zones are considered as a component of Environmental Network. The Program includes financial estimation of funds needed for measures implementation but did not provided clear mechanisms of financial support.

According to the stipulations of the Convention on biodiversity (Rio de Janeiro, 1992) the Ministry of Ecology and Natural Resources of **Moldova** in collaboration with the specialists from other ministries, various institutions and organizations, elaborated the Strategy and Action Plan on Biodiversity Conservation in the Republic of Moldova in 2001. The major goal of the Strategy is the conservation, rehabilitation, reconstruction and efficient use of the biodiversity and landscape to ensure the sustainable social-economic

development of the country. The objectives of the Strategy can be achieved through consequent well-targeted actions, establishing deadlines and funding amount. The main objectives are: in-situ and ex-situ conservation of biodiversity, identification and social-economic evaluation of the biological resources and their sustainable use, reestablishment and maintenance of the genetic fund, ensure the bio security of the country, and creation of the national Environmental Network as a component for the integration of the protection measures of the biodiversity and landscape.

In 2002, the World Bank approved a Wetlands Restoration and Pollution Reduction Project for **Bulgaria**. The project is funded by a grant from the Global Environment Facility (GEF) Trust Fund of US$7.5 million, contributions from the Bulgarian government and local communities (US$3.05 million) and bilateral agencies (US$2.73 million). The project will support local communities in the Persina Nature Park and Kalimok/Brushlen Protected Site to adopt sustainable natural resources management and demonstrate how environmentally friendly agriculture can improve their livelihoods. In support of global environmental goals, the project seeks to replicate successful efforts to reduce transboundary nutrient loading and other agricultural pollution that flow through the Danube into the Black Sea.

The Wetlands Restoration and Pollution Reduction Project would provide financing to:

- Restore critical priority wetlands in the Danube River basin and pilot their use as nutrient traps;
- Establish a comprehensive monitoring system for water quality and ecosystem health;
- Maintain sustainable management of selected areas in the flood-plain of the Danube;
- Strengthen capacity to protect and manage biodiversity and natural resources; and
- Build public awareness of sustainable natural resources management and biodiversity conservation.

This is the first wetlands restoration project under the Strategic Partnership for Nutrient Reduction in the Black Sea and Danube Basin, which aims to help countries undertake investments to control or mitigate nutrient inflow to the Black Sea.

Table 23 Completed Wetland projects 2001-2003

Name of Project	Area size [ha]	End of project [mo/yr]	Estimated costs EUR
Danube (1) Nationalpark Donauauen: LIFE Project "Restoration and management of the alluvial Danube floodplains"	1,500	I / 2003	2,800,000
MARCH / MORAVA 2.1 Droesing: 2.2 Marchegg White Stork Reservat (WWF)	200 1,200	1 / 2002 2003	70,000 200,000
DRAU / DRAVA	100	II / 2003	5,000,000

Table 24 Ongoing Wetland Projects that have started in the period 2001-2003

Name of Project	Area size [ha]	End of project [mo/yr]	Estimated costs EUR
LECH (Total Project Volume: 7,800,000€)	3300	I / 2006	2,000,000
MUR 1st step Project "Muehlbach": Dotation of floodplain areas over 22 km	200	II / 2002	900,000
Danube / Donau (2) LIFE Project "Restoration of the Danube River Banks" between Vienna and Bratislava	2000	III/2006	1,800,000
Danube / Donau (3) Wachau	10.700	III/2008	5,255,000
Mur (2): River district management of the Upper Mur	878	III/2006	2,200,000
Lafnitz River Valley	1.045	III/2003	4,648,640

4.3.2 Implementation of JAP national Investments program: wetlands

The total estimated investments for projects completed and in planning stage is 140 MEUR.

Table 25 Projects implemented and/or in planning stage (DABLAS 2004, ECO EG Country Reports)

Country		Wetlands Sector: Projects implemented and/or in planning				
		No. of Projects	Relevant Area ha	Est. Reduction N, t/a	Est. Reduction P, t/a	Cost MEUR
AT	Austria	0 + 10*	22,727	2,273	227	33.8
BA	Bosnia-Herzegovina	3	28,200	2,820	282	11.9
BG	Bulgaria	2	2,350	235	24	4.0
CS	Serbia-Montenegro[1]	0 + 3	15,041	1,504	150	1.9
CZ	Czech Republic	6	7,450	745	75	6.9
DE	Germany	0 + 13*	7,946	795	79	62
HR	Croatia	no projects indicated				
HU	Hungary[2]	6 + _1*	37,280	3,728	373	7.3
MD	Moldova	5	37,250	3,725	373	5.1
RO	Romania[3]	6	83,798	8,380	838	1.9
SI	Slovenia[4]	3	2,100	210	21	3.0
SK	Slovakia[5]	6	7,150	715	72	2.3
UA	Ukraine	5	data under review			
Totals (all identified sites):		**40 + 27***	**251,292**	**25,129**	**2,513**	**n/a**
Totals (projects with info):		**58**	**190,292**	**19,029**	**1,903**	**140**

*** Projects included in the ECO EG country reports – but not included in the DABLAS 2004 assessment.**

[1]The Zasavica Nature Reserve project in CS (0.78 MEUR) is not included; nutrient reduction not relevant.

[2]The 7.3 MEUR does not include Tisza-Bodrogzug (4,000 ha) wetland; incomplete project planning.

[3]The 1.9 MEUR does not include Potelu swamp (23,000 ha) and Graeca Swamp (34,000 ha); incomplete project planning.

[4]The Triglav peat bogs project in SI (0.47 MEUR) is not included; nutrient reduction not relevant.

[5]The Zohorie peatlands project in SK (0.005 MEUR) is not included; nutrient reduction not relevant.

4.4 Improving the scope of the TNMN, in order to get it in line with the EC Water Frame Directive and to enable its timely operation

4.4.1 Upgrading TNMN

According to the Article 3.6, *The States co-operating under the DRPC (Contracting Parties; Signatory; Observing States)*

- "agree to orient the ICPDR's 'Transnational Monitoring Network (TNMN)' – in accordance with the prescriptions of the EC Water Framework Directive", and
- "promote the continuation and introduction of quality control procedures that will allow a validated representation of the in-stream water status (quality control schemes for chemical analyses and ecological determinands; representative site-specific sampling in 'space and time'), incl. a progress report about the results achieved *(in 2006)".*

The Danube countries have decided to upgrade TNMN to reflect the requirements of the Article 8 of the WFD and to take into account the WFD CIS process. The TNMN shall be revised to provide a coherent and comprehensive overview of ecological and chemical status within the Danube River Basin. For TNMN, the Danube countries have considered 79 sampling stations, 52 determinands in water and 33 in sediment (Figure 10). The revision will be done gradually with the aim to have the TNMN upgrade functional by 2006. In the second phase further refinements will be done based on results of national WFD monitoring programmes performed in 2006. Figure 11 and Figure 12 provide information on the annual loads of inorganic nitrogen at monitoring stations, in 2002, along the Danube and, respectively on selected Danube tributaries.

Since 1991 Austria systematically runs a dense monitoring network according to uniformly determined criteria which includes groundwater measuring points, springs and running water measuring points. This is performed by a coordinated cooperation between the responsible Ministry, the Federal Environment Agency and the nine Bundesländer. The data storage and archiving is operated in a central database in the Federal Environment Agency. The analysis and interpretation of the data takes place in co-operation between the Federal Ministry and the Federal Environment Agency. The results are made available to the general public via annual reports published by the BMLF (WWK/UBA 1993, 1994, 1996, 1997) and via Internet by the Federal Environment Agency´s homepage. A first adaptation of the monitoring network had been undertaken in 2003. The network was upgraded up to 272 sampling points in the Austrian Part of the Danube catchment area (290 sites over all Austria). The implementation of the WFD demands a further adaptation of the monitoring network, which will have to be based on the results of the risk analysis of the water bodies to finish by 2007. This risk analysis is carried out 2004. At the moment the Länder checks the results. In line with the definite results the sites for the future operational network will be established. Details of the enlargement of the network are under discussion. It is intended to upgrade the network to a maximum number of up to 900 sampling sites.

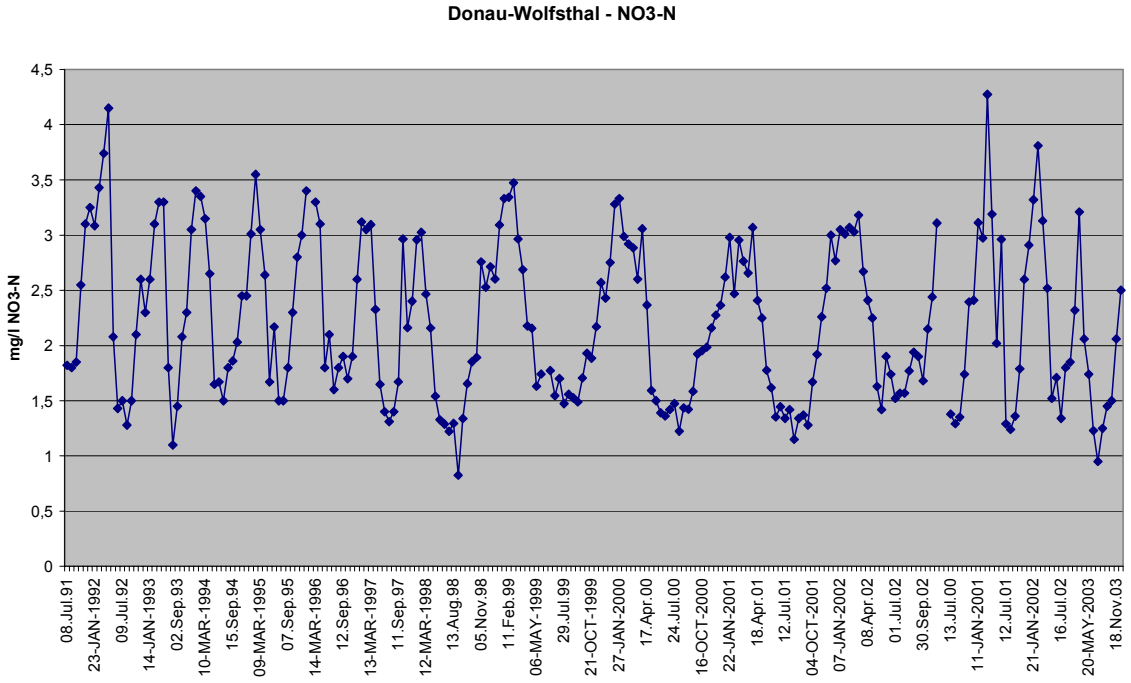
As to Running Waters in the Austrian parts of the Danube catchment area between 1991 and 2003 the network consisted of 230 measuring points and aimed at monitoring areas in particular subject to pollution. It is important to take this fact into consideration when evaluating the monitoring results.

In regard to the Danube-TNMN the four locations delivering data to the TNMN are part of the Austrian monitoring network.

The assessment of the status of water bodies requires the development of new methods, which allow the estimation of the deviation from the reference condition. For the biological parameters indicating the impact of pollution with oxygen-demanding substances and nutrients the development of a mulitimetric index is under discussion. For the general physical-chemical parameters the establishment of type-specific values are provided.

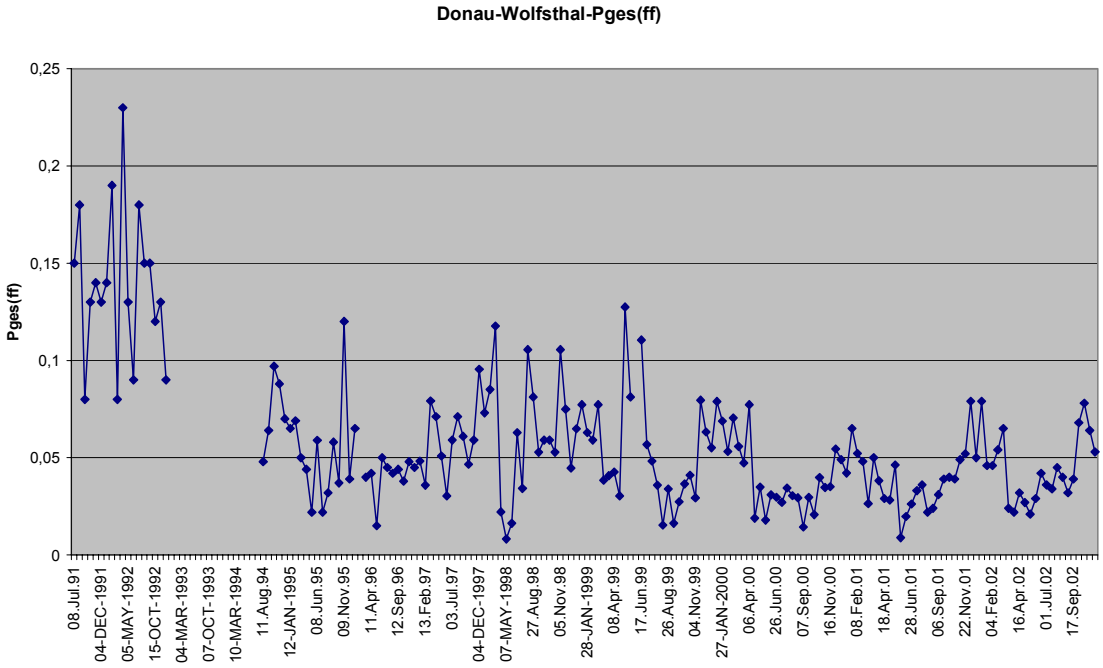
The nutrient results of the last 12 years show that the nitrate-concentration remains within the natural variation over the years more or less at the same concentration (see as example the results of the site Donau/Wolfsthal, Figure 10).

Figure 10 Nitrate-concentration results of the site Donau/Wolfsthal



The phosphorous-concentration showed a significant decrease in the early 1990. Since 2000 the concentrations remain more or less stable. (Figure 11)

Figure 11 Phosphorous concentration



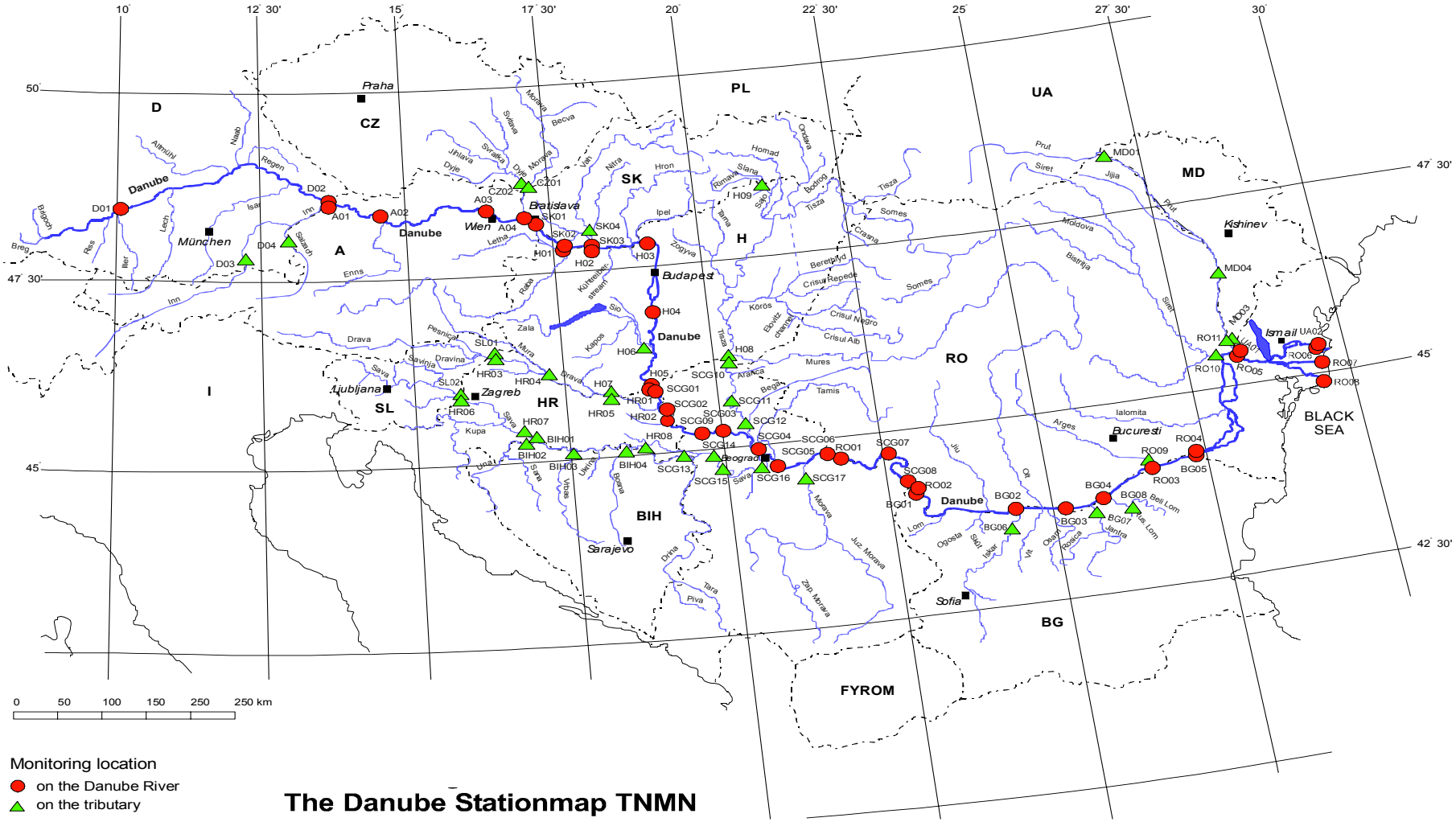


Figure 10 The ICPDR TNMN

Figure 11 Annual loads of inorganic nitrogen at monitoring stations along the Danube

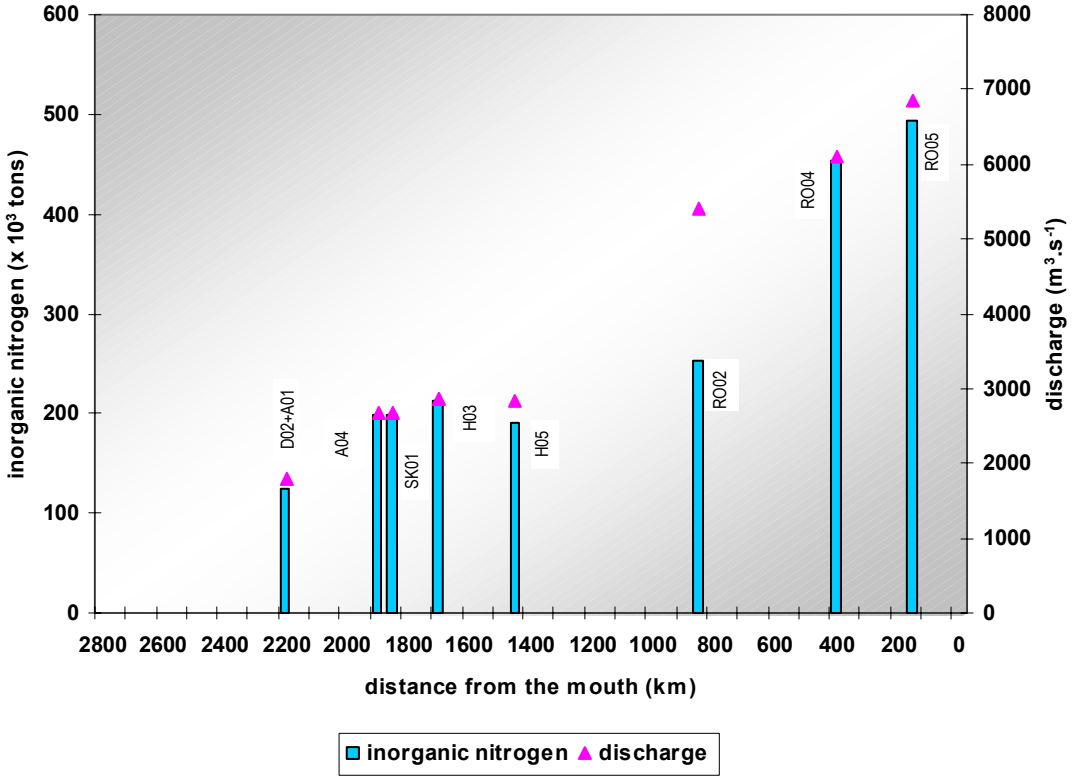
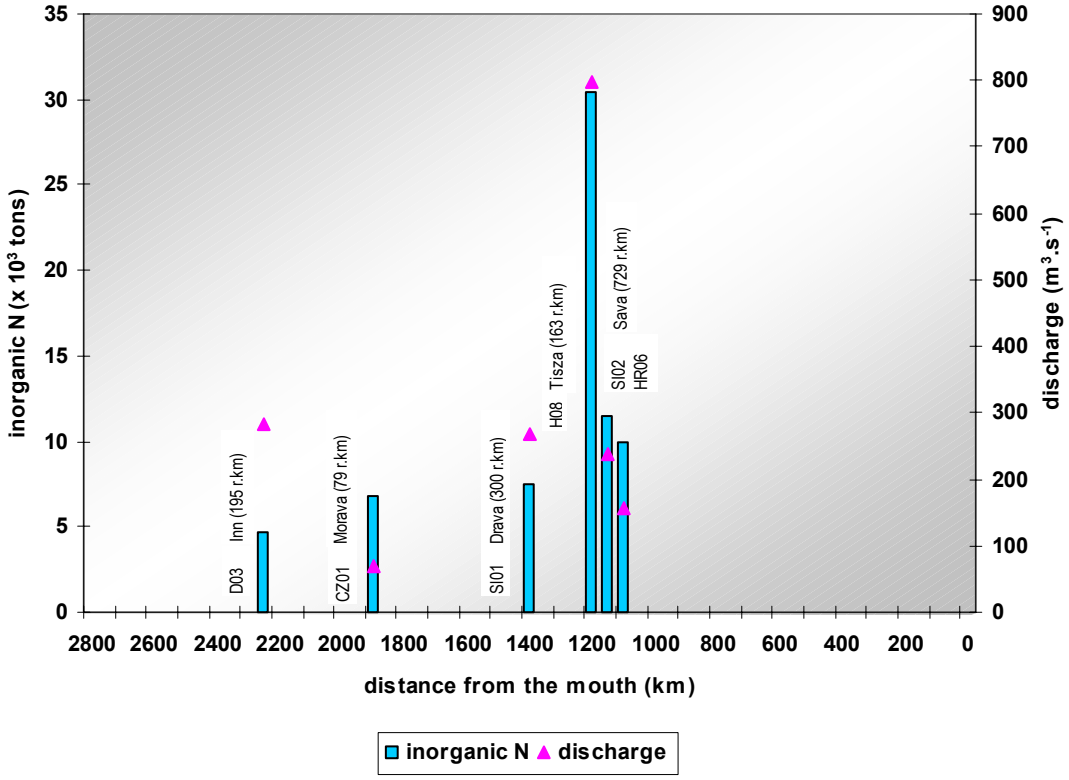


Figure 12 Annual loads of inorganic nitrogen at monitoring stations on tributaries



4.4.2 Joint Danube Survey

An expedition, referred to as Joint Danube Survey (JDS) was launched in August 2001 to investigate the quality of the Danube River along its 2,581-kilometer-long stretch from Regensburg in Germany to its mouth in the Black Sea. JDS was initiated by the ICPDR to improve the validity and comparability of water quality data received from its regular monitoring programme- TNMN. The mission of the ten scientists from Germany, Austria, Slovakia, Hungary, Yugoslavia, Bulgaria and Romania was to collect and analyse samples taken from the Danube River for 140 different parameters ranging from biological indices and chemical pollutant levels to indicators about the state of aquatic flora, fauna, and microorganisms. The main objectives of the JDS were to: (i) produce a homogenous data set for the Danube River based on a single laboratory analysis of selected determinands, (ii) identify and confirm specific pollution sources, (iii) screen the pollutants as specified in the EU Water Framework Directive, (iv) provide a forum for riparian/river basin country participation for sampling and inter-comparison exercises, (v) facilitate specific training needs and improve in-country experience, and (vi) promote public awareness.

During the JDS samples were collected from surface water, sediment, mussels and biological from 98 sampling sites. Suspended solids samples were collected from 63 sections of the Danube, and fifteen parameters (e.g., conductivity, dissolved oxygen, nitrites, nitrates, total coliforms, faecal coliforms) analysed on-board. All samples were sent in regular intervals to the JDS Reference Laboratories for analyses of more than 80 additional determinands.

4.4.3 Introduction of quality control procedures: Analytical Quality Control (AQC) in the DRB

The quality of the TNMN data is regularly checked by a basin-wide analytical quality control programme The results of this programme are reported annually.

Efforts have been undertaken in order to harmonize analytical activities within the DRB countries related to TNMN, as well as implementation and operation of an Analytical Quality Control (AQC) programme to ensure quality and comparability of data (QUALCO-DANUBE). As a consequence, in 2003, 36 TNMN laboratories reported results that provided information on their analytical performance: in general, the analytical results for synthetic samples were better than the results for the real water samples (results influenced by the matrix effect). For most of the general parameters and nutrients a good performance was observed. Problems were reported for analysis of cyanides.

Similarly, performance for the organic pollutants (e.g. COD, BOD, MBAS, TOC, AOX) was relatively good. Analyses of BOD have improved significantly and AOX results were excellent.

The analytical performance in case of heavy metals was moderate. The analyses of arsenic and mercury have improved significantly in comparison with the results from previous years.

The area where improvement is still required is the analysis of organic micropollutants. Especially in the analysis of sediments the data could not be evaluated. The most probable reason was a poor sample pre-treatment.

4.4.4 Load assessment program

The load assessment program, initiated in 2000, is integrated in the TNMN efforts with the view to produce reliable and consistent trend analysis of concentrations and loads of substances diluted in water or attached to sediments. Danube countries have agreed to use the Standard Operational Procedure (SOP) developed in the frame of EU Phare Project "Transboundary Assessment of Pollution Loads and Trends" (1998) for its operation in the Danube River Basin. Loads are calculated for BOD5, inorganic nitrogen, ortho-phosphate-phosphorus, dissolved phosphorus, total phosphorus, suspended solids and chlorides (voluntary). Minimum sampling frequency is at least 24 per year.

Table 26 Load assessment, location, and measurements

Country Code	River	Location	River Km	Number of measurements						
				Q	SS	N_{in}	$P\text{-}PO_4$	P_{tot}	BOD_5	Cl
D02	Danube	Jochenstein	2204	365	26	26	26	26	26	26
D03	Inn	Kirchdorf	195	366	26	26	26	26	24	26
D04	Inn/Salzach	Laufen	47	366	26	26	26	26	26	26
A01	Danube	Jochenstein	2204	366	12	12	12	12	12	12
A04	Danube	Wolfsthal	1874	366	24	24	24	24	24	24
CZ01	Morava	Lanzhot	79	366	12	12	12	12	12	12
CZ02	Morava/Dyje	Pohansko	17	366	12	12	12	12	12	12
SK01	Danube	Bratislava	1869	366	25	25	25	25	24	25
H03	Danube	Szob	1708	364	26	26	26	26	26	26
H05	Danube	Hercegszántó	1435	364	23	36	36	36	36	23
H08	Tisza	Tiszasziget	163	352	19	29	29	29	29	13
HR02	Danube	Borovo	1337	26	26	26	26	26	26	0
HR06	Sava	Jesenice/D	729	26	26	26	26	26	26	12
HR07	Sava	Una Jesenovac	525	0						
HR08	Sava	Zupanja	254	0						
SI01	Drava	Ormoz	300	366	24	24	24	24	24	24
SI02	Sava	Jesenice	729	366	24	24	24	24	24	24
RO 02	Danube	Pristol-Novo Selo	834	366	20	20	20	20	20	20
RO 04	Danube	Chiciu-Silistra	375	366	21	21	21	21	20	21
RO 05	Danube	Reni-Chilia arm	132	366	21	20	20	20	21	21
UA02	Danube	Vilkova-Kilia arm	18	0						

4.5 List of Priority Substances

In line with Article 3.7 of the JAP, the Danube countries will:

- *Establish a "List of Priority Substances for the Danube River Basin", based on ongoing developments at EU level".*
- *Introduce subsequently the substances on such a list into the monitoring programmes for discharges and the in-stream chemical status*
- *Introduce such substances into national permits or to regulate their use via other relevant national legislation*
- *Introduce such priority substances into 'Recommendations on Best Available Techniques' in industrial sectors and any 'Recommendation on Best Environmental Practice', thus addressing the prevention or reduction of those substances.*

The ICPDR EMIS EG prepared and agreed with MLIM EG a proposal for the preliminary ICPDR List of Priority Substances consisting of 2 separate annexes: Annex A, 33 substances, in accordance with the Annex X of the EU WFD (Article 16 of the WFD requires the Commission to establish a list of priority substances and to identify the priority hazardous substances) and Annex B, divided into two groups – B1: General Parameters (COD, NH4-N, Total N, Total P) and B2: Danube Specific Priority Substances (As, Co, Zn, Cr).

In line with WFD, for priority substances, the 'combined approach' has to be applied, i.e. harmonized European emission controls and water quality standards will be elaborated for all substances.

The top down, which addresses the pressures, starts with identifying potential pollutants discharged by point and diffuse sources. Bottom up approach, which addresses the impacts, starts with identifying the reason why good ecological quality is not achieved.

Article 16 WFD sets out a strategy against the pollution of water and outlines the steps to be taken. Art 11 of WFD provides programme of measures for river basin specific pollutants by 2009/2012 (measures shall become operational 2012, but be in place in the 2009 as part of the programme of measures). WFD makes a distinction between priority substances of Annex X and specific pollutants of Annex V. WFD Annex 10 specifies 33 priority substances, which need to be taken into account when assessing the chemical status of surface waters. The WFD requests that the priority hazardous substances are phased out in the next 20 years after adoption of appropriate measures. The Directive also requests to identify additional chemical pollutants if they are of specific concern in the river basin district. For the Danube River Basin District four heavy metals have been identified in addition to the 33: Arsenic, Chromium, Copper and Zinc.

Article 7 of the Dangerous Substances Directive, which will remain in force for 13 years from the adoption of the WFD, also requires the identification of specific pollutants (List II), for which Pollution Reduction Programmes have to be prepared.

The final outcome will be a final ICPDR List of specific substances requiring measures to meet the WFD objectives. Additionally, a list of substances for which further data are required, and a list of substances unlikely to have an effect on water quality will be prepared for the DRB. Finally, the work of the ICPDR will be directed to identification of harmonized emission control strategies as part of EMIS EG work as well as the development of quality standards for priority substances within the frame of MLIM EG. In accordance with on going EU developments, and based on the results of screening at the national level, the ICPDR will elaborate a final list of priority substances.

Results of on going screening at the national level show progress and efforts of the countries to establish comprehensive inventories of all relevant substances from the groups and families of dangerous substances in List II to the Annex of the Directive 76/464/EEC, as amended by WFD. The results will be further used in the development of legally binding pollution reduction programme that need to be collectively implemented by the installations operating in the specific water basin district in accordance with the timetable specified in WFD.

The **Hungarian** Government transposed Directive 76/464/EEC and its "daughter" directives by two governmental decrees (203/2001 and 204/2001) and two implementing ministerial decrees (7/2002 and 9/2002). This legislation prohibit any discharges into surface waters of those List I substances whose production, marketing and/or use has been previously banned, or whose production, marketing and/or use has never taken place in Hungary even in the absence of an explicit ban. Discharges of the remaining List I substances are subject to emission limit values. These limit values are identical to or more stringent than those specified in the various "daughter" directives. In addition, quality objectives will be determined by the applicable Hungarian legislation for all List I substances in accordance with the quality objectives specified by the corresponding "daughter" directives.

On the basis of the **Austrian** Water Act more then 60 branch specific "Emission Ordinances" specify technology, based on BAT and standards for emission limitation of direct and indirect discharges of pollutants. For Priority Substances discharge permits can only be passed for a shorter time period of 5 years. Partially for Priority Substances limit values are expressed via sum- or group-parameters (e.g. AOX, toxicity). A general Ordinance and an Ordinance on indirect discharges supplement the branch-specific Ordinances with regulations for the procedure of permitting, monitoring and reporting.

In accordance with the combined approach the Water Act also requires to take account of the effects of discharges on water quality. The Water Authorities are empowered to stipulate more stringent emission limitations as defined in the respective Ordinances if the requirement to meet the good status of the water body concerned might be jeopardized. The Water Act also requires the development of a transparent strategy for the selection of relevant pollutants to be part of in-stream regulations, for surveillance and operative monitoring of these pollutants and for setting of quality objectives in line with Annex V.1.2.6 of the WFD.

In addition to these regulations a number of other legislation in areas such as chemicals policy, pesticides control and waste management ban or limit the use of Priority Substances (e.g. ban of organic tin compounds as antifoulings, ban of cadmium for most applications, ban of certain chloroalkanes as solvents). Until 2003, a mixed Working Panel of experts was established to elaborate appropriate proposals for the monitoring strategy and for water quality objectives of pollutants. Based on these proposals a study on the selection of relevant hazardous substances has been completed in 2002. A surveillance-monitoring programme of all Danube priority substances (except C10-13 chloroalkanes) has been started in 2003 and will be finished in the end of 2004. This special monitoring programme covers 30 monitoring sites within the Austrian Danube catchment share. The results of the surveillance programme 2003 show that the proposed water quality standards are not exceeded at the surveillance stations within the AT Danube catchment area. Surveillance monitoring constitutes an integrated element of the impact assessment, which is currently under way in accordance with annex V of the EU-WFD.

4.6 Water Quality Standards

Article 3.8 of the JAP states:

- *"ICPDR will establish in-stream Water Quality Standards for the Danube priority list(s) of substances, in order to protect aquatic life in the Danube River Basin by the end of the year 2004".*
- *"ICPDR will publish in 2004 progress reports on the steps achieved for a consistent definition of the good status of waters".*

In 1999 the EU PHARE Programme contributed to the EPDRB by initiating the project "Danube River Basin Water Quality Enhancement". One of the objectives was to make a proposal for a unified water quality classification for the entire Danube River basin region based on:

- review of existing water quality and sediment quality classification methods in Danube countries
- review of EU legislation
- experience within the different countries

The water quality classification scheme (for the interim period) as presented in Table 27 is meant to serve international purposes for the presentation of current status and improvements of water quality in Danube River and its main tributaries and is not to be a tool for implementation of national water policy. It covers 37 determinands. Five classes are used for assessment, with target value being the limit value of class II. The class I should represent reference conditions or background concentrations. For number of determinands it was not possible to establish real reference values due to existence of many types of water bodies in Danube river basin differing in physico-chemical characteristics naturally. For synthetic substances the detection limit or minimal likely level of interest was chosen as limit value for class I.

The classes III – V are on the "non-complying" side of the classification scheme and their limit values are usually 2-5-times the target values. They should indicate the seriousness of the exceedence of the target value and help to recognise the positive tendency in water quality development.

For compliance testing 90-percentile value of at least 11 measurements in a particular year should be used.

Table 27 Water Quality Classification used for TNMN purposes.

Determinand	Unit	Class				
		I	II TV	III	IV	V
		Class limit values				
Oxygen/Nutrient regime						
Dissolved oxygen *	$mg.l^{-1}$	7	6	5	4	< 4
BOD_5	$mg.l^{-1}$	3	5	10	25	> 25
COD_{Mn}	$mg.l^{-1}$	5	10	20	50	> 50
COD_{Cr}	$mg.l^{-1}$	10	25	50	125	> 125
pH	-		> 6.5* and < 8.5			
Ammonium-N	$mg.l^{-1}$	0.2	0.3	0.6	1.5	> 1.5
Nitrite-N	$mg.l^{-1}$	0.01	0.06	0.12	0.3	> 0.3
Nitrate-N	$mg.l^{-1}$	1	3	6	15	> 15
Total-N	$mg.l^{-1}$	1.5	4	8	20	> 20
Ortho-phosphate-P	$mg.l^{-1}$	0.05	0.1	0.2	0.5	> 0.5
Total-P	$mg.l^{-1}$	0.1	0.2	0.4	1	> 1
Chlorophyll-a	$\mu g.l^{-1}$	25	50	100	250	> 250
Metals (dissolved) **						
Zinc	$\mu g.l^{-1}$	-	5	-	-	-
Copper	$\mu g.l^{-1}$	-	2	-	-	-
Chromium (Cr-III+VI)	$\mu g.l^{-1}$	-	2	-	-	-
Lead	$\mu g.l^{-1}$	-	1	-	-	-
Cadmium	$\mu g.l^{-1}$	-	0.1	-	-	-
Mercury	$\mu g.l^{-1}$	-	0.1	-	-	-
Nickel	$\mu g.l^{-1}$	-	1	-	-	-
Arsenic	$\mu g.l^{-1}$	-	1	-	-	-
Metals (total)						
Zinc	$\mu g.l^{-1}$	bg	100	200	500	> 500
Copper	$\mu g.l^{-1}$	bg	20	40	100	> 100
Chromium (Cr-III+VI)	$\mu g.l^{-1}$	bg	50	100	250	> 250
Lead	$\mu g.l^{-1}$	bg	5	10	25	> 25
Cadmium	$\mu g.l^{-1}$	bg	1	2	5	> 5
Mercury	$\mu g.l^{-1}$	bg	0.1	0.2	0.5	> 0.5
Nickel	$\mu g.l^{-1}$	bg	50	100	250	> 250
Arsenic	$\mu g.l^{-1}$	bg	5	10	25	> 25
Toxic substances						
AOX	$\mu g.l^{-1}$	10	50	100	250	> 250
Lindane	$\mu g.l^{-1}$	0.05	0.1	0.2	0.5	> 0.5
p,p´-DDT	$\mu g.l^{-1}$	0.001	0.01	0.02	0.05	> 0.05
Atrazine	$\mu g.l^{-1}$	0.02	0.1	0.2	0.5	> 0.5
Trichloromethane	$\mu g.l^{-1}$	0.02	0.6	1.2	1.8	> 1.8
Tetrachloromethane	$\mu g.l^{-1}$	0.02	1	2	5	> 5
Trichloroethene	$\mu g.l^{-1}$	0.02	1	2	5	> 5
Tetrachloroethene	$\mu g.l^{-1}$	0.02	1	2	5	> 5
Biology						
Saprobic index of macrozoobenthos	-	≤ 1.8	1.81 – 2.3	2.31 – 2.7	2.71 – 3.2	> 3.2

* values concern 10-percentile value

** for dissolved metals only guideline values are indicated

bg background values

TV target value

The results of screening at the national level will serve as a basis for setting limit values and quality objectives for the substances. In Hungary, two projects have been carried out in 2001: "Survey of priority list components of WFD in wastewater discharges and in recipients" and "Report on the survey of the emission of dangerous substances and identification of the emitters". The survey was carried out at 47 sampling points of the national network for surface water quality monitoring. Different types of industrial wastewaters (from pharmaceutical, chemical industry, metallurgical) as well from municipal wastewater treatment plants were analysed – altogether 19 wastewaters – for the relevant priority pollutants.

The survey revealed that significant concentration of widely applied organic solvents (e.g. toluene, dichloroethane) was found in some industrial effluents. Atrazine herbicide from the organic pollutants was present typically in the recipients originating from non-point agricultural pollution sources.

Water quality standards inherited from the past are still in force in **Ukraine**. They are different for different type of waters. The standards for water used for fishing are currently the most stringent. Quality standards of water used for drinking, communal, recreational and other economic needs of the population are more flexible. All of them are based on the assessment of the maximal concentration of harmful contaminants caused zero human health damage during fixed period of time. Maximum allowable concentrations (MACs) were determined for more than a thousand different substances and can be considered as most commonly used environmental quality standards. In spite of the fact that strictness of MACs is an actual application of the precautionary principle in water quality management, this approach does not take into account risk assessment of harmfulness of contaminants, especially in the case of multicontaminated effluents due to integral synergetic effects of mixed solutions. Therefore in many cases, the number and the strictness of MACs are impractical. The resulting complexity of the system undermines enforcement and also overwhelms understaffed and under-equipped regulatory authorities. The issue of revision of the environmental standards and monitoring parameters is currently being addressed and will be reconsidered in the framework of the Program on adaptation of Ukraine's environmental legislation.

In 2000 amendment of the **Austrian** Water Act, a regulation provided that for implementing the EU-WFD the good status of surface waters has to be defined by Quality Objectives and issued as Ordinance. A scientific sound proposal for the selection and level of Quality Objectives and editing strategic information was finalised in 2003 and a public examination procedure has taken place. On the basis of the results the draft-Ordinance is in elaboration, expected to be finalised at the end of 2004 and then undergo the examination procedure.

The elaborated proposals for Quality Standards cover all Danube Priority Substances with the exception of nickel and PAH. For these substances expert discussions are still going on.

Therefore, the ongoing EU developments will influenced further progress of the development of water quality standards in the DRB countries.

4.7 Prevention of accidental pollution events and maintenance of the accident emergency warning system

4.7.1 Inventory of accident risk spots in the Danube River Basin

Experiences with consequences due to several accidental spills has shown that inadequate application of precautionary measures at accident risk spots (ARS) could lead to harmful effects to humans as well as to the environment. For this reason the ICPDR APC EG elaborated in 2001 a basin-wide inventory of potential accident risk spots. For estimation of a real risk at a particular site a set of checklists was elaborated and made available to the Danube countries. In 2003 the existing potential ARS Inventory was supplemented by data from Austria and Bosnia and Herzegovina.

To advance with the risk estimation a pilot project on demonstration of ARS checklists application is expected to start during phase 2 of the UNDP GEF DRP.

To illustrate the Austrian results on the implementation of JAP, their achievements are presented below.

The precaution against accidental pollution by hazardous substances is based on the Act on Order of Industry, which implements also the Seveso II-Directive. The Länder hold competences in the field of abatement against disasters.

Conditions for licensing of hazardous industrial plants comprise a set of different on-site measures regarding the structural security of hazardous plant-elements by a multiple safety concept and non-structural measures including:

- the stability of all plant elements against possible forces including, if applicable, the forces posed by inundation and flood, as primary safety measure
- redundant safety barriers like double-wall containers and pipes with leakage-detection system or leak proof retention rooms as secondary safety measures
- the obligation for regular self-control and for regular inspection by independent experts and/or authorities as tertiary safety measures
- obligatory on site-control of the unimpaired status of relevant plant components, educating and raising awareness of workers concerned and, depending on plant size, introducing a special high qualified person responsible for plant security and contingency planning where feasible.

Mitigating measures, primarily implemented outside of plants include:

-
- securing fast communication ways by informing the public how to react in case of discovering a pollution event
- clear communication ways and responsibilities for public authorities disposing of responsible experts around the clock to decide upon counteraction as fast as possible
- fast and well trained operational forces (fire brigades) for counteraction
- up-dated contingency plans for installations sensitive for accidental pollution like water supplies.

The ICPDR-Recommendations on “Basic Requirements for Installations operating water-endangering substances” and on “Requirements for industrial plants containing water-polluting substances in areas with a risk of Flooding” have been distributed amongst the competent authorities’ experts involved in the licensing- and control procedures of industrial plants. The reflections obtained express that the prescriptions contained in these ICPDR-recommendations are to regard as part of the day-by-day applied safety regime.

4.7.2 Operation and upgrade of the Danube Accident Emergency Warning System

A substantial upgrade in terms of effectiveness and cost-efficiency of the AEWS was carried out in 2003 with support of the UNDP GEF Danube Regional Project. The satellite-based communication was replaced by a web-based communication using Internet and SMS messages to become an integral part of the ICPDR information system (Danubis). The AEWS supporting tools (Danube Basin Alarm Model and database of dangerous substances) are continuously improved. A series of tests of the web-based system were performed in summer/autumn 2003 in all Danube countries to debug the software, to check the technical set-up of national GSM operators and to train staff of Principle International Alert Centres. The final test of the upgraded system performed on 14 June 2004 proved that the system is perfectly working. The implementation of the new system necessitated a revision of basic AEWS documents.

At present, the system deals only with accident spills but it is planned to extend the system activities in the future to ice and flood warning.

4.7.3 Inventory of contaminated sites in flood-risk areas

During heavy rainfall, floods can create pollution and health risks, if precautions are not taken to minimize them. Nitrogen and other non - point-source pollutants may leach from agricultural lands, and the resulting nutrient load may severely stress aquatic ecosystems. It is extremely important to determine the actual risks of polluted floodplain sediments and to predict changes in this ecological risk when sediment is displaced. The 2002 severe flood events in the DRB countries have led to re-examinations of traditional approaches to flood management. The response of the ICPDR to this problem was elaboration of an inventory of contaminated sites in flood-risk areas in the Danube River Basin, which was finalised in 2003 (261 contaminated sites). The ICPDR 6th Ordinary Meeting in December 2003 approved the Safety Requirements for Contaminated Sites in Flood-risk Areas and recommended their application at national level. In addition to the adoption of the Safety Requirements and taking into account the relevance of a general precautionary principle, the ICPDR also encouraged the Danube countries to establish the policy framework and take the necessary measures to prevent any future contamination of sites in flood-risk areas.

For an initial risk assessment of all submitted "candidate" sites a so-called M1 methodology was developed. This methodology is based on assessment of toxic potentials of soil or waste taking into consideration harmful substances to be expected in a certain type of waste or in a specific industrial branch, correlated with the size of the contaminated area. The M1 methodology also served to rank the contaminated sites identified in the national inventories. The results of this evaluation provide the final list of contaminated sites, which are considered that passed through the M1 methodology. The appropriate methodology for flood risk assessment (M2) is under development. After finalization of M2 step a list of sites posing a high risk of contamination of water bodies during floods will be available.

4.8 Reduction of pollution from inland navigation

According to the Article 3.10 of the JAP, "*ICPDR will evaluate the situation concerning such polluting discharges, including the needed cooperation with the Danube Commission".*

The economic development within the European Union over the last years – enforced through the Eastern enlargement – has lead to the increase and strengthening of economic ties. Due to the intensification of trade the amount of traffic in the Danube corridor – defined as Pan-European Corridor VII in the Community's transport network – has been rising rapidly. Commercial transport along the Danube corridor has soared by 85 percent from 1994 to 2002. The planned accession of further Eastern European countries will accelerate traffic increases.

On the **Austrian** Danube compared to 2002 the transport volume for inland navigation is expected to double until 2015. Within this period an increase up to a doubling is estimated for the oily and greasy ship waste. Up to 4 million litres of bilge water, 140.000 litres of used oil and 19.000 kg of other oily and greasy waste could be expected on the Austrian stretch of the Danube for collection, treatment and disposal. It will be a great challenge for inland navigation to cope with these prospects and developments, keeping and/or strengthening its position as an environmentally friendly and clean transport mode.

Results of previous studies and other actions have shown partly significant differences of the currently existing framework conditions, organisational and technical implementations as well as accounting and financing options for the collection and disposal of ship waste in the Danube riparian countries.

To meet these challenges for inland navigation and to secure the future protection of the multifaceted river ecosystem Danube not only an environmentally sound but also a regionally coordinated waste management system for Danube navigation is required.

As the ICPDR has not yet become very active in this area, efforts are necessary to stimulate further involvement of the Contracting Parties to implement and report on actions to address this pollution issue.

In the past, the ICPDR cooperated with Danube Commission in reviewing the guidelines of managing shipping wastes. The EMIS EG has evaluated existing sources of water pollution basin-wide, including those originating from inland navigation, the current procedures of collecting and treating solid and liquid wastes

(e.g. bilge water) in countries in the Danube River Basin. Relevant for the future actions for the Danube countries is considered to be the initiative taken by the Austrian Ministry of Transport which will take the lead in organizing first steps to establish a more effective and harmonized system (Germany, Austria, Slovakia, Hungary) of waste reception and treatment at the Danube River.

The discharges of wastes and bilge water are forbidden. A number of 1100 ships are registered at the Danube River. This is ten times less than in the Rhine River. Based on the provisions of Convention on Wastes from Shipping at the Rhine River in the framework of the Zentralkommission Rheinschifffahrt (ZKR), bilge waters from the ships are collected by special boats (bilge de-oiling boats), treated on the boat or brought to municipal waste water treatment plants. In Germany 8 boats of the Bilgenentölungsverband (BEV) are treating the bilge waters by ultrafiltration and discharging them after treatment into the Rhine River (residual oil content: 1 – 2 mg/l). The BEV is paid (total amount: 2.6 MEUR) by the Länder (regions) while according to polluter-pays-principle, the charge on the fuel (gas-oil) which is bought is paid by the ship owners.

In Austria the harbour companies take over the bilge water without any costs for the ship owner. The further handling and treatment of the bilge water has to be paid by the harbour companies from the harbour charges. Shipping companies would like the government to pay the treatment of the bilge water; the authorities would like to have a more polluter-pays-principle oriented approach with an indirect payment by the ship owner) for the fuel (gas-oil).
In the harbour of Bratislava (Slovakia) an infrastructure pontoon for all services (fuel supply, waste disposal) has been constructed. This pontoon was financed by the harbour and shipping company of Bratislava. It is planned to centrifugate the bilge waters in future (final oil content: 1 mg/l). The aim of the Hungarian authorities is the construction of future installations for treatment of bilge waters. Till then the use of separators is accepted. A funding of investment costs by the government has been proposed.

The only reception facility for bilge waters in Budapest, which is run by a private shipping company, accepts only their own ships. No waste reception facilities exist in Romania and Bulgaria.

In 2001 the Austrian Ministry of Transport took the lead in organizing first steps to establish a more effective and harmonized system (DE, AT, SK, HU) of waste reception and treatment at the Danube River. In 2003 the Austrian Federal Ministry for Transport, Innovation and Technology, the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management and the Community of Public Danube Ports in Austria (IGÖD) jointly contracted the Austrian Consultant VIA DONAU to carry out the project ‘Sustainable and EU compliant collection and treatment of ship waste on the upper Danube’. The aim of this project is – based on the results of previous national and regional activities – to develop an EU compliant and with the states of the upper Danube (Germany, Slovakia and Hungary) regionally agreed collection and treatment system for ship waste in Austria.

In a first phase of the project, a plan for ship waste management has been developed for Austria. The conceptual work was focussed on oily and greasy and other dangerous ship waste. Technical operative aspects of the service implementation and financing aspects have been examined. Necessary measures for all types of ship waste as well as supportive measures have been evaluated. The result is a proposal for a collection and treatment system for waste of Danube navigation, which has been accorded with relevant parties from Germany, Slovakia and Hungary.

To minimize potential evasion reactions of shippers a strong need is seen for the implementation of a regional coordinated technical solution for a ship waste collection and treatment system. Alongside a future-orientated funding model – especially for the oily and greasy waste – following the polluter-pays-principle will need to be set up.

A step towards the implementation of the conceptual work in the upper Danube region shall be made in the second phase of the project. The proposed Austrian ship waste management plan shall be tested in a pilot phase on the Austrian stretch of the Danube. In order to regionally coordinate implementation activities it is planned to seek support within a EU-project in the Interreg program.

The intended EU-project shall aim at establishing stepwise a regionally coordinated practicable solution regarding operative aspects as well as the lack of funding for a waste collection and treatment system for inland navigation on the Danube. In addition to the Austrian pilot action the other states of the upper Danube shall be enabled to set actions towards an implementation and the development of pilot actions shall be coordinated among the Danube riparian countries. A funding model – especially for oily and greasy waste

related operating services – based on the polluter pays principle as well as on indirect payment structures shall be developed for the states of the upper Danube with the intention to integrate further Danube riparian countries in future.

In the long-term perspective the planned EU-project is intended to have a lead function to initiate the implementation of an operational waste management system as well as a regional coordinated funding model along the whole Danube River.

ICPDR need to strengthen the cooperation with Danube Commission on this task.

4.9 Product controls

The prohibition of polyphosphate-based detergents throughout the Danube basin should be seen as a priority objective.

The environmental policy of the past can be described as source, substance, and media - orientated. Recent approaches try to connect isolated instruments such as directive based regulations - by integrating existing measures into a comprehensive framework for sustainable development (market – based instruments and/or voluntary agreements). The main instruments used in the DRB countries today are often grouped into three main clusters: (i) directive based regulations, (ii) market – based instruments and (iii) voluntary agreements.

According to the JAP, a joint decision for a voluntary agreement (Detergent industry (AISE) and the ICPDR) on promoting the introduction and use of phosphate-free detergents to the market of the Danube countries should be formulated. There are several voluntary agreements between governments and industry to limit the use of phosphates in detergents by the detergent industry. In some countries such as Germany the voluntary agreement is in effect equivalent to a "ban" of phosphates in household laundry detergents.

ICPDR has investigated the use of phosphorus within the countries of the Danube basin using data delivered by the detergent industry. In the case of detergents, the increase in phosphorus input due to the introduction of synthetic detergents was seen as a major contributor to the eutrophication (process of nutrient enrichment of water bodies). Control of the level of phosphates in water, such as lakes, rivers and reservoirs, has become desirable in some areas where conditions in the water can lead to excessive growth of algae. The cost of introduction of phosphate-free detergents is much less compared with the cost for improvement of sewage treatment.

Phosphorus has two main impacts:

- As a nutrient in treated effluent that can contribute to eutrophication,
- In sludge, where it contributes to the quantity and is partly available to plants.

The effect of P-replacement in detergents is estimated to realize a 24 % reduction for point sources and for the total P-emissions a reduction of 12 %.

The ICPDR Secretariat has developed an Issue Paper on the rationale for a phosphate ban in detergents.

Phosphate free detergent is used in relatively small quantities in many of the Danube countries. Due to difficulties in obtaining information on production structures, the information is very limited: in Romania, DERO Unilever does not produce phosphate-free detergent. In Bulgaria 95% of household detergents are STPP based. Less than 25% of detergents used contain phosphates in Slovenia. Phosphate-free detergents were used only in small quantity in the past in Czech Republic (20 %), Slovakia (10 %), and Croatia (10%). Current detergent and STPP use in Europe has been estimated by the EC/WRc study from the total spending on detergents, price, and STPP content. According to the arguments of the detergent industry, the phosphates in detergents make a negligible contribution to phosphorus levels in surface waters and have promoted recovery and recycling of phosphates at wastewater treatment plants as an alternative way forward.

Legislative actions to reduce the quantities of phosphates in laundry detergents have been already introduced in 1985 in Austria. However, since about 15 years phosphate free laundry detergents are used as a result of market pressure. The use of phosphate free-detergents was a voluntary development coming from the industry itself, encouraged by public debate on the eutrophication of the aquatic environment. However, phosphates are still used to a certain extent in “non-laundry products” such as certain detergents for

dishwashers. At the time being this source is regarded to be of minor relevance compared to the huge dimension of the problem of polyphosphates in laundry detergents, which was solved.

Table 28 Estimates on the current detergent use in selected Danube countries

Country	Population 2000 Millions	Detergent use 1998		Detergent with STPP builder 2000	STTP consumption		% reduction 1985-2000
		Laundry Kt	Automatic dishwasher Kt	%	Kt	Kg/hd	
Austria	8.1	59	13	0	0	0	100
Germany	81.9	490	158	0	0	0	100
Hungary	10.2	40	1	70	7	0.7	50
Czech Rep	10.3	17	0	65	3	0.3	50

At the Ordinary Meeting of the ICPDR (1-2 December 2003), the following resolution was agreed: "The ICPDR reiterates its commitment expressed in the JAP that reducing phosphates in the Danube river basin is an important issue to be addressed and welcomes the preparedness of the German Delegation to take the lead in coordinating the process in developing options for a voluntary agreement for phosphorous reductions".

1) A small Task Force will be created with the mandate approved by the OM to design policies options and legal procedures in dealing with the phosphate industry and moving towards a phosphate reduction or ban. The proposed strategy will also contain a detailed work programme. The proposal will be discussed and approved by the Standing Working Group Meeting in September 2004.

2) Amendment of the ToR for the activity 1.8 of the DRP as to respond to related EU recent developments and Danube countries specific needs.

3) Initiate a public awareness campaign: (i) through Danube Watch magazine, (ii) DEF activities (Small Grant programs), and (iii) use the opportunity of the Ministerial Conference (December 2004) to send a signal to induce political and public pressure on the need to initiate the negotiation process with the detergent industry.

The UNDP GEF DRP has already started to provide support to the ICPDR on the identification of best alternative to introduce voluntary agreements instruments. The results will be available at a later date. As this process can only be successful in a partnership with all relevant stakeholders, the detergent industry is actively involved in the dialogue.

4.10 Minimizing the impacts of floods

Article 3.12 stated the obligation of the countries consider the *application of UN-ECE-Guidelines on 'Sustainable Flood Prevention' on concrete terms, e.g. via an 'Action Programme for sustainable Flood Prevention' adapted to the specific situation of the overall Danube Basin. In case the overall Danube Basin proves to be too 'wide spanned' for such Programme a setting-up of 'Action Programmes for sustainable Flood Prevention for selected parts of the Basin'* should be considered. The results of these activities should at the latest be presented at the end of 2005.

Historically, and most recently in August 2002, disastrous flood events have occurred in the Danube River basin. In response to the damages, the International Commission for the Protection of the Danube River (ICPDR) decided to establish the long-term Action Programme for Sustainable Flood Prevention in the Danube River Basin.

The first step is the development of a framework Action Programme that is based on the sustainable flood protection programmes developed in the various Danube countries as well as on networking existing

structures and using the future-oriented knowledge base accumulated through a wide range of activities over the past decade. The overall goal of the Action Programme is to achieve a long term and sustainable approach for managing the risks of floods to protect human life and property, while encouraging conservation and improvement of water related ecosystems. In addition, the Action Programme needs to be specified in further detail for sub-basins. In the first part there is a description of the general hydrological and climate characteristics of the Danube River Basin as well as an overview of floods and flood protection. The section on "General considerations, basic principles and approaches" of the Action Programme refer primarily to UN-ECE Guidelines on Sustainable Flood Prevention, EU Best Practices on Flood Prevention, Protection and Mitigation and to EU Communication on flood risk management, COM (2004) 472. The major principles advocated are: (i) the shift from defensive action against hazards to management of the risk and living with floods (ii) the river basin approach taking into account the Water Framework Directive, (iii) joint action of government, municipalities and stakeholders towards flood risk management and awareness raising, (iv) reduction of flood risks via natural retention, structural flood protection and hazard reduction, and (v) solidarity.

The four major basin-wide targets of the Action Programme that will be further defined and elaborated by the Flood Protection Expert Group of the ICPDR are:

- Improvement of flood forecasting and early flood warning systems; interlinking national or regional systems
- Support for the preparation of and coordination between sub-basin-wide flood action plans
- Creating forums for exchange of expert knowledge
- Recommendation for a common approach in assessment of flood-prone areas and evaluation of flood risk.

At the sub-basin level, six targets have been identified in the Action Programme:

- To reduce the adverse impact and the likelihood of floods in each sub-basin through the development and implementation of a long-term flood protection and retention strategy based on the enhancement of natural retention as far as possible
- To improve flood forecasting and warning suited to local and regional needs as necessary.
- To increase the capacity building and raise the level of preparedness of the organizations responsible for flood mitigation
- To develop flood risk maps
- To harmonize design criteria and safety regulations along and across border sections.
- To prevent and mitigate pollution of water caused by floods.

For sub-basin measures, the Action Programme provides a recommended structure of the flood action plans and gives an overview of activities to be considered during their preparation.
Decisions on the framework of implementation of the sub-basin Action Plans is the task and responsibility of the countries affected, according to their national legislation as well as their bilateral and multilateral agreements. Financial resources necessary for the implementation of the Action Programme should be based on the national budgets and other national sources, on EU funds, including new cohesion policy funds, and on the loans from International Financing Institutions.

As many parts of **Austria** are at high risk not only from flooding, but also from landslides and avalanches, there is a well-developed system of planning and funding for protective measures against natural hazards. The disaster Fund Act requires a fixed percentage of the revenue from income tax and corporate tax to go to the Disaster Relief Fund. Therefore it has a fix revenue amounting to about 250 MEUR. Out of these Fund protective measures, and, in case of, damage compensation is financed. Before planning of structural measures can take place a guiding paper has to be developed, integrating in a holistic stewardship approach all other relevant aspects like erosion control, maintenance of the ecosystem and of landscape.

Located in the middle of the Carpathian Basin, **Hungary** is a naturally flood-prone country that has devoted considerable resources and attention over several centuries to flood control. Hungary's flooding can be divided into three types: floods of external waters (the Danube and Tisza) prone to inundate the Hungarian Plain; floods in the plains caused by in-country precipitation; and floods in the smaller watercourses of hilly

or mountainous areas. Of the three, flooding of the Danube and Tisza is by far the most damaging type and the highest priority for control. A governmental program – the New Vásárhelyi Plan – has been started in 2004 on the enhancement of flood safety and the related regional and rural development in the Tisza Valley. The Plan comprises a complex program which covers beyond the creation of a higher level of flood safety, the improvement of the living standards of the rural and urban population of the region, the formulation and introduction of new types of agro-ecological land use in the area of the emergency flood retention reservoirs and the modernisation of the infrastructure in the settlements along the River Tisza, tributary of Danube.

The Integrated Program of the elimination of consequences of the severe flooding of Urban and Rural Territories of **Ukraine** has identified 541 urban and rural settlements suffered from flooding, which covers territory 196,205 hectares (10,85% of total populated territories). The program determines legal, institutional and financial arrangements to rehabilitate and protect flooded areas and provides cost estimation of measures and sources of financing.

Due to the fact, that the frequency and intensity of floods in central European river basins have clearly increased in the last few years, various new legislative regulations at federal and state level (e.g. Federal Regional Planning Act, Water Management Act, Town and Country Planning Code, Federal Building Code) and superordinate guidelines (principles, objectives and guidelines of land-use planning and regional development) have improved the general conditions for flood control measures in **Germany**. Whereas current management strategies tend to favour structural large-scale defence measures, such as dikes, dams etc. one can notice a change of paradigm towards non-structural flood protection measures, such as flood plain management, flood forecasting and warning systems as well as preventative risk reduction by spatial planning.

A new approach of water management and a critical evaluation of conventional flood control have been implemented in **Romania** as well. Instead of the prevention of flood the mitigation of flood was set as the priority. Furthermore, a fundamental change in the approach is the shift from the efforts to control natural processes, to the efforts to work with natural processes.

Improvement of the existing systems of the flood protection is long-term objective of the current water management policy in **Bosnia and Herzegovina.**

4.11 Water Balance

According to Article 9 (3) of the DRPC the „*Contracting Parties shall establish on the basis of a harmonized methodology, domestic water balances, as well as the general water balance of the Danube River Basin. As an input for this purpose the Contracting parties to the extent necessary shall provide connecting data, which are sufficiently comparable through the application of the harmonised methodology. On the same data base water balances can also be compiled for the main tributaries of the Danube Rive*r." Action to be taken in line with Article 3.13 is: "the ICPDR will develop a harmonised methodology for establishing domestic water balances and will present a first general water balance for the whole Danube River Basin including water balances for the main tributaries till the end of 2005".

At the occasion of 6th Steering Group meeting of the ICPDR, a resolution was approved on acceptance of the ICPDR to cooperate with IHP/UNESCO on hydrological issues, for the update of water balance.

The on-going joint research is focused on the basin wide water balance in the DRB, and includes several components with different responsibilities: WatBal Modeling (WRI Bratislava); GIS and balance regions (WRI Bratislava); and GIS and mapping of precipitations (IH-SAS).

The WatBal will be applied in all selected balance regions within the Danube River Basin, considering two methodological topics. Results of the WatBal model application in participating countries have been already delivered to coordinator from the Czech Republic. Results from Austria, Slovenia, Germany (a part only) and Slovakia (a part only) were made available at the last the Expert Group and Steering Committee meeting in Brno, Czech Republic, 28 August 2004.

Thus, a national water balance model has been introduced for 538-gauged catchments in **Austria**. The water balance components shown are corrected precipitation, evaporation, runoff depth and snow equivalent.

Additionally presentations available are the runoff figures Q95 (Low flow), Q5 (Flood Flow) and the runoff components surface runoff, interflow and base flow. For the Austrian share of the Danube catchment the following figures for the addressed components of the water balance can be given: Mean Precipitation 1089 mm/a resulting in a volume of 87.758 Mio m³/a, Mean evaporation 499 mm/a resulting in a volume of 40.182 Mio m³/a, and Mean Runoff 574 mm/a, resulting in a volume of 46.299 Mio m³/a.

Specific issues to be addressed in the final report for DRB countries include:

- Precipitation trends in the Danube River Basin
- Inventory of hydraulic structures
- Statistics on runoff regime
- Updating the Water Balance
- Geometrical features of the riverbed
- Regionalization of maximum flood discharge estimation
- Hydrological Bibliography of the DRB (Phase II)
- Flood conditions in the DRB
- Hydrological meta-database of the DRB
- Stability of runoff regime in the DRB

It is expected that the project will be finalized by the end of 2004.

4.12 River Basin Management

On December 22, 2000 the Water Framework Directive 2000/60/EC (WFD) came into force. The EU Member States (at the time this was Germany and Austria in the Danube basin) are obliged to fulfil this Directive. The WFD brings major changes in water management practices. Most importantly, it:

- sets uniform standards in water policy throughout the European Union and integrates different policy areas involving water issues,
- introduces the river basin approach for the development of integrated and coordinated river basin management for all European river systems,
- stipulates a defined time-frame for the achievement of the good status of surface water and groundwater,
- introduces the economic analysis of water use in order to estimate the most cost-effective combination of measures in respect to water uses,
- includes public participation in the development of river basin management plans encouraging active involvement of interested parties including stakeholders, non-governmental organizations and citizens.

The WFD places obligations on member states to implement measures to achieve specific environmental objectives for water bodies including rivers, lakes, groundwater and estuaries. The WFD requires that for most surface water bodies, the target of "good ecological status" should be achieved within 15 years of adoption of the Directive. For water bodies that already achieve this status and those at "high ecological status" the objective is to maintain this. Some water bodies may not be capable of achieving "good status", simply because they have been heavily physically modified, for example, in the case of engineered river channels or flood defence measures. If so, a more appropriate ecological quality objective may be set – "good ecological potential". In case of disproportionate costs to achieve a specific goal, a derogation of the timetable could be acceptable.

"River Basin Management Plans" (RBMPs) will provide the context for setting out a comprehensive programme of measures designed to achieve the objectives that have been set for water bodies. One of the key features of the Directive is its incorporation of economic considerations. For example, adequate cost recovery for water services, and economic analysis of water use and review of the environmental impact of human

activity to support the development of the River Basin Management Plans are included. Consequently, public consultation plays an important part in their preparation.

The EU as well as ICPDR member countries has agreed that the ICPDR will provide the platform for the coordination necessary to develop and establish the River Basin Management Plan for the Danube Basin.

What makes the implementation process in the Danube River Basin a particular challenge is the fact that only some countries are EU Members and therefore obliged to fulfil the EU WFD. Besides Austria and Germany, four additional Danube countries have become EU Members States on May 1, 2004. Three other Danube countries are in the process of accession and are preparing to conform with the complete body of EU legislation in order to become EU Members. Others have not initiated a formal process to join the EU.

The ICPDR RBM EG is responsible for coordinating the technical work amongst the 13 participating countries and according to the implementation time frame as set by the EU. All Contracting Parties have agreed to make all efforts to arrive at a coordinated international River Basin Management Plan for the Danube River Basin.

The work of the International Commission for the Protection of the Danube River is concentrated on the development of a joint basin management plan and a harmonization of methodologies and approaches for conducting the analysis needed. The first major step in that work – the characterization of the basin – is completed and forms the basis for identifying the problems and additional efforts and actions needed to reduce pollution, and minimize other pressures negatively influencing the quality of water in the basin.

4.12.1 Progress in developing the Danube River Basin Management Plan in line with the WFD

The Water Framework Directive ensures integrated water resources management on river basins. River basin authorities will be required to monitor water quality and quantity, set quality standards, establish rules for water abstraction and waste water discharge permits, and develop action plans to ensure that agreed quality objectives will be met. Public participation in the process is essential. The Directive is particularly demanding in requiring Member States to achieve "good ecological status" and "good chemical status" for all surface and ground water, by 2010. Implementing the water policy legislation will be very demanding and costly for all new members, in administrative, financial and political terms.

In addition to preparing a roof report, the 6th Ordinary Meeting of the ICPDR concluded that all countries should send their national reports to the ICPDR as the platform for coordination. The ICPDR has not yet received the national reports from the EU-Member States: Austria, Czech Republic, Hungary and Slovenia.

The national reports of the Non-EU-Member States were sent to the Commission (Croatia, Serbia and Montenegro, Bulgaria, Romania and Moldova). The Roof report 2003 and the mentioned national reports were also sent to the Heads of Delegation of the ICPDR. Bosnia i Herzegovina has sent its National WFD Report 2003 to the European Commission. Ukraine is currently not in a position to report on WFD implementation.

The first main outputs of the joint efforts to implement the EU Water Framework Directive in the Danube River Basin are the Roof Reports 2003 and 2004. The RBM EG coordinates the work related to WFD implementation.

The WFD Roof report 2003 (Art. 3.8 and Annex I) was finalized on April 16, 2004 and sent to the European Commission as an informal information on June 22, 2004. In addition, the national reports of the Non-EU-Member States (Croatia, Serbia and Montenegro, Bulgaria, Romania and Moldova) were sent to the Commission. Bosnia i Herzegovina have recently sent its National WFD Report 2003 to the European Commission. Ukraine is currently not in a position to report on WFD implementation.

The WFD Roof report 2004 has been prepared in line with Art. 5, 6 and Annexes II, III, IV of the WFD. The report having reporting deadline at March 22, 2005 deals with the characterization of surface waters and groundwater, with the assessment of significant pressures and impacts, and with the economic analysis of water uses. The UNDP GEF DRP has provided financial support for the drafting of the Roof report.

Each state will deliver the roof report (Part A) together with its own national report (Part B). In addition, the ICPDR will informally send the European Commission a copy of the roof report and a copy of the national

reports (Part B) of those countries not obligated to report to the European Commission. The final report will be presented at the Ministerial Meeting in December 2004.

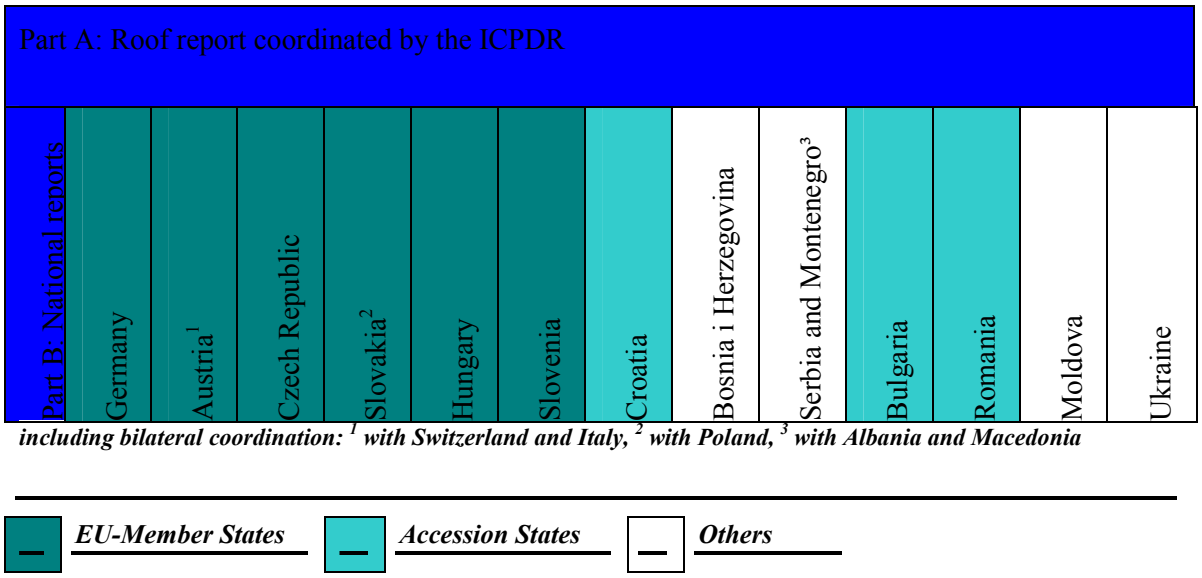
One of the objectives of the Water Framework Directive is specifically to make sure that different objectives are achieved through a cost effective and comprehensive decision-making process.

The Danube River Basin Management Plan has been divided into two parts. Part A (roof of the DRBMP) gives relevant information of multilateral or basin-wide importance, whereas Part B (national input to DRBMP) gives all relevant further information on the national level as well as information coordinated on the bilateral level (Fig 13).

Part A – Roof report

The Roof report deals with information of basin-wide importance. This includes, in particular, an overview of the main driving forces of multilateral or basin-wide relevance and the related pressures exerted on the environment. The analysis is based on available data resulting from past and ongoing programmes and projects. The overview will include effects on coastal waters of the Black Sea as far as they are part of the DRBD, since their status could be a reason for designating the whole DRBD as a sensitive area.

Figure 13. Structure of the report for the Danube River Basin District



Part B – National reports

The National reports give all relevant further information on the national level as well as information coordinated on the bilateral level. Transboundary issues not covered by the ICPDR are solved at the appropriate level of cooperation e.g. in the frame of bilateral/multilateral river commissions.

The Danube states cooperating under the DRPC report regularly to the ICPDR on the progress of WFD implementation in their own states. These national reports serve as a means for exchanging information between the states and for streamlining the implementation activities on the national level.

4.12.2 Characterization of surface waters types and harmonized system for reference conditions

According to Annex II 1.1 WFD "Member States shall identify the location and boundaries of bodies of surface water and shall carry out an initial characterisation of all such bodies …".

The first step in the analysis is the identification of the surface water categories. It has been agreed that the following surface waters are potentially of basin-wide importance and are therefore dealt with in the Roof report:

- all rivers with a catchment size of > 4 000 km²
- all lakes and lagoons with an area of > 100 km²
- the main canals.

These surface waters are shown on the Danube River Basin District overview map (Map 1).

The surface water body categories have been identified on the national level. For each surface water category, the relevant surface water bodies within the river basin district need to be differentiated according to type (Annex II 1.1 (ii) WFD). The state of implementation of WFD varies strongly between the countries in the Danube River Basin, especially for the development of surface water typologies and the definition of their reference conditions.
With support from UNDP GEF DRP, the typology of the Danube River has been developed in a joint activity by the countries sharing the Danube River. The Danube typology therefore constitutes a harmonised system used by all Danube countries. On the basin-wide level, the Danube countries have agreed on general criteria as a common base for the definition of reference conditions. These have then been further developed on the national level into type-specific reference conditions. The Danube flows through or borders on territories of 10 countries (Germany, Austria, Slovakia, Hungary, Croatia, Serbia and Montenegro, Bulgaria, Romania, Moldova and Ukraine) and crosses four ecoregions (9 – Central Highlands, 11 – Hungarian Lowlands, 10 – Carpathians, and 12 – Pontic Province). The Danube typology was based on a combination of abiotic factors of System A and System B. The most important factors are ecoregion, mean water slope, substratum composition, geomorphology and water temperature. The countries developed the typologies of the Danube tributaries individually. Workshops enhanced the exchange of information between the countries and allowed for a streamlining of approaches. In addition, stream types relevant on transboundary watercourses were bilaterally harmonised with the neighbours. The common factors used in all DRB typologies are ecoregion, altitude, catchment area and geology.

4.12.3 Identification of significant pressures

The WFD requires information to be collected and maintained on the type and magnitude of significant anthropogenic pressures, and indicates a broad categorisation of the pressures into:

- point sources of pollution,
- diffuse sources of pollution,
- effects of modifying the flow regime through abstraction or regulation, and
- morphological alterations.

In addition, there is a requirement to consider land use patterns (e.g. urban, industrial, agricultural, forestry) as these may be useful to indicate areas, in which specific pressures are located.

The pressures and impacts assessment follows a four-step process:

1. describing the driving forces, especially land use, urban development, industry, agriculture and other activities which lead to pressures, without regard to their actual impacts;
2. identifiying pressures with possible impacts on the water body and on water uses, by considering the magnitude of the pressures and the susceptibility of the water body;
3. assessing the impacts resulting from the pressures; and
4. evaluating the likelihood of failing to meet the objective.

The analysis is based on screening of emissions (pressures) according to certain criteria, which determine what ‘significant pressure’ means.

The ICPDR Emission inventory is the key database for the assessment of emissions from point sources on the basin-wide level. It includes the major municipal, industrial and agricultural point sources and identifies the total population equivalents of the municipal wastewater treatment plants, the industrial sectors of the

industrial wastewater treatment plants, and the types of animal farms for the agricultural point sources. In addition, it includes information on the receiving water and data on some key parameters of the effluent such as BOD, COD, P and N.

The criteria defined by the ICPDR EMIS EG consider pressures from point sources, especially from substances referred to in Annex VIII WFD, to the Urban Waste Water Treatment Directive (91/271/EEC), to the Integrated Pollution Prevention and Control Directive (96/61/EC) and to the Dangerous Substances Directive (76/464/EEC).

Table 29 Definition of significant point source pollution on the basin-wide level

Discharge of	**Assessment of significance**
Municipal waste water	
any municipal waste water from • agglomerations with < 10,000 PE • WWTPs with < 10,000 PE	Not significant
untreated municipal waste water from • agglomerations with > 10,000 PE	Significant
only mechanically treated municipal waste water from • WWTPs with > 10,000 PE	Significant
mechanically and biologically treated municipal waste water without tertiary treatment from • WWTPs with > 100,000 PE	Significant if at least one parameter is exceeded: – BOD[1] > 25 mg/l O_2 – COD[1] > 125 mg/l O_2 – N_{total}[2] > 10 mg/l N** – P_{total}[2] > 1 mg/l P
Industrial waste water	Significant if at least one parameter is exceeded: – COD[3] > 2 t/d – pesticides[4] > 1 kg/a – Heavy metals and compounds[5]: • As_{total} > 5 kg/a • Cd_{total} > 5 kg/a • Cr_{total} > 50 kg/a • Cu_{total} > 50 kg/a • Hg_{total} > 1 kg/a • Ni_{total} > 20 kg/a • Pb_{total} > 20 kg/a • Zn_{total} > 100 kg/a
Waste water from agricultural point sources (animal farms)	Significant if at least one parameter is exceeded: N_{total}[5] > 50,000 kg/a P_{total}[5] > 5,000 kg/a

WWTP = waste water treatment plant

[1] according to Table 1 of the EU Urban Wastewater Treatment Directive, 91/271/EEC

[2] according to Table 2 of the EU Urban Wastewater Treatment Directive, 91/271/EEC

**) Equivalent of 13 mg/l N in Germany, due to 2h-composite sample monitoring

[3] threshold as in the EMIS inventory for industrial discharges 2000

[4] thresholds water in kg/year as in the EPER

[5] threshold as in the EPER (EMIS inventory for point agricultural sources 2002)

4.12.3.1 Definition of significant point source pollution on the basin-wide level

A comparison of the significant point source emissions with the complete list of point sources in the emission inventory illustrates that only few point sources are responsible for about half of the point discharges into the Danube River system. From this it can be concluded that reduction of emissions (organic substances and nutrients) from these sources would lead to a remarkable reduction of the total point source pollution. This also visible in the results of the DABLAS 2002 estimates of municipal investments in the DRB. (Table 11).

Table 30 Discharges from significant point source according to the criteria, per sub basins.

	COD	BOD	N	P
	t/a	t/a	t/a	t/a
Municipal sources				
01 Upper Danube	11584	1741	7756	313
02 Inn	1316	206	474	33
03 Austrian Danube	604	130	248	14
04 Morava	898	100	189	20
05 Váh-Hron	14899	4248	2102	349
06 Pannonian Central Danube	94759	32304	11618	1495
07 Drava-Mura	14970	5802	2291	418
08 Sava	83649	37102	6005	1358
09 Tisza	37507	14327	4883	1029
10 Banat-Eastern Serbia	13261	4247	2679	619
11 Velika Morava	0	0	0	0
12 Mizia-Dobrudzha	64057	29149	5064	1254
13 Muntenia	59917	29861	15602	1844
14 Prut-Siret	25314	9869	2751	215
15 Delta-Liman	744	272	50	4
16 Romanian Black Sea Coast	10297	2801	910	87
Total Danube river basin district	**433775**	**172159**	**62622**	**9053**
Industrial sources				
01 Upper Danube	7346	49	20	8
02 Inn	8469	375	305	20
03 Austrian Danube	4825	196	12	9
04 Morava	1911	136	130	19
05 Váh-Hron	8294	2681	96	4
06 Pannonian Central Danube	16424	3515	352	13
07 Drava-Mura	29718	6083	185	52
08 Sava	33965	6772	310	374
09 Tisza	16622	3315	331	32
10 Banat-Eastern Serbia	1158	120	20	2
11 Velika Morava	0	0	0	0
12 Mizia-Dobrudzha	9244		0	0
13 Muntenia	16173	5166	2312	5
14 Prut-Siret	4456	903	136	1
15 Delta-Liman	982	0	24	15
16 Romanian Black Sea Coast	842	242	390	
Total Danube river basin district	**160427**	**29555**	**4625**	**555**
Agricultural sources				
07 Drava-Mura	2	1		1
08 Sava	191	41	107	3
09 Tisza	2263	579	749	
10 Banat-Eastern Serbia	357	104	57	16
13 Muntenia	2040	1085	881	57
14 Prut-Siret	285	1074	326	5
15 Delta-Liman	901	206		
Total Danube river basin district	**6039**	**3089**	**2121**	**82**

In 2000, the total nutrient point discharge into the Danube was about 163 kt/a nitrogen and 28.1 kt/a phosphorus. Figure 14 and Figure 15 show the difference in the present state of the nutrient point source

discharges within the Danube countries. For nitrogen it is shown that the lowest point N discharges are in Germany with 4 g/(Inh.·d) per connected inhabitant followed by Austria, Ukraine and Moldova. The picture for phosphorus presented in Figure 15 is similar to that for nitrogen Figure 14, but the differences between the countries are much larger. This is due to the fact that the specific P point discharges reflect, not only the state of the P elimination in waste water treatment plants, but also the existing use of phosphorus in detergents, and discharges from direct industrial sources. For this reason the specific P emissions are above 4 g/(Inh.·d) for Bosnia i Herzegovina, Croatia and Serbia and Montenegro. The medium level P emissions for Czech Republic and Slovakia result from the fact that some WWTPs have additional P elimination.

Figure 14 Inhabitant specific N discharges from point sources 1998 to 2000 (2004).

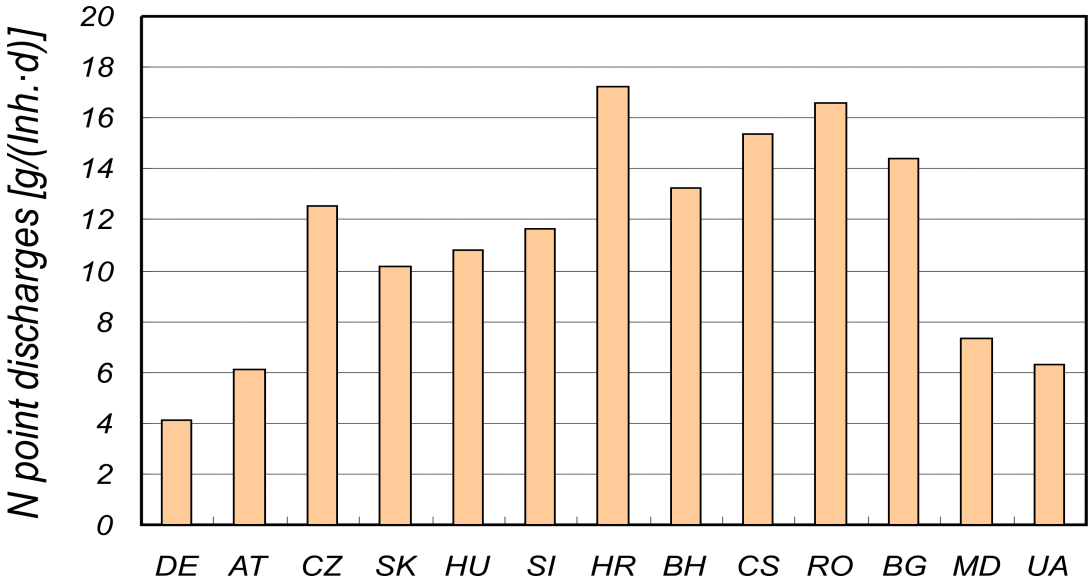
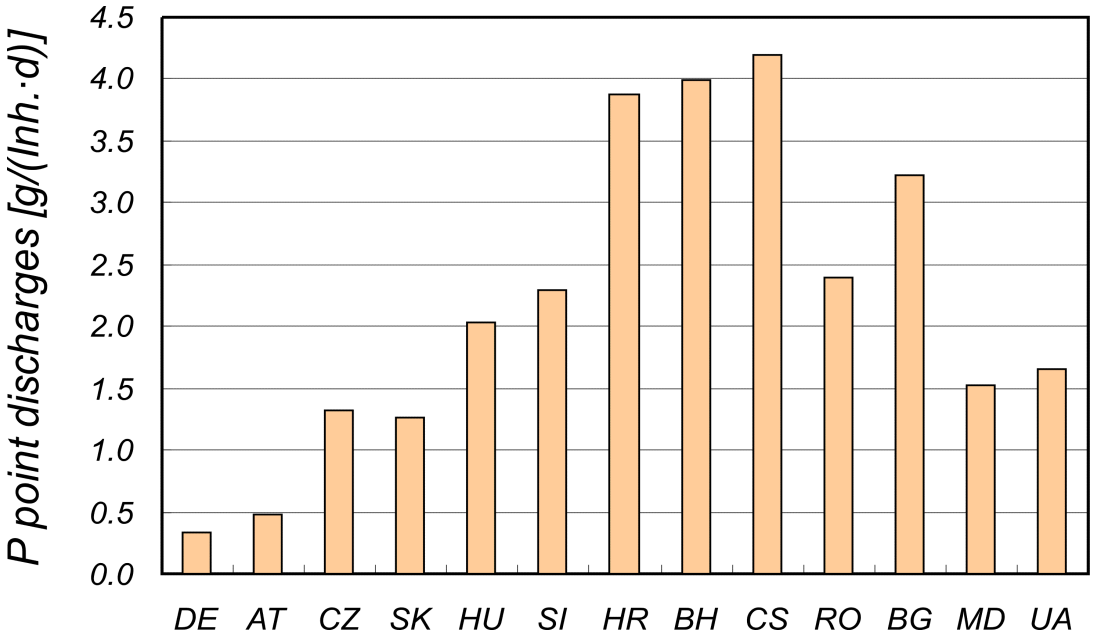


Figure 15 Inhabitant specific P discharges from point sources 1998 to 2000 (2004).



4.12.4 Development of DRBD Overview map and preparation of thematic maps

The main objective of WFD implementation is the development of a Danube River Basin Management Plan. The Danube River Basin covers 801,463 km² and territories of 18 states including EU-Member States, Accession States and other states that have not applied for EU Membership. According to Article 3.3 of the WFD "Member States shall ensure that a river basin covering the territory of more than one Member State is assigned to an international river basin district".

In addition to the Danube River Basin, the small coastal basins of the Black Sea tributaries lying on Romanian territory between the eastern boundary of the DRB and the coastal waters of the Black Sea have been included in the Danube River Basin District**.**

Table 31 Area of the Danube River Basin District

	Territory	**Official area** (km^2)	**Digitally determined area** (km2)
Danube River Basin (DRB)	18 countries		801,463
Black Sea coastal river basins	Romania	5,198	5,122
Black Sea coastal waters	Romania and Ukraine		1,242
Danube River Basin District (DRBD)			807,827

The Danube River Basin District covers: the Danube River Basin, the Black Sea coastal catchments on Romanian territory, and the Black Sea coastal waters along the Romanian and partly the Ukrainian coast.

4.12.5 Development of public participation strategy

Active involvement in planning procedures leads to shared responsibilities and higher acceptance of measures in the WFD implementation process. The ICPDR – being the co-ordination platform for the implementation of the WFD on issues of basin-wide or multilateral concern - has taken this new challenge as a basis to reviewing its ongoing practice. The ICPDR started an active process towards defining a "Danube River Basin Strategy for Public Participation in River Basin Management Planning 2003-2009" and consequently developing an "ICPDR Operational Plan". The basic principles of the "Danube River Basin Strategy for Public Participation in River Basin Management Planning 2003-2009" were approved in June 2003.

Based on Article 14 of the WFD, the objectives of this strategy are to (i) ensure public participation in the implementation of the WFD, especially concerning the development of the Danube River Basin Management Plan, (ii) facilitate the establishment of effective structures and mechanisms for public participation that will continue operating beyond the first cycle of river basin management planning, (iii) provide guidance to national governments on how to comply with their obligations under the WFD by providing practical support and guidance in addressing public participation, and (iv) inform key stakeholders about the structures for public participation and public involvement at the various levels.

The activities at ICPDR level were developed in detail and summarized in the "ICPDR Operational Plan", adopted in December 2003, which provides a description of the activities at the roof level, including a timetable and a workplan. The Operational Plan is seen as a planning tool, which is regularly adjusted to the needs of the ICPDR.

4.12.6 Development of economic indicators

According to Article 5 and Annex III of the WFD, an economic analysis of water uses has to be carried out with the aim of assessing the importance of water use for the economy and assessing the socio-economic development of the river basin.

The Roof report deals with (i) the assessment of the economic importance of water uses, and (ii) projection of trends of key economic indicators and drivers up to 2015. The report contains basic information regarding the characteristics of water services and illustrates the differences in terms of the connection rates of the population to public water supply. Discussions on the characteristics of water uses were based on the economic structure of the Danube countries, which show differences mainly aroused from the varied importance of the agricultural sector. While in Bulgaria, Croatia and Romania around 10 percent of GDP is generated from agriculture, this share is between 1 and 3.7 percent in the remaining countries. The share of industry and electricity generation is more consistent between the countries, which reported these data. To facilitate understanding of the projecting trends in key economic indicators and drivers up to 2015, assessment of key economic variables for developing baseline scenario was concluded. The UNDP GEF DRP offered support for the Danube countries in undertaking the economic analysis for the WFD.

The ICPDR serves as the platform for coordination in the implementation of the WFD in the Danube River Basin District on issues of basin-wide importance. Transboundary issues not covered by the ICPDR are solved at the appropriate level of cooperation e.g. in the frame of bilateral/multilateral river commissions.

4.13 Reporting JAP

The time foreseen for the implementation of this Joint Action Program is from 01/01/2001 till 31/12/2005. The organising of the implementation of the Joint Action Programme lies in regard to the needed transboundary cooperation with the ICPDR and its supporting bodies, and in regard to national tasks with the Contracting Parties to the DRPC.

ICPDR will report on the implementation of the Joint Action Programme for the period 2001 to 2003 at the year 2004, and for the period 2001 to 2005 at the year 2006.

5 INVESTMENTS, FINANCING AND POLLUTION REDUCTION

5.1 Overview of environmental projects in the DRB

The status of environmental investment projects throughout the DRB was evaluated for the following five sectors: **municipal**, **industrial**, **agro-industrial**, **wetlands**, and **land use**.

The investment projects were group into three main categories:

1. Projects implemented in the past five years and projects that are fully financed and under implementation, taking into account type of project (technical description), investment cost, financing modalities and achieved results in terms of compliance with EU directives and pollution reduction (BOD, COD, N and P).

2. Projects that are prepared and do not need further technical support but require further financial support.

3. Projects that require further assistance for technical and investment planning.

Investment project data were collected in the database. The prioritisation criteria were further adapted to account for experiences gained in the DABLAS 2002 assessment ("Development of an Operational Framework for the Prioritisation of Projects") and the additional sectors. The detailed status of all projects reported and the results of screening of investments projects are presented in the DABLAS Report, 2004.

5.1.1 Overview of Results

A total of 354 investment projects were assessed in 11 countries in the Danube River Basin (BA, BG, CS, CZ, HR, HU, MD, RO, SI, SK, UA). (DABLAS Report, 2004)

Table 32 Environmental investments projects in the DRB

Sector Overview: Number of Investment Projects						
Country	**Municipal**	**Industrial**	**Agro-Industrial**	**Land Use**	**Wetlands**	**Total**
Bosnia-Herzegovina – BA	6	20	1	-	3	30
Bulgaria – BG	32	8	5	-	2	47
Croatia – HR	15	4	-	-	-	19
Czech Republic – CZ	26	7	3	-	6	42
Hungary – HU	17	3	-	-	6	26
Moldova – MD	15	5	7	11	5	43
Romania - RO	18	5	11	-	4	38
Serbia-Montenegro – CS	5	-	-	-	-	5
Slovakia – SK	20	16	-	-	6	42
Slovenia – SI	24	9	3	-	3	39
Ukraine - UA	13	-	2	3	5	23
Totals:	**191**	**77**	**32**	**14**	**40**	**354**

Municipal sector projects (191) account for more than 50% of the total number of investment projects. There are 77 industrial and 32 agro-industrial projects; combined, these two point-source sectors represent 30% of the total. Wetlands and Land Use sector have 40 and 14 projects, respectively.

Estimated investment costs for the 354 projects total 3822 million EUR.

Table 33 Total investments per sectors and country

Sector Overview: Total Investments (MEUR)						
Country	**Municipal**	**Industrial**	**Agro-Industrial**	**Land Use**	**Wetlands**	**Total**
Bosnia-Herzegovina – BA	145.2	38.5	2.3	-	11.9	**198**
Bulgaria – BG	217.1	15.2	24.5	-	4	**260.8**
Croatia – HR	217	4.5	-	-	-	**221.5**
Czech Republic – CZ	199.6	7.9	69.2	-	6.9	**283.6**
Hungary – HU	981	41.6	-	-	7.3	**1,029.9**
Moldova – MD	37.1	3.5	10.4	6.2	5.9	**63**
Romania - RO	524.2	33.2	25.5	-	1.9	**584.7**
Serbia-Montenegro – CS	530	-	-	-	-	**530**
Slovakia – SK	271.3	36.2	-	-	1.1	**308.6**
Slovenia – SI	301.1	12.7	10.5	-	3.5	**327.7**
Ukraine - UA	51.1	-	2.6	5.4	15.1	**74.2**
Totals:	**3,475**	**193**	**145**	**11.6**	**57.6**	**3,882**

Hungary accounts for more than 25% (1030 MEUR) of the total investment costs, followed by **Romania** with 585 MEUR and **Serbia-Montenegro** with 530 MEUR. The 3 largest municipal projects are, in fact, in these 3 countries: Budapest-Central, Bucharest, and Belgrade.

The **municipal** projects account for approx. 90% of estimated investment and emission reduction.

Table 34 Summaries of Total Costs and Pollution Reduction

Summary of Total Costs and Pollution Reduction								
Sector	**No. of Projects**	**Cost and Financing**			**Emission Reduction**			
		Total Investment MEUR	**Funds Secured MEUR**	**Funding Gap MEUR**	**BOD t/a**	**COD t/a**	**N t/a**	**P t/a**
Municipal	191	3,474.70	1,700.70	1,774.00	265,644	520,728	44,400	9,070
Industrial	77	193.2	67.4	125.8	25,951	68,341	928	92
Agro-Industrial	32	144.9	10.7	134.3	6,396	4,289	2,032	632
Wetlands	40	57.6	10.5	47.8	not estimated	not estimated	19,029	1,903
Land Use	14	11.6	0.9	10.7	not estimated	not estimated	not estimated	not estimated
Totals:	**354**	**3,882**	**1,790**	**2,093**	**297,991**	**593,358**	**66,389**	**11,697**

There are a number of possible explanations for the high representation of the municipal sector, for example:

- Firstly, and probably most importantly, data were more readily available for the municipal sector (public infrastructure), while pollution reduction and planned investments among the private sector (e.g., industrial and agro-industrial) are not fully publicly disclosed in many of the assessed countries.

- In many cases, the municipal sector projects include sewerage in addition to wastewater treatment, while the industrial and agro-industrial investments are more focused on wastewater treatment and/or management. Thus, investment costs for municipal projects are in general higher than industrial wastewater improvements per reduction of pollutants (but not necessarily in terms of overall benefits attained, for example improved sanitation conditions).

- Also, transposition of the Urban Wastewater Treatment Directive (UWWTD) and consequent inception of investment projects seems to be on a faster track than realisation of other water quality legislation affecting the other sectors, such as the IPPC Directive (relevant for industrial and agro-industrial sectors), Nitrates Directive and CAP reform (applicable to land use reform and also agro-industrial operations).

- The majority of the municipal wastewater investments are implemented by municipalities or publicly owned companies, whereas the industrial sector and increasingly the agro-industrial and agriculture sectors are consolidated in the private sector. Certain financing support facilities are primarily servicing public sector investments, and also,

- there might be an information transfer gap among privately held enterprises regarding available financing instruments.

Nevertheless, there were a significant number of **industrial** and **agro-industrial** projects identified, 77 and 32, respectively, and pollution reduction estimations are considerable for several of the projects. As additional data are made available, these two sectors will be better represented in terms of pollution reduction potential, as compared to the municipal sector.

Wetlands restoration efforts are active among most of the surveyed countries, and completed and planned projects have the potential to realise significant nutrient reductions. Unlike the point-source pollution reduction projects (municipal, industrial, agro-industrial), pollution decreases achieved through wetlands restoration projects are difficult to measure and only approximate estimations can be made, as there are numerous factors involved in the functioning of a wetland as a nutrient “sink”.

Only 2 countries, Moldova and Ukraine, indicated **Land Use** projects. The limited data submitted for the Land Use sector seems to be attributed to following:

- Land Use investment projects were not readily available to the national consultants.

- Some apparent Land Use investment projects were submitted as Wetlands sector projects (e.g., for the Czech Republic and Moldova); these projects are presently being evaluated for inclusion under Land Use.

- Although agricultural reform legislation has been transposed in most of the countries, there are very few concrete “Land Use” investment projects in the pipeline, possibly due to widespread re-organisation of the agriculture sector throughout the lower Danube countries and, the collapse of former markets, the shortage of capital among agricultural enterprises and financing limitations.

5.1.2 Overview of Project Realisation by the end of 2003

Among the 11 DRB countries assessed as part of the DABLAS 2004 programme, there were 29 projects completed for a total investment of 222 MEUR by the end of 2003.

Table 35 Projects in all sectors finalised before the end of 2003, 2005 and after 2005

Project Realisation (all sectors combined)								
Country	All Projects		Projects Completed by 2003		Projects Completed by 2005		Projects Completed after 2005	
	No. of Projects	Investment MEUR	No. of Projects	Investment MEUR	No. of Projects	Investment MEUR	No. of Projects	Investment MEUR
Bosnia-Herzegovina	30	198	0	0	2	0.6	28	197.4
Bulgaria	47	260.8	0	0	2	7.8	45	253
Croatia	19	221.5	0	0	2	2.2	17	219.3
Czech Republic	42	283.6	5	40.6	16	169.8	26	113.9
Hungary	26	1029.9	8	57.7	15	110.7	11	919.2
Moldova	43	63	0	0	1	0.3	42	62.7
Romania	38	584.7	0	0	0	0	38	584.7
Serbia and Montenegro	5	530	0	0	0	0	5	530
Slovakia	42	308.6	11	46.5	23	100.5	19	208.1
Slovenia	39	327.7	5	77	14	176.5	25	151.2
Ukraine	23	74.2	0	0	2	3.9	21	70.4
Totals:	**354**	**3882**	**29**	**222**	**77**	**572**	**277**	**3310**

The completed projects by 2003 were carried out in the four recent EU accession countries, Czech Republic, Hungary, Slovakia, and Slovenia, and total investment costs range from 40.6 MEUR in the Czech Republic (5 projects) to 77 MEUR in Slovenia for completion of 5 projects.

A considerable amount of national and local financing was raised for the 29 completed projects through 2003. In fact, nearly 100% of the investment costs for the 11 completed projects in Slovakia was from national and/or local funds. Similarly, in Hungary and the Czech Republic, the majority of project financing was from national and/or local sources: 88% and 70% respectively. In Slovenia, 24% of the 77 MEUR for the 5 completed projects were raised from national and/or local sources, an additional 20% from EU funds, and the remaining 56% from loans and/or grants from International Financial Institutions (IFIs):

Table 36 Funding sources for projects (all sectors) finalised before the end of 2003

Breakdown of Secured Funding Sources: Projects Completed by 2003						
Country	No. of Projects	Total Investment MEUR	% of Total			
			National Funds	EU Funds	IFI Funds	Missing Funds
Czech Republic	5	40.6	70	0	30	0
Hungary	8	57.7	88	9	3	0
Slovakia	11	46.5	99.9	0	0.1	0
Slovenia	5	77	24	20	56	0
Totals:	29	222				

EU-funding is much lower for the 29 projects completed by 2003 as compared to the total 93 fully financed investments, thus, indicating that (1) the majority of EU funding support is in the pipeline and (2) several of the EU-funded projects are large (e.g., Bucharest) and will not be completed for several more years.

A total of 77 projects (including the ones completed by 2003) are to be realised by the end of 2005, for a combined investment of 572 MEUR. The 48 additional projects, compared to the ones completed by 2003, are again predominantly located within the four recent EU accession countries. In addition, projects in Bulgaria, Bosnia- Herzegovina, Croatia, Moldova, and Ukraine are predicted to be complete by 2005. Some of these estimates might be optimistic, however, as more than 90% of the necessary funds are yet to be secured in these five countries.

Table 36 Funding sources for projects finalised before the end of 2005

Breakdown of Secured Funding Sources: Projects Planned for Completion by 2005						
Country	No. of Projects	Total Investment MEUR	% of Total			
			National Funds	EU Funds	IFI Funds	Missing Funds
Bosnia-Herzegovina	2	0.6	9	91	0	0
Bulgaria	2	7.8	0	0	0	100
Croatia	2	2.2	9	0	0	91
Czech Republic	16	169.8	46	10	41	3
Hungary	15	110.7	91	5	2	2
Moldova	1	0.3	0	0	0	100
Slovakia	23	100.5	84	13	3	0
Slovenia	14	176.5	32	35	25	8
Ukraine	2	3.9	0.9	0	0	99.1
Totals:	**77**	**572**				

5.1.3 Pollution Reduction

Considering the pollution reduction (BOD, COD, Total N, Total P) expected through the 354 DABLAS 2004 investments, approx. 5% of the reduction has been achieved by projects completed by 2003. The rate increases to 10-15% by 2005; however, it is questionable whether all projects planned for completion by 2005 will actually be realised by that time. This means that 85-90% of the expected pollution reduction will be carried out through projects completed after 2005(see DABLAS Report, 2004).

Table 37 Emission reductions for projects finalised before the end of 2003 and 2005

Emission Reduction Breakdown by Realisation Period							
Realisation Period	**Sector**	**No. of Projects**	**Investment MEUR**	**BOD t/a**	**COD t/a**	**N t/a**	**P t/a**
Projects Completed by 2003	**Total**	**29 + 5***	**233**	**14,075**	**31,213**	**7,770**	**1,262**
	Municipal	19	206	13,850	29,700	4,915	977
	Industrial	6	12	224	1,504	0	0
	Ag-Industrial	1	3.5	1	9	1	0
	Wetlands	3 + 5*	11	not estimated	not estimated	2,854	285
	Land Use	0	0	not indicated	not indicated	not indicated	not indicated
Projects Completed by 2005	**Total**	**77 + 5***	**602**	**41,405**	**88,160**	**15,412**	**2,700**
	Municipal	50	498	36,123	75,756	10,562	2,224
	Industrial	14	62	5,281	12,395	92	0
	Ag-Industrial	2	3.8	1	9	1	0
	Wetlands	10 + 5*	35	not estimated	not estimated	4,757	476
	Land Use	1	3.4	not indicated	not indicated	not indicated	not indicated
Projects Completed after 2005	**Total**	**277 + 13***	**3,379**	**256,586**	**505,198**	**50,978**	**8,998**
	Municipal	141	2,976	229,521	444,972	33,838	6,846
	Industrial	63	131	20,670	55,946	836	93
	Ag-Industrial	30	141	6,395	4,280	2,032	632
	Wetlands	30 + 13*	123	not estimated	not estimated	14,272	1,427
	Land Use	13	8.2	not indicated	not indicated	not indicated	not indicated

*Wetlands projects (AT,CS, DE) not included in the DABLAS assessment are added separately. The pollution reduction estimations for the wetlands sector include the 40 projects identified in the DABLAS 2004 assessment and projects in AT, CS, DE included in the ECO EG country status reports.

5.1.4 Nutrient Reduction

Nutrient emissions originate from point source discharges, such as municipal wastewater emissions, industrial effluents (e.g., from fertilizer manufacturing plants), and agro-industrial enterprises (such as livestock rearing operations and manure management facilities), and non-point sources, including run-off of fertilisers and animal wastes from agricultural lands.

Significant nutrient reduction is expected through the realisation of the Danube River Basin Pollution Reduction Programme.

Table 38 Expected reduction JAP (estimates 1999) and DABLAS 2004

Sector	N Reduction, t/a		P Reduction, t/a	
	Expected Reduction[a]	DABLAS 2004	Expected Reduction[a]	DABLAS 2004
Municipal	38,770	44,400	11,348	9,070
Industrial	6,933	928	5,000	92
Agriculture	5,697[b]	2,032[c]	1,034[b]	632[c]
Wetlands	29,872	19,029	2,989	1,903
Total	**81,272**	**66,389**	**20,371**	**11,697**

[a]UNDP/GEF, Danube River Basin Pollution Reduction Programme Report, June 1999.
[b]Includes point source agro-industrial sources and non-point agricultural sources.
[c]Includes points source agro-industrial sources only.

The municipal sector accounts for the majority of nutrient reduction, but the other sectors are also significant contributors. There was limited data available for industrial and agro-industrial projects, and, thus, the DABLAS 2004 assessment for these two sectors are under-estimations. As the IPPC and Nitrates directives start to trickle down to the industrial and agro-industrial enterprises in CEE, there will be higher demands imposed for nutrient reductions.

Regulatory demands regarding implementation of tertiary treatment are variable among the DRB countries, depending primarily on how the sensitivity of surface water resources have been classified in national legislation. Recently, for example, Bulgaria has designated all areas within the Danube catchment area as sensitive, and consequently most of the Bulgarian municipal projects include N and P removal.

Table 39 N and P Removal (Tertiary Treatment) among Municipal Sector Projects

N and P Removal (Tertiary Treatment) Among Municipal Sector Projects			
Country	**Total Number of Municipal Projects**	*Number of Projects with* **N removal**	**Number of Projects with P removal**
Bosnia-Herzegovina	6	4	0
Bulgaria	32	30	29
Croatia	15	4	1
Czech Republic	26*	9	26
Hungary	17	16	11
Moldova	15	12	1
Romania	18	3	3
Serbia and Montenegro	5	0	0
Slovakia	20	19	16
Slovenia	24	19	22
Ukraine	13	7	6
Totals:	**191**	**123**	**115**

*Many of the CZ projects already have N removal implemented

The majority of the projects in the Czech Republic, Hungary, Slovakia, and Slovenia also have tertiary treatment technology, as a result of legislative transposition during the EU accession period. Only 3 out of 18 projects in Romania include N and P removal, and none of the 5 priority projects in Serbia-Montenegro have tertiary treatment. In Bosnia-Herzegovina, Croatia, Moldova, and Ukraine, N removal is more prevalent than P removal among the municipal projects. Among the 191 municipal projects included in the DABLAS 2004 database, 123 of them include N removal and 115 have P treatment technology.

5.2 Financing

5.2.1 Project Development

From DABLAS Report, 2004, **among the 354 projects, 93 projects are fully financed; representing 33% (1247 MEUR) of the total 3822 MEUR estimated investment cost. An additional 115 projects have secured partial funding and/or have more or less completed the planning stages but have not yet attained financing.** These 115 projects have a combined total investment need of 1798 MEUR (47% of the total costs), of which 543 MEUR are confirmed.

Table 40 Project preparedness (all project reported under DABLAS 2004)

Breakdown of Project Preparedness (all sectors combined)									
Country	All Projects		Fully Financed Projects		Partially Funded and/or "Prepared" Projects			"Unprepared" Projects	
	No. of Projects	Cost MEUR	No. of Projects	Cost MEUR	No. of Projects	Cost MEUR	Secured Funds MEUR	No. of Projects	Cost MEUR
Bosnia-Herzegovina	30	198	2	0.6	5	19.3	0.5	23	178.2
Bulgaria	47	260.8	2	4	14	113.3	19	31	143.5
Croatia	19	221.5	0	0	6	80.7	7.2	13	140.8
Czech Republic	42	283.6	17	169.4	5	81.3	10.2	20	33
Hungary	26	1029.9	17	312.7	7	451.7	161.3	2	265.5
Moldova	43	63	0	0	12	32.4	0.5	31	30.6
Romania	38	584.7	7	369.1	27	215.3	38.7	4	0.4
Serbia and Montenegro	5	530	0	0	5	530	173.7	0	0
Slovakia	42	308.6	32	202	7	106.6	54.4	3	0*
Slovenia	39	327.7	16	189.2	13	124.8	70.7	10	13.7
Ukraine	23	74.2	0	0	14	42.9	6.4	9	31.3
Totals:	**354**	**3,882**	**93**	**1,247**	**115**	**1,798**	**543**	**146**	**837**

*Investment costs were not indicated for 3 industrial projects in SK.

There are an additional 146 projects (837 MEUR) indicated as “unprepared”, referring to projects that have no secured funding and require technical assistance for further project planning.

Among the 93 fully financed projects, 82 are situated within the 4 recent EU accession countries: Czech Republic, Hungary, Slovakia, and Slovenia. There are 2 fully funded wetland restoration projects in Bulgaria, and 7 municipal sector investments in Romania that have attained complete financing. In addition, there are 2 financed projects in Bosnia-Herzegovina: a EU-funded wetland restoration project (Bardaca) and a 0.05 MEUR industrial wastewater improvement project.

5.2.2 Funding Sources and Project Realisation

National and/or local funding account for significant proportions of the investments made in the municipal sector in the four recent EU accession countries.

Table 41 Funding sources for municipal sector reported under DABLAS 2004

Breakdown of Funding Sources: Fully Financed Projects						
Country	No. of Projects	Total Investment MEUR	**% of Total**			
			National Funds	EU Funds	IFI Funds	Missing Funds
Bosnia-Herzegovina	2	0.6	9	91	0	0
Bulgaria	2	4	0	0	100	0
Czech Republic	17	169.4	49	10	41	0
Hungary	17	312.7	63*	36	1	0
Romania	7	369.1	32*	68	0	0
Slovakia	32	202	63*	35	2	0
Slovenia	16	189.2	35	42	23	0
Totals:	**93**	**1,247**				

*Municipal loans extended by IFIs are included under "national" for HU, RO, and SK.

EU funding (e.g., through the ISPA programme) has been influential in supporting municipal sector development, for example, approx. 68% of the 369 MEUR for the 7 fully financed projects in Romania are from EU sources. IFIs have also provided important support; Bulgaria has received a 4 MEUR World Bank Grant for wetlands restoration projects, and the EIB and EBRD have extended loans to numerous municipalities throughout the region - see Case Study below.

Upgrade for wastewater treatment in Bacau, Romania (13 MEUR loan, 190,000 residents)

The EBRD is lending Regia Autonoma de Gospodarire Comunala Bacau (RAGC Bacau), the water utility company of the City of Bacau, in eastern Romania, 13 MEUR to finance rehabilitation works for the city's wastewater treatment facilities. The loan, guaranteed by the municipality of Bacau, complements a 39 MEUR grant from the European Union's ISPA programme. The loan is being provided under the Municipal Environmental Loan Facility (MELF), set up in 2000 to provide co-financing with the ISPA programme for wastewater-related projects in Romania. Since then the EBRD has lent more than 80 MEUR to nine transactions, mobilising ISPA grants of around 280 MEUR. The Government of the Netherlands provided 2.2 MEUR in technical cooperation funds to help prepare and implement the projects. In this transaction, EBRD has syndicated 6 MEUR to Bank Austria Creditanstalt, making this the third project in which the two banks have cooperated in Romanian municipal infrastructure.

Dana Craciunescu, EBRD principal banker, said the project reflects the Bank's policy to lend to commercialised utilities in Romania, which have the ability to generate sufficient cash flow to service debt. Those service utilities and local governments that have implemented tariffreform and commercialisation are now in a position to obtain capital directly, Ms Craciunescu added.

Aleksander Majewski, Project Manager, Corporate & Project Finance CEE of Bank Austria Creditanstalt, said that the transaction was yet another example of the excellent cooperation between the EBRD and Bank Austria Creditanstalt. It shows that an international commercial bank is able to provide loan financing to well structured projects at the municipal level in Romania. Bank Austria Creditanstalt has the largest network in Central and Eastern Europe, with 1,300 branch offices in 11 countries employing 28,000.

The EBRD is the largest investor in Romania, having invested €2.5 billion in nearly 120 projects, including more than 300 MEUR in the municipal and environmental infrastructure sector.
Source: European Bank for Reconstruction and Development (EBRD) 26 November 2004

A considerable amount of national and local financing was raised for the 29 completed projects through 2003. In fact, nearly 100% of the investment costs for the 11 completed projects in Slovakia was from national and/or local funds. Similarly, in Hungary and the Czech Republic, the majority of project financing was from national and/or local sources: 88% and 70% respectively. In Slovenia, 24% of the 77 MEUR for the 5 completed projects were raised from national and/or local sources, an additional 20% from EU funds, and the remaining 56% from loans and/or grants from International Financial Institutions (IFIs).

Table 42 Funding sources for all projects (all sectors) interim report on JAP

Breakdown of Funding Sources: Projects Completed by 2003						
Country	No. of Projects	Total Investment MEUR	% of Total			
			National Funds	EU Funds	IFI Funds	Missing Funds
Czech Republic	5	40.6	70	0	30	0
Hungary	8	57.7	88	9	3	0
Slovakia	11	46.5	99.9	0	0.1	0
Slovenia	5	77	24	20	56	0
Totals:	29	222				

EU-funding is much lower for the 29 projects completed by 2003 as compared to the total 93 fully financed investments, thus, indicating that (1) the majority of EU funding support is in the pipeline and (2) several of the EU-funded projects are large (e.g., Bucharest) and will not be completed for several more years.

A total of 77 projects (including the ones completed by 2003) are to be realised by the end of 2005, for a combined investment of 572 MEUR. The 48 additional projects, compared to the ones completed by 2003, are again predominantly located within the four recent EU accession countries. In addition, projects in Bulgaria, Bosnia- Herzegovina, Croatia, Moldova, and Ukraine are predicted to be complete by 2005. Some of these estimates might be optimistic, however, as more than 90% of the necessary funds are yet to be secured in these five countries.

Table 43 Funding sources for all projects (all sectors) by 2005

Breakdown of Funding Sources: Projects Planned for Completion by 2005						
Country	No. of Projects	Total Investment MEUR	% of Total			
			National Funds	EU Funds	IFI Funds	Missing Funds
Bosnia-Herzegovina	2	0.6	9	91	0	0
Bulgaria	2	7.8	0	0	0	100
Croatia	2	2.2	9	0	0	91
Czech Republic	16	169.8	46	10	41	3
Hungary	15	110.7	91	5	2	2
Moldova	1	0.3	0	0	0	100
Slovakia	23	100.5	84	13	3	0
Slovenia	14	176.5	32	35	25	8
Ukraine	2	3.9	0.9	0	0	99.1
Totals:	**77**	**572**				

Table 44 Overview of Funding sources for all projects (all sectors) reported under DABLAS 2004

Country	No. of Projects	Total Investment MEUR	Breakdown of Funding Sources, %			
			National	EU	IFIs	Funding Gap
Bosnia-Herzegovina	30	198	1.6	0.3	18.8	79.4
Bulgaria	47	260.8	23.3	51.2	1.9	23.6
Croatia	19	221.5	14.8		3.2	82.1
Czech Republic	42	283.6	54.4	5.5	36.8	3.2
Hungary	26	1,029.50	47.8	50.9	1.2	0.2
Moldova	43	63.0	1.8	41.0	46.3	10.8
Romania	38	584.7	25.2	43	1.5	30.3
Serbia and Montenegro	5	530	32.8			67.2
Slovakia	42	308.6	58.0	38.9	1.4	1.6
Slovenia	39	327.7	30.8	48.7	13.6	7.0
Ukraine	23	74.2	38.9			61.1
Totals:	**354**	**3,882.1**				

The categories and parameters for prioritization and the results of ranking of the investments projects are presented in the DABLAS Report, 2004.

6 CONCLUSIONS AND RECOMMENDATIONS

Despite the difficulties of cooperation among the large number of states within the Danube region there has been important progress in establishing the necessary mechanisms for coordination and cooperation under the framework of the Danube River Protection Convention. The EU Water Framework Directive has added strength to the efforts to coordinate actions in support of integrated river basin management and pollution control and reduction.

Assistance has been provided to the Danube countries, the ICPDR EGs, and the ICPDR Secretariat to reinforce the national capacities in terms of policy/legislative reforms and enforcement of environmental regulations (with particular attention to the reduction of nutrients and toxic substances). An important goal was to assure a coordinated, harmonized and transferable approach basin wide of policy and legislative measures introduced at the national level of the participating countries.

The mechanisms for cooperation exist and agreement on the nature of the problems has been reached. It will nonetheless be important that many individual actions are taken that in total will add up to a cleaner and healthier Danube.

The current analysis and reviews of activities conducted at the national level within the frame of Joint Action Program highlight that many investment and actions are happening.

Among the 354 projects covering all sectors, 93 projects are fully financed; representing 33% (1247 MEUR) of the total 3822 MEUR estimated investment cost. An additional 115 projects have secured partial funding and/or have more or less completed the planning stages but have not yet attained financing. These 115 projects have a combined total investment need of 1798 MEUR (47% of the total costs), of which 543 MEUR are confirmed. There are an additional 146 projects (837 MEUR) indicated as “unprepared”, referring to projects that have no secured funding and require technical assistance for further project planning.

In addition there has been substantial legislative reform and in particular the implementation of EU community law within the DRB.

In recent years, EU environmental policy has evolved from a traditional, command-and-control approach towards a more integrated and flexible approach. There are now new developments and different instruments to tackle pollution caused by point and diffuse sources used by Danube countries: flexible legislation imposing additional site-specific or national rules, which will vary from one installation to another within the Union (e.g. the IPPC Directive), voluntary and/or market-based instruments setting the basic rules for operators who want to exploit market opportunities (e.g. the EMAS regulation and a future emissions trading scheme), or the introduction of EU-wide environmental quality standards established through the water directives.

The analysis of the JAP implementation has, however, highlighted both the implementation efforts and deficits. This is especially the case for those EU Directives that require substantial administrative reform and financial investments.

Additionally, the results show that future actions in the Danube countries, towards implementation of Danube River Protection Convention should be thoroughly considered in relation to the EU Directives, in particular Water Framework Directive, integrated into the respective program of measures.

The interim report provides a useful starting point for undertaking analysis related to and reporting on the implementation and effectiveness of policies in Danube countries. Second, it shows that appropriate tasks implementation and reporting are useful for the Danube countries in order to better address and measure the policy responses. Third, the report highlighted the need to streamline reporting obligations under various directives in implementing various JAP tasks.

Currently a variety of reporting needs exist under different frameworks. There are gaps and overlapping as still different reporting obligations and periods exist. In the future the reporting and data sharing system shall

be harmonised. A concept for reporting to water is necessary aiming to integrate reporting requirements and create a shared comprehensive data and information management system for DRB.

The implementation of the ICPDR JAP raises a number of shared technical challenges for the Danube countries. A common understanding and approach is crucial to the successful and effective implementation of the DRPC and EU Directives. Ensuring the link as to achieve a combined implementation between WFD and other EU directives, such as UWWTD, IPPC, Dangerous substances, Nitrates Directive, etc would contribute to harmonised data collection, monitoring and reporting from the beginning

Sustainable development in the DRB requires continue and enhanced international cooperation. Success will depend on thorough implementation of actions and commitments of the countries and on effective and coordinated contribution of the international community.

The International Commission for the Protection for the Danube River is assisting in providing a forum for the necessary dialogue, understanding and action needed to meet the challenges that exist.

7 COUNTRY REPORTS

COUNTRY SUMMARY REPORTS

TASK I

IMPLEMENTATION OF POLICIES, REGULATIONS AND MEASURES OF COMPLIANCE IN LINE WITH THE ICPDR JOINT ACTION PROGRAM AND EU RELATED WATER DIRECTIVES

Structure of the country reports

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7.1 Germany

TASK I Germany: Summary Report on the implementation of policies, regulations and measures of compliance in line with the JAP and EU water directives

Policy Objectives

The German water management and protection policy is in compliance with EU water policy, aiming at achieving of good water status for all waters by 2015. With the elimination of biological and chemical pollutions from municipal and industrial sources the most important conditions for further continuous improvements of the water ecology are already met. Main priorities have been given to the over-fertilization of waters and structural changes as a result of river development.

Status of legislation dealing with water management

The legal framework for environmental management of water resources and ecosystems consists of a hierarchic system of decrees, laws, directives, ordinances, regulations and standards on different administrative levels. All EC directives have been transposed in Baden-Württemberg and Bavaria into the national law system. The transposition was finished through updated versions of the Water Resources Act (WHG – 18.6.2002), Bavarian Water Act (BayWG – 1.8.2003), Water Act for Baden-Wuerttemberg (WG - 22.12.2003) and implementation of appropriate ordinances as to the implementation of annex II and V WFD. Germany has a fully appropriated national water management legislation and institutions for processing the EC Directives.

Main barriers to water-related policy and legal reform and JAP implementation

Main barriers in compliance with the objectives of the WFD are the laminar diffuse pollutions from agriculture waters and the structural changes as a result of river development. By the reforms of the common agrarian EU-policy including particularly the funding system diffuse pollution could be reduced. The river development is only retractable in a limited rate, because often it is a precondition for an effective water use or part of the cultural development. Excessive extensions and unintentionally consequences of changes will be tackled in the future. But before we arrange further structure-improvements the relationship between structure and ecology of waters must be analyzed more exactly.

Proposed actions and measures in response to JAP

Municipal discharges

In Germany the development of the public water supply and sewage disposal is widely sophisticated. In 2002, 98,6 % of population was connected to the public drinking water supply networks while 94 % were connected to the public sewerage.

Industrial discharges

In Germany big direct industrial discharges are reported according to EPER. Additionally, reporting to the ICPDR Emission inventories and List of priority substances is included.

Agricultural discharges

The Nitrates Directive 91/676/EEC is transposed into the national law system. The special action program according to article 3 clause 5 Nitrates Directive 91/676/EEC is applied for whole Germany. The over-fertilization of waters, particularly by nitrogen is stagnating in fact, but the over-fertilization is to reduce still more. A substantial progress for this is the present amendment of the Fertilizer Ordinance.

Wetlands and water ecosystem

They were identified and registered. And in future they will be developed and protected according to the directives. Approximately 62 million Euro estimated to realize water courses development and floodplain projects. The projects were started in 2001 – 2002, one project is completed, and the other ones are schedule to be completed between 2005 and 2020. The Bavarian government is fully or partially financing the projects, and only 2 are co-financed with EU funds.

Estimated cost for reforms to respond to JAP

Germany has significantly achieved high standards of emission reduction und water pollution control. Current investment in the water sector in the German part of the Danube River Basin is at the level of about 1,8 billion Euro per year of which 1,5 billion Euro is spend for communal wastewater treatment facilities (including 3rd stage for nutrient removal). With these investment Germany responds to EU Water Directives and in particular the Urban Waste Water Directive. Concerning the ongoing projects indicated in the ICPDR JAP, further investments of 234 million Euro for Germany are foreseen for the period from 2001 to 2005.

7.2 Austria

TASK I Austria: Summary Report on the implementation of policies, regulations and measures of compliance in line with the JAP and EU water directives

Policy Objectives

Primary goal of water policy is to ensure sustainable water management through a prudent human interference into waters. Main principles are: (i) minimizing impacts on water quantity and quality via a stringent system of permits and control, (ii) protection of population and its living pace and goods against floods, and (iii) public awareness on the value of water and for it rational use. The WFD implementation is regarded as an important supporting tool to achieve the primary goal of water policy in Austria.

Status of Legislation Dealing with Water Management

Under the Austrian 1990 Water Act, every impact on water that is above the level of insignificance has to be licensed. Stringent requirements have been set for wastewater discharges, based on best available techniques. 53 sector-specific wastewater emission ordinances are currently in force. In 2003 the provisions for the assessment of water quality and water quantity were adapted to the needs emerging from the EU WFD. New Ordinances are expected: for defining water quality objectives for rivers as well as for lakes and for defining the legal and technical frame of the Austrian Water Data Register. There are a few legal restrictions in Austria specifically addressing the reduction of detergents in washing powders.

Main barriers to water-related policy and legal reform and JAP implementation

Main barriers in compliance with the objectives of the WFD are the laminar diffuse pollutions from agriculture waters and the structural changes as a result of river development. By the reforms of the common agrarian EU-policy including particularly the funding system diffuse pollution could be reduced.

Proposed actions and measures in response to JAP

In response to point sources of pollution, wastewater collection and wastewater treatment stemming from population and industry has reached a high level of realisation. Therefore and from the findings of the analysis 2004 under the EU-WFD it is to conclude that future main efforts of water-investments will focus on further reduction of nutrient charge and on improvements of the hydro-morphological elements of water bodies. In response to the disastrous floods 2002 activities for the protection against floods are intensified.

Municipal discharges

In 2001 the percentage of population served by central wastewater treatment facilities reached 86 % and is equal to the share supplied by central water supply systems. The total wastewater discharged to the central wastewater collection systems amounted to 1.068 Mio m³/a. Out of this figure 898 Mio m³/a, i.e 84 % are treated in tertiary treatment plants, which means P and/or N-removal. The annual BOD-load of the total wastewater is reduced by 95 %, the annual COD-load by 91 %, and the nutrient loads of P by 83 % and of N by 68 % (2001).

Industrial discharges

In terms of COD-load the industrial share comprises about 273.000 t/a, i.e. approximately 50 % of the total COD-load transported to central urban wastewater treatment facilities. Directly discharging industry accounts for about 237.000 t COD/a. Approximately 90 % of this COD-load undergoes tertiary treatment, the remainder biological purification, which altogether results in a treatment efficiency of 85 % reduction of pollution expressed in terms of COD. The ICPDR-BAT-recommendations are covered by the branch-specific Ordinances for the limitation of emissions from the respective industries in combination with the General Wastewater Emission Ordinance.

Agricultural discharges

Agricultural point sources do not exist in a significant order of magnitude as defined by the respective BAT-guideline of ICPDR. In AT about 2,2 Mio Livestock Units (LSU) exist with a rather uneven distribution, resulting in a mean density of approximately 0,65 LSU/ha per ha agricultural land. Use of mineral fertiliser amounts to 100.000 t of N and 45.000 t of P2O5 per year, resulting in a calculated mean application of roughly 29 kg N and 13 kg P2O5 per ha agricultural land. Essential for the protection of water resources from diffuse agricultural pollution in Austria are: the Water Act, the national "Nitrate-Action Programme", complying with the legal prescriptions of the EU-Nitrate-Directive, the Austrian Programme for compensation payments for environmentally friendly agricultural practice "ÖPUL" and the rural advising network for advising farmers in environmentally sound practice and production methods.

Wetlands and water ecosystem

Three major wetland and floodplain restoration projects were finalized on the rivers Danube, March/Morava and Drau/Drava, and six major restoration projects were started on the rivers Danube, Lech, Mur and Lafnitz.

Estimated cost for reforms to respond to JAP

Between 2001-2003 on average 950 MEUR per year were invested in measures for wastewater collection and wastewater purification, summing up to 2.858 MEUR. The estimated investment costs of measures which AT listed for 11 defined wastewater treatment systems as part of the JAP 2001-2005 were 370 MEUR. The costs of finalised wetlands projects for the period 2001-2003 indicate 8,070,000 €.

7.3 Czech Republic

TASK I Czech Republic: Summary Report on the implementation of policies, regulations and measures of compliance in line with the JAP and EU water directives

Policy Objectives

According to the new Czech State Environmental Policy for 2004 – 2010, considerable attention is paid to wetland ecosystems, to rehabilitation of aquatic biotopes, to effective and sustainable protection of surface and ground water bodies, to harmful contaminants, to integrated water protection and management. Through river basin management plans, measures to protect wetlands and floodplains shall be implemented. The use of wetlands and water resources should be sustainable in view of economic pressures and global changes, and this includes principles referring to landscape and environmentally sound agricultural practice, wetland and floodplain uniqueness, restoration, remediation and rehabilitation of damaged wetlands areas. Both the Ministry of Environment and Ministry of Agriculture are the competent authorities responsible for preparation and implementation of the Flood Action Plans. The Czech Republic identified their entire territory as sensitive area.

Status of Legislation Dealing with Water Management

The Czech legislation aimed at the elimination of the inconsistent and the uncoordinated nature of legislation on environmental protection, creation of a system of environmental protection law based on uniform concepts and principles, which will be reasonably interconnected with other areas of the legislation (especially with land-use planning and civil law), modification of institutions and instruments so as to reflect the requirements of sustainable development, including integration of environmental requirements into the policies of the other sectors, and enforcement of the role of environmental law, toward a rational system of all respective authorities, organizations and linkages. The country has a complete set of environmental legislation, general, horizontal and specific, fully harmonised with EU principles.

Main barriers to water-related policy and legal reform and JAP implementation

There have been no large deficiencies related to the implementation of JAP. Transition periods concerning some EC directives have been agreed upon with EU. Still, some problems exist with decentralisation and introduction of subsidiarity principles (clarifying of competencies by all authorities – in government, in regions, districts and municipalities).

Proposed actions and measures in response to JAP

Municipal discharges

Implementation of the UWWT Directive has required considerable financial means from the public and private sector in order to ensure construction, reconstruction of sewerage networks and waste water treatment plants, particularly in agglomerations between 2 000 to 10 000 PE and reconstruction and intensification of WWTPs over 10 000 PE in view of the reduced discharges of nutrients into sensitive areas. The Czech Republic requests a transitional period until 31 December 2010 for the implementation of the requirements for waste water treatment in settlements between 2 000 and 10 000 PE and for the introduction of a more stringent level of treatment required for waste water treatment plants in sensitive areas.

Industrial discharges

The Act No. 76/2002 Coll., on integrated pollution prevention and control (IPPC), corresponding to the EC Directive No. 96/61 is approved.

Agricultural discharges

Czech Republic requested a period to the end of 2006 for the implementation of Council Directive 91/676/EEC concerning the protection of water against pollution by nitrates from agricultural sources.

Estimated cost for reforms to respond to JAP

The reforms should concern institutional and legal measures. In line with State Environmental Policy about 78 EUR.inhabitant$^{-1,}$ per year from private sources about 66 EUR.inhabitant^{-1}, altogether 144 EUR.inhabitant^{-1}. , i.e. approximately 1,510 million EUR for all the Czech Republic and for all environmental sector. The water sector has occupied about 15 – 20% from the value, i.e. 226 – 300 MEUR, for 5 years period 1,130 – 1,500 MEUR, for 10 years period 2,260 – 3,000 MEUR

Values related to the direct investments that have to be carried out to respond to new water related regulations has not been unambiguous. The total cost for direct investments within the Morava River basin should be estimated by total amount of 200 – 250 MEUR for period of 5 years.

7.4 Slovakia

TASK I Slovakia: Summary Report on the implementation of policies, regulations and measures of compliance in line with the JAP and EU water directives

Policy objectives

The implementation of Slovak water management and protection policy is in compliance with EU water policy, i.e WFD, aiming at achieving of good water status for all waters by 2015. Main priority in relevant sectors (urban wastewater, industrial wastewater, land use, wetlands) is implementation of EC directives requirements (urban and industrial wastewater during the transition periods), namely reduction of nutrients and priority substances and creation of effective water management that will be able to promote sustainable water use based on long - term protection of available resources.

General principles include: transposition of EU laws and completion of a comprehensive system of legal regulation on rational use of waters; reduction of the amount of pollutants in discharged wastewaters to the permissible level set by legislative limits for the construction of wastewater treatment plants and sewer system; fulfilment of the requirements under Directive 91/271/EEC; implementation of technical measures to support water retention, slow down runoff to reduce the effects of floods, etc.

Status of legislation dealing with water management

The legislative tools for achieving policy objectives have been prepared. All EC directives have been transposed into the national law system. The transposition was finished in 2004 through an updated version of the Water Act (no. 364/2004). The financial tools for fulfilling of requirements for wastewater treatment are realistic, due to EC support (ISPA, Cohesion funds, Structural funds).

Main barriers to water-related policy and legal reform and JAP implementation

Main barriers during implementation of the Directive 91/676/EEC into the practice are supposed in process of enforcement in agricultural sector. Costs for fulfilment of EU directives requirements will have impact on increase of water services prices. Implementation of Directive 76/464/EEC except financial cost requires education of state water administration concerning new permits for discharging of wastewaters.

Proposed actions and measures in response to JAP

Legal and institutional reforms have been finished. Full transposition of EC Directives related to water into national legislation was made by amendment of Water Act in 2004. WME is the competent authority for WFD implementation. In principle, priority at present is elaboration of updated water policy and its concrete actions in the plans of measures for future period. Basic milestone will be implementation of the requirements of the EU directives, namely directives 2000/60/EEC, 91/271/EEC, 91/676/EEC and 96/61/EC, which are already incorporated into Slovak national water management legislation.

Municipal discharges

In 2002, 84 % of population was connected to the public drinking water supply networks while 55,34% were connected to the public sewerage. Considering the international commitments, economic and technical possibilities, it is necessary to deal with all agglomerations with over 10 000 PE by the year 2010, while the agglomerations exceeding 2 000 PE will be dealt with by 2015.

Industrial discharges

The transitional measures until 31 December 2006 are necessary for three installations, which discharge certain substances from List I. 10 specific installations have the transitional periods for fulfilling of IPPC Directive requirements and their deadline for achieving of compliance is set up between 31 December 2009 and 31 December 2011 at the latest.

Agricultural discharges

Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources is transposed and incorporated into Act No. 364/2004. The Slovak Environmental Agency is entrusted by reporting to this directive. The first report was elaborated in year 2003.

Wetlands and water ecosystem

National inventory of wetlands started in 1991 and during years1992-2000 more than 2,000 wetlands were identified and registered. Action Plan for years 2003 – 2007 (actions, responsible institutions, deadline and costs) was approved on March 2003.

Proposed schedule for approximation and the estimated cost for reforms to respond to JAP

Cost assessment for implementation of the WFD is about 10 MEUR for years 2003 – 2015, of which for years 2004 – 2006 is presupposed amount 2.6 MEUR. State budget is the main source of finance.

7.5 Hungary

TASK I Hungary: Summary Report on the implementation of policies, regulations and measures of compliance in line with the JAP and EU water directives

Policy objectives

All water flowing through the country is concentrated into the Danube river basin. More than 90% of the drinking water supplies, as well as part of the industrial, irrigation and other water demand is provided by ground waters. The quality of groundwater is in general good and their adequate preservation should be considered. Still, some third of the groundwater is vulnerable to pollution of surface origin. Some of the approved policy directions are: regulation development to encourage sustainable and economical water use; improvement of water quality for Danube and Tisza and Lake Balaton; gradual increase (to a level of 65%) of the number of settlements with sewers; at least biological treatment of wastewater from sewers; nitrate and phosphorous load reductions for highly protected and sensitive waters. Main principles of the Plan on safety and rural development approved in 2004 in the Tisza area include: achievement of a higher level of flood safety, the improvement of the living standards of the rural and urban population of the region, the formulation and introduction of new types of agro-ecological land use in the area of the emergency flood retention reservoirs and the modernisation of the infrastructure in the settlements along the Tisza. Finally, an important principle for the water management is linked to the necessity to ensure interdependence between the environmental protection, agriculture and the rural development.

Status of legislation dealing with water management

In response to EU requirements, Hungary finalised in 2003 the legal framework and related institutional arrangements on water quality protection. More recent documents came into force in 2004, for i) adoption of the Water Framework Directive (2000/60/EEC) and ii) improvement and simplification of the relevant decrees, on the basis of the experiences gained during the initial phase of implementation. In order to implement the UWWT Directive, in 2001, a government regulation was issued which contains the national implementation program in harmony with the agreed derogation periods of EU-compliance, and taking into consideration the specific Hungarian requirements to protect the groundwater resources of drinking water supply. The 25/2002 government regulations contain the categorized list of identified agglomerations, and the applied deadlines of sewage collection and treatment developments of the settlements. Preparation of the pollution reduction programs has started, in compliance with the relevant EU directive IPPC Directive. Several key areas for remediation have been identified. Meeting obligation of the Nitrates Directive is also considered by Hungary. Increasing consumption and consequent economic activities increased the environmental risk. Sustainable agriculture is vital from the point of view environmental protection and nature conservation. Other pieces of legislation relevant to the JAP tasks include: the National Environmental Program with substantial provisions and measures for the conservation and management of surface and groundwater resources. A governmental program – the New Vásárhelyi Plan - has been started in 2004 on the enhancement of flood safety and the related regional and rural development in the Tisza Valley.

Main barriers to water-related policy and legal reform and JAP implementation

Main barriers during implementation of the EU Directives might be linked with enforcement and availability of financial resources.

Proposed priority actions and measures to facilitate the development of policies, legal and institutional reforms

Ministerial decree on the observation and monitoring of ground waters and on the observation and monitoring of surface waters are prepared. Also, preparation of the pollution reduction programs has started, in compliance with the IPPC directive. Introduction of the best agriculture practices was started in 2002.

Proposed schedule for approximation and the estimated cost for reforms to respond to JAP

Hungary was granted the following transition periods in the area of water management: (i) until 31 December 2008 for urban waste-water treatment for agglomerations with a population of more than 15,000; until 31 December 2015 for waste-water treatment for agglomerations with a population between 2,000 and 15,000; until 31 December 2008 for discharges of biodegradable industrial waster-water plants (Directive 91/271/EEC on urban waste-water treatment), (ii) until 30 October 2007 for existing industrial installations for integrated pollution prevention and control (Directive 96/61/EC on industrial pollution control and risk management). Also, preparation of the pollution reduction programs in compliance with the IPPC directive until end of 2007 are cca. 1,8 billion €., for the implementation program of Nitrates Directive, aiming to the introduction of the best agriculture practices will cost for next 10 years about 200 MEUR. Preliminary estimated total cost to meet the requirements of the WFD is 440 MEUR.

7.6 Slovenia

TASK I Slovenia: Summary Report on the implementation of policies, regulations and measures of compliance in line with the JAP and EU water directives

Policy objectives

Authority responsible for the transposition and implementation of EU environmental legislation requirements in Slovenia is Ministry of the Environment, Spatial planning and Energy. The complete transposition of EU environmental Acquis in Slovenia's national law has been finished, while implementation and enforcement of the legislative measures is a long-term goal and key task of this constitution. The objectives and strategies for environmental protection and water management are outlined in the main legislative tools: Environment Protection Act (2004), National Environmental Action Programme (1999), Water Act (2002), and Nature Conservation Act (2002). Main policy objectives aim at improvement of environmental quality, the quality of life and protection of natural resources, achieving of good water status, integrated water management on river basin management and sustainable nature protection.

Status of legislation dealing with water management

Water management in Slovenian Region is divided into two main districts: Danube and Adriatic. Water Act (adopted 2002) considers the whole water policy such as protection of water, water use and by-water use areas, management of water and protection of water depending ecosystems. All-important chapters of current EU legislation from water sector are being well harmonized and summarized into national legislation policy.

Main barriers to water-related policy and legal reform and JAP implementation

The National Environmental Action Plan (NEAP, in preparation) is overall strategic document with main scope for improvement of environment considering implementation of EU legislative demands. According to JAP implementation there are not significant barriers to water related policy as defined in national law after entering Slovenia the EU.

Proposed actions and measures for individual relevant priorities of JAP

Full transposition of EC Directives related to water into national legislation is finalised. Implementation of national regulation accordant to Urban Wastewater Treatment Directive (91/271/EEC) will be ready in 2015. Slovenia's integration into EU has significantly marked the legal and programme frameworks of environmental management, particularly priority tasks of wastewater treatment. The key regulation for the area of wastewater collecting and treatment is Decree on the Emission of Substances in the Discharge of Waste – Water from Urban Waste – Water Treatment Plants. Phase one of its implementation (period between 1999 – 2006) is focused on the construction and improvement of the sewerage network and WWTP for municipal wastewater of the areas with the population above 15.000 PE, on the protection of water sources for public drinking water, and on the improvement and construction of water networks in water shortage areas. It is defined in an Operative programme for wastewater collecting and treatment, by a programme of water supply projects approved by the government in 1999. Phase two of the implementation (period between 2002 – 2015) is outlined by mentioned programme in areas with a population between 2.000 and 15.000 PE or less than 2.000 PE, approved by the government in 2001.

Slovenia as one of member state should aim to achieve the objective of at least good water status by defining and implementing the necessary measures within integrated programmes of measures. Where good water status already exists, it should be maintained according to Water Framework Directive.

Proposed schedule for approximation and the estimated cost for reforms to respond to JAP

The European Commission has allocated the following basic funds to Slovenia 25 MEUR, from Phare National Programme, 21 MEUR For ISPA (support to the construction of a large environmental and traffic infrastructure) and 6.3 MEUR For SAPARD (support to agricultural policy and rural development reform). The total environmental cost is about 2,723 MEUR.

7.7 Croatia

TASK I Croatia: Summary Report on the implementation of policies, regulations and measures of compliance in line with the JAP and EU water directives

Policy objectives

Following the signing of the Stabilisation and Association Agreement (SAA) with the EC, much of the country's administration, legislation and infrastructure has already been brought into alignment with the EU. Art 6 of the Water Acts defines water management principles: water is an irreplaceable precondition for life and activity. It is the duty of all persons to protect carefully its quality, and use it sparingly and rationally under equal conditions determined by the law, water shall be managed in accordance with the principle of integrity of the water system and the principle of sustainable development which meets the needs of the present generation without threatening the right and possibilities of future generation to meet their needs; the territorial water management units are the water basins and catchment areas as hydrographic and economic units, the borders of administrative -territorial units shall not present obstacles to integrated water management in such areas. For water use exceeding the limits of permissible general use, as well as for any deterioration of water quality, compensation shall be paid in proportion to the benefit gained, or to the degree and extent of the impact on water quality;

Status of legislation dealing with water management

The legal framework for water management consists of the Constitution of the Republic of Croatia, the Water Act, which includes 42 sub legal acts envisaged by the main act, the Water Management Financing Act, the Law on Environmental Protection, the Nature Protection Act and other relevant regulations. Related to the harmonization of the national legislation with the relevant EU legislation there are two project financed by the EU CARDS program. The main task of this two project is to develop a Strategy for the approximation in environmental sector. Based on results of this two projects and screening which is planned to start end of 2004 the exact dates of the harmonization of specific law, by-law will be defined.

Main barriers to water-related policy and legal reform and JAP implementation

Main deficiencies related to existing legislation are that it is not harmonized with relevant EU legislation. Generally, the existing legal framework is almost complete on the state level. The legal framework, which is under the competence of local authorities, is still not completed. Related to policy reform as main barriers are considered the areas/tasks of the JAP those are not regulated by national legislation. These areas are: reductions of pollution from diffuse sources, wetland and floodplain restoration, reduction of pollution from inland navigation, product control related to phosphate free detergents. As these areas are not/not sufficiently regulated in national legislation implementation of this tasks is performed with lot of difficulties. Other tasks of the JAP can be evaluated as relatively good regulated and implemented, but further improvement are needed. Generally, the harmonization of policies and activities between environment, nature protection, and water management is not coordinated well and funds and resources are not always used effectively. Main barriers to legal reform are insufficient capacity of state administration to deal with increased tasks related to EU harmonization of legislation and development of implementation mechanisms. Existing financing mechanisms in environmental/nature/water protection have to be reformed/improved to better support implementation of the relevant legislation.

Proposed actions and measures in response to JAP

Proposed changes of relevant laws and regulations are oriented mainly to harmonization of the national legislation with the relevant EU legislation. Based on results of two CARDS projects and screening which is planned to start end of 2004 the exact activities and deadlines of the harmonization of specific law, by-law will be defined. In area of institutional arrangements the main task is oriented in decentralization of the water management system and strengthening of the local government capacity to implement legislative framework.

Estimated cost for reforms to respond to JAP

No estimates of costs connected with the reforms have been made until now. According to rough estimates total environmental investments (water, air, waste) will be at the level of at least 1,500-2,000 ECU per capita. For all other areas costs of legislative harmonization will lie between 5 and 8 per cent of the total expenditures required. A rough break-down of costs related to meeting the requirements that arise from legislative harmonization is as follows: for water protection 40-45 per cent of the total costs, for nature protection 4-5 per cent, for industrial pollution control and risk minimization 2 per cent 5, for horizontal legislation harmonization 0.3-0.4 per cent 6 and for the rest 0.1 per cent.

7.8 Bosnia-HerZegovina

TASK I Bosnia and Herzegovina: Summary Report on the implementation of policies, regulations and measures of compliance in line with the JAP and EU water directives

Policy objectives

The present structure of the country (Republika Srpska (RS) and the Federation of Bosnia and Herzegovina (FBiH) was established under the General Framework Agreement for Peace (Dayton). Bosnia and Herzegovina is a full participant in the Stabilisation and Association Process (SAP) that is the framework in which various initiatives (Stabilization and Association Agreements, assistance program CARDS, etc) help the country to progress towards EU membership. In March 2000 the EC presented a "Road Map" of 18 of the most pressing steps which, when implemented, will allow B&H to advance to the next stage within the SAP. Long-term objectives of water management are: improvement of the existing systems of the flood protection, meeting water needs, improvement of water quality protection, and integral and inter-sector planning of the water resources use. Short-term Objectives of Water Management are: adoption of the legislation in accordance with WFD and other relevant legislation, establishment of the institutional frame of the Water Sector in line with WFD and establishment of the sustainable way of the financing. Among specific objectives for environment is the development of an environmental framework in BiH based on the acquis. The most important issues in the environment sector will be identified in the Environmental Action Plan which is being developed with World Bank support. There is a pressing need for the country to put in place key pieces of legislation, including environmental impact assessment laws, and to develop the necessary enforcement capacity and funding mechanism. Important reforms have already begun in the management of water resources and should be pursued. The EC will support measures to develop capacity to deal with environmental issues and to better manage water resources and solid waste. Main objectives: strengthen the capacity of the Ministries and Agencies responsible for the water, waste management, and environment, particularly in relation to meeting international obligations and to contribute to a more rational and sustainable use of BiH's natural resources and to enhance environmental protection. Policy, strategy and organization of water management, problem of water supply, drainage and dispose of wastewater, and water protection are being gradually placed among priority activities.

Status of legislation dealing with water management

According to regulations of the Federal Water, 1998, Federal Ministry of agriculture, water management and forestry is the main authority in charge with water management. Municipality and Municipal Assembly are authorized for water supply, drainage and treatment of wastewater. According to regulations of the Water Law of RS, 1998, the Ministry of agriculture, forestry and water management system as well as the Republic Water Directorate in RS are authorized for water management. Municipalities are authorized for water supply and sewerage systems, and communal work is within the Ministry of Urbanism, Civil Engineering and Ecology. At the BiH level there are no body authorized for water management. In order to coordinate activities in this sector, Inter-entity Commission for coordination of water management system was formed in 1998, based on an agreement. Current position in water management in BiH is characterized as extremely complicated and inaccurate distribution of authorities and because of that inadequate institutional structure. Two new laws on water protection (in RS 2002, and in BiH 2003), which separately approached the water protection increased the difficulties in managing and coordinating the water problems. The Law on Water Protection of the FbiH establishes two river basin district bodies as federal authorities, in charge of the implementation of the law, except for the tasks that are assigned to other authorities.

Main barriers to water-related policy and legal reform and JAP implementation

Given the extreme budgetary constraints, which apply in BiH, it will be necessary to establish mechanisms that will fund environmental protection. Targeted investment support in essential infrastructure needs to be provided.

Proposed actions and measures in response to JAP

BiH is faced with major challenges in the environmental area. There is an urgent need to make progress in the development of environmental strategies and action plans. The institutional capacity of the ministries needs to be strengthened. The priority actions include the achievement of consensus on the direction of the reform, drafting of regulations to assure correct harmonisation with EU legislation, preparatory work for future River Basin Management Plans, preparation of a new framework for financing of the water sector, creating mechanism for access to information and public participation. Although responsibility for environmental affairs rests with the entities and cantons, a BiH wide mechanism is required to ensure coordination and coherence between the different actors and to represent BiH internationally.

Estimated cost for reforms to respond to JAP

The proposed schedule for approximation with EU indicates new Water Law and Law on Environment, compatible with the Acquis, to enter into force by January 2005. Financial allocation for 2002-2004 is 25,6 mil euro. The EC has adopted a EUR63 million Annual Program for BiH for 2003, within the Community Assistance for Reconstruction, Development and Stabilisation (CARDS) Program Democratic Stabilization.

7.9 Serbia and Montenegro

TASK I Serbia & Montenegro: Summary Report on the implementation of policies, regulations and measures of compliance in line with the JAP and EU water directives

Policy objectives

There is no specific program dealing with water management. The water management is faced with serious tasks that require, above all: (i) the creation of a system of stable financing for water management, (ii) the reorganization of water management sector, and (iii) the revision of water legislation and related regulations, in compliance with requirements of European legislation.

It is considered that the current system of policy objectives is not yet clearly developed. However, the country is determined to overcome and reduce the gap and accelerate the reforms in the field of environment and water management.

Major objectives aim at satisfying water demand of all water users, achieving good status of water in accordance with European standards, in particular WFD and implementing necessary organizational, legal and financial changes in the water administration. These objectives can be achieved only with a gradual transition to realistic water prices and fees for water services, which will in turn create an environment of self-financing for water management.

Status of legislation dealing with water management

The status of current water legislation is not fully harmonized with EU directives. Two new laws are under preparation (the Law on water and Law on water management financing) with the view to incorporate the European standards. Law on Environmental Protection, 1991 (Serbia) and 1996 (Montenegrin) is still in force. Apart of its commitment to comply with EU water and environmental legislation, Serbia and Montenegro is effectively involved in transboundary cooperation within the frame of international conventions, particularly within the Danube river basin.

Main barriers to water-related policy and legal reform and JAP implementation

Enforcement and compliance are considered as the main barriers to the effective implementation of the EU Directives and the ICPDR JAP. The difference between high regulatory standards and compliance capacity of the regulated bodies, without having designed flexible compliance schedules prevent authorities from effectively enforcing their regulatory instruments. Lack of a unifying concept on policies instruments choice and implementation across various levels of government still exist.

Proposed actions and measures in response to JAP

1. Harmonization with water and environmental legislation of EU

It is necessary to pass the new Law on Water and Law on Environmental Protection, as well as numerous laws and decrees that support harmonization of various aspects of water management and environmental protection practices with legislation and practice of EU. On controlling diffuse pollution, the Serbian Law on Agricultural Land (1992 with addition 1993) and the Serbian Regulations on permitted amounts of hazard and toxic substances in soil and irrigation water and the methods of their examination (1994) will be revised in line with EU.

2. Approval of multilateral conventions regarding water and environmental protection

The country should also approve multilateral conventions signed under the aegis of the UN/ECE (Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, 1991); Convention on the Protection and use of Transboundary Watercourses and International Lakes, (Helsinki, 1992); Convention on the Law of the Non-Navigational Uses of International Watercourses (New York, 1997). Convention on Access to Information, Public Participation in Decision–making and Access to Justice in Environmental Matters (Aarhus, 1998), etc.

3. Establishment of cooperation with other countries on the basis of multilateral conventions

It is necessary to establish or improve co-operation with international organizations dealing with water management issues (ICPDR, Tisza Forum, etc.), on the basis of multilateral conventions.

Estimated cost for reforms to respond to JAP

Serbia & Montenegro is committed to implement the WFD and the ICPDR JAP. Estimated cost of reform is about 11,600 MEUR.

7.10 Bulgaria

TASK I Romania: Summary Report on the implementation of policies, regulations and measures of compliance in line with the JAP and EU water directives

Policy objectives

Bulgaria expects to become a EU member by 2007. The Bulgarian government approved the National Program for Adopting the EU Acquis Communautaire. The 2000-2006 National Economic Plan sets out the economic priorities for the accession period. The legislation in the "Water quality" sector is amended in line with EU standards. The general policy objectives proclaimed in the Strategy for the Integrated Management of Waters include: ensuring of water for drinking, recreation, curative and other needs, meeting water needs for economic sectors, protection of the environment and aquatic eco-systems, and limiting the impacts of floods and drought.

Status of legislation dealing with water management

The newly developed National Strategy for Management and Development of Water Sector up to 2015 is approved. The legislative acts required for the full transposition of the requirements of the Water Framework Directive into the National legislation are under preparation, and their adoption is envisioned for the end of 2005 as required by the Directive. The National Environmental Strategy and Action Plan 2000-2006 makes a detailed assessment of the water sector. There is no specific programme for the implementation of the WFD. Introduction of some elements of the WFD related to the typology of water bodies, the classification of their environmental status and their intercalibration is under way with Danish assistance. The Water Law, amended in 2003, introduces the principle of integrated river-basin water management and is based on the new water policy.

Main barriers to water-related policy and legal reform and JAP implementation

The budget and other national resources are insufficient for the implementation of the national water sector programmes. The process of re-distribution of functions, archives and equipment between the Basin Directorates and the RIEW takes too much time. The new staff of the Basin Directorates should be provided with additional training and preparation for the development of their administrative and expert capacity. The generated resources are not returned directly into the water sector but are re-distributed through the centralized state budget and the municipalities. The environmental costs for the water sectors are only 26% of the overall environmental expenses in 2002. The rate of collection of fees for water-use and/or water body use, of the sanctions for non-compliance with the permits, and the penalties for non-compliance with the concession agreements has been assessed as unsatisfactory. The wastewater related fees do not cover the full costs of the WWTPs operation and maintenance. The development and implementation of a national programme for conservation of soil fertility and of the environmentally clean agricultural lands is lagging.

Proposed actions and measures in response to JAP

The development of a new Water Act is the first priority action. Since the Water Framework Directive 2000/60/EC has not yet been fully transposed into the national water sector legislation, the next priority is to develop the plan for its implementation. Development of the necessary horizontal legislation to regulated the rehabilitation, conservation and sustainable use of the wetlands and floodplains aiming to preserve the ecological status of water bodies in the spirit of the Water Framework Directive 2000/60/EC. Provision of an integrated approach in water management is also a priority. The national programs for construction and rehabilitation of water supply and sewerage networks should be updated in consideration of the agreed transition periods and the priority activities for the implementation of some directives related to this sector. The issues of ownership over WWTP constructed by joint investment (state and/or municipal budgets, funds from PHARE/ ISPA or from other foreign donors) should be provided for in the legislation.

Estimated cost for reforms

Cost assessment for implementing EU directives is estimated to be about implementation of the WFD 11,000 MEUR.

7.11 Romania

Policy objectives

Romania is in the final stage of negotiation with European Commission. All the commitments should be endorsed till the end of 2004. The implementation of Romanian integrated water management policy is in compliance with EU water policy, i.e WFD, aiming at achieving of good water status for all waters by 2015. The Water Framework Directive has been transposed by the modification of the Water Law 107/1996 (Law no. 310/2004). Main priority in relevant sectors (urban wastewater, dangerous substances discharges, protection against nitrates coming from agricultural sources, wetlands) is implementation of the specific EC directives requirements, including treatment of urban wastewater, reduction priority substances discharges and improvement of water management that will be able to promote sustainable water use based on long - term protection of available resources.

Main objectives of the water management are:

- conservation, development and protection of water resources, and ensuring of a free water flow
- protection against any form of pollution and modification of water resources characteristics
- ensuring of the drinking water supply to population and of public sanitation
- sustainable water management and rational and balanced water distribution
- prevention and control of floods and of any dangerous hydrometeorological phenomena
- promotion of sustainable water use based on a long-term protection of available water resources
- integrated water management at the basin level
- implementation of the EU directives and completion of a comprehensive system of legal regulation
- reduction of the diffuse pollution by implementing Directive 91/271/EEC.

General principles concerning the water policy refer to: management at the basin level, precaution, prevention, rectification of pollution at the source, polluter pays, and integration of environmental protection into other sectors.

Status of legislation dealing with water management

Fundamental document of the water policy in Romania is the Water Management Strategy. This strategy outlines the main directions that have to be followed by the water sector and has as main objective and integrated management of the water resources. The legislative tools for achieving policy objectives have been prepared. All EC directives have been transposed into the national legislation. The implementation of all commitments taken in the EU integration process is depending on the EC support (ISPA, Cohesion funds, Structural funds).

Main barriers to water-related policy and legal reform and JAP implementation

Main barriers are related to the lack of financial resources on short term. Mainly this problem is related to the implementation of the UWWT Directive. Also the implementation of the specific water directives will require financial and technical assistance for updating the existing monitoring and ensuring necessary enforcement capacity.

Proposed actions and measures in response to JAP

Legal and institutional reforms have been finished. MEWM is the competent authority for WFD implementation. In principle, priority at present is elaboration of updated water strategy and the concrete actions in the plans of measures for future period. One important element of this strategy will be related to the implementation of the new legislation concerning wastewater treatment, drinking water quality, and dangerous substances.

Municipal discharges

In 2003, 68 % of population was connected to the public drinking water supply networks while 51,8% were connected to the public sewerage. Romania committed to deal with all agglomerations with over 10 000 PE by the year 2015, while the agglomerations exceeding 2 000 PE will be dealt with by 2020.

Industrial discharges

The transitional measures until 31 December 2009 are necessary for 51 installations, which discharge certain substances from List I. 195 specific installations have the transitional periods for fulfilling of IPPC Directive requirements and their deadline for achieving of compliance is set up between 31 December 2007 and 31 December 2015 at the latest.

Agricultural discharges

Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources is transposed. Ministry of Environment and Water Management together with the Ministry of Agriculture, Forests and Rural Development had to report on this directive.

W*etlands and water ecosystem*

There are 2 wetlands of international importance and 26 wetlands of European importance. Romania has a huge potential for rehabilitation of wetlands, which are mainly located in the Danube floodplain.

Estimated cost for reforms to respond to JAP

Cost assessment for implementation of the WFD is about 15 MEUR for years 2003 – 2015, of which for 2004 – 2006 is assumed an amount of 8 MEUR. State budget is the main source of finance.

7.12 Moldova

TASK I Moldova: Summary Report on the implementation of policies, regulations and measures of compliance in line with the JAP and EU water directives

Policy objectives

The need to implement a unified policy on the environment and the use of natural resources, which integrates environmental requirements into the process of national economic reform, along with the political desire for European integration, has resulted in the review of the existing environmental legislation. Major objectives of the environmental policy were adjusted to take account of the social and economic changes in the country, as well incorporating regional and global programmes and trends in order to prevent the deterioration of the environment. The main objectives of the environmental policy are: a) the prevention and mitigation of negative impact of economic activities upon the environment, natural resources and public health in the context of sustainable national development; b) ensuring a safe environment for the country.

The current priorities for water management include the strengthening of institutional and management capability through improvement of economic mechanisms for environmental protection and the use of natural resources, setting internal environmental performance targets and controls, self-monitoring, review of current legislation in line with European Union Legislation, the adjustment or elaboration on a case-by-case basis of implementation mechanisms. The basic principles of water resources policy adopted in 2003 refer to the integrated river basin management, pollution prevention, rational water use, reversibility, ownership and water rights. The main challenge for the competent authorities is to amend the current environmental legal framework as to entirely respond to EU requirements.

Status of legislation dealing with water management

There is no specific program dealing with water management. Still, the key issue is to improve environmental legislation, to establish new standards in line with EU and to transfer some responsibilities from central ecological authorities to local ones. Current legislation include the National Strategy for Sustainable Development "Moldova 21", the NEAP, 1995, the Concept of the Environmental Policy, adopted on November 2001. Approved in 2002, the Water Supply and Sewage Programme until 2006 highlights the major objectives that will ensure an increase of population connection to water facilities. Since 2003 the National Water Resource Management Strategy is under preparation, which considers the new social and economic conditions in the country as well as the internationally accepted principles and methods in water resource planning and management. Finally, a new National Water Policy has been adopted in July 2003, focussing on integrated water resource management and introduction of river basin concept.

Main barriers to water-related policy and legal reform and JAP implementation

Moldova has a comprehensive set of environmental laws and regulations, which is being supplemented by additional ones. However, enforcement and compliance are considered as the main barriers to their effective implementation. The main constraints are therefore due to weak enforcement, ineffective penalties system, the current structure/content of the laws, and the conflicts and overlapping of some provisions in various laws. Other barriers impeding the implementation of JAP actions are linked to the insufficient capacity building, lack of access to water and environmental relevant information, absence of public participation mechanism in the environmental decision-making process.

Estimated cost for reforms to respond to JAP

Proposed schedule for approximation and the estimated cost for reforms to respond to JAP Actions should be taken to produce a strategic environmental plan for Moldova, which should include realistic priority actions and modalities for their implementation. The current legislation should be entirely revised and appropriate amendments need to be operated. New structure having clear responsibilities for environmental protection should be established. There is a need to strengthen capacities of all sectoral ministries as to support the integration of environmental concerns. These are closely interlinked in Moldova and considerable institutional change may be required to ensure more effective and sensitive stewardship in the future. Enforcement and compliance mechanisms need to be in place. Improved future environmental management requires the collection, synthesis and evaluation of key environmental data at both national and local levels as well as related capacity (hardware and maintenance capability) to operate an integrated environmental monitoring network. Given the current financial and institutional context, a reformed institutional and managerial framework should be established, with appropriate financial support.

Moldova is committed to implement the WFD and the ICPDR JAP. A detailed revision of needs in terms of legislation to respond to WFD is not yet done. Agreement was reached with Romania and Ukraine to implement the WFD on the respective transboundary rivers. Assessment of cost for implementation of the WFD and other EU Directive is not available. The needed investments for JAP implementation are: 296.7 Mio. EURO for municipal wastewater treatment plants, including sewerage systems, 111.2 MEUR for industrial wastewater treatment plants, and 85.0 MEUR for restoring and protecting the wetlands.

7.13 Ukraine

TASK I Ukraine: Summary Report on the implementation of policies, regulations and measures of compliance in line with the JAP and EU water directives

Policy objectives

Ukraine has undertaken serious efforts into the development and implementation of environmental policy based on modern principles of Environment for Europe Process and Agenda 21. The "Principal Directions of the State Policy of Ukraine in Environmental Protection, Use of Natural Resources and Ensuring Environmental Safety" gives the general framework document is considered as an overall basis of national environmental programme. General environmental protection principles have been determined in the basic Law on Environmental Protection (1991) and specified later in some other legal documents. They are: priorities of the environmental safety requirements; mandatory compliance with environmental standards, norms and limits to use the natural resources; ensuring the environmental safety for human health and life; precautionary principle in environmental protection; application of environmentally friendly management and technologies into production activities and nature resources usage and rehabilitation; conservation of the diversity and integrity of natural bodies and ecosystems; integration of environmental, economic and social objectives based on scientific prognostication of the state of the environment. Water quality is on the top of national environmental priorities.

Status of legislation dealing with water management

As of 2004, the Ukrainian legislative and regulatory system in the field of water protection and water management consists of policy documents approved at the level of Parliament and Cabinet of Ministers, basic laws determining relations in this sphere and key rules and principles, set of laws specifically addressing the water issues, large number of sub legal acts approved by the Cabinet of Ministers and other governmental authorities, and focused on practical implementation of the provisions of basic laws national, regional and local environmental programs specifying the mechanisms, resources, institutional provisions, and time frame for achieving defining priorities. Updated version of the Conception of Sustainable Development was resubmitted for approval. The system looks very comprehensive and, in general, provides background for regulation of human activities aimed at the protection of water environment and exploitation of water resources. In March 2004, the State Program of adaptation of legislation of Ukraine to EU legislation has been approved, and this fact is an evidence of the importance of European orientation of Ukraine. The first phase of the Program implementation is scheduled for 2004–2007, and environment as well as protection of human, plants and animals health is determined as a priority sectors.

Main barriers to water-related policy and legal reform and JAP implementation

Ukraine relies upon outdated environmental policy act (The Principal Direction, 1998) and does not have properly developed National Environmental / Sustainable Development Strategy. As regards to water sector, there was developed and approved the Conception and the Program of the Development of Water Economy but at the same time, there is no approved specific national water protection policy act comprising identified priorities, clear objectives, determined mechanisms to achieve these objectives, providing resources needed and institutional support. There is no clear strategy on how to integrate the environmental concerns into social and economic policies under transition to the marked economy and how to harmonise national water policy with EU policies and legislation. Barriers to policy reform relate more to the policy implementation rather then to formulation of the policy objectives and priorities. Analysis of declared policy provisions and current practice may result in conclusion that the main barrier in the subject area is clear domination of economic priorities (and less – social ones) over the environmental objectives. As consequences, water sector is not considered as an integral system, and water economy issues are separated from water protection. Practical domination of economic objectives is proved many times by reality. Another factor hindering the environmental policy in water sector is an inconsistency of general governmental policy.

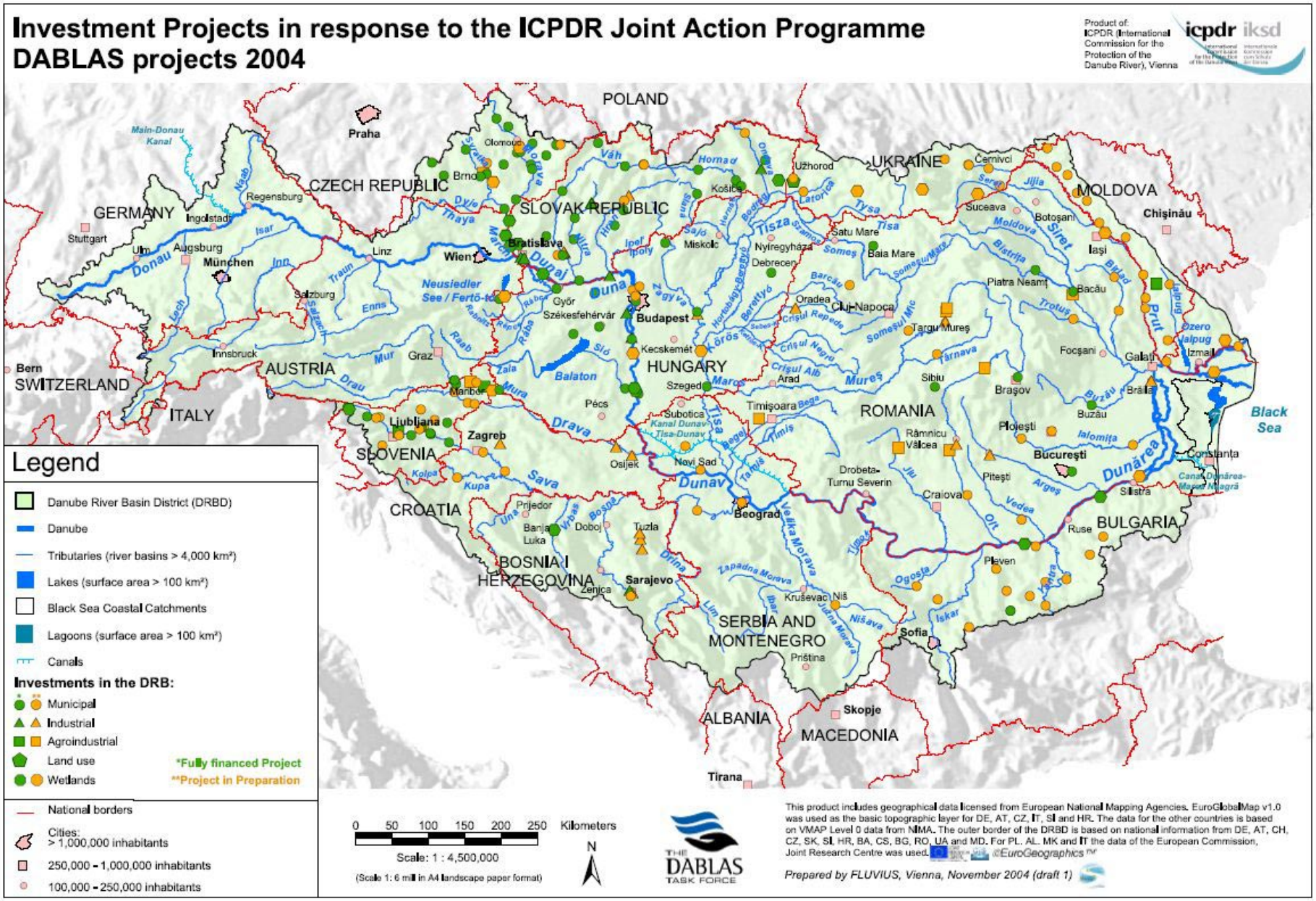
Proposed actions and measures in response to JAP

Reforming the legal system has two dimensions. Improvement of current legal basis by means of further development and adaptation to EU rules and principles of new acts and updating existing ones is very important dimension. To increase an effectiveness of legislative acts, the avoiding contradictions and making the laws easy to implement is an enforcement system. Both improvement of legal framework and providing the resources (human and financial) are prerequisite to strengthen the enforcement system. In order to address these issues, consistent integration of water policy into other sectoral policies (namely, industrial, agricultural, energy, communal, transport, regional and others) should be considered as a prerequisite. The complexity of the issue and the lack of appropriate institutional capacity, human and financial resources hinder effective resolution of current environmental problems, implementation of water policy and stipulate prioritisation of planned activities for transition period.

Estimated cost for reforms to respond to JAP

Estimation on the preparatory period for development of the relevant regulations of national legislation and draft national law identical to EU Directive will take from 18 to 24 months provided appropriate financing. Estimation of time frame and cost needed are not available.

8 MAP



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9 DABLAS DATABASE FORM

DABLAS II Project Data

project_data4_20041206 - Field Data

			Sectors											
Field Name	Sub-field Name	Cr.	M	I	A	W	L	Options	#	New	Type	Length	Obl.	Validation	Remark
General															
Country			x	x	x	x	x	List - Countries	3-a		C	2	Y	code	
Sector			x	x	x	x	x	List - Sector	3-b		C	1	Y	code	
Project ID			x	x	x	x	x		1-a		N	6	Y	not editable	
Revision No.			x	x	x	x	x			x	N	2		not editable	
Project Title			x	x	x	x	x		2		C	255	Y		
Project Description			x	x	x	x	x			x	CLOB				
Assessment	Year		x	x	x	x	x			x	N	4	Y		
	Status		x	x	x	x	x	in preparation, submitted, final, archived		x	C	15	Y	code	
National Project No.			x	x	x	x	x		1-b		C	10			
National Priority			x	x	x	x	x	Y/N	2-n		B				
Impetus			x	x	x	x	x	Voluntary, Regulatory Order		x	C	30			
Project Status			x	x	x	x	x	1-4	2-n		N	1			for reviewers only
Location, Effects, Interactions															
Location Name			x	x	x	x	x		4-a		C	100			
Recipient Body			x	x	x	x	x		4-b		C	100			
Sub-River Basin			x	x	x	x	x	List - Riverbasins (EMIS)		x	N	6		code	
Name of SIA		x	x	x	x	x	x	List - SIA	4-c		N	6		code	
Priority Wetland			x	x	x	x	x	List - Wetlands		x	N	6		code	
EMIS AV Code			x	x	x			List - EMIS Inventory DB	1-c		N	11		code	
TNMN Station			x	x	x	x	x	List - TNMN DB		x	C	5		code	
Longitude	deg		x	x	x	x	x		5-a		N	2			
	min		x	x	x	x	x		5-b		N	2			
	sec		x	x	x	x	x		5-c		N	2			
Latitude	deg		x	x	x	x	x		5-d		N	2			
	min		x	x	x	x	x		5-d		N	2			
	sec		x	x	x	x	x		5-e		N	2			
Downstream Users	Drinking Water	x	x	x	x	x	x	Y/N	6-a		B				
	Irrigation	x	x	x	x	x	x	Y/N	6-b		B				
	Industrial	x	x	x	x	x	x	Y/N	6-c		B				
	Wetlands		x	x	x	x	x	Y/N		x	B				
Transboundary Effects		x	x	x	x	x	x	Y/N	30		B				
Distance to border (km)			x	x	x	x	x			x	N	6			
Benefits	Sanitation	x	x	x	x	x	x	Y/N	28-a		B				
	Recreation	x	x	x	x	x	x	Y/N	28-b		B				
	Biodiversity	x	x	x	x	x	x	Y/N	28-c		B				

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DABLAS II Project Data

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Field Name	Sub-field Name	Cr.	M	I	A	W	L	Options	#	New	Type	Length	Obl.	Validation	Remark
	Flood safety		x	x	x	x	x	Y/N			B				
Responsible Party															
Public Ownership (%)			x	x	x	x	x	0-100		x	N	3		0-100	
Name			x	x	x	x	x		7-a		C	255			
Address			x	x	x	x	x		7-b		C	255			
Postal Code			x	x	x	x	x		7-c		C	8			
City			x	x	x	x	x		7-d		C	255			
Tel No.			x	x	x	x	x		7-e		C	255			
FAX No.			x	x	x	x	x		7-f		C	255			
E-mail			x	x	x	x	x		7-g		C	255			
Web Address			x	x	x	x	x			x	C	255			
Contact Person			x	x	x	x	x		7-h		C	255			
Project Characteristics															
Implement. Period	Year of start	x	x	x	x	x	x		18-a		N	4			
	Year of completion	x	x	x	x	x	x		18-b		N	4		start <= completion	
Measures	Sewage Collection		x	x	x			Y/N			B				(was "Proposed Treatment Technology)
	Pre-treatment of sewage		x	x				Y/N	16-a		B				
	Primary Treatment		x	x				Y/N	16-b		B				
	Secondary Treatment		x	x				Y/N	16-c		B				
	N removal		x					Y/N	16-d		B				
	P Removal		x					Y/N	16-e		B				
	Sludge disposal solution		x	x	x			Y/N		x	B				
	Implement BAT			x	x			Y/N		x	B				
	Implement BAP				x			Y/N		x	B				
	Pre-treatment of wastewater			x	x			Y/N		x	B				
	Final treatment of wastewater			x	x			Y/N		x	B				
	Wetlands restoration					x		Y/N		x	B				
	Creation of wetlands					x		Y/N		x	B				
	Floodplain maintenance					x		Y/N		x	B				
	Establishment of protected areas					x		Y/N		x	B				
	Creation of green corridors					x		Y/N		x	B				
	Conversion to organic farming						x	Y/N		x	B				
	Soil erosion control						x	Y/N		x	B				
	Accident prevention						x	Y/N		x	B				

DABLAS II Project Data

project_data4_20041206 - Field Data

Field Name	Sub-field Name	Cr.	M	I	A	W	L	Options	#	New	Type	Length	Obl.	Validation	Remark
	BEP (Best Environmental Practice)						x	Y/N		x	B				
	Soil reclamation						x	Y/N		x	B				
	Afforestation						x	Y/N		x	B				
Population of community			x						22-a		N	12			
Wastewater Collection (% connected to WWTP)	before - year of start	x	x						22-b		N	3		0-100	
	after - year of completion	x	x						22-c		N	3		0-100	
Size of WWTP (PE)	before - year of start		x						22-d		N	12			
	after - year of completion		x						22-e		N	12			
Capacity (m^3/day)	before - year of start		x	x	x				23-a		N	12			
	after - year of completion		x	x	x				24-a		N	12			
Industrial Input (%)	before - year of start	x	x						23-c		N	3		0-100	
	after - year of completion		x						24-c		N	3		0-100	
Type of Industry				x				List - EMIS Subsectors		x	N			code	
Size of Area (ha)					x	x	x			x	N	12			
Livestock size (number)					x					x	N	12			
Livestock type					x					x	C	30			
Emission Reduction (multiple records)															
Pollutant			x	x	x	x	x	List - Pollutants		x	C	10	Y		
Load at project start			x	x	x	x	x			x	N	12	Y		
Load at project completion			x	x	x	x	x			x	N	12	Y		
Unit			x	x	x	x	x	t/a		x	C	10	Y		
Project costs and Tariffs															
Project Investment Costs	Total (in EUR)	x	x	x	x	x	x		33-a		N	22			
Household Tariffs	before - year of start (EUR/m3)		x							x	N	12			
	after - year of completion (EUR/m3)		x						35-a		N	12			
Industrial Tariffs	before - year of start (EUR/m3)	x	x							x	N	12			
	after - year of completion (EUR/m3)		x						35-b		N	12			
Project funding (multiple records)															
Status		x	x	x	x	x	x	planned, negotiating, confirmed, received	39-e		C	30	Y		
Type		x	x	x	x	x	x	national, internation	39-b		C	30	Y		

DABLAS II Project Data

project_data4_20041206 - Field Data

Field Name	Sub-field Name	Cr.	M	I	A	W	L	Options	#	New	Type	Length	Obl.	Validation	Remark
Source		x	x	x	x	x	x	EU, EBRD, EIB, WB, GEF, other IFIs, public budgets, nat. commercial bank, own sources, unknown	39-a		C	30	Y	reduced list dependend on type	
Description		x	x	x	x	x	x	equity, grant, loan	39-c		C	30	Y		
Amount		x	x	x	x	x	x		39-d		N	12	Y	positive	
Project prepardness and sustainability															
Feasibility Study ready			x	x	x	x	x	Y/N		x	B				
Funding gap (calculated)	Total (in EUR)		x	x	x	x	x							not editable	
	% of Total Project Cost		x	x	x	x	x							not editable	
Guarantee provided			x	x	x	x	x	Y/N		x	B				
Community Involvement			x	x	x	x	x	Y/N		x	B				
Compliance with national regulations			x	x	x	x	x	Y/N		x	B				
Compliance with international regulations	CAP				x	x	x	Y/N		x	B				
	IPPC		x	x	x			Y/N		x	B				
	ISO 14001			x				Y/N		x	B				
	Nitrates Dir.				x	x		Y/N		x	B				
	UWWT Dir.		x	x				Y/N		x	B				
	WFD		x	x	x	x	x	Y/N		x	B				
	Natura 2000					x	x	Y/N		x	B				
	Ramsar					x	x	Y/N		x	B				
	Habitat Directive					x	x	Y/N		x	B				
Affordability of Tariffs	(% of household income)		x							x	N	3			