PROJECT BRIEF FOR THE DANUBE REGIONAL PROJECT

Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary Cooperation in the Danube River Basin

1 September 2000

International Commission for the Protection of the Danube River

UNDP/GEF Assistance

Cover Note

Project Title: "Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary Cooperation in the Danube River Basin"

Date: 31 August 2000

	Work Program Inclusion	Reference/Note:
1. Country Ownership		
• **Country Eligibility**		Cover page
• **Country Driveness**	**Clear description of project's fit within:** • National reports/communications to Conventions • National or sector development plans • Recommendations of appropriate regional intergovernmental meetings or agreements.	 • Chapter 1.1 • Chapter 1.6 • Chapter 1.7; 4
• **Endorsement**	• Endorsement by national operational focal point.	• Annex 13
2. Program & Policy Conformity		
• **Program Designation & Conformity**	• Describe how project objectives are consistent with Operational Program objectives or operational criteria.	• Chapter 1.1 • Chapter 4; Annex 1 • Annex 9
• **Project Design**	**Describe:** • Sector issues, root causes, threats, barriers, etc, affecting global environment. • Project logical framework, including a consistent strategy, goals, objectives, outputs, inputs/activities, measurable performance indicators, risks and assumptions. • Detailed description of goals, objectives, outputs, and related assumptions, risks and performance indicators. • Brief description of proposed project activities, including an explanation how the activities would result in project outputs, • Global environmental benefits of project.	 • Chapter 1.1 – 1.5; 1.7 • Annex 2 • Chapter 2 • Chapter 3; Annex 2 • Chapter 8; Annex 1

	Work Program Inclusion	Reference/Note:
	• Incremental Cost Estimation based on the project logical framework. ▪ Describe project outputs (and related activities and costs) that result in global/regional environmental benefits ▪ Describe project outputs (and related activities and costs) that result in joint global and national environmental benefits. ▪ Describe project outputs (and related activities and costs) that result in national environmental benefits. ▪ Describe the process used to jointly estimate incremental cost with in-country project partner. ▪ Present the incremental cost estimate. If presented as a range, then a brief explanation of challenges and constraints and how these would be addressed by the time of CEO endorsement.	• Annex 1
• **Sustainability (including financial sustainability)**	Describe proposed approach to address factors influencing sustainability, within and/or outside the project to deal with these factors.	• Chapter 4
• **Replicability**	Describe the proposed approach to replication (for e.g., dissemination of lessons, training workshops, information exchange, national and regional forum, etc) (could be within project description).	• Chapter 2 • Chapter 3.2 (v) • Chapter 3.3
• **Stakeholder Involvement**	• Describe how stakeholders have been involved in project development. • Describe the approach for stakeholder involvement in further project development and implementation.	• Chapter 4 • Chapter 10.1
• **Monitoring & Evaluation**	• Describe how the project design has incorporated lessons from similar projects in the past.	• Chapter 5
	• Describe approach for project M&E system, based on the project logical framework, including the following elements: ▪ Specification of indicators for objectives and outputs, including intermediate benchmarks, and means of measurement. ▪ Outline organizational arrangement for implementing M&E. ▪ Indicative total cost of M&E (maybe reflected in total project cost).	• Chapter 10; Annex 2 ▪ Annex 2 ▪ Chapter 10 ▪ included in total project costs

	Work Program Inclusion	Reference/Note:
3. Financing		
• **Financing Plan**	• Estimate total GEF project cost : • Estimate contribution by financing partners : • Baseline Contributions : • Propose type of financing instrument	• Chapter 6.1; Annex 4 • Chapter 6.2 • Chapter 6.3-6.7 • The ICPDR – PMTF shall coordinate donor support and assist to mobilize funds for implementation of investment programs for pollution reduction under the DRPC.
• **Implementing Agency Fees**	• Propose IA fee	• Chapter 6.1; Annex 4
• **Cost-effectiveness**	• Estimate cost effectiveness, if feasible. • Describe alternate project approaches considered and discarded.	• Chapter 8 • The present developed approach promises to be the most effective way to reach the project objectives, considering the implementation of the Pollution Reduction Program (Investment Program) and the development of policies and legislation for nutrient reduction within the institutional and operational frame of the ICPDR.
4. Institutional Coordination & Support		
• **IA Coordination and Support** • **Core commitments & Linkages**	Describe how the proposed project is located within the IA's: • Country/regional/global/sector programs. • GEF activities with potential influence on the proposed project (design and implementation).	• Chapter 10.1 • UNDP/GEF, UNEP and the World Bank (Partnership Program) will participate in the ICPDR/PMTF together with other interested bilateral donors and international organizations to assure efficient project implementation and evaluation of results.
• **Consultation, Coordination and Collaboration between IAs, and IAs and EAs, if appropriate.**	• Describe how the proposed project relates to activities of other IAs in the country/region. • Describe planned/agreed coordination, collaboration between IAs in project implementation.	• The "Programmatic Approach" developed by UNDP/GEF indicates the cooperating mechanisms between the World Bank (WB-GEF Partnership Program), the International Commission for the Protection of the Black Sea and the International Commission for the Protection of the Danube River. • In the frame of the ICPDR/PMTF all activities related to protection of international waters will be coordinated with particular attention to the EU approximation process and the development of policies and legislation in line with international and EU Directives.

	Work Program Inclusion	Reference/Note:
5. Response to Reviews		
Council	Respond to Council Comments at pipeline entry.	To be completed by headquarters
Convention Secretariat	Respond to comments from Convention Secretariats .	To be completed by headquarters
GEF Secretariat	Respond to comments from GEFSEC on draft project brief.	To be completed by headquarters
Other IAs and 4 RDBs	Respond to comments from other IAs, 4RDBss on draft project brief.	To be completed by headquarters
STAP	Respond to comments by STAP at work program inclusion	To be completed by headquarters
Review by expert from STAP Roster	Respond to review by expert from STAP roster.[1]	To be completed by headquarters

[1] STAP Roster Review, and IA response, is a required annex of the project brief.

PROJECT BRIEF

1. IDENTIFIERS

PROJECT NUMBER	
PROJECT NAME	**Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary Cooperation in the Danube River Basin**
DURATION	5 years (July 2001 – June 2006)
IMPLEMENTING AGENCY	UNDP
EXECUTING AGENCY	UNOPS / ICPDR
REQUESTING COUNTRIES	Czech Republic, Slovakia, Hungary, Slovenia, Croatia, Bosnia & Herzegovina, Yugoslavia, Bulgaria, Romania, Moldova, Ukraine
ELIGIBILITY	Eligible under para. 9(b) of GEF Instrument
PARTICIPATING COUNTRIES	Germany and Austria
GEF FOCAL AREA	International Waters
GEF PROGRAMMING FRAMEWORK	GEF Operational Strategy for International Waters / Waterbody-Based Operational Programme (#8)

2. SUMMARY

The long-term development objective of the proposed Regional Project is to contribute to sustainable human development in the DRB through reinforcing the capacities of the participating countries in developing effective mechanisms for regional cooperation and coordination in order to ensure protection of international waters, sustainable management of natural resources and biodiversity.

In this context, the proposed GEF Regional Project should support the ICPDR, its structures and the participating countries in order to ensure an integrated and coherent implementation of the Strategic Action Plan 1994 (SAP 1994), the Common Platform and the forthcoming JAP and the related investment programs in line with the objectives of the DRPC.

The overall objective of the Danube Regional Project is to complement the activities of the ICPDR required to provide a regional approach and global significance to the development of national policies and legislation and the definition of priority actions for nutrient reduction and pollution control with particular attention to achieving sustainable transboundary ecological effects within the DRB and the Black Sea area.

Further, the Danube Regional Project shall facilitate project implementation in providing a framework for coordination, dissemination and replication of successful demonstration that will be developed through the implementation of investment projects (World Bank-GEF Strategic Partnership).

Taking into account the basic orientations of the Danube/Black Sea Basin Programmatic Approach, the following immediate objectives can be designed to respond to the overall development objective:

(1) Creation of sustainable ecological conditions for land use and water management,

(2) Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin,

(3) Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems,

(4) Reinforcement of monitoring, evaluation and information systems for transboundary pollution control and nutrient reduction.

3. COSTS AND FINANCING (US$)

GEF:	- Project	13,800,000 USD
	[administrative cost]	1,200,000 USD
	- PDF	350,000 USD
	Subtotal GEF	**15,350,000 USD**
Co-Financing:	Government	16,500,000 USD
	UNDP	not available
	Subtotal Co-financing	**16,500,000 USD**
Total Project Cost:		**31,850,000 USD**

4. Associated Financing

– Baseline Costs: **881,237,000 USD**

5. GEF Operational Focal Point Endorsements (Annex 13)

Slovakia	31 August, 2000
Hungary	30 August, 2000
Slovenia	29 August, 2000
Bosnia & Herzegovina	1 September, 2000
Bulgaria	1 September, 2000
Romania	30 August, 2000
Moldova	30 August, 2000

6. Implementing Agency Contact

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List of Abbreviations

AEPWS/EG	Accident Emergency Prevention and Warning System Expert Group
AQC	Analytical Quality Control
BAT	Best available technology
BEP	Best environmental practices
BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand
DBAM	Danube Basin Alarm Model
DEPA	Danish Environmental Protection Agency
DANUBIS	Danube Information System
DPRP	Danube Pollution Reduction Program
DRB	Danube River Basin
DRBM/EG	Danube River basin Management Expert Group
DRP	Danube Regional Project
DRPC	Danube River Protection Convention
DWQM	Danube Water Quality Model
EMIS/EG	Emission Expert Group
EPDRB	Environmental Program for the Danube River Basin
GEF IW	Global Environment Facility
GDP	Gross Domestic Product
GPA	Global Programme of Action
IAA	Implementing Agency Agreement
ICPDR	International Commission for the protection of the Danube River
ICPBS	International Commission for the Protection of the Black Sea
IFI	International Financing Institution
IW	International Waters
MLIM/EG	Monitoring Laboratory and Information Management Expert Group
MONERIS	Modeling Nutrient Emission in River System
M&E	Monitoring and Evaluation
MSP	Medium Sized Project
NGOs	Non Government Organisation
PRP	Pollution Reduction Program
S/EG	Strategic Expert Group
SAP	Strategic Action Plan
SIA	Significant Impact Area
STAP	Scientific and Technical Advisory Panel
TAR	Transboundary Analysis Report
UNDP	United Nation Development Program
UNIDO	United Nations Industrial Development Office
UNIDO-TEST	UNIDO - Transfer of Environmentally Sound Technology to Reduce Transboundary Pollution in the Danube River Basin
UNOPS	United Nations Office for Project Services ….
USAID	United State Agency for International Development
WPPCM	Water Pollution Prevention and Control Model

1 Background Information

1.1 Context of the Proposed Danube Regional Project

In the frame of the Environmental Program for the Danube River Basin (EPDRB) international support was provided to facilitate the development and the implementation of the Danube River Protection Convention (DRPC). Since 1992 the European Community has supported, in particular through its Phare and Tacis programs and the UNDP/GEF, in particular through its Pollution Reduction Program (June 1997 to June 1999), the efforts of the Danube countries and of the Interim Commission for the Protection of the Danube River (ICPDR) to develop the necessary mechanisms for effective implementation of the Convention. These mechanisms relate in particular to the development of a regional Strategic Action Plan (SAP) based on national contributions, the elaboration of a Transboundary Analysis to define causes and effects of transboundary pollution within the Danube River Basin and on the Black Sea. Based on the results of the Transboundary Analysis, an investment portfolio has been developed in the frame of the Danube Pollution Reduction Program 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 will further substantially contribute to reducing nutrient transport (Phosphorus by 27 % and Nitrates by 14 %) to the Black Sea to improve, over time, environmental status indicators of Black Sea ecosystems of the western shelf.

Since 1992/1993, donor investments in the frame of the Environmental Program for the Danube River Basin (EPDRB) have been in the order of 27,2 million US$ for the Phare and Tacis Programs (ending October 2000) and of 12,4 million US$ for the UNDP/GEF assistance.

The ICPDR is currently developing a first Joint Action Programme (JAP) for the years 2001 - 2005, which is expected to be adopted at the ICPDR Plenary Session in November 2000. The JAP will deal i.a. with pollution from point and non-point sources, wetland and floodplain restoration, priority substances, water quality standards, prevention of accidental pollution, floods and river basin management.

In order to ensure efficient implementation of the Common Platform for Development of National Policies and Actions for Pollution Reduction under the DRPC (Common Platform), the Pollution Reduction Program and the JAP and to reinforce the appropriate development and application of policies, strategies and legislation for transboundary pollution reduction at the national level, a new phase of GEF assistance shall complement the activities of the ICPDR and the Black Sea PIU.

The new GEF assistance is planned within the frame of the Danube/Black Sea Basin Programmatic Approach (Annex 9) for the Danube and the Black Sea Basin. The Danube–Black Sea program is composed of three complementary parts:

(i) a series of country-related investment projects executed through the World Bank-GEF Strategic Partnership with GEF financial support and

(ii) two Regional Projects for the Danube River Basin and the Black Sea respectively,

(iii) other GEF and donor interventions in the basin targeting reduction of nutrients and toxic pollutants.

The GEF regional Danube/Black Sea basin Programmatic Approach shall provide assistance to the ICPDR and the Black Sea PIU to reinforce their activities in terms of policy/legislative reforms and enforcement of environmental regulations (with particular attention to the reduction of nutrients and toxic substances). The regional projects, in their respective sphere of intervention and jointly, shall also assure a coherent and coordinated approach and global significance of policy and legislative measures introduced at the national level of the participating countries. Further, the GEF regional components of the Danube/Black Sea basin Programmatic Approach shall facilitate project implementation in providing a framework for dissemination and replication of successful demonstration that will be developed through the implementation of investment projects through the World Bank-GEF Strategic Partnership.

In this context, the proposed Danube Regional Project (DRP) has to be seen as an integral part of the Danube/Black Sea basin Programmatic Approach and a logical continuation of the GEF support for capacity building provided for a period of six years to the countries of the DRB. For the reason of continuity and utmost utilization of available expertise, the Danube Regional Project has to take into account and build on the existing mechanisms and structures, including:

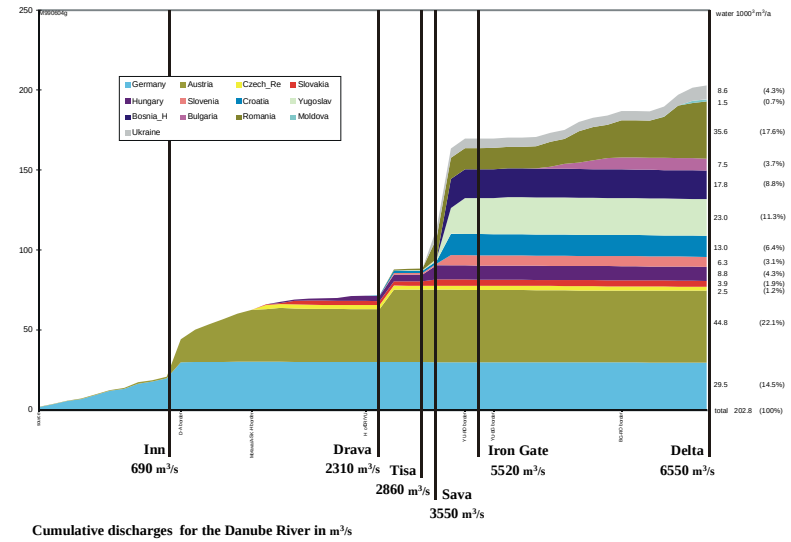
- ⇒ the Common Platform, focusing on policies and strategies for water quality control and pollution reduction with particular attention to transboundary issues and reduction of nutrient transport to the Black Sea; regional policies and strategies have to be coordinated with the development of national policies and legislation and implemented through national investment programs;
- ⇒ the Transboundary Analysis Report (TAR) identifies causes and effects of pollution with particular attention to transboundary issues and nutrient transport to the Black Sea; the TAR defines priorities for control and management strategies at the regional and national levels;
- ⇒ The Danube Pollution Reduction Program (DPRP), is the actual investment program of the ICPDR. It is the operational basis for the promotion and monitoring of pollution reduction measures in the DRB. A total of 421 projects for 5,66 billion US$, primarily addressing hot spots have been identified for municipal, industrial and agricultural projects which, once implemented, would decrease phosphorus and nitrogen loads to the Danube and downstream to the Black Sea by 27 and 14 % respectively;
- ⇒ the ICPDR, its Permanent Secretariat and the existing, respectively proposed expert groups (EMIS/EG, MLIM/EG, AEPWS/EG, S/EG and the Ad-hoc EG for implementation of EU Water Framework Directives and River basin Management DRBM/EG) are responsible for the implementation of the DRPC. The Danube Regional Project shall make use of these structures and instruments to pursue its objectives and organize its activities.
- ⇒ the Joint Action Programme 2001-2005 is presently prepared by the EMIS EG and should be approved by the ICPDR at the Plenary Session in November 2000. The projects and strategic measures contained in the Joint Action Programme are in most cases coherent with the projects in the Five Year Nutrient Reduction Action Plan, where the total amount of investment is 4.11 billion € out of which 3.25 billion € are earmarked as national contributions.

1.2 The Danube River Basin

The Danube River is with a length of 2 780 km the second largest river in Europe and drains an area of 817 000 square km. This includes: all of Hungary, nearly all parts of Austria, Romania, Slovenia, Slovakia and FR Yugoslavia, significant parts of Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Moldova and small parts of Germany and Ukraine. The Danube River discharges into the Black Sea through a delta, which is the second largest natural wetland in Europe.

Discharges of the Danube River, also indicating the inputs of its tributaries, are presented in the attached figure.

Longitudinal profile of the annual water volume in the Danube in 1000³ m³/a, by countries of origin



The Basin, with a total of about 817.000 km² is characterized by an aquatic ecosystem with numerous important wetlands and floodplains. It is of high environmental as well as economic and social value. It supports drinking water supply, agriculture, industry, fishing, tourism and recreation, power generation, navigation, etc. A large number of dams, dikes, navigation locks and other hydraulic structures have been built throughout the region. (Annex 7 - Maps: Major Hydraulic Structures in the Danube River Basin).

Utilizing water resources for important economic activities and the release of waste water without adequate treatment has resulted in changes in the hydrological systems. Problems of water quality and quantity have been created, including significant environmental damage, with resulting impairment of public health and quality of life.

Central and eastern European countries in particular, during the period of centralized planning system, failed to develop adequate environmental protection policies and subsequent measures to fully respond to water pollution and degradation of river ecosystems. The economic situation of the countries in transition, most of which are considered as accession countries to the European Union, does not allow them to fully respond to the needs for environmental protection and the implementation of pollution control measures.

Appropriate water management concerns must be better integrated into municipal, industrial and agricultural policies and legislation to assure sustainable human development and promotion of economic activities. The Danube/Black Sea Basin Programmatic Approach shall in particular assist the countries in transition to respond to the regional and global environmental concerns with particular attention to nutrient reduction and elimination of other toxic substances in the water bodies.

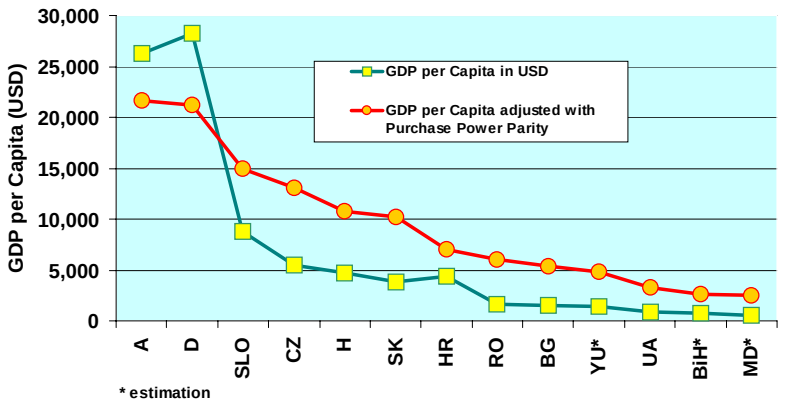
1.3 Political, Demographic and Economic Issues

The present population of the Danube River Basin is about 83 million inhabitants (16 % of the population in Europe). Nearly 57 % of this population lives in increasingly growing urban areas. The share of the population connected to public water supply varies from 29% in Moldova to 98 % in Germany, yielding an average of 74%. The share of population branched to public sewer system varies from 14% in Moldova to 89% in Germany – an average of 52%. Based on the national projection figures, the population of the Danube River Basin can be expected to remain at its present level by the year 2020.

The analysis of economic disparities shows a clear trend of a west – east decline of the GDP from the upstream countries such as Germany and Austria, with about 25,000 US$ per capita and year (in 1997), to the downstream countries among which Ukraine accounts for less than 1,000 US$ per capita and year.

The middle and downstream Danube countries in transition are facing serious economic and financial problems in responding to the objectives of the Danube River Protection Convention and implementing measures for pollution reduction and for environmental protection as required for the accession to the European Union. This analysis also shows the need to assist the countries in transition and makes evident the responsibilities of the international community to respond to the regional and global concerns of environmental protection.

The Danube Countries:
GDP per Capita in USD (1998)
and GDP adjusted for Purchasing Power Parity



In general terms, the 13 DRB countries can be categorized and characterized as follows:

(i) Germany and Austria

These two countries are members of the European Union and are located at the upper part of the DRB. Compared to all other DRB countries, Germany and Austria have significantly higher economic development levels, represented by a per capita income of about 25 000 USD per annum. In terms of pollution reduction (COD, BOD, N and P) they have achieved high standards of emission reduction and water pollution control. From 1990 to 1999 both countries have invested important amounts for the installation of third stages and for the upgrading of municipal waste water treatment plants.

In 1997 and 1998 (2 years) Germany invested more then 2,4 billion US$ for pollution reduction measures to respond to EU Water Directives and in particular to Nitrate Directive. Current investment in the water sector in the German part of the Danube River Basin is at the level of about 1,5 billion US$ per year of which 1.2 billion US$ is spent for communal waste water treatment facilities (including 3rd stage for nutrient removal). From 1993 to 1999 Austria invested about 9 billion ATS (780 million US$) per year for municipal waste water treatment including nutrient removal facilities.

Concerning the ongoing projects indicated in the Nutrient Reduction Plan, further investments of 234 million US$ for Germany and 264 million US$ for Austria are foreseen for the period from 2000 to 2005.

Based on the data from the DWQM, Germany and Austria were in 1996/97 in spite of these efforts still responsible for 26,2 % of the nitrates and 15,3 % of phosphates reaching the Black Sea. In the field of agriculture, even presently, neither country has yet met the European emission standards (EU Nitrate Directive). However, one must bear in mind that changes in agricultural practices and land management will – due to delay in runoff - take five or more years before producing obvious effects in terms of nutrient reduction.

(ii) Czech Republic, Slovakia, Hungary, Slovenia and Croatia

These countries are located in the central part of the DRB. They have to a great extent overcome the former central state planning systems and have reached medium economic development levels reflected in their annual GDP of between USD 4,000 and USD 9,000 per capita. The economic transition process has caused significant reduction of industrial and agricultural production, thus temporarily reducing production-related pollution loads. This has created an opportunity to establish and integrate environmental objectives into industrial and agricultural policies and legislation in line with EU guidelines. All these countries are interested in joining the EU as soon as possible; Hungary, the Czech Republic and Slovenia are obviously the priority candidates. In the process of fulfilling the basic accession criteria, these countries as well as Slovakia will receive special financial and technical support from the European Commission (ISPA funds) to help them develop an infrastructure and meet environmental standards. The present Regional Project shall assist these countries to develop adequate policies and legislation for emission control with particular attention to nutrient reduction.

(iii) FR Yugoslavia and Bosnia and Herzegovina

These two countries, also located in the central Danube River Basin, are still in the critical phase, struggling to overcome the aftermath of the war. In the forthcoming period, their main task will be to re-organize their political, legal, administrative and socio-economic structures in order to comply with the requirements of the commencing process of economic liberalization and privatization as well as of international normalization. With annual per-capita GDP of USD 1,100 (BiH) and USD 1,500 (Yugoslavia), both countries are presently well below their pre-war levels.

(iv) Romania, Bulgaria, Moldova and Ukraine

These countries, located in the lower Danube River Basin, are the major polluters, with a lot of environmental damage done in each country. Romania, Bulgaria and Ukraine are also Black Sea countries and substantially contribute to the degradation of the Black Sea ecosystems. These countries are both polluters and victims of pollution to the Black Sea. All four countries face serious economic problems and are in a difficult phase of political and social transition. Environmental protection and investments for pollution reduction are not the priority issues in the near future. Particularly critical is the fact, that their legal and administrative framework is still to a certain extent determined by the former central planning structures and therefore not yet in compliance with the requirements of the commencing process of economic

liberalization and privatization. This is particularly true for the two former Soviet Union countries Moldova and Ukraine and to a lesser extent for the two potential EU-Accession countries Bulgaria and Romania. The lower economic status of the four downstream Danube River countries is clearly documented by per capita GDP between USD 900 and 1500 per annum.

It is obvious from this broad description of the DRB countries that there is a clear distinction in terms of political, administrative and economic capability from the wealthy countries in the upper DRB, the mid-income countries in the central DRB, down to the poorer countries in the lower part of the DRB.

1.4 Accidental Pollution in the Danube and the Tisza Sub-River Basin

Since the DRPC entered into force, first concerns about contamination of ground and surface waters were raised during the NATO intervention against Yugoslavia from March to June 1999. The bombing and destruction of petrochemical plants and refineries led to contamination of channels and tributaries emptying into the Danube River. Sampling and analysis have shown high levels of contamination with heavy metals, in particular mercury, oil and petroleum products, volatile organic substances, PCBs, PAHs, etc. However, one must bear in mind that the accumulation of toxic substances is not the effect of the recent bombing of industrial installations only but also the result of years of inefficient treatment and careless handling of wastes from industrial and mining activities.

In the beginning of the year 2000 several accidents occurred with disastrous environmental effects in the upper Tisza Sub-River Basin where mining activities are carried out. Waste water containing cyanide and heavy metals was accidentally discharged into receiving waters. Ecosystems where affected and large fish kills of several hundred tons were reported. Drinking water supply for urban centers at the riverbanks and fishing activities had to be suspended. Important economic losses were reported in tourism and fisheries. The effects of the cyanide wave were reported over a stretch of 900 to 1.000 km from the Tisza River to the Danube and dangerous cyanide concentrations were still measured even downstream of the Iron Gate dam in Bulgaria.

Further, there are serious concerns over the possible accumulation of toxic substances in the sediments and biota of the Iron Gate reservoirs. Preventive management programs have to be developed and implemented in order to gradually clean up the sediments and assure the rehabilitation of ecosystems in the central and lower part of the Danube River basin.

1.5 Institutional and Legal Mechanisms and Investment Programs for Nutrient Reduction in the Danube Countries

In the frame of the present project preparation (PDF-Block B activities), specific subjects concerning the institutional, legal and policy frame as well as national investment programs for nutrient reduction have been studied and analyzed.

(i) Inter –ministerial coordination mechanisms

In the frame of the PDF-Block B activities, inter-ministerial mechanism at the national level and concepts of cooperation for pollution reduction, in particular nutrient reduction, have been analyzed. The diversity of views and proposals for the implementation of EU Directives in the frame of the accession process create an encouraging environment for the countries to create new inter-ministerial mechanism or improve the existing structures with nutrient reduction and control responsibilities. Based on the finding of the national contributions, the Danube countries can be classified in three groups.

The first group is made up of EU member countries, Germany and Austria, in which the existing national inter-ministerial structures allow an effective performance of nutrient reduction and control tasks. In Germany, the inter-ministerial cooperation takes place on both federal and state levels, covering legislative procedures, implementation of EU-directives, and development of minimum requirements for point sources for municipalities as well as for industrial branches. In Austria, the recently restructured Ministry of Agriculture, Forestry, Environment and Water Management provides the necessary structure to adequately implement nutrient control and reduction measures.

The second group, made up of the Czech Republic, Hungary, Romania and Bulgaria includes countries where specific mechanisms or inter-ministerial structures for nutrient reduction do not yet exist. However, there are several relevant national inter-ministerial bodies with responsibilities for water pollution abatement and environmental protection. Most of these structures also deal with diffuse sources of pollution, the implementation of pollution reduction measures or approval of new investments in the water sector.

Finally, in the remaining Danube countries, the nutrient reduction and control issues do yet not represent a high priority for the policy makers.

All countries have developed proposals for the improvement/creation of inter-ministerial mechanisms capable of responding to nutrient reduction concerns. These proposals refer to both legal and institutional frameworks and include:

(i) the implementation of nutrient-related legislation based on EU Directives and ratified International Conventions,
(ii) the development of instruments for diffuse pollution characterization and control,
(iii) the elaboration of rules for good farming practices and good practices in drinking water protection zones,
(iv) the application of an integrated approach to the management of water resources on the river basin level.

The Danube countries believe that cooperation between governments, local communities and Non-Governmental Organizations in relation to the nutrient reduction is very important. Nutrient reduction issues are included directly or indirectly in the mandate and the responsibilities of the local authorities, farm enterprises, industrial plants and environmental NGOs. In the frame of river basin organizations the majority of the countries sets good examples of cooperation between the government, inter-ministerial bodies, local communities and NGOs.

The activities of the PDF-Block B investigation have raised awareness and provided important legitimacy to the concept of inter-ministerial mechanism for nutrient reduction and helped move it into the mainstream of policy debate for its implementation. The forthcoming Danube Regional Project will reinforce national initiatives and contribute towards the setting up of adequate nutrient reduction mechanisms at the national and regional levels.

(ii) Policies and legislation relating to nutrient control and reduction

After a critical period of transition, all DRB countries have in the meantime developed a comprehensive hierarchic system of short, medium and long-term environmental policy objectives, strategies and principles which usually reflect the key country-specific environmental problems and the sector priorities on national and regional levels.

Despite the diversity of problems, interests and priorities across the DRB, the Danube countries share certain values and principles relating to the environment, conservation of natural resources and nutrient control and reduction. The most essential and commonly accepted principles are:

- the precautionary principle;
- best available technology (BAT) - best environmental practice (BEP);
- control of pollution at the source;
- the "polluter pays" principle and the related "user pays" principle;
- the principle of integrated approach (e.g. River Basin Management approach);
- the principle of shared responsibilities, respectively the principle of subsidiarity;
- the implementation of EU Directive 76/464/EEC on pollution caused by certain dangerous substances.

None of the DRB countries currently has an explicitly formulated nutrient reduction program. Measures and activities with relevance to nutrient reduction are usually sub-components of or are substantially incorporated in other programs.

While Germany and Austria have legislation in compliance with “highest environmental standards” on nutrients (e.g. EU Nitrate Directive), they have not yet fully implemented / enforced these legislation. The adequacy of the legal framework for sound environmental management of water resources of the other

countries has to be viewed against the political, economic, administrative and social changes that have taken place in the particular DRB countries during the previous years of transition.

Thus, the relevant legislation is in most DRB countries currently undergoing substantial reform and modernization. Given the complexity of the task, the reform can be expected to take several years before the relevant legislation has reached an acceptable level of compliance with the international requirements.

Except for the two EC member states, Germany and Austria, all other DRB countries consider the harmonization of national environment and water-related legislation with EU legislation as the most essential prerequisite for long-term sustainable nutrient control and reduction in their countries. In the Czech Republic, Hungary and Bulgaria, this harmonization is incorporated in an ongoing program and considered as a short-term task.

In Romania, Slovakia and Slovenia, the harmonization of relevant national laws with EU legislation or standards is expected to be achieved in the short, respectively medium term. For the final implementation of the Urban Waste Water Treatment Directive, an adjustment period of approximately 10 to 20 years is considered to be necessary.

In other countries - Moldova, Ukraine and the war-impacted countries Croatia, Bosnia-Herzegovina and Yugoslavia - the status of the water sector legislation is still unsatisfactory.

From the point of view of nutrients, the most essential issue is the substantial transposition of:

- the proposal for a Council Directive establishing a framework for community action in the field of water policy – (97/C 184/02) COM(97) 49 final - (particularly regarding the River Basin Management task);
- the Council Directive 91/271/EEC of May 1991 concerning urban waste-water treatment;
- the Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources.

Regarding the particular issue of control, respectively the out-phasing of phosphate-containing detergents, the current situation in the particular DRB countries indicates that there is a substantial potential for phosphorus reduction in most DRB countries, which should be followed up on.

(iii) Nutrient reduction programs 2000 – 2005 and related investments

(a) Point Source Projects and anticipated nutrient reduction

Within the elaboration of the PDF-B project all 13 DRB countries have provided a draft national lists of priority projects that are supposed to be ready for implementation in the coming 5-year period and can be considered as a reasonable basis for the elaboration of comprehensive Nutrient Reduction Action Plans as part of the ICPDR Joint Action Program.

According to the available data, the total investment required for the 244 priority point source projects for all 13 DRB countries amounts to about EUR 4100 million.

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

	Municipal	**Industrial**	**Agricultural**	**Wetlands**	**Total**
No of Projects	157	44	21	22	244
Million EUR	3404	267	113	318	4,111
(%)-Structure	83%	7%	3%	8%	100

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

	GER	**A**	**CZ**	**SK**	**HUN**	**SLO**	**CRO**	**B&H**	**YUG**	**BUL**	**RO**	**MOL**	**UA**	**TOT**
No of Proj.	11	4	11	20	24	24	11	12	40	21	24	31	10	243
Mill. EUR	231	264	144	118	687	384	433	176	783	125	204	493	67	4,111
(%)	6	6	4	3	17	9	10	4	19	3	5	12	2	100

The anticipated composition of the funding of the identified priority projects across the DRB countries is as follows:

Funding component	Million EUR	(%) – Structure
National funding contribution	1662	41 (%)
International loans:	1016	25 (%)
International grants:	575	14 (%)
Not secured funding components:	848	21 (%)
Total:	4101	100 (%)

According to the available data provided by the national reports, total pollution reduction as a result of the implementation of the proposed priority point source projects including waste water from urban areas, which are not connected to WWTP, is anticipated to be in the following ranges:

	Municipal	Industrial	Agricultural	Wetlands	Total
No of Projects	157	44	21	22	244
N (t/y)	32 200	3 800	6 700	16 600	59 300
P (t/y)	7 400	3 700	1 100	1 800	14 000
BOD (t/y)	181 000	39 700	9 500	5 900	236 000
COD (t/y)	351 000	78 700	15 000	32 400	477 000

(b) Nutrient reduction from agricultural non point sources of pollution

Based on the available data, the assessment of the anticipated nutrients reduction from agricultural non point sources of pollution shows values ranging between 10 and 25 % for nitrogen and between 3 and 25 % for phosphorus.

To ensure significant nutrient loads reduction from diffuse sources of pollution, the Danube countries have identified measures that primarily address:

(i) Policy and legislation-related actions: the improvement of national policies and legislation regarding the utilization of fertilizers and livestock waste and approximation of national legislation to relevant EU legislation and standards;

(ii) Institutional strengthening and capacity building: the elaboration and enforcement of guidance on the application of the agro-environmental schemes;

(iii) Raising public awareness and strengthening public participation in nutrient reduction initiatives: the development of pilot projects for the implementation of alternative methods.

The estimates of the nitrogen and phosphorus reduction for point sources and non point sources as presented in the national contributions are summarized below:

Country	Nutrient loads (DWQM)		Anticipated national emission reductions				Expected national load reduction	
			Point Sources		Non Point Sources*			
	N (t/y)	P (t/y)	N (%)	P (%)	N (%)	P (%)	N (t/y)	P (t/y)
Germany	68,000	3,700	6.0	2.0	10.0	3.0	10.891	185
Austria	77,000	3,800	5.1	10.6	10.0	3.0	11.650	518
Czech Republic	15,000	1,100	7.3	5.6	10.0	3.0	2.591	95
Slovakia	30,000	1,700	8.6	8.6	15.0	10.0	7.074	318
Hungary	31,000	3,800	21.6	40.1	15.0	10.0	11.358	1.902
Slovenia	20,000	1,300	26.2	62.6	15.0	10.0	8.233	944
Croatia	23,000	2,200	6.6	10.9	15.0	10.0	4.959	459
Bosnia-Herzegovina	36,000	2,200	13.1	38.8	10.0	10.0	8.300	1.073
Yugoslavia	72,000	7,000	9.4	69.3	10.0	10.0	13.993	5.550
Bulgaria	23,000	4,000	11.7	15.0	10.0	10.0	4.983	999
Romania	121,000	12,700	8.3	8.6	10.0	10.0	22.120	2.361
Moldova	8,000	1,400	86.3	64.6	5.0	5.0	7.298	975
Ukraine	28,000	4,000	1.7	1.6	10.0	5.0	3.286	265
Total	552,000	48,900	10.3	23.8	10.9	8.2	116.736	15,643

* Percentage for expected reduction of nutrient emissions from non-point sources for groups of countries has been estimated, based on available information and data for expected emission reduction following the implementation of new policies and legislation in line with EU Directives

The results indicate that with the implementation of structural (projects) and non-structural measures (policies and legislation), the total annual nutrient reduction will be about 117.000 tons for nitrogen and 16.000 tons for phosphorus. It can be further assumed that about half of the nitrate reduction will come from the rehabilitation of point sources (waste water treatment) and the other part from nutrient reduction from diffuse sources, in particular from change of agricultural practices. The GEF Regional Project will provide the necessary support to the ICPDR and the participating countries to realize these goals and to contribute essentially to the improvement of water quality and ecosystems in the Danube River Basin and consequently in the Black Sea.

1.6 Mechanisms for Regional Cooperation for the Protection of Water and Ecological Resources in the Danube River Basin

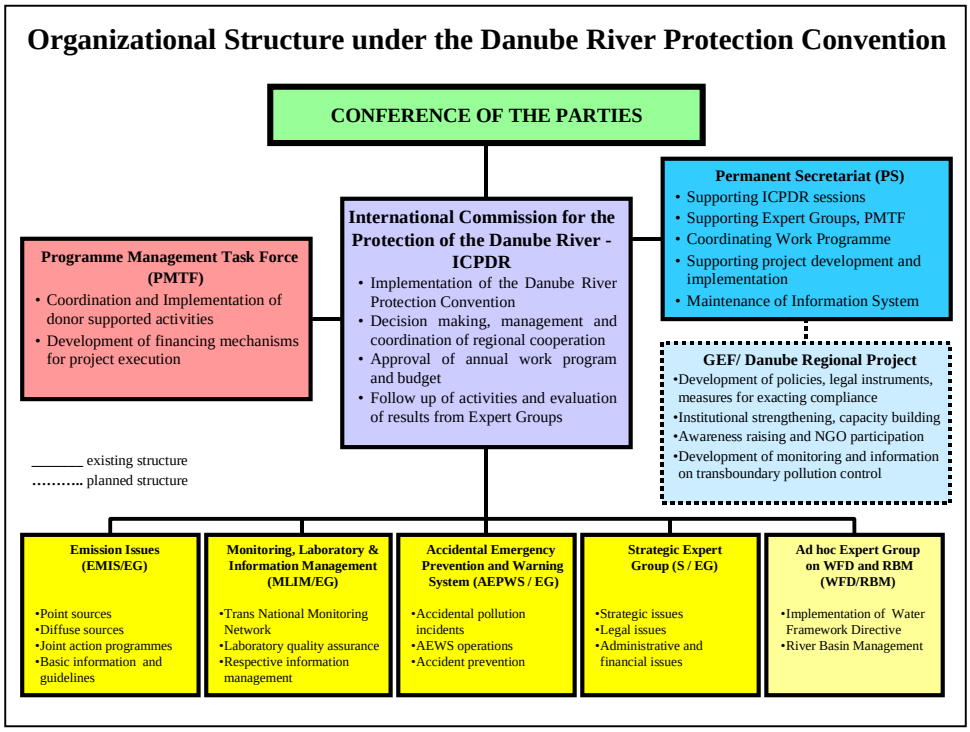
(i) The Danube River Protection Convention

The Danube River Protection Convention is a legally binding instrument, which provides a substantial framework and a legal basis for cooperation between the contracting parties, including enforcement. The main objective is the protection and sustainable use of ground and surface waters and ecological resources, directed at basin-wide and sub-basin-wide cooperation with transboundary relevance. Joint activities and actions are focused on coordination and enhancement of policies and strategies, while the implementation of measures lies mainly with the executive tools at the national level. The Strategic Action Plan provides for 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 Danube River Protection Convention.

Eleven of the 13 DRB countries eligible to join the Convention have signed with the European Commission the Danube River Protection Convention (DRPC), which came into force in October 1998, and most have ratified it.

(ii) The International Commission for the Protection of the Danube River (ICPDR)

Recognizing individually and responding in common to the obligations of the DRPC, the Danube countries have established the International Commission for the Protection of the Danube River to strengthen regional cooperation. It is the institutional frame not only for pollution control and the protection of water bodies but it also sets a common platform for sustainable use of ecological resources and coherent and integrated river basin management. The Commission has created several Expert Groups to strengthen the proactive participation of all Contracting Parties and associated countries in the design and implementation of joint measures for pollution reduction, including nutrients, and water management.



1.7 Cooperation between the ICPDR and the International Commission for the Protection of the Black Sea (ICPBS)

(i) Findings of the Joint Ad-hoc Technical Working Group of the ICPDR and the ICPBS

In 1998, the ICPDR and the ICPBS established a joint Working Group, which analyzed the causes and the effects of eutrophication in the Black Sea. In its findings, the Working Group indicated that the loads entering the Black Sea from the Danube had fallen in recent years due to the collapse of the economy of many transition countries formerly attached to the Soviet Block, the measures undertaken to reduce nutrient discharges in the upper Danube countries, in particular Germany and Austria, and a decline in the use of phosphate in detergent.

The Working Group concluded that in spite of the evidence of recovery in the Black Sea ecosystems, there were still concerns that the nutrient discharges to the Black Sea – in line with the expected economic growth – were likely to rise again unless action was taken to implement nutrient discharge control measures as part of economic development strategies.

The Working Group went on to define the possible objectives and strategies, which are presently included in the Memorandum of Understanding between the ICPDR and the ICPBS, as follows:

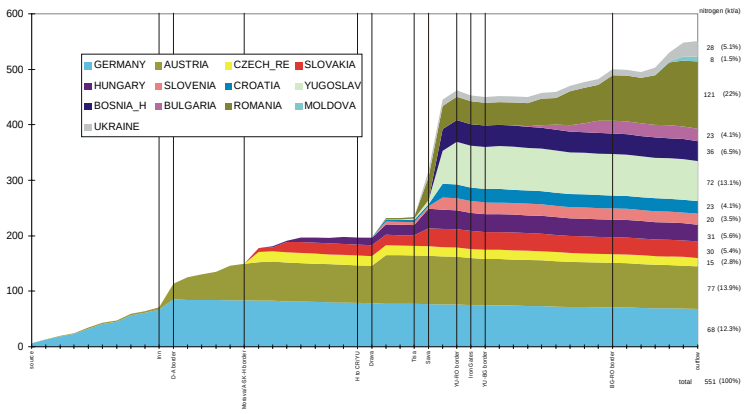
- ⇒ the long-term goal is defined as a recovery of the Black Sea ecosystems to conditions similar to those in 1960;
- ⇒ as a mid-term goal, measures should be taken to prevent discharges of nutrients and hazardous substances from exceeding the levels of 1997;
- ⇒ inputs of nutrients and hazardous substances should be assessed, monitoring and sampling procedures should be determined, and the results should be reported.

(ii) Analysis of Point Sources and Non-Point Sources of Pollution with particular Attention to Nutrient Transport to the Black Sea

In the frame of the Pollution Reduction Program, over 500 hot spots were identified for the municipal, industrial and agricultural sectors. The geographical distribution of hot spots in the Danube River Basin indicates a clear concentration of municipal and agricultural hot spots in the upper Drava and Sava Sub-river Basins, in the Lower Tisza and around Belgrade and in the central part of Bosnia-Herzegovina. In the Carpathian Mountains of the upper Tisza and Prut Sub-river Basins, important mining and industrial hot spots have been identified, from which recent accidents - the cyanide spill of Baia Mare and the sludge containing heavy metals from Baia Borsa - have been reported. (Annex 7 – Maps: Distribution of Hot Spots in the Danube Sub-River Basins).

Applying the Danube Water Quality Model (DWQM), the total nutrient transport from point and non-point sources, to the Black Sea was analyzed, indicating a total of 551 kilotons of nitrogen and 48,9 kilotons of phosphorus reaching annually the Black Sea. Studies undertaken in the frame of the Danube Environmental Program suggest that about half of the nutrient discharged internally in the basin come from agriculture (diffuse sources of pollution), slightly more than one quarter from domestic sources, an additional larger share comes from industry and the remainder from "background" sources.

Annual Nitrogen Load in the Danube (in kt/y), by countries of origin, with a high estimate for the in stream denitrification (= removal rate)



2 Project Objectives

The long-term development objective of the proposed Regional Project is to contribute to sustainable human development in the DRB through reinforcing the capacities of the participating countries in developing effective mechanisms for regional cooperation and coordination in order to ensure protection of international waters, sustainable management of natural resources and biodiversity.

In this context, the proposed GEF Regional Project should support the ICPDR, its structures and the participating countries in order to ensure an integrated and coherent implementation of the Strategic Action Plan 1994 (SAP 1994), the Common Platform and the forthcoming JAP and the related investment programs in line with the objectives of the DRPC.

The overall objective of the Danube Regional Project is to complement the activities of the ICPDR required to provide a regional approach and global significance to the development of national policies and legislation and the definition of priority actions for nutrient reduction and pollution control with particular attention to **achieving sustainable transboundary ecological effects** within the DRB and the Black Sea area.

Further, the Danube Regional Project shall facilitate project implementation in providing a framework for coordination, dissemination and replication of successful demonstration that will be developed through the implementation of investment projects (World Bank-GEF Strategic Partnership).

Taking into account the basic orientations of the Danube/Black Sea Basin Programmatic Approach, the following immediate objectives can be designed to respond to the overall development objective:

(1) OBJECTIVE : Creation of sustainable ecological conditions for land use and water management

Output : Nutrient reduction policies, legal instruments and measures for exacting compliance are developed and implemented in all Danube River Basin countries.

Approach : Supporting the ICPDR and the DRB countries in developing of appropriate policies and legal instruments to improve water management and water quality control with particular attention to toxic substances and nutrient reduction (e.g. agricultural, industrial, and municipal policy and legislative reforms, wetlands management) and in developing of mechanisms for exacting compliance with policies and legislation.

Assuring policy coherence to the guidelines of the Global Program of Action on Control of Land Based Sources of Pollution, with particular emphasis on the strategic goals regarding mitigation of transboundary effects and rehabilitation of the Black Sea.

(2) OBJECTIVE : Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the DRB

***Output* :** Institutional and organizational mechanisms for transboundary cooperation in pollution control and nutrient reduction are developed and operational at the regional and national level.

***Approach* :** Supporting the ICPDR and its Expert Groups to improve their institutional, administrative and technical capacities to assure basin wide harmonization of water quality regulatory standards including specific provisions for nutrient reduction; to further develop specific regional information system and mechanisms for transboundary pollution monitoring and evaluation considering EU regulations (WFD) and GEF IW M&E indicators (process, stress reduction, environmental status).

Organizing workshops and training courses on institutional, administrative, technological and economic issues for individuals and participants from ministries, public authorities and private institutions with responsibilities related to the use, control and impacts of nutrients in the DRB, respectively their effects on the Black Sea.

(3) OBJECTIVE : Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems

***Output* :** Community based projects for nutrient reduction and awareness campaigns are prepared and implemented all DRB countries and public concern and response to ecological issues has increased.

Approach : Supporting NGOs in professional, institutional, administrative and funding issues to boost their capacities for active participation in transboundary pollution control with particular attention to nutrients and certain toxic substances.

In this context, NGO activities shall be reinforced through the setting up of a Small Grants Program ("applied" awareness raising) to provide financial support for community based nutrient reduction projects.

(4) OBJECTIVE : Reinforcement of monitoring, evaluation and information systems for transboundary pollution control and nutrient reduction

***Output* :** A Danube Basin wide system for monitoring and evaluation and is developed and operational, using indicators for process, stress reduction and environmental status in line with EU and international reporting requirements, allowing at the same time follow-up and evaluation of project implementation results.

***Approach* :** supporting the development and the upgrading the monitoring and information systems, which are of significant importance for transboundary cooperation in water quality and water management and of common interest for the Danube and the Black Sea countries. Particular attention will be given to the development of indicators (process, stress reduction and environmental status indicators) to monitor progress of project implementation. For this purpose special methodologies will be developed for assessment of sediments (heavy metals, toxic substances) and nutrient removal capacities of wetlands. Also economic mechanisms will be analyzed to encourage investments in nutrient reduction measures.

3 Project description

The compilation of immediate objectives indicates the broad spectrum of project components and activities to be dealt with in the framework of the proposed Danube Regional Project in order to fulfil its role as an integral part of the proposed Danube/Black Sea Basin Programmatic Approach.

In line with the immediate objectives, the particular project components of the proposed Regional Project can be grouped as follows:

1. Creation of sustainable ecological conditions for land use and water management;
2. Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin;
3. Strengthening of public involvement in environmental decision making awareness and reinforcement of community actions for pollution reduction and protection of ecosystems;
4. Reinforcement of monitoring, evaluation and information systems for transboundary pollution control and nutrient reduction.

3.1 Creation of sustainable ecological conditions for land use and water management

In most central and downstream DRB countries, the development of water-related policies and legal instruments are still in the phase of preparation and it is obvious that there are significant deficiencies in the existing policy framework. Most of these countries are in the EU accession process and have to adjust their legal frame to meet the EU directives and regulations and assure compliance. For issues that are of common interest for the DRB countries and of special importance for water quality and water resource management, particularly related to nutrients, seven project components have been identified to be carried out in the frame of the present Regional Project.

(i) Development of policy guidelines for river basin and water resources management

Considering the DRPC´s mandate to assure sustainable water management in the DRB and taking into account the central role of the river basin management in implementing the new EU Water Framework Directive, there is a substantial need to facilitate the development of river basin management plans in the Danube River Basin and in its sub-basin areas. These river basin management plans will have to deal with nutrient reduction from point and non- point-sources.

To assure efficient implementation of the EU Water Framework Directive and a coherent approach to River Basin Management, the ICPDR has set up a specialized Expert Group to develop guidelines for the elaboration of the River Basin Management Plans, their implementation and the development of institutional and legal mechanisms. Two workshops are currently being organized in the frame of the EC Phare assistance program and case study materials are being prepared. These elements will be integrated in the proposed activities of the GEF-DRP.

The activities of the EG shall be supported by international expertise in order to develop standardized methodologies and guidelines for sub-river basin management plans and a methodology for the aggregation of the sub-river basin management plans to a basin wide management concept. This should take into consideration EU-WFD and GEF IW strategies to develop guidelines for particular sub-river basins to reinforce transboundary cooperation.

The main activities to be supported and carried out by relevant ICPDR Expert Group can be summarized as follows:

- defining sub-river basins for planning purposes on geographic and socio-political grounds;
- analyzing river basin management practices in selected DRB countries;
- developing river basin management tools, using in particular satellite remote sensing for analysis of surface materials and pathways of pollution;
- identifying typical deficiencies and needs in relation to the requirements of the new EU-Water Framework Directive with particular attention to nutrient reduction;

- developing methodology, standards and guidelines for the preparation of sub-river basin management plans (ref. EU WFD, Annex VII, June 2000);
- developing methodology for the aggregation of sub-river basin management plans to a basin-wide management concept;
- introducing appropriate structures at national, regional and basin wide level (ICPDR) to assure efficient transboundary cooperation;
- developing strategies for the particular DRB countries to bring them in compliance with the new EU Water Framework Directive with particular attention to nutrient reduction;
- organizing sub-regional workshops with participants from relevant ministries, local administration and the private sector to reinforce transboundary cooperation for the development and implementation of Sub-river-basin Management Plans.

(ii) Reduction of nutrients and other harmful substances from agricultural non-point sources through appropriate agricultural practice and organic farming

As indicated in chapter 1.7 it is assumed that about half of nutrient discharged internally in the Danube Basin to the fine web of the river network comes from agriculture. The project will support a series of measures to operationalize actions for reduction of non-point source pollution from agriculture. A first analysis should be based on and take into account the findings and recommendations of the field-based demonstration programs conducted in Eastern European countries with the support of the European Union and GEF. The project will identify specific policy and legal measures to assist the participating countries in meeting their obligations to reduce agricultural non-point source pollution. For EU accession countries, specific programs will be developed that will assist them in meeting their obligations under the EU Environment and Water Framework Directives, as well as the requirements of the important Nitrate Directive (91/676/EEC).

The main focus of this assistance is to identify the main legal, administrative, institutional and funding deficiencies and develop priority reform measures required to support integration of environmental concerns into farm management, including improvements in the handling of manure and sludge from livestock operations, minimization of chemical fertilizers and pesticides, promotion of improved tillage methods, management of restored wetlands and buffer zones as well as farmer education and outreach activities.

For this purpose, the following actions should be considered:

- assisting the countries in designing new agricultural non-point source pollution control policies and legislation and compliance and enforcement plans in line with the existing and emerging (including EU accession) national legislation;
- reviewing relevant legislation, the current state of its enforcement, the existing programs and pilot projects for appropriate agricultural practices and organic farming in selected DRB countries;
- identifying agrochemicals (fertilizers, pesticides, etc.) that are relevant in terms of utilized quantities, misuse of application, environmental impacts and potential for reduction;
- identifying the main legal, administrative, institutional and funding deficiencies;
- developing and assessing alternative concepts for the introduction of appropriate agricultural practices and organic farming in the central and downstream DRB countries by taking into account the traditional, country-specific social and economic issues with particular attention to the transition process and the gradual recovery of the agricultural sector;
- introducing necessary changes in legislation which will lead to a significant reduction in the use of agrochemicals and ensure compatibility with the EU directives and guidelines;
- implementing necessary complementary measures on the national level (training, financial support, institutional and legislative measures);
- organizing a series of workshops with participants from relevant ministries, private organizations, farmers´ associations, etc., dealing with country-specific legal and institutional reform measures to facilitate the introduction of appropriate agricultural practices and organic farming in specific DRB countries.

(iii) Development of pilot projects for a reduction of nutrients and other harmful substances from agricultural point-sources by introduction of appropriate manure handling

This project component has to be considered as complementary to the above-described activity, particularly focusing on adequate handling of manure considering agro-technical and economic issues. Agricultural point sources, including inappropriate handling of manure, are estimated to supply 2,5% and 6,8 %, respectively, of the nitrogen and phosphorus reaching the Danube River Basin.

Relevant sites for demonstration projects should be identified in the frame of the above-mentioned sub-regional agro-policy workshops.

The following steps should lead to an efficient implementation of this project component:

- assisting the countries with the development of new nutrient point source control policies and legislation and compliance and enforcement mechanisms in line with existing and emerging (including EU accession) national environmental legislation;
- reviewing legislation and actual state of enforcement at country level;
- analyzing existing programs and pilot projects for animal farming and manure handling and share information with similar activities planned under the GEF Baltic Regional Project;
- developing alternative concepts for the introduction of appropriate animal farming practices and manure handling in the central and downstream DRB countries by taking into account national demand and international markets;
- implementing the necessary complementary measures on national level (information on best available techniques, financial support, etc.);
- preparing and developing for the central and lower DRB countries typical pilot projects;
- implementing pilot projects with the cooperation of interested farmers and associations and assure monitoring and evaluation of progress;
- disseminating component results to farming communities in the basin through appropriate networks;
- organizing a series of demonstration workshops with participants from the farming community, banking institutions and government agencies.

(iv) Policy development for wetlands rehabilitation and remedial measures in response to inappropriate land use (resulting from settlement, agricultural activities, hydraulic structures, etc.)

In the case of conflicting land use, priorities were in the past usually set on extension and intensification of human settlement and economic activities, with the consequence that ecologically sensitive areas/wetlands were steadily impacted in their function or completely disappeared.

The present project component shall address questions in relation to typical situations of inappropriate land use resulting from municipal settlement, agricultural activities, hydraulic structures and their impact on ecologically sensitive areas and wetlands and effects of transboundary pollution with particular attention to nutrients and toxic substances. Standardized concepts shall be developed for the rehabilitation of sensitive areas/wetlands, and required policy, legal and institutional reforms shall be proposed for specific cases.

The main tasks of the proposed activity can be summarized as follows:

- assisting the countries to prepare new land use and wetlands rehabilitation/protection policies and legislation and compliance and enforcement mechanisms in line with the existing and emerging (including EU accession) environmental legislation.
- analyzing typical situations of inappropriate land use that leads to significant transboundary pollution from nutrients and toxic substances in the DRB;
- developing alternative concepts for harmonization of land use with particular consideration of conflicting environmental and economic issues and identify required legal and institutional reforms;
- implementing required actions and measures (regulatory and legal issues, economic fines and incentives, compensation payments, etc);
- defining pilot projects for each of the identified types of conflicting land use with particular attention to wetlands rehabilitation;
- organizing a workshop on policy and legal issues of land rehabilitation and wetlands management with participants from relevant ministries of the particular DRB countries.

(v) Industrial reform and development of policies and legislation for clean industrial production towards nutrient and toxic substance reduction

Industrial reform is one of the most urgent and most critical issues in most central and lower DRB countries and can certainly not be efficiently initiated by an environmental program of this scale. Considering that in transition countries the industrial production is actually very low, it is not surprising, that industry generates only respectively 5 and 8 % of nitrogen and phosphorus that enter the Danube River.

Taking into account the expected revitalization of industries, it is necessary to focus on industrial policies and on a review of legislation in order to ensure that environmental considerations are adequately taken into account and that mechanisms for compliance are put in place.

The project should also address the problem of industrial nutrient hot spots in relation to Significant Impact Areas (SIA) as identified in the Transboundary Analysis, to determine transboundary nutrients and toxics pollution from particular industries and identify possible solutions (clean technologies, treatment process, etc.) to reduce the emissions of toxic substances and nutrients in particular.

The subject of this component is closely related to the work of the EMIS/EG., therefore the project component should closely cooperate with the envisaged UNIDO-TEST MSP to ensure that interventions at the policy/legislative and at the technical (demonstration) levels are complementary. In this context, the execution of the project component through an IAA or sub-contract with UNIDO should be considered.

The following steps should lead to an efficient implementation of this project component:

- assisting countries in development of new industrial nutrient/toxics pollution control policies and legislation and compliance enforcement mechanisms in line with existing and emerging (including EU legislation) national legislation.
- reviewing the data and information on the current status of industrial production technologies involving nitrogen and phosphorus in the DRB countries;
- reviewing the policies and legislation for industrial pollution control and the actual state of enforcement at country level;
- collecting information on relevant EU-legislation and international standards and assist DRB countries to adapt national legislation accordingly;
- developing the necessary complementary policy and legal measures for the introduction of clean technologies (regulatory and legal issues, awareness raising, financial fines and incentives, etc.).
- identifying, in relation to Significant Impact Areas (SIA), the industries that have significant impacts on water resources and water quality and implement measures for reduction of water pollution with nutrients and toxic substances in the most cost-effective way;
- developing for the different categories of DRB countries alternative concepts for a step-by-step introduction of environment-friendly production technologies in industries utilizing or producing nitrogen and/or phosphorus, taking into account the restricted financial capabilities of the industrial enterprises and the economic affordability for the particular countries;
- organizing a series of workshops for industrial managers, banking institutions and government agencies, supplying them with information on the best available technologies, financial support, etc.

(vi) Policy reform and legislative measures for the application of economically and socially acceptable waste water tariffs, focusing on nutrient reduction and control of toxic substances

It is obvious from the National Review Reports and investment programs that the funding of water sector-related investments and the cost coverage for the operation of WWTP in the DRB countries largely depends on economically and socially acceptable water and waste water tariffs. An assessment of water and waste water tariffs is currently being conducted with financial support from the Austrian Environmental GEF Trust Fund. Based on the results of this study, policy and legislative measures shall be developed for interested DRB countries to assure the introduction of economically and socially acceptable tariffs. This project component shall help to improve the investment possibilities for reduction of nutrients and toxic substances.

The implementation of new policy and legislative measures can make a substantial contribution towards increasing internal funds and releasing public budgets and can thus facilitate the provision of baseline contributions for new investment projects in transboundary nutrient reduction and pollution control.

Based on the results of the assessment of Water and Waste Water Tariffs, the following actions shall be considered:

- assisting the countries in the development of new tariff systems to facilitate cost covering operations of WWTP with third stage for nutrient reduction and to encourage respective investment decisions;
- analyzing significant deficiencies in international comparison (level of tariffs, status of metering, collection rate, etc);
- developing for the different categories of DRB countries alternative concepts for tariff reforms, considering cost covering models also for the low income segments of the population;
- assessing for the particular DRB countries the potential for additional revenues from water and wastewater services as additional funding sources for water sector operation and investment;
- proposing recommendations for phased implementation of tariff reforms;
- organizing a workshop with participants from relevant ministries, municipalities and the private sector on the introduction of economically and socially acceptable waste water tariffs with particular attention to the operation of treatment plants with nutrient reduction stage.

(vii) Implementation of effective systems of water pollution fines and incentives, focusing on nutrients and toxic substances

It is obvious from the National Review Reports that most DRB countries are not currently applying an effective system of fines for water pollution and respective incentives in comparison to industrialized Western European countries. The basic idea is, therefore, to assist the interested DRB countries to develop an effective system of fines and incentives to promote rational utilization of water resources and to prevent or reduce effects of environmental pollution, specifically nutrients and certain toxics. Within the broad framework of fines and incentives particular attention should be given on discharges of nutrients and toxic pollutants with significant transboundary effects.

The main tasks of the proposed activity can be summarized as follows:

- assisting the countries in preparation of new systems of fines for water pollution and/or respective incentives.
- analyzing the present systems of fines for water pollution (nutrients, toxics) and respective incentives in the DRB countries and identifying significant deficiencies in international comparison (types of fines and incentives, effectiveness, collection procedures, exemptions, etc);
- identifying the most essential and effective fines and incentives, assess the main problems for their introduction and develop mechanisms to assure compliance;
- assessing the willingness and institutional and economic capabilities of the particular DRB countries for a reform of pollution fines and incentives;
- developing for the different categories of DRB countries alternative concepts for the introduction of balanced and effective systems of pollution fines and incentives;
- organizing a workshop on the application of pollution fines and incentives, in conjunction with the workshop on tariffs, with participants from relevant ministries, municipalities and the private sector.

(viii) Recommendations for changes in legislation concerning phosphorus reduction by means of restricted detergent standards

The EU policies and legislation do not provide for phosphate detergents phase-out plans. The present situation in the EU countries is based on voluntary arrangements set by the industry.

The basic idea of this project component is to:

- examine the existing legislation and to assess the stakeholders´ reform willingness;
- develop phosphorus restricting standards and a timeframe for phosphorus detergents phase-out plans taking into account EU Directive 73/404/EEC and 73/405/EEC concerning detergents methods of testing, covering anionic, non-ionic, cationic and amphoteric surfactants ;
- develop proposals for enforcement and compliance (economic, financial incentives);
- assist particular countries to introduce policy and legislative reforms;
- evaluate the results.

The country-specific recommendations and implementation schedules should be mostly based on the experiences from Western European countries and should take into account the institutional and especially the economic capability of the particular DRB countries.

3.2 Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin

One of the essential and positive results of the previous GEF-Project was the successful support provided for institutional strengthening and capacity building of government, local administration and the private sector (NGOs) in the participating DRB countries.

In order to ensure efficient implementation of the ICPDR policies and related Investment Program defined under the DRPC, it is recommended that national capacities of the central and the sub-ordinate national level should be reinforced. In this context, exchange of information, reinforcement of environment research and standardization of methods and parameters are essential to strengthen regional cooperation and joint decision making in implementing the SAP.

The respective project components defined in the frame of the present Regional Project are primarily designed to support the ICPDR in establishing an appropriate Management and Information System and in establishing appropriate indicators for evaluation and monitoring of program and project implementation (process, status and stress reduction). Secondly, the Expert Groups established under the ICPDR should be supported in carrying out the particular tasks and activities clearly dealing with nutrient reduction and transboundary issues, which might not be adequately covered without GEF assistance.

(i) Development of operational tools for monitoring, laboratory and information management and for emission analysis from point and non-point sources of pollution with particular attention to nutrients and toxic substances

The subject of this component is professional and financial support aimed at reinforcing the activities related to emission control (EMIS/EG) and monitoring of water quality, laboratory and information management (MLIM/EG), particularly aiming at improvement, further development and application of:

- the Danube Water Quality Model;
- the Modeling Nutrient Emissions in River Systems (MONERIS);
- the Analytical Quality Control (AQC).

If adequately designed and provided with reliable data, these two models and the quality assurance program are essential tools for a profound assessment of transboundary nutrient and toxic pollutant flows as well as an assessment of the expected effects of nutrient and other pollution reduction measures. The present nutrient reduction plans can be adjusted and the implementation of policy measures can be focused on specific areas or sectors.

Further assistance is proposed to strengthen other activities in the MLIM/EG and the EMIS/EG, with particular attention to the following nutrient/pollution reduction and transboundary issues:

- harmonization of water quality standards and quality assurance as well as methods for water sampling and laboratory analysis for nutrients and toxic substances;
- database and emission inventory for point and non point sources of phosphorus and nitrogen;
- sources and amounts of transboundary pollution for substances on the list of EU priority chemicals.

In this context, consultation and working meetings of the Expert Groups for particular research work (modeling, development of nutrient data base, etc) should be arranged in cooperation with international consultants specialized in the respective field of work. For this purpose, special TOR have to be defined by the Expert Groups.

To assure the coherence and viability of data collection in all Danube countries, it would be necessary to provide training and additional laboratory and monitoring tools, in particular for those countries that:

- still need to be brought to the same operational level (Ukraine, Moldova) or
- are not yet integrated in the MLIM and EMIS systems (Bosnia-Herzegovina, FR Yugoslavia).

(ii) Improvement of procedures and tools for accidental emergency response with particular attention to transboundary emergency situations

The recent accidental pollution of the Tisza river from mining activities and the effects of NATO intervention in Yugoslavia, the bombing of petrochemical and other industrial complexes in the Danube River Basin, lad to a contamination of ground water and rivers with toxic substances (PCBs, PAHs, cyanide, etc.), the accumulation of heavy metals in sediments and to a destruction of ecosystems (fish kill). Hence, urgent support is needed to improve preventive and emergency response measures.

The subject of this project component is to support development activities for accident emergency warning and prevention of accidental pollution. The experience from the recent accidental pollution events indicates that the basically established AEPWS/EG needs substantial improvement before it can become a satisfactory tool for adequate management of transboundary contamination from catastrophic events.

In this context, technical assistance and reinforcement of operational conditions are required for:

- The design of preventive measures, adaptation of national legislation and improve compliance with safety standards;
- the reinforcement of operational conditions in national stations and geographical extension of the AEPWS in Moldova, Ukraine, Bosnia & Herzegovina and the FR of Yugoslavia[1)];
- the completion of the inventory presently available only for the upper Tisza River Basin, and evaluation of all high accidental risk spots in all countries in the Danube River Basin considering that similar accidental "hot spots exist in many transition countries;
- the functional upgrading and calibration of the Danube Basin Alarm Model (DBAM), to monitor pollution transport of toxic substances in the Danube River system and to the Black Sea;
- the organization of workshops to reinforce cooperation in accidental emergency warning and development of preventive measures.

(iii) Support for reinforcement of ICPDR Information and Monitoring System (DANUBIS)

The Danube Information System (DANUBIS) has been developed with the financial support from the Austrian Government (computer equipment and software) and from the Austrian Environmental Trust Fund, administered by UNOPS (concept and development of the Information System). The system is presently installed at the Permanent Secretariat of the ICPDR (Vienna International Center) and fully operational.

Further professional/technical and financial support is needed for the build-up and extension of DANUBIS to assure adequate administration of the information and reporting obligations under the DRPC. A new interactive web-site is to be adapted ensuring a smooth flow of textual and geographic information between the national level and the central unit at the ICPDR Secretariat to achieve permanent monitoring and exchange of information on pollution control and nutrient reduction measures and to disseminate information to the public on policy and legal matters related to nutrient reduction: GEF nutrient reduction policies, relevant EU guidelines and directives, other information from international initiatives/conventions concerning land based sources of pollution, agricultural practices, fertilizer application, phosphate free detergents, etc.

This would require that:

- The ICPDR information System, used by its expert groups and other operational bodies, would be fully integrated in the frame of the Water Pollution Prevention and Control Model (WPPCM);
- All Contracting Parties of the ICPDR and other participating countries would be linked to DANUBIS, which applies the development and implementation of national linkages and establishment of operational units to communicate also in case of accidental emergency situations;

[1] The FR of Yugoslavia is situated in an extremely important geographical position in the center of the Danube River Basin where the most important tributaries, Tisza, Sava and Drava are joining the Danube. During the recent accidental pollution the AEWS has also informed Yugoslavia and cooperated with its technical staff to monitor the effects of accidental pollution. The UNEP Balkan Task Force and the EU-Baia Mare Task Force have closely cooperated with Yugoslavian authorities in the assessment of accidental pollution and the design of emergency measures.

- DANUBIS would be reinforced through the implementation of an interactive web-site to integrate further textual, numerical and digital mapping information and to fulfill all the requirements of the work of the Nutrient Reduction Program (communication, monitoring, public information, etc.);
- An extensive training program would be launched and series of workshops be organized at different users level and in different regions of the DRB to train and assist futures users in the best use of the tools made available by the system.

It should be noted that the ICPDR assure regular maintenance and up-dating of the information with particular attention the Data Base developed within the frame of the previous GEF project (Danube Pollution Reduction Program.

(iv) Implementation of the Memorandum of Understanding between the ICPDR and the ICPBS relating to discharges of nutrients and hazardous substances to the Black Sea

This implies assisting the ICPBS and the ICPDR in further implementation of the Memorandum of Understanding, identifying appropriate modalities for the implementation and developing a monitoring system for commonly agreed process, stress reduction and environmental status indicators for the Black Sea.

The main tasks for the implementation of the MoU can be summarized as follows:

- organizing joint Danube-Black Sea meeting to approve and sign MoU by both Commissions;
- developing a joint work program for MOU implementation;
- defining and agreeing on status indicators to monitor nutrient transport from the Danube and other sources and consequent and change of ecosystems in the Black Sea;
- defining and implementing a common AQC system and monitoring and sampling procedures;
- defining and establish reporting procedures;
- re-establishing and organizing regular meetings of the Joint Danube-Black Sea Working Group to evaluate progress of nutrient reduction and recovery of Black Sea ecosystems.

(v) Training and consultation workshops for resource management and pollution control with particular attention to nutrient reduction and transboundary issues

In order to assure sustainability of appropriate resources management and pollution control and to assure the same level of understanding throughout the Danube River Basin, it is necessary to provide training in the fields of environmental analysis and planning, management and impact assessment for nutrient reduction and control of toxic substances through workshops, consultation meetings and study tours for participants from government, local administration, NGOs and other stakeholder from the private sector (professional associations, opinion leaders, etc.). Besides this, additional materials and equipment should be supplied and technical assistance should be provided where necessary.

Besides the workshops on policy development and legislation to be organized in the frame of each of the above-described project components, training courses should be provided in the following fields:

- policy development and legal frame for transboundary cooperation in nutrient reduction and control of toxic substances;
- technical and legal issues of river basin planning and transboundary water resources management in line with the new EU Water Framework Directive with a view to ensuring effective nutrient reduction;
- technical and legal issues (land reclamation) of wetland restoration and management to assure nutrient removal;
- innovative technologies for municipal and industrial waste water treatment; use of sewage and animal waste as fertilizer to reduce nutrient emissions;
- technical and legal issues of management and control of use of fertilizers and manure;
- preparation of documents for nutrient reduction projects with international co-funding and application of GEF criteria concerning incremental cost calculation.

The last training course should also focus on methodology and standards for economic and financial analysis of bankable projects with international co-funding; and in particular on identification and documentation of nutrient reduction projects according to GEF requirements and guidelines regarding baseline / incremental cost, transboundary effects, etc.

The proposed training courses should be organized with the assistance of experienced international consultants in a series of three-to-five-day workshops and should also be run in the national languages at least twice during the project period of 5 years. Regional Workshops designed to reinforce transboundary cooperation should be attended by at least two or three participants from each DRB country. One essential task will be to prepare, prior to the workshops, adequate documents and case study materials for dissemination among the participants.

3.3 Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems

All activities outlined in the previous chapter on institutional strengthening and capacity building contribute to awareness raising in a broader sense. The publication through the mass media and through publications of the ICPDR (Danube Watch etc.) of the results of ICPDR´s and its Expert Groups´ activities, in particular the results of workshops and consultation meetings, constitute an excellent opportunity to raise public awareness. These actions of awareness raising should primarily address representatives from central and local governments and from administration and - to a lesser extent - from the private sector.

The Regional Environmental Center (REC) in Hungary has elaborated a project proposal for GEF financial support for the Building of Environmental Citizenship to Support Transboundary Pollution Reduction in the Danube. Public awareness and public participation, as well as cooperation with the government and administration, shall be demonstrated in the frame of two pilot projects in Hungary and Slovenia.

The present project component has a much wider spectrum and geographical outreach but should nevertheless benefit from the REC initiative and establish close cooperation during its implementation period.

The objective of the present project component is to enhance awareness raising in the civil society and the reinforcement of the role of NGOs in water management and pollution reduction (nutrients and toxic substances) with particular attention to transboundary cooperation and river basin management. This can best be achieved through practical measures and the support of community-based activities for rational resources management, transboundary cooperation and pollution control with particular attention to nutrient reduction. Financial support should be provided to assist the implementation of community-based demonstration projects in various Danube River Basin countries (Small Grants Program).

Cooperation of the civil society and in particular the local NGOs is essential to achieving the objectives and goals of the ICPDR and the new Danube Regional Project. Particular attention will be given to the reinforcement and the role of the Danube Environmental Forum (DEF), which is the umbrella organization of the NGOs in the Danube River Basin. The previous GEF Project has supported the organization of NGO cooperation at the national level and the establishment of the Danube Environmental Forum.

Within the frame of the present project component, the support for awareness raising should be linked with the reinforcement of NGO activities and should focus on measures of pollution control, nutrient reduction and transboundary cooperation. In this context, the following project components have been identified as particularly promising:

(i) Support for institutional development of NGOs and community involvement

This should come in the form of technical/professional assistance and financial support for the Danube Environmental Forum and for national NGOs working on transboundary pollution issues and nutrient reduction, focusing on:

- support for the DEF Secretariat for operation, communication and information management;
- organization of consultation meetings and training workshops on nutrients and toxics issues;
- publishing special NGO publications in national languages on nutrients and toxic substances;
- organization of training courses for the development of NGO activities and cooperation in national projects (nutrient reduction).

(ii) Applied awareness raising through community based Small Grant Program

It is necessary to provide administrative, professional and financial support for the continuation of the GEF-Small Grants Program, mainly focusing on the performance of:

- environmental assessment related to nutrients and toxic substances and effects of transboundary pollution;
- demonstration activities and awareness campaigns for sustainable land management and pollution reduction (nutrients) in the agricultural, industrial and municipal sectors;
- small-scale community-based investment projects for pollution control, rehabilitation of wetlands, best agricultural practices, reduction in the use of fertilizers, manure handling, improvement of village sewer systems, etc.

(iii) Organization of public awareness raising campaigns on nutrient reduction and control of toxic substances

- conceptualization and implementation of public awareness raising campaigns on nutrients issues;
- development and production of materials for public press and mass media on nutrients and toxics;
- support to the publication of scientific documents and regular papers or special issues on water management and pollution reduction with particular attention to nutrient issues and Black Sea recovery.

3.4 Reinforcement of monitoring, evaluation and information systems for transboundary pollution control and nutrient reduction

The development and the upgrading the monitoring and information systems, is of significant importance for transboundary cooperation in water quality and water management and of common interest for the Danube and the Black Sea countries. Particular attention will be given to the development of indicators (process, stress reduction and environmental status indicators) to monitor progress of project implementation. For this purpose special methodologies will be developed for assessment of sediments (heavy metals, toxic substances) and nutrient removal capacities of wetlands. Also economic mechanisms will be analyzed to encourage investments in nutrient reduction measures.

Regarding specific issues on monitoring and preparation of information, the following project activities have been proposed to be carried out within the frame of the Danube Regional Project:

(i) Development of indicators for project monitoring and impact evaluation

To assure efficient monitoring and evaluation of project implementation and to document project and program achievements, it is necessary in line with EU and the existing international requirements to establish an operational system of indicators (process, stress reduction and environmental status) under the ICPDR. It should be considered, that under the forthcoming EC Water Framework Directive criteria for the assessment of the ecological status of the rivers and for monitoring the achievement of good ecological status will have to be applied. The following tasks should be carried out under this component:

- developing and operationalizing a monitoring and evaluation system to follow project and program implementation in financial and technical terms (pollution reduction) and assess environmental impact (water quality, health, recovery of ecosystems, etc.);
- reviewing indicators for emission control and water quality monitoring with particular attention to nutrients and toxic substances;
- developing progress indicators for the monitoring of project implementation (GEF- supported nutrient reduction projects);
- developing impact indicators (process, stress reduction, environmental status) to evaluate environmental effects of policy and program implementation (nutrient reduction);
- analyzing ecological characteristics and development of bio-indicators;
- preparing a manual on the use and application of monitoring and impact indicators.

(ii) Analysis of sediments in the Iron Gate reservoir and impact assessment of heavy metals and other toxic substances on the Danube and the Black Sea ecosystems

In the frame of the UNEP-Habitat-Balkan Task Force/ICPDR Expert Mission to Yugoslavia in August 1999, a first sampling of sediments in the Iron Gate was carried out to analyze heavy metals and other toxic substances as a consequence of NATO air strikes on industrial and other targets in the Danube River Basin. The present project component should extend the first analysis and provide a complete coverage of the quality analysis of the sediments of the Iron Gate including toxic substances (heavy metals) and phosphorus. Based on the results of the analysis, adequate measures should be developed to undertake precautionary measures to prevent future deterioration of water quality in the Danube and negatives effects on the Black Sea ecosystems.

This study should be carried out as a special activity of the MLIM/EG and should cover the following tasks:

- collecting and reviewing the existing data and information on present situation;
- assessing the main types and quantities of dangerous substances;
- assessing the potential environmental impacts on the Danube and the Black Sea;
- forecasting development for a period of 20 years;
- discussing possible precautionary and rehabilitation measures for the Danube and the Black Sea;
- preparing recommendations for dealing with this problem in the forthcoming decade (measures to be included in the joint action program of the ICPDR);
- proposing further monitoring programs.

(iii) Monitoring and assessment of wetlands´ nutrient removal capacities

In the frame of the Pollution Reduction Program, the rehabilitation and management of about 600.000 hectares of wetlands and floodplains in the DRB have been proposed. In the World Bank-GEF Strategic Partnership, the restoration or creation of wetlands is one of the three types of projects eligible for funding. It is generally recognized that the removal capacity varies considerably according to water flow, concentration, loads and natural conditions of the wetlands. In the frame of the proposed implementation of wetland rehabilitation schemes under the Partnership, monitoring systems would be installed to show effective nutrient removal. These results would considerably improve and disseminate world-wide the knowledge about nutrient removal through wetlands rehabilitation and would define the technical and economic parameters for efficient wetlands management.

This proposed project component, which would support a larger GEF need in the frame of Targeted Research, should cover the following tasks:

- classifying the wetlands in the DRB by categories and define rehabilitation pilot projects and observation sites;
- defining the methodological approach for assessment of nutrient removal capacities of wetlands and flood plains;
- defining and implementing an observation program to assess the annual nutrient removal capacity (tons of N and P per ha) for each category of wetland for a period of 20 years (5 years covered by the present project);
- evaluating the aggregated nutrient removal capacities/potentials of the wetlands proposed for restoration (DPRP) and floodplains, taking into account the results of the “Danube Green Corridor” and other investment programs under the Partnership;
- developing optimized wetlands management programs to assure maximum nutrient removal under best environmental, social and economic conditions;
- preparing relevant regulations for wetland restoration to assure implementation of projects with maximum nutrient removal capacities.

(iv) Danube Basin feasibility study and consultation process on economic instruments for nutrient reduction

In the frame of the study on Financing Pollution Reduction Measures in the DRB – Present Situation and Suggestions for New Instruments, the implementation of a system of nutrient discharge quotas and auctions has been proposed. Considering the diversified economic conditions of the riparian countries and the particular relation of the Danube countries to the Black Sea new approaches, in particular economic instruments would be necessary to achieve efficiency in nutrient reduction reforms. Whenever the principle of "pollutant auctions" is presently not compatible with the EU water quality guidelines, which are based on the emission principle, interesting and innovative approaches could be developed and possibly introduced in the forthcoming EU policies to solve the nutrient problem. Further, the results would also contribute to support a larger GEF need for targeted research in developing economic instruments for nutrient reduction.

It should further be noted that the present study proposed for the Danube River Basin (considering in particular the EU policies and directives) is complementary to a similar study conducted by the World Bank in the frame of the Black Sea Regional Project, which shall develop the concept of nutrient emission trading taking into account the specific conditions of the Black Sea countries.

For this purpose, it is proposed to prepare an EU-Danube specific assessment covering the following main issues:

- a review of the existing concepts of successful "pollutant auctions" or "pollution trading" in the water and air pollution sector in the US and Europe;
- a study of the general possibility to establish economic instruments for nutrient reduction under the EU policies and directives in the Danube River Basin;
- an assessment of the main problems and the interest of the particular DRB countries (polluting and receiving countries) to establish discharge quotas and to develop economic solutions for nutrient reduction;
- the initiation of a "thinking" process within the EU on how to introduce in medium and long term economic instruments (economic sanctions, incentives, nutrient emission trading, auctions, etc)
- the development of alternative concepts and timeframe for the introduction of economic instruments for nutrient reduction at the river basin or regional level;
- Discuss concepts with EU and participating countries (polluting and receiving countries) and develop timeframe for implementation of economic instruments for nutrient reduction in EU regulations and national legislation.

4 Sustainability and Participation

The proposed Danube Regional Project has to be seen as a logical continuation of the GEF assistance to the Danube Environmental Program. The Danube Pollution Reduction Program has established the necessary conditions for the ICPDR and for the DRB countries to assure efficient implementation of policies and measures for pollution reduction and resource management. The proposed Danube Regional Project can build on a very favorable framework for sustainability and participation and the findings and recommendations of:

- the SAP 1994 as the agreed-upon policy document of the EPDRB focussing on policies and strategies for pollution control and resource management,
- the Common Platform for the Development of National Policies and Actions for Pollution Reduction under the DRPC, representing a summary of policies and actions developed in the frame of the Pollution Reduction Program,
- the Danube Pollution Reduction Program (DPRP) and the Inventory of Investment Projects (Database) providing the operational basis for promoting investments for pollution reduction measures.

Institutional capacities and arrangements: With its entry into force on 22 October 1998, the Danube River Protection Convention (DRPC), to which the ECE-Convention for the protection and use of transboundary waters (Helsinki Convention 1992) is the framework, became the overall legal instrument for cooperation and transboundary water management in the Danube River Basin. Since mid-1999 all bodies of the ICPDR, the Expert Groups and the ICPDR Permanent Secretariat have been fully operational. The primary objective of the proposed Danube Regional Project is to support the ICPDR in order to achieve a well-balanced integrated implementation of the Common Platform, the PRP and the forthcoming JAP. It is assured that there is a full developed and functioning institutional framework for project performance.

As the ICPDR is permanently sustained via financial contributions of the member states, the GEF intervention would support and strengthen the ICPDR and its Expert Groups to improve technical and management capacities for the implementation of nutrient reduction measures identified in the Pollution Reduction Program.

The participation of the contracting parties including the European Community, the signatory countries (Ukraine) and other cooperating countries (Bosnia-Herzegovina and Yugoslavia) of the DRB is assured through the work of ICPDR-Steering Group and the through the Conference of Parties, which is the highest body for the implementation of the Danube River Protection Convention.

Government commitment : All countries in the DRB have actively participated in the frame of the elaboration of the Pollution Reduction Program and have provided all necessary information for the preparation of the present Project Brief (PDF-Block B actives) and thus demonstrated their interest in and commitment to pollution control, nutrient reduction and sustainable water management. Further, it should be noticed that central and downstream Danube countries are actually preparing for accession to the European Union and are therefore committed to applying the European water directives and guidelines for pollution reduction with particular attention to the EU Nitrate Directives, the Urban Waste Water Directives and the implementation of the new EU Water Framework Directives.

Legal Frame: The Danube River Protection Convention is a legally binding instrument, which provides a solid framework and a legal basis for cooperation, including enforcement. The International Commission for the Protection of the Danube River (ICPDR) has been established according to the Danube River Protection Convention provision (Art.18) and has its seat in Vienna, Austria. The ICPDR and its bodies are responsible for the implementation of the Danube River Protection Convention.

Stakeholder participation: The development of NGOs and the creation of the Danube Environmental Forum as an umbrella organization for all Danube NGOs was an essential contribution of the previous GEF assistance to assure public participation in the planning and plan implementation process. Further, the GEF Small Grants Program has facilitated the implementation of community-based projects in the middle and lower Danube countries. It is thus assured that the existing structures of local NGOs and the DEF will play an important role in the implementation of the Pollution Reduction Program and in the development and application of new policies and regulation to improve water quality and to assure rational use of resources.

5 Lessons Learned

Some important lessons have been learned from a range of GEF and other environmental planning projects in the region and elsewhere, and especially from the essential one – the GEF-supported Danube Pollution Reduction Program, which has recently been completed.

The first phase of the DPRP in particular indicated how time-consuming and difficult it is to set up institutional structures, information networks and to introduce new approaches of planning in countries that are in a continuous process of political and economic transition. Based on this experience, it is recommended that – wherever possible - the existing institutional settings, networks and methodological tools should be used for the performance of the Danube Regional Project. Special emphasis should be put on the maximum utilization of the participatory approach, which is now fully understood and accepted by the participating countries.

A general lesson learned from other projects in the region is an awareness of the difficulty of getting projects endorsed and implemented when there is not a clear coordination and cooperation between the different implementing agencies and potential IFIs. In addition, inter-ministerial coordination is another common and serious problem for project implementation when coordinating structures are missing at national levels. The involvement and cooperation of all relevant governmental bodies, in particular the Ministry of Finance, Ministry of Agriculture, Land Reform, Foreign Affairs, etc. is essential in the early project preparation phase.

In many transition countries the policy and legal frame is presently being reviewed and adjusted, in particular unclear land ownership and uncontrolled resource management (forestry, mining, etc.) are leading to environmental degradation and damages. Compliance with environmental laws and regulations is in many countries not controlled and is consequently very low. This is partially due to structural and organizational weaknesses and more to budgetary limitations.

Another lesson learned is that project activities conducted by international expert teams without close integration and cooperation with experts from the relevant Danube countries are often not recognized. In the frame of the Environmental Program for the Danube River Basin many project components have failed to be sufficiently coordinated with the ICPDR and its Expert Groups and thus did not respond to the expressed needs of the beneficiaries. It is therefore recommended that all project components should be carried out under the guidance of the ICPDR and in close cooperation with its expert bodies, that highly qualified national experts/consultants – available in all DRB countries – should be contracted.

A particular feature impacting basin-wide project activities is that the different categories of DRB countries still have clearly different institutional, administrative and economic capabilities and are confronted with qualitatively different requirements. Particular attention should be given on the one hand to the EU accession countries that have reached a high level of competence and organization and, on the other hand, to the central Danube Basin countries as Bosnia-Herzegovina and Yugoslavia, which have been affected by the war and political instability.

6 Project Budget and Financing

6.1 GEF Budget Contribution

The total financial requirements for the performance of the proposed Danube Regional Project are USD 15.0 million. According to the provisional estimates the allocation of the budget by cost categories is anticipated as follows:

BUDGET OF THE DRP BY COST CATEGORIES	USD	Percentage
Permanent professional project staff	1,200,000	8,0 %
Subcontractors / International consultants from DRB countries	2,589,240	17,3 %
National consultants from the DRB countries	2,360,000	15,7 %
Project Support Staff	750,000	5,0 %
Workshops, training courses, meetings	2,200,760	14.7 %
"GEF- Small Grants Program"	2,000,000	13.3 %
Awareness raising and public information material	800,000	5.3 %
Equipment for nutrient monitoring/information	700,000	4.7 %
Project operational costs	700,000	4.7 %
Organizational support for DEF and NGOs	500,000	3.3 %
UNOPS/ICPDR Support cost	1,200,000	8.0 %
Total	**15,000,000**	**100.0 %**

The allocation of the budget by the main project components according to the budget proposal (Annex 4) is as follows:

	BUDGET BY MAIN PROJECT COMPONENTS	USD	Percentage
(1)	Creation of sustainable ecological conditions	5,653,100	37.7 %
(2)	Capacity building and reinforc. of transboundary cooperation	2,749,360	18.3 %
(3)	Strengthening of public involvement and reinforc. community actions	4,304,500	28.7 %
(4)	Reinforcement of monitoring, evaluation and info. systems	1,093,040	7.3 %
	UNOPS/ICPDR Support cost	1,200,000	8.0 %
	Total	**15,000,000**	**100,0 %**

From the GEF budget contributions 37.7 % is earmarked for the development of policies and legal instruments for nutrient reduction and will be invested directly in supporting the work at the national level. 18.3 % of the budget is aimed at strengthening regional cooperation for implementing the ICPDR policies and related investment programs (JAP) and at reinforcing monitoring and information capacities. In both first project components a total of 25.6 % is allocated for training courses and workshops.

The budgetary allotment for awareness raising and NGO activities is 28.7 % out of which 46.5 % is for the implementation of community-based nutrient reduction projects to assure participation of the civil society in nutrient reduction activities. 7.3 % of the GEF budget is earmarked for strengthening monitoring, evaluation and information systems. 8.0 % is earmarked as support cost for the executing agencies.

	Detailed Budget by Project Components and Assigned Baseline Costs	Project Budget (USD)		Baseline Costs
		GEF	ICPDR	
1	**Creation of sustainable ecological conditions for land use and water management**			
	General project costs	1,653,000		1,000,000
1.1	Development of policy guidelines for river basin management	1,078,080	2,970,000	55,840,000
1.2	Reduction of nutrients and harmful substances from agricultural non-point sources	809,040		41,850,000
1.3	Reduction of nutrients from agricultural point sources/manure handling	809,040		41,850,000
1.4	Policy development for wetlands and remedial of inappropriate land use	440,760		23,490,000
1.5	Industrial reforms and policies and legislation for "clean" industrial production	689,080		39,915,000
1.6	Policies for application of acceptable waste water tariffs	248,840		18,950,000
1.7	Implementation of water pollution fines and incentives focusing on nutrients	218,840		11,625,000
1.8	Legislation concerning phosphorus reduction and restricted detergents standards	194,420		9,310,000
	Subtotal	**6,141,100**	**2,970,000**	**243,830,000**
2	**Capacity building and reinforcement of transboundary cooperation**			
	General project costs	780,500		6,000,000
2.1	Monitoring, laboratory and information management	561,600	2,722,500	55,800,000
2.2	Accidental emergency response to transboundary situation	397,360	1,905,750	39,060,000
2.3	Reinforcement of ICPDR information and monitoring systems	695,900	2,994,750	61,380,000
2.4	Implementation of the Memorandum of Understanding for ICPDR and ICPBS	50,000	544,500	11,160,000
2.5	Training and consultation workshops for management and pollution control	512,000		344,500,000
	Subtotal	**2,997,360**	**8,167,500**	**517,900,000**
3	**Strengthening of public involvement in env. decision making and reinforcement of community actions**			
	General project costs	651,500		25,250,000
3.1	Institutional development of NGOs and community involvement	625,000	358,050	6,310,000
3.2	Community based "Small Grants Program"	2,246,000	138,600	22,530,000
3.3	Public Awareness raising campaigns on nutrient reduction	1,156,000	658,350	117,000
	Subtotal	**4,678,500**	**1,155,000**	**54,207,000**
4	**Reinforcement of monitoring, evaluation and information systems**			
	General project costs	445,000		
4.1	Development of indicators for project monitoring and impact evaluation	142,800	907,500	18,600,000
4.2	Analysis of sediments in Iron Gate and impact on Black Sea ecosystems	184,000	990,000	13,950,000
4.3	Monitoring and assessment of nutrient removal capacities of wetlands	237,240	1,320,000	18,800,000
4.4	Consultation process on economic instruments for nutrient reduction	174,000	990,000	13,950,000
	Subtotal	**1,183,040**	**4,207,500**	**46,700,000**
	PDF-B	**350,000**		
	PROJECT TOTAL	**15,350,000**	**16,500,000**	**881,237,000**

6.2 Contributions from the ICPDR and participating countries:

Total ICPDR and Danube country contributions : 16,500,000 USD

- **The ICPDR, Permanent Secretariat** will facilitate overall project implementation with an annual operational budget of 800.000 USD for a period of 5 years : **4,000,000 USD**
- **The ICPDR Expert Groups** will assure the implementation of project components. The cost for experts, operation, participation and communication can be estimated at 1.200.000 USD per year, for a period of 5 years : **6,000,000 USD**
- **The participating countries** will contribute in the frame of joint activities under the DRPC to project implementation through financial and in kind contributions (experts, equipment, operational cost), estimated at 100.000 USD per country and year, for 13 countries and 5 years : **6,500,000 USD**

6.3 National Capital Investments (JAP) and Development Costs

The Joint Action Program (JAP) has been developed under the ICPDR, and is in most cases coherent with the Five-Year Nutrient Reduction Action Plan prepared in the frame of the PDF-Block B activities (see Annex 8-3). The following costs for policy and legislation development and for capital investments for municipal and industrial waste water treatment and wetland restoration have been identified :

Total capital investments[2)] : 4.11 billion €

- Assured national funding : 1.66 billion €
- Assured international loans : 1.02 billion €
- Expected grants (national and EU) : 0.58 billion €
- Additional funding to be raised : 0.86 billion €

Total cost for non-structural measures : 0.51 billion €

It should be noted that from the planned investments of 4.11 billion €, about 3.25 billion € have been made available from national funding sources, whereas 0.86 billion € remain to be raised. 510,989,000 € are estimated for developing adequate monitoring and enforcement systems in the frame of the EU accession process[3)] and are considered as non-structural investments to be mobilized by all Danube countries.

6.4 World Bank Partnership and UNDP

W.B. Nutrient reduction projects :

- Loans 210.000.000 USD
- GEF Grants: 70.000.000 USD

} **280,000,000 USD**

UNDP country programs (not complete) 300.000 USD

6.5 Investments from EU for environmental measures (accession countries)

The following investment from the EU is for a period of seven years to assist accession countries to improve environmental management and to build or modernize waste water treatment plants and other technical structures; it can be assumed that about half of the Phare money is earmarked for non-structural measures:

Total investment for a period of 7 years [4)] 13.5 billion €

- EU Stability Pact for Southeastern Europe (Danube countries) : 3.0 billion €
- Phare for environmental protection (Danube countries) : 5.3 billion €
- ISPA funds for environment and infrastructure (Danube countries) : 3.5 billion €
- SAPARD funds for agricultural sector (Danube countries) : 1.7 billion €

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2) 3.74 billion US$, respectively 2.96 billion USD available and 0.74 billion USD to be raised
3) Sector Case Study, WRc, Report CO 3291/2, 1993
4) 12.28 billion US$, applied exchange rate : 1 € = 0.91 USD

6.6 Assistance from bilateral sources

- USAID (amount allocated for environmental/sustainable development projects in 2000) **162,000,000 USD**
- Danish Environmental Protection Agency (DEPA) } not available
- Netherlands (Wetlands Ukraine) }

6.7 Assistance provided through private sector organizations (international and Danube NGOs)

Total Investments:	**29,437,000 USD**
o Regional Environmental Center (REC): support for national NGO activities (environmental, sustainable development, awareness raising)	22,500,000 USD
o World Wide Fund for Nature (WWF): Implementation of environmental projects in cooperation with governments and national NGOs	5,800,000 USD
o Danube national NGOs (ECCG-Romania, Distelverein-Austria)	1,137,000 USD

6.8 Total contributions for environmental protection and nutrient reduction in the Danube River Basin

The total allocations earmarked for pollution control and nutrient reduction in the Danube River Basin fall into two categories:

1. **Non-structural projects:** Reinforcement of legislation and institutional mechanisms for transboundary cooperation (Danube Regional Project for nutrient reduction):

• GEF UNDP: Danube Regional Project :	15,000,000 USD
• ICPDR and participating countries for Danube Regional Project:	16,500,000 USD
• Bilateral Assistance (USAID) and UNDP (not complete):	42,300,000 USD
• International private organizations and NGOs	29,437,000 USD
• National investments for monitoring and enforcement systems	465,000,000 USD
• EU program for Danube accession countries, 5 years period (10 % of Phare program is estimated for non structural measures)	344,500,000 USD

The GEF budget and the contributions from the ICPDR and the participating countries are considered as "incremental" costs for the overall development and implementation of new policies and legislation in line with GEF operational principles for international waters and with EU environmental directives. The non-structural "baseline" cost is 881.2 million US$, out of which the Danube countries will contribute 52.8 % and the EU in the frame of the Phare program 39.1 %. Other types of bilateral assistance and NGOs will provide 8.1 % of the total costs. However, it has to be taken into account that the actual figures are incomplete and that real bilateral and NGO contributions in the coming 5 years will be a great deal higher than indicated.

2. **Structural projects:** Investments in waste water treatment facilities, wetland restoration, the reduction of pollution from non-point sources (agricultural pilot projects, etc):

• GEF World Bank Partnership Program :	280,000,000 USD
• Bilateral Assistance (USAID, other not available) :	120,000,000 USD
• Joint Action Program (assured funds from Danube countries) :	2,960,000,000 USD
• EU program for Danube accession countries, 5-year period (ISPA, SAPARD, Stability Pact, 90% Phare for structural measures) :	9,002,737,000 USD

In the frame of the Joint Action Program (5-Year Nutrient Reduction Plan), the Danube countries contribute from own resources and internal loans 23.9 % to finance structural projects (municipal and industrial waste water treatment plants, wetlands restoration, agricultural projects etc.). The EU provides the biggest share of 72.8 % of investments to support national efforts of EU accession countries. The contribution of the World Bank Partnership represents 2.3 % of investments for structural projects and is complementary to the UNDP/GEF Danube Regional Project. Other contributions, e.g. from the EBRD or the EIB, are not taken into account.

3. Summary of capital investments by country and expected nutrient reduction

Country	Assured Funding	Funds to be raised	Total Investments	Expected Reduction (t/y)	
				N	P
Germany	231,000,000		231,000,000	4,091	74
Austria	264,000,000		264,000,000	3,950	404
Czech Republic	101,000,000	43,000,000	144,000,000	1,091	62
Slovakia	54,000,000	65,000,000	118,000,000	2,574	147
Hungary	682,000,000	5,000,000	687,000,000	6,708	1,522
Croatia	12,000,000	421,000,000	433,000,000	5,233	814
Slovenia	382,000,000	2,000,000	384,000,000	1,509	239
Bosnia & Herzegovina		176,000,000	176,000,000	4,700	853
Yugoslavia	785,000,000		785,000,000	6,793	4,850
Bulgaria	37,000,000	88,000,000	125,000,000	2,683	599
Romania	204,000,000		204,000,000	10,020	1,091
Moldova	493,000,000		493,000,000	6,901	905
Ukraine	5,000,000	62,000,000	67,000,000	486	65
TOTAL	**3,250,000,000**	**862,000,000**	**4,111,000,000**	**56,739**	**11,625**

4. Summary of investments for non-structural projects / programs by country and expected nutrient reduction

Country	Funding Scheme (USD)						Expected Reduction (t/y)	
	Governments	UNDP	USAID	EU	NGO	Total	N	P
Germany	51,290,900					51,290,900	6,800	111
Austria	43,400,000				1,583,300	44,983,300	7,700	114
Czech Republic	15,781,800	95,000	2,455,000	14,681,900	2,983,300	52,632,900	1,500	33
Slovakia	29,309,100	125,000	5,454,000	27,266,400	2,983,300	69,190,200	4,500	170
Hungary	57,490,900		5,454,000	53,484,000	2,741,700	97,005,300	4,650	380
Croatia	9,581,800		3,954,000	8,914,000	2,741,700	47,596,200	3,000	130
Slovenia	18,036,400	80,000	2,455,000	16,779,300	2,741,700	54,630,700	3,450	220
Bosnia & Herzegovina	16,345,500		3,954,000	15,206,200	2,500,000	54,118,200	3,600	220
Yugoslavia	50,727,300		2,455,000	47,191,800	2,741,700	87,241,700	7,200	700
Bulgaria	21,981,800		3,954,000	20,449,800	3,466,700	60,721,200	2,300	400
Romania	127,381,800		6,955,000	118,503,800	3,503,700	169,158,200	12,100	1,270
Moldova	6,200,000		2,455,000	5,767,900	483,300	40,456,100	397	70
Ukraine	17,472,700		2,455,000	16,254,900	966,600	52,212,100	2,800	200
TOTAL	**465,000,000**	**300,000**	**42,000,000**	**344,500,000**	**29,437,000**	**881,237,000**	**59,997**	**4,018**

Total Expected Nutrient Reduction from capital Investments and investments for non-structural projects	**116,736 tons N / y**
	15,643 tons P / y

7 Incremental Costs

The description and calculation of baseline and incremental costs can adequately be done for technical investment projects designed for the protection and management of international waters, respectively the conservation of biodiversity. In these cases it is possible to determine for each expected output and for each activity the respective baseline and incremental costs and analyze the resulting domestic and global benefits.

In the case of the Danube Regional Project, "incremental" costs are considered to be the GEF project cost (including PDF-B) of 15,350,000 US$. The special contributions of the ICPDR and the participating countries for implementing the DRPC, which amount to 16,500,000 US$, are considered as "incremental" co-financing costs. The Project, with a total financial support of 31,850,000 UD$ will reinforce - in addition to the investments described under "baseline" cost - the capacities of the ICPDR and the participating countries to address adequately the problem of nutrient reduction. "Incremental" costs are specially defined to strengthen transboundary cooperation under the DRPC for the development of national policies and legislation and the identification of jointly implemented priority actions for nutrient reduction leading to the restoration of the Black Sea ecosystems.

For the definition of "baseline" costs directly related to the development of adequate monitoring and enforcement systems at the national level, the results of the WRc Sector Case Study from 1993[5)] have been taken into account. According to this report, the present systems of monitoring are budget inadequate, staff resources are overstretched and laboratory facilities overloaded. The report estimates the annual cost of compliance for Bulgaria 10 million €, Hungary 12 million €, Romania 28 million € and Slovakia 6 million € based on per capita cost of 1.16 € at 1990 prices. Based on this information, the total cost for compliance, also for those Danube countries, which are not yet in the approximation process but which are undertaking special efforts to upgrade their legislation and mechanisms for compliance with international and EU standards has been estimated at 465,000,000 US$ for the coming 5 years.

Other "baseline" costs, with a total of 416.2 million US$, but only indirectly related with project activities, can be identified in relation to non-structural projects for the development of policies, legislation, institutional mechanisms and enforcement systems, which are financed in the frame of technical assistance projects from bilateral and international sources :

- Bilateral Assistance (USAID) and UNDP (not complete): 42,300,000 USD
- International private organizations and NGOs 29,437,000 USD
- EU program for Danube accession countries, 5 years period 344,500,000 USD
  (10 % of the Phare Program is estimated for non structural measures)

Considering that the approximation process of the Danube countries will take between 10 and 20 years, including the introduction of new environmental standards in line with international and EU directives, the "incremental" support of the Project will enhance the process with particular attention to nutrient reduction and will considerably accelerate the development and implementation of policies, regulations and adequate monitoring and enforcement systems for nutrient emissions and reduction of nutrient loads discharged into the Black Sea.

Structural projects concerning investments in waste water treatment facilities, wetland restoration, agricultural pilot projects and other environmental measures, contributing mostly to pollution reduction from point sources or in-stream pollution reduction, amount to 12.4 billion US$. These capital investments are not contributing to project implementation and therefore are not considered as baseline cost.

[5)] Sector Case Study, WRc, Report CO 3291/2, 1993

8 Cost-effectiveness

Taking into account the social and economic development which will take place in the coming 10 to 20 years in the Danube Transition Countries and considering the EU approximation process and the need to adapt environmental standards to international and EU directives, it is evident that investments in environmental protection and management of resources are necessary to assure a sustainable development in the countries of the Danube River Basin.

It is to be expected that most Danube countries - mainly those in transition – will in the next five years see their GDP grow at an annual rate of 2 to 4 % ending up in five years from now at 10 to 20 % above its current level. This economic growth will be the result of economic recovery in transition countries and new investments in industry, agriculture and services. The development and implementation of adequate environmental standards and mechanisms for compliance is, therefore, essential to assure sustainable development in the region.

The implementation of projects for waste water treatment in the urban and industrial sectors (including agro-industries) is part of national investment programs for pollution reduction from point sources, summarized in the Five-Year Nutrient Reduction Action Plan and the Joint Action Plan of the ICPDR respectively. According to these documents, capital investments will be about 4.11 billion € (3.74 billion US$). Considering EU engagements for accession countries and other multilateral and bilateral assistance in the form of soft loans and grants (World Bank/GEF), the additional financial assistance for implementation of structural projects will be 9.4 billion US$. These investments will lead to an annual reduction of 56,700 tons of nitrogen and 11,600 tons of phosphorus representing 10.3 % and 23.9 % respectively of the total nutrient loads discharged into the Black Sea.

Non-point sources of pollution in relation to land use and agricultural activities represent about half of all nutrients, in particular nitrogen, discharged into the Black Sea. It is assumed that through the development and implementation of policies, legislation and mechanism for compliance, nutrient emissions from non-point sources (land use and agriculture) can be considerably reduced. The actual estimations in the Five-Year Nutrient Reduction Action Plan show that development and implementation of appropriate policies and legislation will lead to a reduction of about 60,000 tons of nitrogen and 4,000 tons of phosphorus, representing 10.9 % and 8.2 % respectively of total nutrient loads discharged into the Black Sea.

The corresponding investments for the development of new policies, legislation and monitoring and enforcements systems in line with international and EU directives are 913.1 million US$, out of which the major part – 465.0 million US$ or 50.9 % – is considered as national contributions and part of direct baseline costs. 344.5 million US$ or 37.7 % is provided from the EU Phare program to the accession countries and 71.7 million US$ or 7.9 % is provided in the frame of international, bilateral and non-governmental assistance. These investments for technical assistance are also baseline cost but only indirectly related to project implementation measures.

Considering the GEF/ICPDR investment of 31.85 million US$ in the particular sector of nutrient reduction and restoration of the Black Sea ecosystems, the benefits for nutrient reduction from non-point sources of pollution - 10.9 % for nitrogen and 8.2 % for phosphorus - can be calculated as representing 20 % of the value for capital investments for nutrient reduction in point sources projects of the Five Year Nutrient Reduction Action Plan, which is equal to 748.2 million US$[6)].

The cost-effectiveness of this Project lies in the opportunity to improve water quality in general and to reduce transboundary nutrient loads in particular, thus contributing to the rehabilitation of the Black Sea ecosystems. Considering incremental cost of 31.85 million US$, the benefits of the Project, at a cost-effectiveness ratio of 1:24, are considerable in terms of its contribution to reducing and mitigating serious damage to regional and globally important waters and ecosystems.

[6)] The Pollution Reduction Program Report, GEF/Environmental Program for the DRB, June 1999 indicates in its methodological approach that 20 % of investments in WWTP are specified for nutrient reduction. Considering a total investments in the 5-YNRAP of 4.11 billion € = 3.74 billion US$, 20 % of the investment = 748.2 million US$ would be needed for pollution reduction from point sources. This amount is considered as the comparative benefit for removal of nutrient also from non-point sources of pollution.

9 Project Risks

The success of two Regional Projects for the Danube and the Black Sea depends ultimately upon the political willingness and the financial and technical means of the contracting parties and participating countries to cooperate. This willingness depends not only on issues related to national or international security but also on changing political and economic conditions of the countries involved. Risks for the performance of the proposed Danube Regional Project might be occur in the following fields:

(i) Commitment of participating countries

At the institutional level the conditions for the implementation of the Danube Regional Project are already set-up through the structures of the ICPDR, which have already been successfully utilized in the frame of the Pollution Reduction Program. Taking into account that financial inputs from the participating countries are relatively small, there are probably no significant risks for project performance. All Danube countries are prepared to deliver in-kind contributions in the frame of the ICPDR Expert Groups and experience has shown that special in-kind contributions to the project implementation are also voluntarily made available.

Considering political and administrative constraints and slow decision-making process, a certain risk can be expected for the actual implementation of the findings and recommendations of the project, especially regarding the issues of policy reforms and changes of legislation. Also administrative obstacles might hamper the implementation of measures for exacting compliance.

(ii) Methodological approach

As long as the methodology applied for the implementation of the proposed project components is in line with the work program of the ICPDR and corresponds national standards it is unlikely to expect major problems.

An essential prerequisite is in this context the choice of qualified experts, which should be familiar with the social and economic conditions in the Danube River Basin and in the participating countries, knowledgeable about modern planning methodology and the efficient organization of consultation meetings and workshops.

The scope for the organization of workshops and awareness building activities should be clearly defined from the beginning and accepted by the participating countries; this should include the precise definition and agreement for the selection of participants, which is a joint responsibility of the stakeholders involved.

The same agreements have to be reached for the identification of sub-contractors and national consultants, which should respond to defined levels of professional standards and be acceptable to the ICPDR and the Executing Agency.

(iii) Delivery of counterpart contribution and availability of information

Considering administrative and financial constraints, participating countries might not be able to provide in time necessary data for the proposed project components and administrative support for meetings and workshops.

Hence, requests for counterpart contribution are to be precisely defined and timely delivery has to be agreed upon. The type of analysis and information needed has to be clearly identified in order to assure the timely availability of precise and viable information.

10 Institutional Frameworks and Implementation

10.1 Institutional Arrangements

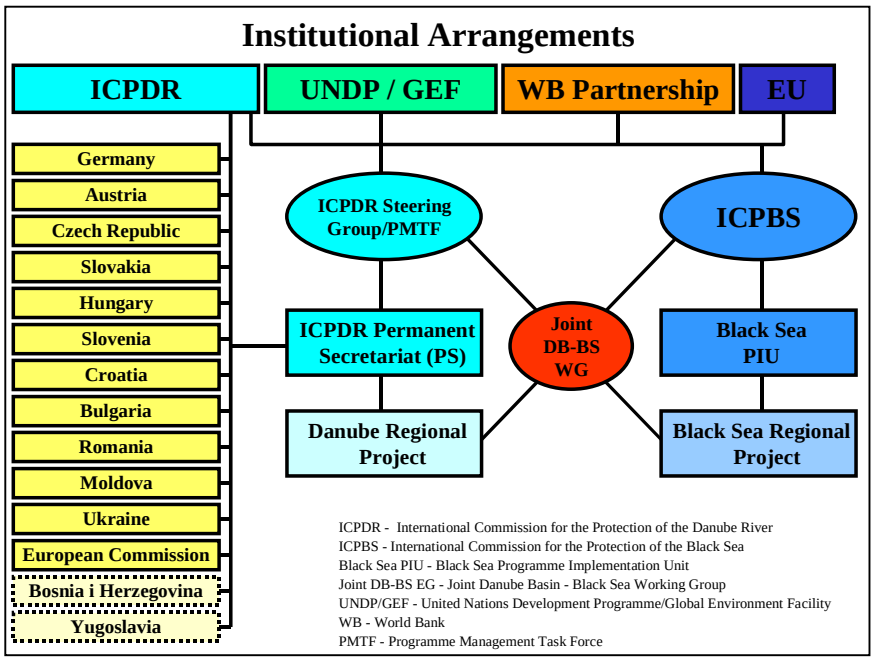
Taking into account that there was a successful GEF project in operation for 6 years, which resulted in a revised SAP (Common Platform for Development of National Policies and Actions for Pollution Reduction under the DRPC), and a Pollution Reduction Program for the DRB, it is proposed to make utmost use of institutional mechanisms and structures which are already operational.

In this context it is proposed that the International Commission for the Protection of the Danube River (ICPDR) will become the responsible organization for project implementation in cooperation with UNOPS as executing agency. A Project Coordinator, under the supervision of the ICPDR Executive Secretary, shall establish close cooperation with all participating countries, organise efficiently the planning process and assure timely execution of all project components.

The ICPDR Steering Group enlarged by the PMTF members should guide the implementation of the Danube Regional Project and assure engagement and cooperation at the national level. For this purpose the ICPDR SG/PMTF should meet :

- at the beginning of the project to review and define scope, planning approach and work program of the project;
- during project implementation use regular, twice a year, Steering Group/PMTF meetings to review and assess the progress, to evaluate completed project components and to make recommendations for the continuation and/or adjustment of activities;
- at the end of the project to assess and approve the final results at a terminal joint review meeting.

Regarding the elaboration of detailed scope of work and actual performance of the various project components it is proposed to use the professional competence and country specific experience of the existing Expert Groups established under the ICPDR : EMIS, MLIM, AEPWS and the newly created Ad-hoc Expert Group for implementation of Water Framework Directives and River Basin Management.



At the central level, the Project Coordinator, under the supervision of the ICPDR Executive Secretary and following the directives of the Steering Group/PMTF, will have the mandate to organize and coordinate the planning process and implementation activities and to assure, with UNOPS administrative support, proper management of the GEF project funds.

At the national level it is proposed to incorporate as far as possible the professional competence, experience and knowledge of the Country Program Coordinators (CPC) assigned in the framework of the previous GEF-Pollution Reduction Program.

A Joint Danube Basin-Black Sea Working Group (DB-BS/WG) shall assure proper coordination of activities between the Danube Regional Project, the Black Sea Regional Project and the W.B. Partnership. Besides this coordinating role of project activities, the WG shall also follow-up the implementation of the Memorandum of Understanding for the Protection of the Black Sea agreed upon by the two Commissions. The Joint DB-BS Working Group shall meet at least twice a year after the respective Steering Group meetings of the two Commissions.

According to the broad spectrum of activities it is envisaged that most of the particular project components should be carried out by consultant services (on the basis of sub-contracts for international consulting companies and individual consultants from the DRB countries). Objectives, scope and terms of reference will have to be defined in close co-operation with the respective Expert Groups of the ICPDR and approved by the Steering Group Meeting.

In this case the project personnel employed on a fixed term basis and located in the offices of the ICPDR Permanent Secretariat can be restricted to :

- one highly-qualified environmental policy expert, with particular experience in institutional arrangements and water pollution legislation and knowledge of EU environmental directives and guidelines and nutrient issues;
- one specialist for awareness raising, organization of training courses and follow up of NGO activities, in particular implementation of the Small Grants Program;
- one project administrator, with particular experience in budgeting, follow-up of expenditures and establishment of contracts;
- two administrative project assistant/secretary (support staff).

For specific tasks, conceptualization of activities and evaluation of results, highly specialized international consultants shall be assigned.

10.2 Monitoring and Evaluation

The project will submit an APR (Annual Project/Program Report) in line with UNDP requirements and also participate in the GEF's PIR (Project Implementation Review) exercise each year.

The project will be subject to two external reviews during the 5-years execution period, the first one preferably in mid-term and the second one at the end of the project period. At these occasions an independent consultant team shall make an overall assessment of the project advancement and prepare an Independent Evaluation. During the first review the team should particularly formulate recommendations for eventual adjustments of procedures and activities.

The members of the ICPDR Steering Group should meet after the first external review to evaluate project performance and make recommendations for the continuation and/or adjustment of activities and should assess and approve the final results at a terminal joint review meeting.

At the end of the project period, the project team, under the guidance of the ICPDR Permanent Secretariat, shall prepare a Project Performance Evaluation Report, which should be endorsed by the ICPDR Plenary Session.

10.3 Implementation Schedule

A provisional implementation schedule for the proposed Danube Regional Project is presented in Annex 5.

The project is supposed to start in the first half of 2001 and will have a total duration of 60 months. This period includes a project mobilization phase of four month for putting in place institutional structures and organizational preparation of project activities, and a four months consolidation phase, serving as a buffer zone at the end of the project period.

ANNEXES

ANNEX 1 Incremental Cost Analysis and Matrix

INCREMENTAL COST ANALYSIS

1. BROAD DEVELOPMENT GOAL

The Danube River Basin is an extensive unique ecosystem in which the balance between the non-living and living resources on one hand and human population on the other has been repeatedly disturbed. Due to the numerous environmental disturbances within its own limits, the Danube River has a negative impact on the complex ecosystems of the Black Sea. All Danube countries are urgently seeking to address environmental protection of transboundary waters under the Danube River Protection Convention.

The current economic conditions of the countries in transition do not allow them to fully respond to the needs for environmental protection and implementation of pollution control measures. Therefore, the GEF project will assist the countries in transition to respond to regional and global environmental issues with particular attention to pollution control and nutrient reduction.

The major perceived problems of the Danube River Basin can be summarised as follows:

- Significant degradation of water quality and ecosystems
- Change in hydrological systems
- Increased nutrient loads to the Black Sea
- Reduced quality of life and human health
- Limited capability to create a sustainable mechanism for co-operation that will be embodied in an international legal and policy framework for co-operation in protection and sustainable use of the Danube River.

The long-term development objective of the proposed Regional Project is to contribute to sustainable human development and promotion of economic activities in the DRB through reinforcing the capacities of the participating countries in developing effective mechanisms for regional cooperation and coordination, in order to ensure protection of international waters, sustainable management of natural resources and biodiversity.

2. BASELINE

The need for protection and management of the Danube river basin environment and its resources has preoccupied the Danube countries for some years. However, while the EU member States, Germany and Austria have already adapted their legal frame according to EU requirements, the Danube countries in transition are still making great efforts to revise and adapt their legislation to EU standards.

Recently, largely as a consequence of the development of previous UNDP/GEF project "Danube Pollution Reduction Program", there has been an increasing awareness that legal measures and projects to reduce emissions from point and non-point sources of pollution are urgently needed, in particular measures that will substantively contribute to reducing the transport of nutrients, in particular nitrates to the Black Sea.

The commitment to cooperate and seek common solutions towards implementing nutrient reduction and pollution control measures has been underlined during the development of the Pollution Reduction Program and the elaboration of the Transboundary Analysis. In addition, the Danube countries have cooperated either in the frame of ICPDR or bilaterally and multilaterally, through conventions and agreements, with a view to jointly formulating and implementing transboundary pollution reduction and environmental protection actions and measures.

However, national mechanisms for pollution control in transition countries are often not fully operational and the inter-ministerial structures for transboundary cooperation in water related environmental issues are weak or missing in most of the transition countries.

All Danube countries, in particular Germany and Austria, have made significant investments in an effort to reduce emissions and improve environmental standards. These ongoing programs form an important part of the project baseline. In addition, there is financial support being provided by international and bilateral organisations. Contributions came from EU PHARE and TACIS, GEF/UNDP, USAID, DEPA, and other multilateral and bilateral donors as well as from international NGOs.

The ICPDR Expert Groups and the Joint Danube-Black Sea Ad-hoc Working Group have already formulated and facilitated the development of common strategies and policies to assure a reduction of nutrient load in the Black Sea. It is a solid baseline for co-operative research and joint implementation of measures for pollution abatement. Moreover, the ICPDR Information System, DANUBIS, has contributed to an efficient exchange of information throughout the Danube Basin countries.

Considering that the approximation process of the Danube countries will take 10 to 20 years, including the introduction of new environmental standards in line with international and EU directives, the "incremental" support of the Project will enhance the process with particular attention to nutrient reduction and will considerably accelerate the development and implementation of policies, regulations and adequate monitoring and enforcement systems for nutrient emissions and reduction of nutrient loads discharged into the Black Sea.

3. GLOBAL ENVIRONMENTAL OBJECTIVE

The global environmental objective of the proposed project is to ensure a regional approach to (i) the development of national policies and legislation and, (ii) the identification of priority measures and actions for nutrient reduction and pollution control, so as to obtain maximum long-term benefits while protecting human health and ecological integrity and ensuring sustainability.

The potential global and regional benefits are likely to be substantial, including the protection of international waters, sustainable management of natural resources and the maintenance of a diverse aquatic ecosystem. The project will also develop effective mechanisms for regional co-operation and co-ordination geared towards the implementation of pollution control and nutrient reduction measures.

The GEF interventions will be accompanied by the current support through bilateral and multilateral programmes in the basin.

4. GEF PROJECT ACTIVITIES

GEF will provide the catalytic support for incremental costs associated with the development of nutrient reduction policies and the creation of efficient mechanisms for regional co-operation under the Danube River Protection Convention to assure efficient control and monitoring of transboundary benefits of the reduction of nutrients and toxic substances within the Danube River Basin.

The strengthening of transboundary co-operation will contribute to an efficient implementation of the Joint Action Program under DRPC with particular benefits gained due to nutrient reduction in the Black Sea and the rehabilitation of its ecosystems.

The approach would be consistent with the guidance for the GEF "Waterbody-based Operational Programme." For this project, the goal is to assist the Danube countries, especially the transition countries, in making changes in the ways that human activities are conducted in different sectors so that the Danube River and its multi-country drainage basin can sustainably support the human activities. Projects in this OP focus mainly on seriously threatened water bodies and the most imminent transboundary threats to their ecosystems as described in the Operational Strategy. Consequently, priority is placed on changing sectoral policies and activities responsible for the most serious root causes needed to solve the top priority transboundary environmental concerns which is given for this present project by the pollution and nutrient reduction.

The GEF alternative would support the proposed project in:

- Developing nutrient reduction policies and legal instruments and measures for exacting compliance
- Strengthening institutional mechanism and building capacity for transboundary cooperation in nutrient reduction
- Raising awareness and reinforcing NGO participation in implementing "Small Grants" Projects
- Strengthening the monitoring and information mechanisms on transboundary pollution control and nutrient reduction

This regional project represents a motivating case in which the improvement of transboundary co-operation and co-ordination shall help ICPDR and the countries to reinforce their efforts aimed at an efficient implementation of the DRPC.

In addition, improved transboundary co-operation will provide a better basis for the sustainable use of natural resources and the conservation of biological diversity in the Danube river basin. The cost of doing this is evidently incremental to the national efforts of all thirteen countries, focused on maximising environmental benefits through comprehensive global and domestic environmental management strategies.

5. SYSTEM BOUNDARY

For the purpose of this project, the area of GEF interventions is defined by the hydrological catchment basin of the Danube river, as regards the international water boundaries, and beyond this, the natural resources of the Danube countries, as regards the natural resources management and biodiversity conservation objectives.

The project will inevitably result in a large number of domestic and regional impacts and benefits and attention has been paid to include these within the system boundary.

The participating countries include Germany, Austria, the Slovak Republic, the Czech Republic, Hungary, Slovenia, Croatia, Bosnia & Herzegovina, Yugoslavia, Bulgaria, Romania, Moldova and Ukraine.

Over the long-term, a variety of domestic benefits would be gained through the implementation of the proposed project. The most valuable domestic benefits to be gained from the project are associated with substantially strengthened institutional and human capacity in pollution control and water quality assessment, increased technical knowledge and public awareness of Danube environmental issues and transboundary co-operation, and improved national capacities in environmental legislation and enforcement as well as in natural resources management.

Bilateral and multilateral programmes focused on domestic improvements in water management and pollution control have been included within the baseline in order to clearly distinguish between actions most likely to result in domestic benefits (baseline bilateral projects) and those that will mainly result in regional and global ones (the present project).

Summary Incremental Costs :

Baseline	881,287,000 USD
Alternative	913,087,000 USD
Incremental	31,850,000 USD
GEF Financing:	
Project	13,800,000 USD
PDF-B	350,000 USD
Project Support Costs	1,200,000 USD
Co-Finance	16,500,000 USD
Total project Cost	31,850,000 USD

Incremental Cost Matrix – Benefits

Component	Benefits	Baseline	Alternative	Incremental
OBJECTIVE 1: **Creation of sustainable ecological conditions for land use and water management**	Domestic	1. EU member states, Germany and Austria, have adapted their legal frame to EU standards and are improving conditions through additional investments to assure compliance; 2. Danube countries in transition are in different stages of adapting their legislation to EU standards; 3. Countries in transition have to revise their water and waste water tariffs to assure amortization of investments and economic operation of treatment plants, considering in particular third stage for nutrient removal; 4. At the national level, most Danube countries in transition have no efficient mechanisms or inter-ministerial structures for cooperation in water related environmental issues (pollution control, nutrient removal, etc.); 1. All Danube countries have developed investment programs to reduce emissions and improve environmental standards; the total investment of committed priority projects for municipal, industrial, agricultural waste water treatment facilities and wetland restoration projects is 4.1 billion €.	1. EU member states Germany and Austria will continue to improve compliance with guidelines for nutrient reduction from non-point sources of pollution through changes in agricultural and land use practices (eco-farming); 2. Countries in transition in the central and lower DRB will increase their efforts to adapt national legislation to EU standards with particular attention to the EU nitrate directives and phosphorus phase-out regulations for detergents; 3. Economic conditions for investments and operation of waste water treatment facilities in the municipal, industrial and agro-industrial sectors, in particular for nutrient reduction, will be improved through adopted regulations and new tariffs for waste water management; 4. Policies and regulations as well as mechanisms for compliance will be developed for nutrient reduction from non-point sources of pollution with particular attention to agricultural practices (organic farming) and land management (green river belts, wetlands restoration; etc);	1. Improved harmonization of policies and regulations with those existing in EU member states and improved mechanisms for compliance are developed to assure efficient reduction of nutrients and toxic substances : • from agricultural non-point sources of pollution by introducing new agricultural practices (organic farming) and land management (green river belts, wetlands restoration; etc); • from agricultural point sources of pollution (animal farms, agro-industries) by introducing adequate waste water treatment and new manure handling practices; • from industrial and mining companies introducing “clean” industrial production and safety regulation in the industrial and mining sectors; 2. Existence of revised tariffs, incentives and fines in all transition countries to assure amortisation of investments and coverage of operational cost for waste water treatment and nutrient reduction; 3. Existence of legislation adapted to EU standards in all transition countries and existence of measures for compliance in relation to the implementation of the Nitrate Directive and regulations for phosphorus phase-out in detergent;

Component	Benefits	Baseline	Alternative	Incremental
OBJECTIVE 1: **Creation of sustainable ecological conditions for land use and water management**	Global-Regional	1. Either in the frame of the ICPDR or bilaterally and multilaterally, the Danube countries formulate common policies and actions for transboundary cooperation in pollution reduction and environmental protection; compliance is often not assured 2. The ICPDR has created an ad-hoc working group to assure efficient implementation of the new EU Water Framework Directive using river basin management as the appropriate approach to assure stakeholder participation and transboundary cooperation; 3. In the Joint Action Program of the ICPDR, transboundary policy measures and projects have been identified to reduce transboundary pollution;	1. The harmonization of national standards and procedures will facilitate regional cooperation under the Danube River Protection Convention as well as control and monitoring of transboundary benefits of pollution and nutrient reduction; 2. The new EU WFD will be implemented in the whole DRB using river basin management as the most efficient approach; this calls for the cooperation of all Danube countries, the civil society and NGOs to develop joint mechanisms and structures at the ICPDR and the sub-regional level; 3. The implementation of the Joint Action Program under the DRPC will be reinforced through transboundary cooperation, defining complementary actions to reach common goals of pollution reduction in Significant Impact Areas (SIA) and rehabilitation of ecosystems; particular benefits will be the reduction of nutrient load in the Black Sea and the rehabilitation of its ecosystems;	1. Improved and harmonized standards and procedures in all participating countries will facilitate joint monitoring of transboundary effects and control of pollution and nutrient reduction measures introduced in municipal, industrial and agricultural sectors; 2. Middle and lower Danube states will have defined their respective program of cooperation for the implementation of the EU WFD and their participation in the development of River Basin Management Plans; 3. The first and second phase of the EU WFD will be implemented by the majority of the DRB countries and operational mechanisms and structures for the preparation of RBM plans will be put in place; 4. The existence of common policies for sustainable use of land and natural resources, nature conservation and wetland restoration, developed in the frame of an Annex to the Convention, will facilitate the development of RPM plans; 5. Improved capacities for cooperation under the DRPC and improved linkages to International Financing Institutions will facilitate the implementation and enlargement of the Joint Action Plan and, consequently, a further reduction of pollution and nutrient loads affecting SIA in the DRB and the Black Sea;

Component	Benefits	Baseline	Alternative	Incremental
OBJECTIVE 2: Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin	Domestic	1. National mechanisms for pollution control in transition countries are frequently not fully operational (lack of funds, outdated equipment etc.) 2. National allowable emissions and quality standards are not yet fully harmonized with EU standards and control mechanisms (laboratories) are insufficiently equipped; 3. In transition countries, national mechanisms for environmental impact assessment are weak and control mechanisms are often not operational (see recent accidental pollution in theTisza River Basin);	1. National and transboundary mechanisms for pollution control will reach comparable standards in all Danube countries to assure reliable data and coherence of information; 2. National emission limits and water quality standards will be adapted to EU regulations and control mechanisms will be fully functional in all DRB countries; 3. Environmental impact assessment will be part of national regulations to assure efficient control of industrial, mining and transport activities and to introduce preventive measures;	1. The improvement and strengthening of national mechanisms for pollution control, standards for emission control and water quality assessment and environmental impact assessment for prevention of accidental pollution will facilitate regional cooperation; 2. The improvement of the accidental emergency system will facilitate efficient monitoring of accidental "hot spots" and prevention of accidental pollution from toxic substances from mining and industrial plants;
	Global-Regional	1. The ICPDR has put in place Expert Groups to develop common strategies and standards for pollution control (emissions), water quality control, accidental emergency warning and river basin management (implementation of EU WFD); 2. The Joint Danube–Black Sea ad-hoc working group has formulated common strategies to assure a reduction in nutrient load in the Black Sea with the objective to restore the Black Sea ecosystems; 3. The ICPDR has put in place an Information System (DANUBIS) to assure efficient exchange of information within the member states and Expert groups and to provide information to the public	1. To facilitate monitoring and evaluation of joint implementation of pollution reduction measures, the participating countries under the ICPDR will improve mechanisms for monitoring and evaluation and develop indicators to measure process, environmental status and stress reduction; 2. The Danube–Black Sea Joint Working Group will implement the commonly agreed strategies and actions, develop respective impact indicators and report the results regularly to both Commissions; 3. All Danube countries will use the ICPDR Information System (DANUBIS) as an interactive plat-form for the development and exchange of information and provide access to reliable data and information to the public;	1. The existence of commonly agreed indicators to measure process, environmental status and stress reduction will facilitate joint monitoring and evaluation of the implementation of pollution reduction measures; 2. Increased technical and managerial knowledge for transboundary cooperation and development of joint policies and actions through training workshops and organization of regional consultation meetings; 3. The publishing of regular evaluation reports on water quality and nutrient loads/concentrations in the TNMN Yearbooks and other relevant documents will facilitate cooperation and public information; 4. Regular reports on the status of the Black Sea ecosystems will be issued by the Joint Danube-Black Sea Working Group based on observation of commonly agreed indicators; 5. The existence of the ICPDR Information System will facilitate interactive internal monitoring and information exchange and provide information to the public;

Component	Benefits	Baseline	Alternative	Incremental
OBJECTIVE 3: Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems	Domestic	1. National NGO have been actively participating in implementing GEF Small Grants projects and in conducting awareness raising campaigns for pollution reduction; 2. In Germany as well as in Austria and also in several Danube transition countries, national NGOs have established good working or influential relationships with governments at national and local level; 3. Government campaigns for awareness raising for pollution control and waste water management are relatively rare in transition countries (scarcity of funding); 4. Reports from mass media on National Planning Workshops, organized in the frame of the UNDP/GEF Pollution Reduction Program in 1998/99, contributed to public awareness raising;	1. Community-based activities for pollution/nutrient reduction measures and wetlands restoration will be supported by the "Small Grants Programme" and implemented through NGO involvement; 2. National NGO's will be strengthened to enable them to participate in national debates and public hearings on environmental issues with particular attention to pollution control, nutrient reduction and EIA; 3. National NGOs will organize and implement, in relation to "Small Grants Programmes" particular awareness raising campaigns for pollution control and nutrient reduction;	1. Community based actions and programs for nutrient reduction and awareness raising are efficiently implemented with the financial support of the "Small Grants Program", and with the cooperation of national NGOs; 2. Efficient participation of NGOs in national debates and public hearings related to environmental protection and RBM is archived trough their involvement in the Small Grants Programme and in the organization of awareness raising campaigns; 3. Improved public awareness and response to nutrient reduction and pollution control is archived through public campaigns and the implementation of actions and projects in the frame of the Small Grants Programme ("applied" awareness raising);
	Global-Regional	1. At the regional level, national NGOs are organized in the Danube Environmental Forum (DEF); DEF representatives participate in ICPDR meetings and in the ad-hoc RMB/WFD Expert Group; an internal information exchange by e-mail is functioning; 2. International NGOs, and WWF in particular, play an important role in wetland restoration and environmental awareness raising and participate in all emergency situations (Balkan Task Force, Baia Mare Task Force, etc.); 3. Under the Danube River Basin Environmental Program, the periodical "Danube Watch" was published quarterly from 1995 (?) to 2000 as a channel to inform the government and private readers about water pollution and related problems in the DRB and the progress made in implementing the programme in support of the DRPC;	1. The Danube Environmental Forum will be fully operational at the national and regional levels; the DEF will participate with qualified expertise in all ICPDR Expert Groups to assure the implementation of NGO strategies and actions in support of the DRPC; 2. The DEF has developed mechanisms to assure sustainable financial resources for its operation and activities; 3. Under the ICPDR, basin-wide awareness raising campaigns will be organized to enhance public participation in the implementation of the water framework and nitrate directives with particular attention to nutrient reduction measures and phosphorus phase- out programmes; 4. The Danube Watch will be used as a periodical information journal of the ICPDR;	1. The existence of operational mechanisms and structures for basin-wide coordination and development of NGO policies and actions under the DEF is achieved through operational and structural support; 2. Improved and efficient cooperation with the ICPDR is assured through participation in ICPDR bodies and decision making process; 3. Financial sustainability of the DEF is assured though development of funding schemes and resource mobilization; 4. Increased awareness of the public and the decision makers of nutrient reduction and pollution control is achieved through public awareness raising campaigns organized in cooperation with the DEF and national NGOs and through special publications of the ICPDR;

Component	Benefits	Baseline	Alternative	Incremental
OBJECTIVE 4: Reinforcement of monitoring, evaluation and information systems for transboundary pollution control and nutrient reduction	Domestic	1. In transition countries, the analysis of sediments and monitoring of bio-indicators is only done occasionally; funding of institutions and laboratories is insufficient to conduct regular programs; 2. Monitoring of nutrient-removal capacities of wetlands is only done in the frame of specific projects outside the DRB; no regular programme exists in the Danube countries;	1. Specialized institutions at the national level will be identified to participate in the sampling and analysis of bio- indicators and sediments to control toxic substances, heavy metals and other pollutants in national waters; 2. In the frame of the implementation of wetland rehabilitation projects, monitoring programmes will be set up to analyse the effects of nutrient reduction and to determine the most cost-effective solutions for wetland restoration in the DRB;	1. Improved performance of national institutions to execute sampling and analysis of bio-indicators and sediments to control toxic substances, heavy metals and other pollutants in national waters; 2. Improved knowledge on toxic substances accumulate in sediments in the Danube River and its tributaries and on possible effects on the Black Sea; 3. Improved knowledge on the most cost-effective way of wetland restoration in the DRB;
	Global-Regional	1. Upstream Danube countries, in particular Germany and Austria, are not fully in compliance with EU water quality directives (Nitrate Directive) whereas downstream countries have a good potential (but no funds!) to introduce cost-efficient nutrient reduction measures 2. Transboundary effects of pollutants in sediments (toxic substances and heavy metals) are not investigated; transport mechanisms of sediments and effects on the Black Sea ecosystems are presently not know;	1. EU countries, Germany and Austria are increasing their efforts to comply with EU Nitrate Directive in regard to diffuses sources of pollution, (in particular agricultural activities); in this context, economic measures will be examined to speed up nutrient reduction measures in the frame of joint actions under the ICPDR; 2. The ICPDR will set up a regular programme for the sampling and analysis of bio indicators and sediments to control transboundary flow of toxic substances, heavy metals and other pollutants as well as their effects on ecosystems in the DRB and the Black Sea;	1. Economic instruments are defined and discussion with the EU is initiated to identify new or alternative ways for the implementation of nutrient reduction measures, including incentives and voluntary measures of basin wide cooperation; 2. The existence of regular monitoring programs to analyse the effects of nutrient reduction and to evaluate their effect on ecosystems in the DRB and the Black Sea;

Component	Benefits	Baseline	Alternative	Incremental
INVESTMENTS: Five Year Nutrient Reduction Plan / ICPDR Joint Action Programme	Domestic	Investments: 4.1 billion € for five years out of which 41% of funding is assured through national funding, 25 % through international loans and 14% through international grants; 21% of the proposed investment remains to be raised. Through the implementation of projects for waste water treatment in the municipal, industrial and agro-industrial sectors (ICPDR Joint Action Programme), domestic benefits in pollution reduction (COD, BOD, N + P) are achieved;	In the frame of the existing funding schemes, additional funds (850 million €) will be mobilized through: • World Bank Partnership : 210 million $ in loans and 70 million $ in GEF grants • ISPA funds : 3.5 billion € • SAPARD funds : 1.7 billion € • Other EU funds : 8.3 billion € • EBRD funds : to be determined • Bilateral funds : to be determined Considering that the economic situation of all transition countries will be improved over time, the 5-year investment program can be amended and additional investments can be foreseen to further facilitate the implementation of pollution reduction measures. Particular attention will also be paid to nutrient reduction from non-point sources of pollution through the development and implementation of respective policies and legislation.	Through the implementation of the above-mentioned measures of the GEF Regional Project in terms of the development of policies and regulations for nutrient reduction in line with EU Directives (Urban Waste Water Directive, Nitrate Directive, WFD, etc.), additional benefits will be achieved in reducing emissions from non-point sources, in particular from agricultural activities.
	Global-Regional	The implementation of the above measures will also yield transboundary and therefore regional benefits; concerning the reduction of nutrient transport to the Black Sea, global benefits will also be achieved.	All the projects described above and the measures implemented at the national level will have transboundary consequences in the improvement of health and ecological conditions in the Danube River Basin (Sensitive Impact Areas) and, through reduction of nutrient load, in the recovery of the Black Sea ecosystems.	The implementation of the above measures at the national level will also yield transboundary and therefore regional benefits in improving the ecological conditions in Significant Impact Areas of the DRB; concerning the reduction of nutrients from non-point sources, substantive global benefits will also be achieved for the Black Sea and the restoration of its ecosystems.

Incremental Costs Matrix - Costs

Objective	Outputs	Baseline Costs						Alternative Costs	Incremental Costs		
		Governments	UNDP	Bilat. Donors (USAID)	EU	NGOs	Total Baseline		ICPDR	GEF	Total Incremental
Objective 1: Creation of sustainable ecological conditions for land use and water management	General costs related to Objective 1			1,000,000			1,000,000	2,165,000		1,165,000	1,165,000
	1.1 Development of policy guidelines for river basin and water resources management	55,800,000	40,000				55,840,000	59,888,080	2,970,000	1,078,080	4,048,080
	1.2 Reduction of nutrients and other harmful substances from agricultural non-point sources	41,850,000					41,850,000	42,659,040		809,040	809,040
	1.3 Development of pilot projects on reduction of nutrients and other harmful substances from agricultural point-sources	41,850,000					41,850,000	42,659,040		809,040	809,040
	1.4 Policy development for wetlands rehabilitation and remedial measures for inappropriate land use	23,250,000	40,000			200,000	23,490,000	23,930,760		440,760	440,760
	1.5 Industrial reform and development of policies and legislation for "clean" industrial production	34,875,000	40,000	5,000,000			39,915,000	40,604,080		689,080	689,080
	1.6 Policy reform and legislative measures for the application of waste water tariffs	13,950,000		5,000,000			18,950,000	19,198,840		248,840	248,840
	1.7 Implementation of effective systems of water pollution fines and incentives	11,625,000					11,625,000	11,843,840		218,840	218,840
	1.8 Recommendations for changes in legislation concerning phosphorus reduction	9,300,000	10,000				9,310,000	9,504,420		194,420	194,420
	Subtotal	232,500,000	130,000	11,000,000		200,000	243,830,000	252,453,100	2,970,000	5,653,100	8,623,100
Objective 2: Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin	General costs related to Objective 2			6,000,000			6,000,000	6,532,500		532,500	532,500
	2.1 Development of operational tools for monitoring, laboratory and information management and for emission analysis	55,800,000					55,800,000	59,084,100	2,722,500	561,600	3,284,100
	2.2 Improvement of procedures and tools for accidental emergency response	39,060,000					39,060,000	41,363,110	1,905,750	397,360	2,303,110
	2.3 Support for reinforcement of ICPDR Information and Monitoring System (DANUBIS)	61,380,000					61,380,000	65,070,650	2,994,750	695,900	3,690,650
	2.4 Implementation of the "Memorandum of Understanding"	11,160,000					11,160,000	11,754,500	544,500	50,000	594,500
	2.5 Training and consultation workshops for resource management and pollution control	0			344,500,000		344,500,000	345,012,000	0	512,000	512,000
	Subtotal	186,000,000		6,000,000	344,500,000		517,900,000	548,324,360	9,075,000	2,749,360	10,916,860
Objective 3:Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems	General costs related to Objective 3			10,000,000		15,250,000	25,250,000	25,527,500		277,500	277,500
	3.1 Support for institutional development of NGOs and community involvement		60,000			6,250,000	6,310,000	7,293,050	358,050	625,000	983,050
	3.2 Applied awareness raising through community based "Small Grant Program"		30,000	15,000,000		7,500,000	22,530,000	24,914,600	138,600	2,246,000	2,384,600
	3.3 Organization of public awareness raising campaigns on nutrient reduction and control of toxic substances		80,000			37,000	117,000	1,931,350	658,350	1,156,000	1,814,350
	Subtotal		170,000	25,000,000		29,037,000	54,207,000	59,666,500	1,155,000	4,304,500	5,459,500
Objective 4: Reinforcement of monitoring, evaluation and information systems for transboundary pollution control and nutrient reduction	General costs related to objective 4							355,000		355,000	355,000
	4.1 Development of indicators for project monitoring and impact evaluation	18,600,000					18,600,000	19,650,300	907,500	142,800	1,050,300
	4.2 Analysis of sediments in the Iron Gate reservoir and impact assessment of heavy metals	13,950,000					13,950,000	15,124,000	990,000	184,000	1,174,000
	4.3 Monitoring and assessment of nutrient removal capacities of wetlands	18,600,000				200,000	18,800,000	20,357,240	1,320,000	237,240	1,557,240
	4.4 Danube Basin feasibility study and consultation process on economic instruments for nutrient reduction	13,950,000					13,950,000	15,114,000	990,000	174,000	1,164,000
	Subtotal	46,500,000	0			200,000	46,700,000	51,093,040	3,300,000	1,093,040	5,300,540
Total Capacity Building		465,000,000	300,000	42,000,000	344,500,000	29,437,000	881,237,000	911,537,000	16,500,000	13,800,000	30,300,000
PDF-B										350,000	350,000
Support Costs										1,200,000	1,200,000
Total		465,000,000	300,000	42,000,000	344,500,000	29,437,000	881,237,000	913,087,000	16,500,000	15,350,000	31,850,000

Bilateral Donors: USAID, DEPA NGOs: REC, WWF, Danube NGOs

ANNEX 2 Logical Frame Matrix (Objectives, Outputs, Activities)

Logical Frame Matrix (Objectives, Outputs, Activities)

Objectives/Purpose	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
1. Long-term development Objective: The long-term development objective of the proposed Regional Project is to contribute to sustainable human development in the DRB through reinforcing the capacities of the participating countries in developing effective mechanisms for regional cooperation and coordination in order to ensure protection of international waters, sustainable management of natural resources and biodiversity. **2. Overall Objective:** The overall objective of the Danube Regional Project is to complement the activities of the ICPDR required to provide a regional approach and global significance to the development of national policies and legislation and the definition of priority actions for nutrient reduction and pollution control with particular attention to achieving sustainable transboundary ecological effects within the DRB and the Black Sea area. **3. Purpose of the Project:** Further, the Danube Regional Project shall facilitate project implementation in providing a framework for coordination, dissemination and replication of successful demonstration that will be developed through the implementation of investment projects.	**Overall Project Objective:** At the end of the project period, nutrient loads to the Black Sea are considerably reduced by 21,1 % for nitrogen and 32,0 % for phosphorus,	• Reports of Joint Danube/ Black Sea Working Group, in 2005; • TNMN Annual Reports.	• The Danube/Black Sea Joint Working Group if operational.
	Objective 1 : At the end of the project period all Danube River Basin countries have developed and ratified policies and legal instruments and Action Plans for nutrient reduction and have put in place mechanisms for exacting compliance,	• Revised Joint Action Plan including nutrient reduction measures is adopted legally binding by the ICPDR.	• All countries participate in the elaboration of the revised JAP.
	Objective 2: Operational mechanisms for monitoring of water pollution and control of emissions from point sources and non-point sources and a reliable information system under the ICPDR are functional at the regional and national level to assess improvement of water quality and nutrient reduction to the Black Sea,	• The ICPDR Information system is operational in all Danube countries as a tool for transboundary monitoring of water pollution and implement-ation of reduction measures.	• National Governments have provided sufficient funding for operation of national Information System.
	Objective 3: The civil society and in particular national NGOs in all Danube countries are at the end of the project period proactively implicated in national nutrient reduction measures, have conducted at least two national awareness raising campaigns and have participated in the implementation of community based nutrient reduction projects financed under the GEF Small Grants Program,	• The Danube Environmental Forum is represented in all Danube countries and has an established Secretariat with its proper financial means; • The GEF Small Grants Program is fully implemented and 80 % of all projects show sustainable results	• The DEF has mobilized the necessary funds for operation.
	Objective 4: Knowledge on sedimentation, transport and removal of nutrients and toxic substances is considerably increased and economic instruments to encourage investments for nutrient reduction are developed and put in place at the national and regional level.	• Measures to reduce toxic substances from the Iron Gate reservoirs are introduced; • Nutrient retention capacities of wetlands are know; • Economic instruments to facilitate investments in nutrient reduction projects are defined and implemented.	• Cooperation of all countries and organizations, in particular the EU in the analysis and application of proposals.

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Objective / Output / Activity	**Objectively Verifiable Indicators**	**Sources of Verification**	**Assumptions and Risks**
Output 1.1: Development of policy guidelines for river basin and water resources management	1. sub-river basins are defined 2. river basin management practices are identified and gaps and needs in relation of WFD requirements are clarified 3. methodology for preparation and aggregation of sub-river basins management plans is developed 4. appropriate structures for transboundary cooperation such as river basin committees are created and operational 5. transboundary cooperation and coordination is enhanced	1. maps with sub-river basin boundaries 2. reports on required steps to ensure WFD implementation 3. methodology and guidelines for river basin management plans 4. rules of procedure for creation and operation of river basin authorities 5. coherent river basin management plans are in preparation	1. differing concepts on the sub-river basins delimitation might appear 5. limited capacities for implementation of WFD of downstream countries

1.1.1 Define sub-river basins for planning purposes on geographic and socio-political grounds;
1.1.2 Analyse river basin management practices in selected DRB countries;
1.1.3 developing river basin management tools, using in particular satellite remote sensing for analysis of surface materials and pathways of pollution;
1.1.4 Identifying typical deficiencies and needs in relation to the requirements of the new EU-Water Framework Directive (in particular the EU Nitrate Directive);
1.1.5 Develop methodology, standards and guidelines for the preparation of sub-river basin management plans;
1.1.6 Develop methodology for the aggregation of sub-river basin management plans to a basin-wide management concept;
1.1.7 Introduce appropriate structures at national, regional and basin wide level (ICPDR) to assure efficient transboundary cooperation;
1.1.8 Develop strategies for the particular DRB countries to come in compliance with the new EU Water Framework Directive and particularly the EU Nitrate Directive;
1.1.9 Organize sub-regional workshops with participants from relevant ministries, local administration and the private sector to reinforce transboundary cooperation for the development and implementation of Sub-river-basin Management Plans.

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Objective / Output / Activity	**Objectively Verifiable Indicators**	**Sources of Verification**	**Assumptions and Risks**
Output 1.2: Reduction of nutrients and other harmful substances from agricultural non-point sources through appropriate agricultural practice and organic farming	1. assessment of legislation on non-point sources of pollution, enforcement and existing projects for agricultural practices and organic farming is updated 2. list of hazardous agrochemicals and their impacts is identified 3. alternative concepts for agricultural practices and farming in line with EU requirements for central and downstream Danube countries are elaborated 4. national institutional, legal and capacity building measures for designing and implementing new agricultural non-point sources policies are developed 5. appropriate agricultural practices and organic farming are introduced in the central and downstream Danube countries	1. analysis reports available 2. qualitative and quantitative list of suitable agrochemicals approved 4. - 5. guidebooks for implementing new agricultural non-point sources policies elaborated	1. information need to be available 2. shortage of public funds in support of agricultural research 3. policy makers discourage the adoption of new appropriate agricultural practices and organic farming 4. trained labour, time and management skills are necessary 5. slow decision making process
1.2.1 Assist countries in design of new agricultural non-point source pollution control policies and legislation and compliance and enforcement plans in line with existing and emerging (including EU accession) national legislation; 1.2.2 Review relevant legislation, actual state of enforcement, existing programs and pilot projects for appropriate agricultural practices and organic farming in selected DRB countries; 1.2.3 Identify agrochemicals (fertilizers, pesticides, etc.) which are important in quantities of utilization, misuse of application, environmental impacts and potential for reduction; 1.2.4 Identify main legal, administrative, institutional and funding deficiencies; 1.2.5 Develop and assess alternative concepts for the introduction of appropriate agricultural practices and organic farming in the central and downstream DRB countries by taking into account country specific traditional, social and economic issues with particular attention to the transition process and the gradual recovery of the agricultural sector; 1.2.6 Introduce necessary changes in legislation which will lead to a significant reduction in utilization of agrochemicals and ensure compatibility with EU directives and guidelines; 1.2.7 Implement necessary complementary measures on national level (training, financial support, institutional and legislative measures); 1.2.8 Organize a series of workshops with participants from relevant ministries, private organizations, farmer's associations etc, dealing with country specific legal and institutional reform measures to facilitate the introduction of appropriate agricultural practices and organic farming in specific DRB countries.			

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Objective / Output / Activity	**Objectively Verifiable Indicators**	**Sources of Verification**	**Assumptions and Risks**
Output 1.3: Development of pilot projects on reduction of nutrients and other harmful substances from agricultural point-sources by introduction of appropriate manure handling	1. assessment of legislation on point sources of pollution, enforcement and existing projects for animal farming and manure handling are updated 2. alternative concepts for animal farming and manure handling in line with EU requirements for central and downstream Danube countries are elaborated 3. understanding of decision makers and farmers on the need to introduce new concepts for animal farming and manure handling is improved 4. monitoring and progress evaluation through pilot projects is performed	1. analysis reports available 2. guidebooks and instructions for implementation available 3. new concepts in place 4. number of pilot projects	1. information availability 3. knowledge is needed to inform farm managers and policy makers on the trade-off between on-farm practices and off-farm consequences 4. controversy on the economic and financial viability of selected pilot farms may occur
1.3.1 Assist countries in development of new nutrient point source control policies and legislation and compliance and enforcement mechanisms in line with existing and emerging (including EU accession) national environmental legislation; 1.3.2 Review legislation and actual state of enforcement at country level; 1.3.3 Analyze existing programs and pilot projects for animal farming and manure handling; 1.3.4 Develop alternative concepts for the introduction of appropriate animal farming practices and manure handling in the central and downstream DRB countries by taking into account national demand and international markets; 1.3.5 Implement necessary complementary measures on national level (information on best available techniques, financial support, etc.); 1.3.6 Prepare and develop for the central and lower DRB countries typical pilot projects; 1.3.7 Implement pilot projects with the cooperation of interested farmers and associations and assure monitoring and evaluation of progress; 1.3.8 Disseminate component results to farming communities in the basin through appropriate networks; 1.3.9 Organize a series of demonstration workshops with participants from animal farms, banking institutions and government agencies.			

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Objective / Output / Activity	**Objectively Verifiable Indicators**	**Sources of Verification**	**Assumptions and Risks**
Output 1.4: Policy development for wetlands rehabilitation and remedial measures for inappropriate land use (resulting from settlement, agricultural activities, hydraulic structures, etc.)	1. assessment of inappropriate land use is updated 2. legal and institutional reform for integration of environmental and economic issues is prepared 3. legal and market based instruments are elaborated and implemented 4. pilot projects in areas with inappropriate land use practices are developed 5. lessons on land rehabilitation are learned and stakeholders cooperation is achieved	1. analysis report available 2. guidelines on land uses and wetlands restoration available 3. new regulations on payments and compensations for land use and environmental services adopted 4. - 5. recommendations for various types of conflicting land use	1. need for interdisciplinary problem solving research system 2. knowledge on the economic and environmental benefits and costs of various land uses 3. participatory approach ensured between economical and environmental authorities 4. uncertainty in assessing the location potential to demonstrate the value of the wetland or the costs of various conflicting land uses 4. - 5. financial resources secured
1.4.1 Assist countries to prepare new land use and wetlands rehabilitation/protection policies and legislation and compliance and enforcement mechanisms, in line with existing and emerging (including EU accession) environmental legislation. 1.4.2 Analyze typical situations of inappropriate land use which leads to significant transboundary pollution from nutrients and toxic substances in the DRB; 1.4.3 Develop alternative concepts for harmonization with particular consideration of the usually conflicting environmental and economic issues and identify required legal and institutional reforms; 1.4.4 Implement required actions and measures (regulatory and legal issues, economic fines and incentives, compensation payments, etc); 1.4.5 Define pilot projects for each of the identified types of conflicting landuse; 1.4.6 Organize a workshop on policy and legal issues of land rehabilitation with participants from relevant ministries of the particular DRB countries.			

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Objective / Output / Activity	**Objectively Verifiable Indicators**	**Sources of Verification**	**Assumptions and Risks**
Output 1.5: Industrial reform and development of policies and legislation for "clean" industrial production towards nutrient and toxic reduction	1. inventory on industrial production technologies is updated 2. assessment of the existing legislative and enforcement status is elaborated 3. DRB countries have adapted national legislation in line with the EU 4. national action plan for nutrient reduction to respond to SIA are implemented 5. alternative concepts for environmentally friendly production technologies in industries in particular countries are developed 6. knowledge and understanding on the benefits and costs of various alternative concepts are improved	1. -2. reports on inventory of industrial technologies and existing legal status available 3. relevant legal documents adapted available 4. statistics of compliance schedule and enforcement actions taken by industries 5. guides to pollution reduction for different industries available 6. case studies of application of alternative concepts	1. accessibility to the most updated databases 3. industrial managers, researchers and policy makers will perceive the benefits of the EU policies 4. the national government policy inhibits the action plan implementation 5. the industries are reluctant to the changes

1.5.1 Assist countries in development of new industrial nutrient/toxics pollution control policies and legislation and compliance enforcement mechanisms in line with existing and emerging (including EU legislation) national legislation.

1.5.2 Review data and information on the actual status of industrial production technologies involving nitrogen and phosphorus in the DRB countries;

1.5.3 Review policies and legislation for industrial pollution control and the actual state of enforcement at country level;

1.5.4 Collect information on relevant EU-legislation and international standards and assist DRB countries to adapt national legislation accordingly;

1.5.5 Develop necessary complementary policy and legal measures for the introduction of clean technologies (regulatory and legal issues, awareness raising, financial fines and incentives, etc.).

1.5.6 Identify, in relation to Significant Impact Areas (SIA), industries with significant impacts on water resources and water quality and implement measures for reduction of nutrients and toxics water pollution in the most cost effective way;

1.5.7 Develop for the different categories of DRB countries alternative concepts for a step-by-step introduction of environment friendly production technologies in industries utilizing or producing nitrogen and/or phosphorus, taking into account the restricted financial capabilities of the industrial enterprises and the economic affordability of the particular countries;

1.5.8 Organize a series of workshops for industrial mangers, banking institutions and government agencies, introducing information on best available technologies, financial support, etc.

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Objective / Output / Activity	**Objectively Verifiable Indicators**	**Sources of Verification**	**Assumptions and Risks**
Output 1.6: Policy reform and legislative measures for the application of economically and socially acceptable waste water tariffs, focusing on nutrient reduction and control of toxic substances	1. deficiencies in international comparison related to tariffs, metering etc. are identified 2. most appropriate cost recovery models and gradual tariffs reform are proposed for specific countries 3. economic and financial viability of the water companies for specific countries are ensured 4. improved knowledge on the best tariff alternatives are ensured	1. comparative tariff study available 2. policies and recommendations on cost recovery models available 3. financial accounts of the water companies available 4. tariff schemes rules economically and socially accepted	1. information accessibility 2. political and administrative constrains 3. keeping the water companies competitive 4. absence of governmental income support program
1.6.1 Assist countries in development of new tariff systems to facilitate cost covering operations of WWTP with third stage for nutrient reduction and to encourage respective investment decisions; 1.6.2 Analyze significant deficiencies in international comparison (level of tariffs, status of metering, collection rate, etc); 1.6.3 Develop for the different categories of DRB countries alternative concepts for tariff reforms, considering cost covering models also for the low income segments of the population; 1.6.4 Assess for the particular DRB countries the potential for additional revenues from water and wastewater services as additional funding sources for water sector operation and investment; 1.6.5 Propose recommendations for phased implementation of tariff reforms; 1.6.6 Organize a workshop with participants from relevant ministries, municipalities and the private sector on the introduction of economically and socially acceptable wastewater tariffs with particular attention to the operation of treatment plants with nutrient reduction stage.			

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Objective / Output / Activity	**Objectively Verifiable Indicators**	**Sources of Verification**	**Assumptions and Risks**
Output 1.7: Implementation of effective systems of water pollution fines and incentives, focusing on nutrients and toxic substances	1. alternative concepts for introduction of incentives based instruments for groups of DRB countries are identified 2. institutional and economic capabilities to implement economic instruments are assessed 3. water pollution fines, incentives and tariffs are harmonised and implemented 4. information on the cost-benefits of incentives based instruments are disseminated	1. proposals of incentive based instruments for specific groups of DRB countries available 2. recommendations on strengthening of institutional and economic capabilities developed 3. rules for water pollution fines, incentives and tariffs available 4. workshop reports existing	1. low government willingness to introduce economic incentives 2. lack of commitment of economic authorities to introduce incentives 3. limited knowledge on costs and benefits of incentives schemes
1.7.1 Assisting the countries in preparation of new systems of fines for water pollution and/or respective incentives. 1.7.2 Analyzing the present systems of fines for water pollution (nutrients, toxics) and respective incentives in the DRB countries and identifying significant deficiencies in international comparison (types of fines and incentives, effectiveness, collection procedures, exemptions, etc); 1.7.3 Identifying the most essential and effective fines and incentives, assess the main problems for their introduction and develop mechanisms to assure compliance; 1.7.4 Assessing the willingness and institutional and economic capabilities of the particular DRB countries for a reform of pollution fines and incentives; 1.7.5 Developing for the different categories of DRB countries alternative concepts for the introduction of balanced and effective systems of pollution fines and incentives; 1.7.6 Organizing a workshop on the application of pollution fines and incentives, in conjunction with the workshop on tariffs, with participants from relevant ministries, municipalities and the private sector.			
Output 1.8: Recommendations for changes in legislation concerning phosphorus reduction by means of restricted detergent standards	1. analysis of legal and institutional possibilities for introducing restrictive standards for detergents use is performed 2. proposals of severe standards and implementation schedule for phosphorus reduction are developed 3. proposals for enforcement and compliance are elaborated 4. lessons on phosphorus reduction are learned	1. options paper prepared 2. draft standards and phase-out plans for phosphorus detergents available 3. economic and financial rules developed 4. recommendations on future actions on phosphorus reduction available	1. low priority concern for introducing detergents standard at governmental level 4. weak governmental support for producers of detergents
1.8.1 Examine the existing legislation and assess the stakeholders´ reform willingness; 1.8.2 Develop phosphorus restricting standards and a timeframe for phosphorus detergents phase-out plans; 1.8.3 Develop proposals for enforcement and compliance (economic, financial incentives); 1.8.4 Assist particular countries to introduce policy and legislative reforms; 1.8.5 Evaluate the results.			

Objective 2: Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin

Objective / Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 2.1: Development of operational tools for monitoring, laboratory and information management and for emission analysis from point and non-point sources of pollution with particular attention to nutrients and toxic substances	1. water quality objectives and nutrient and toxics quality conditions are harmonised 2. statistics of emissions from point and non-pint sources for P and N are existing 3. inventory of priority chemicals in line with EU are prepared 4. laboratories are equipped and operational 5. information system and network are operational	1. standards and river classification available 2. list of N, P emissions from point and non-point sources accessible 3. statistic of priority chemicals existing 4. results of analysis available 5. transmission reports available	1. criteria for harmonization agreed 2. - 4. capacity building and training ensured 5. need for participatory approach
2.1.1 Harmonization of water quality standards and quality assurance for nutrients and toxic substances, 2.1.2 Database and emission inventory for point and non point sources of phosphorus and nitrogen, 2.1.3 Sources and amounts of transboundary pollution for substances on the list of EU priority chemicals			
Output 2.2: Improvement of procedures and tools for accidental emergency response with particular attention to transboundary emergency situations	1. guidelines on accidental pollution prevention are designed, adapted and implemented 2. national stations - PIACs for MD, UA, BiH, YU are fully operational 3. inventory and assessment of high accidental risks spots are completed in all countries 4. DBAM is improved to respond to pollution transport issues 5. cooperation on preventive and emergency measures is improved	1. guidelines on interventions during accidents available 2. transmission files available 3. , 5. reports and statistics of emissions accessible 4. rules of operation of DBAM existing	1. inferior priority on the accidental pollution issues of the ministries 2. delays in regulatory decisions 3. financial and material resources secured 4. countries need to receive information and assessment in developing new management skills 5. methods have not focused on integrating knowledge into practical solutions to intervene during accidents
2.2.1 Design of preventive measures, adaptation of national legislation and improve compliance with safety standards; 2.2.2 Reinforcement of operational conditions in national stations and geographical extension of the AEPWS in Moldova, Ukraine, Bosnia & Herzegovina and the FR of Yugoslavia1), 2.2.3 Completion of the inventory presently available only for the upper Tiza River Basin, and evaluation of all high accidental risk spots in all countries in the Danube River Basin considering that similar accidental "hot spots" of mining and industrial activities exist in many transition countries, 2.2.4 Functional upgrade and calibration of the Danube Basin Alarm Model (DBAM), to monitor pollution transport of toxic subst. in the Danube River system and to the Black Sea; 2.2.5 Organization of workshops to reinforce cooperation in accidental emergency warning and development of preventive measures;			

[1] The F.R. of Yugoslavia is situated in an extreme important geographical position in the center of the Danube River Basin where the most important tributaries, Tiza, Save and Drave are joining the Danube. During the recent accidental pollution the AEWS has also informed Yugoslavia and cooperated with its technical staff to monitor the effects of accidental pollution. The UNEP Balkan Task Force and the EU-Baia Mare Task Force have closely cooperated with Yugoslavian authorities in the assessment of accidental pollution and the design of emergency measures.

Objective 2: Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin

Objective / Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 2.3: Support for reinforcement of ICPDR Information and Monitoring System (DANUBIS)	1. ICPDR Information System as a part of WPPCM is fully integrated 2. networking within DANUBIS by all ICPDR contracting parties is realised 3. DANUBIS web site is operational 4. mechanisms of having access to information are available	1. WPPCM scheme available 2. information exchange during emergency situations files 3. web site accessible 4. rules of accessions rights to DANUBIS approved	1. delays in reaching agreement on the integration within WPPCM 2. low commitment and limited resources of governments to link to DANUBIS 3. inadequate user skills 4. countries must undertake interactions to facilitate transboundary communication
2.3.1 The ICPDR information System, used by its expert groups and other operational bodies, would be fully integrated in the frame of a Water Pollution Prevention and Control Model (WPPCM); 2.3.2 All Contracting Parties of the ICPDR and other participating countries would be linked to DANUBIS, which applies the development and implementation of national linkages and establishment of operational units to communicate also in case of accidental emergency situations; 2.3.3 DANUBIS would be reinforced through the implementation of an interactive web-site to integrate further textual, numerical and digital mapping information and to fulfill all requirements of the work of the Nutrient Reduction Program (communication, monitoring, public information, etc.); 2.3.4 An extensive training program would be launched and series of workshops be organized at different users level and in different regions of the DRB to train and assist futures users in the best use of the tools made available by the system.			
Output 2.4: Implementation of the "Memorandum of Understanding" between the ICPDR and the ICPBS relating to discharges of nutrients and hazardous substances to the Black Sea	1. joint work programme for MoU is developed 2. agreement of status indicators is reached 3. joint AQC system is defined and implemented 4. rules of reporting are developed 5. agreement on regular meetings is concluded 6. MoU is signed	1. joint work programme available 2. - 5. agreements on the indicators and rules accessible 6. MoU file available	1. unequal involvement of ICPDR and ICPBS 2. delayed national contributions the MoU
2.4.1 Develop joint work program for MOU implementation 2.4.2 Define and agree on status indicators to monitor nutrient transport from the Danube and change of ecosystems in the Black Sea; 2.4.3 Define and implement a common AQC system and monitoring and sampling procedures; 2.4.4 Define and establish reporting procedures 2.4.5 Reestablish and organize regular meeting of the Joint Danube - Black Sea working Group to evaluate progress of nutrient reduction and recovery of Black Sea ecosystems. 2.4.6 Organize joint Danube - Black Sea meeting to approve and sign MOU;			

Objective 2: Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin

Objective / Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 2.5: Training and consultation workshops for resource management and pollution control with particular attention to nutrient reduction and transboundary issues	1. knowledge, professional skills and understanding on nutrient reduction issues are enhanced	1. number of workshops and trained participants	

Training courses in the following fields

2.5.1 Policy development and legal frame for transboundary cooperation in nutrient reduction and control of toxic substances;

2.5.2 Technical and legal issues of river basin planning and transboundary water resources management in line with the new EU Water Framework Directive in view to assure effective nutrient reduction;

2.5.3 Technical and legal issues (land reclamation) of wetland restoration and management to assure nutrient removal;

2.5.4 Innovative technologies for municipal and industrial waste water treatment; use of sewage and animal waste as fertilizer to reduce nutrient emissions;

2.5.5 Technical and legal issues of management and control of use of fertilizers and manure;

2.5.6 Preparation of documents for nutrient reduction projects with international co-funding and application of GEF criteria concerning “incremental cost” calculation;

Objective 3: Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems			
Objective / Output / Activity	**Objectively Verifiable Indicators**	**Sources of Verification**	**Assumptions and Risks**
Output 3.1: Support for institutional development of NGOs and community involvement	1. optimal operation of DEF secretariat is achieved 2. knowledge on nutrient and toxic are improved 3. reports on nutrient and toxic, in national languages, are published 4. cooperation between NGOs and governments is strengthened	1. rules of operation of the DEF secretariat approved 3. reports printed	1. lack of adequately trained staff 4. low willingness of governments to collaborate with NGOs
3.1.1 Support for the DEF Secretariat for operation, communication and information management; 3.1.2 Organization of consultation meetings and training workshops on nutrients and toxics issues; 3.1.3 Editing of special NGO publications in national languages on nutrients and toxic substances; 3.1.4 Organization of training courses for development of NGO activities and cooperation in national projects (nutrient reduction);			
Output 3.2: Applied awareness raising through community based “Small Grant Program”	1. efficient and effective NGO involvement through assessment exercise and pilot and investment projects is ensured	1. list of proposed and implemented projects available	1. correct acknowledgement of the SGP ensured
3.2.1 Environmental assessment related to nutrients and toxic substances and effects of transboundary pollution; 3.2.2 Demonstration activities and awareness campaigns for sustainable land management and pollution reduction (nutrients) in the agricultural, industrial and municipal sectors; 3.2.3 Small scale community based investment projects for pollution control, rehabilitation of wetlands, best agricultural practices, reduction of use of fertilizers, manure handling, improvement of village sewer systems, etc.			
Output 3.3: Organization of public awareness raising campaigns on nutrient reduction and control of toxic substances	1. realistic approach on organizing public campaigns is developed 2. sufficient and reliable information for mass media purposes are prepared 3. documents are published	1. rules for public hearings available 2. mechanisms of having access to information developed 3. printed materials available	1. willingness of local administration to support organization of public events 2. information access restricted 3. limited funds
3.3.1 Conceptualization and implementation of public awareness raising campaigns on nutrients issues; 3.3.2 Development and production of materials for public press and mass media on nutrients and toxics; 3.3.3 Support publication of scientific documents and regular papers or special issues on water management and pollution reduction with particular attention to nutrient issues and Black Sea recovery.			

Objective 4: Reinforcement of monitoring, evaluation and information systems for transboundary pollution control and nutrient reduction			
Objective / Output / Activity	**Objectively Verifiable Indicators**	**Sources of Verification**	**Assumptions and Risks**
Output 4.1: Development of indicators for project monitoring and impact evaluation	1. monitoring and evaluation system for project implementation is developed and operational 2. indicators for emissions and water quality are reviewed to answer to nutrient concerns 3. progress indicators for monitoring project progresses are developed 4. impact indicators to evaluate environmental effects are defined 5. ecological indicators are developed 6. guidelines on the monitoring and impact indicators use are elaborated	1. monitoring and evaluation procedures available 2. statistics on the emissions and water quality status accessible 3. - 5. list of progress, impact and ecological indicators accessible 6. guidelines files available	1. - 6. knowledge is needed to define the most appropriate monitoring and assessment methods and indicators 1. - 6. countries need to agree with selected indicators
4.1.1 Develop and operationalize a monitoring and evaluation system to follow project and program implementation in financial and technical terms (pollution reduction) and assess environmental impact (water quality, health, recovery of ecosystems, etc.) 4.1.2 Review indicators for emission control and water quality monitoring with particular attention to nutrients and toxic substances; 4.1.3 Develop progress indicators for monitoring of project implementation (GEF- supported nutrient reduction projects); 4.1.4 Develop impact indicators (process, stress reduction, environmental status) to evaluate environmental effects of policy and program implementation (nutrient reduction) 4.1.5 Analysis of ecological characteristics and development of bio-indicators, 4.1.6 Prepare a manual on use and application of monitoring and impact indicators.			
Output 4.2: Analysis of sediments in the Iron Gate reservoir and impact assessment of heavy metals and other toxic substances on the Danube and the Black Sea ecosystems	1. assessment of the heavy metal contents and impacts in relation to the sediments dynamics are updated and predicted 2. recommendations, control measures and monitoring programmes are proposed	1. study including maps and diagrams showing the existing situation and expected trends available 2. joint action programme available	1. appropriate analysis equipment and trained personnel available 2. financial sources assured
4.2.1 Collect and review existing data and information on present situation; 4.2.2 Assess main types and quantities of dangerous substances; 4.2.3 Assess potential environmental impacts in the Danube and the Black Sea; 4.2.4 Forecast development for a period of 20 years; 4.2.5 Discuss possible precautionary and rehabilitation measures for the Danube and the Black Sea; 4.2.6 Prepare recommendations how to deal with this problem in the forthcoming decade (measures to be include in the a joint action program of the ICPDR); 4.2.7 Propose further monitoring programs;			

Objective 4: Reinforcement of monitoring, evaluation and information systems for transboundary pollution control and nutrient reduction			
Objective / Output / Activity	**Objectively Verifiable Indicators**	**Sources of Verification**	**Assumptions and Risks**
Output 4.3: Monitoring and assessment of nutrient removal capacities of wetlands	1. criteria for wetlands classification and projects prioritization are defined 2. methodological approach for assessment of nutrient removal capacities is developed taking into account results of other projects 3. observation programme to assess annual removal capacities is designed and implemented 4. wetland management programmes and regulations are implemented	1. list of criteria and projects available 2. methodology report existing 3. observation programme file available 4. list of measures and regulations for wetland restoration programmes accessible	1. lack of understanding on the need to restore wetlands 2. absence of methodology for correlation and interpretation of results of linked projects 3. review the state of scientific and economic knowledge on wetlands restorations and to determine what type of research is needed
4.3.1 Classify the wetlands in the DRB by categories and define rehabilitation pilot projects and observation sites; 4.3.2 Define the methodological approach for assessment of nutrient removal capacities of wetlands and flood plains; 4.3.3 Define and implement an observation program to assess the annual nutrient removal capacity (tons of N and P per ha) for each category of wetland for a period of 20 years (5 years covered by the present project); 4.3.4 Evaluate the aggregated nutrient removal capacities/potentials of the wetlands proposed for restoration (DPRP), taking into account the results of the “Danube Green Corridor” and other investment programs under the Partnership; 4.3.5 Develop optimized wetlands management programs to assure maximum nutrient removal under best environmental, social and economic conditions; 4.3.6 Prepare relevant regulations for wetland restoration to assure implementation of projects with maximum nutrient removal capacities.			
Output 4.4: Danube Basin feasibility study and consultation process on economic instruments for nutrient reduction	1. understanding on tradable permits approach and potential are facilitated 2. assessment on discharge quotas between involved neighbouring countries are undertaken 3. agreement with EU requirements on introduction of economic instruments through a consultation are achieved 4. proposals and schedules for implementation are developed	1. comparison of national experiences world-wide available 2. waste water balance reports existing 3. compilation of EU requirements file available 4. list of economic instruments and work plan accessible	1. clear understanding on the need to shift from traditional to market approach 2. willingness of governments to accelerate the EU harmonization 3. governmental support to implement economic instruments 4. tradable permits must be carefully adapted to economic and social condition of the countries and regions
4.4.1 Review existing concepts of successful “pollutant auctions” or “pollution trading” in the water and air pollution sector in the US and Europe; 4.4.2 Study the general possibility to establish economic instruments for nutrient reduction under the EU policies and directives in the Danube River Basin; 4.4.3 Assess the main problems and the interest of the particular DRB countries (polluting and receiving countries) to establish discharge quotas and to develop economic solutions for nutrient reduction; 4.4.4 Establish a consultation process with the EU to introduce in medium and long term economic instruments (economic sanctions, incentives, nutr. emission trading, auctions, etc) 4.4.5 Develop alternative concepts and timeframe for the introduction of economic instruments for nutrient reduction at a river basin ore regional level; 4.4.6 Discuss concepts with EU and participating countries (polluting and receiving countries) and develop timeframe for implementation of economic instruments for nutrient reduction in EU regulations and national legislation.			

ANNEX 3 STAP Review (UNDP) and Response

Annex 3.1 STAP Review

Annex 3.2 Response to STAP Review

Elaboration of a Danube Regional Project: Strengthening of Implementation Capacities for Nutrient Reduction and Transboundary Cooperation. Proposed UNDP/GEF: International Waters Project

STAP-Roster Independent Technical Review undertaken by

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Overall impressions - general soundness

Since 1992 the European Community and the UNDP/GEF have supported efforts of the Danube countries and the Interim Commission for the Protection of the Danube River (ICPDR) to develop the necessary mechanisms for effective implementation of the Convention.

The new project is developed to ensure efficient implementation of the regional Strategic Action Plan based on national contributions, the Transboundary Analysis of causes and effects of transboundary pollution within the Danube River Basin and on the Black Sea and the Pollution Reduction Program resulting from that. In order to do so it would be necessary to reinforce the appropriate development and application of policies, strategies and legislation for transboundary pollution reduction at the national level.

The new GEF assistance, which is planned within the frame of the Danube/Black Sea Basin Programmatic Approach for the Danube and the Black Sea Basin, should complement the activities of the ICPDR and the Black Sea Program Implementation Unit. It shall

- provide assistance for them to reinforce their activities in terms of policy/legislative reforms and enforcement of environmental regulations, including for measures introduced at the national levels of the participating countries, and
- facilitate project implementation in providing a framework for dissemination and replication of successful demonstration that will be developed through the implementation of investment projects through the World Bank-GEF Strategic Partnership.

The Danube Regional Project is, according to the Project Brief, to be seen as an Integral Part of the Danube/Black Sea Basin Programmatic Approach and a logical continuation of the GEF support for capacity building provided for a period of six years to the countries of the Danube River Basin. The Project is to utilise available expertise and build on the existing mechanisms and structures.

The overall impressions of the project as described in the project brief are very positive. Even though a Strategic Action Plan has been developed and revised for the area it is essential that regional policies and strategies be coordinated with the development of national policies and legislation and implemented through national investment programs. Some of the countries will need assistance to develop adequate policies and legislation for emission control with particular attention to nutrient reduction. This is particularly true for those who will need to re-organise their political, legal, administrative and socio-economic structures due to the economic transition process or to the aftermath of the war. The project will facilitate the provisions for protection of the environment in those countries where environment protection and investments for pollution reduction are not the priority issues in the near future. It will thus help providing for a coordinated regional and transboundary water management of the whole Danube River Basin including its discharge area in the Black Sea.

1. Relevance to GEF, priority

The project would be of great importance and it relates highly to the *International Waters focal area* as it will ensure protection of international waters (the Danube River Basin and the Black Sea), sustainable management of natural resources and biodiversity. It is of high priority as it would help ensuring implementation of regional policies and strategies for nutrient and pollution reduction at national level in the whole river basin.

It has particular relevance under the Operational Program Number 8: *Waterbody-Based Operational Program* and to some extent under OP No 10: *Contaminant-Based OP*. It aims at "undertaking projects that involve helping groups of countries to work collaboratively with the support of implementing agencies in achieving changes in sectoral policies and activities so that transboundary environmental concerns degrading specific water-bodies can be resolved"(OP 8). It does also aim at "demonstrate ways of overcoming barriers to the use of best practices for limiting release of contaminants causing priority concerns in the International Waters focal area…"(OP 10).

2. Objectives

The overall objective of the Danube Regional Project is to "complement the activities of the ICPDR required to provide a regional approach and global significance to the development of national policies and legislation and the priority actions for nutrient reduction and pollution control with particular attention to transboundary effects within the DRB and the Black Sea area". This objective is valid although it lacks the recognition of the environmental concerns that needs to be taken into account. A long term objective should be to achieve environmental sustainability in the transboundary Danube River Basin including in its discharging area in the Black Sea. To reach such an objective it would be necessary to apply the regional approach and undertake the priority actions as described. It is essential that a GEF supported project is focused towards achieving sustainable transboundary *ecological* effects.

The presented four immediate objectives:

- "development of nutrient reduction policies and legal instruments and measures for exacting compliance;
- institutional strengthening and capacity building for transboundary cooperation in nutrient reduction;
- awareness raising and reinforcement of NGO participation in nutrient reduction activities; and
- strengthening the monitoring and information mechanisms on transboundary pollution control and nutrient reduction"

in the presentation should further be regarded as activities to reach the objectives. They do, how ever necessary, sound too technical to be regarded as objectives and do not pay sufficient attention to the ecological concerns. The activities as described in the project brief would if properly implemented result in a transboundary cooperation and ecological sustainability but the latter must be clearly identified as an objective to ensure such a result.

3. Approach

The project brief defines the approach as being coherent and coordinated and that the project will build on existing mechanisms and structure. As the proposed Danube Regional Project is to be an integral part of the proposed Danube/Black Sea Basin Programmatic Approach it needs to be identified within that framework. The approach is technically sound, in line with the overall framework. It would result in achieving the objectives as presented, including the environmental benefits that are not identified in the project brief but would be an overall long-term objective for GEF support.

As the Black Sea is a water-body big enough to have a coriolis induced current system, nutrients and pollution discharged by the Danube River into the Black Sea might adversely affect coastal zones of other countries in the Black Sea. These effects might be defined in earlier Black Sea projects but are not taken into account in the current project brief. Such effects need to be made clear in order to define whether any of the other Black Sea riparians ought to be included in the project.

4. Background Information

As the Danube Regional Project is seen as a logical continuation of previous projects, focusing on Strengthening of Implementation Capacities for Nutrient Reduction and Transboundary Cooperation background information provided is essentially building on information within this context. This information is both relevant and substantial. It would, however, be useful to include project evaluations of these projects as annexes. This information could serve as a useful point-of-departure for the project as defined in the project brief.

5. Funding level

The project needs to be seen within the framework of the whole Danube-Black Sea program which is composed of three complementary parts:

1. a series of country-related investment projects executed through the World Bank-GEF Strategic Partnership with GEF financial support,
2. two Regional Projects, for the Danube River Basin and the Black Sea respectively, and
3. other GEF and donor interventions in the basin targeting reduction of nutrients and toxic pollutants.

The proposed Danube Regional Project should be implemented within that context, thus taking into account and build on the existing mechanisms and structures. The project would thus not need to establish new systems which of course would imply financial as well as structural benefit. Funding for the Environmental protection and nutrient reduction in the Danube River Basin will be provided from different sources in accordance with what is described in the project brief. The proposed UNDP/GEF Danube Regional Project would be an integral part of that. Against this background, the funding level should be seen as appropriate.

6. Innovation

The most innovative aspects of this project proposal lie in the framework in which it is based, the Danube/Black Sea Programmatic Approach. This has a truly integrated approach, including its technical aspects of transboundary pollution reduction, and application of regional policies at national level to protect the environment. The transboundary cooperation that is needed to succeed in development and application of policies and strategies between countries where the economic, social and political pre-conditions are so different is a true challenge.

One of the activities to be undertaken as part of the project in order to meet the immediate "objective" of awareness raising and reinforcement of NGO participation in nutrient reduction activities is supporting NGOs to boost their capacities for active participation within the project by setting up a Small Grants Program. This would provide for cooperation between all actors, governmental as well as NGOs. Such innovative cooperation if successful could serve as a model for future cooperation and collaboration in larger, integrated GEF-supported projects.

7. Strengths/Weakness

The greatest strength of the project is the it could be seen as a natural continuation of two successful projects, and what is described above as the most innovative aspects of the proposal.

The most significant weaknesses of the proposal is that it is lacking proper references to the environmental impacts of the nutrient and toxic emissions. Further, although the strengthening of the monitoring and information mechanisms is one of the immediate "objectives", there is no proper process for Monitoring and Evaluation of the project included in the project brief. The component aiming at Strengthening of the monitoring and information mechanisms would include provisions for "Analysis of sediments in the Iron Gate reservoir and impact assessment of heavy metals and other toxic substances on the Danube and the Black Sea ecosystems", "Monitoring and assessment of wetlands' nutrient removal capacities", and "Danube Basin feasibility study and consultation process on economic instruments for nutrient reduction".

Some of the aspects of these monitoring and assessments could be used in a Project Monitoring and Evaluation process of the Project Implementation but it is important to early in the process establish criteria and indicators in order to be able to undertake a proper process, thereby to identify successes and failures in the project and its implementation.

The project, which is a very useful and innovative project would benefit from a stronger reference to and analyses of environmental impacts and ecosystem degradation from the nutrient and toxic effluents. A better developed system for project Monitoring and Evaluation should be developed. And an evaluation report from the earlier GEF supported projects in the Danube and Black Sea should be annexed. This would strengthen the project.

28 August, 2000

Gunilla Björklund

Response from the ICPDR/GEF Project team to the comments from:

STAP-Roster Independent Technical Review undertaken by

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On the Danube Regional Project: "Strengthening of Implementation Capacities for Nutrient Reduction and Transboundary Cooperation in the Danube River Basin

General comment:

We appreciate the comments received from Dr Gunilla Björklund, which are well founded and which we have taken into account to prepare a revised version of the Project Brief. This revised version reflects also other comments received in the meantime from participating countries and from the GEF Secretariat, as from Al Duda and others.

Specific amendments in relation to STAP-Roster Independent Technical Review:

2. Objectives

1. We think that the overall objective reflects the situation under given conditions and in how far the project can contribute to environmental concerns.
2. The Project Objective has been amended : The overall objective of the Danube Regional Project is to complement the activities of the ICPDR required to provide a regional approach and global significance to the development of national policies and legislation and the definition of priority actions for nutrient reduction and pollution control with particular attention **to achieving sustainable transboundary ecological effects** within the DRB and the Black Sea area.
3. The four immediate objectives have been changed (made less technical), we do hope with some success :

   OBJECTIVE 1: Creation of sustainable ecological conditions for land use and water management

   OBJECTIVE 2: Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the DRB

   OBJECTIVE 3: Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems

   OBJECTIVE 4: Reinforcement of monitoring, evaluation and information systems for transboundary pollution control and nutrient reduction

3. Approach

Effects concerning the ecosystems in the Black Sea and its coastal zones are indeed defined in other reports : (i) we do hope in the Black Sea Project Brief and (ii) in the report , Annex 11 to the Danube Project Brief :"Causes and Effects of Eutrophication in the Black Sea".

4. Background Information

Two evaluation reports from the UNDP/GEF Pollution Reduction Program have been added in Annex 12 : (i) Terminal Evaluation from UNOPS, (ii) Terminal Report from the Project Manager

6. Innovation

Thanks for recognizing this innovative approach; I do hope that all decision makers see this as well: "One of the activities to be undertaken as part of the project in order to meet the immediate "objective" of awareness raising and reinforcement of NGO participation in nutrient reduction activities is supporting NGOs to boost their capacities for active participation within the project by setting up a Small Grants Program. This would provide for cooperation between all actors, governmental as well as NGOs. Such innovative cooperation if successful could serve as a model for future cooperation and collaboration in larger, integrated GEF-supported projects"

7. Strengths/Weakness

To provide information on environmental impacts of the nutrient and toxic emissions, we have added as Annex 10 a report on "Causes and Effects of Eutrophication in the Black Sea"; this report has been elaborated in June 1999 by the joint Danube/Black Sea Ad-hoc working Group and is the basis for the "Memorandum of Understanding" between the Danube and the Black Sea Commission and describes the effects of nutrient emission and toxic substances to the Black Sea.

Concerning Objective 4, which has been reformulated, we have moved Activity 2.4 under Objective 4 to adequately respond to activities in relation to monitoring, evaluation and information, with particular attention to indicators. Activities under Objective 3.4 are now the following:

(i) Development of Indicators for project monitoring and impact evaluation;
(ii) Analysis of sediments in the Iron Gate reservoir and impact assessment of heavy metals and other toxic substances on the Danube and the Black Sea ecosystems;
(iii) Monitoring and assessment of wetlands nutrient removing capacities;
(iv) Danube Basin feasibility study and consultation process on economic instruments for nutrient reduction.

Concerning development of indicators please refer also to Annex 8.4 : "Development of Process, Stress Reduction and Environmental Status Indicators to Monitor Nutrient Reduction and its Effects in the Danube River and the Black Sea"

Vienna, August 31, 2000
Joachim Bendow
Executive Secretary ICPDR

ANNEX 4 Project Budget

Annex 4: Project Budget - Danube Regional Project

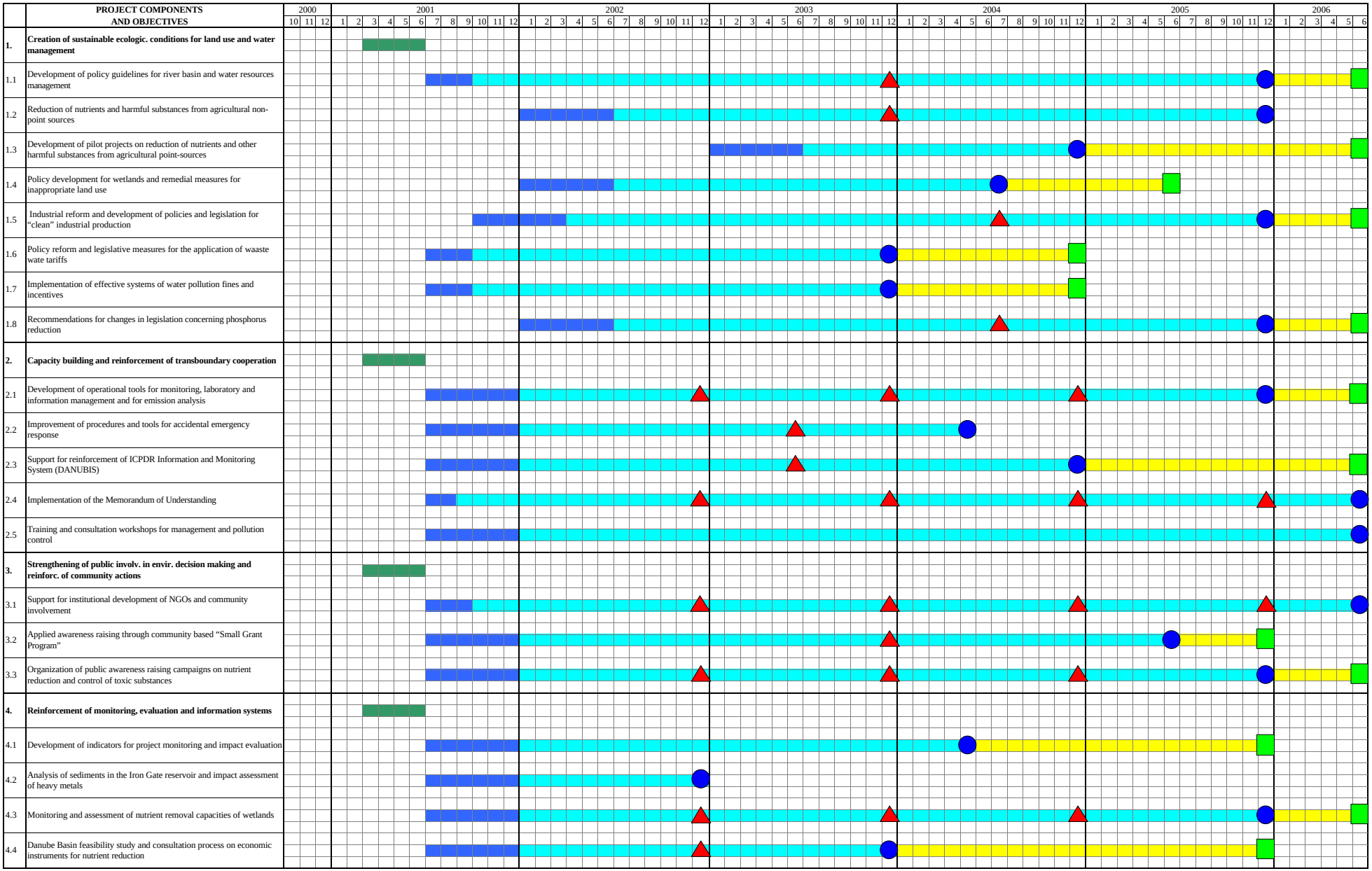
PROJECT COMPONENTS AND OBJECTIVES	Permanent Project Staff: Professional Staff		Permanent Project Staff: Admin. Technical Support Staff		Sub-contractors/ Int. Consultants (15000 USD/month)		National Consultants (5000 USD/month)		Workshops/Training Courses/Meetings (120 USD per diem /day/participant) (500 USD travel cost / participant)				Investments (Small Grants, equip./trans.)	Operation & administrative support	Support cost UNOPS/ ICPDR	TOTAL Budget
	Months	USD	Months	USD	Months	USD	Months	USD	No of workshops	No of Particip.	No of Days	USD	USD	USD	USD	USD
1 Creation of sustainable ecological conditions for land use and water management																
A) General project costs	**30**	**390,000**	**60**	**375,000**									**100,000**	**300,000**	**488,000**	**1,653,000**
B) Costs attributed to specific objectives :																
1.1 Development of policy guidelines for river basin management					20	360,000	66	330,000	12	33	4	388,080				1,078,080
1.2 Reduction of nutrients and harmful subst. from agricultural non-point sources					14	252,000	66	330,000	12	22	3	227,040				809,040
1.3 Reduction of nutrients from agricultural point sources/manure handling					14	252,000	66	330,000	12	22	3	227,040				809,040
1.4 Policy development for wetlands and remedial of inappropriate land use					13	234,000	30	150,000	2	33	3	56,760				440,760
1.5 Industrial reforms and policies and legislation for "clean" industrial production					20	360,000	30	150,000	11	22	2	179,080				689,080
1.6 Policies for application of acceptable waste water tariffs					5	90,000	22	110,000	2	33	2	48,840				248,840
1.7 Implementation of water pollution fines and incentives focusing on nutrients					5	90,000	16	80,000	2	33	2	48,840				218,840
1.8 Legislation concerning phosphorus reduction and restricted detergents standards					5	90,000	16	80,000	1	33	2	24,420				194,420
1 Subtotal	**30**	**390,000**	**60**	**375,000**	**96**	**1,728,000**	**312**	**1,560,000**	**54**	**231**	**21**	**1,200,100**	**100,000**	**300,000**	**488,000**	**6,141,100**
2 Capacity building and reinforcement of transboundar cooperation																
A) General project costs	**15**	**195,000**	**30**	**187,500**										**150,000**	**248,000**	**780,500**
B) Costs attributed to specific objectives :																
2.1 Monitoring, laboratory and information management					2	36,000	22	110,000	10	22	4	215,600	200,000			561,600
2.2 Accidental emergency response to transboundary situations					2	36,000	22	110,000	8	22	3	151,360	100,000			397,360
2.3 Reinforcement of ICPDR information and monitoring systems					8	144,000	22	110,000	5	33	3	141,900	300,000			695,900
2.4 Implementation of the Memorandum of Understanding for ICPDR and ICPBS						0	10	50,000				0				50,000
2.5 Training and consultation workshops for management and pollution control					4	72,000		0	10	40	5	440,000				512,000
2 Subtotal	**15**	**195,000**	**30**	**187,500**	**16**	**288,000**	**76**	**380,000**	**33**	**117**	**15**	**948,860**	**600,000**	**150,000**	**248,000**	**2,997,360**

Annex 4: Project Budget - Danube Regional Project

PROJECT COMPONENTS AND OBJECTIVES	Permanent Project Staff: Professional Staff		Permanent Project Staff: Admin. Technical Support Staff		Sub-contractors/ Int. Consultants (15000 USD/month)		National Consultants (5000 USD/month)		Workshops/Training Courses/Meetings (120 USD per diem /day/participant) (500 USD travel cost / participant)				Investments (Small Grants, equip./trans.)	Operation & administrative support	Support cost UNOPS/ ICPDR	TOTAL Budget
	Months	USD	Months	USD	Months	USD	Months	USD	No of workshops	No of Particip.	No of Days	USD	USD	USD	USD	USD
3 Strengthening of public involv. in envir. decision making and reinforcement of community actions												0				
A) General project costs	**5**	**65,000**	**10**	**62,500**									**0**	**150,000**	**374,000**	**651,500**
B) Costs attributed to specific objectives :												0				
3.1 Institutional development of NGOs and community involvement	10	70,000				0	11	55,000				0		500,000		625,000
3.2 Community based "Small Grants Program"	20	140,000			2	36,000	14	70,000				0	2,000,000			2,246,000
3.3 Public Awareness raising campaigns on nutrient reduction	30	210,000			2	36,000	22	110,000				0	800,000			1,156,000
3 Subtotal	**65**	**485,000**	**10**	**62,500**	**4**	**72,000**	**47**	**235,000**	**0**	**0**	**0**		**2,800,000**	**650,000**	**374,000**	**4,678,500**
4 Reinforcement of monitoring, envaluation and information systems																
A) General project costs	**10**	**130,000**	**20**	**125,000**									**0**	**100,000**	**90,000**	**445,000**
B) Costs attributed to specific objectives :																
4.1 Development of indicators for project monitoring and impact evaluation					2	36,000	11	55,000	2	35	2	51,800				142,800
4.2 Analysis of sediments in Iron Gate and impact on Black Sea ecosystems					8	144,000	8	40,000								184,000
4.3 Monitoring and assessment of nutrient removal capacities of wetlands					10	177,240	12	60,000								237,240
4.4 Consultation process on economic instru-ments for nutrient reduction					8	144,000	6	30,000								174,000
4 Subtotal	**10**	**130,000**	**20**	**125,000**	**28**	**501,240**	**37**	**185,000**	**2**	**35**	**2**	**51,800**	**0**	**100,000**	**90,000**	**1,183,040**
Project TOTAL	**120**	**1,200,000**	**120**	**750,000**	**144**	**2,589,240**	**472**	**2,360,000**	**89**	**383**	**38**	**2,200,760**	**3,500,000**	**1,200,000**	**1,200,000**	**15,000,000**

ANNEX 5 Project Implementation Schedule

Annex 5: Project Implementation Schedule - Danube Regional Project



ANNEX 6 Assessment of Nutrient Emissions and Loads Discharged into the Black Sea

Assessment of Nutrient Emissions and Loads Discharged into the Black Sea

1. Introduction

The Danube River Protection Convention, created in the framework of the ECE-Convention for the protection of trans-boundary waters (Helsinki Convention 1992), became with its entry into force on 22 October 1998 the overall legal instrument for co-operation and trans-boundary water management in the Danube River Basin. The overall objective of the DRPC is to achieve and maintain the sustainable development and use of water resources in the Danube River Basin. The Contracting Parties are recommended to aim at an intensified regional co-operation, a due balance between ecology and economy, an integrated implementation as well as goal-oriented policies and strategies, executive structures and tools. In order to achieve substantial progress in the protection and sustainable use of the water resources, the following overall strategic goals and targets are defined:

- to maintain and improve the status of water resources as to quality and quantity;
- to prevent, reduce and control water pollution, including accidental pollution, in particular where hazardous substances and nutrients are involved;
- to improve the aquatic ecosystems and biodiversity;
- to contribute to the protection of the Black Sea from land-based pollution.

National and regional policies are based on common principles related to the protection and use of natural resources, in particular on the Precautionary and the Polluter Pays Principles, the best available technology (BAT) and the best environmental practice (BEP). The same applies to the Convention. Most of the Contracting Parties have developed a water management policy as part of their national policy. Sector policies for reducing point sources of pollution are mostly in place whereas specific policies for reducing diffuse sources of pollution are partly under development; policies regarding wetland rehabilitation are emerging.

The protection of the Black Sea and its ecosystems from land-based pollution constitutes a multifaceted regional framework objective. Its realisation depends to a considerable degree on the implementation of relevant objectives and policies in the Danube River Basin, in particular regarding eutrophication caused by nutrient discharges. Hence, the Commissions responsible for the protection of the Danube River (ICPDR) and the protection of the Black Sea (ICPBS) jointly declare their policies and willingness to co-operate for achieving common strategic goals as specified in a “Memorandum of Understanding” which shall be adopted in the year 2000. These goals particularly address assessment and urgent control measures regarding nutrients and hazardous substances. A defined ecological status is intended to be maintained and in the long term recovered through ensuring appropriate practices and measures.

In the frame of the Danube Environmental Programme, the UNDP Global Environment Fund and the EU through its Phare and Tacis programs, have since 1992 provided international assistance to develop appropriate mechanisms and planning tools for the implementation of the Danube River Protection

Convention. In the particular context of the Pollution Reduction Programme, the causes and the effects of water pollution have been analysed and policy guidelines, strategies, and projects for pollution reduction and water management have been developed. The project considers root causes for “Inadequate Management of Water Resources”, referring primarily to the middle and lower Danube countries, taking into account problems related to socio-political transition, reforms and general economic recession; war and displacement of population; absence of national strategies for water management and inefficient environmental management, enforcement and compliance.

Concerning direct causes, important sources of pollution or priority “hot spots” have been identified for the municipal, industrial and agricultural sectors. 51 “Significant Impact Areas” have been identified in the Danube River Basin, which are in particular affected by industrial pollution, COD and toxic materials as well as by excessive nutrient loads. Special consideration was also given to the nutrient transports to the Black Sea, indicating a total of 552 kilotons of Nitrate and 48,9 kilotons of Phosphorus annually reaching the Black Sea.

In the frame of the "Five Year Nutrient Reduction Programme", elaborated under the PDF-B activities, over 240 projects have been developed, responding generally to "hot spots" or point sources of emission, representing national priorities and taking equally into account the obligation to mitigate trans-boundary effects. Particular attention was given to the identification of sites for wetland restoration, which play an important role not only as natural habitats, but also as nutrient sinks.

The total investment required to respond to the priority projects is estimated to be about 4,1 billion US$, covering the following sectors:

- Municipal waste water collection and treatment plants
- Industrial waste water treatment
- Agricultural projects and land use
- Rehabilitation of wetlands

The expected results of the implementation of the Five Year Nutrient Reduction Plan show a considerable decrease of pollution in terms of COD/BOD, respectively in terms of N and P. The implementation of the proposed priority projects in the municipal, industrial and agricultural sectors will lead to an annual reduction of about 116,736 tons of N and 15,657 tons of P. The latter has a direct influence on the Black Sea and will contribute to achieving common Danube and Black Sea goals to restore marine ecosystems in the north-western shelf.

2. The Danube Water Quality Model

The Danube Water Quality Model (DWQM) was developed in the frame of the Danube Pollution Reduction Programme to simulate the actual in-stream nutrient load. Simulations have been conducted to support the Trans-boundary Analysis as well as to support the definition of priority measures of the Pollution Reduction Programme demonstrating nutrient reduction through the implementation of the projects and policy measures. Details about the work can be found in the related report (GEF, 1999).

2.1 System description

The Danube Water Quality Model (DWQM) describes the fate of the nutrients nitrogen (N) and phosphorus (P) in the Danube catchment. These nutrients are discharged in the aquatic environment due to human activities and natural processes. The model contains a schematisation of the Danube River and its main tributaries, derived from (Vituki, 1996) and the National Reviews (GEF, 1998), called "the network" as presented in Fig. 1.

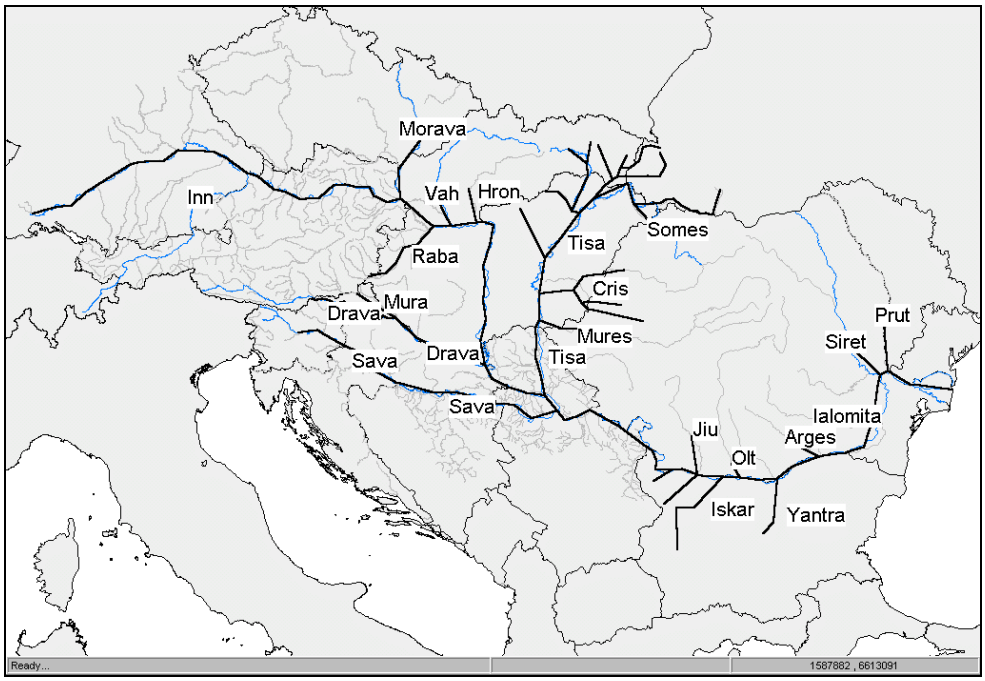


Fig. 1: The river network of the DWQM.

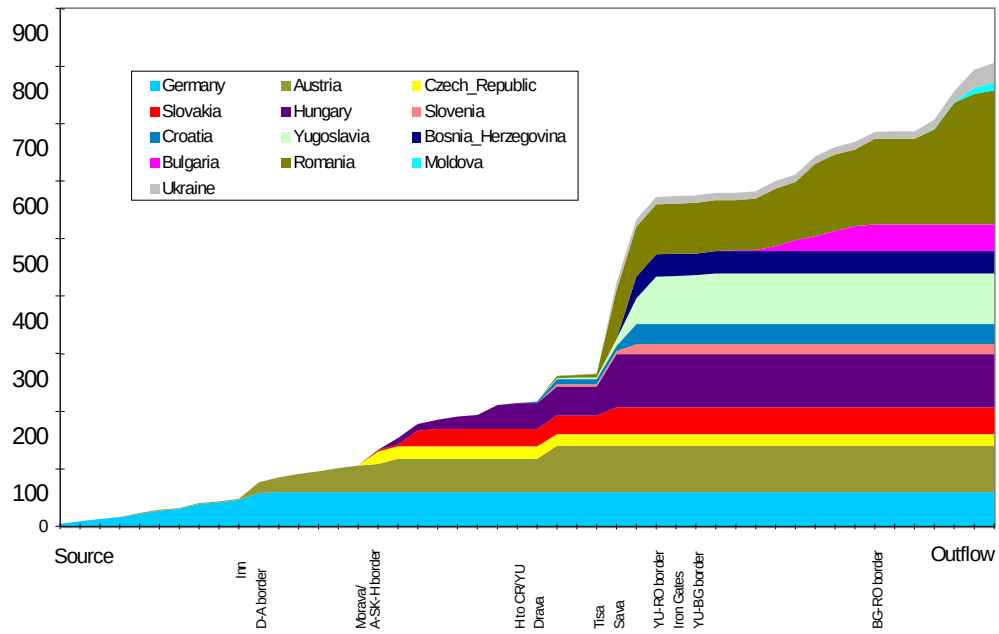


Fig. 2: The catchment profile along the Danube (in 1000 km^2), subdivided over the 13 principal Danube countries.

With the DWQM's objectives in mind, the catchment has been subdivided over the 13 principal Danube countries (see Fig. 2).

2.2 Conceptual model

The conceptual model of the DWQM is shown in Fig. 3. The emissions are split into two parts: the emissions directly to the river network and the retained emissions, which refer to any process effectively removing nutrients from the catchment[1]. Seasonal cycles of uptake and release are not considered retention. Relevant retention processes of nitrogen therefore include: (a) denitrification in the ground water and the surface water, (b) long-term accumulation of nitrogen in the ground water.

Retention processes of phosphorus include net storage in the sediments of lakes, flood plains and wetlands. The part of the remaining emissions not retained in the catchment reaches the network as effective emissions to the river. The final result is the in-stream transport of nutrients which is equal to the trans-boundary nutrient loads at the borders between the Danube countries.

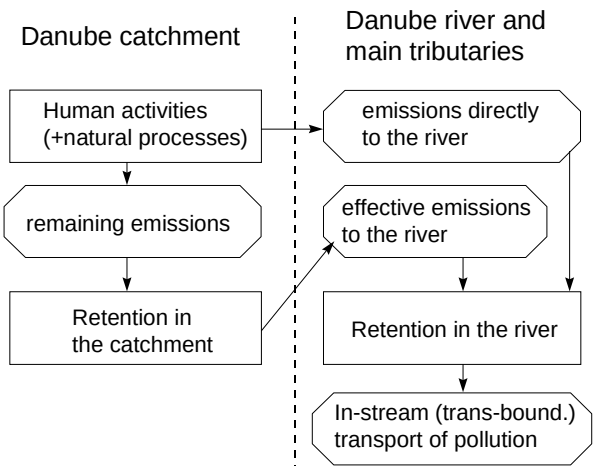


Fig. 3: Systems diagram

2.3 Implementation

The total emissions have been computed for all the Danube countries based on the "materials accounting method" (University of Vienna ea., 1997). The emissions estimates were originally made for the years 1988/1989 and 1992, but were later updated (University of Vienna, 1999) to 1994-1997 based on data collected in the National Reviews (GEF, 1998), see Fig. 4 and Fig. 5.

[1] The subject of retention of nutrients in the aquatic cycles of river catchments has been described in detail by many authors, e.g. Tonderski (1997), de Wit (1999).

Large individual point sources of N and P discharging directly to the river network were identified based on the EMIS inventory (Mehlhorn, 1998) and the National Reviews (GEF, 1998). The remaining emissions (Fig. 3) were computed by subtracting these emissions directly to the river from the total emissions discussed above.

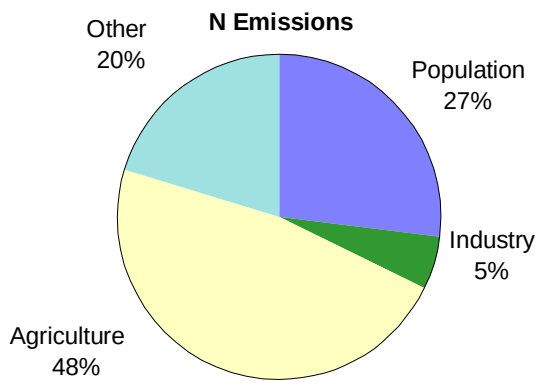


Fig. 4: Subdivision of N emissions.

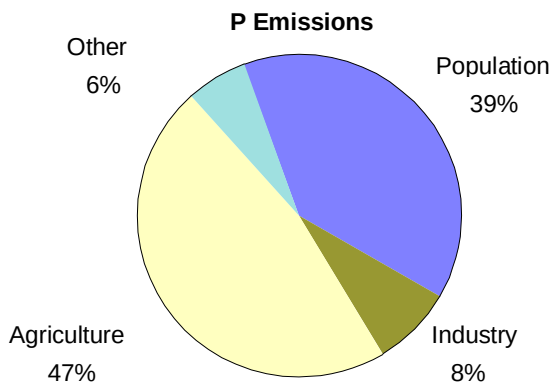


Fig. 5: Subdivision of P emissions.

The retention in the catchment is represented by an empirically derived "immission/emission-ratio". High (95% probability) and low (5% probability) estimates for these factors for N and P, as a function of the area specific run-off, were derived from Behrendt ea. (1999). The values for N range from 5-36% (low runoff) to 59-88% (high runoff), while the values for P range from 5-36% (low) to 72-100% (high).

Based on an analysis of the available data, two processes were identified as having the potential to cause a non-negligible retention in the river: denitrification (N) and net sedimentation in the backwater area of the Iron Gates dams on the Yugoslavian-Romanian border (P).

3. Results

3.1 The Trans-boundary Analysis

The Danube Water Quality model has been used to support the Trans-Boundary Analysis (TBA). To this end, a computation was carried out for a situation somewhere between the high and low estimates.

The precise definition of the computation was made by matching in-stream loads with the best available load data derived from observed nutrient concentrations and water discharges.

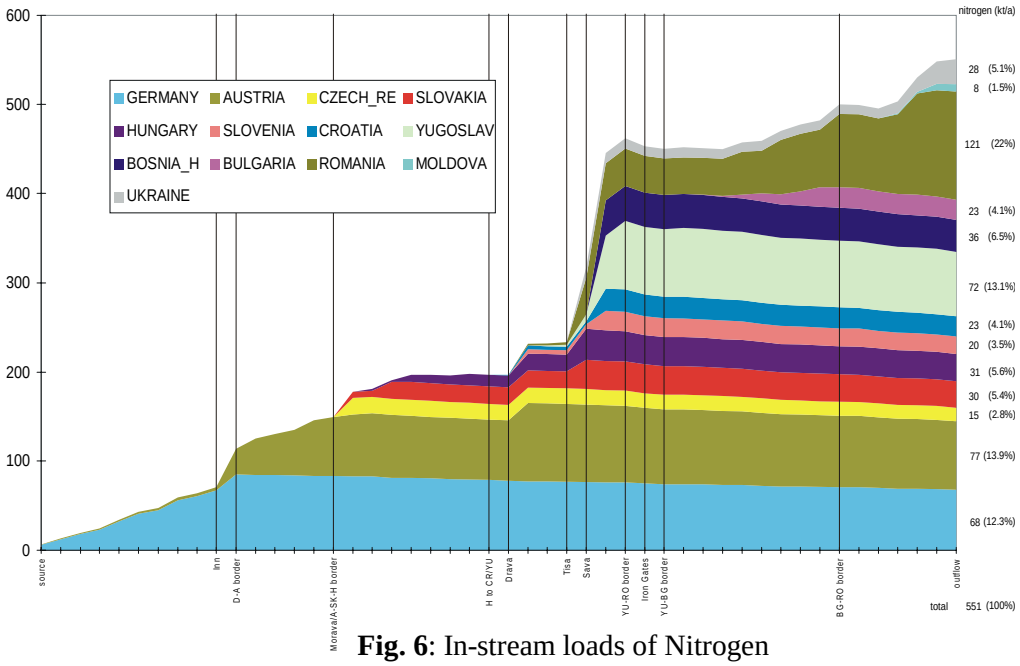


Fig. 6: In-stream loads of Nitrogen

The overall computation was split into 13 different segments: each one of them with the emissions from one individual country. The results of the 13 computations were superimposed to obtain the overall result. Because all equations in the DWQM were strictly linear, this was a mathematically valid procedure.

The results are

presented in Fig. 6 and Fig. 7. Both figures present the nutrient loads (vertical axis) as a function of the distance along the river (horizontal axis).

Fig. 6 shows the gradual increase of the in-stream nitrogen load from the source of the Danube up to the middle Danube area, where it increases very rapidly due to the inflows of the Drava, Tisza and Sava tributaries. The gradual increase continues up to the outflow.

The country contributions show a gradual or jump-wise build-up, similar to the build-up of their catchment contributions (see Fig 2). Downstream, the country nitrogen load contributions decrease gradually. This is the result of in-stream denitrification.

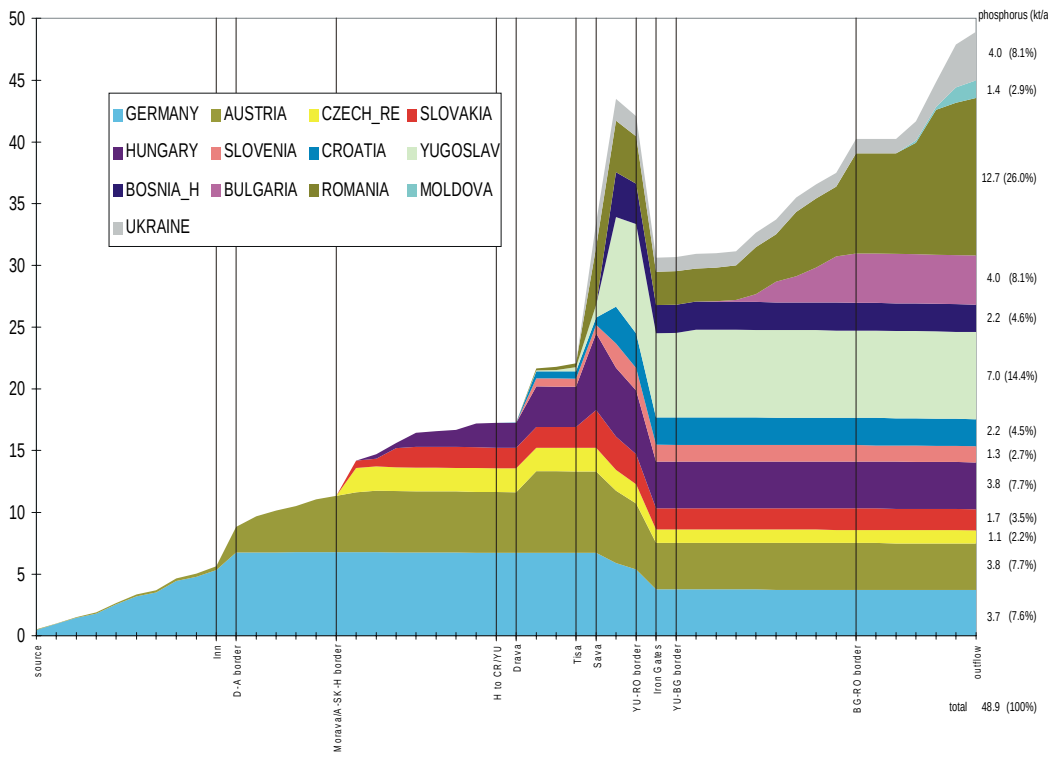


Fig. 7: In-stream loads of Phosphorus.

Fig. 7 shows a similar picture for phosphorus. In this case, however, the in-stream removal is not distributed over the whole river as with nitrogen.

Phosphorus is only removed from the river in the Iron Gates lakes area, downstream of the inflows of the Drava, Tisza and Sava tributaries.

Therefore, the in-stream load sharply decreases just downstream of the strong increase at the locations of these tributaries.

3.2 The Five Year Nutrient Reduction Action Plan

Taking into account the implementation of all projects of the Five Year Nutrient Reduction Action Plan (5YNRAP) and other pollution reduction measures in the Danube River Basin countries, the expected pollution reduction in terms of N is presented per country and sector in Fig 8 and summ-arised for N and P per sector in Fig 9.

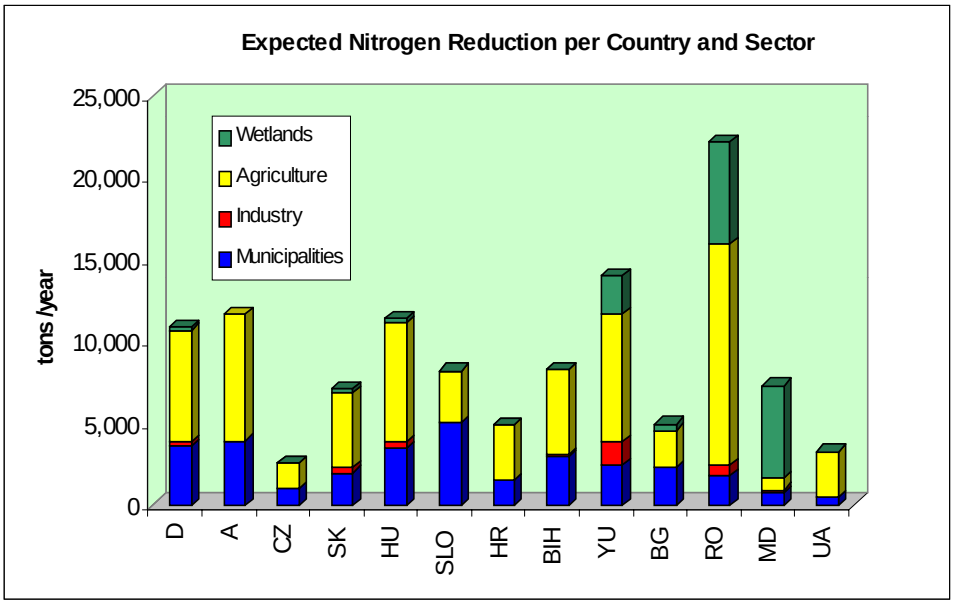


Fig. 8: Expected pollution reduction of N from proposed and ongoing national projects and policy

measures per country and per sector.

The presentation shows the particular importance of N and P reduction through municipal waste water treatment facilities and through the restoration or rehabilitation of wetlands functioning as nutrient sinks.

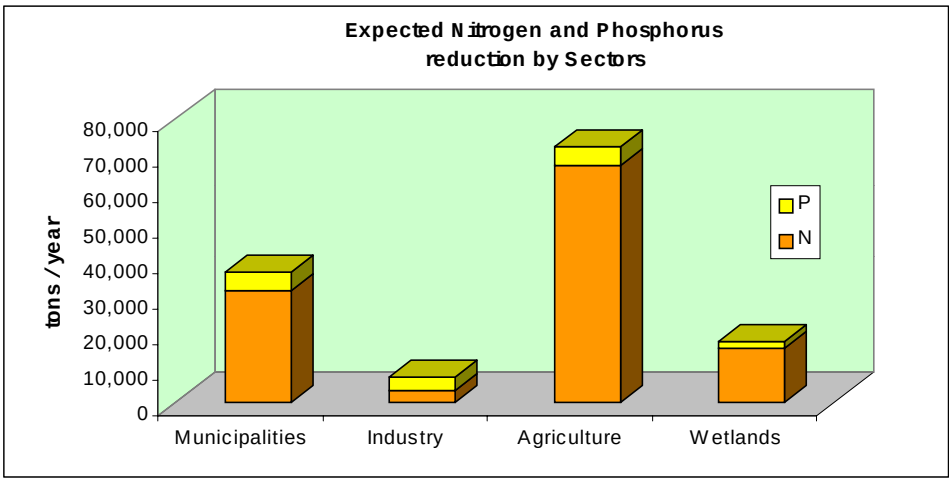


Fig. 9: Expected pollution reduction of N and P from proposed and ongoing national projects, summarised per sector.

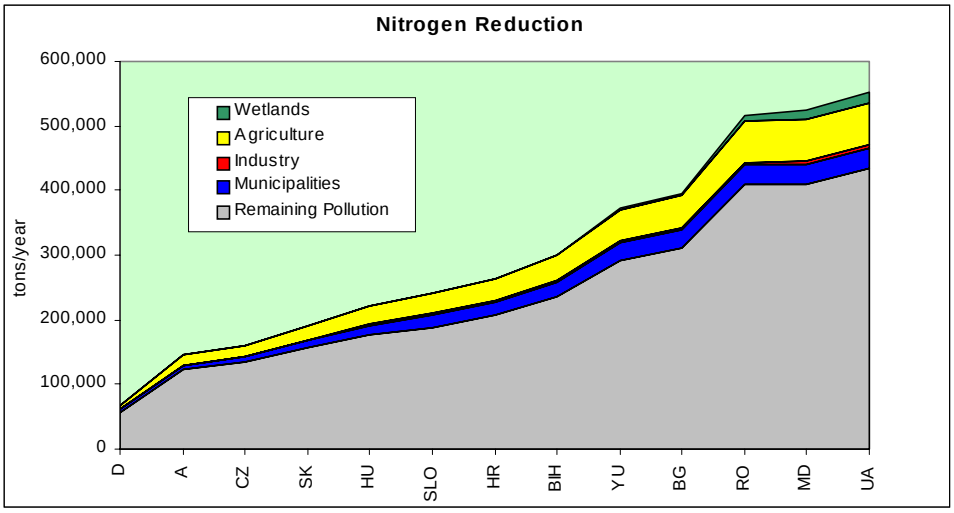


Fig. 11: In-stream nitrogen load profile for the Danube countries, before and after implementation of the 5YNRAP, with the additional effect of the restoration of wetlands.

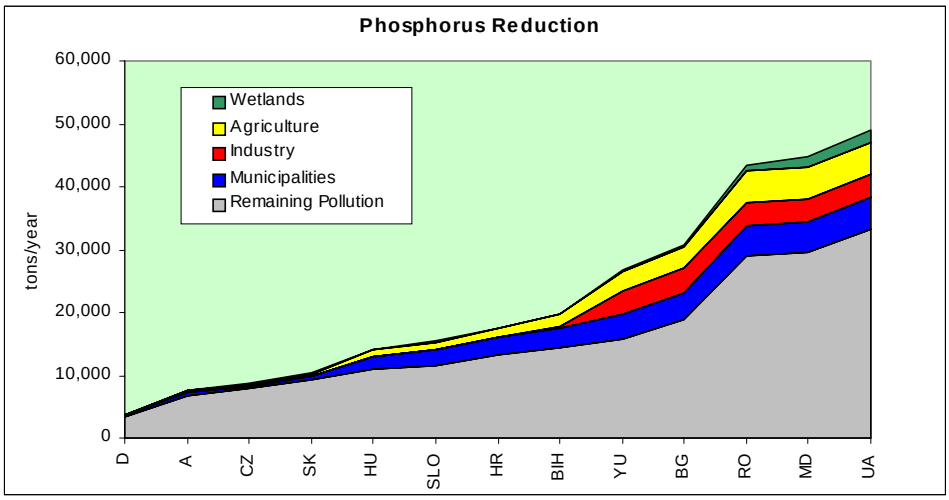


Fig. 10: In-stream phosphorus load profile for the Danube countries, before and after implementation of the 5YNRAP, with the additional effect of the restoration of wetlands.

Concerning the comparatively high reduction from the agricultural sector, it should be noted, that agricultural projects refer mainly to point sources of pollu-tion (animal farms). The largest share of the nutrient pollution in the agricultural sector, which is caused by diffuse emissions from fertiliser application, will be reduced through a change of agricul-tural practices and new policy instruments, which will be devel-oped during the new GEF Regional Project.

The positive impacts on the Black Sea concerning the reduction of nitrogen and phosphorus load are indicated in Fig 10 and Fig. 11.

Altogether the reduction of nutrient load discharged into the Black Sea is expected to reach the amount of 117,000 t/y for nitrogen and 16,000 t/y for phosphorus after the implementation of the proposed projects for municipal, industrial, agricultural waste water treatment plants, wetland restoration and reduction from agricultural non-point sources of pollution through the application of EU Nitrate Directive and consequent change of agricultural practices.

The highest concentration of hot spots is in the middle but also in the lower part of the Danube River Basin. As the DWQM results show that P reduction in respect to the Black Sea might be more effective closer to the Black Sea, whereas N reduction does not appear to be so distance related, emphasis should be given to projects in the middle and lower Danube to reduce loads to the Black Sea. These considerations should be balanced with the responsibility of all countries that contribute nutrients to the Danube to take action (Polluter Pays Principle).

The analysis of the effects of emission reductions per sector (see Fig. 10 and 11) shows clearly the importance of actions to be undertaken in the central and downstream countries of the Danube River Basin. Projects developed for the urban sector (population) are leading to a considerable decrease of nutrient emissions in particular phosphorus, which reflects the result of important investments in this sector. The industrial sector seems insignificant in terms of nutrient emissions, but could have a devastating effect if in downstream countries old industries with outdated technologies would be put back into operation. The agricultural sector accounts for the highest contribution of the nutrient load and proposed measures will in fact show more important results after 2005, when all policy measures for nutrient reduction have been implemented.

In the downstream countries, the reduction of nutrients is merely due to the rehabilitation of wetlands then to the reduction of use of fertilisers and pesticides. The most attention should therefore be paid to policy reforms and changes of agricultural practices, which is the main focus of the present GEF Regional Project.

Annex: Estimation of Nutrient Load and Expected Reduction

Country	Total Emissions (DWQM)		Five Year Nutrient Reduction Plan								Total Expected Load Reduction				Remaining Pollution	
			Municipalities		Industry		Agriculture*		Wetlands**							
	N (t/y)	P (t/y)	N (t/y)	P (t/y)	N (t/y)	P (t/y)	N (t/y)	P (t/y)	N (t/y)	P (t/y)	N (t/y)	N(%)	P (t/y)	P(%)	N (t/y)	P (t/y)
Germany	68,000	3,700	3,620	13	260	40	6,800	111	211	21	10,891	16	185	5	57,109	3,515
Austria	77,000	3,800	3,950	404	0	0	7,700	114			11,650	15	518	14	65,350	3,282
Czech Republic	15,000	1,100	1,010	58	61	1	1,520	36	0	0	2,591	17	95	9	12,409	1,005
Slovakia	30,000	1,700	2,001	125	348	0	4,500	170	225	23	7,074	24	318	19	22,926	1,382
Hungary	31,000	3,800	3,455	1,153	420	6	7,250	720	233	23	11,358	37	1,902	50	19,642	1,898
Slovenia	20,000	1,300	5,053	786	0	0	3,180	158	0	0	8,233	41	944	73	11,767	356
Croatia	23,000	2,200	1,509	239	0	0	3,450	220	0	0	4,959	22	459	21	18,041	1,741
Bosnia -Herzegovina	36,000	2,200	3,005	450	125	53	5,170	570	0	0	8,300	23	1,073	49	27,700	1,127
Yugoslavia***	72,000	7,000	2,486	700	1,347	3,571	7,840	942	2,320	350	13,993	19	5,563	79	58,007	1,437
Bulgaria	23,000	4,000	2,308	562	0	0	2,300	400	375	37	4,983	22	999	25	18,017	3,001
Romania	121,000	12,700	1,804	323	688	3	13,474	1,420	6,154	615	22,120	18	2,361	19	98,880	10,339
Moldova***	8,000	1,400	784	119	167	36	747	95	5,600	725	7,298	91	975	70	702	425
Ukraine	28,000	4,000	486	65	0	0	2,800	200	0	0	3,286	12	265	7	24,714	3,735
Total	552,000	48,900	31,471	4,997	3,416	3,710	66,731	5,156	15,118	1,794	116,736	21	15,657	32	435,264	33,243

* Agriculture = agricultural industries and diffuse sources

** Wetlands = in-stream reduction

*** Data adjusted: YU - Municipalities; MD - Wetlands

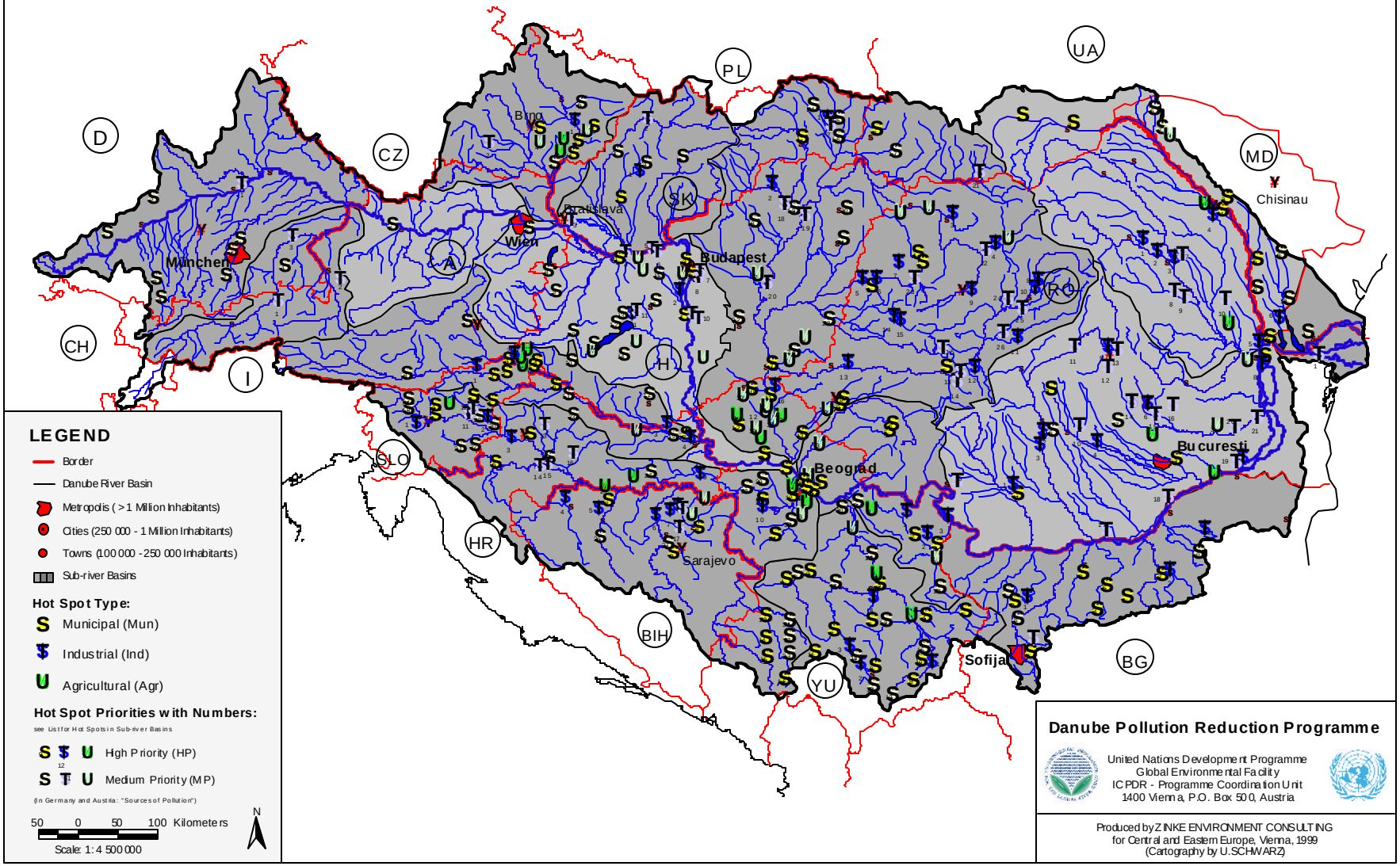
ANNEX 7 Thematic Maps

Annex 7.1 Distribution of Hot Spots in the Danube Sub-river Basins

Annex 7.2 Major Hydraulic Structures and Descriptions in the Danube Basin

Distribution of Hot Spots in the Danube Sub-river Basins

Based on National Planning Workshop Reports 1998, Updates March 1999



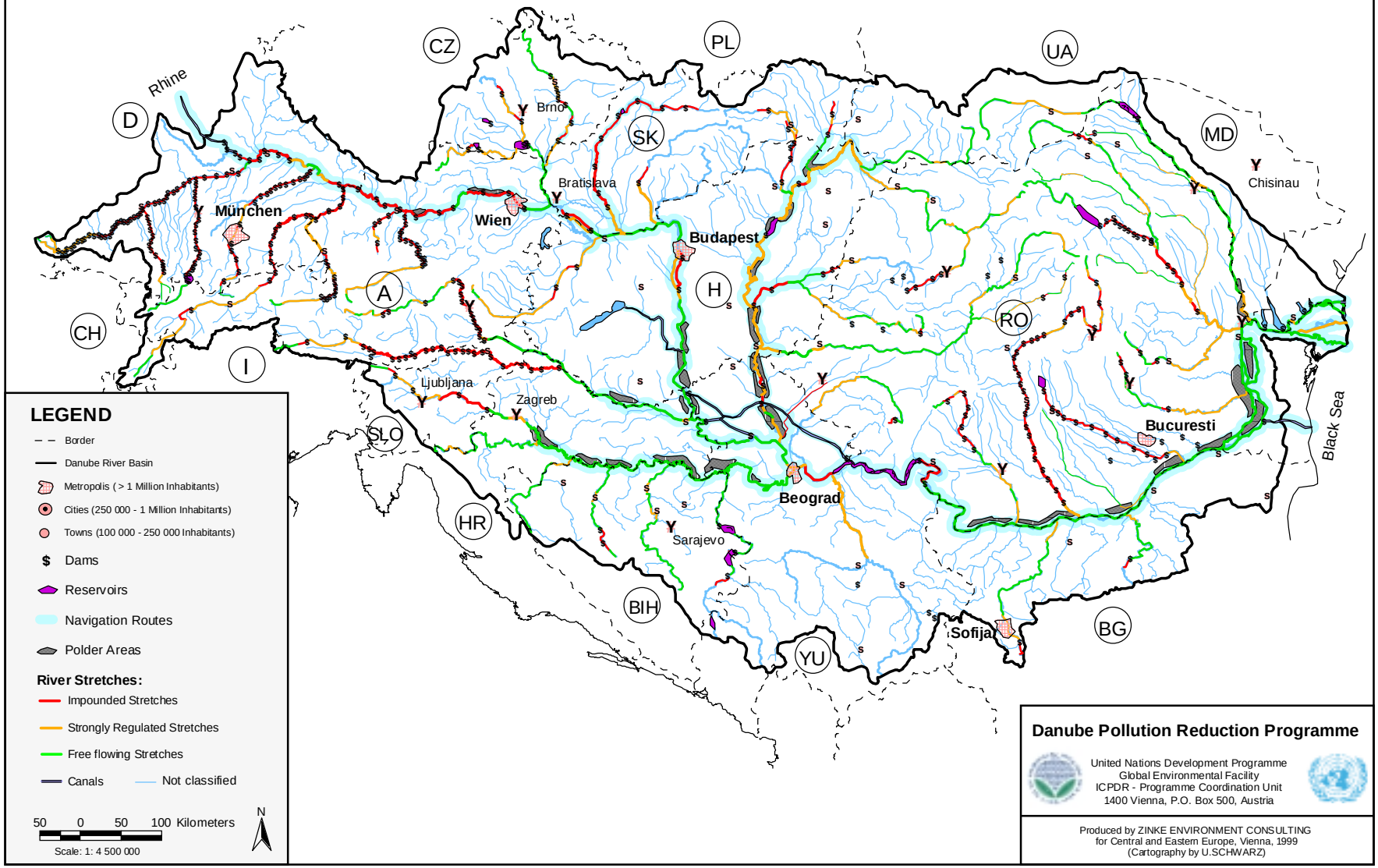
Danube Pollution Reduction Programme

United Nations Development Programme
Global Environmental Facility
ICPDR - Programme Coordination Unit
1400 Vienna, P.O. Box 500, Austria

Produced by ZINKE ENVIRONMENT CONSULTING
for Central and Eastern Europe, Vienna, 1999
(Cartography by U.SCHWARZ)

Major Hydraulic Structures and Description of Rivers in the Danube Basin

Based on Information from National Level and Additional Research 1999



ANNEX 8 Summary Reports on National Contributions in Support of the Project Brief

Annex 8.1 Existing and Planned Inter-ministerial Co-ordination Mechanisms Relating to Pollution Control and Nutrient Reduction

Annex 8.2 Existing and Planned Policies and Legislation Relating to Pollution Control and Nutrient Reduction

Annex 8.3 Five Year Nutrient Reduction Action Plan

Annex 8.4 Reinforcement of NGO Activities in Project Implementation and Awareness Raising

Annex 8.5 Development of Process, Stress Reduction and Environmental Status Indicators to Monitor Nutrients Reduction and its Effects in the Danube River Basin and the Black Sea

STRENGTHENING THE IMPLEMENTATION OF NUTRIENT REDUCTION MEASURES AND TRANSBOUNDARY COOPERATION IN THE DANUBE RIVER BASIN

EXISTING AND PLANNED INTER-MINISTERIAL CO-ORDINATION MECHANISMS RELATING TO POLLUTION CONTROL AND NUTRIENT REDUCTION

SUMMARY REPORT IN SUPPORT OF THE PROJECT BRIEF

AUGUST 2000

International Commission for the Protection of the Danube River

UNDP/GEF Assistance

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COUNTRY REPORTS

LIST OF ABBREVIATIONS

AHEG	Ad-Hoc Expert Group
BD	Bucharest Declaration
BOD5	Biochemical Oxygen Demand in 5 days
COD	Chemical Oxygen Demand
CPC	Country Program Co-ordinator
DRB	Danube River Basin
DRBPRP	Danube River Basin Pollution Reduction Programme
DWQM	Danube Water-Quality Model
EIA	Environmental Impact Assessment
EMIS/EG	Emission Expert Group
EPA	Environmental Protection Act
EPDRB	Environmental programme for Danube River Basin
EU	European Union
GEF	Global Environment Facility
GNP	Gross National Product
HS	Hot Spot
ICPDR	International Commission for the Protection of the Danube River
IPPC	Integrated Pollution Prevention and Control
ISPA	Instrument for Structural Policies for Pre-Accession
IWWTP	Industrial Waste-Water Treatment Plants
LAWA	Joint Austrian water commission of the states
MAFF	Ministry of Agriculture, Forestry and Food
MTCWM	Ministry of Transport, Communication and Water Management
MESP	Ministry of Environment and Spatial Planning
MH	Ministry of Health
MIT	Ministry of Industry and Trade
N	Nitrogen (all forms)
N/A	Not Available (i.e. missing data)
NEAP	National Environmental Action Programme
NEPP	National Environmental Protection Program
NFP	National Focal Point
NGO	Non-Governmental Organisation
NRL	National Reference Laboratory
P	Phosphorus (all forms)
PCU	Program Co-ordination Unit (in Vienna)
PE	Population Equivalent = load of one person into waste water
PHARE	European Union Programme for Development
PPP	Polluter Pays Principle
RBM	River Basin Management
SIA	Significant Impact Areas
SWWTP	Small Waste-Water Treatment Plants
TAIEX	European Union programme for technical assistance
TOR	Terms of Reference
UNDP	United Nations Development Programme
UWWTD	Urban Waste Water Treatment Directive
WFD	Water Framework Directive

1 INTRODUCTION

The purpose of this Summary Report is to provide an overview and assessment of the existing and planned inter-ministerial mechanisms related to pollution abatement with particular attention to nutrient control and reduction in the Danube River Basin countries.

The Summary Report is an integral component for the preparation of the GEF/UNDP funded project entitled ”Strengthening Implementation of Nutrient Reduction Measures and Transboundary Co-operation in the Danube River Basin”. The basic task of this preparatory work is to prepare a qualified material basis for the elaboration of a complete Danube Regional Project for submission to the GEF Council.

The GEF/UNDP funded project aims to promote (i) a basin wide approach to the development of national policies and legal instruments to improve water quality, (ii) integration of nutrient control and reduction measures into environmental policies, (iii) institutional strengthening and capacity building to assure compliance and enforcement, and (iv) awareness raising for active involvement in transboundary pollution control and environmental protection.

The underlying problem causing unsustainable water use practices leading to an increased nutrient content in the Danube River is that nutrient control and reduction measures are often not determined and implemented as part of water resources management policies or environmental protection strategies. For some countries, such as the Czech Republic, nutrient control and reduction measures are part of the water and environmental protection strategy.

This Summary Reports represents an assessment for all DRB countries, respectively particular categories of DRB countries and the country presentation on existing and planned inter-ministerial structures relating to nutrient control and reduction, based on reports from national consultants for each of the DRB countries. The contributions delivered by the consultants differ in terms of depth, completeness and totality of the presentations.

The structure of the Country Report follows the structure of the ”national reports”, and provides both particular information and data for each of the DRB countries. Country-specific information is structured as follows:

(1) Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction
- Organization, duties, responsibilities, rules of procedure and results
- Co-operation between governments and local communities/ non-governmental organizations in relation to nutrient reduction concerns
- Description of main problems

(2) Guidelines for the improvement/creation of national inter-ministerial nutrient control and reduction mechanisms
- Recommendations for improvement of the existing national inter-ministerial mechanisms to respond to nutrient reduction concerns
- Suggestions for the creation of new mechanisms for nutrient control and reduction

(3) Main barriers to the creation of national inter-ministerial mechanisms
- Legal and institutional barriers
- Financial barriers

(4) Proposed national inter-ministerial mechanisms
- Institutional and legal framework
- Schedule for implementation

(5) Main country-specific features and conclusions

2 ASSESSMENT OF RESULTS AND CONCLUSIONS

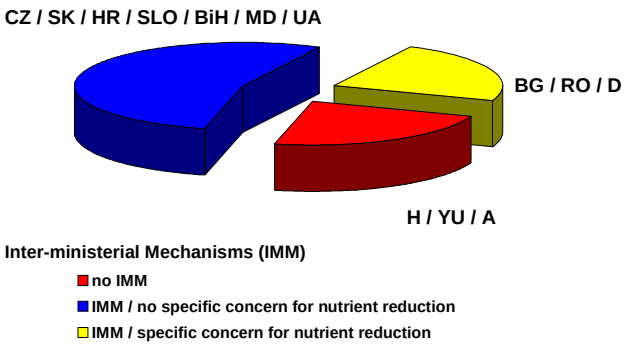
2.1 Analysis of the existing national inter-ministerial mechanisms for nutrient control and reduction

Not all Danube countries place sufficient emphasis on cooperation between environmental and agricultural authorities or industrial enterprises, farmers and local communities as a substitute for the traditional systems based on fragmented decision making process. For most of the countries, especially for those in transition, the idea of a national inter-ministerial mechanism for pollution control and nutrient reduction does not represent a priority. However, the governments are aware of the potential such a mechanism carries in terms of reducing nutrients in the Danube River Basin and the Black Sea. The diversity of views and proposals and the biases built into modern EU Directives concepts create a precondition encouraging the countries to create a new inter-ministerial mechanism or improve the existing structures by charging them with nutrient reduction and pollution control responsibilities.

The Danube countries identified agricultural diffuse sources as the most damaging and widespread threat to the environment.

There is a substantial need in the Danube River Basin countries for the creation of nutrient reduction and pollution control mechanisms. Among the accession countries in particular, there is a large potential and willingness to implement nutrient reduction measures.

Existence of Inter-ministerial Mechanisms for Nutrient Reduction



Based on the findings of the national contributions, the countries can be divided into three groups. The first group includes EU member countries such as Germany and Austria, whose existing national inter-ministerial and ministerial structures allow an effective performance of nutrient reduction and control tasks. The second group includes countries where specific mechanisms for nutrient reduction do not exist. However, there are several relevant national inter-ministerial mechanisms with responsibilities for water pollution abatement and environmental protection. Most of these structures also deal with diffuse pollution, implementing pollution reduction measures or approving new investments in the water sector. This group comprises the Czech Republic, Romania and Bulgaria. Finally, in the rest of the Danube countries, nutrient reduction and pollution control is not high on the policy makers' agenda.

The existing national inter-ministerial and ministerial mechanisms include central environmental authorities, water companies, agricultural, forestry, industry, finance and health authorities.

Composition of the Existing Inter-ministerial Mechanisms

	D	A	CZ	SK	H	SLO	HR	BiH	YU	BG	RO	MD	UA
central environm. authorities								x					x
environment	x	x	x	x	x	x	x		x	x	x	x	
water	x	x	x		x		x		x	x	x	x	
agriculture	x	x	x	x	x	x	x		x	x	x	x	
forestry		x					x			x	x	x	
industry						x	x			x	x	x	
finance				x					x				
health					x	x	x		x	x	x	x	

2.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

Proposals for the improvement or creation of inter-ministerial mechanisms capable to respond to nutrient reduction concerns have been developed by all countries.

These proposals refer to both legal and institutional frameworks and include: (i) the implementation of nutrient-related legislation based on EU Directives and ratified International Conventions, (ii) the development of instruments for diffuse pollution characterization and control, (iii) the creation of rules for good farming practices and good practices in drinking water protection zones, and (iv) the application of an integrated approach to the management of water resources on the river basin level.

Proposed Improvement of Inter-ministerial Mechanisms

	D	A	CZ	SK	H	SLO	HR	BiH	YU	BG	RO	MD	UA
legislative improvement of existing IMM	x		x			x	x	x	x	x		x	x
institutional improvement of existing IMM	x	x	x		x	x	x	x			x	x	x
creation of new legislation			x	x	x	x		x	x	x	x		x
creation of new institutions			x	x	x	x	x	x	x	x	x		x

The Danube countries believe that cooperation between governments and local communities/ non-governmental organizations with respect to nutrient reduction issues is very important. Nutrient reduction is directly or indirectly included in the duties and responsibilities of several ministries, local authorities, farmers, new owners of industrial plants, environmental NGOs and researchers.

The majority of DRB countries have proposed the creation of national pollution control and nutrient reduction mechanisms.

Very good examples for cooperation between the governments, the inter-ministerial mechanisms and the local communities and NGOs are shown by the majority of the countries through the establishment of the river basin authorities.

However, there are limitations to the identified mechanisms of the middle and lower Danube countries, including: restricted financial resources, inadequate legal and institutional frameworks, and low priority placed on nutrient reduction compared to other water quality or environment-related problems.

2.3 Main barriers to the creation of national inter-ministerial mechanisms

There are several legal and institutional barriers to the creation of national inter-ministerial mechanisms dealing with nutrient reduction and pollution control.

These measures are mainly referring to the (i) lack of adequate environmental legislation and institutional frame, (ii) fragmentation of responsibilities among the water, environmental and agricultural authorities, and (iii) limited integration of environmental requirements into economic development policies. In addition, transition countries are faced with financial barriers related to reduced financial resources.

Problems of the Existing Inter-ministerial Mechanisms

	D	A	CZ	SK	H	SLO	HR	BiH	YU	BG	RO	MD	UA
fragmented water management administration tasks		x	x			x						x	x
low priority of nutrient reduction at the governmental level					x		x	x					
weak institutional capabilities								x		x			
insufficient legal framework				x		x	x	x	x	x	x		
insufficient database								x					
limited funds			x	x		x	x	x					x

2.4 Proposed national inter-ministerial mechanisms

The proposals - formulated mainly by the transition countries - for the improvement or creation of national inter-ministerial mechanisms for nutrient reduction and pollution control are related to both legal and institutional framework and cover:

(i) harmonization of the existing legislation with the EU requirements, including the implementation of nutrient-related legislation based on EU Directives and ratified international conventions and agreements,

(ii) the creation of rules for good agricultural practices, and

(iii) the introduction of an integrated water management approach on the river basin level, including the creation of river basin committees.

The majority of the Danube River Basin countries do have the potential and the willingness for the creation of national pollution control and nutrient reduction mechanisms.

2.5 Inter- ministerial Mechanisms for Nutrient Reduction in the Danube River Basin

Existing inter-ministerial mechanisms				Proposed inter-ministerial mechanisms			
Name	**Composition**	**Tasks**	**Problems**	**Improvement of existing structures**		**Creation of new structures**	
				Legal framework	**Institutional framework**	**Legal framework**	**Institutional framework**
1. Germany (incl. Bavaria)							
1) Co-ordination of legalisation on federal and state level	1. LAWA* and federal ministries	1. Implementation of EU-directives, federal regulations and acts; set minimum requirements for municipalities and industries					
2. Coordination groups for legal regulations and planning 3. Coordination groups for environmental affairs 4. Regional planning association 5. Working groups on administrative level 6. Cooperation between federal and state administrations and scientific and technical associations	2. State ministries 3. State ministries for environment and agriculture 4. Relevant social groups including municipalities 5. State office for water management, Geological survey, state offices for agriculture 6. LAWA and ATV-DVWK	2. Bavarian water act, State development program 3. Program „Stickstoff 2000“; „Gülleprogramm“; „Kultur-Landschaftsprogram“ „Good farming practice“ 4. Regional plans (18 Regions) 5. Regulations for protected areas for drinking water, program for water quality in rural areas, projects for water quality protection in catchment areas of lakes and reservoirs 6. Investigations and reviews concerning agricultural impacts on water quality		1. Intensify the use of the existing mechanism	1. Intensify the use of the existing mechanism		

Existing inter-ministerial mechanisms				Proposed inter-ministerial mechanisms			
Name	**Composition**	**Tasks**	**Problems**	**Improvement of existing structures**		**Creation of new structures**	
				Legal framework	**Institutional framework**	**Legal framework**	**Institutional framework**
2. Austria							
1. The main competencies for protection of waters are allocated to the Ministry of Agriculture, Forestry, Environment and Water Management. 2. Work based on inter-ministerial co-operative mechanism was done on a case by case basis: e.g.: Former Elaboration of Austria's National Environmental Plan (in cooperation with different ministries, stakeholders and NGO's) e.g.: Former Elaboration of the National Environmental Health Action Plan within the frame of UN-ECE Water and Health.	1. Central authority for water protection is the Ministry of Agriculture, Forestry, Environment and Water management. 2. Soil protection is competence of the Länder. 3. Implementation of related EU-legislation lies within the federal level and Länderlevel	1. Policy setting and implementation 2. Preparation of water and environmental legislation. Provision of financial incentives for technical measures as well as for introduction of environmental friendly agricultural practices. 3. Water Quality and Quantity monitoring. 4. Awareness raising	1. By combining the former Ministry of Agriculture and Forestry and the former Ministry of the Environment (Youth and Family) co-operation and co-ordination has further improved.		1. Improvement of co-operation between central authorities		
3. Czech Republic							
1. Ad-hoc WG on various subjects 2. WGs on harmonisation of legislature with EU 3. No specific mechanism on nutrient reduction	Central and local authorities dealing with environment, water and agriculture	1. Water and environmental protection 2. Drafting new laws 3. Harmonization with EU regulations	1. Division of main tasks in water management between two ministries 2. Lack of funds	1. Finalization of the new Water Act	1. Intensified research regarding EU Directive on Nitrates requirements	1. Approval of new Water Act and of a set of laws regarding state administration 2. EU Directive on Nitrates implementation	1. Improved co-operation between responsible ministries in the form of WGs on specific subjects

Existing inter-ministerial mechanisms				Proposed inter-ministerial mechanisms			
Name	**Composition**	**Tasks**	**Problems**	**Improvement of existing structures**		**Creation of new structures**	
				Legal framework	**Institutional framework**	**Legal framework**	**Institutional framework**
4. Slovakia							
1. Inter-ministerial co-operation during permitting process 2. No specific mechanism on nutrient reduction set up but with initial elements in place	Central authorities dealing with environment, soil management, economy, finance	1. Water quality and environmental protection 2. Designing legislation	1. Incomplete legislation 2. Limited financial support			1. Design EU harmonized legislation 2. Introduce rules on the use of P-free detergents	1. Create WG on nutrient reduction 2. Improve communication and exchange of information between sectors
5. Hungary							
1. No specific mechanism 2. Co-operation between specific bodies: Inter-ministerial Committee on Central Environmental Fund, chaired by MoE, Inter-ministerial Committee on Water Management Fund chaired by MTWM, Inter-ministerial Steering Committee for the Implementation of WFD chaired by MTWM, WG for the implementation of NEPP 3. National Environmental Council 4. Bodies of the ongoing government programmes	Central authorities for environment, agriculture, regional development, health, transport, water In the intersectoral bodies, NGOs and the commercial sector are represented	1. Water and environmental protection, according to the National Environmental Protection Programme, including nutrient reduction	1. Slow development process	1. Incorporate more explicitly nutrient reduction concerns into the existing legislation	1. Improve operation of National Environmental Council 2. Establish institutional mechanism for the implementation of WFD	1. Implement WFD 2. Implement Nitrate Directive 3. Implement Urban Waste Water Directive 4. Implement Sewage Sludge Directive	1. Create bodies requested by WFD and with the nutrient handling body as advised by EU 2. Set up National Water Framework Committee 3. Create National River Basin Planning Committee

Existing inter-ministerial mechanisms				Proposed inter-ministerial mechanisms			
Name	**Composition**	**Tasks**	**Problems**	**Improvement of existing structures**		**Creation of new structures**	
				Legal framework	**Institutional framework**	**Legal framework**	**Institutional framework**
6. Slovenia							
1. Inter-ministerial ad-hoc groups responsible for environment and physical planning, industry, agriculture, public health, etc.	Central authorities dealing with environment and physical planning, industry, agriculture	Water and environmental protection and public health	1. Absence of adequate legal framework 2. Lack of financial support 3. Conflicts of interest between bodies	1. Set up government body for sustainable development	1. Improve local level Agenda 21 body for sustainable development	1. Implement Water Framework Directive	1. Develop regional level authority for integrated river basin management
7. Croatia							
1. National Water Council co-operating with other bodies 2. No specific mechanism on nutrient reduction	State Water Directorate, Croatian Waters, central authorities dealing with environment, agriculture and forestry, health, public works, tourism and finance	Water quality protection including nutrient reduction concerns	1. Absence of legal framework 2. Low priority 3. Lack of time 4. Lack of funds	1. Improvement of National Water Council	1. Improvement of National Water Council		1. Creation of a special Co-ordination Body for nutrient reduction
8. Bosnia-Herzegovina							
1. Environmental Steering Committee 2. Commission for Water Management	Central authorities dealing with environment, physical planning, construction	1. Environmental protection 2. Water management	1. Lack of adequate unified legal approach between the bodies 2. Weak institutional capabilities 3. Insufficient database 4. Low priority 5. Limited funds	1. Ensure implementa-tion of an integrated approach to the management of water resources 2. Implement EU Directive on nitrates	1. Set up for both countries a common central authority responsible for environmental and water issues	1. New legal framework 2. Create complete database 3. Access to information 4. Develop pollution register	1. WG co-ordinated by the Environmental Steering Committee

Existing inter-ministerial mechanisms				Proposed inter-ministerial mechanisms			
Name	**Composition**	**Tasks**	**Problems**	**Improvement of existing structures**		**Creation of new structures**	
				Legal framework	**Institutional framework**	**Legal framework**	**Institutional framework**
9. Yugoslavia							
1. WG on various subjects 2. No specific mechanism on nutrient reduction	Federal and republican-level ministries dealing with water, environment, agriculture, health and economy	1. Water management and environmental protection	1. Absence of adequate legal framework for nutrient reduction	1. Improve legal framework		1. Develop new rules imposing tasks on nutrient reduction	1. Create new inter-ministerial mechanism at the governmental level for nutrient reduction
10. Bulgaria							
1. Inter-ministerial Expert Group for Implementation of NEHAP 2. National Environmental Protection Fund 3. Supreme Environmental Experts Council 4.WG on various subjects 5. National Commission for Sustainable Development 6. Advisory Council of MOEW	1-6. Central authorities dealing with environment, agriculture, water, forest, health, public works and regional development	1. Environment and water management on national and regional levels 2, 3. Approval of investments 4-6. Water quality, health and environmental protection	1. Insufficient staff 2. Lack of adequate legislation, including a nutrient reduction strategy	1. Completion of the ongoing process of development of new EU-harmonised legislation for water, environment, CAP and BAT. 2. Ensure introduction of River basin management and implementation of integrated environment and water management		1. Design new strategy for nutrient reduction 2. Set up river basin management plan	1. New Inter-ministerial Commission 2. Creation of a commission with the Supreme Consultative Water Council 3. Creation of River Basin Council

Existing inter-ministerial mechanisms				Proposed inter-ministerial mechanisms			
Name	**Composition**	**Tasks**	**Problems**	**Improvement of existing structures**		**Creation of new structures**	
				Legal framework	**Institutional framework**	**Legal framework**	**Institutional framework**
11. Romania							
1. Inter-ministerial committee for environmental development 2. Various structures (WG, Task Force) co-operating on environmental and water issues	Central, basin-level and local authorities dealing with water, environment, forestry, agriculture, food, industry, trade, land planning, consumer protection, health	1. Multipurpose water management approach, integrated land and water management plans, environmental audit, mechanisms for control of nutrient application 2. Pollution abatement, design of economic instruments	1. Lack of logical framework approach matrix for long/ short terms 2. Unclear developed objectives	1. Implement BEP and BAT		1. Develop specific sectoral strategy for sustainable agricultural practices	1. Create special WG for nutrient reduction
12. Moldova							
1. National Committee 2. Inter-ministerial committees 3. No specific nutrient reduction mechanism	Central and local authorities dealing with environment, industry, foreign affairs, civil defense, health, water and forest companies, institutes for hydro-meteo, geography ecology, zoology	Water and environmental protection	1.Division of responsibilities 2. Too many organizations 3. Lack of collaboration at the central level	1. Intensified collaboration 2. integration of environmental concerns into sectoral policies	1. Strengthening institutions capabilities		

Existing inter-ministerial mechanisms				Proposed inter-ministerial mechanisms			
Name	**Composition**	**Tasks**	**Problems**	**Improvement of existing structures**		**Creation of new structures**	
				Legal framework	**Institutional framework**	**Legal framework**	**Institutional framework**
13. Ukraine							
1. Inter-sectoral committees with WGs on various subjects 2. Council for Environmental Problems of Dnipro River Basin	Ministry of the Environment and Natural Resources	Water quality protection, environmental concerns	1. Lack of funds 2. Conflict of interest between bodies 3. Insufficient co-ordination between state programs	1. Harmonize legislation with EU	1. Improve institutional capacity for pollution control and prevention during land privatization process 2. Improve institutional capacities of river basins authorities	1. Create regulatory framework for decreasing the use of P-free detergents	1. New inter-sectoral committee with WG on nutrient reduction 2. New inter-sectoral committee for the implementation of State Program for the Protection and Rehabilitation of Azov and Black Seas

ANNEX COUNTRY REPORTS

1. **GERMANY**
2. **AUSTRIA**
3. **CZECH REPUBLIC**
4. **SLOVAKIA**
5. **HUNGARY**
6. **SLOVENIA**
7. **CROATIA**
8. **BOSNIA-HERZEGOVINA**
9. **YUGOSLAVIA**
10. **BULGARIA**
11. **ROMANIA**
12. **MOLDOVA**
13. **UKRAINE**

1 GERMANY

1.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

In Germany, inter-ministerial cooperation takes place on both federal and state levels. First, on the federal level, there is inter-ministerial coordination in the frame of legislative procedures, e.g. plant protection act, nutrient-application regulation, implementation of EU-directives, development of minimum requirements for point sources for municipalities as well as industrial branches. Second, coordination and cooperation between the federal and the state levels exist for the establishment of legislative procedures through a joint water commission of the states (LAWA). Third, at the state level (Bavaria), there are inter-ministerial coordination groups for legal regulations and planning on state level, e.g. Bavarian water act and state development program. Finally, there is bilateral cooperation in cases of inter-ministerial concern. Examples of cooperation of the state ministries for environment and agriculture include "Stickstoff 2000", "Gülle Programm", "Kultur-Landschafts-Programm" programmes involving the development of rules for good farming practices.

In most of the states, nutrient control and reduction is under the responsibility of the ministries of the environment and the ministries of agriculture. The implementation of the relevant legal regulations belongs to the responsibilities of the state administrations. The nitrate directive and the requirements for drinking water supply from groundwater are controlled by the agricultural as well as by the water administration. Groundwater protection and in this context the role of agriculture as the main non-point source of pollution are of major importance for the policy makers.

In Bavaria, on the state level, in all water plans prepared until now, the relevant topics concerning nutrients and pesticides have been developed in cooperation with the agricultural administration. Further, inter-ministerial activities on the administrative level include the development of recommendations for good practices in drinking water protection zones.

There is cooperation between governments and local communities / non-governmental organizations in relation to nutrient reduction concerns. In the preparation phase of all laws in general, the federal and state ministries usually arrange hearings with relevant experts and, in particular, with the technical and scientific associations (ATV-DVWK).

On the federal level, working groups are organized, with participants coming from state institutions as well as from industries, universities and private consultant enterprises.

In Bavaria, forums for different environmental aspects are established, and one of them relates to environment and agriculture. The participants come from different governmental, economic, social and private institutions and organizations.

Agricultural associations are usually represented in the state development and regional planning councils. Intensive negotiations take place between water supply companies and municipalities on the one side and farmers in the catchment area of the groundwater abstraction locations on the other side, based on the recommendations developed by the state administration.

Germany has suggested that cooperation between the water and the agricultural administration should be intensified in the sense that the measures regarding farming practices and agricultural methodologies should to a large extent be placed under the responsibility of the agricultural administrations and associations. The first steps have already been taken and the necessary negotiations on the inter-ministerial level are have been embarked on.

1.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

(1) Recommendations for improvement of the existing national inter-ministerial mechanisms to respond to nutrient reduction concerns.

For Germany, the development of nutrient control mechanisms should be based on (i) legal regulations and mandatory objectives for ground and surface water quality, (ii) instruments of execution which include emission standards, water quality standards for users and ecological requirements and regulations or standards for a good and ecologically sustainable practice, and (iii) enforcement through licensing, command and control measures, economic instruments or action programs.

Therefore, Germany has proposed improvements of the legal instruments on diffuse sources, which are less developed. On the emission side, regulations exist for fertilizers and their application, which were originally not designed with a view to meeting the EU-Nitrate-Directive. The execution of these regulations is difficult and requires strong cooperation between water and agricultural administrations. Positive steps have already been taken through the implementation of several programs initiated by the agricultural and environmental administrations.

(2) Suggestions for the creation of new mechanisms for nutrient control and reduction

Additional mechanisms of inter-ministerial coordination might be necessary if the responsibilities are spread over more than one ministry or distributed between the federal and state administrations. Especially for the control of pollution from non-point sources, new and efficient mechanisms have to be developed through joint efforts of the agricultural and water administrations.

1.3 Main barriers to the creation of national inter-ministerial mechanisms

(1) Legal and institutional barriers

The main barrier to progress in nutrient control is set by the difficult economic situation in agriculture. A profitable agricultural production implies application of intensive farming methods with high rates of fertilizers, which contravene the environmental requirements.

(2) Financial barriers

The high cost of preparing arable land for a switch to extensive production methods or for reduction of cattle density per ha could be considered as financial impediments. Since arable land is private property, income reductions have to be compensated by incentives, such as subsidies.

1.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

In Germany, both the existing institutional and legal frameworks allow the creation of new inter-ministerial structures according to requirements mainly imposed by nutrient reduction and control from diffuse sources of pollution. There is a specific concern that fully developed methods, which have proved their efficiency in practical tests, may be implemented on small-scale applications as well as to larger catchment areas.

(2) Schedule for implementation

Germany considers that a stepwise approach seems to be the only way of ensuring development and application of regionally differentiated rules for best farming practice, teaching and education of farmers and implementation of methods for minimization of fertilizer input based on a regional balance. The whole process is expected to take five years.

1.5 Main country-specific features and conclusions

Germany is one of the few countries in the Danube River Basin where cooperation between the environmental and agricultural authorities through inter-ministerial mechanism on nutrient reduction and control issues is significant. One specific feature involves the existence of two levels of cooperation, the federal and state levels. Other features of Germany are related to (1) intensified activities leading to the development and implementation of rules for good farming practices and good practices in drinking water protection zones, (2) the importance placed by the policy makers on groundwater protection issues and the role of agriculture as the main non-point pollution source, and (3) active co-operation between governments and local communities/non-governmental organizations regarding nutrient reduction concerns.

Like other Danube countries, Germany considers that there is a need to enhance cooperation between the water and agricultural administrations. Positive steps are already taken through the implementation of several programs initiated by the agricultural and environmental administrations.

Germany believes that additional mechanisms of inter-ministerial coordination might be necessary, especially for the control of pollution from non-point sources through joint efforts of both agricultural and water administrations.

2 AUSTRIA

2.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

In Austria, the Federal Ministry of Agriculture and Forestry formulates the agricultural and water protection policies. Therefore, competencies and responsibilities for implementing nutrient control and reduction measures belong to the same authority.

There were in the past examples of overall environmental policy formulation which also involved the Ministry of the Environment.

With the changes the new Austrian government introduced in spring 2000, the former Ministries of Agriculture and Forestry and the Ministry of the Environment (previously responsible for overall environmental policy affairs) were merged and now constitute a single Ministry of Agriculture, Forestry, Environment and Water Management.

2.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

(1) Recommendations for improvements of the existing national inter/ministerial mechanisms to respond to nutrient reduction concerns

Austria considers that the implementation of agricultural and water policies through the newly created central authority is a way to assure that responsibilities related to nutrient reduction are efficiently carried out.

(2) Suggestions for the creation of new mechanisms for nutrient control and reduction

Austria considers that an inter-ministerial mechanism for co-operation on nutrient reduction measures is not necessary as long as the Federal Ministry of Agriculture and Forestry efficiently performs the tasks related to pollution control and nutrient reduction concerns.

2.3 Main barriers to the creation of national inter-ministerial mechanisms

(1) Legal and institutional barriers

There are no institutional or legal barriers that might impede a clear functioning of the new ministry as a mechanism able to perform pollution control and nutrient reduction tasks.

(2) Current financial barriers

Austria considers that also, there are no significant financial barriers.

2.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

No inter-ministerial mechanism is needed in the future as all environmental competencies, including those related to nutrient reduction, have recently been assigned to a single ministry.

2.5 Main country-specific features and conclusions

The most outstanding feature is related to the fact that Austria is the only one country in the Danube River Basin that has one competent central authority that can function as an inter-ministerial mechanism on nutrient reduction and control problems. Therefore, the country considers that an inter-ministerial mechanism for co-operation on nutrient reduction measures is not necessary as long as the Federal Ministry of Agriculture, Forestry, the Environment and Water Management efficiently performs, among its other responsibilities, the tasks related to nutrient reduction and control concerns.

Significant efforts are being made by the policy makers to reduce and control nutrients from both types of pollution sources, diffuse and point sources.

3 CZECH REPUBLIC

3.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

The Czech Republic is actively preoccupied with the requirements related to the expected accession to the European Union. Most of its environmental policy and legislation is geared towards preparing the Czech Republic for membership in the European Union, which is the government's first priority.

In the Czech Republic, nutrient control and reduction concerns are an integral component of comprehensive water resources management activities.

Two ministries share the main responsibilities for water and environmental protection in the Czech Republic: Ministry of the Environment and Ministry of Agriculture.

Ad-hoc working groups have been created to fulfill the tasks emerging especially from the need to develop new laws and other regulations.

There is also a Working Committee for the Realization of the European Agreement, which co-ordinates the activities of all central authorities to meet the targets related to the EU accession.

Based on the decision of the Working Committee, 23 working groups have been established. In some of these groups, in co-operation with all interested ministries, water quality-related issues are addressed together with some broader environmental problems.

The Czech Republic considers that a well-informed public is a powerful tool for implementing government policy in environmental protection, with NGOs playing the main role. This legal tool allows the public to be actively involved in the decision making process.

Although the Czech Republic, unlike most Danube countries, has reported good results in water protection actions and in water management planning, nutrient removal in wastewater treatment plants was neglected in the past. The new economic and political situation since 1990 has brought about new challenges, which are supposed to be solved in the next few years, especially those related to the (i) completion of the legislative arrangement and its approximation to EU regulations, (ii) need to change the public administration structure, and (iii) clarification of duties and responsibilities in relation to water management problems.

3.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

(1) Recommendations for improvements of the existing national inter-ministerial structures to answer to the nutrient reduction concerns

The Czech Republic considers that the main frame-guidelines for water quality improvement are provided by the 1999 updated version of the State Environmental Policy.

New principles have been incorporated in these guidelines, relating to (i) sustainable development, (ii) harmonization of the Czech legislation with EU regulations, (iii) shift from the traditional command and control approach to market-based instruments, and (iv) introduction of voluntary compliance.

In addition, the regulations establish parameters and their limits for municipal, industrial and agricultural point sources of pollution. Moreover, immission limits for two categories of surface waters are also defined.

The Czech Republic has also introduced a flexible and incentive system of charges for wastewater discharge into surface water. Emissions exceeding the limited amount or concentration of COD, dissolved matters, suspended solids, nutrients, specific organic compounds and some heavy metals are chargeable.

One significant initiative of the country is reflected in the Voluntary Agreement the Ministry of the Environment concluded with the Association of Soap and Detergents Producers on the reduction of environmental impact of their products. The producers are bound by the

agreement to ensure that their products do not exceed a 5% limit on phosphorus content, while the production of detergents without phosphorus is encouraged.

The Czech Republic proposes recommendations for expanding cooperation between the involved authorities within the work performed by WGs to incorporate specific nutrient reduction tasks.

As nutrient control and reduction measures are viewed as an integral part of water protection in general, the Czech Republic does not make any additional proposals for mechanism for nutrient reduction and control. The new Water Act will bring positive changes in terms of incorporating modern principles and strict permitting procedures. The new law on water supply and sewage systems will also contribute to the improvement of the existing legal framework, by setting severe limits on discharges to the municipal sewage systems.

(2) Suggestions for the creation of new mechanisms for nutrient control and reduction

As for the Czech Republic, nutrient reduction and control measures are perceived as an integral part of water protection measures. The suggestions include the creation of a special working group to carry out tasks related to nutrient reduction and control while at the same time avoiding an unnecessary increase in the number of working groups and commissions of this type.

3.3 Main barriers to the creation of national inter-ministerial mechanisms

(1) Legal and institutional barriers

The Czech Republic recognizes the need to update the current legal framework to better respond to the actual needs, especially related to the EU harmonization process. One particular example is the Water Act of 1973, which has already been revised and is in the stage of approval.

In the field of water management and protection, preparations for entry in the EU are complicated and require both a large investment and respective organizational measures.

(2) Financial barriers

There is a need to ensure the necessary funds for the improvement of water-related infrastructure in small municipalities. In addition, there is little experience with co-financing on municipal level. Finally, there is not a sufficient level of willingness on the part of small municipalities to form associations in order to solve wastewater problems.

3.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

The Czech Republic will create inter-ministerial working groups and specify their responsibilities according to the actual need. The ad-hoc working group set up to design the new Water Act is an example of such a mechanism.

(2) Schedule for implementation

The schedule for harmonization of the Czech laws with EU regulations is provided in the Approximation Strategy. Priority is given to EU directives 91/271/EEC, 91/676/EEC, and 75/440/EEC, which relate to water protection against nutrients and their control. The Czech Republic will create working groups on other specific concerns according to the actual need.

3.5 Main country-specific features and conclusions

Like some other Danube countries, the Czech Republic, too, is actively involved with the requirements related to the expected accession to the European Union.

A specific feature of the country's legal framework is the application of an integrated approach to the management of water resources, in which nutrient reduction already occupies an important place. The responsible bodies for water and environmental protection include Ministry of the Environment and Ministry of Agriculture.

Ad-hoc working groups have been created to fulfil tasks emerging especially from the need to develop new laws and regulations.

There is also a Working Committee for the Realization of the European Agreement, which co-ordinates the activities of all central authorities in order to fulfill the targets related to the EU accession.

The Czech Republic believes that a well-informed public is a powerful tool in the government's environmental policy and that NGOs have a major role to play in this respect.

Unlike most Danube countries, the Czech Republic has reported good results in its efforts to improve water quality. One significant initiative of the country is reflected in the Voluntary Agreement which the Ministry of the Environment concluded with the Association of Soap and Detergents Producers regarding the reduction of environmental impact of their products. The producers are bound by the agreement not to exceed the 5% limit on the content of phosphorus in their products while the production of detergents without phosphorus is encouraged.

The Czech Republic has made recommendations for expanding cooperation between the involved authorities within the work performed by WGs to incorporate specific nutrient reduction tasks.

In addition, the country has pointed to the need to create a new working group, with experts from various organizations, able to implement nutrient reduction and control tasks in line with the EU Association Agreement.

4 SLOVAKIA

4.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

In the Slovak Republic, competencies related to water management are shared between the Ministry of the Environment (MOE) and Ministry of Soil Management (MSM). In addition, state administration of the regions is carried out by eight Regional Offices and 79 District Offices with their Environmental Departments established under the Ministry of the Interior. The operation and maintenance of drinking water systems, public sewerage and WWTPs, as well as agricultural activities, are under the scope of activities of MSM.

For the time being, there are no established inter-ministerial environmental committees, which should have a responsibility for the coordination of activities related to control and reduction of nutrient content in surface waters. However, coordination of these activities does exist and elements of inter-ministerial mechanisms designed to protect surface water quality can be considered as existing on different levels.

In the case of control of nutrient input into surface waters from point sources of pollution, there is a governmental decree that sets maximum permissible pollution levels (including N and P) in both discharged waste waters and in receiving surface water.

Slovakia is among the few countries that have designed a Law on Fertilizers. The new Law on Fertilizers establishes conditions for the registration, stocking, and utilization of both artificial fertilizers and manure.

An example of cooperation between the government, local communities and NGOs in the development of legislative material is the preparation of National Environmental Action Plan II, which defines the priorities, principles, objectives of the state environmental policy and measures to be realized to fulfill the set objectives.

4.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

(1) Recommendations for improvements of the existing national inter-ministerial structures to respond to nutrient reduction concerns

First improvements related to the clarification of duties and responsibilities between the relevant sectors will be reflected in the new Water Law expected to come into force in 2001. Second, transposition of the EU water legislation in the national legislation is seen as a major contribution towards water pollution abatement and control mechanisms.

As regards the control of quality of wastewater discharged into surface waters, the content of N and P is not measured for all relevant polluters. This makes it difficult to calculate the nutrient input from point sources of pollution, although such information is very important for the state administration to set quantitative targets, plan measures for the protection of waters, and monitor improvements. It is suggested that this activity should be coordinated from one organization/institution of MOE, in order to ensure a unified approach.

The other recommendation refers to the need to involve the Ministry of Finance in solving the problem of compensation of financial losses to agricultural companies, which would result from limitation of their activities in the areas of special land regime.

(2) Suggestions for the creation of new mechanisms for nutrient control and reduction

One suggestion made by Slovakia involves the creation of mechanisms for decreasing the use of P-free detergents. The process should involve Ministry of the Environment, Ministry of Soil Management, Ministry of Economics and the Finance Ministry.

Another suggestion involves the creation of economic tools for applying ecological soil management.

4.3 Main barriers to the creation of national inter-ministerial mechanisms

(1) Legal and institutional barriers

The only legal or institutional barriers to be considered for the operation of a future inter-ministerial structure on nutrient reduction issues are those related to the completeness of the existing legislation, with required pieces of laws and rules for pollution abatement, in particular for nutrient reduction.

(2) Financial barriers

The available financial sources are a limiting factor in the process of reduction of nutrients input into waters. Funding is necessary for the construction of sewerage, waste water treatment plants, technological changes in the manufacturing process, building of suitable storage capacities for manure, etc. This problem is a real concern for Slovakia.

4.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

In the national inter-ministerial mechanisms for nutrient reduction and control to be created in the future, the Ministry of the Environment, Ministry of Soil Management, Ministry of the Interior, Ministry of Economics and the Finance Ministry should be involved as core sectors.

The general objective should refer to the reduction of nitrogen and phosphorus.

In order to ensure an effective reduction in nitrogen and phosphorus content in waters, actions and measures need to be taken by all involved ministries, which should closely co-operate from the very start, i.e. in defining the targets and measures. The targets and measures need to be achievable and realistic in terms of the current economic situation in the country.

(2) Schedule for implementation

The proposed inter-ministerial mechanism may be created during the coming three-year period.

4.5 Main country-specific features and conclusions

Since the Slovak Republic is in the process of accession to the EU, transposition and implementation of EU Directives, including those related to control and reduction of nutrients in water, are the government's priorities. Therefore, it is expected that important legislation regarding the reduction and control of nutrients will come into force in the coming few years.

As a result of the country's economic transformation, the amount of used fertilizers and the amount of produced manure have rapidly decreased, and the reduction of nutrient input from fertilizers/manure does not seem to be a priority. As it is expected that the amount of fertilizers/manure will be continuously increasing in the future, it is necessary to prepare proper legislation regarding good agricultural practice, in order to minimize the input of nutrients into waters from soil management.

Slovakia proposes the creation of mechanisms for decreasing the use of P-free detergents. Moreover, the introduction and use of economic instruments to control soil management is also seen as an immediate priority.

5 HUNGARY

5.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

In Hungary, the regulation of inter-ministerial mechanisms for nutrient control and reduction is part of the general provisions of the environmental legislation. There are no mechanisms addressing exclusively nutrient control and reduction.

However, there are some inter-ministerial structures dealing with nutrient control, which include (1) Inter-ministerial Committee on Central Environmental Fund chaired by MoE, (2) Inter-ministerial Committee on Water Management Fund chaired by MTWM, and (3) Inter-ministerial Steering Committee for the Implementation of Water Framework Directive, also chaired by MTWM.

There are, in addition, other inter-sectoral coordinating bodies dealing with nutrient reduction, including the National Environmental Council and the National Regional Development Council.

Finally, Hungary has several ongoing governmental programmes related to nutrient control, in which the decision of the government determines the required inter-ministerial mechanism for their implementation. These programs are related to the water management development program for Lake Balaton, the national programme for the protection of other lakes, and a programme for the rehabilitation of oxbows and floodplains of the Tisza river.

5.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

(1) Recommendations for improvements of the existing national inter-ministerial structures to respond to nutrient reduction concerns

Hungary believes that the development of inter-ministerial mechanisms for nutrient reduction should be correlated with the provisions of the draft Water Framework Directive (WFD). Proposals are currently being drafted and the process is controlled by an inter-ministerial Steering Committee.

(2) Suggestions for the creation of new mechanisms for nutrient control and reduction

Hungary has proposed an inter-ministerial mechanism on nutrient reduction to be developed in accordance with the provisions of the Water Framework Directive (WFD). This exercise is already initiated and coordinated by an inter-ministerial Steering Committee. In addition, Hungary has suggested that the performance of this inter-ministerial mechanisms for nutrient-reduction should be synchronized with the administrative arrangements within the river basin districts.

It is expected that the implementation of WFD will require a global co-ordination mechanism for all water management issues, both at the river basin and ministerial levels. The nutrient reduction problems that cannot be handled at the river basin level will be solved through inter-ministerial mechanisms.

5.3 Main barriers to the creation of national inter-ministerial mechanisms

(1) Legal and institutional barriers

Hungary believes that, from the legal and institutional point of view, there are no detectable barriers to the functioning of the existing mechanisms.

(2) Financial barriers

The creation of a national inter-ministerial mechanism for nutrient control is not only a financial issue; rather, it depends on governmental priorities in environmental protection.

5.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

Hungary has proposed the creation of two major structures at the ministerial level: Water Framework Committee and River Basin Planning Committee. Clarification of duties and responsibilities has not yet been achieved. A Nutrient Reduction Working Group could be set up as a subdivision to the Water Framework Committee.

(2) Schedule for implementation

The schedule for the implementation of the proposed inter-ministerial mechanism is directly influenced by (i) date of entering into force of the WFD and (ii) the country's preparation programme for EU membership. According to the Government Programme, Hungary has to fulfill all the legal approximation by December 31, 2001.

5.5 Main country-specific features and conclusions

Like other countries of the Danube River Basin, Hungary has embarked on an ambitious program leading to EU accession.

One obvious particularity of Hungary is the current reduced interest in nutrient reduction concerns on the part of policy makers. However, this may be taken into consideration and further developed within the framework of the future proposed committees.

The proposals refer to the creation of inter-ministerial committees that will deal with the Water Framework Directive and with the implementation of river basin planning approach through the creation of river basin councils. The created bodies will also undertake tasks related to nutrient reduction and control measures.

6 SLOVENIA

6.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

Like other Danube countries, Slovenia is rapidly approaching the EU – regarding the adoption of the EU legislation, restructuring of the economy and government administration, building democracy, etc.

Inter-ministerial cooperation and coordination is still developing, with occasional problems related to intra-ministerial coordination. Still, a number of bodies and working groups have been established to ease the cooperation and coordination between different sectors and ministries.

Vertical cooperation is to some extent obstructed by two distinct levels of administration, i.e. the state government and the local government. In this respect, Slovenia will have to introduce an intermediate level – a regional (basin wide) level.

As regards nutrient control and reduction or removal measures, Slovenia has already adopted some key EU directives, such as the Nitrates Directive, the Urban Wastewater Treatment Directive, the Quality of Water for Human Consumption and is preparing to accept Water Framework Directive through the Water Law (Water Act), which is currently being debated in Parliament.

Environmental considerations are being integrated into the policies of five key sectors - industry, energy sector, agriculture and forestry, traffic and tourism. The aim of the integration of environmental policy into individual activities/sectors is primarily linked to the harmonization process with the requirements of Agenda 21, the Environmental Protection Act and EU policy in individual areas.

Coordination between different ministries during the phase of preparation of legal instruments, such as national programmes, strategies, action plans, laws and implementing regulations is informal. Formally, these instruments are coordinated at the cabinet level by at least one of the three existing standing governmental committees.

Cooperation is mainly established through many NGOs, which take an active part in public life and in ministerial affairs. Ministries are keen to invite public and NGOs to workshops and other public presentations or working bodies for diverse projects.

Slovenian NGOs have participated in the preparation of initiatives and demands concerning motorway construction and in the preparation of the document “Agenda 21 for Slovenia”. NGOs also play an important role in the promotion of sustainable agriculture and nature conservation (in the process of the adoption of agricultural reform, e.g. PHARE pilot project on Dravsko polje) and in the field of energy efficiency (example: the construction of a new facility - thermal power plant Trbovlje 3).

6.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

(1) Develop recommendations for improvement of the existing national inter-ministerial structures with the revision of their responsibilities to respond to nutrient reduction concerns

By signing the Europe Agreement, Slovenia accepted the foundations of the environmental protection policy of the EU and committed itself to establishing and using new instruments for its enforcement. This calls for (1) active monitoring of the adoption of new environmental protection requirements within the EU, and (2) incorporation of these requirements into the Slovenian legal system in all sectors. It also requires an upgrading of the institutional system for putting these requirements into practice.

(2) Suggestions for new mechanisms for nutrient control and reduction

Slovenia is willing to propose a new inter-ministerial mechanism charged with nutrient reduction tasks. The ongoing pre-accession programs (e.g. twinning, TAIEX, PHARE) will help develop the needed mechanisms for better inter- as well as intra-ministerial cooperation and coordination. The task of establishing an intermediate level of government (at the basin level) will also stipulate cooperation between ministries. More active involvement of the public and NGOs will also be needed.

6.3 Main barriers to the creation of national inter-ministerial mechanisms

(1) Legal and institutional barriers

Slovenia recognizes the presence of some barriers which include: (I) conflict of interests – environmental protection hinders the implementation of certain sectoral policies (i.e. agriculture/nature; energy sector/environment), (ii) political opposition, (iii) lack of legal, administrative and institutional capabilities, (iv) lack of qualified staff.

(2) Financial barriers

The integration of environmental considerations into sectoral policies demands substantial financial resources which the economy is reluctant to commit due to a lack of money.

6.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

Slovenia is willing to create a new inter-ministerial structure based on a detailed analysis. The Ministry of Environmental and Spatial Planning is willing to harmonize all the relevant environmental legislation within a short period of time of approx. 2-3 years. The involvement of the Ministry of Agriculture, Forestry and Food, which is already performing tasks related to nutrient reduction, is essential for the efficiency of nutrient reduction and control measures implementation phase.

(2) Schedule for implementation

An implementation period of 2-3 years is anticipated. However, a common agreement between the main players (the two ministries) is needed in order to ensure an effective nutrient reduction and an efficient nutrient control.

6.5 Main country-specific features and conclusions

Slovenia believes that - in spite of a certain lack of administrative and institutional capabilities - one must recognize the already existing large administration in a relatively small country. Thus, a very special program of professional education of key ministerial personnel will be of utmost importance.

Slovenia hopes for more flexibility on the policy makers' side to facilitate the implementation of new water pollution measures, including those related to nutrient reduction.

7 CROATIA

7.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

Croatia has identified two coordination bodies subordinated to the government: Governmental Coordination for Environment and Governmental Coordination for the Economy, which usually deal with water issues.

In accordance with the provisions of the Water Act, another officially created mechanism is in existence, i.e. the National Water Council, established for carrying out water management activities, coordination of various needs and interests, and proposing measures for the development and improvement of the water system in the Republic of Croatia.

There are two main organizations with responsibilities in relation to nutrient control and reduction:

- The State Water Directorate is responsible for the protection of water and sea from land-based sources, for planning and harmonizing the development and construction of water supply and waste water systems of national importance and for water management inspection. The State Water Directorate is established as the leading body in all nutrient control and reduction issues
- "Hrvatske vode" – Croatian Waters – is an institution dealing with water resources management and operates under the supervision of the State Water Directorate.

Other responsible ministries are: Ministry of the Environment and Physical Planning, Ministry of Agriculture and Forestry, Ministry of Health, Ministry for Public Works, Reconstruction and Construction.

However, in any debate related to nutrient control and reduction, the Ministry of Economics, Ministry of Tourism and the Finance Ministry can make important contributions to the nutrient issue dialogue.

Cooperation between the government and local communities/ non-governmental organizations in relation to the nutrient reduction concerns usually takes place at the rule-making stage.

However, there are limitations associated with the identified mechanisms, including: limited time allocated, reduced financial resources, inadequate legal framework and low priority placed on nutrient reduction concern against other water quality or environment-related problems.

7.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

(1) Recommendations for improvements of the existing national inter-ministerial structures to respond to nutrient reduction concerns

Croatia's first recommendation is that the National Water Council, as an already existing body, should become fully operational. This mechanism can play an important role in promoting environmental protection, integrated water management and nutrient control and reduction. The second recommendation is related to the need to improve cooperation between the ministries and state directorates not only during the design but also during the rule implementation stage.

There is currently ongoing cooperation between the State Water Directorate and the Ministry of Agriculture and Forestry on problems related to nutrient pollution from diffuse sources.

(2) Suggestions for the creation of new mechanisms for nutrient control and reduction

One suggestion for the creation of new mechanisms is linked to the proposal of establishing a coordinating body for the implementation of measures for nutrient control and reduction within the National Water Pollution Control Plan. This coordinating body would be responsible for the implementation of the National Water Pollution Control Plan, especially for nutrient control and reduction measures. The responsible bodies for the implementation according to the mentioned plan would be the State Water Directorate, Hrvatske vode, industries, municipalities, and other potential water pollution. Effective harmonization and

close collaboration between the responsible bodies would be necessary to facilitate the implementation of this plan under the coordination of the State Water Directorate.

The government of the Republic of Croatia has already been informed about the preparation of this project and the future need for national inter-ministerial mechanism. Strong emphasis is placed on full participation of other responsible ministries and institutions and their possible financial support. Information about the specific implementation schedule cannot yet be provided at this stage.

7.3 Main barriers to the creation of the national inter-ministerial mechanisms

(1) Legal and institutional barriers

Croatia believes that once the design of the National Water Pollution Control Plan has been finalized and its main implementing bodies have been nominated, the success of the performed nutrient reduction and control tasks will depend only on the current institutional capabilities of the main involved stakeholders.

(2) Financial barriers

The creation of a new mechanism (coordinating body, working group, etc) would require some funding. This can be considered as a serious constraint towards a smooth implementation of the nutrient reduction measures.

7.4 Proposed national inter-ministerial mechanism

(1) Institutional and legal framework

Croatia's proposal refers to the creation of a new mechanism closely related to the new structure within the National Water Pollution Control Plan, i.e. the Coordination Body for the Implementation of Measures for Nutrient Control and Reduction. The State Water Directorate shall ensure its coordination. The preparation of a National Nutrient Reduction Action Plan represents the main initial task of this inter-ministerial mechanism.

(2) Schedule for implementation

The National Water Pollution Control Plan has incorporated deadlines for its implementation schedule based on long periods of time: short-2005, medium-2010 and long terms-2025.

7.5 Main country-specific features and conclusions

Croatia is one of the few Danube countries that has the privilege to initially benefit from both institutional and legal capabilities to perform water pollution control, and nutrient reduction tasks in particular. This is facilitated by the existing structures that include the State Water Directorate and the Croatian Waters, institutions dealing mainly with issues related to the management of water resources. Moreover, the development of the National Water Pollution Control Plan ensures an initial legal background for carrying out these activities.

The proposed structure, i.e. the Coordination Body for the Implementation of Measures for Nutrient Control and Reduction within the National Water Pollution Control Plan" under direct supervision of the State Water Directorate, may perform tasks such as those related to the preparation of National Nutrient Reduction Action Plan.

However, financial constraints might impede the progress of the proposed structure.

Finally, the country is willing to promote any necessary measure to implement nutrient reduction actions within its share of the Danube basin.

8 BOSNIA – HERZEGOVINA

8.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

According to the provisions of the Dayton Peace Accord, environmental issues represent a common concern for both The Federation of B&H and Republic of Srpska.

F B&H and RS have a separate system of organisation of the environmental sector. The Federal Ministry of Physical Planning and the Environment is the relevant ministry in the F B&H, while the relevant ministry in RS is Ministry of Urbanism, Physical Planning, Construction and the Environment. In both F B&H and RS, the Ministry of Agriculture, Water Management and Forestry (MoAWF of F B&H and MoAWF of RS) plays the main role in the water sector. The ministries are responsible for water strategy and policy, including the setting of standards and regulations as well as the enforcement of laws and regulations through licensing and inspections.

At present, national inter-ministerial mechanisms for water quality and particularly for nutrient control and reduction do not exist. Control of nutrients is included in water quality control that is organized by Public Companies for the Watershed Area of the Sava river (in F B&H) and by Hydrometeorological Institute of RS (in RS). There is no harmonized monitoring and control of surface and ground waters of B&H. In addition, the Water Law does not contain sufficient provisions on permitting procedures, legal procedures, international standards or conditions for rational water use.

However, during the last few years, international programs have supported the development of new legislative and institutional structures dealing with environmental protection and water quality control. Another very important issue has been the improvement and strengthening of co-operation between the two entities, F B&H and RS, in dealing with environmental protection issues.

In spite of the currently large number of citizens associations and professional organizations engaged in environmental protection actions, there is a lack of co-operation between governments and non-governmental communities. Vertical co-ordination in F B&H is weak (at all levels: local, cantonal, federal), with responsibilities overlapping between different government levels and departments. Inter-entity institutional co-ordination is also poor.

Moreover, there is a lack of encouragement to improve environmental practices while in some cases experts are independently employed in developing projects aimed at improving agricultural practices or raising public awareness.

The main problems of the current mechanisms are linked to (i) institutional and human resources problems and, (ii) water quality issues.

First, a lack of adequate co-operation on the national level and inappropriate institutional capacity building to implement the legislation represent the main constraints which impede a satisfactory performance of environmental and water quality tasks.

Second, the absence of sufficient and coordinated environmental databases, together with a lack of monitoring, restrain the enforcement of and compliance with environmental legislation. In extension, there is ineffective co-ordination between the various sectors at both local and national levels in performing water management tasks; low priority is awarded to nutrient reduction issues at the government level and limited funds are consequently earmarked for the purpose.

8.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

(1) Recommendations for improvements of the existing national inter/ministerial mechanisms to respond to nutrient reduction concerns

B&H believes that the implementation of integrated approach to the management of water resources on the river basin level, with strong horizontal and vertical co-operation, is the most appropriate recommendation for improving the existing environmental and water quality mechanisms to perform water pollution reduction tasks. The other recommendation is related to the urgent need to facilitate the implementation of the EU Directive on nitrates, i.e. the Framework Water Directive.

(2) Suggestions for the creation of new mechanisms for nutrient control and reduction

There are proposals directed to the creation of new structures able to carry out tasks related to nutrient control and reduction measures, including: (i) the establishment of a surface and ground water quality data base within an adequate water quality control (including nitrates, phosphorus), (ii) the creation of mechanisms providing access to relevant data on groundwater quality, monitored by public water supply companies, according to the provisions of the Water Law, and (iii) the establishment of a register of point sources of pollution.

8.3 Main barriers to the creation of national inter-ministerial mechanisms

(1) Legal and institutional barriers include:

- Fragmentation of responsibilities as the principle of integrated water resources management on river basin level has not yet been implemented
- Environmental legislation and policy has not yet been harmonized with the EU legislation
- Water management issues are not integrated in environmental management concerns.

(2) The current financial barriers are related to the following deficiencies:

- Poor social and economic conditions hampering an adequate development of environmental policy
- Economic instruments are not yet introduced
- Reduced financial resources as the reconstruction of the country and ongoing process of privatization consumed most of the government's financial funds.

8.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

A key institutional proposal - also suggested in a previous EU-developed project - refers to the need of integration of environmental and water administrations in a new structure called the Ministry of Environment and Water Management (MoEWM) for F B&H and RS.

This body would be responsible for (i) developing water policies and environmental strategies, (ii) drafting legislation and, (iii) issuing regulations. The Ministry would apply its policy through a network of seven new River Basin Steering Committees (RBSC) in the respective River Basin Bodies, in both FB&H and RS.

In addition, working groups need to be established, with members drawn from all involved ministries, to deal with nutrient control and reduction issues. These working groups should be co-ordinated by the Environmental Steering Committee (on both levels - river basin and national) on items related to nutrient control and reduction, particularly on actions that include: (i) participation in the implementation of water-management plans for catchment basins, (ii) developing codes of good agricultural practice for the training of farmers, (iii) establishing and implementing action programs for vulnerable zones, and (iv) periodically reviewing designations and effectiveness of the action programs.

(2) Schedule for implementation

1st September 2000 represents the date for the implementation of Terms of Reference for the preparation of environmental legislation in Bosnia-Herzegovina, within the EU Environmental Program for B&H as well as the date for the implementation of the Water Sector Institutional Strengthening in both F B&H and RS.

8.5 Main country-specific features and conclusions

One significant particularity of B&H is related to the actual institutional framework dealing with water and environmental issues, which is fragmented between the two entities F B&H and RS.

Recognizing the need to (i) strengthen the institutional system, (ii) develop and implement EU-harmonized legislation, (iii) incorporate market-based instruments in water and environmental policies, and (iv) enhance the understanding of both government and local communities on the necessity to urgently consolidate the link between them, the country embarked on an ambitious program of legal and institutional reform. This action will also include tasks related to the improvement of water quality, pollution abatement and the implementation of nutrient control and reduction measures.

Recommendations for the improvement of the existing inter-ministerial mechanisms to respond to nutrient reduction concerns include (i) the application of water resources integrated man integrated approach to the management of water resources on the river basin level, with effective horizontal and vertical co-operation and (ii) the implementation of the Directive on Nitrates, i.e. the Framework Water Directive.

9 YUGOSLAVIA

9.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

There is no specific inter-ministerial mechanism responsible for nutrient control and reduction. However, Yugoslavia believes that such a structure could operate through the Federal Government as well as through the Republican Governments Ministries responsible for environmental and water protection the implementation of any proposal concerning nutrient control and reduction.

Those responsible for water-related issues directly or indirectly connected with nutrient control and reduction include (i) at the Federal Level – the Federal Ministry for Development, Science and the Environment, the Federal Ministry of Agriculture, the Federal Ministry of Health and Social Affairs and the Federal Ministry of Economics, and (ii) at the Republican Level – the Ministry of Agriculture, Forestry and Water Resources Management, the Ministry for the Protection of the Environment, the Ministry of Civil Works, the Ministry of Health, the Ministry of Economics.

All departments of the Ministry of Agriculture, Forestry and Water Resources Management are directly or indirectly responsible for nutrient control and reduction.

Cooperation between the governments and local communities/non-governmental organizations in relation to nutrient reduction concerns can not be judged properly as there has not been any important request by local communities/NGOs in that direction. Nevertheless, the government(s) are open for cooperation and support various activities of NGOs. Representatives of NGOs participate in meetings organized by ministries while the ministries responsible for environmental and water protection disseminate relevant information and support the organizing of workshops, conferences and other appropriate activities of NGOs, particularly those dealing with the presentation of research results.

9.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

(1) Develop recommendations for improvement of the existing national inter-ministerial structures with the revision of their responsibilities to answer to the nutrient reduction concerns

Yugoslavia believes that the existing environmental legal and institutional framework needs to be revised. In addition, it is necessary to strengthen the enforcement of and compliance with the environmental requirements.

(2) Suggestions for the new mechanisms for nutrient control and reduction

Since it is recognized that there is a certain lack of knowledge concerning nutrient control and removal, it has been suggested that the country would benefit from a timely and serious deployment of national scientific and research potentials in order to improve knowledge about nutrient control and removal, through cooperation with the relevant international research and consulting centers.

Other suggestions refer to the necessity to construct new wastewater treatment plants for municipalities and industries in Yugoslavia as measures to reduce and control pollution.

9.3 Main barriers to the creation of national inter-ministerial mechanisms

(1) Legal and institutional barriers

There are no legal or institutional barriers to the creation of national inter-ministerial mechanisms. The Government(s) allow(s) enough room for inter-ministerial cooperation for any initiative coming from the ministries responsible for environmental issues.

Lack of adequate legislation related to nutrient reduction is one of the main constraints recognized by Yugoslavia.

(2) Financial barriers

Financing is the driving force behind any improvement in the field of water pollution control and in nutrient control and reduction. The economy of FR of Yugoslavia is weak in this moment and is, therefore, not able to provide funds for serious investment in water pollution control. Yugoslavia needs financial support to be able to carry out specific tasks related to nutrient reduction issues.

9.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

There is no special proposal for national inter-ministerial mechanism. It may be created at any when and if the need arises.

(2) Schedule for implementation

Yugoslavia will provide this information during project development stage.

9.5 Main country-specific features and conclusions

Yugoslavia is as willing to create an inter-ministerial mechanism dealing with nutrient reduction issues as its neighboring Danube countries.

Besides, the country already possesses the conditions necessary for the creation and operation of such a structure. The main constraint is related to the limited financial resources to translate into practice any water pollution abatement measure.

10 BULGARIA

10.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

Bulgaria has identified several relevant national inter-ministerial mechanisms with responsibilities for water pollution abatement and environmental protection. Most of these structures also deal with diffuse-source pollution, implementing pollution reduction measures or approving new investments in the water sector.

Among them, the Supreme Environmental Experts Council (within the Ministry of the Environment and Water), the Supreme Technical Experts Council (within the Ministry of Regional Development and Public Works) or the existing Expert Working Groups within the Ministry of the Environment and Water are viewed as the existing structures that can easily incorporate tasks related to nutrient control and reduction.

To exemplify, the Supreme Environmental Experts Council is a current inter-ministerial body, established on a national level, with representatives of different ministries, such as the MRDPW, MoAF, MoH, MoE, MT, MoF, National Electrical Company and representatives of BAS and other experts. The SEEC is chaired by the Deputy Minister of Environment and Water. The main duties of the Council are to discuss EIA Reports and to decide on issuing permits for the construction/rehabilitation of WWTP's. This would also reflect the reduction of nutrient pollution load from the municipalities and from the industry by the introduction of best environment- friendly technologies.

Bulgaria believes that the future adoption and enforcement of (i) the Regulation on the Protection of Water from Pollution with Nitrates of Agricultural Origin, (ii) the Regulation on the Emission Norms for Admissible Content of Harmful and Dangerous Substances in Wastewater Discharged into Natural Receivers, (iii) the Regulation on Issuing Permits for Wastewater Discharges in Water Bodies and, (iv) the setting of individual emission limits on point sources of pollution should have a significant positive impact on nutrient reduction.

In order to facilitate water management at the national level (according to Article (9) of the Water Law), a Supreme Consultative Water Council will be established within the MOEW. The SCWC will include representatives of the MOEW, MRDPW, MoAF, MoE, MoT, MoH, MoF, Civil Defense, the State Agency for Energy and Energy Resources, the Bulgarian Academy of Sciences, the municipalities, non-governmental organizations directly related with waters etc. The Minister of the Environment and Waters will issue a Regulation defining the structure and activities of the Supreme Consultative Water Council.

The management at basin level within one or several watersheds will be implemented by basin water management bodies, such as the Basin Directorates under MOEW and Basin Councils (according to Art. 153 of the Water Law). The Basin Council will be a state public consultative commission responsible for supporting the activities of the Basin Directorate. The Basin Council will include representatives of the state administration, municipal administration, water users and environmental organizations within the range of the basin as well as representatives of the scientific organizations connected with water-related issues.

An analysis of the relevant, existing national inter-ministerial mechanisms shows that these councils, expert working groups and commissions have, to a certain level, duties and responsibilities in relation to nutrient reduction and control or other similar tasks related to fertilizers, nitrates and/or phosphorus use and control. However, none of these structures has direct duties or responsibilities in relation to nutrient reduction and control.

Bulgaria believes that cooperation between governments and local communities/ non-governmental organizations in relation to nutrient reduction is very important. Nutrient reduction is included - directly or indirectly - in the duties and responsibilities of several ministries, local authorities, farmers, new owners of industrial plants, environmental NGOs and researchers.

One very good example of cooperation between the governments, inter-ministerial mechanisms and the local communities and NGOs is the establishment of the pilot Yantra River Basin Council. The main purpose in establishing the Council was to experiment with the implementation of integrated water resources management in Bulgaria and was to some extent related to nutrient reduction. Another example of ongoing cooperation between the governments, inter-ministerial mechanisms and local communities/NGOs in relation to general pollution reduction concerns is provided by the public discussions of EIA reports. Yet another

example is – to some extent - the existing Group 22. Finally, the preparation of the project for wetland rehabilitation in Kalimok and Belene in relation to nutrient reduction and biodiversity preservation is also worth mentioning in this context.

Even now, some of the inter-ministerial structures could be used for co-ordination of the development of a National Nutrients Reduction Strategy and the co-ordination of the implementation of the NNRAP. However, the main problems are due to the limitations of the duties and responsibilities of the already identified structures.

10.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

(1) Recommendations for improvements of the existing national inter-ministerial mechanisms to respond to the nutrient reduction concerns

The recommendations are not oriented to the improvements of the existing national inter-ministerial mechanisms to respond to nutrient reduction concerns because of their status duties and responsibilities. Nevertheless, at this stage a revision of the responsibilities of the SEEC at the MOEW to answer to the nutrient reduction concerns as a temporary measure could be considered as the most appropriate recommendation.

(2) Suggestions for the creation of new mechanisms for nutrient control and reduction

Bulgaria has proposed the creation of a new mechanism for nutrient control and reduction. First, there are two possibilities on the national level: the creation of a separate inter-ministerial body or the creation of a commission in the future Supreme Consultative Water Council. Second, on the basin level it will be possible to use the future Basin Council.

10.3 Main barriers to the creation of national inter-ministerial mechanisms

(1) Legal and institutional barriers

Inter-ministerial co-ordination and co-operation for the implementation of nutrient reduction and control measures depends to a great extent on the need to enhance the understanding of policy makers. The main barriers are related to the (i) limited number of staff at the ministries (ii) lack of a clear division of duties and responsibilities between different ministries, and (iii) absence of adequate legislation. However, new legislation is in the process of being developed.

(2) Financial barriers

Effective nutrient control and reduction requires a huge amount of investment. Absence of financial support could be one of the main barriers.

10.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

Bulgaria has proposed the establishment of a new national, interim inter-ministerial commission on an expert level, within the MOEW, with full commitment of the other interested ministries. Based on the rule of procedures proposed by the Minister of the Environment and Waters, the commission will initially have a limited mandate until an adequate commission is created under the future Supreme Consultative Water Council. The main duties of the Commission should be (i) to provide support to the MOEW for the development of a National Nutrient Pollution Reduction Strategy and the implementation of the Action Plan and, (ii) to coordinate the activities of the different institutions for better nutrient control and reduction actions.

(2) Schedule for implementation

Such an inter-ministerial structure is currently being established in order to support the preparation of the 5-year draft Nutrient Reduction Action Plan for the Black Sea catchment area. Under the new Water law, Bulgaria will have four Expert Groups (EG) for its four river basin regions. Therefore, four national commissions can be established where each EG will be responsible for coordinating the activities in one of the four basin regions. The proposed schedule for implementation of a new inter-ministerial mechanism able to carry out the tasks related to nutrient reduction and control starts in May 2000 and will last for the next 5 years. The new Four River Basin Councils could be created within this period of time.

10.5 Main country-specific features and conclusions

Bulgaria is one of the few countries of the Danube River Basin which benefits from the results of many identified national inter-ministerial mechanisms with responsibilities for water pollution abatement and environmental protection. Most of these structures are also dealing with diffuse pollution, implementing pollution reduction measures or approving new investments in the water sector.

The Supreme Environmental Experts Council is a current inter-ministerial body, established on a national level, with representatives of different ministries, such as the MRDPW, MoAF, MoH, MoE, MT, MoF, National Electrical Company and representatives of BAS and other experts. The SEEC is chaired by the Deputy Minister of Environment and Water. The main duties of the Council are to discuss EIA Reports and to decide on issuing permits for construction/rehabilitation of WWTP's. This would also reflect on the reduction of nutrient pollution load from the municipalities and from the industry by the introduction of best environment-friendly technologies.

Bulgaria believes that the future adoption and enforcement of the (i) Regulation on the Protection of Water from Pollution with Nitrates of Agricultural Origin, (ii) Regulation on Emission Norms for Admissible Content of Harmful and Dangerous Substances in Wastewater Discharged into Natural Receivers, (iii) Regulation on Issuing Permits for Wastewater Discharges in Water Bodies and, (iv) determination of individual emission limitations of point sources of pollution should have a significant positive impact on nutrient reduction.

Within the MOEW, a Supreme Consultative Water Council will be created.

Bulgaria believes that cooperation between governments and local communities/ non-governmental organizations in relation to nutrient reduction concerns is very important. Nutrient reduction issues are included, directly or indirectly, in the duties and responsibilities of several ministries, local authorities, farmers, new owners of industrial plants, environmental NGOs and researchers.

A very good example of cooperation between the governments, the inter-ministerial mechanisms and the local communities and NGOs is the establishment of the pilot Yantra River Basin Council.

Some inter-ministerial structures could be charged with coordinating the development of a National Nutrients Reduction Strategy and the implementation of the NNRAP. However, the main problems are due to the too narrowly defined scope of the duties and responsibilities of the already identified structures.

Bulgaria has proposed the creation of a new mechanism for nutrient control and reduction. First, there are two possibilities on the national level: the creation of a separate inter-ministerial body or the creation of a commission in the future Supreme Consultative Water Council. Second, on the basin level it will be possible to use the future Basin Council.

11 ROMANIA

11.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

Inter-ministerial co-ordination mechanisms for environmental problems, particularly relating to nutrient control and reduction, are in Romania based on a special Committee which is mainly responsible for (i) providing a general framework for the development of environmental strategy taking into consideration sectoral strategies, (ii) creating an operational frame for the implementation of a National Environmental Action Plan (NAEP), and (iii) improving public participation – in the sense of access to information and involvement.

There is no special committee for nutrient control and reduction but there is an inter-ministerial working group for environmental development. In the case of water-related problems, including nutrients, the most relevant institutions involved include: the Ministry of Waters, Forests and Environmental Protection, Ministry of Agriculture, Ministry of Industry, Ministry of Health, Ministry of Public Works and Land Planning, National Water Company Apele Romane, Consumer Protection Office, NGOs and some donor organizations.

The specific tasks related to nutrients include (1) implementation of nutrient-related legislation based on EU Directives and International Conventions ratified by Romania, (2) carrying out international programmes in which Romania is involved, (3) periodical assessment of the PSIR cycle (pressure/ stress/ impact/ reaction) and control of relationships functions between priority pollutants/ target group/ environmental functions/ environmental themes, (4) assessment of national nutrient balance, (5) development of instruments for diffuse pollution characterization and control (risk assessment and management).

Apart from some general barriers (lack of legislation, management tools, and infrastructure), there are other specific constrains related to the agricultural sector in particular (lack of logical framework Approach Matrix (LFA), absence of clear objectives, etc).

11.2 Guidelines for the improvement of national inter-ministerial nutrient control and reduction mechanisms

(1) Recommendations for improvements of the existing national inter-ministerial structures to answer nutrient reduction concerns

Romania has developed several recommendations aimed at improving cooperation between various representatives within the existing inter-ministerial mechanism.

(2) Suggestions for the creation of new mechanisms for nutrient control and reduction

A special Working Group for Nutrient Control and Reduction Action Plan (NCRAP) should be created in the ICIM. Based on the already started process of approximation to the EU legislation, the Working Group will focus on nutrient-related topics addressed by: EWFD (COM 98/76), IPPC Directive (96/161/EEC), Urban Waste Directive (91/271/EEC, 98/15/EEC), Nitrate Directive (91/679/EEC) etc. In addition, one of the Group's main tasks would be the establishment of mechanism to control nutrient application.

11.3 Main barriers to the creation of national inter-ministerial mechanism

(1) Legal and institutional barriers

There are not any major legal or institutional barriers to be considered in the operation of the inter-ministerial structure on nutrient reduction issues. The current legal framework facilitates the creation and functioning of such a mechanism while its host, ICIM, could provide the institutional arrangements.

(2) Financial barriers

Romania believes the current limited financial resources to represent one of the most relevant constraints.

11.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

The proposed specific WG dealing with nutrient reduction and control problems needs to be created within the ICIM. This WG will take measures to facilitate the development and implementation of the Nutrient Reduction and Control Action Plan.

(2) Schedule for implementation

As Romania is already committed to the implementation of nutrient reduction measures, the time schedule is very tight and the WG is due to be set up during this year.

11.5 Main country-specific features and conclusions

Romania is one of the Danube countries for which nutrient reduction and control represents a main concern. This is why the country has already created an inter-ministerial mechanism to address broader environmental topics, but with environmental and agricultural authorities already involved. Moreover, Romania is willing to improve this structure with an additional WG, designated only for nutrient reduction and control issues.

Another specific characteristic of Romania is related to the continuos support the government provides to environmental authorities for their institutional strengthening and capacity building, for reinforcing environmental research, improving exchange of information and public involvement, and for intensifying regional cooperation on the implementing nutrient reduction measures.

12 MOLDOVA

12.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

In Moldova, there is a National Committee established in 1996 and responsible for supervising the implementation of the provisions of a number of international agreements, including those related to pollution control and reduction. Several relevant sub-committees and inter-ministerial committees were established, charged with environment-related responsibilities. However, cooperation between these entities is weak.

There is no example of nutrient-related cooperation between governmental organizations and local communities and non-governmental organizations. This is due to two reasons. Firstly, there is a reduced interest in nutrient reduction issues on the part of policy makers. Secondly, there is a general absence of good cooperation in relation to environmental issues.

However, Moldova believes that - for the time being - there is no need to establish specific committees dealing with nutrient control and reduction issues since this problem is not on the country's priority list given that it is faced with more acute problems affecting its economy.

The division of responsibilities between the Ministry of the Environment and Territorial Development and the Ministry of Health, set out in a 1992 agreement between the two entities, provides for a clear division of tasks in relation to water. The Department of Environmental Protection is responsible for water quality and pollution control, rational use, restoration and protection of water, promotion of best available technologies for water use and treatment, etc. The same agreement clarified the allocation of tasks between the Ministry of Environment and Territorial Development and the former Ministry of Agriculture and Alimentation on the promoting the strict regime of water resources in Moldova.

The role of local communities in the decision-making process is very small, mainly due to a lack of public access to environmental information and – in the participation process – failure to recognize their importance.

12.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

(1) Recommendations for improvement of the existing national inter-ministerial structures to answer nutrient reduction concerns

Moldova has made several recommendations aimed at (i) improving the current structure of the Ministry of the Environment and Territorial Development, (ii) strengthening the inter-ministerial mechanism in order to incorporate environmental considerations into the economic development programme, (iii) decentralizing tasks and, (iv) raising public awareness and public participation in the decision-making process.

(2) Suggestions for the creation of new mechanisms for nutrient control and reduction

Moldova has not yet considered the option of creating a new inter-ministerial mechanism.

12.3 Main barriers to the creation of national inter-ministerial mechanisms

(1) Legal and institutional barriers

Moldova sees the following barriers:

- Inadequate legal framework dealing with issues related to water quality management, including pollution control in Moldova
- Lack of qualified staff dealing with water quality issues within the Ministry of the Environment and Territorial Development
- Insufficient cooperation between organizations, including government and NGOs
- Lack of adequate staff training programs

(2) Financial barriers

- Lack of financial support to facilitate the creation of a possible inter-ministerial mechanism.

12.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

Moldova has suggested various mechanisms, which are mainly geared towards pollution control.

This list includes (i) revision of the National Economic Development Program to meet the integration requirements with a view to incorporating environmental impacts of macro and sectoral policies into the economic development programmes, (ii) development of interim emissions limits and a compliance schedule, (iii) creation of an effective permitting systems, and (iv) implementing charge schemes.

(2) Schedule for implementation

Moldova has not yet proposed any deadlines for the implementation of the suggested measures.

12.5 Main country-specific features and conclusions

Moldova has several authorities involved in water and environmental protection activities. In addition, the existing National Committee has the task to supervise the implementation of the provisions of the different international agreements, including those related to pollution control and reduction. Several relevant sub-committees and inter-ministerial committees were established with environment-related responsibilities. However, cooperation between these entities is weak.

There is no example of cooperation between governmental organizations and local communities and non-governmental organizations in relation to nutrient reduction problems. One particularity of Moldova is related to the reduced interest in nutrient reduction issues on the part of policy makers. In addition, Moldova considers that - for the time being - there is no need to establish specific committees dealing with nutrient control and reduction issues since this problem is not on the country’s priority list given that it is faced with more acute problems affecting its economy.

13 UKRAINE

13.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

The establishment of inter-sectoral committees and working groups for co-operation between different sectors of the economy and social groups is a common practice in Ukraine.

Legislation on nutrient reduction is part of a broader body of legislation on pollution control and protection against pollution. Ukraine believes that the future development of legislative measures in this field will depend on progress made in economic reform.

The legislative acts provide some tools for decision making in the rational use of natural resources and environmental protection, but do not address nutrient reduction in particular.

The Ministry of the Environment and Natural Resources of Ukraine performs functions related to the management and control of water use and protection and renewal of water resources.

Based on these responsibilities, the Ministry of the Environment and Natural Resources co-ordinates environmentally important issues related to different sectors.

A typical example of an inter-ministerial Committee is the Council on Environmental Problems of the Dnipro River Basin and Drinking Water Quality, established to facilitate the implementation of the State Program on Rehabilitation of the Environment and Improvement of Drinking Water Quality in the Dnipro River Basin. Co-ordination of the environmental policy for the use of nature and environmental protection in the Dnipro river basin was set forth by a 1999 Resolution of the Cabinet of Ministers.

13.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

(1) Develop recommendations for improvement of the existing national inter-ministerial structures with the revision of their responsibilities to answer to the nutrient reduction concerns

Ukraine believes that a reorganization of the Ministry of the Environment and Natural Resources would contribute towards strengthening inter-sectoral co-ordination.

The improvement of economic conditions and the introduction of economic incentives for involved institutions and organizations in Ukraine will result in improved inter-sectoral co-operation and more efficient work of the inter sectoral bodies.

(2) Suggestions for new mechanisms for nutrient control and reduction

Ukraine believes that the Cabinet of Ministers may create inter-ministerial mechanism charged with nutrient reduction tasks. Currently, the Ministry of the Environment and Natural Resources is drafting ministerial orders for the establishment of the Black Sea and the Danube Committees, whose agenda may involve tasks related to nutrient reduction in the Black Sea basin.

A typical arrangement would be to establish working groups within the inter-ministerial mechanism to address the more specific issues within the scope of its general objectives.

13.3 Main barriers to the creation of national inter-ministerial mechanisms

(1) Legal and institutional barriers

Although the current legislative framework and the previous experience with inter-sectoral co-operation seem to be successful, there are some important limitations affecting the work of inter-sectoral committees.

The decision to develop nutrient reduction program will depend on the legal approval by the Cabinet of Ministers.

(2) Financial barriers

The most important barrier concerns the lack of financial resources to cover operational costs for members of inter-sectoral committees, secretarial work, office equipment and/or office space for the important programs. Insufficient funding and human resources impair the efficiency of the Inter-sectoral Committee. Within the ongoing administrative reform designed – among other things – to downsize the ministries, many tasks assigned to inter-ministerial committees will create an additional burden for the ministerial personnel.

Since inter-sectoral committees and working groups operate on a non-paid basis, the members' motivation is very low and participation becomes very formal. Moreover, due to very limited financial resources for implementing the programs, projects, proposals, the agency that initiates the activities tends to dominate and control the financial resources with all resulting drawbacks such as poor information exchange, lack of ideas sharing, etc.

13.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

Ukraine has proposed several measures leading to the creation of a national inter-ministerial mechanism to address nutrient reduction concerns, including (i) strengthening river basin management, (ii) creating river basin authorities, (iii) developing environmental protection programmes. Once these programmes have been approved, inter-sectoral bodies will be created. Part of these bodies will be working groups charged with nutrient reduction and control tasks.

(2) Schedule for implementation

In the 2001-2015 period, several significant programs will be implemented in Ukraine. Firstly, the protection and rehabilitation of the Azov Sea and the Black Sea are the objectives of the main program to be implemented between 2001 and 2010. Secondly, the development and approval of the state program for environmental protection of the Danube River Basin is also scheduled for the 2002-2012 period.

13.5 Main country-specific features and conclusions

Like many other countries in the Danube River Basin, Ukraine is committed to performing nutrient reduction tasks within the existing committee or through a new mechanism.

A particularity of Ukraine is the fact that the country's legislation does not yet contain any specific provisions on nutrient reduction and control issues. Moreover, even the notion of nutrient as a pollutant is incorporated into the broad definition of a pollutant.

However, Ukraine has incorporated modern principles in environmental and water management, including integrated water resources management approach, the use of economic instruments and the polluter pays principle.

Like other countries, Ukraine is facing severe budgetary constraints that might obstruct a good performance of the prospective inter-ministerial mechanisms.

STRENGTHENING THE IMPLEMENTATION OF NUTRIENT REDUCTION MEASURES AND TRANSBOUNDARY COOPERATION IN THE DANUBE RIVER BASIN

EXISTING AND PLANNED POLICIES AND LEGISLATION RELATING TO POLLUTION CONTROL AND NUTRIENT REDUCTION

SUMMARY REPORT IN SUPPORT OF THE PROJECT BRIEF

AUGUST 2000

International Commission for the Protection of the Danube River

UNDP/GEF Assistance

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ANNEX
COUNTRY REPORTS

LIST OF ABBREVIATIONS

AHEG	Ad-Hoc 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
DPRP	Danube Pollution Reduction Programme
DRB	Danube River Basin
DRBPRP	Danube River Basin Pollution Reduction Programme
DWFD	(Draft) Water Framework Directive
DWQM	Danube Water-Quality Model
EC	European Commission
EIA	Environmental Impact Assessment
EMIS/EG	Emission Expert Group
EPA	Environmental Protection Act
EU	European Union
GFE	Global Environment Facility
ICPDR	International Commission for the Protection of the Danube River
IPPC	Integrated Pollution Prevention and Control
ISO	International Organization for Standardization
ISPA	Instrument for Structural Policies for Pre-Accession
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
NFP	National Focal Point
NGO	Non-Governmental Organisation
NIS	Newly Independent States
OHR	Office of High Representative
P	Phosphorus (all forms)
PCU	Programme Coordination Unit
PE	Population Equivalent = load of one person into waste water
PHARE	European Union Programme for Development
PWCA	Public Company for Watershed Areas
RBM	River Basin Management
SEP	State Environmental Policy
SIA	Significant Impact Areas
UNDP	United Nations Development Programme
UWWTD	Urban Waste Water Treatment Directive
WWTP	Waste Water Treatment Plant

1 INTRODUCTION

This Summary Report is an integral component for the preparation of the GEF/UNDP funded project entitled "Strengthening Implementation of Nutrient Reduction Measures and Transboundary Cooperation in the Danube River Basin". The basic task of this preparatory work is to prepare a qualified material basis for the elaboration of a complete "Danube Regional Project" to be submitted to the GEF Council.

The purpose of this Summary Report is to provide an assessment for all DRB countries, respectively particular categories of DRB countries and the country presentations on of the existing and planned national policies and the status and reform requirements of legislation related to pollution reduction with particular attention to nutrient control and reduction in the Danube River Basin countries.

The structure of the Country Report follows the structure of the "national reports", and provides a "country profile" for each of the Danube River Basin countries. The "county profiles" are structured as follows:

(1) Policy objectives, priorities and principles for nutrient control / reduction

- General policy objectives, priorities, principles
- Policy objectives and programmes by sectors
- Policy objectives and programmes by short, medium, long term
- Status of nutrient related international conventions, declarations, etc.

(2) Status of legislation dealing with nutrient control / reduction

- Relevant laws and regulations currently in force
- Relevant laws and regulations in the pipeline
- Present status regarding out-phasing of phosphate-containing detergents
- Main deficiencies

(3) Main barriers to policy and legal reforms

(4) Proposed / envisaged changes of nutrient-related legislation

- Out-phasing of phosphate-containing detergents

(5) Approximation of national legislation to EU legislation in terms of pollution control, particularly nutrient control / reduction / removal

2 ASSESSMENT OF RESULTS AND CONCLUSIONS

2.1 Policy Objectives, Priorities and General Principles for Nutrient Control / Reduction

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.

In this context, all countries have developed a hierarchic system of short, medium and long-term objectives and principles which usually reflect the key environmental problems and sector priorities on national and regional level.

Long-term objectives are usually very general and often not related to any time frame for implementation or solution. In addition, there is usually no assessment of the overall long-term funding requirements. In the DRB countries, long-term objectives of environmental policy mainly focus on:

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

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

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

Despite the diversity of problems, interests and priorities across the DRB, the Danube countries share certain values and principles relating to the environment and the conservation of natural resources. The most essential principles, also relevant for water pollution, respectively nutrient reduction, include:

- The precautionary principle: under certain circumstances it is better to be on the safe side, even if firm evidence is lacking, than to be actually wrong;
- Best available technology (BAT) - best environmental practice (BEP);
- Control of pollution at the source: it is usually less expensive to prevent the creation of harmful wastes or pollution through cleaner technologies and processes than to cure and repair the damage to the environment afterwards;
- The polluter pays principle and the related user pays principle.
- The principle of integrated approach;
- The principle of shared responsibilities, respectively the principle of subsidiarity.

In the meantime, all DRB countries have - at least theoretically - recognized that the adoption of these principles is indispensable for appropriate prioritization and implementation of environment-related measures.

None of the DRB countries presently disposes of an explicitly formulated nutrient reduction programme. Measures and activities with relevance to nutrient reduction are usually sub-components of or to a large extent incorporated in other programmes.

In all DRB countries, the main ongoing programmes regarding nutrient reduction are investment programmes for new construction, extension, rehabilitation or improvement of effluent standards (biological treatment, N+P elimination) of municipal WWTPs. Involved are occasionally the provision of guidelines for selection of priority projects, country-specific effluent standards depending on plant capacity, and technical and operational standards.

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

Table 2.1-1: Status of Nutrient-Related Policy and Programmes in the DRB Countries

Country	Explicitly formulated policy objectives for nutrient control / reduction	Programmes especially dealing with nutrient control / reduction
GER	Appropriate system of policy objectives	Programme for the implementation of buffer zones to surface waters
A	Appropriate system of policy objectives	Programme of environment-friendly agriculture;
CZ	Appropriate system of policy objectives	Programme for adequate implementation of municipal WWTPs
SK	Satisfactory system of policy objectives	Codex of Good Agricultural Practices
HUN	Appropriate system of policy objectives	National waste water collection and treatment programme; National agro-environmental protection programme; Other programmes (lake, oxbow lake, low land, etc.);
SLO	Satisfactory system of policy objectives	No explicit programmes
CRO	Satisfactory system of policy objectives	No explicit programmes
B&H	No explicit policy objectives	No explicit programmes
YUG	Satisfactory system of policy objectives	No explicit programmes
BUL	Satisfactory system of policy objectives	Programme for construction of municipal WWTPs
RO	Satisfactory system of policy objectives	A series of nutrient-related programmes to be carried out during the forthcoming period 2000-2010
MOL	No explicit policy objectives regarding nutrient emissions or loads	No explicit programmes
UA	Satisfactory system of policy objectives	No explicit programmes

2.2 Status of Legislation Dealing with Nutrient Control and Reduction

Except for Germany and Austria, the adequacy of the legal framework for sound environmental management of water resources has to be viewed against the background of political, economic, administrative and social changes which have taken place in the particular DRB countries during the previous years of transition.

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.

The international agreements and conventions signed or ratified by the particular countries constitute a kind of orientation framework for the national environmental policies and legislation of the member countries.

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.

The environmental efforts in the Danube countries will be dominated by the need to confirm to European standards, less by domestic priorities and not decisively by agreements within the framework of the DRPC. The EU member countries are obliged to adopt the EU directives and transform them into national legislation. The EU candidates are in process of adoption to insure the obligations of harmonization. Other Danube countries follow the same line and transform their national regulations according to EU directives

Indeed, inmost DRB countries, 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.

Countries in which the legal framework for environmental management of water resources and ecosystems has to be considered as fully adequate and in consistence with international requirements are Germany and Austria.

Countries in which the legal framework for environmental management of water resources and ecosystems has to be considered as generally appropriate, respectively satisfactory, are Hungary, Czech Republic, Slovenia and Slovakia.

In the other countries, the current environmental and water-related legislation cannot be considered as adequate regarding sound and sustainable environmental management of water resources and ecosystems; there are still essential deficits and problems that can be summarized as follows:

- in some countries 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;
- some countries are currently in the process of establishing new environmental and water- related legislation, whose practical applicability and effectiveness has not yet been proven;
- some countries have developed relatively sophisticated systems of environmental and water-related legislation, which can at present not really be enforced due to critical social and economic issues in the country.

Common deficiencies and 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 status of nutrient-related legislation (and standards of nutrient control and reduction) in the particular DRB countries can be assessed in general terms as follows:

Table 2.2-1: Status of Nutrient-Related Legislation in the DRB Countries

Country	Explicitly formulated legal provisions for nutrient control / reduction	Explicitly defined standards regarding nutrient control / reduction
GER	Fully appropriate legislation	Appropriate system of standards
A	Fully appropriate legislation	Appropriate system of standards
CZ	In general appropriate legislation	In general satisfactory system of standards
SK	In general appropriate legislation	In general satisfactory system of standards
HUN	In general appropriate legislation	In general satisfactory system of standards
SLO	In general appropriate legislation	In general satisfactory system of standards
CRO	Legislation not fully satisfactory (mainly focusing on point sources);	No fully satisfactory system of standards: - Water quality standards by water classes; - Standards on hazardous substances; - Effluent standards: maximum allowed concentration of hazardous substances in waste water;
B&H	No explicit legal provisions	No satisfactory system of standards
YUG	Legislation not fully satisfactory	No fully satisfactory system of standards: - no effluent standards
BUL	Legislation not fully satisfactory	No fully satisfactory system of standards:

Country	Explicitly formulated legal provisions for nutrient control / reduction	Explicitly defined standards regarding nutrient control / reduction
		- ambient water quality permissible limits; - Black Sea water quality permissible limits; - State standard for drinking water quality;
RO	Legislation not fully satisfactory (no specific nutrient-related regulations);	No fully satisfactory system of standards
MOL	No explicit legal provisions	No fully satisfactory system of standards: Ambient water quality standards, emission standards, and effluent standards are incorporated in overall pollution control standards
UA	Legislation not fully satisfactory	No fully satisfactory system of standards

In summary, it can be concluded that in none of the DRB countries (except for Germany and Austria) nutrient-related legislation is presently on a fully adequate level from the international point of view. This indicates that the improvement of the respective legislation is an essential prerequisite and constitutes a substantial potential for future nutrient reduction in the majority of the DRB countries.

2.3 Main Barriers to Policy and Legal Reforms

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 (OOO = “high relevance”; O = “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 structures
- Outdated administrative structures
- Outdated business structures / methods
- Inappropriate agricultural structures and practices
- Inappropriate industrial structures / production / production methods
- Unsolved ownership situation - public sector
- Unsolved ownership situation - private sector
- Inappropriate attitude of population (wastage of water, etc)

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

A	B&H	BUL	CRO	CZ	GER	HUN	MOL	RO	SK	SLO	UA	YUG
	**	**	**	*		*	***	**	*	*	***	***

***** low priority; ** medium priority; *** high priority

(2) Economic issues

- Deteriorated economic capacities
- Decreased industrial production
- Decreased agricultural production
- Decreased export opportunities
- Decreased international tourism
- Decreased livestock farming
- Inadequate status of privatization
- Inappropriate public infrastructure (waste water collection systems, WWTP)

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

A	B&H	BUL	CRO	CZ	GER	HUN	MOL	RO	SK	SLO	UA	YUG
	***	**	**	*		*	***	**	*	*	***	***

(3) Socio-economic issues

- Low private (per capita) income
- Low living standard
- High portion of low-income population
- High unemployment

Provisional assessment of the relevance of socio-economic issues in the DRB countries:

A	B&H	BUL	CRO	CZ	GER	HUN	MOL	RO	SK	SLO	UA	YUG
	***	***	**	*		*	***	***	*	*	***	***

(1) Financial issues

- Lack of domestic public funds for environmental issues
- Lack of international funds at favorable terms
- Lack of adequate funding mechanisms
- Lack of adequate funding tools (incentives, charges)
- Low purchasing power of the population

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

A	B&H	BUL	CRO	CZ	GER	HUN	MOL	RO	SK	SLO	UA	YUG
	***	***	*	*		*	***	**	*	*	***	***

(2) Institutional / administrative issues

- Inadequate personnel capability
- Inadequate personnel 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 adequate data basis
- Lack of adequate monitoring systems and methods
- Lack of scientific knowledge
- Lack of private sector participation (investment, management)

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

A	B&H	BUL	CRO	CZ	GER	HUN	MOL	RO	SK	SLO	UA	YUG
	**	*	*	*		*	**	*	*	*	**	**

(3) 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 information / knowledge
- Lack of private sector participation (investment, management)

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

A	B&H	BUL	CRO	CZ	GER	HUN	MOL	RO	SK	SLO	UA	YUG
	**	**	**	*		*	**	**	*	*	**	**

(4) 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)
- Unsanitary disposal of solid wastes and hazardous wastes (in the past / ongoing)
- 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 county:

A	B&H	BUL	CRO	CZ	GER	HUN	MOL	RO	SK	SLO	UA	YUG
	**	**	**	*		*	**	**	*	*	**	**

2.4 Envisaged Changes of Nutrient-Related Legislation

Most DRB countries do not envisage any substantial changes of nutrient-related legislation besides the changes they will carry out within the process of harmonization of national legislation with EU legislation. These changes are dealt with in Section 14.5.

Only some countries are currently in the process of updating and adjusting particular laws or regulations that are directly or indirectly related to nutrient-related issues.

The need for improvement of nutrient-related legislation in the particular DRB countries can be assessed in general terms as follows:

The EU regulations with respect to nutrient emissions require a great effort in introducing new measures, new technologies, and upgrade existing facilities.

Table 2.4-1: Needs for Improvement of Nutrient Related Legislation in the DRB Countries

Country	Needs for improvement of legislation	Needs for improvement / adjustment of nutrient related standards
GER	No need for new legislation	No requirements
A	No need for new legislation	No requirements
CZ	Need for adjustment of legislation in line with established schedule for approximation of national legislation to EU legislation	Need for adjustment of standards
SK	Need for adjustment of legislation in line with established schedule for approximation of national legislation to EU legislation	Need for adjustment of standards
HUN	Need for adjustment of legislation in line with established schedule for approximation of national legislation to EU legislation	Need for adjustment of standards
SLO	Need for adjustment of legislation in line with established schedule for approximation of national legislation to EU legislation	Need for adjustment of standards
CRO	Need for improvement of legislation	Need for completion and adjustment of standards
B&H	Substantial need for improvement of legislation	Substantial need for completion and adjustment of standards
YUG	Need for improvement of legislation	Need for completion and adjustment of standards
BUL	Need for adjustment of legislation in line with established schedule for approximation of national legislation to EU legislation	Need for completion and adjustment of standards
RO	Need for adjustment of legislation in line with established schedule for approximation of national legislation to EU legislation	Need for completion and adjustment of standards
MOL	Substantial need for improvement of legislation	Need for completion and adjustment of standards
UA	Need for adjustment of legislation in line with established schedule for approximation of national legislation to EU legislation	Need for completion and adjustment of standards

Regarding the particular issue of control, respectively out-phasing of Phosphate-containing detergents, the situation in the particular DRB countries is compiled in Table 14.4-2,

Table 2.4-2: Present Status and Proposed Actions Regarding Phosphate-containing Detergents

Country	Present Situation	Planned / Proposed Actions
GER	Satisfactorily regulated by respective law and ordinances	No requirements for changes in national legislation
A	Issues of detergents in washing powders are regulated by the Act on Chemicals and the Ordinance on the Degradability of Certain Detergents, which are in compliance with the respective EU Directives 73/404/ECC, 73/405/ECC and 82/243/ECC	No requirements for changes in national legislation
CZ	Voluntary agreement between the MOE and the Association of Soup and Detergents Producers on reduction of environmental impact of their products	New arrangement envisaged, form currently in discussion
SK	No explicit legal provision or regulation	There are plans to prepare by the end of 2000 a proposal on methods of control of biological degradability of active substance detergents
HUN	State standard: Pulverous synthetic detergents (MSZ 14604-86)	No plan or schedule for changes
SLO	No explicit legal provision or regulation; EU-market conditions forced industry to abandon use of phosphate; Less than 1/3 of all detergents sold is supposed to still have phosphate contents;	No explicit plan or schedule for control or out-phasing of P-containing detergents
CRO	No explicit legal provision or regulation	No explicit plan or schedule for control or out-phasing of P-containing detergents
B&H	No explicit legal provision or regulation, Present production on zeolite basis	No explicit plan or schedule for control or out-phasing of P-containing detergents
YUG	No explicit legal provision or regulation; It is left to the producers to decide what kind of detergents they produce	No explicit plan or schedule for control or out-phasing of P-containing detergents
BUL	No explicit legal provision or regulation	Plan regarding P-containing detergents currently under preparation
RO	No explicit legal provision or regulation	Introduction of P-free detergents in discussion, estimated cost ~ EUR 50 million
MOL	No explicit legal provision or regulation; Problem not relevant;	No explicit plan or schedule for control or out-phasing of P-containing detergents
UA	No explicit legal provision or regulation	No explicit plan or schedule for control or out-phasing of P-containing detergents

The information provided by the national reports indicates that there is a substantial potential for Phosphorus reduction in the majority of the DRB countries. Therefore, this issue should be followed up.

The replacement of phosphates in detergents is cost-effective strategy leading to pollution reduction.

2.5 Schedule for Approximation of National Legislation to EU Legislation

With the exception of Germany and Austria, all other 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 nutrient control and reduction in their countries.

In the Czech Republic, Slovakia, Hungary and Bulgaria this harmonization is incorporated in an ongoing programme and considered as a short-term task.

Romania, Slovenia (and Ukraine) plan to reach a harmonization of particular national laws with EU legislation or standards in the short, respectively mid-term (2001 to 2005).

For both categories of countries, the final implementation of the Urban Waste Water Treatment Directive will require relatively long adjustment periods of at least 10 to 20 years.

For the other countries, Moldova and the war-impacted countries Croatia, B&H and Yugoslavia, 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.

Table 14.5-1 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 issue of pollution control, in particular to nutrient control / reduction).

Table 2.5-1: Planned Schedule for Approximation of National Legislation to EU Legislation

Country	**EC COM 97(49)** Draft Water Framework Directive	**EC 91/271/EEC** on urban waste water treatment	**EC 91/676/EEC** on the protection of waters against pollution caused by nitrates from agricultural sources	**EC 80/68/EEC** on the protection of ground water	**EC 98/83/EEC** on the quality of water for human consumption and household needs	**EC 76/464/EEC** on dangerous substances	**EC 73/404/EEC** on biodegradability of detergents	**EC 78/659/EEC** on the quality of fresh water needing protection or improvement in order to support fish life
GER		Full compliance	Full compliance	Full compliance	Full compliance	Full compliance	Full compliance	Full compliance
A		Full compliance	Full compliance	Full compliance	Full compliance	Full compliance	Full compliance	Full compliance
CZ	01.01.2003 /	01.01.2003/2010	01.01.2003/2006	01.01.2003 /	01.01.2003 /	01.01.2003/2008	01.01.2003 /	01.01.2003 /
SK		2002 / 2009-2015	2003 / 2008	2001 / 2005	2002 / 2008	2002 / 2006	2000	2002 / 2004
HUN	31.12.2002 /	31.12.2002 /	31.12.2002 /	07.06.2000 /			31.12.2002 /	
SLO	2000 / 2001	1996 / 2015	2001 /		1997 /			
CRO	--	--	--	--	--	--	--	--
B&H	--	--	--	--	--	--	--	--
YUG	--	--	--	--	--	--	--	--
BUL	31.12.2000 / (*)	31.12.2000 / (*)	31.12.2000 / (*)	31.12.2000 / (*)	31.12.2000 / (*)	31.12.2000 / (*)		
RO	2005 / 2010	2001 / 2010	2001 / 2010					2006 / >2010
MOL	--	--	--	--	--	--	--	--
UA		2003 /	2003 /	2003 /	2003 /	2005 /	2003 /	2002 /
Note:	First date = proposed year of transposition / second date = anticipated year of full implementation							
(*)	Full compliance after the envisaged transition periods of 2 to 6 years							

ANNEX COUNTRY REPORTS

1. **GERMANY**
2. **AUSTRIA**
3. **CZECH REPUBLIC**
4. **SLOVAKIA**
5. **HUNGARY**
6. **SLOVENIA**
7. **CROATIA**
8. **BOSNIA-HERZEGOVINA**
9. **YUGOSLAVIA**
10. **BULGARIA**
11. **ROMANIA**
12. **MOLDOVA**
13. **UKRAINE**

1 GERMANY

1.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

During the previous decades, Germany has established a comprehensive hierarchic system of objectives, principles and priorities for pollution reduction both on the national level and - due to the distinct federal structure of the country – supplementary ones on the state level. Regarding pollution reduction, the policy objectives and principles are fully in compliance with international standards.

Nutrients in surface waters result from point sources and diffuse sources (mainly nutrient emissions from the agricultural sector and nitrogenous substances from the transport and industrial sector).

(1) Control of point sources

Regarding point sources, the basic principle is that nutrient load of waste water discharged from treatment plants is to be kept as low as possible according to the "best available techniques". The particular minimum requirements regarding nutrient elimination have been laid down in the waste water emission ordinances and their annexes.

Through a strict application of the emission principle, a significant nutrient elimination could be achieved in the surface waters.

For discharge of waste water, a waste water charge is to be paid, also in the case the legal requirements are fulfilled. This waste water charge can be set off against investment cost for reduction of nutrient load; thus this regulation fulfills an essential incentive function.

The legal prescriptions regarding content of phosphorus components in washing powders and detergents have to be considered as satisfactory and have contributed to a significant reduction of phosphorus levels in surface waters.

(2) Control of non-point sources

In Germany, the impact of nutrients on both surface and ground waters has been increasingly coming from diffuse rather than point sources. The essential diffuse sources are agricultural animal keeping and land use (utilization of fertilizers) as well as nitrogenous substances from the air (e.g. from traffic, industry and agriculture).

From these diffuse sources, both soil and surface and ground water are still significantly impacted by nutrients. Attempts have been made to counteract this development by legal regulations (Water Act, Fertilizer Act, Fertilizer Ordinance, etc). A reduction is, for example, expected to be achieved by a restriction of nutrient content in fertilizers as well as by provisions regulating the utilization of fertilizers (e.g. appropriate buffer zones to surface waters, restrictions on the periods when manure may be spread, etc.).

Germany currently spends about one million EUR per annum for measures and actions aimed at nutrient reduction from diffuse sources in the DRB area of Germany.

1.2 Status of Legislation Dealing with Nutrient Control and Reduction

Legislation related to pollution, respectively nutrient reduction, is in full compliance with the requirements of EU legislation and the relevant international conventions signed by Germany.

The national legislation is composed of a comprehensive set of laws, regulations and ordinances on the national level and a relatively high number of laws and regulations on state level. The Water Resources Policy Act provides sets framework conditions for water management and water control on the national level; the federal states have their own water acts.

In fulfilling the requirements of the relevant EU Directives and the requirements of the national legislation, a multitude of projects, measures and activities related to nutrient reduction have been implemented over a long period of time and have actually led to exceptionally high standards of the relevant infrastructure and administrative and institutional framework by international comparison.

Pollution originating from non-point sources, mainly from agriculture remains a matter of concern.

1.3 Main Barriers to Policy and Legal Reforms

In Germany, the crucial problem is currently not the status of legislation, but the difficulties with the appropriate transposition of the legal regulations.

Non-point source emissions result from a variety of emitters that are partly outside the direct influence sphere of the relevant water sector authorities, which hampers protection measures.

As diffuse emissions can often not be remedied by technical measures, the nutrient emissions have to be controlled or reduced at the source. The solution to these problems requires strategies which both support awareness raising of and provide incentives for the main target groups of emitters.

However, another prerequisite is that adequate legal provisions be established and necessary technical means provided.

1.4 Proposed / Envisaged Changes of Nutrient-Related Legislation

The emission into the air of nitrogenous substances from the transport sector and the agricultural sector calls for particular measures since conventional water protection measures and regulations are in this case not efficient. Essential measures to be considered include:

- development and introduction of emission reducing technologies and techniques;
- intensification of public awareness raising and consultation;
- reduction of emissions into the air as an integral component of an overall environment protection strategy (as laid down in respective international conventions);
- environment-friendly utilization of resources (materials, energy);
- environment-friendly forms of land use;
- systematic survey of emission development,
- exchange of pertinent knowledge and experience;
- environmental impact assessment.

Reduction of phosphorous does not need to be additionally regulated in Germany.

1.5 Approximation of National Legislation to EU Legislation

Being an EU Member State implies the obligatory compliance with nutrient and waste water- relevant EU Directives.

As EU legislation provisions have been incorporated in the national laws, regulations and ordinances, the national legislation is basically in line with the requirements of the relevant EU Directives and will - where required – be gradually adjusted with regard to nutrient control and reduction.

2 AUSTRIA

2.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

In the course of the past decades the Austrian Government has undertaken ambitious efforts to reduce pressures arising from households, industry and agriculture in order to protect and maintain the water resources and their sustainable use. The present water quality monitoring results, which are published on a regular basis, prove that those efforts have been very efficient and successful.

The main principles of the Austrian Water Protection Policy with regard to nutrient control are enshrined in the Austrian Water Act in order:

- to safeguard sustainable use of water for all different purposes (households, industry, agriculture, recreation, fish life, etc);
- to protect resources against pollution that can be harmful to human health and animals;
- to safeguard water as drinking water resource;
- to maintain the natural physical, chemical and biological status of all water bodies.

The key elements for nutrient control and reduction in Austria are:

- Control of point sources via a combined approach;
- Reduction of impacts from diffuse sources.

The progressive combined approach is also enshrined in the future EU Water Framework Directive, which will come into force in the second half of the year 2000. Within this approach both the quality objectives of the receiving waters and the stringent limit values set for discharges have to be respected. Those limit values are set for all major sectors and are based on best available techniques.

The legislation in Austria is harmonised with the requirements of EU legislation for discharges and does not - in general – differentiate between short, medium or long-term measures.

2.2 Status of Legislation Dealing with Nutrient Control / Reduction

(a) Control of point sources

Under the Austrian Water Act, every impact on water (abstractions as well as discharges) that is above the level of insignificance has to be licensed by governmental water authorities. The license is granted for a limited period only. Adaptations due to changing circumstances can be requested by the authorities. Violations of the licenses are fined and in severe cases lead to loss of the permit. The licenses for waste water discharges are based on the combined approach.

Based on the Austrian 1990 Water Act, stringent requirements have been set for waste water discharges, based on best available techniques. 53 sector-specific waste water emission ordinances are currently in force. They determine the relevant sectors and specific parameters and limit concentrations or set maximum loads according to the best available techniques. These standards are part of the license issued by the authority. For waste water producers or for parameters not found in the sector-specific ordinances, the General Ordinance on Waste Water Emission with basic principles and provisions, last amended in 1996, has to be observed.

(b) Phosphorous containing detergents

There are a few legal restrictions in Austria specifically addressing the reduction of detergents in washing powders. The basic act is the Austrian Act on Chemicals BGBl. 53/1997, which requires according to §§ 32 and 33 that the ingredients of washing powder fulfil certain degradability criteria and that harmful substances be replaced by those less harmful to the environment on the basis of best available technique. Further requirements dealing with degradability are fixed in the Ordinance on the Degradability of Certain Detergents BGBl. Nr. 639/1989 as well as in the EU Directives 73/404/EEC, 73/405/EEC and 82/243/EEC.

These three EU directives are currently being reworked with a view to stipulating more ambitious levels of degradability.

Since 1987 phosphorous-containing detergents in washing powders have been reduced to a minimum, in line with the provisions of the Washing Powder Act BGBl. 300/1984, amendment in Annex 1, 1987.

Input of phosphorous in urban waste water has been reduced by more than 50% resulting in significantly reduced P-concentrations in surface waters.

(c) Control of diffuse sources

The main legal instrument to control diffuse sources is based on the EU Nitrates Directive 91/676/EEC (Council Directive covering the protection of waters against pollution caused by nitrates from agricultural sources). A new Austrian Action Programme based on §55b of the Austrian Water Act and in line with the provisions of this directive was launched in September 1999.

The core parts of this Action Programme include:

- restrictions on the period when manure may be spread;
- restrictions in the amount of manure (210 kg nitrogen per hectare at the moment, 170 kg nitrogen per hectare and year after 2002) allowed to be spread;
- provisions for minimum capacities for storage of manure;
- further restrictions on spreading manure along rivers, on slopes etc.

Application of nitrogen (sum of mineral fertiliser and manure) exceeding 210 kg nitrogen per hectare on grassland and 175 kg nitrogen per hectare arable land requires a license according to the provisions of the Austrian Water Act amended in 1990.

In order to avoid an excessive intensification of agriculture "ÖPUL" (Austrian Programme of Environmental Friendly Agriculture) was initiated. This national programme, co-financed by the EC on the basis of regulation agri-environment 2078/91, provides financial incentives for e.g.:

- renunciation of certain fertilisers and pesticides;
- stabilisation of crop rotation;
- bio-farming and integrative production;
- extensification of production;
- maintaining cultivation of extensive grassland (e.g. alpine meadows) and other ecological important areas;
- protection against erosion.

2.3 Main Barriers to Policy and Legal Reforms

In fulfilling the requirements of the relevant EU Directives and the requirements of the national legislation a multitude of projects, measures and activities related to nutrient reduction have been implemented and have led to a high standard in the relevant infrastructure and the administrative and institutional framework in international comparison. Thus, there are currently no relevant barriers to policy and legal reforms.

2.4 Envisaged Changes of Nutrient-Related Legislation

In summary, it can be stated that the objective to reduce nutrient input is laid down in various types and sectors of both national and EU legislation. At present, there seems to be no further need for new legislation or special nutrient reduction programme to be designed to address that specific issue.

2.5 Approximation of National Legislation to EU Legislation

Austria disposes of a broad set of legally binding, stringent regulations for point sources as well as for diffuse sources and detergents.

Being an EU Member State implies obligatory compliance with the waste water-relevant EU directives such as the Dangerous Substance Directive (76/464/EEC), the Urban Waste Water Treatment Directive (91/271/EEC) and the Integrated Prevention and Pollution Control – IPPC Directive (96/91/EEC) which lays down an integrated pollution prevention and control approach for industrial plants.

Provisions of the EU legislation have been incorporated in the national ordinances, so that Austrian legal norms are completely in line with the requirements of the relevant EU Directives.

3 CZECH REPUBLIC

3.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

The State Environmental Policy of the Czech Republic, approved in 1995 and up-dated 1999, is focused on the strict implementation of sustainable development principles in all sectors and harmonization of the Czech legislation with EU legislation.

In approving the updated SEP, government accepts a number of principles set out in accepted documents of the international community, such as the: (i) precautionary principle, (ii) principle of prevention, (iii) principle of reducing risks at the source, (iv) *polluter pays* principle, (v) the principle of shared responsibilities, (vi) principle of subsidiarity, (vii) principle of integration, (viii) principle of best available technology, and (ix) principle of substitution.

The acceptance of these internationally approved principles is reflected in the general environmental policy objectives and measures and objectives concerning the hydrosphere as follows:

- Ensure the meeting of international commitments of the Czech Republic in relation to the protection of the watersheds of the Elbe, Morava-Danube and Odra and to co-operation with neighboring countries where waters form the border;
- gradually restore natural water cycles, protect ground waters, increase the retentive ability of the land and ensure the renewable nature of water resources;
- continue with the watercourse rehabilitation programme, renewal of riverbank vegetation and natural meanders and the creation of protective riverbank zones along watercourses and reservoirs;
- for municipal pollution sources, achieve the objective of mechanical and biological treatment of waste water for all settlements with more than 2,000 population equivalents by the year 2005;
- support the application of sludge from wastewater treatment plants in agriculture, especially through limitation of discharges of hazardous substances from industry into public sewers;
- extend monitoring of the quality and quantity of ground and surface waters, including monitoring of the ecological state of waters according to EU requirements, and unify monitoring of rivers and small watercourses;
- prepare and implement action plans for achieving the environmental quality standards set by individual EU Directives in the area of water protection.

The new strategy aims at gradually shifting from normative tools to economic and voluntary ones. Highest priority is given to the protection of surface and ground waters for human consumption, protected areas and wetlands; second priority is given to stretches of watercourses that are classified as heavily polluted.

3.2 Status of Legislation Dealing with Nutrient Control / Reduction

The most essential laws and regulations dealing with nutrient pollution control and prevention are as follows:

- Act No 138/1973 Coll. (Water Act) and its Amendment No 14/1998 Coll., according to which all waters used for human consumption are protected by „protection areas„ where agricultural activities are restricted;
- Act No. 130/1974 Coll. of CNC on State Administration and Water Management, amended by CNC Act No. 49/1982 Coll., Act No. 425/1990 Coll. and Act No. 23/1992 Coll.; (The full text of Act of CNC No. 458/1992 Coll., Amended by Act of CNC No. 114/1995 Coll.);
- Government Decree No 82/1999 Coll., establishing parameters and limits of acceptable degree of water pollution (differentiated for municipal, industrial and agricultural waste water discharge) and also immission limits for two categories of surface waters: (i) surface waters for the abstraction of drinking water and (ii) other waters;
- Act No 58/1998 Coll. on charges for waste water discharge to water bodies;

- Intimation of the Ministry of Environment No 137/1999 Coll. to the Water Act establishing the list of water reservoirs designated for drinking water production and principles for specification of protected areas of water resources.

3.3 Main Barriers to Policy and Legal Reforms

The new political orientation launched in 1990 has brought significant changes to all domains of public life. A lot of them have had a favorable impact, especially relating to the environment, and have also influenced organizational and legislative structure of water management.

The main institutional barriers to policy and legal reform include:

- Organizational arrangement of state administration did not include regional arrangement and did not satisfy all present needs.
- Due to the privatization and removal of the centralized water management, access to needed data has partially been restricted; Law No 123/1998 Coll. regulates access to information on impact on the environment; the prepared law on water supply and sewage will enable access to information on treated and discharged waste water.
- Under the Act on Municipalities, the responsibility for drinking water supply, sewerage system and waste water treatment was assigned to municipalities. Their attitude to the solution of water management problems is weakened by the necessity to solve other problems and low accessibility of financial sources for the construction of sewer systems.
- The transformation of the legal system of the Czech Republic has not yet been accomplished. With the new act, a clear declaration of jurisdiction and responsibilities at all levels of water administration is expected.
- Changes in the structure of the public service and self-government decentralization has not yet been accomplished. The dossier of new laws specifying the responsibilities and cognizance of regions, districts and municipalities is under preparation.
- There are conflicts between environmental protection and economic concerns; lack of finances does not allow sufficient attention to be paid to water-related problems and their solution.

3.4 Envisaged Changes of Nutrient-Related Legislation

Regarding nutrient-related legislation, only one directive of minor relevance - the EU Directive 78/659/EEC on the quality of fresh waters needing protection or improvement in order to support fish life - is totally missing in the actual legislation of the Czech Republic.

The most essential laws and regulations currently in the preparation stage include:

- The New Water Act corresponding to EU regulations is still on the “legislative schedule” for the year 2000;
- A set of four laws concerning new organizational structure of state administration;
- The adjustment of all laws and regulations required for reaching full compatibility with EU legislation.

3.5 Schedule for Approximation of National Legislation to EU Legislation

The approximation process is based on the Position Document, the National Programme of the Preparation of the Czech Republic for the EU Membership, and on new Implementation Plans prepared for the individual directives.

The preparation period for the envisaged EU accession has been designated by the Czech Government until January 1, 2003. By this reference date, the EU-condition requiring incorporation of the Acquis Communautaire into the Czech legislature should be fulfilled and relating requirements of its practical application fully implemented.

According to the provided data, the Czech republic requests a transition period for the following issues:

- For the implementation of the Directive 91/676/ECC in connection with implementation of required measures in agriculture (2006);
- For meeting the requirements established by Directive 91/271/EEC for agglomerations between 2000 -10000 PE (construction or up-grading of WWTPs) and for more stringent level of treatment required for WWTPs in sensitive areas (2010);
- For the implementation of Directive 76/464/EEC and its daughter directives regarding some heavy metals and organic compounds from industry (2008);
- For attainment limits for the content of some organic compounds and metals in drinking water (2006)

Taking into account the significant improvements achieved during the previous few years, it is expected that the Czech Republic - one of the priority candidates for joining the EU before the year 2005 - can successfully achieve the required harmonization of national environmental legislation with the EU legislation in time; especially if this ambitious task is further supported by international co-funding.

4 SLOVAKIA

4.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

The most recent document in which objectives, priorities and principles of the national environmental policy are defined is the National Environmental Action Plan II (December 1999).

The priorities of the national environmental policy of the Slovak Republic related to the water sector are defined in NEAP II as follows:

- to ensure sufficient amount and quality of drinking water and reduction of pollution of other waters to acceptable level;
- to ensure biological diversity, protection and rational use of natural resources.

The general principles of the national environmental policy are:

- solving environmental problems within the context of the economic development in the society;
- a preference for preventive measures over corrective ones;
- enforcement of environmental policy on all levels and in all sectors, responsible for taking care of the environment, including municipalities, etc;
- solving environmental problems in a synergetic way;
- considering healthy environment as a basic requirement for public health;
- implementing the polluter pays principle;
- assessing the impact of interference related to the environment.

Particular objectives for the water sector are formulated in the NEAP II as follows:

- transposition of EU legislation;
- reduction of polluting substances in waste water discharges to acceptable level by construction of WWTP; use of treatment methods with high efficiency and fulfillment of requirements of EU Directive 91/271;
- realization of measures to support water retention, especially in areas suffering on water deficiency, alleviation of negative effects of flood events;
- introduction of measures to decrease drinking water consumption mainly by reducing losses in waterworks, more reasonable handling by consumers, stricter control of and preventive measures for potential accidents;
- introduction of measures to reduce pollution of watercourses and creation of suitable conditions for their revitalization;
- stricter control and reasonable utilization of water sources;
- protection and rational use of water resources;
- reduction of amount of carcinogenic, teratogenic, mutagenic and other harmful substances in waters below defined acceptable level
- enforcement of a complex monitoring and information system.

4.2 Status of Legislation Dealing with Nutrient Control / Reduction

The water sector, respectively nutrient-related legislation is formed by the following acts:

Table 4.2-1: Main Laws and Regulations Dealing with Nutrient Control / Reduction (Actually in Force)

(1) Law on Water 138/1973
(2) Governmental Decree 242/1993
(3) Regulation 117/1976 on Slovak Water Management Inspection
(4) Governmental Decree 31/1975 on fines for violation of obligation in the water management area
(5) Governmental Decree 35/1979 on charges in water management area
(6) Law 595/1990 on State Administration for Environment
(7) Ministerial Order 23/1977 on the protection of surface and ground water quality
(8) Ministerial Order 5000/1982 on the protection of water against pollution from agriculture
(9) Ministerial Order 5001/1982 on handling and use of manure
(10) Law 136/2000 on fertilizers

Governmental decree 242/1993 has to be used by water management authorities when issuing permits for discharge of waste water; Annex 1, respectively Annex 2 to this decree provide indicators for:

- Maximum permissible pollution level of discharged municipal and industrial waste water;
- Permissible pollution levels in receiving surface water.

Ambient water quality is dealt with in the Slovak Technical Standard STN 757221 Classification of surface water quality, used exclusively for evaluation from the ecological point of view (not for determination of suitability of water for different water uses).

Water sector-related laws currently in progress are:

(1) Law on Water (including transposition of EU directives 75/440/EEC, 76/464/EEC, 80/68/EEC, 91/271/EEC)
(2) Governmental Decree on maximum permissible pollution of waters

Current environmental legislation, especially regarding effective public participation, has not yet recognized the principles already incorporated in the legislation of western democracies.

4.3 Main Barriers to Policy and Legal Reforms

The main barriers fall into two groups: a) those concerning the process of transposition and implementation of the European Union legislation and b) those concerning the implementation and enforcement of the new legislation and regulations.

The first priority is to make a clear definition of the future competencies of the Ministry of the Environment and the Ministry of Soil Management for the water sector. This is the basic prerequisite for the preparation of a new Water Law, which will constitute the basic legal document in the water sector to be accompanied by other laws and regulations.

(1) In order to overcome the deficiencies in institutional and administrative capabilities, the following steps are required:

- Personnel strengthening in the Ministry of the Environment; increase of language capabilities and expertise of personnel to enable adequate transposition of EU Directives into national legislation;
- Personnel strengthening in state administration on regional and district level to support an adequate enforcement of the new legislation;
- Harmonization of monitoring, state statistics and preparation of reporting to the EU Commission;
- Personnel strengthening in the Slovak Environmental Inspection to support adequate enforcement of the existing and new legislation in the environmental sector;
- Personnel strengthening and strengthening of technical capabilities in the Slovak Hydro-meteorological Institute and in the Slovak Environmental Agency.

(2) A very critical issue, it seems, involves the weak enforcement of legislation by the concerned authorities on the national, regional and district level, where the number of employees decreased by 32 % in comparison to year 1996. It is envisaged to reach at least again the level of year 1995. The updated Law on State Administration (planned to be in force by the year 2000) will be very important in this context.

(3) A further critical issue involves the huge financial means required to adjust the national legislation to the EU-Legislation and to secure its implementation. It is estimated that approximately EUR 3,3 - 3,4 billion will be needed in the water sector only, mainly for the implementation of the Urban Waste Water Treatment Directive 91/271/EEC.

4.4 Envisaged Changes of Nutrient-Related Legislation

One of the basic priorities of the Government of the Slovak Republic is accession to the EU. In this context, the highest priority regarding nutrient-related legislation is the transposition and implementation of the relevant EU-legislation. Table 10.4-1 contains a list of the planned activities.

Table 4.4-1: List of planned activities in the process of transposition and implementation of EU legislation related to nutrient control and reduction

Activity	Deadline	Resp.authority
Draft Law on sewage	2002	MSM SR
Draft Law on water and related documents by which transposition of EU directives 75/440/EEC, 76/464/EEC, 80/68/EEC, 91/271/EEC will be ensured	2001	MOE SR
Draft Governmental Decree setting maximum permissible pollution	2001	MOE SR
Assessment and implementation of requirements of Water Framework Directive from the point of view of legislative and organizational competencies and duties of water management authorities/institutions	2001	MOE SR
Preparation of a time schedule of UWWT Directive in relation to investments needed	2001-2002	MOE SR
Identification of investment needed to implement UWWT Directive	2001-2002	MOE SR
Identification of technical and investment projects necessary for implementation of measures ensuring good water quality status and their monitoring in accordance with Water Framework Directive	2002	MOE SR
Identification and evaluation of areas sensitive to eutrophication processes in accordance with UWWT Directive	2002	MOE SR
Preparation and implementation of the Code of good agricultural practice with the purpose to reduce pollution caused by nitrates	2002	MSM SR
Definition of criteria for identification of water pollution by nitrates from agricultural sources (in relation to Nitrates Directive)	2002	MOE SR
Identification of vulnerable areas regarding the Nitrates Directive	2002	MoE SR
Development of Action Programmes in vulnerable areas to ensure protection of waters against pollution from agriculture (in relation to Nitrates Directive)	2004	MSM SR
Implementation of IPPC Directive in water sector (study)	2003	MOE SR

Regarding the issue of detergents, a proposal on methods of control of biological degradability of active substances detergents is planned to be prepared by the end of 2000. The Ministry of Economics is responsible for the preparation of this proposal.

4.5 Schedule for Approximation of National Legislation to EU Legislation

The National Programme for Transposition of Acquis Communautaire constitutes the basis for the definition of the envisaged time schedule as outlined in the table below and the financial requirements for the transposition of the EU legislation.

Table 4.5-1: Schedule for Approximation of National Legislation to EU Legislation

Name of National Law, Regulation	Related EU Directive / Standard	Proposed Period of Adjustment	Proposed Date of coming In Force
(1) Law on Water	75/440/EEC, 76/464/EEC, 80/68/EEC, 91/271/EEC	2002	91/271/EEC will fully be implemented by 2015
(2) Nitrates Directive (Exact name not known)	91/676/EEC	2003	Full implementation by 2008
(3) IPPC Directive	96/61/EEC		Full implementation by 2008

5 HUNGARY

5.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

According to the National Environmental Programme (1997-2002) it is an issue of high priority to decrease nitrate and phosphorous load of protected water resources sensitive to nutrients; these areas are priority areas for WWTP with improved (third degree) treatment standards.

According to the EU guidelines wastewater treatment should adequately be solved in settlements with more than 15,000 inhabitants by the year 2000 and in settlements of more than 2,000 inhabitants by the year 2005. The Hungarian national programme of waste water treatment is designed to fulfill these tasks by the year 2010 (due to financing problems).

The long-term objective of the waste water treatment programme is to achieve 67% of sewage collection and treatment all over the country, with a special emphasis on nutrient reduction at vulnerable water resources.

As approximately half of N and P pollution in the country comes from non-point sources, this is clearly recognized as the main area of concern, requiring substantial improvement.

Due to a lack of public subsidies, nutrient pollution from agriculture has dropped substantially and is currently responsible for not more than 15% of total nutrient pollution in the country. Recently, the use of pesticides and artificial fertilizers has became so low that a further reduction seems very difficult; therefore, the basic objective is to maintain the current levels and to prevent an increase in the future.

In October 1999 the Hungarian Government approved the National Agro-Environmental Protection Programme that was elaborated in accordance with Council Regulation 2078/92/EEC on implementation and support of agricultural practices serving protection of environment and safeguarding of landscape values. The programme contains measures planned for the 2000-2006 period, such as:

- Rationally reduced utilization of fertilizers and pesticides;
- Bio-production;
- Extensification;
- Reduction of density;
- Reinforcement of environmentally friendly methods;
- Conservation of landscape;
- Educational programmes and projects.

There is currently no programme on the national scale specifically related to nutrient removal or reduction. The MoE is, however, responsible for programmes that are closely linked to nutrient removal and reduction either for the whole country or for particular regions. The most important programmes are:

- National waste water collection and treatment programme, aimed at he development of adequate waste water treatment capacities of large cities and settlements according to the requirements of EU legislation between 1997 and 2010;
- Programme to improve the water quality and ecological status of Lake Balaton, including the implementation of Phase II of the Kis-Balaton project;
- Programme on Velence Lake;
- A governmental programme is being designed for the implementation of EU nitrate directive.
- Programme on Great Lowland;
- Programme on water supplement of Mid-Danube-Tisza Region;
- Programme on rehabilitation of oxbow lakes.

Hungary has with all its neighbors bilateral, trans-boundary cooperation agreements that also contain nutrient reduction related issues.

5.2 Status of Legislation Dealing with Nutrient Control / Reduction

The most essential acts currently dealing with nutrient pollution reduction and prevention are compiled in the following table.

Table 5.2-1: Main Laws and Regulations Dealing with Nutrient Control / Reduction (Actually in Force)

Name of Law, Regulation	Main Subjects	Effective since
(1)Act no. LIII on General Rules of Environmental Protection	Concept, principles and responsibilities in relation to the environment. Functions and activities of the state and the self-governments. Protection of ground and surface waters.	22 06 1995
(2)Act no LVII on water management	Basic rules, functions and principles of water management. Obligations to water and water facilities. Provision on sewer fine. Obligations for the operating of public utilities.	23 06 1995
(3)83/1997 Decision of Parliament on National Environmental Programme	Major targets of environmental protection by environmental elements. Tasks to reach the targets planned and proposed programmes.	26 09 1997
(4) 2126/1999 Decision of Government on Action Programme to National Environmental Programme	Tasks and programmes of year 1999.	
(5) 2207/1996 (VII.24.) Government Decision on Waste water disposal and treatment programme for Hungarian settlements		24 07 1996
(6) 3/1984 Decree of President of National Water Authority on waste water fines	Method of calculation of waste water fines. Definition of damaging pollution and the procedure of imposing and utilization of waste water fines.	00 00 1984
(7) 4/1984 Decree of President of National Water Authority on sewerage fines	Prohibits emission of harmful waste water. Regulation of sampling. Method for calculating and paying the charge.	
(8) MSZ12749 Hungarian Standard on quality of surface water; quality characteristics and classification		
(9)33/2000 Government decree on ground water protection	Protection of ground waters in full accordance with EC 80/68/EEC directive	07.06.2000
(10) Decree of Minister of Transport, Communication and Water Management on Water management council	Regulation of the tasks, contents and field of activity of WM Councils	00 00 1998.

The following eight items, expected to regulate nutrient emissions, are currently in the process of preparation, under the co-ordination of the MoE.

Table 5.2-2: Main Laws and Regulations Dealing with Nutrient Control / Reduction (Currently in Progress)

Name of Law, Regulation	Main Subjects	Date of Coming in Force
(1) Decree of government on surface water pollution control	EU-harmonized regulation; subject outlined in the name of the law.	2001
(2) Ministerial Decree on waste water emission permits	EU-harmonized regulation; subject outlined in the name of the law.	2001
(3)Ministerial Decree on sensitivity of surface waters	EU-harmonized regulation; subject outlined in the name of the law.	2001
(4)Ministerial Decree on water quality classification on ecological basis	EU-harmonized regulation; subject outlined in the name of the law.	2002
(5) Ministerial Decree on surface water quality objectives	EU-harmonized regulation; subject outlined in the name of the law.	2002
(6) Ministerial Decree on good agricultural practice	EU-harmonized regulation; subject outlined in the name of the law.	2002
(7) Ministerial Decree on identification of zones, vulnerable to nitrate pollution, for the protection of ground water	EU-harmonized regulation; subject outlined in the name of the law.	2002
(8)Governmental Decree on protection of waters against N-pollution from agricultural sources	EU-harmonized regulation; subject outlined in the name of the law.	2002

If these decrees should come in force as scheduled, Hungary would dispose of a relatively complete and satisfying legal framework for water management and water pollution control.

5.3 Main Barriers to Policy and Legal Reforms

The main barrier to policy and legal reforms in Hungary is the slow lawmaking process, which is mainly caused by inappropriate structure of the administrative system. The nutrient issue – including detergents – is dealt with in the following ministries:

- Ministry of the Environment,
- Ministry of Transport and Water Management,
- Ministry of Health,
- Ministry of Agriculture and Regional Development,
- Ministry of Economics.

5.4 Envisaged Changes of Nutrient-Related Legislation

(1) Enforcement of the existing and future legislation concerning N and P removal in waste water treatment in the catchments of sensitive surface and subsurface waters.

(2) Phosphate-free detergents

In 1996, a PHARE programme was completed on phosphorous subject. The Project no: EU/AR/205/97; Contract no. 95-0036.00 Title: Removal of Phosphate from detergents in the Danube basin.

Experts from 12 DRB countries were involved in this project. According to the findings of this project, criteria for the selection of environmentally friendly detergent products should focus on:

- reduction of the load and impact of detergents to the necessary extent (e.g. criteria on dosage, soluble/insoluble inorganic, aerobic/anaerobic biodegradable ingredients);
- preference for those ingredients undergoing quick and ultimate biodegradation and with aquatic impairments as low as possible, which is considered under the criterion: critical dilution volume;
- non-use of ingredients which are known to have adverse effects on the aquatic environment;
- restriction on ingredients having high figures on acute toxicity and on combinations with low biodegradability and/or accumulation potential:
- consumer should be better informed on the environmental impacts of the products."

According to the above listed issues, Hungary has not introduced the simplified approach of "phosphate free detergents", but a more careful classification of detergents with State Standard: pulverous synthetic detergents (MSZ 14604-86).

According to this Standard, detergents fall into the following categories:

- pre-wash: loosen the dirt even in cold water, making washing easier
- hand-wash: neutral, or lightly alkaline chemical reaction, suitable for sensitive to heat, alkaline and easy-to-handle textile materials, gentle hand or machine washing at the temperature of up to 60 C.
- regular: produced in the largest volume, light or medium alkaline products, suitable for washing at the temperature of 30-40 C as well as over 60 C.

Classification of detergents on the basis of phosphorus content by Standards:

Category	Description	P_2O_5 - Content (%)
A	Environment friendly	less than 7%
B	Within safe limit	between 7-15%
C	Maximal allowed quantity	maximal 20%
D	Prohibited	over 20%

Zeolite A is most commonly used for replacing the water softening property of phosphates in P- free detergents The average Zeolite A content is about 20%.

(3) Introduction of good agricultural practice including reduced use of fertilizers in sensitive areas.

5.5 Schedule for Approximation of National Legislation to EU Legislation

With decision No. 2280/1999. (XI.30.) and amendment No. 2140/2000 (VI.23) the Hungarian government has established a binding schedule for approximation of the national legislation to the EU-legislation, with the end of 2002 set as the deadline for completing the approximation.

Regarding nitrate/phosphorous reduction, the national legislation will be completed with new laws fully in line with the requirements of the respective EU-Directives:

Table 5.5-2: Schedule for Approximation of National Legislation to EU Legislation

Name of National Law, Regulation	Related EU Directive / Standard	Period of Adjustment	Date of coming In Force
(1) New regulation	EC 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources	2000-2002	2003
(2) New regulation	EC 73/404/EEC on biodegradability of detergents	2000-2002	2003
(3) New regulation	EC 73/405/EEC on establishing monitoring methods for anionic surfacants	2000-2002	2003
(4) New regulation	EC 82/242/EEC on establishing monitoring methods for non-anionic surfacants	2000-2002	2003
(5) New regulation + amendments	Water Framework Directive	2000-2002	2003
(6) New regulation + amendments	EC 91/271/EEC on urban waste water treatment	2000-2002	2003
(7) 33/2000.(III.17.) Gov. Decree on protection of quality of ground water	EC 80/68/EEC on protection of ground water	1998-2000	07.06. 2000

Taking into account the significant improvements achieved during the previous few years, it is expected that Hungary - one of the priority candidates to join the EU before the year 2005 - can successfully achieve the required harmonization of the national environmental legislation with the EU legislation in time, especially if this ambitious task is further supported by international co-funding.

6 SLOVENIA

6.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

The most recent document in which objectives, priorities and principles of the state environmental policy are defined is the National Environmental Action Plan, and a more detailed action plan, i.e. the National ISPA Strategy of the Republic of Slovenia: Environmental Sector (1999).

From the NEAP, the following main policy principles can be summarized:

- Slovenia has to adapt its environmental protection system to meet the EU requirements;
- The adoption of the EU legal issues regarding the environment is not only an obligation but also an opportunity to solve the environmental problems faster;
- The alignment with EU environmental policy is an opportunity to introduce changes to the production and consumption patterns;
- The expected negative effects of Slovenia's approximation to the EU have to be controlled;
- Transitional periods and additional funds have to be ensured for certain sectors or tasks, e.g. UWWTD, IPPC, etc.

The main objectives as formulated by the National Water Programme are as follows:

- Formulation of principles for sustainable water management;
- Implementation of integrated water management;
- Creation of regional institutions and enterprises to manage water quality and quantity;
- Development of a financial system to support the water management strategy;
- Development of inspection and control systems;
- Development of an information system on water economy.

6.2 Status of Legislation Dealing with Nutrient Control / Reduction

(1) Relevant laws and regulations currently in force

In the field of pollution reduction, MESP in 1993 drafted the Environmental Protection Act (EPA) which played a major role in the modernization of the perception of the environment by all stakeholders. Nowadays, it needs some amendments that will be passed together with the Water Act (Water Law) which is expected to come into force in summer/autumn this year. Along with these two umbrella laws, a list of subordinated regulation has been made since. The most important ones are: (i) the Slovenian Urban Waste Water Treatment Directive with accompanying sub-directives regarding different types of industries and wastewater, and (ii) the Slovenian Nitrates Directive.

Table 6.2-1: Main Laws and Regulations Dealing with Nutrient Control / Reduction (Currently in Force)

Name of Law, Regulation	Authority Responsible	Main Subjects	Effective since	Main Deficiencies
(1) Environmental Protection Act, EPA	MESP	umbrella law for the environment	(OJ RS, 32/93).	needs to be reviewed due to EU WFD and SI Water Act
(2) National Environmental Action Programme, NEAP	MESP	concrete measures up to 2003, programme up to 2008	September 1999	not specific enough
(3) Emission regulations	MESP	limit emissions in terms of concentration and mass load for WWTP's and diverse industries	Subsequently from 1996	OK, in compliance with Annex III of EU UWWTD 91/271/EEC
(4) Nitrates Directive	MESP	limit loads of nutrients and dangerous substances into soil	(OJ RS 68/96) November 1996	as in EU difficult to follow compatible to EU Nitrates Directive 91/676/EEC
(5) Water taxation	MESP	taxation for pollution, increases tax each year	Start in 1995	money goes to the state budget rather than to water sector
(6) EIA	MESP	Environmental impact assessment	2000	OK

(2) Relevant laws and regulations in progress

The most urgent regulation is the Water Act, which was supposed to come into force already two years ago. It is now finally being debated in the Parliament and is expected tol come into force in summer/autumn 2000. Similarly, the Slovenian Integrated Pollution Prevention Directive is being prepared; due to the great economic impact on the industry it will probably need an implementation period until the year 2011.

The Decree On Water Pollution Tax is amended each year raising the unit price for pollution. Its progressive rise is an incentive for polluters to take care of their pollution either to reduce it by change of technology or to remove it from waste-water by WWTP.

In agriculture, there is a need to systematically review the agricultural practices in order to reduce nutrients release/washout into the environment.

Table 6.2-2: Main Laws and Regulations Dealing with Nutrient Control / Reduction (Currently in Progress)

Name of Law, Regulation	Authority Responsible	Main Subjects	Date of coming In Force	Main Deficiencies
(1) Water Act	MESP	Umbrella law for water, corresponding to EU WFD	Summer 2000	not totally compatible with EU WFD
(2) Water Act	MESP	Definition of vulnerable zones	Summer 2000	OK
(3) Sensitive zones	MESP	Definition of eutrophic zones	Autumn 2000	weak definition in EU
(4) Urban agglomerations	MESP	Defines urban agglomerations for UWWTD	Autumn 2000	weak definition in EU
(5) IPPC	MESP	Integrated pollution prevention	2000	
(6) WFD	MESP	Covers issues from EU WFD	2000, or 2001	regional government is not established yet, no provision for RBM

(3) Main deficiencies

There are certainly no substantial deficiencies in the newly accepted regulations, although some of them are not fully compatible with the existing or future EU legislation. However, it is to be expected that given its restricted financial resources Slovenia will not be able to fulfill all the requirements of the new legislation by the time of the envisaged accession to the EU.

6.3 Main Barriers to Policy and Legal Reforms

Main barriers are listed in the National Environmental Action Programme (NEAP) of 1999.

(1) Main barriers to policy reform:

- Lack of adequately trained personnel at governmental level;
- Slow planning and decision making processes;
- Insufficient binding;
- Apparent lack of consistency;
- Excessive administrative apparatus.

(2) Main barriers to legal reform:

- Lack of adequately trained personnel at governmental level;
- Slow response to necessary changes;
- Legal provisions based on threats rather than rewards.

6.4 Envisaged Changes of Nutrient Related Legislation

(1) Proposed changes of relevant laws and regulations

The most urgent changes have basically been done. The UWWTD and the Nitrates Directive were introduced in 1996; the Water Act and amendments to the EPA are now expected to come into force. No explicit changes to nutrient control or reduction are expected, as the decrees already satisfactorily reflect the corresponding EU legislation. Only the agricultural sector has still to provide guidelines and regulations for sustainable agriculture.

(2) Proposed schedule for out-phasing of P-containing detergents

Slovenia is in the favorable position that the EU market has already forced industry to abandon P-containing detergents. The detergents Slovenia imports are also P- free.

6.5 Schedule for Approximation of National Legislation to EU Legislation

Due to the enormous costs associated with complying with the UWWTD (approximately 50% of all environmental costs!), Slovenia is not able to fulfill the requirements in a short time. As part of integrated water management policy, the Operational Programme for Urban Wastewater Collection and Treatment With the Water Supply Projects Programme (Ur. l. RS, 94/99) has been adopted. It determines the schedule for the implementation of measures (programmes and investments) included in the National Environmental Action Programme. The register of agglomerations - areas where the population and/or economic activities are sufficiently concentrated for urban wastewater to be collected and conducted to a public wastewater treatment plant - has been drawn up, and data on industrial waste water have been collected, as laid down in Annex III to the Directive. The final date for compliance with the EU UWWTD is scheduled for the end of 2015.

Table 6.5-1: Schedule for Approximation of National Legislation to EU Legislation

Name of National Law, Regulation	Related EU Directive / Standard	Proposed Period of Adjustment	Date of Coming in Force	Final Status of Compliance
(1) Urban Wastewater Treatment Directive, UWWTD	Urban Wastewater Treatment Directive, UWWTD	until 2015	1996 stepwise	until 31.12.2015
(2) Nitrates Directive	Nitrates Directive	until 2001	1996 stepwise	until 2001
(3) Agricultural practices	2078/92 and the Nitrates Directive	Unknown	Unknown	unknown
(4) IPPC	MESP	Integrated pollution prevention	2000	30.09.2011

7 CROATIA

7.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

According to the National Water Pollution Control Plan of January 1999, the overall objective for water pollution control is to protect the environment and life and health of people by providing adequate water for different purposes of utilization.

The priorities regarding water pollution control and water management are ranked as follows:

- Preservation of water resources which are still clean (i.e. upstream river stretches of quality class I and groundwater) as future drinking water resources;
- Avoidance of further degradation of the current water quality;
- Restoration or removal of sources of pollution concerning existing or planned drinking water resources, as well as other resources where water is used for different human and economic purposes (usually water resources of class II or III);
- Strengthening the monitoring of sources of water pollution or potential accidental emergencies.

The objective of the National Water Pollution Control Plan is that water shall be managed in accordance with the principle of integrity of the river system and the principle of sustainable development.

The National Water Pollution Control Plan includes the following principles: (i) precautionary principle, (ii) the use of BAT, (iii) control of the pollution at source, (iv) the *polluter pays* principle, and (v) commitment to regional cooperation and shared information among the neighboring countries.

Regarding municipal WWTPs, the priorities are defined as follows:

- WWTPs > 50000 PE: in this category there are 29 WWTPs to be newly constructed or extended for improved treatment standards (biological treatment, N+P elimination);
- WWTPs > 10000 PE in sensitive areas (to be implemented by the year 2005);
- WWTPs > 15000 PE (to be implemented by the year 2010);
- WWTPs between 2000 and 15000 PE (to be implemented by the year 2025).

7.2 Status of Legislation Dealing with Nutrient Control / Reduction

Due to the fact that Croatia has been an independent state only since 1990, its legal and institutional structures are still in the process of transformation, which also applies to the fields of water management and environmental protection. The most essential laws and regulations dealing with nutrient reduction are:

- The Water Act, which provides a framework for new regulations in the fields of water pollution control and water quality control in compliance with the EU regulations and the relevant international conventions;
- Water Management Financing Act (No 10795);
- Ordinance on Water Classification (No 77/98);
- Ordinance on Hazardous Substances in Water (No 78/98);
- Regulations on the issuing of water management consents and permits (No 28/96);
- National Water Pollution Control Plan (8/99);
- Regulation on the discharge of hazardous and other substances into water (No 44/99).

Ordinance No 77/98 on water classification defines: (i) water quality related to maximum allowed values of specific groups of water quality indicators, (ii) methods of sampling and analyzing and methods of defining and presenting water classification, (iii) ambient quality standards.

Ordinance 78/98 on water-related hazardous substances defines, beside others, two groups of substances:

- Group A - substances that are forbidden to be discharged into waters;
- Group B – substances that can be discharged into waters but only at maximum permissible levels; regarding nutrient reduction in group B are regulated: (i) biological non suspended detergents and other surface active substances; (ii) inorganic phosphorus compounds and elementary phosphorus, and (iii) inorganic nitrogen compounds and elementary nitrogen.

Regulation on maximum allowed concentrations of hazardous substances in waste waters defines effluent standards as follows:

- For total phosphorus, ortho-phosphates, ammonia, nitrites, nitrates, total nitrogen for discharging of waste water in categories II, III. IV, V of planned water classes (discharging of waste water to category I is forbidden);
- For waste water quality from municipal sources (SS, BOD, COD total P, total N) dependent on size of WWTP (PE), and water categorization (planned class), respectively sensitivity of the recipient.

The main deficiency underlying all legislation regarding nutrient control and reduction is that legislation is primarily oriented to point-sources pollution. The issues of diffuse pollution are regulated very generally (only basic principles).

Particular deficiencies in comparison to EU-legislation and standards exist in relation to EU Nitrates Directive. Related to Water Framework Directive and Urban Waste Water Directive, the national legislation complies with more elements than in the case of the Nitrates Directive.

Regarding the out-phasing of P-containing detergents there is no existing or planned regulation. But according to the regulations of the Water Act, water management permits have to be issued for chemicals and their derivatives which get into water after use. That is the only existing mechanism that can be directly used regarding P-containing detergents. The existing mechanisms which can indirectly be used regarding P-containing detergents are ambient quality standards and effluent standards which are regulated in the following ordinances and regulations: (i) Ordinance on water classification, (ii) Ordinance on water related hazardous substances, (iii) Regulation on maximum allowed concentrations of hazardous substances in waste water.

Mechanisms for the implementation of the egislation (especial financial mechanisms) are not completely developed. Regulations for calculation of water pollution charges and definition of charging levels are currently in the status of preparation and are expected to become effective in 2000.

7.3 Main Barriers to Policy and Legal Reforms

The main barriers to policy and legal reforms can be summarized as follows:

- Environmental protection, respectively water protection is not considered as a top priority in Croatia. As in the past, this issue continues to be neglected and mechanisms for environmental protection are not developed.
- Due to the bad economical situation and due to the basically improved environmental conditions (mainly resulting from decreased industrial and agricultural production) it is difficult to convince the responsible officials about the necessity to spend for environmental protection the money that is urgently needed for other developmental tasks.
- There is a significant lack of administrative and institutional capabilities; particularly regarding local community authorities and particularly in the less developed rural areas. In other words, a task assigned to the authorities of a local community can only be executed with assistance from the state administration.

7.4 Envisaged Changes of Nutrient-related Legislation

Since the Republic of Croatia became an independent country, legislation related to water management/pollution control has been changed. These changes are in the final phase on the state level; the coming task for the state administration will be to assist the local authorities by establishing necessary legislation/regulations on the local level and to improve and develop the mechanisms for the implementation of the legislation.

The main changes that have to be considered in the near future are supposed to result from the approximations of the national legislation to the EU legislation.

There are currently no explicit plans for nutrient-related changes in the legislation. The existing legislation requires particular tasks to be fulfilled which will definitely need changes, respectively the development of new nutrient-related legislation; these tasks are: (i) Revision of the monitoring system, (ii) Water Management Master Plan for Croatia and County Master Plans, (iii) County Water Pollution Control Plans, etc.

There is currently no concrete programme or schedule for control, respectively out-phasing of P-containing detergents.

7.5 Approximation of National Legislation to EU Legislation

Until now the Government of the Republic of Croatia has not yet established a National Programme for EU-accession. In January 1999, the government officially addressed the responsible ministries and state directorates asking them to research the possibilities for approximation of the national legislation to the EU legislation, including water management and control issues. Partial approximation has already been accepted, but there are no systematic plans for fulfilling this crucial task. The actual status can be outlined as follows:

- Water Framework Directive
  - The approach of this Directive seems basically accepted for incorporation into national legislation (river basin approach, river basin districts, river basin management plans, public information and consultations, programme of measures).
- Nitrate Directive
  - This Directive is only accepted as “issue” which has to be taken into consideration, but not in a systematic way.
  - Regulation on the protection of agricultural land against pollution from hazardous substances defines (i) substances that have to be considered as hazardous for agricultural land, (ii) maximum allowed quantities of these substances in the soil, (iii) measures for soil protection in order to protect agricultural land for the production of healthy food.
- Urban Waste Water Directive
  - This Directive is basically accepted; what currently still remains to be fully accepted is a binding time schedule for implementation, strict obligations related to tertiary treatment (only in sensitive areas), and strict standards regarding waste water control (frequency of sampling, methods of analyzing, water quality indicators); issues related to sludge treatment have basically been accepted but not regulated in detail.
  - The national effluent standards take into account the standards of the Urban Waste Water Directive.

There are no explicit plans for a full approximation of nutrient-related national legislation to the respective EU Directives. At the same time, it is obvious that these plans will have to defined within a very short time, but more detailed information can not be provided at this point.

8 BOSNIA-HERZEGOVINA

8.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

Since the Dayton Peace Agreement of 1995, the Republic of Bosnia-Herzegovina has consisted of two entities: the Federation of B&H and the Republic Srpska. Both entities have their own policies and legislation regarding the management and protection of water resources, but they share some common principles, i.e.:

- water is a public good;
- water is a limited natural resource which has to be used rationally within the limits of recoverability, both in quantity and quality;
- water management and protection is a joint task of all institutions, companies and individuals dealing with water.

Generally, B&H is faced with big economic and social constraints. In such a situation it is very difficult for policy-makers to develop long-term objectives with priority to environmental protection and management. Lack of coordination and cooperation between the ministries and authorities responsible for environmental issues constitutes the main obstacle to efficient and fast legislative preparation and adoption.

Until now, there have been no explicitly formulated policy objectives, priorities or programmes on water protection in general and on nutrient control / reduction in particular.

8.2 Status of Legislation Dealing with Nutrient Control / Reduction

Since the declaration of the new constitution in 1994, environmental legislation is still in the constitutional phase.

Responsible ministries in both Entities have prepared draft Environmental Laws; as it was recognized that the draft laws were not in accordance with the principles of the EU legislation. OHR terminated their adoption.

Laws on Physical Planing that are currently enforced in both Entities of B&H, address the issues of urban planning, environment protection and land, water and air protection, while the Water Laws, different for both Entities, deal with water management issues.

The Federal Water Law seems to be mainly focused on the establishment and financing of Public Companies for Watershed Areas (PWCAs) for the Sava River and the Adriatic Sea catchment areas. The Water Law does not contain sufficient provisions on permits, legal procedures, international standards and conditions for water use. In consequence, it fails to provide an effective basis for water regulation. The main deficiencies include a strong concentration of the PWCAs and insufficient alignment to EU principles, particularly those relating to an integrated environmental approach to river basin management.

Besides the Regulation on Harmful Substances not to be Discharged into Waters, there are no explicit legal provisions or standards within the current legislative directly or indirectly dealing with nutrient control and reduction.

The existing legislation does not contain any binding provisions on out-phasing P-containing detergents. The only detergent producing factory in B&H is currently using both zeolite and phosphorus components in its products. It is left to the producers to use the ingredients they prefer, but they are advised to use environment-friendly ingredients such as zeolite.

Table 8.2-1: Main Laws and Regulations Dealing with Nutrient Control / Reduction

Name of Law, Regulation	Main Subjects	Effective since
(A) Currently in force		
(1) Law on Physical Planing	Urban planning, environmental protection and land, water and air protection	April, 1987
(2) Water Law	Water management	May, 1998
(3) Regulation on Hygienic Accuracy of Drinking Water	Drinking water standards	May 1987, rev. 1991
(4) Regulation on Harmful Substances not to be Discharged into Waters	Threshold values for harmful substances not to be discharged	January, 1966
(5) Regulation on Types, Manner and Scope of Measurement, Investigation of Used and Discharged Polluted Water	Wastewater quality standards, method for analysis and taxation mechanisms	December 1998
(B) Currently in progress		
(1) Regulation on Threshold Concentrations of Harmful and Dangerous Materials that May be Found in Process Waters		In progress
(2) Regulation on Threshold Concentrations of Harmful and Dangerous Materials that may be Discharged to the Recipient after Treatment		In progress
(3) Regulation on Threshold Concentrations of Harmful and Dangerous Materials that may be Discharged onto Agricultural Land		In progress

8.3 Main Barriers to Policy and Legal Reforms

During the previous decade of dramatic changes, no progress was made in the development of the national legal system in general or the legal system for environmental protection in particular. Lack of efficient coordination and cooperation between the two entities' environmental authorities and poor cooperation between provincial and local authorities responsible for environmental development and planing are considered to be the major barrier to policy and legal reforms. The issue of establishing better cooperation among environmental authorities in B&H has for some time been on the political agenda of B&H and the European Commission representatives in B&H.

The main problems and deficiencies can be summarized as follows:

(1) Regulatory and institutional deficiencies/problems

- environmental legislation and policy is not harmonized and integrated at the country level;
- framework environmental laws at entity level do not exist;
- bodies/agencies for integrated coastal and river basin management do not exist;
- weak vertical co-ordination in the Federation of B&H;
- weak inter-entities institutional co-operation;
- shortage of qualified expert staff and education;
- shortage of basic data on human activities and human resources;
- inadequate monitoring of water quality and quantity;
- weak public participation in decision making process.

(2) Environmental deficiencies/problems

- uncontrolled discharging of municipal and industrial waste water into surface waters;
- shortage of waste water treatment plants;
- uncontrolled disposal of solid waste - unsanitary damping sites and illegal landfills;
- uncontrolled flood risks;
- ecosystem degradation;
- loss of biological diversity, endangered species and habitats;
- shortage of modern intensive agricultural production;
- inadequate use of available water resources.

(3) Social/economical problems

- unemployment and low living standard of the population;
- significant decrease in national and especially international tourism;
- destroyed industrial facilities,
- significantly reduced agricultural production and livestock farming.

(4) Public participation

- public participation in environmental matters is the key to successful implementation of an appropriate environmental strategy;
- public awareness of environmental problems and interest in solving these problems do not currently exist;
- active public participation in environmental policies has to be encouraged; non-governmental environmental organizations have to be supported; environmental information and its dissemination trough the mass media have to be improved.

8.4 Envisaged Changes of Nutrient-Related Legislation

For the time being, there are no explicit plans for nutrient-related changes in legislation; but the adoption of the new environmental law is urgently awaited.

Since the envisaged harmonization of the national legislation with EU legislation will automatically lead to the elaboration and adoption of laws and regulations on nutrient control and reduction, this procedure is considered as a high priority for the current year.

There are currently no explicit plans for control, respectively out-phasing of P-containing detergents.

8.5 Approximation of National Legislation to EU Legislation

The country as a whole is deeply committed to approaching EU standards, but in order to do so it must first fulfill at least the minimum preconditions required for an appropriate management and monitoring of the environment at the national level.

Drawing up and adopting the Framework Environmental Law is a prerequisite for B&H to establish an efficient environmental management and protection system and to become a member of the EU and other international organizations. During 1999, the Terms of Reference were prepared and the finalization of this Law is expected within the current year.

It is clearly recognized that the existing laws are not harmonized with the EU principles and should therefore be modified. Within the current reforms in the water and environment sector in B&H, the EC will through the EC Environmental Programme for B&H provide technical and financial assistance for the elaboration of Laws on Water Protection, Laws on Solid Waste, Laws on Nature Protection, Laws on Air Protection, and Laws providing a comprehensive framework for environment licensing for both Entities. The drawing up of sector laws will be based on the Framework Environmental Law guidelines and is planned to start within the current year.

A concrete time schedule for approximation of national legislation to EU legislation in terms of pollution control / reduction has not yet been established.

9 YUGOSLAVIA

9.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

The general policy objectives, priorities, and principles for nutrient control and reduction are laid down in the Resolution on the Environment Protection Policy adopted by the Federal Government, and can be summarized as follows:

- Creation of a basis for the development of a humane society in the Federal Republic of Yugoslavia which will continue to develop on a permanent basis in conformity with nature, bearing in mind the right of the future generations to satisfy their needs on the same or a higher level;
- Creation of conditions for the preservation and rational use of natural resources and prevention of their degradation; prevention of uncontrolled pollution and further degradation of the environment, and elimination of the consequences of earlier pollution and degradation of the environment;
- Management of the environment in a manner conducive to the protection and improvement of human health;
- Development of an integral system of protection and improvement of the environment and quality of life, improvement of the existing system of protection of the environment and provision of an institutional frame for effective operation of that system;
- Gradual enforcement of the *polluter pays* principle on the basis of regulations applicable to the country as a whole;
- Creation of conditions for the development of pollution control methods suited to the peculiarities of the country and its attained level of development;
- Preservation of a “satisfactory” ecological balance in the country and participation in the protection of the biosphere;
- Prevention of the import and transfer of hazardous matters and so-called “dirty” technologies.

Most of these objectives and principles indirectly relate to nutrient control and reduction.

Concerning water pollution control, the above mentioned objectives are to be reached by the following means:

- further development of integral River Basin Management;
- further development of “polluter pays” principle and strict implementation in the practice;
- further development of market mechanisms in Water Sector;
- implementation of strict regulations;
- construction of new WWTPs;
- renovation of industrial capacities and replacement of old facilities and technologies by environment-friendly ones;
- strengthening of monitoring system and inspection;
- strengthening of research, education and training.

All these measures will not only improve the water quality of recipients in general but also reduce nutrient emission. With the construction of the planned municipal WWTPs based on biological treatment and proper operation, an average removal of Nitrogen and Phosphorous of 15%, respectively 25% can be anticipated.

International cooperation in the field of environmental protection was very intensive and rather successful before sanctions were imposed on the Federal Republic of Yugoslavia. FR YU has ratified 51 international treaties relating to the issues of the environment thus showing its readiness to cooperate.

9.2 Status of Legislation Dealing with Nutrient Control / Reduction

The legal framework for environmental protection and the protection of water resources and aquatic eco-systems is created by federal and republican regulations. The Federal and Republican constitutions stipulate the responsibilities of the Federal level and the Republican level for environmental protection issues.

The general characteristic of the legal system of the Federal Republic of Yugoslavia, which also exerts influence on environmental protection, is a maladjustment of its elements, i.e. a discrepancy between the republican constitutions and the federal constitution. The system does provide mechanisms for the removal of these discrepancies, but they have not been sufficiently used so far. Therefore, it is reasonable to expect that these discrepancies in the system will be regulated in the near future. This calls for coordinated activities between the republics, which fully-developed systems of environmental protection, and the federation, which is authorized to lay down the fundaments of the system of environmental protection. In addition, the federal state, as a legal entity in international law, has the right to sign and ratify international treaties and agreements.

It should be pointed out that numerous regulations relating to water management (especially by-laws) were adopted a long time ago, that they were frequently amended and that it is necessary to revise them.

There are at present no laws or regulations explicitly related to nutrient control and reduction, but there are some appropriate mechanism in use (issuing of Water Consent, approval of Environmental Impact Assessment Studies).

Regarding nitrogen and phosphorus emissions, there is a system of use-related criteria, regulations and standards for recipients. Effluent standards have not yet been established.

Maximum permissible levels for nitrogen (ammonia, nitrates, nitrites) concentration in the recipients are related to different water classes as in other countries and are relatively strict.

Maximum permissible levels for Phosphorous are not regulated in the federal legislation but are indirectly defined by oxygen saturation indicators for the different water classes.

Although the maximum permissible levels for Phosphorous in recipients are not prescribed by regulations, the State Service has been monitoring the concentration of Phosphorous in the rivers for a long period so that it was possible to compute the P-mass balance and changes of P-mass flow in the rivers within the Danube Basin in FR Yugoslavia.

9.3 Main Barriers to Policy and Legal Reforms

The main barriers to sector policy reform are:

- unstable economic and political situation;
- lack of funds.

The main barriers to legal reform are in addition:

- Lack of sectoral and regional consensus on the environmental issue;
- Lack of finance to support the urgently required revision of the existing legal framework.

9.4 Proposed Changes of Nutrient-Related Legislation

(1) Proposed changes of relevant laws and regulations

There is currently no new legal document dealing with the issue of water pollution control in general or with nutrient control/reduction in particular.

There is a substantial need to revise the legal framework related to environmental protection in general and to water protection, respectively nutrient control and reduction, in particular, in order to achieve an utmost approximation to the requirements of the EU-Legislation.

A thorough proposal for the required changes of relevant regulations could only be done on the basis of a serious study of this issue.

(2) Out-phasing of P-containing detergents

The consumption of detergents in FR of Yugoslavia is about 52 000 t/y. There is no production of P-free detergents in FR YU. In the past, the main producers have tried to establish a production of detergents based on zeolites (instead of polyphosphates) but no serious improvement was made.

For the time being, there is neither a plan nor a schedule for the out-phasing of P-containing detergents. It is left to the producers to decide what kind of detergents they will produce depending on their capabilities and availability of raw materials under the current circumstances. Therefore, there is also no analyses or estimate of the cost of introduction of P-free detergents.

9.5 Schedule for Approximation of National Legislation to EU Legislation

Although FR Yugoslavia is not seen as a candidate to access EU in the next decade, there is a general statement of the Federal Government that each new legal document has to be approximated as much as possible to the EU regulations.

Under the current political circumstances there is no real motivation for serious and urgent work for harmonization of the national legislation with EU legislation, which means that this will probably be done case by case under pressure from the need for new regulations.

For the time being, there is no schedule for approximation of the national legislation to the EU-legislation.

10 BULGARIA

10.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

The MOEW carries out the government policy for integrated water management and sustainable water use aimed at meeting the demand and preserving the water resources for future users.

The environmental policy currently implemented by the Ministry of Environment and Waters, includes reduction and prevention of nutrient pollution. It is designated to:

- EC Accession Partnership and Implementation of the National Programme for the Adoption of the Acquis (NPAA);
- Government Programme 2001;
- Environmental Strategy for ISPA;
- National environmental sector strategies and programmes;
- National sector strategies and programmes; and
- fulfilling obligations under the Conventions for the Protection of the Danube River and the Black Sea.

There are several policy documents, but no one especially for nutrient reduction.

The recently developed national programme for Priority Construction of Urban WWTPs in Bulgaria was adopted by the Council of Ministers in 1999.

The objective of this programme is to establish priorities by river basin for the construction of urban WWTPs for all settlement areas in the country with over 10,000 equivalent inhabitants, as well as national short-term priorities until 2002. It includes completion, construction, reconstruction, extension and modernization of the existing urban WWTP, as well as the design and construction of new urban WWTPs. All proposed projects are within the scope and correspond to the requirements of EC Directive 91/271/EEC.

10.2 Status of Legislation Dealing with Nutrient Control / Reduction

The harmonization of the national legislation regarding water and solid waste management, ecology, health and the procedures for environmental impact assessment with international regulations and standards was started in 1990 and is an ongoing process. Up to now, the complex system of environment and water-related legislation has obviously not been made fully compatible and suitable for adequate control and management of the serious environmental problems faced by the country.

As the existing legislation in the water sector does not sufficiently correspond to the requirements of the EU legislation, a specific programme for a harmonization of the national legislation with the EU legislation has been launched.

In July 1999, a new water act was adopted by the parliament and put in force on 28 January, 2000. This water act introduces the guiding requirements of the EU Water Framework Directive and provides the framework for introducing sub-ordinate directives. It provides the basis for an integrated water resources management and sustainable use, including the protection of water from pollution. The Law regulates property rights over waters, water-economic systems, equipment and works. The water management is realized: (i) on the national level by the Council of Ministers and the MOEW, (ii) on the basin level by the River Basin Directorate.

It is expected that - with the introduction of particular laws and regulations – a complete approximation to the relevant EU directives will be achieved in the short term.

Table 10.2-1: Main Laws and Regulations Dealing with Nutrient Control / Reduction

Name of Law, Regulation	Main Subjects	Effective since
(A) Currently in force		
(1) Environmental Protection Law	Environmental management	1991
(2) Regulation No 4	This Regulation sets certain conditions, procedures and requirements for Environmental Impact Assessments as provided for in the Environment Protection Act	7 July, 1998
(3) Water Law	This Law provides the activities for integrated water resources management and their sustainable use, including the protection of water from pollution. The Law regulates property rights over waters, water-economic systems, equipment and works. The water management is realized: (i) on the national level by the Council of Ministers and MOEW, (ii) on the basin level by the River Basin Directorate.	28 January, 2000
(B) In progress		
(1) Draft Law for Water Users Associations	It will regulate the establishment and competence of these associations. The law will set the rules for the exploitation of water and the use of drainage systems by the Water Users Association.	Not yet adopted

The currently adopted standards with respect to nutrient control / reduction are laid down in the following regulations:

- Regulation No 7 for the ambient water quality permissible limits;
- Regulation No 8 for the Black Sea water quality permissible limits;
- BDS 2585 - Bulgarian State Standard for drinking water quality.

A particular problem in this context is that the currently adopted ambient water quality permissible limits, which are even stronger than the EU standards, are not achievable.

10.3 Main Barriers to Policy and Legal Reforms

The main barriers to policy and legal reforms can be summarized as follows:

- Continuos transition period from planned to market-oriented economy;
- Low economic capabilities and high investment needs for further economic development;
- Lack of adequate funds;
- Social problems, especially in rural areas;
- Lack of a particular National Nutrient Pollution Reduction Strategy;
- Lack of administrative and institutional capabilities for the enforcement of EU principles and implementation of the integrated water management approach;
- Weak enforcement due to insufficient resources (staff numbers, motivation, training, equipment);
- Lack of a concept for tertiary treatment of municipal wastewater as „sensitive areas“ in the sense of the Urban Wastewater Directive have not yet been defined; according to the experts of the MOEW at least the Black Sea WWTPs require tertiary treatment (nutrient removal);
- Good agricultural practices are not pursued due to lack of knowledge, continuos agrarian reform and lack of investment means;
- Lack of control of the use of livestock waste (manure/slurry);
- Lack of public awareness, and support for necessary nutrient control initiatives.

10.4 Envisaged Changes of Nutrient-Related Legislation

Beside the ongoing process of harmonization of the national legislation with the EU legislation, there are currently no concrete plans for changes in nutrient-related legislation.

There is currently no explicit programme or schedule for the control, respectively out-phasing of P-containing detergents; plans are currently in the stage of preparation.

10.5 Approximation of National Legislation to EU Legislation

The proposed schedule for the approximation of the national legislation to the EU legislation in terms of pollution control is in accordance with the state institutions schedule in all sectors. According to the proposed schedule, national nutrient-related legislation is expected to comply by the end of the year 2000 with the following EU Directives: (i) Draft Water Framework Directive, (ii) Nitrates Directive, (iii) Urban Waste Water Treatment Directive, (iv) other directives which are not so relevant with respect to N and P control / reduction. The national laws and regulations are envisaged to be in full compliance with the requirements of the EU Directives after an envisaged transition period of two to six years.

Table 10.5-1: Schedule for Approximation of National Legislation to EU Legislation

Name of National Law, Regulation	Related EU Directive / Standard	Period and status of adjustment
(1) Regulation on survey, use and protection of ground water	Directive EC 80/68/EEC concerning the protection of ground water and Directive EC 76/464/EEC concerning dangerous substances	31.12.2000 full
(2) Regulation on the quality of water intended for human consumption and household purposes	Directive EC 98/83/EEC on the quality of water for human consumption and household needs	31.12.2000 full
(3) Regulation on the quality requirements for the surface water intended for human consumption and household purposes	Directive EC 75/440/EEC	31.12.2000 full
(4) Regulation on protection of water from pollution with nitrates from agricultural origin	Directive EC 91/676/EEC on protection of water from pollution with nitrates from agricultural origin	31.12.2000 full
(5) Regulation on the quality of fish and shellfish waters		31.12.2000 full
(6) Regulation on the categorization of the waters	Draft Framework Directive EC COM 97(49), Directive EC 76/464/EEC, Directive EC 91/271/EEC concerning urban waste water	31.12.2000 full
(7) Regulation on the quality of the coastal waters	Directive EC 79/923/EEC, Directive EC 91/271/EEC	31.12.2000 full
(8) Regulation on the emission norms for admissible content of harmful and dangerous substances in waste waters discharged into water objects	Draft Framework Directive EC COM 97(49), Directive EC 76/464/EEC and daughter directives; Directive EC 91/271/EEC	31.12.2000 full
(9) Regulation on issuing permissions for waste water discharges in water objects and determination of individual emission limitations in the point sources of pollution		31.12.2000 full

11 ROMANIA

11.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

In Romania, the Ministry of Waters, Forests and Environmental Protection (1990) plays the leading role in water management. A National Company called Romanian Waters, established in 1999, is responsible for the national strategy of water management implementation. The drinking water supply, waste water treatment, waste disposal and sewerage network are the responsibility of municipalities.

The most relevant objectives for water pollution reduction can be summarized as follows:

- Reducing nitrates, organic substances and pesticides;
- Decreasing the amounts of heavy metals and highly degradable organic compounds in sediments;
- Reducing BOD5, N and P emissions from WWTPs;
- Controlling diffuse pollution.

The strategic directions, which are to be followed up by structural and nonstructural projects and measures proposed for pollution reduction, include:

- Gradual development of municipal waste water treatment capacities;
- Gradual development of waste water treatment in the agricultural sector;
- Gradual development of waste water treatment in the industrial sector;
- Integrated management of water resources;
- Abatement of risks related to accidental pollution and natural calamities;
- Ecological reconstruction.

In the transboundary context, Romania ratified a series of international conventions and declarations, such as: Bucharest Declaration (1985), Protection of the Transboundary Waters Convention (1995), Black Sea Convention (1992), Danube River Protection Convention (1995) and others.

11.2 Status of Legislation Dealing with Nutrient Control / Reduction

Environmental and water-related legislation is currently undergoing a process of transformation. The reorganization of the legislation framework reflects the need to manage all the natural resources as part of an integrated system and strategy, which involves cooperation between all relevant authorities and institutions on the different administrative levels.

The Frame Water Law (107/1966), which provides a framework of technical regulations for water pollution reduction and water management, and the Law on Environmental Protection (137/1995), which comprises special provisions for water protection, are in the process of being upgraded and revised. The same applies to a series of norms and standards.

Table 11.2-1: Main Laws and Regulations Dealing with Nutrient Control / Reduction (Currently in Force)

Name/ No. Type	Responsible authority	Main subject	Effective since
Government decision			
GD 1001/1990	MWFEP	Unitary system for water management services tarifs	1990
GD 101/ 1997	MWFEP/MH	Norms for sanitary protection areas	1997
GD 730/ 1997	MWFEP	Norms for waste water discharges in receivers NTPA 001 (concentration)	1997
GD 172/ 1997	MWFEP/MH MWSP	National Register of Potentially Toxic Chemicals	1997
MWFEP orders			
NTPA 002		Conditions for discharging waste water into sewerage	1998
699		Procedure and competences for issuing water management permit/ authorisation	1999
251		Procedure, competences in the case of special monitoring regime in the case of non-compliance with water permit	1997
277		Guidelines and norms for producing technical documentations for the obtaining of water permit Notification procedure	1997
280		Acces mechanism for water management information	1997
281		Water users and public participation in the consulting activity	1997
282		Water Register Establishment	1997
166			1999

Table 11.2-2: Main Laws and Regulations Dealing with Nutrient Control / Reduction (Currently in Progress)

Type	Authority responsible	Main subjects	Date of coming in force
Law	MWFEP	Law on the Modification of Environmental Protection Law (137/95)	2001
Law	MWFEP	Law on the Modification of Water Law (107/96)	2001
Law	MWFEP	Law on the Establishment and Operation of National Council for Environment and Sustain. Development	2001
Law	MWFEP	Law on the approval of National Plan for land planning sec.III protected areas	2001
Law	MWFEP	Law on Integrated Management of Coastal Areas	2001
GD	MWFEP	Hydrographic Basin Committee Establishment	2001
GD	MWFEP	Upgrading of NTPA 001/97	2001
GD	MWFEP	Approval of frame schemes for management and planning of hydrographic basins	2001
GD	MWFEP+ MAF	Approval of the Action Plan dor water protection against nitrate pollution from agricultural sources	2001

The most relevant deficiencies concerning the water legislation, particularly related to nutrient control, are the following:

- The N,P emissions limits are related to concentration only; there are not any provisions for discharged load except the water permit;
- there are not (yet) any national water quality objectives/ targets;
- in the case of the actual STAS 4706/88 – surface waters – quality technical conditions:
  - the limits cover only the water column compartment without considering sediment associated pollution;
  - for some specific pollutants (heavy metals, organic micro-pollutants) the limits are higher in comparison with EU legislation;
- there are (STAS 4706/88) not any provisions concerning nutrient concentration in the Black Sea;
- in the case of total nitrogen and total phosphorous, the current STAS 4706/88 refers to total inorganic N, P concentrations without considering the organic forms;
- there are no laws, regulations or proposals regarding phosphorous-free detergents.

11.3 Main Barriers to Policy and Legal Reforms

As regards nutrient-related issues, there are:

- general barriers (lack of adequate legislation, management mechanisms, infrastructure, etc.);
- specific constrains generated by natural resources (surface waters, ground waters, Black Sea, etc.);
- socio-economic system conflict areas (especially related to the agriculture target group).

In this respect, two interrelated issues in particular should be analyzed and followed up:

- promotion of the new legislation; and
- stipulation of specific implementation processes.

11.4 Envisaged Changes of Nutrient-Related Legislation

The proposed new legislation should provide:

- a regulatory framework for dealing efficiently with a variety of environmental problems, particularly nutrient-related ones; and
- a balance between conflicting interests in using the water, as well as between environmental issues and other issues (e.g. economic, employment and social issues).

The required actions are:

- Stepped improvement of standards:
  - integrated approach to immission / emission (point/ diffuse) standards, particularly for nutrient reduction;
  - ambient quality standards;
  - effluent standards;
- Introducing an efficient framework for water management;
- Establishing adequate institutional and regulatory framework;
- Introducing Phosphorus-free detergents:
  - improvement of detergent legislation/standards; besides biodegradability, the P content should be decreased and limited in accordance with the EU coming legislation;
  - P-free detergent plan implementation, starting with the technological issues (MIT);
  - marketing study;
  - it is anticipated that the cost of introducing P-free detergent could reach EUR 50 million (provision with new technology).

Explicit proposals for changes of respective legislation are:

- The effluent standards (NTPA 001) will be revised in 2001. There are not any river quality standards (immissions) at the level of the EU, including the ICPDR. In this respect, it is envisaged by order of MWFEP to promote in October 2000 "Water Quality Targets" based on the five classes agreed by the ICPDR which is (more or less) in the light of EWFD.
- EWFD is already in force; the promotion in Romania is expected in 2001 (implementation might take 30-35 years).
- Urban Waste Water Directive, Nitrates Directive and other water-related directives are in the transposition process (2000-2001).

11.5 Schedule for Approximation of National Legislation to EU Legislation

In accordance with the National Environmental Action Plan, the following schedule is designed for the approximation process:

- Short term:
  - transposition of the Urban Waste Water Directive (91/271/EEC);
  - transposition of the Nitrate Directive (91/676/EEC).
- Medium and long term:
  - Water Framework Directive (COM 97/49 – 97/614, 98/76).

Table 11.5-1: Actions for the approximation of national legislation to EU nutrient legislation

Year	EU Directive	Actions
2000	Urban Waste Water Directive 91/271/EEC	1. Identification of communities which need WWTP 2. Project for the Water Law (107/96) revision 3. Revision of the GD 730/97 concerning effluent discharging by introducing new definitions such as equivalent population 4. Water classification: (i) vulnerable, (ii) normal, (iii) less vulnerable 5. Generation of Priority Action Programme for implementation 6. Development of strategies for municipal WWTP sludge use
2000 2001	Nitrates Directive 91/675/EEC	1. Evaluation of the existing information concerning the identification of vulnerable zones 2. Identification of specific waters and notification of vulnerable zones 3. Action Programme development for the vulnerable zones
2000 2001 2002 2004 2010	Framework Directive (98/76/EEC)	1. Norms for surface and ground water classification; basic conditions for the establishment of protected zones 2. Analysis and implementation of a penalties system in accordance with WFD 3. Ecological status monitoring and chemical status monitoring surface waters and chemical monitoring for ground waters 4. Water management planning (hydrographic basins) 5. Updating of the EIA of human activities at the HB level 6. Approval of the HB Water Management Plans 7. Plans implementation, recovery of cost for urban waste water treatment.

Table 11.5-2: Schedule for Approximation of National Legislation to EU Legislation

Name of National Law, Regulations	Related EU Directive	Proposed period of adjustment	Proposed date of coming in force	Final status of compliance
1. Urban Waste GD	91/271/EEC	2000 - 2001	2001	2010
2. Nitrate GD	91/676/EEC	2000 – 2001	2001	2010
3. Water Framework GD	98/76/EEC	2000 – 2004	2005	2010
4. Fish waters standard	78/659/EEC	2000 – 2005	2006	>2010
5. Shellfish waters standard	79/923/EEC	2000 – 2005	2006	>2010
6. Bathing water standard	76/160/EEC	2000 - 2005	2006	>2010

12 MOLDOVA

12.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

The most important documents in which the policy objectives on environmental protection are formulated include:

- National Strategic Action Plan for Environmental Protection
- National Environmental Action Plan for the Environment
- The Comprehensive Long-Term Programme for Environmental Protection

The new priorities of environmental protection policy under the new economic situation are:

- The former environmental protection policy, focusing on end-of-pipe technologies for pollution abatement, is becoming unacceptable from the environmental and economic point of view;
- The new economic order calls for the development of market-oriented environmental policy and instruments that support the adoption of low-waste technologies and rational exploitation and use of natural resources.

The national objectives regarding reduction of water pollution are:

- to maintain human health and to eliminate health risk in water resources;
- to provide sources of nutrition and to maintain and restore biodiversity.

This would require the performance of the following tasks:

- Comprehensive evaluation of water resources conditions and elaboration of a concept of protection and rational use of water resources and water balanced systems based on sustainable development approach;
- Elaboration of a scheme for river basins use;
- Development of ecological criteria for assessment of permissible loads into surface waters;
- Development of integrated parameters and criteria for maintaining ecological balance in water bodies;
- Preparation of a profound basis for rehabilitation and maintenance of proper ecological conditions in water bodies for different uses.

There are currenntly no explicitly formulated policy objectives regarding nutrient emissions or loads; these issues are considered as integral parts of environmental management, waste water treatment programmes, etc.

The Foreign Policy Concept of the Republic of Moldova, approved by Parliament in February 1995, confirms the principles of international law that are of special importance both for Moldova's foreign relations and for its environmental protection.

12.2 Status of Legislation Dealing with Nutrient Control / Reduction

According to the constitution of the Republic of Moldova, the President of the Republic is responsible to the world community for the state of the environment and represents, at the international level, the interests of Moldova related to environmental protection.

Although there is a complex system of environmental legislation (with a high number of decrees, laws and regulations elaborated and amended since 1990), there remains the problem of enforcement due to the problematic economic situation and a lack of professional capability.

The existing legislation, while providing a number of starting points for the implementation of sustainability, pollution and waste reduction, and cleaner technology, is considered to be insufficient for the future.

Currently, there are no laws and regulations in force or in progress, directly dealing with nutrient control and reduction; the existing legal provisions on emission standards, effluent standards and ambient water quality are usually incorporated in overall pollution control and reduction regulations.

12.3 Main Barriers to Policy and Legal Reforms

In spite of the fact that there are clearly-determined policy objectives, legal and policy reforms are hampered due to:

- a continuous crisis of the national economy (particularly regarding industry and agricultural production);
- a lack of domestic financial resources;
- improper administrative and institutional cooperation and coordination; and
- lack of professional capability.

12.4 Envisaged Changes of Nutrient-Related Legislation

According to the provisions of the 1995 National Environmental Action Plan, changes of legislation should aim at the introduction of feasible environmental management strategies, and particularly contribute to:

- the revision of the water quality standards (within three years);
- the development and adoption of long-term environmental programme (within one year);
- the provision of a framework to restore and sustain legal reference service (within one year);
- the development of a policy toward harmonization Environmental Standards with those of the EU (within two years);
- the passage of water pollution quality law with new standards (within two years);
- the preparation of a new draft law on self-monitoring by major pollutants (within two years).

For the time being, however, these issues are not being elaborated.

There is currently no legal provision regarding control or out-phasing of P-containing detergents since this problem is not a topical issue in Moldova.

12.5 Schedule for Approximation of National Legislation to EU Legislation

In June 1998, Moldova ratified the Agreement on Partnership and Cooperation between the EU and Moldova, according to which Moldova is committed to making its legislation gradually compatible with that of the EU in a number of sectors including the environment.

The Agreement calls for a strengthening of environmental cooperation between Moldova and the EU, and states that cooperation programmes shall continue to contribute to strengthening environmental institutions and public awareness. It also states that cooperation shall aim to combat the deterioration of the environment including in particular local, regional and transboundary water pollution and water quality.

Currently, Moldovan legislation does not contain provisions equal or similar to those required by the two nutrient related EU Directives on “Urban Waste Water Treatment” and “Dangerous Substances in the Aquatic Environment”.

There is a general understanding of the necessity to approximate national pollution-related legislation (including nutrient issues) to the respective EU Directives; but at present the statements have mostly declarative character, partly due to lack of appropriate knowledge of the directives themselves and the complexity of appropriate application.

Approximation to EU-legislation would also require new conceptual approaches, which currently do not have any equivalent in the Moldovan legal framework, e.g.:

- Integrated river basin management approach;
- Combined approach for setting standards, which involves setting both discharge limits and quality standards in an integrated way;
- Licensing on the basis of:
  - best technical means available;
  - best available techniques;
  - all technical precautions.

Taking into account the current discrepancies between the national legislation and the EU-requirements and the critical economic situation in the country, it cannot be expected that the harmonization of national and EU-legislation can be achieved in the short or medium term.

13 UKRAINE

13.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

In Ukraine, policy objectives and principles for nutrient reduction are included as sub-components in the overall environmental protection strategy formulated in the Main Directions of State Policy on the Environmental Protection, Utilization of Natural Resource and Environmental Safety (1998). This document clearly defines the key priorities of Environmental Policy and Practical Actions including international obligations of Ukraine to nutrient pollution reduction as follows:

- Improvement of the environment status in the Dniper Basin and potable water quality;
- Prevention of pollution and improvement of the environmental status of Black Sea;
- Improvement of the environmental status in the Donetsko-Prydniprovsky Industrial Regions;
- Construction and reconstruction of municipal waste water systems.

These defined priorities are directly related to sustainable water management and clearly stipulate the necessity of consolidation of national (inter-sectoral) and international efforts for practical actions in pollution reduction.

The main objectives with relevance to nutrient reduction are:

- Reduction of nutrients load (N, P, BOD), oil products, pesticides, heavy metals ions, radionucleides and other harmful substances in the water bodies;
- Pollution reduction from WWTPs, including pollution from municipal waste water;
- Pollution reduction from diffuse sources, particularly from agriculture;
- Improvement of regulatory, legislative, environmental and economic bases for quality of water bodies;
- Improvement of registration, monitoring, and control systems of surface and ground water pollution; development and setting up of a system for identification and analytical control of all surface water pollution sources;
- Conservation of biological and landscape diversity; expansion of the network of national parks and reserves and restoration of wetlands.

The integration in the European Union, identified as an objective of international policy of Ukraine, implies a sustainable use of natural resources, improvement of environmental health and a restoration of the ecosystems. Heavy environmental problems inherited from the Former Soviet Union due to extensive style of resource utilization and mismanagement, are on the top of the national priority list for actions.

13.2 Status of Legislation Dealing with Nutrient Control / Reduction

The basic principles for the protection of the environment in the Ukraine are regulated by the Law on the Protection of the Environment (1996), and the Law on Sanitary and Epidemiological Security of the Population (1994). The main water related issues are regulated by The Water Code of Ukraine (1995).

In addition, there are a number of regulations, rules norms, etc., regulating particular issues in detail.

Altogether, it is recognized that an improvement of the unsatisfactory environmental situation can only be achieved by more effective control and enforcement of gradually improved environmental legislation.

Ukraine does not currently have any direct legislative norms or standards regulating the content of nutrient discharges into surface waters and related eutrophication; instead, there are norms for N and P discharges in terms of maximum permitted concentrations which can serve as an indirect tool for controlling nutrients loads.

13.3 Main Barriers to Policy and Legal Reforms

When Ukraine became an independent country in 1991, it had to revise the former Soviet environmental legislation and develop a new, market-oriented environmental legislation.

This process was and still is hampered by:

- historical issues (structures of administration and public enterprises, ownership of public infrastructure, process of privatization, social attitudes, etc);
- critical situation of the national economy (industry, agricultural production);
- critical social situation and the low living standard of a significant portion of the population;
- typical deficiencies in institutional and administrative capabilities;
- lack of modern control tools (e.g. environmental audit);
- enforcement of new economic tools to address environmental issues and prevent environmental pollution (e.g. payments for use of natural resources and release of pollutants in the environment.

13.4 Envisaged Changes of Nutrient-Related Legislation

In order to address nutrient reduction, Ukraine plans to:

- Improve regulations on the application of N and P fertilizers;
- Develop regulations for P-free detergents;
- Develop and introduce techniques for the assessment of diffuse pollution loads.

The ultimate goal is the harmonization of Ukrainian legislation on nutrients with the existing EU Directives and future Framework Water Directive.

13.5 Schedule for Approximation of National Legislation to EU Legislation

Water-related legislation in Ukraine and the EC are substantially different in their structures. Therefore, the harmonization of the Ukrainian legislation with the EU legislation is a long-term objective (for a period until 2015).

The envisaged harmonization of Ukrainian legislation with the relevant EU Directive should take into account the following sequence of priorities:

- measures with low financial requirements including amendments and additions to the acting legislation, regulations, standards, etc.
- measures with affordable financial requirements including improvement of control system, and optimization of monitoring that satisfy the information needs of environmental management; an enforcement system for improved environmental legislation for water users and polluters of water resources, etc.
- measures that will require significant financial investments (including international investments): reconstruction and improvement of the existing manufacturing and waste water treatment technologies; construction of new urban waste water treatment facilities (in compliance with the respective EU Directives), etc.

The identification of the financial needs for the harmonization of environmental legislation of Ukraine and EU Directives requires a separate study.

Unlike other Central European Countries, Ukraine’s integration into European Union is not a matter of the near future. Nevertheless, the harmonization of Ukrainian environmental legislation with the EU Directives, including the EU Water Framework Directive, is an important component for the development of the national legislation process.

STRENGTHENING THE IMPLEMENTATION OF NUTRIENT REDUCTION MEASURES AND TRANSBOUNDARY COOPERATION IN THE DANUBE RIVER BASIN

FIVE YEAR NUTRIENT REDUCTION ACTION PLAN

SUMMARY REPORT IN SUPPORT OF THE PROJECT BRIEF

AUGUST 2000

International Commission for the Protection of the Danube River

UNDP/GEF Assistance

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1 INTRODUCTION

The Summary Report is an integral component for the preparation of the GEF/UNDP funded project entitled ”Strengthening Implementation of Nutrient Reduction Measures and Transboundary Co-operation in the Danube River Basin”. The basic task of this preparatory work is to prepare a qualified material basis for the elaboration of a complete Danube Regional Project for submission to the GEF Council.

The purpose of this summary report is to provide an overview and assessment of the basic materials, data and information available for the elaboration of comprehensive “Five Years National Nutrient Reduction Action Plans” on national level for all DRB countries.

The Country Reports, based on contributions from national consultants follows the structure of the “national reports” and provides country specific data and information for each of the Danube River Basin. The “country specific information” is structured as follows:

(1) Verification of Data and Information on Nutrient Emissions / Loads

(2) Identification of Measures for Nutrient Reduction from Diffuse Sources

(3) Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

(4) Identification of Projects Ready for Implementation

(5) Assessment of the Anticipated Nutrient Reduction from Point-Sources

(6) Summary of Main Country Specific Particularities

2 SUMMARIZING CONCLUSIONS

2.1 Verification of Data and Information on Nutrient Emissions / Loads

Most of the data and information required to be reviewed and verified have been identified in official reports, updated statistical documents and previously developed projects. However, at this stage of the project development, data on nutrients loads/emissions are not yet available in some areas. The revision of data and information on nutrient emissions/ loads performed by the Danube countries has taken into consideration nutrient mass balance, with main emphasis on diffuse pollution, nutrient transport, wetlands and losses of nutrients in water systems.

Generally, the countries considered that diffuse pollution sources include direct discharges of private households (not connected to sewers), storm water overflow, direct discharge of manure, base flow (percolation of human waste, agriculture land), erosion run-off from forests, air depositions and ground water flow. However, agricultural production and livestock farming represent the main diffuse sources of pollution.

The agricultural diffuse pollution contribution is large and can be controlled best by regulatory measures. The range of measures necessary can be seen in the regulations on the "Prevention of Pollution from Agriculture adopted by Helsinki Commission" (1998).

The present farming system, known as "conventional farming", has produced progressively negative social and economic results and serious environmental damages upon its vital resources, i.e. water and soil, and, consequently, upon bio-diversity as a genetic basis as well as on human health.

Moreover, if we consider the potential synergetic effects, about which little is known at this point (we must note also the fact that in several sectors, agriculture is both polluted and polluting), we shall begin to understand the severity of the situation.

The negative effects of fertilization are a long term problem. Danube countries cannot afford to delay implementation of nutrient reduction measures.

The first conclusion is that there have been no significant changes in the diffuse pollution loads on the territory of the Danube River Basin since 1998. In many parts of the region, industry and agriculture are still in recession while the first signs of improvement have became visible only since 1999.

Second, the data show that fertilizers were used on a small scale. The unbalanced fertilization and the deficit in the main nutrients have been detrimental to both crop production and soil fertility, which adversely influenced the basin's environmental situation.

2.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

The urgent measures proposed by the countries of the Danube River Basin to be implemented with a view to nutrient reduction refer to the improvement of both legal and institutional framework.

Moreover, public awareness raising and strengthening public participation in nutrient reduction initiatives are both seen as priorities.

In order to achieve maximum nutrient load reduction within their share of the Danube River Basin, the countries have identified measures for nutrient control and reduction from diffuse sources that mainly address policy and legislation-related actions, institutional strengthening and capacity building.

Proposed Measures for Nutrient Reduction from Diffuse Sources

	D	A	CZ	SK	H	SLO	HR	BiH	YU	BG	RO	MD	UA
creation / harmonization of legislation	x	x		x	x		x	x			x		
delimitation of "sensitive water areas"	x		x	x	x		x						x
watershed management	x									x	x		
P-free detergents			x		x	x	x	x		x			
soil conservation	x		x	x		x			x	x		x	
good agricultural practice		x		x				x	x	x	x		
wetland restoration		x	x							x	x	x	x

Animal production and manure application to fields are important for the economies of many Danube countries, but they are also the biggest contributors to diffuse sources of water pollution.

There is a growing consensus among policy makers of the Danube countries that command and control environmental regulations stifle the efficiency and innovation by heterogeneous plants to adopt a uniform abatement strategy. Plants are allowed to develop pollution control strategies that replace or modify specific regulatory requirements on the condition that these strategies improve their environmental performance. Germany is an example of a Danube country where voluntary, site-specific performance standards exist which can give the plants regulatory flexibility to meet the standards in unconventional ways.

Further, it appears that watershed management is an attractive concept for Danube countries with economies in transition. For some countries, such as Romania and Bulgaria, the implemented watershed approach, which basically relies on stakeholder involvement, could in principle improve coordination between agencies and jurisdictions with water quality responsibilities, help set priorities for action on a systematic basis, promote cost-effective control policies and targeting of funds, further public participation and public-private partnerships. The latter may be particularly important in the Danube transition economies, where funds for environmental programs are severely limited and the involvement of affected stakeholders essential for identifying critical problems and building support for program activities.

Developing a culture of enforcement, compliance, and cooperation that supports implementation is considered by the Danube transition countries likely to be critical when pollution control is involved.

Some Danube countries (Germany, the Czech Republic, Slovakia, Slovenia, Yugoslavia, Bulgaria and Moldova) have already initiated actions leading to nutrient reduction that are based on the need to implement soil conservation measures.

Protecting the environment, safeguarding human health and promoting effective agricultural practices go hand-in-hand.

The introduction of P-free detergents has been already taken into consideration by most of the countries. In addition, the need to develop a code of good practice, covering matters such as periods when land

application of fertilizers is inappropriate and the conditions for land application of fertilizers near watercourses have been taken into consideration by the policy makers of the whole basin. Examples of such countries include: Austria, Slovakia, Bosnia-Herzegovina, Yugoslavia, Bulgaria and Romania.

Finally, the identification of vulnerable areas regarding the Nitrates Directive and the new proposal on the methods of control of biological degradability of active substance detergents will soon bring the countries of Danube River Basin in line with EU standards.

2.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

Most countries have found it difficult to make estimates, but it is assumed that noticeable nutrient reduction from diffuse sources might be recorded once the required measures and actions have been implemented. As a consequence of the recent economic development of the countries in the region, mainly through the extension of cultivated agricultural areas and the intensification of farming, a future increase in nutrient emission can be expected.

However, if the proposed urgent measures are introduced during the year 2001, visible effects in terms of nutrient content reduction can be expected in the year 2005.

The anticipated nutrient reduction from diffuse sources is estimated to reach high values in countries such as Yugoslavia (25% for N and P) or average values as 10% of N for countries such as the Czech Republic, Slovakia, Romania and Ukraine.

A designation of vulnerable areas and the implementation of the required forms of farming in these areas will bring the countries of the basin in line with EU requirements. The nutrient pollution reduction in waters will mostly be of local character. Programs aimed at revitalizing landscape, streams, small wetlands constructing etc. will also contribute to improving the environmental situation in the Danube River Basin.

Anticipated Nutrient Reduction from Diffuse Sources

	N reduction		P reduction	
	(%)	[kt N]	(%)	[kt P]
D	n.a.	n.a.	n.a.	n.a.
A	n.a.	n.a.	n.a.	n.a.
CZ	10	n.a.	3	n.a.
SK	10	n.a.	10	n.a.
H	20	n.a.	20	n.a.
SLO	n.a.	n.a.	n.a.	n.a.
HR	n.a.	n.a.	n.a.	0,239
BiH	n.a.	n.a.	n.a.	n.a.
YU	25	n.a.	25	n.a.
BG	n.a.	n.a.	n.a.	n.a.
RO	13,3	13,4	15,5	1,7
MD	n.a.	50	n.a.	5
UA	10	n.a.	10	n.a.

n.a. - not available

2.4 Identification and Assessment of Proposed Priority Projects

(1) Quality of provided data

At this stage, all the thirteen DRB countries have provided “draft national lists of priority projects” which are supposed to be ready for implementation in the coming 5-year period and can be considered as a reasonable basis for the elaboration of comprehensive “Five Year National Nutrient Reduction Action Plans”.

The ”draft lists of priority projects” have been prepared by the national consultants usually in close co-ordination and co-operation with the concerned national ministries and authorities.

The ”lists of priority projects” are mainly based on and derived from the list of projects compiled in the “Danube Action Pollution Reduction Programme”, developed within the framework of the DRPRP in June 1999 and updated within the framework of this project.

According to the requirements of the TOR, the national consultants had explicitly to take into account the projects included in the EMIS/EG - Joint Action Programme, which is currently under preparation.

As a first conclusion it can be stated that both (i) the structure and completeness of the "lists of priority projects", and (ii) the quality, completeness, accuracy and reliability of the particular project data are significantly different from country to country.

Countries that provided relatively complete project lists, respectively relatively complete project data for the identified priority projects include Austria, the Czech Republic; Hungary; Germany, Moldova; Romania; Slovenia and Yugoslavia.

The "national lists of priority projects" of these countries can be considered as a profound basis for further elaboration of comprehensive "Five Year National Nutrient Reduction Action Plans".

The "project lists" provided by the other countries show significant gaps which can be summarized as follows:

- ⇒ Incomplete data on expected nutrient reduction - particularly Bosnia-Herzegovina, Croatia, Ukraine, (partly Hungary regarding BOD and COD);
- ⇒ Inadequate data on project specific investment requirements - all DRB countries have eventually provided investment cost figures for more or less all proposed priority projects; in the majority of the counties it is obvious that the cost estimates need partial, respectively substantial up-date;
- ⇒ Incomplete data regarding differentiation by baseline and incremental cost (as required for GEF co-financing) - particularly Bulgaria, Slovakia, Slovenia, Yugoslavia;
- ⇒ Incomplete data regarding adequate project funding schemes - particularly Bosnia- Herzegovina, Bulgaria, Croatia, Slovakia, Ukraine.

For these countries, the list of identified projects itself or the particular project data need partially substantial improvement. Especially as long as a clearly defined project sponsor and an appropriate funding scheme is not available, a project cannot really be considered in the short-term as a candidate project for a "National Nutrient Reduction Action Plan".

(2) Summarized Results

The composition of the "national project lists" and the details of the identified priority projects can be seen from the annexed county tables (Annex II).

An overall summary with full information on the priority projects, as identified by the national consultants in the framework of this study, is compiled in Table 2.4-1.

A summary of the structure of the priority projects by country is compiled in Table 2.4-2.

A summary of the structure of the priority projects by sector is compiled in Table 2.4-3

(a) Investment Requirements

According to the available data provided by the national reports, the total investment requirements for the 13 DRB countries amount to about EUR 4100 million.

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

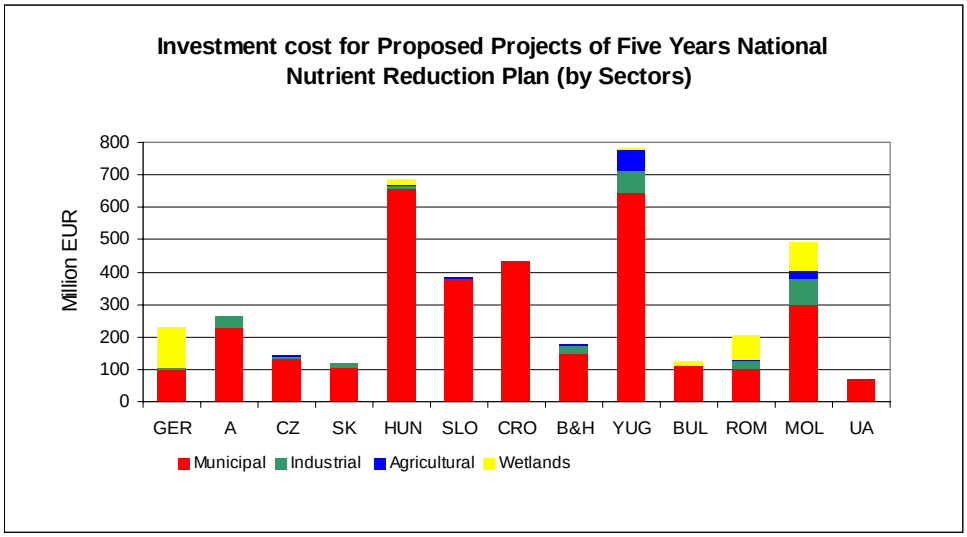
	Municipal Sector	Industrial Sector	Agricultural Sector	Wetlands	Total
No of Projects	156	44	21	22	243
Million EUR	3416	267	113	318	4113
(%)-Structure	83%	6%	3%	8%	100

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

	GER	A	CZ	SK	HU	SLO	CRO	B&H	YUG	BUL	RO	MOL	UA	TOT
No of Proj.	11	4	11	20	24	24	11	12	40	21	24	31	10	243
Mill. EUR	231	264	144	118	687	384	433	176	783	125	204	493	67	4111
(%)	6	6	4	3	17	9	10	4	19	3	5	12	2	100

Countries with the highest identified investment requirements of more than EUR 500 million include Yugoslavia and Hungary.

Countries with the lowest identified investment requirements of less than EUR 200 million include Ukraine, Slovakia, the Czech Republic (small DRB area), Bulgaria and B&H.



The most of the countries have basically derived their "national project list" from the list of projects already identified in the "Action Pollution Reduction Programme" (elaborated within the framework of the DRPRP, 1999).

Taking into account the reduced number of projects compiled in the "draft national project lists" the identified investment requirements of about EUR 4.1 billion seem rather reasonable in comparison to the investment requirements of about EUR 5.6 billion as identified in the framework of the "Danube Action Pollution Reduction Programme" in 1999.

(b) Project Funding

According to the data provided by the national reports, the anticipated composition of project funding for all DRB countries is as follows:

Funding component:	Million EUR	(%) – Structure
National funding contribution	1659	40
International loans:	1016	25
International grants:	575	14
Not secured funding components:	861	21
Total	4111	100

The country-specific composition of project funding can be seen from Table 2.4-2.

- The following seven countries could provide a more or less complete funding scheme for the proposed priority projects to be completed within the coming 5-year period: Austria, Germany, Hungary, Moldova, Romania, Slovenia and Yugoslavia.
- Countries in which funding is not secured for the majority of the proposed priority projects include B-H, Croatia, Ukraine.
- In the other countries (Bulgaria, the Czech Republic, Slovakia) portions between 30% and 70% of the identified investment requirements are at the present stage of knowledge supposed to be secured; the rest remains to be raised.

(c) Assessment of the Anticipated Nutrient Reduction from Point Sources

According to the available data provided by the national reports, the total nutrient reduction anticipated with the implementation of the proposed priority point source projects should be in the range of:

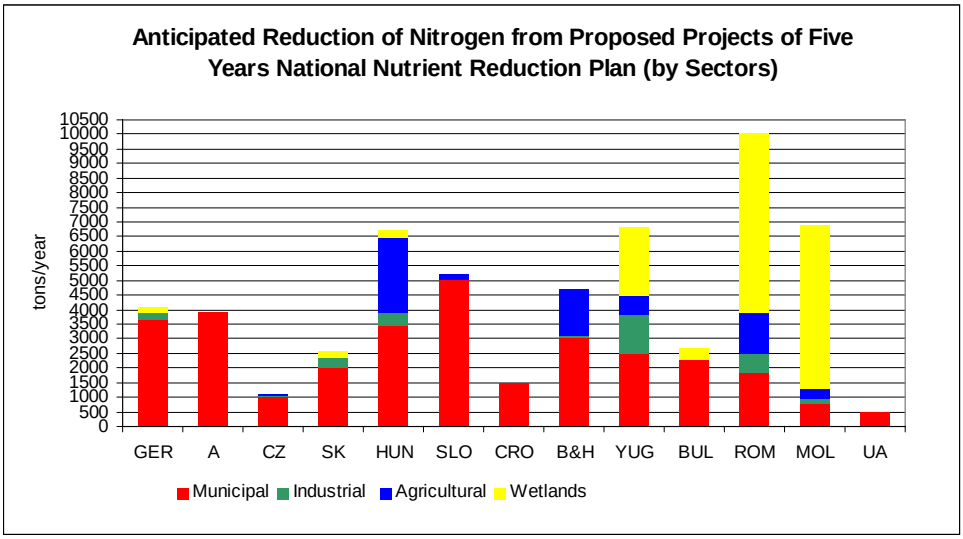
- N: 57 000 tons/year;
- P: 12 000 tons/year;
- BOD: 236 000 tons/year;
- COD: 477 000 tons/ year

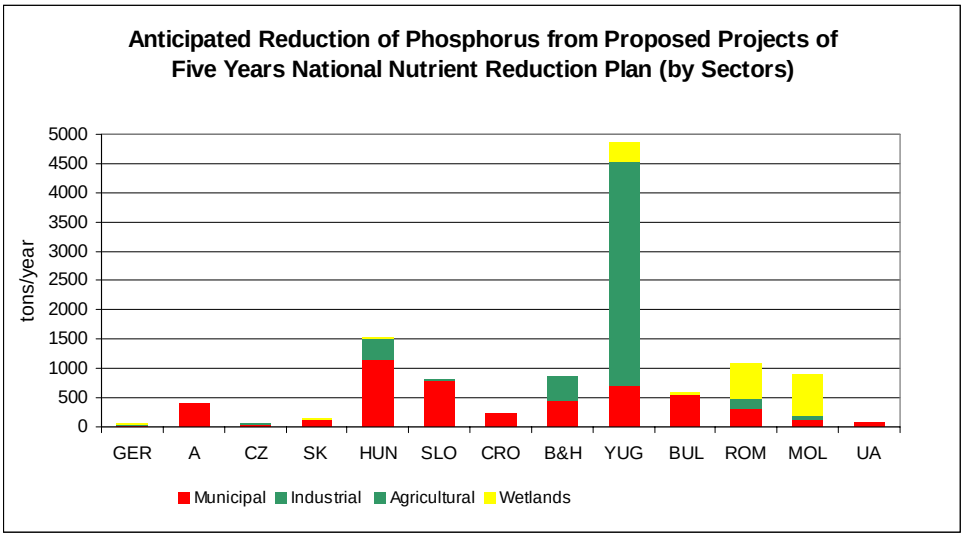
The composition of the anticipated nutrient reduction by sector is approximately as follows:

Nutrient Reduction	Municipal Sector	Industrial Sector	Agricultural Sector	Wetlands	Total
No of Projects	156	44	21	22	243
N (t/y)	31 500	3 400	6 700	16 600	57 200
P (t/y)	5 000	3 700	1 100	1 800	11 600
BOD (t/y)	181 000	39 700	9 500	5 900	236 000
COD (t/y)	351 000	78 700	15 000	32 400	477 000

The composition of the anticipated nutrient reduction by countries is compiled in Table 2.4-2.

It has to be mentioned at this point that the BOD and COD data in particular are still preliminary, because in some countries they have not yet been determined completely or correctly for some or even the majority of the identified projects.





Tab 2.-14

fig 2.4-2/3

ANNEX I COUNTRY REPORTS

1. **GERMANY**
2. **AUSTRIA**
3. **CZECH REPUBLIC**
4. **SLOVAKIA**
5. **HUNGARY**
6. **SLOVENIA**
7. **CROATIA**
8. **BOSNIA-HERZEGOVINA**
9. **YUGOSLAVIA**
10. **BULGARIA**
11. **ROMANIA**
12. **MOLDOVA**
13. **UKRAINE**

1 GERMANY

1.1 Verification of Data and Information on Nutrient Emissions / Loads

The analysis of the existing data shows that immission loads for nutrients in the German part of the river Danube, calculated from regularly monitored water quality data, reach a level of around 85 000 t N and 4000-6000 t P per year. Especially phosphorus loads have been decreased very dramatically for the last twenty years but also nitrogen loads show a decreasing trend for the last years. Emission values vary according to the method applied for their evaluation. An investigation of Behrendt (1999) mention about 130 000 t N and 5300 t P for the years 1993 to 1997. The major part of the nutrient input derives from diffuse sources. For nitrogen, the diffuse input reaches 80 % with 60 % stemming from groundwater and around 10 % from drainage. For phosphorus, 70% of the input is provided by diffuse sources with 35% stemming from erosion, 15% from surface flow and 10 % from groundwater. Concerning point sources, the major part origins from municipal wastewater, industrial input can be neglected.

For the year 1996, the use of mineral fertilizers amounts about 220 000 tN/a and 70 000 tP/a. Generally, the application of mineral fertilizers decreased, for the Bavarian part of the Danube River Basin while the use of nitrogen dropped since 1989 from 119 kg/ha to 80 kg/ha (1997). The organic fertilizer application declined for the last 5 years, too.

Most of the 9 135 000 inhabitants are connected to sewage system (Bavaria part: 91%, 1998). The wastewater treatment plants show a high degree of elimination for nutrients (Bavarian part: 75% for P and 45% for N (1998)).

1.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

Measures for nutrient reduction are based on legislation given by EU-guidelines and water acts of the German Republic (framework conditions) and the German Federal States.

In order to reduce nutrient input to the Danube basin, a number of measures have been already taken and some important targets have been achieved. The input of nutrients has been decreased e.g. by elimination of these substances on wastewater treatment plants and by imposing legal restrictions for phosphates in detergents.

Further targets are (i) the consequent applying of legal instruments for nutrient input reduction, (ii) the maintenance and upgrading of wastewater sewage systems to reduce nutrients from point sources and, (iii) the stimulation of new approaches for reducing nutrients from diffuse sources.

Some approaches concerning diffuse sources are to reduce nutrient input by (1) applying extensive and ecological farming, (2) using modern technologies to determine fertilizers needed and to minimize the losses by fertilizing, (3) identifying and defining protection areas e.g. river banks, sensible regions where restrictions for agricultural activities have to be required, and (4) protecting landscape from erosion. In addition, the capability of ecosystems to keep and transform nutrients can be strengthened by river and wetland renaturation.

Germany is introducing flexibility in implementation of these measures, within the frame of a close cooperation between water managers, farmers and researches. First, a common consensus on the importance of nutrient reduction must be funded. Methods have to be developed on how to reduce nutrients in a efficient and cost-effective way e.g. by pilot studies and through permanent training and consulting on the state of art.

Instruments to initiate and continue this process include the (1) promotion of methods for nutrient reduction, and (2) financial support for farmers and for research, education and consulting. In the German part of the Danube River Basin, different action programs make use of these instruments e.g. the "Bayerische Kulturlandschaftsprogramm".

Besides these programs aiming mostly at agricultural methods, measures that are oriented at rivers and wetlands are also undertaken. River management plans lead to a development in a sustainable way e.g. by

river renaturation or riverbank protection. These measures have also to be applied in a cooperative way and to be agreed by all groups of interest.

In general, measures for nutrient reduction of diffuse sources have to be an integrated part of the overall plans for land use and development.

1.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

The measures just undertaken and planned in the future for nutrient reduction of diffuse source will lead to a decrease of nutrient input. However, the complex nature of processes makes difficult to quantify this nutrient reduction. It is anticipated that the whole process will last over 10 to 20 years and only long-term changes are to be expected.

1.4 Identification of Projects Ready for Implementation

The identified projects which are currently under implementation or supposed to be ready for implementation in the coming 3 years are compiled and characterized in Annex 6.4.

The total investment requirements of the 11 identified priority projects is EUR 231 million; their composition by sectors is as follows:

- 8 municipal projects with investment requirements of EUR 98.3 million,
- 2 industrial projects with investment requirements of EUR 6.3 million;
- no agricultural point-source project;
- 2 wetland projects with investment requirements of EUR 126.7 million;

In addition to these 11 point-source projects Germany is going to spent about EUR 1.0 million per year in the DRB area of Germany for measures related to reduction of nutrient emissions in the agricultural / land use sector (buffer zone program, etc).

Regarding project funding it is assumed that the required funds will fully be covered by national sources.

1.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

For the 12 identified projects the anticipated nutrient reduction is stated in detail in Annex II-1 and can be summarized as follows:

- N: 4091 tons/year;
- P: 74 tons/year;
- BOD: 75 tons/year;
- COD: 1291 tons/year;

The composition of the anticipated nutrient reduction by sectors is compiled in Section 1.6(2).

1.6 Summary of Main Country Specific Particularities and Conclusions

(1) Main particularities regarding “non point source” issues

The verification of data shows that especially phosphorus loads have been decreased very dramatically for the last twenty years but also nitrogen loads show a decreasing trend for the last years.

Generally, the application of mineral fertilizers decreased, for the Bavarian part of the Danube River Basin while the use of nitrogen dropped since 1989 from 119 kg/ha to 80 kg/ha (1997). The organic fertilizer application declined for the last 5 years, too.

It is obvious that the efforts undertaken by Germany in reducing nutrient emissions from diffuse sources of pollution are mainly based on a flexible approach which allow the polluters to voluntarily agree with the suggested measures. It is considered that the major part of the nutrient input derives from diffuse sources.

Germany suggests measures to reduce nutrient input from diffuse sources which include the use of (1) extensive and ecological farming, (2) modern technologies to determine fertilizers amounts, (3) protection areas e.g. river banks, sensible regions where restrictions for agricultural activities have to be required, and (4) protecting measures against soil erosion.

(2) Main particularities regarding "point source" projects

Germany is one of the countries which provided a complete project list and a complete set of project data regarding investment requirements and funding schemes for the priority projects to be implemented in the coming five year period.

The primary characteristics of the identified priority projects can be summarized as follows:

Table 1.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	7	3620	13	75	511	98.3
Industrial point sources	2	635	40	0	780	6.3
Agricultural point sources	0	0	0	0	0	0
Wetlands	2	211	21	0	0	126.7
Total	12	4091	74	75	1291	231.3

It is assumed that the required funds of about EUR 231 million will fully be covered by national sources.

In addition to the 11 point-source projects Germany is going to spent about EUR 1.0 million per year in the DRB area of Germany for measures related to reduction of nutrient emissions in the agricultural / land use sector (buffer zone program, etc).

2 AUSTRIA

2.1 Verification of Data and Information on Nutrient Emissions / Loads

In Austria requirements for urban wastewater treatment (i.e. all plants > 50 p.e.) are fixed in the First Emission Ordinance BGBl. In this ordinance quality standards for wastewater treatment plants for e.g. phosphorous or nitrogen are fixed. The treatment of industrial wastewater is performed by internal industrial wastewater treatment plants or together with urban wastewater in urban wastewater treatment plants. The requirements for the indirect discharge are as well laid down in the sector specific emission ordinances and in the Ordinance for Indirect industrial WasteWater Emissions BGBl.

The following tables provide relevant statistical figures on wastewater treatment in Austria.

Table 2. 1-1: Population

Country total popul.	Emission coefficient		Population not connected to sewerage (1)	Population connected to sewerage*			
	kg N/ inh/y (2)	kg P/ inh/y (2)		Without treatment	Mech. Step	Biolog. Step*	Tertiary step
8,038,200	**3.4**	**0.37**	**1,486,059 (1)**	**11,500**	**41,500**	**6,499,141**	**n.a.**

***Source: Federal Ministry of Agriculture Forestry Environment and Water management: BMLFUW:* „Gewässerschutzbericht 1999“, Table 4.8, p.92**

Note: (1) This figure means not connected to public sewers, these inhabitants are connected to smaller waste water treatment plants, cess pools or other facilities.

(2) values also include N and P discharges of small and medium served enterprises, served by urban waste water treatment plants, as emission coefficient has been calculated by dividing loads from the waste water treatment plants through number of inhabitants served by those facilities.

The following table presents the loads (t/a) of urban wastewater treatment plants into receiving waters in Austria 1998.

Austria 1998	**BOD_5-Load**	**COD-Load**	**N-Load**	**P-Load**
Urban waste water treatment plants	t/a	t/a	t/a	t/a
Plants with biological treatment	17,206	62,848	21,804	2,412
Plants with mechanical treatment	919	1,944	242	43
Total	**18,125**	**64,792**	**22,046**	**2,455**

***Source: Federal Ministry of Agriculture Forestry Environment and Water management: BMLFUW:* „Gewässerschutzbericht 1999“**

Finally, the next table presents the comparison for the years 1981, 1991, 1995, 1998 in terms of wastewater treatment plants in Austria.

Austria	**1981**		**1991**		**1995**		**1998**	
Urban waste water	**Pers.**	**%**	**Pers.**	**%**	**Pers.**	**%**	**Pers.**	**%**
Connected to sewer system	4,374,547	57.9	5,544,833	71.0	5,987,105	75.7	6,552,141	81.5
Small sewer systems	*1,219,321*	*16.1*	*762,732*	*9.8*	*659,768*	*8.3*	*519,961*	*6.5*
Cess pools	*1,530,610*	*20.3*	*1,386,894*	*17.8*	*1,192,459*	*15.1*	*917,730*	*11.4*
Others	*428,567*	*5.7*	*113,638*	*1.5*	*68,564*	*0.9*	*48,368*	*0.6*
Without sewer system, sum	3,178,498	42.1	2,263,264	29.0	1,920,791	24.3	1,486,059	18.5
Total	**7,533,045**	**100**	**7,808,097**	**100**	**7,907,896**	**100**	**8,038,200**	**100**

***Source: Federal Ministry of Agriculture Forestry Environment and Water management: BMLFUW:* „Gewässerschutzbericht 1999“**

In 1998 in Austria 6,552,141 inhabitants were connected to sewers. Among them 6,540,641 were connected to a wastewater treatment plant (WWTP), 11,500 were connected to the sewerage system but without WWTP. The total population in Austria is 8,038,200 from them 1,486,059 Austrian inhabitants were not connected to a public sewer system which equals to a percentage of 18.5 %. This percentage of 18.5% comprises 6.5% who are connected to a small waste water treatment plants, 11.4 % to cess pools and 0.6 % to other facilities.

The following table shows the agricultural area in Austria and types of crops, (chemical fertilisers in kg N or P/ha/year).

Table 2.1-2: Agricultural land

Surface ha 1997	***Culture***	**Culture**	**Culture**	**Runoff coefficient**
ha	**Type of crop**	**Kg N/y**	**Kg P /ha/y**	
259,800	Wheat	*	++	
57,800	Rye	*	++	
260,600	Barley	*	++	
40,100	Oats	*	++	
188,300	Maize	*	++	
23,500	Potatoes	*	++	
51,600	Sugar beet	*	++	
3,422,449	Sum of agricultural land	42	7.3	

Total of agricultural land (including grassland): 3,422,449 mio. ha (1997)

Without extensive grassland (e.g. alpine meadows): 2,417,324 mio. ha (1997**)**

(Source: Federal Ministry of Agriculture, Forestry, Environment and Water Management, Report „Austria's Agriculture, Forestry and Water Management 1998")

Note: * N-chemical fertiliser: 143,818 tons (1997)

++ P –chemical fertiliser: 24,942 tons (1997)

(Source: Federal Ministry of Agriculture, Forestry, Environment and Water Management, Report „Grüner Bericht", Table 4.9, 1998")

Recommendations for fertilising of crops exist, statistical figures on actual fertilisation per crop are not available. The average application of chemical fertiliser per ha of agricultural land in 1997 was in terms of N 42 kg/ha and in terms of P 7.3 kg/ha of the total agricultural land.

Finally, the emission coefficients and the number of animals in Austria are presented in the next table.

Table 2. 1-3: Livestock units

Inventory of animals 1997	***Number (1998)***	**Number of animal in GVE (1 GVE = livestock unit with 500 kg alive**	**Emission coefficient**	**Emission coefficient**
			Kg N/head/y	Kg P/head/y
1. pigs	3,810,310			
2. cows	882,994			
3.cattle total	2,171,681			
4.horses	75,347			
5.sheep	360,812			
6.poultry*	13,539,693			
7. others				

Source: Federal Ministry of Agriculture, Forestry, Environment and Water Mangement, Report „Güner Bericht 1998", Tables 3.15

**** Number of chicken***

Sum of manure N of all livestock: 169,750,000 kg (1995)

Sum of manure P: 37,755,000 kg (1995)

Sum of agricultural land (1995): 3,470,570 ha

Manure N/year and ha: 48.9 kg/y/ha (1995)

Manure P/year and ha: 10.9 kg/y/ha (1995)

Source: "Bodenschutz in Österreich, Edit: A. Köchl, Federal Ministry of Agriculture and Forestry 1997, p. 189 and the Report Grüner Bericht 1998.

The manure application is comparatively low in Austria with other EU countries.

2.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

Austria is very actively involved in restoring wetland and floodplain areas where feasible and possible.

The (1995) "Austrian Programme for the promotion of a sound environmental friendly and extensive natural resources protecting agriculture" (ÖPUL) shall be substituted by the further advanced programme "ÖPUL 2000".

2.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

Due to the measures already imposed in wastewater purification and by encouraging environmentally friendly agriculture and due to the comparatively very low figures in nutrient application and livestock density, in Austria, no really considerable further reductions of nutrient input in Austrian waters will be achievable.

Significant efforts to quantify the effects of the measures introduced in agriculture and also, most important, of the natural and non-avoidable existing background-loads shall be undertaken in the near future.

2.4 Identification of Projects Ready for Implementation

The identified point-source projects that are supposed to be ready for implementation in the coming 5 years are compiled and characterized in Annex 2.4.

The total investment requirements of the 4 identified projects are EUR 264 million; the composition by sectors is as follows:

- 3 municipal projects with investment requirements of EUR 231 million;
  - WWTP Vienna (extension and upgrade of N / P removal);
  - WWTP Linz-Asten (extension and upgrade of N / P removal);
  - WWTP Graz (extension and upgrade of N / P removal);
- 1 industrial project with investment requirements of EUR 33 million;
- no agricultural point-source projects;
- no wetland point-source projects.

Regarding project funding it is assumed that the required funds will fully be covered by national sources.

2.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

For the four identified point-source projects in the municipal and industrial sectors the anticipated annual nutrient reduction is stated in detail in Annex II-2 and can be summarized as follows:

- N: 3950 tons/year;
- P: 404 tons/year;
- BOD: 11240 tons/year;
- COD: 16528 tons/ year;

The composition of the anticipated nutrient reduction by sectors is compiled in Section 2.6(2).

2.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding “diffuse” projects

Austria is one of the few Danube countries, which is already taken measures leading to nutrient reduction and control through various programs on promotion of a sound environmental friendly and extensive natural resources protecting agriculture". In addition, Austria is very active in restoring and conserving wetlands and vulnerable areas.

(2) Main particularities regarding “point source” projects

Austria is one of the countries which provided a complete project list and a complete set of project data regarding investment requirements and funding schemes for the priority projects to be implemented in the coming five year period.

The primary characteristics of the identified priority projects can be summarized as follows:

Table 2.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	3	3950	404	5740	12028	231.0
Industrial point sources	1	0	0	5500	4500	33.0
Agricultural point sources	0	0	0	0	0	0
Wetlands	0	0	0	0	0	0
Total	4	3950	404	11240	16528	264.0

It is assumed that the required funds of about EUR 264 million will fully be covered by national sources.

3 CZECH REPUBLIC

3.1 Verification of Data and Information on Nutrient Emissions / Loads

Analysis of data information on nutrient loads is based on available data in 1999, from official sources of information as the Statistical yearbooks, WRI databases prepared in National water protection project and other sources used by WRI.

The data presented in the tables 1-3 are based on estimation of the real nutrient run-off into surface and ground waters. Total N and P production calculated from specific production and number of inhabitants has a decreasing tendency, in accordance with the assumed wastewater treatment plants efficiency.

The expected nutrient discharge from both large municipal point sources and small diffuse municipal sources is 13,735 t/y of N and 1,587 t/y of P.

Czech Republic considers that farmland nutrient balances are influenced by many factors apart of the basic inputs and outputs, which can include hydrology, climate and geographic conditions, as well as weather in particular years.

Within the Morava River basin it is assumed that about 30-50 % of N and 2-5 % P balance surplus, calculated for the representative year 1996, will represent run-offs into waters.

Table 3.1-1: Population

Total population of Morava river basin in CZ	Emissions Coefficients		Population not connected to sewerage	Population connected to sewerage			
	Kg N/inh/y	Kg P/inh/y	Inh.	mechanical step	biological step	tertiary step	
						N	P
2 700 000	6,2	0,73	710 000	1 990 000	1850 000	300 000	50 000

Table 3.1-2: Loads-Agricultural Land

Surface ha	Culture	Consumption of fertilisers		Runoff coefficient
	Type of crop	kg N/ha/y	kg P/ha/y	
909500	Arable land	64,5	14,6	
15000	Vineyards			
110000	Meadows			
78000	Pasture land			

Table 3.1-3: Number of Livestock

Inventory of animals	Number	Specific Emission	
		kg N/head/y	kg P/head/y
1. pigs	1382500	9,4	2,2
2. cows	165000	41,5	1,1
3. cattle	273000	41,5	1,1
4. horses	6000	48	1,3
5. sheep	19500	8,9	1,8
6. poultry	8627500	0,9	0,3

3.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

According to the Statistical Yearbook, application of industrial fertilizers is decreased from 98,8 kg N/ha/y (1988) to 64,5 kg N/ha/y (1998), and from 68,4 kg P/ha/y (1988) to 14,4 kg P/ha/y (1998). In the same period, the number of breeding farm animals has been significantly reduced and the quantity of applied farmyard manure diminished as well. An additional decrease of these inputs is not expected. On contrary, favorable economic situation could have been resulting in a slight increase of applied fertilizers. It is obvious that the response of fertilization decrease is a long-term process that may have been outlasting for a few tens of years.

A favorable impact on the nutrient run-off reduction is expected after the designation of vulnerable areas and implementation of the required forms of farming in these areas. The nutrient pollution reduction in waters will mostly be of local character. The revitalization programs of landscape, streams, small wetlands constructing etc. will help to improve mainly the ecological situation in their neighborhood.

One of the problems still pertaining in some areas is water erosion, transporting into streams, together with soils, high concentrations of nitrates and partly of phosphorus as well.

A schedule of the intended extent of anti-erosion measures for the following 5 years as well as calculation of nutrient reduction due to these measures is difficult to elaborate, without detailed research and investigation.

Presently, the amount of P in detergents is regulated by the "Voluntary agreement on gradual decrease of impact of detergents on the environment" (1995) which has been concluded between the Ministry of the Environment of the Czech Republic and the Czech corporation of producers of soaps, detergents and cleaning agents. Further decrease of P emissions from detergents depends on negotiations between the involved partners.

3.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

The total reduction of nutrient out flow from agricultural land is assumed as 10% of N and 3% of P. As the main focus of both Czech State Environmental Policy and the EU directives are on large localities, for the next five years period, from the category of diffuse sources of pollution from small municipalities and scattered farms it cannot be expected any nutrient reduction.

3.4 Identification of Projects Ready for Implementation

The identified priority projects that are supposed to be ready for implementation in the coming 5 years are compiled and characterized in Annex 3.4.

The total investment requirements of the 11 identified projects (including not further specified "small scale municipal projects") are EUR 144 million; their composition by sectors is as follows:

- 6 municipal projects with investment requirements of EUR 92 million,
  (other "small scale municipal projects with investment requirements of EUR 42 million);
- 4 industrial projects with investment requirements of EUR 5,1 million,
- 1 agricultural project with investment requirements of EUR 5,3 million,
- no wetland projects.

Wetland projects are not included because there are no wetlands of point source type in the Morava River basin. Czech Republic has identified a number of 24 actions concerning wetland restoration or similar activities together for about EUR 3.4 million as an integral part of the five year Joint Action Programme. Details on nutrient reduction effects after the implementation of these projects are subject of further studies.

Regarding project funding it is expected that national funds, 16% by international loans and about 11% by international grants will cover about 44%; the funding of the residual 30% is not yet secured.

3.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

For the identified priority projects the anticipated nutrient reduction is stated in detail in Annex II-3 and can be summarized as follows:

- N: 1091 tons/year;
- P: 62 tons/year;
- BOD: 1246 tons/year;
- COD: 120 tons/year;

The composition of the anticipated nutrient reduction by sectors is compiled in Section 3.6(2).

In addition, significant nutrient reduction is expected in the future from the application of the EU Directive standards, which require wastewater treatment for all municipalities with more than 2000 PE.

Further nutrient reduction is expected from the requirements of the UWWD Directive 91/271/EEC regarding increased treatment efficiencies for emission sources in “designated sensitive areas”. As the designation of sensitive areas is only in the stage of preparation, the expected effects will probably not become evident before 2005.

3.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding “non-point source” issues

Analysis of data information on nutrient loads has been performed based on available data in 1999, using official sources of information and documents. As other Danube countries, total N and P production calculated from specific production and number of inhabitants has also recorded a decreasing tendency during last years.

Czech Republic considers that farmland nutrient balances are influenced by many factors, which can include hydrology, climate and geographic conditions, as well as weather in particular years.

A specific characteristic of this country is related to the effect of the possible favorable economic situation, which can be resulting in a slight increase of applied fertilizers. Therefore, the response of fertilization decrease is a long-term process that may have been outlasting for a few tens of years.

Czech Republic proposes various methods aiming to nutrient reduction. Designation of vulnerable areas and implementation of the required forms of farming in these areas will bring the country in line with EU requirements. The nutrient pollution reduction in waters will mostly be of local character. The revitalization programs of landscape, streams, small wetlands constructing etc. will help to improve mainly the ecological situation in their neighborhood.

Other particularities is given by the effects of water erosion, transporting into streams, together with soils, high concentrations of nitrates and partly of phosphorus as well.

A schedule of the intended extent of anti-erosion measures for the following 5 years as well as calculation of nutrient reduction due to these measures is difficult to elaborate without detailed research and investigation.

(2) Main particularities regarding “point source” projects

Czech Republic is one of the countries which provided a more or less complete project list and set of project data regarding investment requirements, implementation schedule and funding scheme for the priority projects to be implemented in the coming five year period.

The primary characteristics of the 11 identified priority projects can be summarized as follows:

Table 3.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	6	1010	58	1228	93	133,7
Industrial point sources	4	61	1	18	26	5,1
Agricultural point sources	1	20	3	0	0	5,3
Wetlands	0	0	0	0	0	0,0
Total	11	1091	62	1246	120	144,1

The development of the anticipated nutrient reduction can be summarised as follows:

Table 3.6-2: Development of anticipated Nutrient Reduction

Sector	Nutrient load 1998		Nutrient load 2005		Reduction 1998-2005	
	N (t/y)	P(t/y)	N (t/y)	P(t/y)	N (%)	P(%)
Municipal point sources	13735	1587	12725	1530	8	4
Industrial point sources	215	35	154	34	28	3
Agricultural point sources	159	16	139	13	14	3
Sub-total	14109	1638	13018	1577	8	4
Agricultural non-point sources	22900	150	20600	145	10	3
Total	37009	1788	33618	1722	10	4

4 SLOVAKIA

4.1 Verification of Data and Information on Nutrient Emissions / Loads

Emissions from diffuse sources of pollution in Slovakia can be divided as emissions coming from population not connected to sewerage system, from agricultural land (by erosion) and from livestock. Table 4.1-1 contains information on population and emissions coefficients for N and P coming out from inhabitants not connected to sewage system. Different coefficients are given for inhabitants connected to water works, but not to sewerage system (emission coefficients are supposed to be higher) than those for inhabitants not connected neither to water works nor to sewerage system).

Table 4.1-1: Population

Country total population	Emissions coefficients		Population not connected to sewerage	Population connected to sewerage			
	kg N /inh/y	kg P/inh/y*		without treatment	Mechanical step	bological step	tertiary step
5 398 657				96030	29100	2784870	
	2,19	0,69	1 550 000 inh. (Inhabitants connected to water works but not to sewage system)				
	0,44	0,13	938 657 inh. (inhabitants connected neither to water works or sewage system)				

* - Phosphorus from detergents included

Table 4.1-2 presents data on main type of crops cultivated in Slovakia with corresponding areas and amount of nitrogen and phosphorus applied on particular lands. The values of nutrients from both organic and artificial fertilizers applied have been considered. Runoff coefficients have been estimated as 20 % of applied nitrogen and 2 % of applied phosphorus. The average amount of nutrients applied on agricultural land in Slovak Republic is 48,74 kg of nitrogen and 8,0 kg of phosphorus (for period 1998-99).

Table 4.1-2: Agricultural Land

Surface (ha)	**Culture**			Runoff coefficient	
	Type of crop	kg N/ha/y	kg P/ha/y	kg N/ha/y	kg P/ha/y
870 449	***Cereals in total, of which:***				
415 708	- Wheat	77,61	8,0	15,5	0,16
34 369	- Rye	43,13	3,6	8,6	0,07
252 885	- Barley	53,55	5,8	10,7	0,12
19 641	***- Oats***	32,79	3,8	6,6	0,08
118 230	- Grain maize	88,06	5,0	17,6	0,10
34 657	Legume in total	13,59	5,6	2,7	0,11
29 332	Potatoes in total	117,22	19,4	23,4	0,39
37 667	Sugar – beet	95,79	14,8	19,2	0,30
142 351	**OIL - PLANTS IN TOTAL, OF WHICH*:***				
61 155	- Rape	95,64	9,0	19,1	0,18
67 126	- Sunflower	52,4	4,9	10,5	0,10
3 556	- Soya	52,4	4,9	10,5	0,10
2 450	- Poppy seeds	37,09	7,4	7,4	0,15
1 455	Flax	29,64	3,8	5,9	0,08
1 019	Tobacco	14,45	13,3	2,9	0,27
40 516	Market vegetables	76,19	3	15,2	0,06
6 173	Feeding root - crops	54,00	3,5	10,8	0,07

Surface (ha)	**Culture**			Runoff coefficient	
	Type of crop	kg N/ha/y	kg P/ha/y	kg N/ha/y	kg P/ha/y
162 009	**FODDER ON ARABLE LAND ANNUAL, OF WHICH**				
119 318	Unripe and ensilage maize	74,42	5,1	14,9	0,10
152 011	***Lasting more years***	15,98	1,7	3,2	0,03
28 377	Vineyards	22,33	4,0	4,5	0,08
19 017	Orchards	21,07	7,7	4,2	0,15
1 031	Hop-gardens	107,3	28,7	21,5	0,57

Runoff coefficients are 20 % of applied N and 2 % of applied P to be in line with methodology used in National Reviews 1998, Part C: Water Quality

One important information is that in the last years, the amounts of nitrogen and phosphorus applied on agricultural land are lower than their real need for cultivation of crops. The study performed by Central Control and Testing Institute of Agriculture (CCTIA) shows the need of an additional 23-kg N/ha nitrogen application and 6-kg P/ha. The difference of required nutrient for crops were provided by the soil.

Table 4.1-3 contains information on number of animals that are breeding in Slovakia with their corresponding emission coefficients for Nitrogen and Phosphorus.

Table 4.1-3: Number of Livestock

Inventory of animals*	Number (1998)	Emission Coefficient	
		kg N/head/y	Kg P/head/y
1. pigs	1 593 000	0,094	0,022
2. cows	284 000	1)	1)
3. cattle	421 000	0,415	0,083
4. horses	10 000	no emission coefficient available	no emission coefficient available
5. sheep	326 000	0,089	0,018
6. poultry	13 117 000	0,009	0,003
7. others			

* no waste water treatment plant provided

1) No emission coefficient especially for cows, only for cattle in general

The estimated total amount of nitrogen and phosphorus coming from diffuse sources of pollution is presented in the table below.

	N 1000 t/y	P 1000 t/y]	Note
Erosion	6,1	0,24	Emission coefficients for released N and P by erosion given by Bedrna (1985) were used. From the given range 0,5 – 15 kg N/ha and 0,01 – 0,20 kg P/ha the following data were used, taking into account low amount of fertilisers used in the last decade: N : 2,5 kg /ha P : 0,1 kg /ha
Washing-out	24,0	0,39	It was assumed that 20 % of applied N and 2 % of P on agricultural land is washing out. In the figures given for N and P, the release from animals is already included as in the data from CCTIA total amounts of N and P applied on agricultural land from both organic and artificial fertilisers are included.
Population connected to water works, but not connected to sewerage system	3,4	1,07	
Population connected neither to water works, or sewerage system	0,4	1,82	
Total	33,8	1,82	

4.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

The most important measures for nutrient reduction from diffuse sources of pollution are prepared mainly in accordance with transposition and implementation of European Union legislation. The basic document in the field of approximation process is the „National Programme for transposition of Aquis Communautaire“. In addition, requirements resulting from the governmental priority related to the EU accession process has also been transformed as „National Environmental Action Plan II“ (1999), with particular tasks to transpose and implement EU legislation.

In addition to the recent approved Law on fertilizers, Slovakia proposes the following measures that are supposed to become effective in the forthcoming period of five years, with the purpose to reduce nutrient emissions from diffuse sources:

(1) Preparation of Governmental Decree on protection of water resources against pollution from agriculture

(2) Development and implementation of the Code of good agricultural practices with purpose to reduce pollution caused by nitrates

(3) Defining criteria for identification of water pollution by nitrates from agricultural sources (in relation to Nitrates Directive)

(4) Identification of vulnerable areas regarding the Nitrates Directive

(5) Development of Action Programme in vulnerable areas to ensure protection of waters against pollution from agriculture (in relation to Nitrates Directive)

(6) Establishment of a „Soil Service“ which should serve as advisory unit in the field of utilization and protection of soils. It should cooperate with relevant institutions with purpose to protect environment

(7) Establishment of „State Inspection for Soil Protection“ as a new institution under MSM SR to control legislative measures for soil protection enforcement.

Moreover, Slovakia, through the Ministry of Economy is preparing a new proposal on the methods of control of biological degradability of active substance detergents.

4.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

The assessment of the nutrient reduction from non-point sources of pollution is considered difficult to be carried out during the period of economic transformation as it is recognized the influence of reduced financial means on the implementation of the necessary measures to decrease nutrient release.

There is a large need of investments to ensure the increase of share of the population connected to sewerage system (now, only 54 % of total population is connected).

In the last decade, the consumption of artificial fertilizers decreased rapidly (app. 38,3 kg N/ha and 9,6 kg P/ha of agricultural land), but on long-term is expecting an increase of this amount up to 90 kg N/ha. The amount of applied artificial fertilizers in the future is also strongly dependent on financial situation of agricultural enterprises.

Slovakia encourages the beneficial application of the code of good agricultural practices in relation to the release of nutrients from agricultural land.

With all these measures being implemented in the forthcoming five years, the amount of nutrients from diffuse sources of pollution can be lowered by 10 %. More significant effects can be observed after longer periods of time, as most of the planned activities are due to the year 2002 and full implementation needs some additional time.

4.4 Identification of Projects Ready for Implementation

The list of priority projects supposed to be ready for implementation in the coming five years is presented in Annex 4.4. The elaboration of this list is based on:

- Projects included in the Joint Action Programme, which is under preparation under EMIS/EG at this time
- Final draft of Up-dated National Action Plan for Danube River Basin, containing priorities of both Ministry of Environment and Ministry of Soil Management regarding projects of construction/reconstruction/expansion of sewer systems and waste water treatment plants
- The National Environmental Action Plan, approved in December 1999, containing the list of particular measures to achieve objectives set up for the water management sector in SR

Regarding data on investments and funding status it is expected that the partly existing information gaps can be filled through information directly provided by the authorities or companies, responsible for project realisation.

The total investment requirements of the 20 identified projects are EUR 118 million; their composition by sectors is as follows:

- 13 municipal projects with investment requirements of EUR 103 million,
- 4 industrial projects with investment requirements of EUR 14 million,
- no agricultural project;
- 3 wetland projects with investment requirements of EUR 0,9 million,
  (of which two projects "Integrated Management in Olšavica River Basin" and "Floodplain Meadow Restoration in the Lower Morava River" are already implemented and the third project "Wetland Restoration in Laborec River Basin" is prepared, but financial sources not yet secured).

Regarding project funding it is expected that about 38% will be covered by national funds, 4% by international loans and about 3% by international grants; the funding of the residual 55% is not yet secured.

4.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

Regarding municipal sector, the nutrient emissions have either been known from wastewater quality monitoring data, which are stored in Slovak Hydro-meteorological Institute or have been estimated by a standardized method, based on per capita emission coefficients.

In discharged wastewater from industrial sources, nitrogen and phosphorus is measured only in case of significant emissions. This is the reason why the total amount of discharged N and P from industry is not given in Annex II-4.

The expected reduction of BOD, COD, nitrogen and phosphorus has been estimated on the basis of planned measures in the particular source of pollution. If estimation of expected reduction is higher than the present discharge, the reason is primarily that the expansion of the sewer system is usually planned for a higher number of people connected to the wastewater treatment plant.

he anticipated nutrient reduction from the identified point source projects and the composition by sectors is compiled in Section 4.6 (2) and can be summarized as follows:

- N: 2574 tons/year;
- P: 147 tons/year;
- BOD: 13609 tons/year;
- COD: 27148 tons/ year;

4.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding "non-point source" issues

Emissions from diffuse sources of pollution are considered in Slovakia as emissions coming from population not connected to sewerage system, from agricultural land (by erosion and washing up) and from livestock. Two important particularities of the country are related to the amounts of nitrogen and phosphorus applied on agricultural land that are lower than their real need for cultivation of crops and the initiative to implement soil conservation measures.

The most important measures for nutrient reduction from diffuse sources of pollution are prepared mainly in accordance with transposition and implementation of European Union legislation.

Slovakia is so far the only one country of the Danube river basin that has a recent approved Law on fertilizers. In addition, development and implementation of the Code of good agricultural practices with purpose to reduce pollution caused by nitrates is having a high priority.

Finally, the identification of vulnerable areas regarding the Nitrates Directive and the new proposal on the methods of control of biological degradability of active substance detergents bring Slovakia in line with EU standards.

With all these measures being implemented in the forthcoming five years, the amount of nutrients from diffuse sources of pollution can be lowered by 10 %.

(2) Main particularities regarding "point source" projects

Altogether Slovak Republic could provide a relatively complete set of project data regarding investment requirements, implementation schedules (and partly funding schemes) for the identified priority projects to be implemented in the coming five year period. It is expected that the existing data gaps can be filled through information directly provided by the authorities or companies, responsible for project realisation.

The primary characteristics of the identified priority projects, which are envisaged to be implemented within the coming period of five years in Slovakia, can be summarized as follows:

Table 4.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	13	2001	125	12968	25458	103.4
Industrial point sources	4	348	0	641	1690	14.2
Agricultural point sources	0	0	0	0	0	0.0
Wetlands	3	226	23	0	0	0.9
Total	20	2574	147	13609	27148	118.4

5 HUNGARY

5.1 Verification of Data and Information on Nutrient Emissions / Loads

The revision of data and information on nutrient emissions/ loads performed by Hungary has been accomplished taking into consideration (i) the nutrient mass balance with main accent on diffuse pollution, nutrient transport, wetlands and losses of nutrients in water systems, along the Danube and, (ii) the functioning of the Black See ecosystems, with regard to the nutrient discharges.

The updated data and information are presented in table 5.1-1, 5.1-2 and 5.1-3.

Table 5.1-1. Population

Country total population 1998	Emissions coefficients		Population not connected to sewerage	Population connected to sewerage *			
Inh	Kg N/inh/y	Kg P/inh/y	inh	without treatment	Mechanical step	Biological step	Tertiary step
10,135,000			4,358,000	81,833,000	231,634,000	245,386,000	11,762,000

Source: Housing Statistics and Public Utilities 1998, Central Statistical Office

* Data refer to waste water discharge expressed in m^3

Table 5.1-2: Agricultural Land

Surface	**Culture**			Runoff coefficient
Ha	Type of crop	kg N/ha/y	kg P/ ha/y	
1,183,000	Wheat			
1,023,000	Maize			
370,000	Barley			
67,000	Rye			
194,000	Others			
2,837,000	Total			
1,766,000	Of which fertilized area	133		

Source: Statistical Yearbook of Agriculture 1998, Central Statistical Office

Table 5.1-3: Number of Livestock

Inventory of animals*	**Number**	**Emission Coefficient**	
Type	Heads	Kg N /head/y	kg P/ head /y
1. pigs	5,479,000		
2. cows	407,000		
3. cattle	873,000		
4. horses	70,000		
5. sheep	909,000		
6. poultry	30,557,000		
7. others			

Source: Statistical Yearbook of Agriculture 1998, Central Statistical Office

* no wastewater treatment plant provided

The evolution of the of total fertilizer usage per hectare of arable land, garden, orchard and vineyard at the world scale and Hungary is presented in the table below:

Country	1992	1993	1994	1995	1996
World total	87	84	85	89	89
Austria	177	175	168	158	152
Germany	239	224	242	234	234
Hungary	38	41	56	49	54

The assessment of amount of fertilizers used in Hungary between 1992-1996 is presented in the next table:

Fertilizer use	1992	1993	1994	1995	1996
Total quantity in 1000 t	189	207	280	247	270
Use on arable land, for 1 ha kg/ha	38	41	56	49	54
Out of which:					
N kg/ha	30	32	45	38	40
P kg/ha	4	5	5	6	7
K kg/ha	4	4	6	5	7

5.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

The identified measures for nutrient reduction from diffuse sources by Hungary, which are supposed to become effective within the forthcoming period of 5 years are based on the following concerns:

- introduction of P-free detergents;
- improvement of national policies and legislation regarding utilization of fertilizers and livestock waste;
- approximation of national legislation to relevant EU legislation and standards.

The National Environmental Programme of Hungary in relation to the nutrient reduction from diffuse sources defines two major measures:

(1) The wastewater treatment in the region of nutrient sensitive waters should be at least 3rd degree.

(2) The nutrient emission into surface waters should be reduced below 20% in comparison with the recent level.

Introduction of P-free detergents measure is not yet included in the National Environmental Programme of 1997-2006 neither in environmental, nor in the economic chapters.

5.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

The assessment of the anticipated annual potentials of nutrient reduction has been difficult to be carried out by Hungary due to the lack of data.

However, the implementation of the following projects in the agricultural sector will lead at a reduction of minimum 2,000-t/year N provided by non point sources of pollution:

- Introduction of EU-conform and environmentally protective pig fattening technology, in Mosonmagyarovar region;
- Agriculture originated pollution minimization in the floodplain of Tisza river;
- Establishment of agro- and nature-conservation training centers in the Koros-Maros National Park;

- Central-Danube Valley organic farming, nutrient control, wetland rehabilitation;
- Babocsa Organic farming in the Drava floodplain.

5.4 Identification of Projects Ready for Implementation

The identified priority projects that are supposed to be ready for implementation in the coming 5 years are compiled and characterized in Annex II-5.

The total investment requirements of the 24 identified priority projects are EUR 687 million; their composition by sectors is as follows:

- 16 municipal projects with investment requirements of EUR 658 million,
- 1 industrial project with investment requirements of EUR 5.9 million,
- 5 agricultural project with investment requirements of EUR 7.2 million,
- 2 wetland projects with investment requirements of EUR 15.4 million.

Regarding project funding it is expected that about 39% will be covered by national funds, 27% by international loans and about 34% by international grants.

5.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

The anticipated nutrient reduction for the 24 identified priority projects is stated in detail in Annex 5.4 and can be summarized as follows:

- N: 6708 tons/year;
- P: 1522 tons/year;
- BOD: - (figures not available);
- COD: - (figures not available);

The composition of the anticipated nutrient reduction by sectors is compiled in Section 5.6(2).

5.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding “non-point source” issues

The revision of data and information on nutrient emissions/ loads performed by Hungary has taking into consideration the nutrient mass balance, with main accent on diffuse pollution, nutrient transport, wetlands and losses of nutrients in water systems.

Specific for Hungary is the increase of the fertiliser usage per hectare of arable land, garden, orchard and vineyard for the last eight years.

The identified measures for nutrient reduction from diffuse sources by Hungary, which are supposed to become effective within the forthcoming period of 5 years include the introduction of P-free detergents and improvements of national policies and legislation regarding utilisation of fertilisers and livestock waste.

An another particularity of Hungary is given by the measure to introduce wastewater treatment in the region of nutrient sensitive waters.

It is expected that the implementation of the nutrient reduction measures in the agricultural sector will lead to a reduction of minimum 2,000-t/year N.

(2) Main particularities regarding “point source” projects

Hungary is one of the countries which provided a complete project list and set of project data regarding investment requirements, implementation schedule and funding scheme for the identified priority projects to be implemented in the coming five year period.

The primary characteristics of the identified priority projects which are envisaged to be implemented within the coming period of five years in Hungary can be summarized as follows:

Table 5.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	16	3455	1153	-	-	658.2
Industrial point sources	1	420	6	-	-	5.9
Agricultural point sources	5	2600	340	-	-	7.2
Wetlands	2	233	23	-	-	13.3
Total	23	6708	1522	-	-	686.7

At the time being there are no figures on anticipated reduction of BOD and COD.

6 SLOVENIA

6.1 Verification of Data and Information on Nutrient Emissions / Loads

The verification of data and information were performed based on the estimates of the ad-hoc expert group of Slovenia. Although some measurements exist, the current monitoring procedures do not contain rules to allow measurements of Nitrogen and Phosphorus.

To facilitate the interpretation, Slovakia used the same values for one pollution equivalent (PE) as it is reported elsewhere in the literature, e.g. the Haskoning report of 1999 as indicated below:

1 PE (of municipality origin) is:

- 60 g BOD5/day => 25 kg BOD5/year
- 150 g COD/day => 50 kg COD/year
- g N/day => 5 kg N/year
- 2.5 g P/day => 1 kg P/year

It is also considered necessary to implement a new regulation on the responsibilities of large polluters to measure apart of BOD and COD content, also N and P.

For situations when part of data on BOD and COD were not reliable, the calculations were based on the population of the localities, adding measured or estimated values of the industrial load. An asterisk denotes such values (*).

The data are presented in the Tables 6.1-1, 6.1-2, 6.1-3 below.

Table 6.1-1: Population

Country Total population in the DRB	Emissions Coefficients		Population not connected to sewerage	Population connected to sewerage			
	Kg N/nh/y	Kg P/inh/y		without treatment	Mechanical step	biological step	tertiary step
87.7% of total	5	1	56% =	13 % =	16% =	15% =	0% =
1,754 000			982 240	228 020	280 640	263 100	0

Table 6.1-2: Agricultural Land

Surface (ha) in the DRB	Culture			Runoff coefficient
	Type of crop	kg N /ha/y	kg P/ ha / y	Total Outflow / Total Precipit.
234 230	Fields	N/A	N/A	estimate 0.55 whole DRB
15 500	Vineyards	N/A	N/A	estimate 0.55 whole DRB
37 220	Orchards	N/A	N/A	estimate 0.55 whole DRB
310 430	Meadows	N/A	N/A	estimate 0.55 whole DRB
154 230	Pastures	N/A	N/A	estimate 0.55 whole DRB
868 980	Forests	N/A	N/A	estimate 0.55 whole DRB
130 210	Other	N/A	N/A	estimate 0.55 whole DRB
1 750 810	Total			estimate 0.55 whole DRB

Table 6.1-3: Number of Livestock

Inventory of animals*	Number in the Republic of Slovenia	Emission Coefficient	
	(factor 0.90 for DRB)	kg N /head/y	kg P/ head / y
1. pigs	116 658	N/A	N/A
2. cows	381 846	N/A	N/A
3. cattle	N/A	N/A	N/A
4. horses	10 312	N/A	N/A
5. sheep	22 972	N/A	N/A
6. poultry	1 419 884	N/A	N/A
7. others			

* no waste water treatment plant provided

6.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

As a consequence of EU accession process, Slovenia is already introducing EU market rules in terms of P-free detergent use.

Slovenia proposes measures to improve the national policies and legislation regarding utilization of fertilizers and livestock waste.

The Slovenian transposition of the EU Nitrates Directive states that total Nitrogen application on 1 ha of land could be less than 210 kg N/year. This maximum allowable value is further limited on water protection zones according to the type of the crop, e.g. maize 170 down to 80 kg N/year for 1 ha of land for wheat.

These lower limits shall also be taken into consideration on the country level once the forthcoming Water Act will come into force.

Slovenia already initiated actions to elaborate the code of proper best agricultural practices for achieving a sustainable agriculture.

It is expected that the national legislation shall be harmonized with the EU legislation within 2-3 years, while the full compliance time for some directives will be extended up to the year 2011 (IPPC) or even 2015 (UWWTD).

6.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

The assessment of the nutrient reduction measures has been performed with the view that EU approximation will bring positive changes but with long waiting periods to be able to properly valuing them.

As it has been already presented in some earlier studies (e.g. Haskoning, 1992 and 1993) Slovenia considered that there would be extremely difficult to reduce the present diffuse loads.

One reason is given by the fact that 50% of Slovenia’s population live in settlements below 2000 PE, and almost 70 % below 10 000 PE. As the Urban Wastewater Treatment Directive calls for centralized treatment, the number of PE connected to WWTP’s will be much higher, which will, in turn, negligibly reduce diffuse pollution, but, significantly, increase point-sources pollution. Any attempt in agriculture to compensate for this increase in point-source pollution will mean great financial, logistic and management burden for Slovenia.

6.4 Identification of Projects Ready for Implementation

The list of projects that are supposed to be ready for implementation in the coming 5 years is presented in Annex II-6. The elaboration of this list of projects is mainly based on the up-dated Action Pollution Reduction Programme of the DDPRP and a selection of the most feasible and best-prepared projects (with complete project files, adequate funding schedules, and ready for implementation) been considered:

The total investment requirements of the 24 identified projects are EUR 384 million; their composition by sectors is as follows:

- 23 municipal projects with investment requirements of EUR 383 million,
- no industrial project;
- 1 agricultural project with investment requirements of EUR 1,7 million;
- no wetland project.

Regarding project funding it is expected that about 85% will be covered by national funds, 12% by international loans and about 3% by international grants.

6.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

The overall anticipated nutrient reduction from the identified point source projects and the composition by sectors is stated in the compilation presented in section 6.6 (2) and can be summarized as follows:

- N: 5233 tons/year;
- P: 814 tons/year;
- BOD: 28816 tons/year;
- COD: 47040 tons/ year;

6.6 Main Country Specific Particularities

(1) Main particularities regarding “non-point source” issues

The verification of data and information were performed based on the estimates of the ad-hoc expert group of Slovenia, with some constraints related to the current monitoring procedures which do not contain rules to allow measurements of Nitrogen and Phosphorus.

As a consequence of EU accession process, Slovenia is already introducing EU market rules in terms of P-free detergent use.

Slovenia proposes also measures to improve the national policies and legislation regarding utilisation of fertilisers and livestock waste. Moreover, Slovenia already initiated actions to elaborate the code of proper best agricultural practices for achieving a sustainable agriculture.

The assessment of the nutrient reduction measures has been performed with the view that EU approximation will bring positive changes but with long waiting periods to be able to properly valuing them.

(2) Main particularities regarding “point source” projects

Altogether Slovenia provided a complete project list and set of project data regarding investment requirements, implementation schedules and funding schemes for the identified priority projects to be implemented in the coming five year period.

The primary characteristics of the identified priority projects which are envisaged to be implemented within the coming period of five years in Slovenia can be summarized as follows:

Table 6.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	23	5 053	786	27 836	45 440	382,5
Industrial point sources	0	0	0	0	0	0.0
Agricultural point sources	1	180	28	980	1 600	1,7
Wetlands	0	0	0	0	0	0.0
Total	24	5 233	814	28 816	47 040	384.2

7 CROATIA

7.1 Verification of Data and Information on Nutrient Emissions / Loads

Croatia was not the part of the Nutrient Mass Balance Project within the Danube Program.

The analysis/verifications of the data and the information on nutrient emissions/loads has been performed for population and livestock unit, as most of the necessary data for agricultural land do not yet exist.

Moreover, data about emissions of Phosphorus and Nitrogen need to be collected which it will take some time and supplementary investigations.

However, it was possible that some data that refer to the type of crop production, by specific crop production, in tons in 1997, to be reviewed. Tables 1 and 3 contain some information that were collected and reviewed.

Table 7.1-1: Population

Country total population	Emissions Coefficients		Population not connected to sewerage	Population connected to sewerage			
	Kg N/inh/y	Kg P/inh/y		without treatment	mechanical step	biological step	tertiary step
3 250 000	4,0	0,9	1 583 100	1 475 600	45 700	145 600	-

Table 7.1-2: Agricultural Land

Surface ha	Culture			Runoff Coefficient
	Type of crop	kg N/ha/y	kg P/ha/y	
	n.a	n.a	n.a.	

Table 7.1-3: Number of Livestock

Inventory of animals*	Number (1998)	Emission Coefficient	
		kg N/head/y	kg P/head/y
1. pigs	1 333 449	8,0	
2. cows	232 694		
3. cattle	377 307		
4. horses	10 075		
5. sheep	157 287	8,0	
6. poultry	8 736 791	0.7	
7. others	-		

- total – with and without treatment

7.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

In accordance with the National Pollution Control Plan of Croatia, the proposed measures include:

- Preservation of the water resources quality
- Reduction of the pollution sources
- Strengthening of the monitoring system inclusively for accidental pollution.

For the next five years, Croatia proposes the necessary measures for nutrient reduction that include (i) introduction of P-free detergents, (ii) improvement of national policies and legislation regarding utilization of fertilizers and livestock waste, and (iii) approximation of national legislation to relevant EU legislation, respectively EU-standards.

7.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

During the last decade, the use of plant protection agents has decreased, not due to ecological reasons, but exclusively because of the economic constraints.

It seems that visible nutrient reduction from diffuse sources might take place only once the required measures and actions will be implemented.

7.4 Identification of Projects Ready for Implementation

The identified priority projects, which are supposed to be ready for implementation in the coming 5 years, are compiled and characterized in Annex II-7.

The total investment requirements of the 11 identified priority projects are EUR 433 million; their composition by sectors is as follows:

- 11 municipal projects with investment requirements of EUR 421 million (including EUR 256 million for implementation of biological treatment in Zagreb, 1500000 PE):
  - Cakovec (extension of WWTP for tertiary treatment;
  - Varazdin (reconstruction works and sludge treatment);
  - Koprivnica (secondary and tertiary treatment for 90000 PE);
  - Zagreb (biological treatment for 1500000 PE);
  - Sisak, Karlovac (preparatory works);
  - 5 other smaller WWTPs
- no industrial projects;
- no agricultural projects;
- no wetland projects.

Industrial, agricultural and wetland projects could not yet be identified because these projects need commitment from other authorities which is not to be obtained in the short term.

Regarding project funding the figures presented in Annex 7.4 are just for ongoing projects, respectively contracted values. For the majority of the projects there are no adequate funding schemes available.

7.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

The anticipated nutrient reduction for the identified priority projects is stated in detail in Annex 7.4 and summarized in Section 7.6(2).

As nutrient reduction figures are not available for all of the identified priority projects, the provided figures do not fully represent the actual nutrient reduction.

7.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding "non-point source" issues

Specific for Croatia is the fact that it has not been part of the Nutrient Mass Balance Project within the Danube Program. Most of data are not available and the analysis/verifications of the data and the information on nutrient emissions/loads has been performed only for population and livestock units.

In accordance with the National Pollution Control Plan of Croatia, the proposed measures include:

- Preservation of the water resources quality
- Reduction of the pollution sources
- Strengthening of the monitoring system, inclusively for accidental pollution.

For the next five years, Croatia proposes the necessary measures for nutrient reduction that include (i) introduction of P-free detergents, (ii) improvement of national policies and legislation regarding utilization of fertilizers and livestock waste, and (iii) approximation of national legislation to relevant EU legislation, respectively EU-standards.

It has been difficult to make estimates, but it is assumed that noticeable nutrient reduction from diffuse sources might be recorded once the required measures and actions will be implemented.

(2) Main particularities regarding "point source" projects

Up to now, there is no formalized, respectively officially agreed program or plan for nutrient reduction projects in Croatia.

There is a relatively clear priority schedule and implementation program for WWTP in the municipal sector; (but not for the industrial and the agricultural sector, and not for wetlands).

The primary characteristics of the identified priority projects which are envisaged to be implemented within the coming period of five years in Croatia can be summarized as follows:

Table 7.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	11	1509	239	15310	34424	433.4
Industrial point sources	0	0	0	0	0	0
Agricultural point sources	0	0	0	0	0	0
Wetlands	0	0	0	0	0	0
Total	11	1509	239	15310	34424	433.4

Even these priority projects in the municipal waste water sector cannot be considered as really committed, as there are no committed funding schemes for the majority of the identified projects.

According to the provided data there are no figures for the anticipated nutrient reduction for the majority of the identified projects.

8 BOSNIA - HERCEGOVINA

8.1 Verification of Data and Information on Nutrient Emissions / Loads

In comparison with similar previous revisions of data on emissions and loads, for this project, Bosnia - Herzegovina presented a full picture of all rivers belonging to the Danube river basin on its territory.

However, since the system of monitoring and assessment has not been yet re-established and therefore the up-dated values are not yet available, the data and information on nutrient emissions/loads represent estimations from the pre-war period.

Moreover, Bosnia - Herzegovina included recorded data on nutrient content at the mouths of main rivers into Sava river to be considered for transboundary pollution analysis within the framework of this present project.

The data on total nitrogen and phosphorus content measured in monitoring stations that are not up-dated are presented in the following table:

No	River	COD (t/y)	BOD5 (t/y)	Total N (t/y)	Ortho P (t/y)
1.	Una	32.777	14,000	-	600
2.	Vrbas	52.305	22,500	2,600	95
3.	Bosna	29.601	14,200	6,540	270
4.	Drina – downstream of Visegrad	33.726	9,500	-	135

At present about 88.61 % or 3,348 734 inhabitants of the total B&H population lives in the Danube river basin. Data for the share of Danube river basin related to pre-war and present population are summarized in the Table 8.1-1, with emissions coefficient calculated per capita and year.

Table 8.1-1: Population

The population in the DRB	Emissions Coefficients		Population not connected to sewerage system	Population connected to sewerage system			
	Kg N/inh/y	Kg P/inh/y	(65 %)	without treatment	Mechanical step	biological step	Tertiary step
4,010 467*	0.78	0.23	2,606 804	933,663	-	470,000	0
3,348 734**	N/a	n/a	2,176 677	896,881	-	15,500	0

* population in 1991, within Danube River Basin

** population from post-war period (assessment)

Most of the data required to fill up the Tables 8.1-2 and 8.1-3 were not yet available. Data given (agricultural areas and number of livestock) refers to the entire territory of B&H.

Table 8.1-2: Agricultural Land

Surface (ha)	Culture			RunoffCoefficient
	Type of crop	kg N/ha/y	kg P/ha/y	
1,055,000	Ploughed fields and gardens	n/a	n/a	n/a
100,000	Orchards	n/a	n/a	n/a
4,000	Vineyards	n/a	n/a	n/a
383,000	Meadows	n/a	n/a	n/a
1,542,000	Total arable land	n/a	n/a	n/a
866,000	Pastures	n/a	n/a	n/a
7,000	Fish ponds, pools and reeds	n/a	n/a	n/a
873,000	Total uncultivable land	n/a	n/a	n/a
2,415,000	Total agricultural area	n/a	n/a	n/a

Source: Unpublished data of the two entity statistic institutes

Table 8.1-3: Number of Livestock

Inventory of Animals*	Number (B&H , 31.12.1997)	Emission coefficient	
		kg N/head/y	Kg P/head/y
1. pigs	372,654	n/a	n/a
2. cows	574,102	n/a	n/a
3. cattle	417,704	n/a	n/a
4. horses	56,807	n/a	n/a
5. sheep	580,493	n/a	n/a
6. poultry	3,362 488	n/a	n/a
7. others	n/a	n/a	n/a

* no waste water treatment plant provided

Only a very small number of inhabitants are served by sewerage system (up to 35 %), mostly located in larger municipalities. All other settlements do not have any sewerage system or connection to wastewater treatment plants. The increase of number of settlements having access to sewerage and treatment facilities is considered as being a priority by the government. As an example, two newly constructed wastewater treatment plants are already in operation. Also, the rehabilitation of those wastewater treatment plants that were damaged in the past represents a concern for the policy makers.

8.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

The nutrient content of waters of B&H provided by the diffused sources of nutrient emissions is mainly from the agricultural production and livestock farming.

As a consequence of recent economic development of the country mainly through both the extension of cultivated agricultural areas and intensification of farming, a future increase of nutrient emission can be expected.

The current legal framework related to water and environmental concerns, which can be considered as the most appropriate measure to control and reduce nutrient is mainly out-dated and does not allow the harmonization to the relevant EU legislation.

Although, at the state level, new pieces of legislation are in the process of preparation, there are still no instruments available to both control and enforce the necessary measures in reducing nutrient emissions. One example can be given by the existence of the only one recorded Detergent Production Factory – DITA located in Tuzla which produces P-free detergents, in spite of the fact that there are may other producers which are not yet part of the evidence in the water and environmental registers.

The urgent measures proposed by Bosnia - Herzegovina to be implemented include:

- Creation of various relevant legal regulations and rules in accordance to EU legislation referred to the use of various chemical products in agriculture;
- Introduction and use of relevant standards for production/use of various chemical products in agriculture;
- Introduction and use of relevant standards for production/use of various chemical products in agriculture;
- Setting up of relevant institutions to be responsible for enforcement of legal instruments and standards;
- Establishment of an inspection system to enforce the legal requirements;
- Promotion of sanitation measures of all centralized farms and construction of wastewater treatment plants on farms in parallel;
- Development and implementation of relevant regulations related to the production of phosphorus-free detergents.

8.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

Taking into consideration the necessity of development of the required legal framework, which can allow the introduction of nutrient control and reduction measures, it is understandable that the first results concerning the reduction of emissions/loads pollutants will be visible after the implementation period of the proposed urgent measures.

Under these conditions, if the predicted urgent measures shall be introduced during the year 2001, one can expect reduction of nutrient emissions in the after-coming period. If it is assumed that the adoption and implementation of regulations and standards will be within the next two years, then visible effects of nutrient content reduction can be expected in the year 2005.

However, improvement of the economic situation of the country can already be seen especially in the field of agriculture and stock farming. As the activities in the field of agriculture and livestock farming are recently intensified, the nutrient content will record higher levels. This concern is going to be taking into consideration and included in the proposed urgent measures of B&H.

Generally, it can be assumed that the condition of transboundary rivers, considering pollution impacts in general, is better than the assessed conditions in the previous period. However, figures showing the expected nutrient reduction are not available at the moment.

8.4 Identification of Projects Ready for Implementation

The Long Term Protection Program finalized in 1991 (just before the war started) proposed different activities that were supposed to be implemented within a period of 18 years. At that time, the expected investment cost for the defined priority projects to be implemented within the next five years period was as following:

River basin	Investment cost (Million EUR)
Una-Sana	210
Vrbas	460
Bosna	480
Sava	105

Up to now, there is no formalized, respectively officially agreed investment programme or action plan for nutrient control/reduction projects in B&H.

The most urgent priority projects which should be implemented within the coming period of five years are compiled in Annex II-8.

The total investment requirements of the 12 identified priority projects is EUR 176 million; the composition by sectors is as follows:

- 5 municipal projects with investment requirements of EUR 147.0 million;
- 6 industrial projects with investment requirements of EUR 27.1 million;
- 1 agricultural project with investment requirements of EUR 2.3 million;
- no wetland project.

Even these projects with total investment requirements of about EUR 156 million cannot be considered as really committed, as for most of the projects, adequate implementation and funding schedules are not yet available.

8.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

Since data on current nutrient emissions are not really known for most of the discharge points, and since available data are mainly based on pre-war measurements, it is actually not possible to assess the anticipated nutrient reduction correctly.

The anticipated nutrient reduction from the implementation of the identified priority projects (which can due to the incomplete data actually not be considered as the total nutrient reduction) is compiled in detail in Annex 8.4 and summarized in section 8.6(2).

8.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding "non-point source" issues

Bosnia - Herzegovina reviewed recorded data on nutrient content for all main rivers located within the Danube basin share. However, at this stage of the project development, most of the data required are not yet available.

Agricultural production and livestock farming represent the main diffuse sources of pollution. However, the large diffuse pollution provided by the lack of treatment facilities for 65% of the population living in the country imposed new priorities fr the policy makers, in relation to the constructed of new wastewater treatment plants or the rehabilitation of those plants that were damaged in the past.

The current legal framework related to water and environmental concerns is mainly out-dated and does not allow the harmonization to the relevant EU legislation.

The introduction of P-free detergents has been already taken into consideration.

The urgent measures proposed by Bosnia - Herzegovina to be implemented in relation to the nutrient reduction concern refer to improvements of both legal and institutional framework.

As a consequence of recent economic development of the country mainly through both the extension of cultivated agricultural areas and intensification of farming a future increase of nutrient emission can be expected. However, if the predicted urgent measures shall be introduced during the year 2001, visible effects of nutrient content reduction can be expected in the year 2005.

(2) Main particularities regarding "point source" projects

Up to now, there is no formalized, respectively officially agreed investment programme or action plan for nutrient control/reduction projects in B&H.

The primary characteristics of the identified priority projects which are envisaged to be implemented within the coming period of five years in B&H can be summarized as follows:

Table 8.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	5	3005	450	7689	14802	147.0
Industrial point sources	6	125	63	963	2159	27.1
Agricultural point sources	0	1570	350	0	0	2.3
Wetlands	1	0	0	0	0	0
Total	12	4700	863	8652	16961	176.4

Even these most urgent priority projects, with total investment requirements of about EUR 176 million, cannot be considered as committed, as even for these projects, adequate implementation schedules and funding schemes are not yet available.

At the time being, there are no reliable data on the existing situation of nutrient emissions, respectively the anticipated nutrient reduction from the implementation of proposed "point source" projects. Thus the above stated figures do due to missing data actually not represent the total nutrient reduction of the proposed priority projects

9 YUGOSLAVIA

9.1 Verification of Data and Information on Nutrient Emissions / Loads

Yugoslavia verified the data and information on nutrient emissions/loads that were collected before the year 1992. This is justified by the fact that the data collected after this period present a particular character of uncertainty. In addition, it is considered that the data from the period up to 1992 reflect more realistically the situation for the planning period covered by Phase II of the Strategic Action Plan for the Danube River.

Table 9.1-1: Population

Country total population living in DRB	Emissions coefficients		Population not connected to sewerage	Population connected to sewerage in the DRB			
	Kg N/inh/y	Kg P/inh/y	Inh.	without treatment	mechanical step	biological step	tertiary step
9 016 000	4.0	0.95	6 039 000	2 400 000	80 000	447 000	50 000

Note:

The consumption of detergents in the FR YU DRB is 52 000 t/y or about 6 kg/cap/y.

The production of P-free detergents is not practiced yet. It is estimated that 1 400 t/y of Phosphorous emission comes from detergents.

This amount is included in the data of municipal wastewater emission.

Table 9.1-2: Agricultural Land

Surface	Type of crop	Applied fertilizers (kg/ha/y)				Runoff Coefficient (see remarks)	
		Mineral	Manure	mineral	manure	kg/ha/y	kg/ha/y
(ha)		Nitrogen	N	P	P	N	P
850 000	Wheat	25	25	12.0	10.0		
1 350 000	Maize	30	25	14.0	10.0		
160 000	Sunflower	15	15	7.0	6.5		
55 000	Sugar beat	90	15	30.0	6.5		
17 000	Rye	20	10	4.0	4.0		
200 000	Vegetables	25	15	7.5	6.5		
100 000	Grapes, Fruits	20	15	7.5	6.5		

Remarks:

(1) In the YU Part of DRB there are: Arable land 4 680 000 ha (60% cultivated for the crop);

(2) Natural pastures – 1 011 900 ha; Forested land – 2 707 000; Water bodies – 137 000 ha; Unspecified land – 348 900 ha;

(3) About 2 600 000 ha of arable land lye in the flat area where vertical component of runoff dominates;

(4) Due to low consumption of fertilizers there is 25-30 % deficit of Nitrogen in the soil. The largest portion of Phosphorous is adsorbed by unsaturated soil;

(5) There is no data on the runoff (export) coefficients for specified crop, but the average export coefficients for N and P estimated on the basis of N and P mass flow for several rivers (exactly defined watersheds) are: 1 - 1.5 (kg N/ha/y) and 0.15 - 0.25 (kg P/ha/y) respectively;

(6) The emission of Nitrogen and Phosphorous from diffuse pollution sources in the YU Part of DRB is about 15 000 tons N/y and 2000 tons P/y respectively.

Table 9.1-3: Number of Livestock

Inventory of animals (no waste water treatment plant provided)	Number	Emission Coefficient (average)	
		Kg N/head/y	Kg P/head/y
Pigs (breeding in the larger farms)	1 200 000	7.15	2.68
Pigs (small private livestock, individual households)	3 000 000	5.36	2.05
Cows (breeding in the larger farms)	150 000	26.60	11.6
Cows (small private livestock, individual households)	500 000	20.00	8.62
Cattle (breeding in the larger farms)	150 000	38.40	38.00
Cattle (small private livestock, individual households)	1 120 000	28.10	28.70
Horses	90 000	No data	No data
Sheep (small private livestock, individual households)	2 500 000	No data	No data
Poultry (breeding in the larger farms)	12 000 000	0.42	0.22
Poultry (small private livestock, individual households)	15 000 000	0.32	0.15

Remarks :

(1) The emission coefficient for animals breeding in small private livestock and individual households is lower due to the different feeding practice

(2) Manure is usually discharged into lagoons and after enough period of maturation is used for application on the land

(3) A neglecting portion of manure directly reaches watercourses.

9.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

The nutrient emissions from diffuse sources do not present significant values to justify the implementation of severe measures. As estimated, the total emission of nitrogen and phosphorous from diffuse sources are about 14 -15 000 t/y and 1600 – 2000 t/y, respectively.

The reduced emissions are due to the effects of using, on most of the arable land (85%), of the good agricultural practices (soil care, using of manure rather than mineral fertilizers, adjusting of the periods of soil application manure, etc.). As the consequence, nutrients run off from the largest part of arable land is minimized to the lowest level.

However, in the plain region, the run-off is low and nutrients are transformed or adsorbed by the soil. The small part of it reaches the recipients.

The consumption of fertilizers in FR of Yugoslavia in the last then years has severely decreased. In this period it is just one third of what it was before the year 1990. As estimated, the uptake of nutrients by plants overcomes the consumption by 25%.

The proposed measures for nutrient reduction from diffuse sources include:

(1) Continuation of the use of good agricultural practices

(2) Controlling of the use of mineral fertilizers, particularly in the slope areas

(3) Forestation in order to decrease erosion

9.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

The effects of measures for nutrient reduction from diffuse sources could be observed on the long-term basis. Comparing with nutrient emission data, an improvement could be recorded by decreasing erosion i.e. by afforesting measures implemented in the areas of excessive erosion. It is estimated that the current emission could be decreased for about 25%.

9.4 Identification of Projects Ready for Implementation

Yugoslavia provided a complete project list and set of project data regarding investment requirements, implementation schedule and funding schemes for the identified priority projects to be implemented in the coming five year period.

The identified priority projects that are supposed to be ready for implementation in the coming 5 years are compiled and characterized in Annex II-9.

The total investment requirements of the 40 identified priority projects are EUR 783 million; the composition by sectors is a s follows:

- 21 municipal projects with investment requirements of EUR 646 million,
- 7 industrial projects with investment requirements of EUR 68.5 million,
- 7 agricultural project with investment requirements of EUR 65.8 million,
- 5 wetland projects with investment requirements of EUR 2.5 million.

Regarding project funding it is expected that about 22% will be covered by national funds, 65% by international loans and about 13% by international grants.

9.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

The overall anticipated nutrient reduction from the identified point source projects and the composition by sectors is stated in the compilation presented in Section 9.6 (2) and can be summarized as follows:

- N: 6793 tons/year;
- P: 4863 tons/year;
- BOD: 115358 tons/year;
- COD: 277196 tons/ year.

9.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding “non-point source” issues

Yugoslavia considered that the data and information on nutrient emissions/loads recorded before the year 1992 reflect more realistically the situation for the planning period subject to the Strategic Action Plan for the Danube River.

One significant particularity of Yugoslavia is related to the current reduced nutrient emissions from diffuse sources with values of about 14 -15 000 t N/y and 1600 – 2000 t P/y, respectively.

The reduced emissions are due to the effects of using, on most of the arable land (85%), of the good agricultural practices (soil care, using of manure rather than mineral fertilizers, adjusting of the periods of soil application manure, etc.). As the consequence, nutrients run off from the largest part of arable land is minimized to the lowest level.

As in other countries, the consumption of fertilizers, in the last ten years, has severely decreased. In this period it is just one third of what it was before the year 1990.

The proposed measures for nutrient reduction from diffuse sources include:

(1) Continuation of the use of good agricultural practices

(2) Controlling of the use of mineral fertilizers, particularly in the slope areas

(3) Forestation in order to decrease erosion

The effects of measures for nutrient reduction from diffuse sources could be observed on the long-term basis. Comparing with nutrient emission data, an improvement could be recorded by decreasing erosion i.e. by afforesting measures implemented in the areas of excessive erosion. It is estimated that the current emission could be decreased for about 25%.

(2) Main particularities regarding "point source" projects

Yugoslavia provided a complete project list and set of project data regarding investment requirements, implementation schedule and funding schemes for the identified priority projects to be implemented in the coming five year period.

The primary characteristics of the identified priority projects can be summarized as follows:

Table 9.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	21	2 486	3 147	76 280	169 212	646.0
Industrial point sources	7	1 347	3 571	29 345	64 710	68.5
Agricultural point sources	7	640	242	5 133	11 074	65.8
Wetlands	5	2 320	350	4 600	32 200	2.5
Total	40	6 793	7 310	115 358	277 196	782.8

If these extraordinary high anticipated nutrient reduction figures could really be realized the implementation of the proposed point source projects in Yugoslavia would lead to a significant reduction of nutrient emissions and nutrient loads in the DRB.

10 BULGARIA

10.1 Verification of Data and Information on Nutrient Emissions / Loads

The verification of the data and information on nutrient emissions in Bulgaria implied initially the organization of data and information provided by various specific institutions on the river basin basis. This exercise made possible the separation, with some kind of uncertainty, at this time of the development of the project, of the independent contributions of both diffuse and point sources of pollution. However, the precise correction of nutrient mass balance with main accent on diffuse pollution, nutrient transport, wetlands and losses of nutrients in water systems along the Danube on the Bulgarian territory was not possible at this stage.

Therefore, the data and information relating to agricultural and municipal sectors were updated for the year 1998. The evaluation of nutrient emissions/loads is presented in the tables 10.1-1, 10.1-2 and 10.1-3.

The updated data on the total number of the population in the Danube river basin on the Bulgarian territory, the emissions coefficients, the number of the population connected and not connected to sewerage are given in Table 10.1-1.

Table 10.1-1: Population

Country total population-Danube RB		Emissions Coefficients		Population not connected to sewerage	Population connected to sewerage			
Inhabitants		Kg N/inh/y	Kg P/inh/y	inhabitants	Without treatment	Mechanical step	Biological step	Tertiary step
Zone A	137 744			71 214	66 530	-	-	-
Zone B	408 795			236 868	159 276	-	77 592	-
Zone C	1545 417			426 484	53 427	26 608	1 016 218	22 680*
Zone D	411 029			204 750	86 229	-	120 050	-
Zone E	560 047			272 372	209 020	13 655	65 000	-
Zone F	189 277			132 015	15 338	-	41 924	-
Zone G	645 911			350 371	198 964	-	96 576	-
Total	3 898 220	4,015	0,913	1 694 074	788 784	40 263	1 417 360	22 680*
100%				43,47%	35,11% **	1,79%**	63,09%**	1,0%**

Source: NSI, MRDPW

* WWTP- Samokov, not yet under operation

** 35,11% of the population connected to sewerage; the share of the population connected to sewerage is 66,53% of the total population in the Danube catchment

The percentage of the population, which is not connected to sewerage, is 43,47% within the Danube river catchment area. The amount of wastewater of 35,11% of the population connected to sewerage is discharged without treatment while 1,79% is treated using only mechanical step and 63,09% is biologically treated. There is a small portion of only 1% of the total wastewater that is treated using tertiary stage.

The expressed data for the population, which refer to nitrogen and phosphorus emissions are as follows:

Average parameters „pollution production“ of one person in one day or one year	BOD5		Total N		Total P	
	g/inh/day	kg/inh/year	g/inh/day	kg/inh/year	g/inh/day	kg/inh/year
Adopted in Bulgaria	54	19,71	11	4,015	1,44	0,526
European (often used)	60	21,90	11	4,015	2,50	0,913

The structure of the agricultural sector by type of activity and production in 1997 and 1998 is considered to be almost the same. On a national level, the crop production has the biggest share 63,9%. Next to this is the livestock production with 16,2% and mixed (crop and livestock) with 6,1%.

The updated information, concerning the agricultural land use and the types of crops are presented in Table 10.1-2.

Table 10.1-2: Agricultural Land

Surface (ha)	Culture			Runoff coefficient
	Type of crop	kg N/ha/y	kg P/ha/y	
584 203,6	Wheat			
105 547,3	Barley			
353 846,0	Maize			
325 292,9	Sunflower			
104,1	field tomatoes			
35 821,9	Grapes			

Source: NSI, MoAF

In Bulgaria there are several regions with well-developed agriculture, such as Dobrich, Pleven, Silistra, Russe, Veliko Tarnovo, Vratza, Razgrad, Montana.

Therefore, the fertilization of the cultivated land is of great importance for the agricultural output and the nutrient balance. The imbalance fertilization and deficit of the main nutrients have been detrimental to both crop production and soil fertility, that adversely influenced the country's environmental situation (see the table below).

Average Use of Mineral Fertilizers (in tons) – Country Bulgaria:

Year	NPK- total	Kg/ha	N	kg/ha	P205	kg/ha
1981	1056369	226,98	511761	109,94	419688	90,16
1995	142127	30,69	129545	27,60	12426	2,68
1996	164894	35,61	151883	32,36	12824	2,76
1997	163922	36,47	145773	32,49	16275	3,58
1998	113146	24,11	97497	20,77	8900	1,89
30.06.1999	111972		107662		3328	

Source: Ministry of Agriculture, Annual report 1999.

The high cost of chemical treatment of soil impeded improvements or amelioration work during past 6 years. According to MoAF data, before 1998, only some 7.7% of the areas under crops was treated with phosphorous fertilizers, 5.9% with nitrogen fertilizers and a bare surface of 0.2% experienced potassium treatment.

The Nutrients Balance shows the values indicated in the table below:

Years	Balance Elements	N	P205
		(in 1000 t)	(in 1000 t)
1986-1990	Exported with crop exports	272	104
	Imported with fertilizer imports	441	230
	Balance	+ 169	+ 126
1991-1995	Exported with crop exports	205	102
	Imported with fertilizer imports	165	23
	Balance	- 40	- 79
1996	Exported with crop exports	120	70
	Imported with fertilizer imports	152	13
	Balance	- 32	- 57
1998	Exported with crop exports	184	92
	Imported with fertilizer imports	97	9
	Balance	- 77	- 83

Source: Ministry of Agriculture, Annual report 1999.

Regarding the livestock production in 1998, both animal numbers and production were increased (sheep and buffalo numbers being an exception to the trend) against 1997, but comparing with 1989/1990 the numbers show several fold decrease.

The number of animals bred in small family farms has been increasing in recent years. The number of livestock ranges - 1 to 3 cows, and 5 to 10 sheep.

Based on the research work carried out by the Soil & Science Institute „N. Pushkarov“ it is shown that the solid and liquid wastes from cattle (cows, calves, and buffaloes) constitute 8% of the animal weight and they are at rate of 1,66:1. Presuming that the average weight of a cow is 500 kg, one cow should deliver daily 25 kg solid and 15-kg liquid wastes. The solid and liquid wastes from a pig constitute 7% of its weight i.e. for a 100 kg pig the wastes will be 7 kg/day in relation 0,62:1, etc. The average annual load per an animal (N & P) is given in the table below.

Type of animal	Quantity of manure (tons/year)	Total Nitrogen (TN) (kg/head/year)	Total Phosphorous (TP) (kg/head/year)
Cow	14,6	66,3	17,83
Pig	2,5	16,0	6,45
Sheep	1,0	5,0	0,87
Hens	0,054	0,6	0,32

Source: Research publication of Soil Science Institute „N. Pushkarov“

The updated information, concerning inventory of animals, their number and emission coefficient is presented as Table 10.1-3.

Table 10.1-3: Number of Livestock

Inventory of animals*	Number	Emission Coefficient	
(*no WWTP provided)			
		kg N/head/y	kg P/head/y
1. pigs	610 049	16,0	6,45
2. cows	220 960	66,3	17,83
3. sheep	1 045 736	5,0	0,87
4. poultry	7 101 697	0,6	0,32

Source: NSI, MoAF

10.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

To achieve the largest nutrient loads reduction within the border of its Danube share, Bulgaria identified measures for nutrient control and reduction from diffuse sources that mainly address (i) the policy and legislation related actions, (ii) institutional strengthening and capacity building, and (iii) public awareness raising and strengthening public participation in nutrient reduction initiatives.

The identified preventive measures that are supposed to be implemented during the next 5 years include:

(1) Improvement of national policies and legislation regarding utilization of fertilizers and livestock waste and approximation of national legislation to relevant EU legislation and standards through the following measures:

- Development and enforcement of the effluent limits/emission standards;
- Adoption and enforcement of the Regulation on the protection of water from pollution with nitrates from agricultural origin;
- Improvement of soil conservation measures;
- Improvement of water and soil monitoring systems on non point sources of pollution;
- Establishment of necessary data bases for assessment of nutrients related parameters and indicators with the MOEW Water Directorate;
- Development of a river bank erosion monitoring system and analysis of the causes of erosion (mainly related to river-bank deforestation);
- Adaptation of the EU methodology for assessment of non point sources of pollution for the Bulgarian conditions;
- Implementation of the National Plan for the development of agriculture and rural areas;
- Development of the Geographic Information System, aimed to support and to facilitate the management process;

(2) Institutional strengthening and capacity building through the following measures:

- Training of the experts from the different stakeholders groups on topics such as river basin management and nutrients control and reduction, and establishment of the training center in Veliko Tarnovo;
- Development and enforcement of guidance for the application of the agro-environmental schemes (including: guidelines on fertilizer (organic & inorganic) application rates to individual crops; guidelines on crop rotation; guide-lines/rules on preventive application of manure/slurry; guidelines on proper on-farm manure storage/composting, etc.);
- Development and enforcement of guidelines for river basin management;
- Development and implementation of guidelines for the measurement and calculation of total emission of nutrients by source;

(3) Public awareness raising and strengthening public participation in nutrient reduction through the following measures:

- Organization of a targeted public awareness campaigns;
- Development of a regional agri-environmental scheme for sustainable development and efficient management of agricultural activities (including organic agriculture, manure storage, erosion control etc.);
- Development of a pilot projects for implementation of alternative methods (construction of artificial wetlands) for households wastewater treatment in the small towns and villages;
- Development of a pilot project for wetlands restoration;
- Development of a pilot project for changes of the consumer practices (including introduction and use of phosphate free detergents).

10.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

At this stage, it is very difficult to evaluate the nutrient loads and their expected reduction. However, the anticipations for improvement of the arable land fertilization in the coming 5 years are not very optimistic. Therefore, on the Bulgarian territory of the Danube river basin, only insignificant changes are expected in the coming 5 years.

The most important beneficial expected changes are related to those obtained as a result of the creation and implementation of new legislation harmonized with EU legislation. Moreover, the institutional strengthening will also contribute to positive changes concerning the nutrient reduction measures.

10.4 Identification of Projects Ready for Implementation

The elaboration of the „list of projects, which are supposed to be ready for implementation in the coming 5 years“ was made in close co-operation with EMIS/EG and in full compliance with the national program for priority construction of urban WWTP’s with more than 10 000-population equivalent. The identified projects are compiled in Annex II-10.

The national priority ranking for completion, rehabilitation, upgrade, update and construction of new urban WWTPs, is based on a “point score method” with scores calculated according to the set up criteria, and the adoption of respective weighing factors.

The investment cost for construction of priority WWTP’s is determined by the chief designers of the sites (if a detailed design exists) and updated bills of quantities. For sites, which do not have detailed designs, the costs were based on parameters, following the methodology of the Institute on Water Quality and Waste Management at the Technical University in Vienna, published in the "Guide on strategies for waste water management" from 1996.

The total investment cost is extracted from the National Programme for Priority Construction of Urban Wastewater Treatment Plants.

The investment cost of the 21 identified priority projects which are envisaged to be implemented within the coming period of five years is about EUR 125 million; their composition by sectors is as follows:

- 17 municipal projects with investment requirements of EUR 112 million;
- 1 industrial projects with not yet identified investment requirements;
- no agricultural projects;
- 3 wetland projects with investment requirements of EUR 13.5 million;
  (the rehabilitation of two priority wetlands will be done under the Danube Partnership Programme with the financial support of World Bank/GEF).

Data on project funding (regarding national and international composition) have not been provided, because adequate information is not available at the time being.

The anticipated funding components from international funding sources are mainly addressed to EU/ISPA. The national contributions will mainly be covered by the National Environmental Protection Fund and by the State Budget.

10.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

The expected results in terms of pollution/nutrient reduction (BOD, COD, N and P) are based on the information provided by the EMIS/EG.

If the identified projects will be implemented according to the designs and will be operated and maintained properly within the next 5 years, the anticipated reduction of the N and P total loads is about 30% and of the BOD_5 load about 50-60%.

The anticipated nutrient reduction for the identified projects is stated in detail in Annex 10.4 and can be summarized as follows:

- N: 2683 tons/year;
- P: 599 tons/year;
- BOD: 19747 tons/year;
- COD: 35373 tons/year;

The composition of the anticipated nutrient reduction by sectors is compiled in Section 3.6(2).

10.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding "non-point source" issues

The verification of the data and information on nutrient emissions in Bulgaria performed for the year 1998 shows that the structure of the agricultural sector by type of activity and production in 1997 and 1998 is considered to be almost the same. On a national level, the crop production has the biggest share 63,9%. Next to this is the livestock production with 16,2% and mixed (crop and livestock) with 6,1%.

The use of fertilizers was very small. The imbalance fertilization and deficit of the main nutrients have been detrimental to both crop production and soil fertility, which adversely influenced the country's environmental situation. In addition, the high cost of chemical treatment of soil impeded improvements or amelioration work during past 6 years.

Regarding the livestock production in 1998, both animal numbers and production were increased against 1997, but comparing with 1989/1990, the numbers show several fold decreases.

To achieve the largest nutrient loads reduction within the border of its Danube share, Bulgaria identified measures for nutrient control and reduction from diffuse sources that mainly address policy and legislation related actions, institutional strengthening and capacity building. Moreover, public awareness raising and strengthening public participation in nutrient reduction initiatives are both seen as priorities. A specific particularity for Bulgaria, concerning nutrient reduction actions is given by the need to implement soil conservation measures.

On the Bulgarian territory of the Danube river basin, only insignificant changes are expected in the coming 5 years. The most important beneficial expected changes are related to those obtained as a result of the creation and implementation of new legislation harmonized with EU legislation.

(2) Main particularities regarding "point source" projects

Up to now, there is no formalized, respectively officially agreed investment program or action plan for nutrient reduction projects in Bulgaria.

There is, however, a relatively clear priority schedule and implementation program for WWTP in the municipal sector; (but not for the industrial and the agricultural sector, and not for wetlands).

The primary characteristics of the identified priority projects that are envisaged to be implemented within the coming period of five years can be summarized as follows:

Table 10.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	17	2308	562	19448	34718	111.9
Industrial point sources	1	0	0	299	655	0
Agricultural point sources	0	0	0	0	0	0
Wetlands	3	376	37	0	0	13.5
Total	21	2683	599	19747	35373	125.4

Even these priority projects with total investment requirements of about EUR 125 million cannot be considered as really committed, as there are no committed funding schemes for the identified projects.

11 ROMANIA

11.1 Verification of Data and Information on Nutrient Emissions / Loads

According to the Romanian legislation, the contribution of the diffuse sources to the pollution in the nutrient balance is provided by (i) direct discharges of private households (not connected to sewers), (ii) storm water overflow, (iii) direct discharge of manure, (iv) base flow (percolation of human waste, agriculture land), (v) erosion run-off from forests and others, (vi) air depositions and, (vii) ground water flow.

The diffuse pollution is derived from the population not connected to the sewerage network (60.1%) which represents 13.7 mill inh. Using the emission factors and taking into consideration that 10% of the diffuse emissions reach the water receiver, the population related diffuse nutrient pollution is 4.93 thou tons Nitrogen per year and 0.89 thou. tons Phosphorus per year.

Table 11.1-1: Population

Country total population in D.R.B.	Emissions coefficients		Population not connected to sewerage	Population connected to sewerage 9.1 mil.			
	Kg N/inh/yr	Kg P/inh/yr		Without treatment	Mechanical step	Biological step	Tertiary step
22.8 mil.	3.6	0.65	13.7 mil.	2.3713	1.2312	5.4948	-

The weight of diffuse pollution in the total emissions from the population target is represented in the next table:

Population	Total		Point discharges		Diffuse pollution	
	1000 tons/yr	%	1000 tons/yr.	%	1000 tons/yr.	%
Nitrogen	30.83	100	25.9	83.9	4.93	16.1
Phosphorous	5.3	100	4.41	83.2	0.89	16.8

The diffuse pollution for the industry is considered to be quite small (5%) as the most relevant food processing industry is connected to the municipal wastewater treatment plant.

Source	N 1000 tons/year	P 1000 tons/year	% of total	
			N	P
Agricultural land diffuse pollution (inorganic fertilizers)	5.9	2.5	11.7	59.6
Manure application and waste from agriculture	44.68	1.68	88.3	40.4
Total	50.6	4.2		

The total nutrient emissions are about 100 Thou. tons Nitrogen per year and 11 Thou. tons Phosphorus per year. The weight of the nitrogen diffuse pollution is about 56% while in the case of phosphorous 46%.

Table 11.1-2: Agricultural Land

Surface ha (mil.)	Culture nutrient application (1993-1997)					Run-off coefficient
	Type of crop	N	N	P	P	
		Total	Kg/ha	Total	Kg/ha	Nitrogen 0.02 Phosphorous 0.05
17.9	Maize, wheat, rye, barley etc.	293 KT	26.9	50.2 KT	5.4	

Table 11.1-3: Number of Livestock

Inventory of animals* (mil.)	Number (mil.)	Emission coefficient	
		Kg N/head/yr	Kg P/head/ yr
1. pigs	7.8	6.57	1.4
2. cows	-	-	-
3. cattle	3.5	44.2	7.65
4. horses	-	-	-
5. sheep	10.0	6	1.5
6. poultry	70.0	0.2	0.1
7. others	-	-	-

* no waste water treatment plant provided

In the total emissions of Nitrogen, agriculture represents 57%, population 30.9% and industry 12.1%. For Phosphorous, the weight of target groups in the total emission is as follows: agriculture 51%, population 48.3% and industry 0.7%.

The table below presents the overview of the total nutrient emissions in Romania:

Sector	Nitrogen			Phosphorus		
	Point	Diffuse	Total	Point	Diffuse	Total
Population	25.9	4.93	30.83	4.41	0.89	5.3
Industry	11.4	0.60	12.0	0.076	0.004	0.08
Agriculture	6.2	50.6	56.8	1.4	4.2	5.6
Total	43.5	56.13	99.63	5.89	5.09	10.98

Taking into consideration the relevance of the diffuse pollution attention should be paid to the agriculture that has a weight of 90% in the case of Nitrogen and 82% in the case of Phosphorous.

In spite of the drastic reduction in the use of fertilizers in Romania, the positive effects on the Danube Delta are not yet evident. It is considered that the reduction on the measured Nitrogen loads on the delta is not yet very evident. One assumption is related to the potential reservoir role played by the ground water in the whole basin. In addition, the large number of inhabitants, which are not adequately connected to the treatment facilities, is considered as the main cause of pollution.

Based on the DWQM, the difference between immission and emission values is considered in the case of nitrogen to be primarily caused by denitrification, and to a much lesser extend by a similar retention as with phosphorous. Phosphorous retention is believed to be related to sedimentation and temporal storage in the sediments of the P – absorbed by suspended solids. It is considered, with some risk of uncertainties, that the floodplains in the Romanian Danube basin are capable of retaining an average of the amount of Phosphorous that is of the same order of magnitude as the current yearly emissions. This value corresponds with the difference between the total P load at the border between Yugoslavia and Romania (33 thou. tons per year) and the entrance of the Danube Delta (22 thou. tons per year).

Romania considers the role of Iron Gate reservoir to be significant in relation to the retention of Phosphorus content and increase of Nitrogen load. This would mean a retention of 27% or about 6 thou. P per year and an increase of Nitrogen concentration with about 0.5 mgN/l, which would mean that 80 thou.N per year, is added. The undecided justification of this phenomenon is currently based on the Nitrogen fixation by blue/ green algae.

Among the processes that influences the nutrient reduction, the role of wetlands play a significant position during both summer and winter seasons.

In a WWTP study „Evaluation of wetlands and flood plains areas in the Danube river basin“ (1999) the capacity for removal is estimated at 100 kg N/ha/yr and 10 kg P/ha/yr. For Romania this would mean a removal of 80 thou. tons N/year and 8 thou. tons P/year.

11.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

Romania proposes a substantial programme of associated measured related to (a) the improvement of national legislation, and (b) insurance of its approximation with the EU legislation and standards.

(a) First, the improvement of national policies and legislation regarding utilization of fertilizers and livestock waste takes into consideration three main areas: (i) legislation, (ii) institutional development and, (iii) investments promotion.

(i) The legal framework will be improved with regulations related to (1) waste management and control, (2) norms for maximum allowable number of capita in the livestock's farms, and (3) norms for manure application.

(ii) The improvements of the institutional framework will take into consideration the strengthening of the institutional capabilities to facilitate (1) the implementation of the water management multipurpose approach in order to ensure an integrated water and land management, in order to protect the sensitive areas and to ensure the conditions for BAT/BEP implementation, and (2) establishment of a framework for control and limiting the inorganic fertilizer application.

(iii) On the investment encouragement side, the necessary ingredients include (1) development and implementation of the agricultural run-off source pollution reduction plan as part of a Programme concerning the introduction and development of an environmental sound and sustainable agricultural products and practices, (2) programs for individual environmentally sound wastewater management for rural areas, (3) environmentally friendly landfills with phosphorous salts, and (4) pilot/ demo projects of Best Environmental Practice (BEP) implementation in the agriculture.

(b) Second, the approximation of national legislation to relevant EU legislation and standards will include (1) on short term, transposition of the Urban Waste Water Directive (91/271/EEC) and of Nitrate Directive (91/676/EEC), and (2) on medium term, the implementation of the European Water Framework Directive (COM 97/49-97/614, 98/76).

11.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

As a very rough estimation, a reduction of at least 10% for the nitrogen total diffuse (agriculture) reduction could be anticipated and for phosphorous which is related more with the erosion a decrease of around 20%. That means 5 thou tons N/year and 0.84 thou. tons P/year a supplementary reduction by buffer zones.

Beside of the wetland/flood plain restoration measures, one of the most important action aiming to decrease the run-off from the agricultural lands is to set-up buffer zones for erosion/ run-off limitation (this buffer zones could include the forestation zones, too).

In total, taking into account the effects of wetlands, flood plains, buffer zones, control of the nutrient application, etc. the following diffuse pollution reduction from agriculture could be anticipated:

- N: 13.4 thousand tons /year
- P: 1.7 thousand tons /year

This reduction represents a decrease by 13.4% N and 15.5% P from the total actual emissions.

Romania considers that it might take several years before the effects of reduced fertilizer use become effective in the river load, mainly due to the changes of the ground water base flow and the role of the ground water as a large stock of nitrates. If the yearly flow of Danube divided over the surface area of the whole basin represents 200 mm, the amount of ground water stocked may represent several meters (hydraulic residence in ground water reservoirs is estimated between 10-30 years).

In addition, the erosion – run-off may have caused dramatically changes because many hectares of arable land are overgrown by weeds due to the economical crisis in agriculture. The cumulative effect of

elimination of fertilizer use and the weed growth could significantly reduce the erosion run-off almost by 95%.

11.4 Identification of Projects Ready for Implementation

For the elaboration of a draft list of projects supposed to be ready for implementation in the coming 5 years the following criteria have been considered:

(i) financial viability;

(ii) environmental effectiveness (based on Environmental Impact Assessment);

(iii) preparedness/readiness (availability of feasibility study, quality of project documents)

The projects identified on this basis are compiled and characterized in Annex II-11.

The total investment requirements of the 24 identified priority projects are EUR 204 million; their composition by sectors is a s follows:

- 9 municipal projects with investment requirements of EUR 104 million,
- 7 industrial projects with investment requirements of EUR 22 million,
- 3 agricultural project with investment requirements of EUR 3.7,
- 5 wetland projects with investment requirements of EUR 74 million.

Regarding project funding it is expected that about 60% will be covered by national funds, 32% by international loans and about 8% by international grants.

11.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

Excluding the wetland projects, the anticipated nutrient reduction from the identified point source projects can be summarized as follows:

- N: 3866 tons/year;
- P: 475 tons/year;
- BOD: 19811 tons/year;
- COD: 19470 tons/ year;

From the implementation of the proposed wetland projects an additional reduction of about 6000 tons/a of N and about 600 tons/a of P is anticipated.

Excluding wetland projects the dominating improvements are expected from the municipal sector (80%); followed by the industrial sector (17%) and the agricultural sector (3%).

In terms of cost efficiency, the relatively small investment in the agricultural sector has to be considered as very rational.

The composition of the anticipated nutrient reduction by sectors is compiled in Section 11.6(2).

11.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding "non-point source" issues

The first particularity of Romania is related to the approach of considering the diffuse pollution sources as being provided by diversified causes which include: direct discharges of private households (not connected to sewers), storm water overflow, direct discharge of manure, base flow (percolation of human waste, agriculture land), erosion run-off from forests and others, air depositions and, ground water flow.

In the total emissions of Nitrogen, agriculture represents 57%, population 30.9% and industry 12.1%. For Phosphorous, the weight of target groups in the total emission is as follows: agriculture 51%, population 48.3% and industry 0.7%.

As other countries, Romania also recorded a drastic reduction in the use of fertilisers.

In addition, Romania considers that among the nutrient reduction measures, Iron Gate reservoir and the existence of wetlands can play a significant role in relation to the retention or increase of Nitrogen and Phosphorus contents.

Romania proposes a substantial programme of associated measured related to the improvement of national legislation, and insurance of its approximation with the EU legislation and standards. One important initiative is considered to be the proposal to develop the code of good agricultural practices.

A reduction of at least 10% for the nitrogen and around 20% for phosphorous is anticipated by Romania, which in total can lead to 13.4 thousand tons N /year and 1.7 thousand tons P/yr.

(2) Main particularities regarding "point source" projects

Romania is on of the countries which provided a more or less complete set of project data regarding investment requirements, implementation schedules and funding schemes for the identified priority projects to be implemented in the coming five year period.

The primary characteristics of the identified priority projects which are envisaged to be implemented within the coming period of five years in Romania can be summarized as follows:

Table 11.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	9	1 804	323	13 521	13 154	104.4
Industrial point sources	7	688	3	2 947	4 110	22.0
Agricultural point sources	3	1 374	150	3 343	2 208	3.7
Wetlands	5	6 154	615	0	0	73.9
Total	24	10 020	1 091	19 811	19 470	204.0

Regarding project funding it is expected that about 60% will be covered by national funds, 32% by international loans and about 8% by international grants.

12 MOLDOVA

12.1 Verification of Data and Information on Nutrient Emissions / Loads

In 1998, the total number of population not connected to the sewerage in the Moldovan part of the Danube River basin was quite large: 938,802 inh. (85.55%).

The total emission of nutrients resulted from population has been estimated based on the population statistics, N and P emission coefficient (9 kgN/day or 3.3 kgN/year per inhabitant for Nitrogen and 2.4 gP/day or 0.9 kgP/year per inhabitant for Phosphorus) and characteristics of sewerage system and wastewater treatment.

Therefore, the nutrient load from population on the Moldovan part of the Danube River basin could be estimated as follows:

- Nitrogen - as 3.3 kg/N x 1096464 inhabitants =3. 62 thousand tons;
- Phosphorus - as 0.9 kg/P x 1096464 inhabitants =0.99 tons.

Table 12.1-1: Population

Population	Total	Population not connected to sewerage	Population connected to sewerage
Urban	306863	159876	146987
Rural	78900601	778152	11449
Total (urban and rural)	1096464	938028	158436
Share (%)		85.55	14.45

Source: National Review. Moldova. Technical Report. Social and Economic Analysis.

Danube Pollution Reduction Programme. PCU. UNDP/GEF. 1998

The input nutrients from population into surface water is assessed as being for Nitrogen - 0.5 thousand tons and for Phosphorus - 0.1 thousand tons while into groundwater is assessed as being for Nitrogen - 3.1 thousand tons and for Phosphorus - 0.8 thousand tons.

Most of the industrial and agro-industrial enterprises are still not operated. Therefore, the nutrients load from industrial wastewater treatment plants at wineries, diaries, sugar refinery plants and some others is estimated as being not significant- 47.4 tons of Nitrogen and 8.5 tons of Phosphorus.

Moldova is mainly an area with very active erosion processes, due to intensive agricultural practices, combined with specific natural features that provoke a massive loss of fertile soil (5 mln tons per year agricultural land on the Danube river basin share) and nutrients. In general, for Moldova, the average losses of nutrients with eroded soil are estimated at 34 kgN/ha and 18 kgP_2O_5/ha per year.

According to the results of the Nutrient Balance Study (1996), on average, 7.5 tons of soil are washed away from one hectare of arable land and perennial plantations, and 1.5 tons/ha from grassland.

In 1998, the nutrient loads due to soil erosion constituted about 7 thousand tons Nitrogen and 3 thousand tons Phosphorus.

The nutrient load from main crops on arable lands constituted 26,1 thousand tons of Nitrogen and 4,7 thousand tons of Phosphorus in 1998 as it presented in the Table 12.1-2.

Table 12.1-2: Agricultural Land (1988)

Type of crop	Harvest, tons	N Content, %	P Content, %	N load tons	P load tons
Sugar-beet	710000	0.33	0.07	2 343	497
Cereals	650000	3	0,5	19500	3 250
Vegetables	240000	0,2	0,025	480	60
Grapes	220000	0,25	0,025	550	55
Fruits	150000	0,25	0,025	375	37,5
Potatoes	85000	0,2	0,025	170	21,3
Sunflower	65000	4	1,1	2 600	715
Soybean	2200	3	0,8	66	17,6
Total	2122200			26084	4653

The application of mineral fertilizers decreased drastically within the last years. According to the data presented in Statistical Guide Agriculture, in 1998 in Moldova 2,76 thousand tons (active component) of mineral fertilizers have been applied. Out of this amount 2,71 thousand tons were nitric fertilizers and 0,05 tons of phosphate fertilizers.

According to assessment made in Nutrient Balance Study (1996), on average 17,5 % of the nitrogen and 1,5 % of phosphorus from the amounts applied as mineral fertilizers end up in the surface waters. Considering gaseous losses of N-compounds from mineral fertilizers applied on arable lands is on average 7,5 %, in 1998 the nutrient loads into surface waters originating from mineral fertilizer application was for Nitrogen - 0,4 thousand tons and for Phosphorus - 0,0007 tons.

Considering that (1) nutrient input on agricultural land from manure (in 1998 estimated at 86,2 thousand tons) constitutes 0.45% N and 0.13% P, (2) 20% of nitrogen is lost in gaseous form and, (3) applying the runoff coefficients of 30% for N and 20% for P, the nutrient load on surface waters originating from organic fertilizer could be assessed as for Nitrogen - 0,29 thousand tons and for Phosphorus - 0,09 thousand tons.

Currently, in Moldova exist very few cattle-breeding farms, pig farms and poultry at the public sector. Most of domestic animals (65%) belong to the private sector.

In 1998 from animal husbandry, Nitrogen load constituted 18.8 thousand tons, including 6.6 thousand tons from public sector and Phosphorus load - 4.8 thousand tons, including 1.7 thousand tons from public sector (livestock indexes in the Moldovan part of the Danube River basin are presented in Table 12.1-3).

Table 12.1-3: Number of Livestock

Index	Cattle		Pigs		Horses		Sheep goats		Domestic Birds	
Total Number	250000		430000		25600		520000		4320500	
Excrement rate t/head/year	* 9		* 1.6		* 9		* 0.7		* 0.02	
Amount of manure, k/t	2250		688		230,4		364		86,41	
Content in manure	N	P	N	P	N	P	N	P	N	P
%	* 0.39	* 0.12	* 0.57	* 0.15	* 0.35	* 0.08	* 0.92	* 0.16	* 2.22	* 0.40
Nutrient Load,k/t	8.78	2.7	3.92	1.03	0.81	0.18	3.35	0.58	1.92	035
Total N (k/tons) 18.78										
Total P (k/tons) 4.84										

Source: Nutrient Balance for Danube River Countries. Draft Report from Moldova. 1996

12.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

The existing legal framework in Moldova does not impose yet the identification of areas vulnerable to water pollution from agricultural sources of nitrates. However, nitrate pollution of groundwater is a serious problem in Moldova while the agricultural run-off is not considered to be a significant factor.

In addition, the need to develop a code of good practice, covering matters such as periods when land application of fertilizers is inappropriate and the conditions for land application of fertilizers near watercourses, has not been yet taken into consideration by the policy makers.

The sources of water pollution due to agricultural practice include mainly the following causes:

- Lack of adequate water treatment and manure storage facilities;
- Absence of regulation imposing the maximum permissible number of animals per hectare. Cattle, goats and sheep often graze in forests;
- Reduced proportion (35%) of scientifically grounded crop rotation to be implemented;
- Deficit of separation zones between forests and agricultural lands which impede the proper management of both, i.e. natural afforestation actions;
- The often use of contaminated water (dry saline residue) for irrigation.

Moldova proposed agricultural pollution reduction measures aiming at the water protection objectives in (i) the designation of agricultural lands (e.g. riverbanks), (ii) the suitability of water used for irrigation and, (iii) handling and application of agro-chemicals. In addition, soil conservation represents a special concern.

The proposed measures include:

- Constructing storage and treatment facilities for manure;
- Establishing sewerage systems of appropriate type in rural area;
- Implementing wetland conservation and restoration programmes;
- Introducing a specific program on lands that serve as buffer strips and buffer zones for protection of water resources;
- Introducing land use restriction on highly eroded lands;
- Completing the afforestation programme and permanent vegetable cover;
- Sustainable fertilizers application;
- Developing the organic farming methods;
- Introducing soil conservation measures to reduce agricultural run-off.

12.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

The anticipated nutrient reduction from diffuse sources is estimated to reach a value of 320 tons for Nitrogen and 20 tons for Phosphorus taking into consideration the effects of the national pollution reduction projects review.

Second, as a result of implementation of Afforestation Programme (planting trees that would serve as buffer strips and buffer zones in the selected areas on the lower Prut) will contribute to a reduction of 195 tons of Nitrogen and 20 tons of Phosphorus.

Finally, as a consequence of the application of Soil Conservation Programme (land use restrictions on highly eroded lands and appropriate crop rotation on upper Prut), the anticipated nutrient reduction is assessed to be 80 tons of Nitrogen and 5 tons of Phosphorus.

12.4 Identification of Projects Ready for Implementation

The identified priority projects that are supposed to be ready for implementation in the coming 5 years are compiled and characterised in Annex II-12.

The total investment requirements of the 31 identified projects are EUR 492.9 million; their composition by sectors is as follows:

- 15 municipal projects with investment requirements of EUR 247 million,
- (other small scale municipal projects with investment requirements of EUR 50 million);
- 11 industrial projects (plus not further specified small scale projects) with investment requirements of EUR 84.7 million,
- 3 agricultural projects (plus not further specified small scale projects) with investment requirements of EUR 26.6 million;
- 2 wetland projects (plus not further specified small scale projects) with investment requirements of EUR 85.0 million.

Regarding project funding it is expected that about 31% will be covered by national funds, 36% by international loans and about 34% by international grants.

12.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

The anticipated nutrient reduction for the 31 identified point source projects (and the not further specified small scale projects) is stated in detail in Annex II and can be summarized as follows:

- N: 6901 tons/year;
- P: 891 tons/year;
- BOD: 1595 tons/year;
- COD: 832 tons/ year;

The composition of the anticipated nutrient reduction by sectors is compiled in Section 12.6(2).

12.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding "non-point source" issues

Moldova is mainly an area with very active erosion processes due to intensive agricultural practices, combined with specific natural features that provoke a massive loss of fertile soil (5 million tons per year agricultural land on the Danube river basin share) and nutrients.

The application of mineral fertilizers decreased drastically within the last years.

The existing legal framework in Moldova does not impose yet the identification of areas vulnerable to water pollution from agricultural sources of nitrates. However, nitrate pollution of groundwater is a serious problem in Moldova while the agricultural run-off is not considered to be a significant factor.

In addition, the need to develop a code of good practice, covering matters such as periods when land application of fertilisers is inappropriate and the conditions for land application of fertilisers near watercourses, has not been yet taken into consideration by the policy makers.

Moldova proposed agricultural pollution reduction measures aiming at the water protection objectives in the designation of agricultural lands, constructing storage and treatment facilities for manure, establishing sewerage systems of appropriate type in rural area and implementing wetland conservation and restoration programmes.

The anticipated nutrient reduction from diffuse sources is estimated to reach the highest values within the whole Danube river basin, taking into consideration (i) the effects of the national pollution reduction projects, (ii) implementation of Afforestation Programme, and (iii) the application of Soil Conservation Programme.

The anticipated nutrient reduction is assessed to be 50,000 tons of Nitrogen and 5,000 tons of Phosphorus.

(2) Main particularities regarding "point source" projects

Moldova provided a more or less complete project list and set of project data regarding investment requirements, implementation schedule and funding scheme for the identified priority projects to be implemented in the coming five year period.

The primary characteristics of the 31 identified priority projects can be summarized as follows:

Table 12.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	15	784	119	248	458	296.7
Industrial point sources	11	167	36	27	74	84.7
Agriculture	3	350	25	20	70	26.6
Wetlands	2	7100	725	1300	230	85.0
Total	31	8401	905	1595	832	492.9

Regarding project funding it is expected that about 31% will be covered by national funds, 36% by international loans and about 34% by international grants.

13 UKRAINE

13.1 Verification of Data and Information on Nutrient Emissions / Loads

The most important sources of diffuse pollution in Ukrainian part of the Danube river basin include crop production, animal farming and households unconnected to sewer systems.

The revision of data and information was facilitated by the assessment carried out in previous studies (Monitoring and Assessment of Water Quality of Latorytsia/Uzh river basins, Selected Measures in the Danube river basin).

As a conclusion, updated statistical data shows that there are not significant changes in the diffuse pollution loads on the territory of Ukraine since 1996. The industry and agriculture in Ukraine are still in recession while the first signs of improvement became visible only since few months due to the Decree of President on Land privatization.

The approximations for pollution loads are made with assumption that the share of the Danube river basin is 5.4% of total territory of Ukraine. The Latorytsia and Uzh river basin occupies 0,81 % of territory of Ukraine.

Diffuse pollution from arable lands was estimated with emission factors considering soil type, area, slopes, etc. The emissions factors in the Latorytsia/Uzh River Basins are presented below:

River basin	Year	Emission N Kg/ha/year	Emission P, Kg/ha/year
Latorytsia, total	1992	0.59	0.19
Latorytsia, total	1996	0.56	0.19
Latorytsia, total	1997	0.58	0.19
Latorytsia, total	1998	0.59	0.19
Uzh,total	1992	0.19	0.07
Uzh,total	1996	0.20	0.07
Uzh,total	1997	0.20	0.07
Uzh,total	1998	0.21	0.07

Ukraine made estimates for 1992 and 1998 for Nitrogen and phosphorus loads from arable land in the Latorytsia and Uzh river basin as a whole and its tributaries as presented in the next table:

River basin	N, kg per year		P, kg per year	
	1992	1998	1992	1998
Uzh	31186	33963	10569	10502
Latorytsia	188609	189244	59740	59910
total	219795	223207	70309	70412
Danube basin	1450647	1486558.62	464039.4	468943.92

The updated data on the total number of the population in the Danube river basin on the Ukrainian territory are given in the next table.

Table No. 13.1-1: Population connected to the sewer system in the Ukrainian Part of the Danube River Basin

Country total population	Emissions coefficients		Population not connected to sewerage	Population connected to sewerage			
	kg N /inh/y	kg P/inh/y		without treatment	mechanical step	biological step	tertiary step
3010000	1,8	0,4	55%	45	55%	55%	none

The updated information concerning the agricultural land use and the types of crops are presented in table 13.1-2.

Table 13.1-2: Agricultural land

Surface ha	Culture		
	Type of crop	kg N /ha/y	kg P/ ha / y
894850	Arable lands		
138734	Perennial plants		
262004	Hayfields		
446766	Pastures		
1742354	Total agricultural lands	0.45	1.21

The updated information, concerning inventory of animals, their number and emission coefficient is presented as table 13.1-3.

Table 13.1-3. Number of Livestock

Heads of animals, total * (1999)	Number	Emission Coefficient	
		kg N /head/y	kg P/ head / y
1. pigs	536.05	10.01	1.94
2. cows	316.49	3.75	2.70
3. cattle	372.02	3.75	2.70
4. sheep	108.86	13.44	14.44
5. poultry	6957.41	0.81	1.02

* no waste water treatment plant provided

13.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

Ukraine considers that reduction of nutrient pollution from diffuse pollution should be addressed through various measures including (i) the strengthening of institutional capacity of controlling and regulating bodies, dealing with environmental issues, (ii) introduction of environmentally sound agricultural practices, (iii) establishing the buffer zones of streams and tributaries of the Danube rivers, (iv) assessment and implementation measures for solid waste management and wastewater treatment in rural settlements, and (v) education of general public.

The following measures are proposed:

- Inventory of diffuse pollution sources in the Ukrainian part of the Danube river basin
- Strengthening the institutional capacity of environmental, municipal and agricultural entities
- Establishing the Farmer Training Centers in Uzhgorod, Chernisvtsi, Ivano-Frankivsk and Izmail to introduce principles of organic farming.
- Implementation of Buffer Zones along Rivers of the Danube River Basin
- Public Awareness on Nutrient Reduction and Reduction of Domestic Wastes
- Wetland Conservation in Lower Danube

13.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

Ukraine assumes that implementation of proposed measures will result in anticipated reduction of diffuse nutrient load by 10% during five years, and will prevent pollution when economy will start recovering from recession.

13.4 Identification of Projects Ready for Implementation

The identified priority projects that are supposed to be ready for implementation in the coming 5 years are compiled and characterized in Annex II-13.

The total investment requirements of the 10 identified projects are EUR 67 million; their composition by sectors is as follows:

- 10 municipal projects with investment requirements of EUR 67 million;
- no industrial projects;
- no agricultural projects;
- no wetland projects;

Even these priority projects cannot be considered as really committed, as project funding is not yet secured.

13.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

The anticipated nutrient reduction for the 10 identified municipal point-source projects is stated in detail in Annex II - 13 and can be summarized as follows:

- N: 486 tons/year;
- P: 65 tons/year;
- BOD: 677 tons/year;
- COD: 621 tons/ year;

13.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding "non-point source" issues

The most important sources of diffuse pollution in Ukrainian part of the Danube river basin include crop production, animal farming and households unconnected to sewer systems.

The revision of data and information was facilitated by the assessment carried out in previous studies and the updated statistical data shows that there are not significant changes in the diffuse pollution loads on the territory of Ukraine since 1996. The industry and agriculture in Ukraine are still in recession while the first signs of improvement became visible only since few months due to the Decree of President on Land privatization.

Ukraine considers that reduction of nutrient pollution from diffuse pollution should be addressed through various measures including the strengthening of institutional capacity of controlling and regulating bodies, introduction of environmentally sound agricultural practices, establishing the buffer zones of streams and tributaries of the Danube rivers, assessment and implementation measures for solid waste management and wastewater treatment in rural settlements, and education of general public.

One particularity of Ukraine is related to the emphasis on the wetland conservation measures proposed in Lower Danube.

Ukraine assumes that implementation of proposed measures will result in anticipated reduction of diffuse nutrient load by 10% during five years, and will prevent pollution when economy will start recovering from recession.

(2) Main particularities regarding “point source” projects

The 10 municipal point-source projects supposed to be ready for implementation within the coming 5 year period have investment requirements of about EUR 67 million.

Even these priority projects cannot be considered as really committed, as project funding is not yet secured.

The primary characteristics of the identified priority projects can be summarized as follows:

Table 13.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	10	486	65	677	621	67.2
Industrial point sources	0	0	0	0	0	0.0
Agricultural point sources	0	0	0	0	0	0.0
Wetlands	0	0	0	0	0	0.0
Total	10	486	65	677	621	67.2

ANNEX II

COUNTRY LISTS OF PRIORITY PROJECTS PROPOSED FOR FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLANS

1. **GERMANY**
2. **AUSTRIA**
3. **CZECH REPUBLIC**
4. **SLOVAKIA**
5. **HUNGARY**
6. **SLOVENIA**
7. **CROATIA**
8. **BOSNIA-HERZEGOVINA**
9. **YUGOSLAVIA**
10. **BULGARIA**
11. **ROMANIA**
12. **MOLDOVA**
13. **UKRAINE**

Table 13.5-1: Schedule for Approximation of Ukraine's Legislation to EU Legislation

Name of National Law, Regulations	Related EU Directive	Proposed Period of Adjustment (years)	Proposed Date of Coming in Force
Water Code of Ukraine	Principles of the EC Water Policy (draft, 4/12/96)	10	2010
On Reduction of Waste of Nitrates in Agriculture	On Protection of Waters from Pollution by Nitrates from Agricultural Sources (91/676/EEC)	3	2003
On Integrated Pollution Prevention and Control	On Pollution Caused by Certain Dangerous Substances, Discharged into Water Bodies (76/464/EEC)	5	2005
On Municipal Wastewater Treatment	On Urban Wastewater Treatment (91/271/EEC)	3	2003
On Water for Human Consumption	On Water Quality for Human Consumption (80/778/EEC, COM(94), 612 final – 95/10(SYN))	3	2003
On Amendments to the List of Industrial Parts of Fishery Water Bodies (Parts Thereof), approved by the Resolution of the CMU # 552 of May 22, 1996;	On Surface Water Quality Necessary to Support Fish Life (78/659/EEC)	2	2002
Regulations on Detergents	Directive on Detergents (73/404/EEC, 73/405/EEC)	3	2003

STRENGTHENING THE IMPLEMENTATION OF NUTRIENT REDUCTION MEASURES AND TRANSBOUNDARY COOPERATION IN THE DANUBE RIVER BASIN

REINFORCEMENT OF NGO ACTIVITIES IN PROJECT IMPLEMENTATION AND AWARENESS RAISING

SUMMARY REPORT IN SUPPORT OF THE PROJECT BRIEF

AUGUST 2000

International Commission for the Protection of the Danube River

UNDP/GEF Assistance

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ABBREVIATIONS

DEF	Danube Environmental Forum
DRB	Danube River Basin
DRPC	Convention for the Protection and Sustainable Use of the Danube River
DW	Danube Watch - Magazine
GEF	Global Environment Facility
ICPDR	International Commission for the Protection of the Danube River
NGO	(environmental) non-governmental organisation
NIS	New Independent States of the former Soviet Union (here: Moldova, Ukraine)
PMTF	Programme Management Task Force (part of the ICPDR)
PRP	(Danube) Pollution Reduction Programme of UNDP/GEF
REC	Regional Environmental Centre, Szentendre (H)
SGP	Small Grants Programme
TF	(Danube) Task Force of the Environmental Programme for the Danube River Basin
UNDP	United Nations Development Programme
WWF	World Wide Fund for Nature

1 INTRODUCTION

Since 1992, the European Community has - through its Phare and Tacis programmes (Strategic Action Plan Implementation Programme), and the UNDP/GEF, in particular through its Danube Pollution Reduction Programme (1997-1999) - supported and facilitated the development and implementation of pollution abatement and environment rehabilitation projects in the Danube River Basin as well as of the Danube River Protection Convention.

A change came with the entering into force of the Convention in October 1998 and the installation of its Permanent Secretariat on the one hand, and the end of the UNDP/GEF PRP Programme and the EU-Phare and Tacis supports (October 2000) on the other. In order to ensure an efficient implementation of the Danube Strategic Action Plan and the Pollution Reduction Programme, a new GEF assistance is under preparation for the 2001-2005 period; a second part of this assistance will support similar activities in the Black Sea region.

This document is part of the preparation of a ***Danube Regional Project***, which in turn forms part of the Black Sea Basin Programmatic Strategy aimed at sustainable human development in the Danube River Basin by reinforcing the capacities of the participating countries for effective regional co-operation, protection of international waters and sustainable management of natural resources and bio-diversity. This Danube Regional Project serves to strengthen the capacities of the ICPDR Secretariat in providing a regional approach for nutrient pollution reduction.

One of the immediate objectives of the Danube Regional Project has been defined as "***awareness raising and reinforcement of NGO participation***" in water management, trans-boundary pollution control and environmental protection.

In close communication with the ICPDR Secretariat and the Focal Points, as well as with the Country Programme Co-ordinators, public participation has been assessed in three of its aspects:

- The existing NGO structures (especially the Danube Environment Forum)
- Small Grants Programme
- Public awareness activities, including the magazine "Danube Watch" and the homepages of Danube PCU and ICPDR

For all three aspects, the objective of this project was to:

- ✓ evaluate previous GEF-funded activities
- ✓ prepare a concept for future public participation with the specification of the three themes' components.

During the assessment, available documents (reports, concepts) on past and present projects and programmes were evaluated. Further, various meetings were held with the ICPDR Permanent Secretariat and the Danube PCU in Vienna, with the Regional Environmental Center for Central and Eastern Europe in Szentendre (H) and its local offices in Ljubljana (Slovenia) and Bucharest (Romania), as well as with the Speakers of the Danube Environmental Forum (DEF) and WWF International - Danube Carpathian Programme. During field visits in Slovenia and Romania, NGO projects financed under the UNDP/GEF Danube PRP-Small Grants Programme were visited. The present report was prepared by Zinke Environment Consulting for Central and Eastern Europe, Vienna. Overall project guidance and support was provided by the ICPDR Permanent Secretariat.

2 EVALUATION OF THE SMALL GRANTS PROGRAMME

2.1 General Results

Within the UNDP/GEF Danube Pollution Reduction Programme, a Small Grants Programme (SGP) was implemented by the "*Regional Environmental Centre for Central and Eastern Europe*" in Szentendre (H). Increasing public awareness and public participation was one of the main objectives of the PRP, and the provision of small grants to the NGO/Private sector was considered an efficient way to reach this goal.

The REC is a special institution initiated by the US government and established in 1991 to facilitate the institutional development of the NGO community in Central and Eastern Europe. The REC receives various (mostly governmental) grants and distributes them through competitive calls to NGOs, usually via its national offices located in all CEE countries. Over the years, the REC has built up comprehensive expertise in managing NGO support projects, both as a well-known and appreciated NGO partner and a reliable partner for donors. Through its national offices, the REC is able to have close and direct contact with NGOs during the entire project cycle. The REC often translates special donor requests into NGO language and vice-versa - NGO reports into donor language (e.g. from Hungarian into English).

The main goal of the UNDP/GEF PRP 1998-99 Small Grants Programme was to reinforce NGO participation on community-based pollution reduction measures and awareness-raising projects. The SGP should also strengthen small local NGOs and community initiatives.

Out of the 11 eligible countries, eight were chosen by the Danube PRP for this SGP (i.e. no SGP projects were awarded to CZ, SK and H, apart from D and A). UNDP/GEF provided a total of $ 200,000, i.e. up to $ 25,000 per country: For the NIS countries Moldova and Ukraine, UNDP/GEF funds were directly given to the UNDP offices. For the six CEE countries, namely Slovenia, Croatia, Bulgaria, Romania, Bosnia-Herzegovina and FR Yugoslavia, the REC ran the programme. Maximum available grant per NGO project was $ 5,000.

The REC provided comprehensive reports about the results of its UNDP/GEF SGP. The consultant visited both the REC headquarter as well as the country offices in Slovenia and Romania where a detailed look and personal visit to various project sites could be accomplished. Both countries were chosen as examples (one small and rich country from the upper Danube basin; one large, poor country from the lower basin), and within both countries, detailed project information was gained and two field projects were visited in each.

Grant proposals were invited by the REC and guidelines were issued with May 15, 1998 set as the deadline for submission. Local Advisory Boards in each of the 6 countries received and evaluated 98 project proposals, out of which - due to limited funds - only 55 projects (approx. nine per country, varying form $ 800 to $ 5,000) were selected on the basis of general NGO criteria and specific PRP criteria, as prepared by the REC. The funded activities can be connected to the following environmental fields:

- ✓ Environmental education and awareness raising to develop sensitive and active local people
- ✓ Integration of biological and landscape diversity objectives into water management
- ✓ Integration of biodiversity objectives into agriculture
- ✓ Monitoring of environmental quality
- ✓ Restoration, maintenance and conservation of key ecosystems (mainly wetlands) and species
- ✓ Promotion of sustainable rural development (eco-farming and -tourism)

Out of the 55 funded projects, the REC lists:

- ✓ 24 projects on awareness raising and education (mostly in BG and SLO)
- ✓ 17 projects on nature protection in the Danube watershed (mostly in HR)
- ✓ 8 projects on water quality research (mostly in B-H)
- ✓ 3 projects on water quality monitoring
- ✓ 3 projects on policy making (in SLO and YU).

Number of awarded projects by sector and country:

Sector	Slovenia	Croatia	Bosnia-Herz.	Yugoslavia	Bulgaria	Romania
Awareness Raising	7	3	2	3	4	5
Nature protection	2	4	4	1	2	4
Research			5	2	1	
Policy Making	1			1	1	
Monitoring				2	1	
Total	**10**	**7**	**11**	**9**	**9**	**9**

The projects started in summer/fall 1998 and ended by fall 1999.

2.2 Results from Slovenia

This was the first country visited by the public participation consultant. Ten projects proposed by Slovenia received from the REC grants from UNDP/GEF funds, with seven focusing on public awareness, two on nature protection and one on policy making.

The NGO community in Slovenia is well developed but suffers from major financial constraints (key donor organisations have suspended their support), which has forced the vast majority of NGOs to be rather passive. In addition, transboundary issues and co-operation are not yet a major concern. Therefore, institutional development of the NGO community on transboundary environment issues is critically needed.

During the trip, four projects were reviewed off site and another two were visited on site.

- **Project D08029 Revitalisation of the Krupa River Area**: This is located in a karst mountain area in south-eastern Slovenia where a big river source had for decades been polluted by PCBs stemming from a condensator plant. This news was shocking for the local people relying on good water quality. However, no direct health impact could apparently be verified. After the site had been cleaned some years ago, the SGP project ($ 2,000 for the NGO "Tourist Society Semic") aimed at improving local public awareness about the uniqueness of the nature area and the sensitive karst water system (multi-lingual info brochure with 3,000 copies; 18 tables built to illustrate a new learning pathway along the river), but also included the cleaning of the Krupa river banks. This helped to change the image of the area from a contaminated site to an attraction for tourists and a nice area to live in. The project helped to establish a new NGO "Ecological Society Semic" and to further improve cooperation of local people on water protection (e.g. accelerated construction of a sewage collector system).
- **Project D08035 What kind of tourism do we want on Kolpa river**: Kolpa river forms the border between Slovenia and Croatia and is largely still intact (national park project on Slovenian side), but subject to illegal sewage disposal and intensive recreational activities. The NGO "Fishing Society Crnomelj" used the $ 2,500 from SGP to increase the local awareness: From June to September 1998, seven littered areas along rivers banks were cleaned and a public awareness campaign was started to prevent further degradation (via national TV, local radio and newspaper). 200 posters and 2,000 info brochures were spread. A list of illegal sewage spots was given to the environment inspectorate, which resulted both in stopping a few of them and in contacts with the local industry. Yet, no complete improvement can be reported.
- **Four other projects reviewed during individual meetings at the REC office**: The "Water Detective" project is a most remarkable initiative which invites primary school kids (6-14 years) to make simple *research and art on water* and to report about it in papers, drawings and poems (published in local media). About 10,000 pupils from 140 schools (= 1/3 of Slovenia!!) have already participated. SGP helped with $ 3,000 to publish a booklet for teachers (100 pages, colour print, 2,000 copies), which was delivered to all primary schools in Slovenia.

  The "Building Wetlands for Waste Water Treatment" project promotes constructed wetlands in rural areas. For $ 1,000 SGP support, two workshops informed over 100 people about this technology and

construction projects were initiated in four villages. However, only one village is currently ready to build a constructed wetland because there is yet no governmental incentive for this kind of waste water treatment.

The "Four Seasons" project was supported with $ 3,000 to organise training workshops for 100 teachers and agricultural students on water management, which were held at a perma-culture farm. Topics included river revitalisation, water on a perma-culture farm, water quality monitoring etc.

The project "Internal Inspection and Certification of Organic Farms" financed with $ 5,000 the introduction of an independent organic farms certification (IFOAM control system) in Slovenia. In 1998, 12 inspectors were trained and 25 farms applied, out of which 13 received the status of organic farms and 8 became farms in conversion. Today, the control system is fully operating. By the summer of 2000, 600 farms had already been certified and the first markets opened in Ljubljana and Maribor with products from those farms certified in 1998. In this case, the benefit for nutrient reduction is most evident and sustainable.

2.3 Results from Romania

Romania was the second country visited. It has much more wide-spread and prominent environment pollution problems. Nine SGP projects were financed, five of them dealing with public awareness and four with nature protection. Due to the big travel distances, only two projects could be visited:

- **Project D05039 "Children and the Danube"**: The "Al. Borza Naturalist Foundation" in Braila in eastern Romania works for the protection and revitalisation of the Lower Danube floodplains (little Braila island). For the SGP support of $ 4,000, this group organised various ecological camps (including training of students to do environment education with children), a seminar "Hope for Danube" (where 300 kids hold a trial for the Danube) and water quality monitoring of the Danube and Braila city. Further, funds were used to produce small info bulletins (1,000 copies distributed to kids) and a book entitled "Only one Danube" (220 pages; 1,000 copies distributed to schools). As project effects, seven "Eco Clubs" were founded involving up to 500 children and teachers from various schools, and the NGO became the city's resource center for environmental education.
- **Project D05022 "Involvement of Civil Society in Developing a Wetland Protection Plan for north-west Dobrogea**": With $ 3,060 received, the ECOS Youth Organisation from Tulcea (entrance of the Danube delta) could launch new co-operation between the local authorities and people, aimed at reducing local pollution and at better protecting several large Danube wetlands upstream of the delta (part of the Green Danube Ecological Corridor). Altogether 40 actions were organised, including education programmes with young students from local villages, the printing and distribution of a wetland booklet (1,000 copies - 800 distributed), various local meetings, field trips, press releases etc. The SGP support also helped to raise other matching funds.

2.4 Results from Moldova

The short evaluation report indicates that the SGP started in September 1998 and that 28 project proposals were submitted to UNDP Moldova, where a Local Advisory Board of knowledgeable experts made recommendations to the UNDP Resident Representative. Five projects were eventually accepted (awards were 4 x $ 4,600 and one $ 4,050) which started in December 1998 and ended in July 1999.

The five projects were focusing on awareness raising among the local people (e.g. via map, video film, photo exhibition, brochures, pupil competition; educational CD-ROM for schools on the local fauna, TV/Radio/newspaper reporting; opinion polls, round-table discussions, an Environmental Guide promoting eco-tourism) but also on some concrete work (cleaning of the Prut river springs, tree planting, water quality monitoring). Local environment and health authorities as well as the Ministry for Environment were closely involved but the projects also helped to establish new links to business and research institutions. The existing NGOs were strengthened, and even new NGOs were established. In spring 1999, each granted NGO planted 400 trees in its project area, and in a NGO meeting on 8 November 1999, the NGO community was informed about the achievements, problems and experiences of this SGP.

2.5 Evaluation

The brief survey and intensive visits helped to identify the various strengths and weaknesses of the SGP programme. It is possible – although not very correct - to extrapolate the experiences of these example SGP projects to the entire list of projects supported by the UNDP/GEF SGP:

Strengths

- It seems that UNDP/GEF funds were used most efficiently: The amount of activities and outputs is very impressive for the very small amount of money received. This can be explained by the voluntary work that most NGO do and by their efforts to make the most out of the available support.
- Environmental education programmes, especially the training of teachers, have multiplying and lasting effects.
- Co-operation with the local media also increased public information/awareness and supported the credibility/strength/standing of the NGO in the eyes of the local public.
- All projects have some kind of environmental awareness objective, which secures a dissemination of environmental information and more sustainable impacts (e.g. change of behaviour).
- A number of projects were in fact co-funded, which made a bigger and/or more complex project feasible.

Weaknesses

- Too little funds per project were directed to concrete "pollution reduction" activities.
- Criteria to produce concrete pollution reduction were not strongly advocated in the call phase.
- There are limits on NGOs' capacity and competence in implementing concrete action (e.g. activities which require legal permits, large funds, long negotiation processes, complex technical problems).
- The available time for this SPG was sometimes too short to achieve more comprehensive results.
- The PR for the actual donor (UNDP/GEF) was very weak.
- It was diplomatically unfortunate that three Danube basin countries were not eligible for this SGP.

Conclusion

- This SGP can be considered very successful; the available funds were in most cases spent in a very efficient way, with sustainable benefits.
- In terms of direct nutrient reduction, only a few projects could be listed (e.g. conversion of farms, cleaning of river banks) but all projects have indirect effects built in in terms of awareness raising, education and initiation of nutrient reduction projects. Regrettably, none of the projects produced a quantitative figure of such success.
- There is a need and opportunity in various projects to build up on the work done before in order to materialise and extend the beneficial outputs.
- Investing in NGO activities is in most cases very cost-efficient, since NGOs work close to the problem and to the target audience, their office costs and fees are very small; they have all possibility for flexible contacts. The failure rate is small and so are the potential financial losses.
- NGOs need to be better informed in advance about the background and objectives of the SGP.
- Selection criteria should be further developed (specified) and communicated when issuing the call for submission and should then become part of the contract and reporting.
- While many projects were already designed and executed with good PR work, future projects need to have special media components to better spread information about the environmental action.
- All Danube Basin countries are in need of such NGO projects; a future SGP should involve both the countries in transition as well as Germany and Austria where a complementing SGP should be established via domestic or "western" sources (GEF is not eligible).

3 EVALUATION OF NGO STRUCTURES UNDER THE DANUBE ENVIRONMENT FORUM (DEF)

3.1 Background

The involvement of NGOs in environmental policies in the Danube Basin dates back to the governmental conference in Sofia in September 1991 when Danube governments, donor organisations and NGOs met to discuss and launch the "Environmental Programme for the Danube River Basin". While NGOs were later excluded from the preparatory process of the Danube Protection Convention, a few of them were invited to participate in the Danube Task Force (WWF, IUCN, Equipe Cousteau and the Regional Environmental Center which later stopped being considered as NGO).

The need to establish something like a basin-wide NGO network or platform was soon realised and then followed up both by the NGO community, the REC and the Danube PCU (UNDP). There were problems assopciated with the fact that the NGO community was a very young, dynamic and largely inexperienced group, while the top-down efforts of installing one partner body for the Task Force (rather than having e.g. one NGO representative per country, resulting in 13 TF members) failed. Also, the TF was considered by some NGOs as a governmental forum, which they did not want to support in general (e.g. NGO critique of a lack of governmental policy towards sustainable development or true public participation; also: controversy over the Gabcikovo hydrodam).

UNDP/GEF then funded several NGO consultation workshops which were organised via the REC in June 1992 in Bratislava (where a support for a so-called NGO Danube Forum was not granted by the NGO community), via WWF Austria & Global 2000 in September 1993 in Vienna (calling the TF to grant two seats for eastern NGOs) and via the NGO Danube Forum/Ecologist Youth of Romania on 17-20 February 1994 in Sinaia (RO) where eventually three interim NGO representatives were elected. At the 5th Task Force meeting in Regensburg (D) in July 1994, CEE NGO representatives together with western NGO representatives used the first opportunity since Sofia 1991 to raise their critical voice against a narrow-scoped draft of the Danube Strategic Action Plan that according to them lacked broad ecological goals (this was appreciated by several delegations and helped to improve the draft SAP).

A major step forward was achieved in October 1994 at the Danube NGO International Meeting (supported by UNDP and the Danube Task Force) in Mikulov (CZ) when 31 NGO representatives agreed to the establishment of the "***Danube Environment Forum (DEF)***". Following this, the elected three DEF speakers were invited to Task Force meetings but over time failed to secure sustainable, competent participation and communication (this was partly due to the absence of follow-up baseline support to the DEF by UNDP/GEF after 1996). In 1995, NGO focal points in the Czech Republic, Slovakia, Croatia, Romania, Moldova and Ukraine organised meetings to promote NGO collaboration. On 1 December 1995, the DEF board met in Budapest to prepare the **1st General Assembly**, which was held on 15-17 February 1996 in Kosice (Slovakia) with 75 participants from 51 Danube basin NGOs. After that, however, the activities of the DEF speakers receded and by 1997, there was no more activity within the DEF.

3.2 Reinforcement of NGO Cooperation in the DRB

Within the Danube PRP, a new effort was undertaken to reinforce and develop the NGO community in the region. This firstly focused on the national NGO communities and started with the training of NGO facilitators (10-19 March 1998 in Baden/A), who conducted from April to June 1998 national NGO consultation workshops (each 2 days long). They were organised by the REC in 11 Danube Basin countries and involved altogether 212 NGO representatives out of which five to eight NGO representatives per country were nominated to take part in the PRP National Planning Workshops, and three to four NGO representatives were nationally nominated and invited to the DEF Regional Consultation Meeting held in Szentendre (H) on November 12-14, 1998.

On this occasion, the 39 participants agreed to **re-establish** the NGO platform named "***Danube Environment Forum***". Again, three speakers were elected (for the upper, middle and lower Danube Basin parts) and an ***Interim DEF Secretariat*** became established in Bratislava at the office of the NGO Daphne. The speakers, together with the Secretariat, prepared the crucial institutional development steps (secretary; e-mail conference; new logo; project proposals for baseline funding submitted to PCU/UNDP). On March 18-19, 1999, the **first DEF Board meeting** was held in Bratislava, which prepared the DEF statute, the DEF registration, the national DEF structure and fund raising; this meeting was again funded by UNDP/GEF.

In April 1999, the official legal registration of DEF as an international organisation under the Slovak law was initiated (founding members were Daphne/SK. Union for the Morava River/CZ and Distelverein/A) which was accomplished in October 1999 (*Memorandum of Foundation of DEF*).

At the ICPDR-PMTF meeting on 12 June 1999, three project proposals on DEF institutional strengthening, public awareness raising and wetland restoration were presented (they later became part of the Project Brief for the Preparation of the GEF Danube Regional Project!). In November 1999, the DEF submitted its formal application to the ICPDR for being granted "observer" status, which was accepted at the ICPDR meeting on 22-23 November 1999 in Sinaia/RO.

3.3 Situation of the DEF today

In 1999, another fifteen NGOs from ten Danube countries applied for DEF membership and ten were granted it by the DEF Board at the DEF Strategy Meeting in Bratislava on March 6-7, 2000(meeting funded by the Austrian Federal Chancellery).

Today, the **DEF has 13 members representing 11 Danube Basin countries** (i.e. in all except Hungary and Moldova). Another five NGOs have requested membership (status April 2000). In **six countries**, DEF also disposes of approved **DEF National Focal Points** (Austria, the Czech Republic, Slovakia, FR Yugoslavia, Romania, Ukraine), for another five (B-H, BG, HR, D, SLO) this is under preparation during 2000. In Slovakia, Yugoslavia and Romania, there exist already active DEF networks with each more than ten local NGOs that benefit from the DEF information service provided by the Secretariat in Bratislava.

Except for the mentioned meetings and the invitation of DEF speakers to UNDP/GEF PRP or ICPDR meetings (e.g. at the Hernstein workshops, PMTF and Steering Group meetings, to the Ad-hoc Expert Group on River Basin Management), DEF has yet no institutional financial support; and all expenses such as registration, secretariat and communication are covered by the Secretariat, Speakers and DEF members. Still, efforts are under way to make possible the first general Assembly in 2000 (planned in Galati/RO).

Apart from WWF, DEF is the only relevant NGO in the Danube Basin that works on regional level on environment (water). It is recognised within the NGO community but yet not well known especially among NGOs working in other fields than water and nature. It is a fact that until today only very few NGOs in the region work on international level and that the importance of e.g. transboundary pollution problems posing a task for local NGOs became only evident with the Tisza accidental spills in early 2000.

Until this day, the DEF has not been able to establish national links in Hungary and Moldova. Hungary is a special case because a few NGO leaders with their negative experience of the early 1990s top-down NGO involvement process still today dominate the opinion about the DEF, the EPDRB and ICPDR. However, recent communication indicates that the DEF could enlisist Hungarian and Moldovian members by the end of 2000.

The participation of NGO representatives at the 11 PRP National Planning Workshops in 1998 strengthened the participatory and communication process with governmental bodies. Representatives from local communities and science also contributed to an open assessment of environmental problems, policy objectives and measures to be undertaken. Participating NGOs also expressed their satisfaction with these workshops and their outcome. The only country where these workshops and NGO involvement were not successful is Hungary: For many years already, a few prominent Hungarian NGO leaders have not favoured the Danube regional process.

Further, it should be mentioned that a few NGO representatives (DEF, WWF) attended the two successful Danube Transboundary Analysis workshops in January and May 1999 in Hernstein (A).

3.4 Other NGO Involvement

To assess if and how NGO participation and awareness raising were reinforced by the UNDP/GEF Pollution Reduction Project, a Questionnaire was distributed to the national consultants asking them to respond to the following questions :

1. During the DPRP there were several activities related to public participation. In what respect did each government in the DRB notice an (beneficial ?) impact from this? (was it through NGO participation in national workshops, through the Small Grants Programme or through the involvement of the DEF?)

Replies from most countries state that NGO participation in the National Workshops was viewed as a very positive experience (e.g. as a second, independent opinion, provision of new facts). Moreover, the SGP proved to be a successful contribution towards to increasing NGOs' level of expertise and local public awareness/environmental education activities.

2. What possibilities and needs do the governments suggest in order to improve public participation in the future? In particular, what should new NGO programmes focus on more (e.g. local field activities, public awareness raising via the media, direct cooperation of specific NGOs with government authorities on specific projects).

Based on the answers to this question, it seems that funds are the only limiting factor rather than knowledge or lack of cooperation with NGOs. It was felt as a pity that very rewarding NGO ideas and initiatives are not better supported. Future NGO SGP should focus on concrete local field activities and public awareness raising (e.g. introduction of phosphorus-free detergents), also to demonstrate the importance of local communities in solving global problems. Interest was also expressed in improving the involvement of NGOs and the public in governmental decision-making processes.

3.5 Conclusion

- It can be stated that the UNDP/GEF PRP in 1998/99 helped to raise awareness among a large number of national NGOs regarding the Danube Basin environmental problems and the role and tasks of the Danube Convention and its ICPDR.
- UNDP/GEF funds were decisive in re-institutionalising the DEF but were insufficient to sustain it. The DEF (through its elected speakers and Secretariat) was able to then establish itself as a legal body with elected speakers, board, secretariat, national representation in most Danube countries and various policy work. However, when viewed against the large NGO community and NGO competence available in the region, the DEF still seems to be weak in its structure, membership, communication and policy work (not forgetting that it has officially existed for less than a year only!).
- The **future development** of DEF still depends on outside funding (e.g. UNDP/GEF) which should focus on the following priorities:
  - ✓ Institutional development of DEF (more members, more internal and external communication, better information service by the secretariat, better communication and co-ordination of speakers, board & national focal points, more concrete outputs);
  - ✓ Strengthening the local NGO community interest in the Danube Basin policy issues, aiming at bilateral co-operation with the DEF international structure via national DEF Focal Points and their projects (awareness raising, education, wetlands, hot spots etc.) including annual national NGO meetings;
  - ✓ Promotion of the development and submission of NGO projects to the UNDP/GEF Small Grants Programme, i.e. the DEF should invite both its National Focal Points and the national NGO community to prepare respective proposals for nutrient reduction (e.g. via wetland restoration);

- ✓ Strengthening the DEF policy work through regular DEF board meetings and General Assemblies, the enlisting of DEF experts for Danube issues as well as active DEF participation at ICPDR meetings, workshops and training;
- ✓ Public awareness raising within in the general public (local people) about the needs for local and transboundary water management, pollution prevention and mitigation, wetland conservation and restoration;
- ✓ Competent DEF engagement in important regional issues, e.g. Tisza spills (BMTF), Lower Danube Green Corridor, GEF Strategic Partnership etc.

4 EVALUATION OF PUBLIC AWARENESS RAISING

4.1 Background

The distribution of information and the raising of public awareness has not yet been a prominent activity of the Danube programmes since 1991. There have been a few press releases for the media (e.g. on the occasion of the signing of the Danube SAP in December 1994) but no real PR campaign. The most relevant activities were

- the release of the quarterly bulletin "*Danube Watch*" since December 1994
- the establishment of web-pages by the Danube PCU (www.rec.org/DanubePCU) and by the ICPDR (www.icpdr.org/DANUBIS)
- the request expressed to NGOs to engage in public awareness raising which has lately been indirectly successful through the NGO Small Grants Programme (1998-1999)

4.2 Evaluation of previous Public Awareness Raising Activities

4.2.1 Danube Watch

"*Danube Watch - The Magazine of the Environmental Programme for the Danube River Basin*" was launched in December 1994 by the Danube PCU. It is an independent quarterly magazine of 16 A4 pages bringing stories of mostly 1-3 pages on a whole range of environmental issues within the region with a focus on activities under the EPDRB and the ICPDR as well as on local issues related to environmental policy, protection, pollution and restoration (mostly written by journalists). Information is also brought to the reader in the form of interviews, statements by national government officials, local special authorities and NGOs. In other words, a big portion of the DW is written by involved officials and experts.

In 1995, a special brochure called "*Action for a Blue Danube*" presented the Environmental Programme for the DRB and its first results (24 pages).

After being published first in black and blue until June 1997, a re-launched DW in March 1998 appeared in a full colour version with shorter stories (still 16 pages).

In 1999, a new tender resulted in a change of publisher and a change of the design but a continuation of the content concept (June 1999).

With the 2/2000 issue (expected in September), the funding of *Danube Watch* by EU-Phare Programme and the UNDP/GEF will cease. How the magazine will be sustained beyond that point remains to be decided. The support for single issues by national donors, as in the case of no. 1/1999, funded by the Austrian Federal Chancellery, could be a bridging solution but cannot secure a regular publication of the magazine.

Danube Watch can be ordered free of charge from the Danube PCU and the ICPDR Secretariat. It is presently (July 2000) mailed to 6,400 addresses reaching an estimate of 10,000 readers:

- ✓ 7% government authorities and administration,
- ✓ 27% international organisations and IFIs,
- ✓ 25% R & D, professional training and universities
- ✓ 11% private individuals and NGOs,
- ✓ 17% civil engineers, scientists etc.).

It is obvious that *Danube Watch* reaches quite efficiently the specific target audience of the DRPC and ICPDR as well as a broader range of persons and institutions.

Since 1999, DW has also been published on the homepage of the Danube PCU (www.rec.org/DanubePCU) which will be incorporated into the ICPDR homepage (http://www.icpdr.org/Danubis) in fall 2000.

Danube Watch is the only available environmental magazine in and for this European region. This indicates its importance as a - largely independent - information source especially for regional issues and for the ICPDR (especially since 1998).

Danube Watch has a very positive image in the region as an interesting, attractive and instructive source of information. Readers to whom it is mailed respond unusually positive to the publisher.

Self-financing of Danube Watch

Several efforts have been undertaken over the past years and in particular since 1999 to sell advertising space to make the magazine financially independent and sustainable. For independent financing, ten full-page advertisements would need to be sold. However, potential advertisers have expressed very little interest, much below the minimum funds required for self-financing..

Reasons:

- The overall number of copies distributed and read is too small for companies doing advertisement. Potential donors such as banks, airlines, insurance and business companies have shown no interest.
- DW is still a special magazine through which the general public cannot be reached. Even though it is non-scientific, its content is relevant only for a restricted audience and not attractive for most local people (even if national editions would be produced);
- The region and sectors addressed cannot be well reached by business groups through such advertisements; experience gained over the past years has shown that direct lobbying and personal communication is more effective for these companies than public advertisements.

As a second alternative for the raising of funds, those interested in the magazine were contacted and asked if they could secure the publication of the magazine. An informal survey condicted by the publisher and Danube PCU/ICPDR has indicated that

- single readers would not be ready to pay as much (e.g. via paid order) as needed to simply cover the administration of these payments
- the governments in the region do not have respective budgets to share the cost of a regular publication (more than one issue is not feasible).

Therefore, for the coming years, the benefit of having and spreading Danube Watch in the region cannot be secured from sources within the region.

Recommendations to improve Danube Watch

The fact of another re-launch of *Danube Watch* in 2001 should be used to undertake further activities towards0 improving the magazine, namely

- ✓ Development of a general **magazine concept** including the magazine structure (e.g. pre-fixed cover stories, special pages for the ICPDR Secretariat, governments, NGOs, a news page, ICPDR President's comment, updated calendar of events, contact addresses etc.).
- ✓ The **parallel publication** on the **ICPDR homepage** should be continued as a *complementing* publication form to expand its outreach. However, the electronic version cannot replace the print version because the latter is received by a broader and more interested readership (the internet will for many years to come remain a very uncommon tool in downstream countries).
- ✓ A DW "**Readers Online Forum**" should be established via an **inter-active chat-page**: given that the issues appear at rather long time intervals, the internet should be used to establish more short-term communication among the readers.
- ✓ The **sub-title of the magazine** should be changed/updated from "*Magazine of the EPDRB*" to e.g. "*Magazine of the International Commission for the Protection of the Danube River*".
- ✓ The **distribution of the magazine** should be improved: mailing lists should be reviewed and updated and new readers should be included (e.g. from Romania, Moldova, Ukraine), the overall distribution concept should be re-assessed (e.g. via the central government, the DEF Focal Point, or one contracted student).

- ✓ While it seems reasonable to have the editorial team located in Austria near the ICPDR, it should be financially advantageous to **re-locate** the **printing** from Vienna to a less expensive transition country, e.g. to printing companies in Bratislava, Brno or Györ.
- ✓ **Special DW editions** could be produced to address certain reader groups or refer to certain events/occasions, e.g. national editions with many or all texts translated; an issue targeting children or high school or college students to complement a public awareness campaign; an issue presenting very obvious results of projects funded from the Small Grants Programme, etc.

4.2.2 Homepage

There are currently two internet addresses under which Danube region information can be found:

- The homepage of the Danube PCU (www.rec.org/DanubePCU)

  This is a comprehensive source of information covering all subjects and activities undertaken within the EPDRB over the last years. It brings broad or in-depth information about
  - The Danube Protection Convention including the ICPDR
  - The organisation, structure and institutions under the EPDRB
  - The Geography and Nature of the DRB
  - Publications and Projects under the EPDRB (list and summary of implemented projects)
  - News and events
  - Useful links

  As the EU-Phare programme is ending its support, the Danube PCU office will be closed in October 2000 and this homepage will consequently be closed by the end of 2000 and incorporated into the ICPDR homepage.

- ICPDR homepage: http://www.icpdr.org/DANUBIS

  This is presently mainly serving as an **intranet system** for ICPDR members, containing many "confidential" data (e.g. various national data, reports, meeting minutes etc.). The information provided to external users is presently almost non-existing, even though there are important chapters listed:
  - Legislation
  - News and events
  - Administration
  - Agriculture
  - Disasters, accidents, risks: provides a lot of information from the Elbe and Rhine rivers!
  - Information
  - Pollution
  - Water

  The sensitivity of no-public-accessibility presumably stems from "pre-Aarhus Convention" times when many governments and authorities were (still are!) not used to or reluctant to open their files to inform the general public. With the Aarhus Convention ("on Access to Information, Public Participation in Decision-Making, and Access to Justice in Environmental Matters") and the EU Guidelines for Public Information in force, a substantial change of the ICPDR's access-to-information policy is overdue. The IC has on its agenda the revision of the homepage with a larger part of information to be publicly available ("Access Rights Concept" from July 2000) and is expected to improve the situation in the coming months. From October 2000 on, the ICPDR will incorporate the homepage of the Danube PCU (www.rec.org/DanubePCU) and integrate it into the Danubis homepage.

4.2.3 Other Public Awareness Activities

Apart from the already mentioned activities, two project components from the Pollution Reduction programme contributed essentially to awareness raising :

- The organization of National Planning Workshops using target-oriented methodology and a participatory approach,
- The implementation of community-based projects with the financial support of the GEF Small Grants Programme.

National Planning Workshops conducted in 1998 in the frame of the Pollution Reduction Programme in each of the central and downstream Danube countries, contributed in an essential manner to public awareness raising. In each national workshop, 30 to 40 experts from ministries, local governments, scientific institutions and national NGOs participated, carrying the message of pollution reduction and environmental protection to their respective departments, institutions and to the general public. At the decision making level, ministers, vice-ministers and directors were involved in the organization of National Workshops. Statements, interviews and speeches were brought by the mass media to a large audience.

The preparation, publication and implementation of community-based projects under the GEF Small Grants Programme has contributed equally to public awareness raising. Calls for submission of project proposals were publicly launched to all NGOs in the participating countries. The implementation of projects was reported by the local press, informing a large public about the initiatives taken by local NGOs to assure environmental protection and pollution control. Some projects were conceived for raising public awareness on specific environmental problems.

Conclusion

National Workshops and the implementation of the Small Grants Programme were essential elements to reinforcing public awareness at the grass-root level as well as the decision making level.

Training programmes, workshops and the implementation process for the future Small Grants Programme should contain special components for “applied public awareness raising” through frequent and regular information of the public on “success stories” related to environmental protection, pollution control and especially on nutrient reduction projects.

5 CONCEPT PAPER FOR NGO ACTIVITIES, SMALL GRANTS PROGRAMME AND PUBLIC AWARENESS

The overall idea is to increase public involvement in basin-wide nutrient reduction measures, including practical (replicable!) and community-based projects, education and training, monitoring and control or policy programmes. Awareness raising can effectively contribute to expanding the local perception of transboundary and regional issues and even boost the global understanding of environmental problems and solutions.

5.1 Concept for Small Grants Programme

Based on the discussions with the REC headquarter, the REC local offices in Slovenia and Romania as well as with the DEF speakers, WWF and local NGOs, it seems that benefits from SGP can be increased if the programme incorporates the following ideas:

- More substantial SGP projects by increasing the maximum grants and time to each 15-20,000 $: This will improve the relevance/capacity of each project and importance of possible outputs/ benefits/ impact e.g. for nutrient pollution aspects.
- Two project phases within the new SGP, with each lasting about 18 months, with experience from the first SGP phase used for the second phase: A small-grants project should not run beyond a maximum of two years. However, thanks to the long period of the new UNDP/GEF programme, two SGP phases can be implemented.
- The project calls should rather be issued on regional level, giving preference to the best ideas having the potential of producing basin-wide model results: As the issues tackled are not of essentially local or national character, there is no need to restrict the SGP to an even allocation of funds to all countries. The tender and the proposals should also reflect the character of the programme - both are regional.
- Each project proposal should be submitted in English and should indicate an English-speaking contact person: This will help to overcome the language constraints that many NGOs have while in fact English is not essential for the actual progress of most projects but only for its international communication.
- Preference should be given to SGP projects dealing with important model hot spots of nutrient pollution and transboundary aspects: While this should not be an exclusive condition (there may be excellent project proposals e.g. on diffuse nutrient pollution), the SGP should focus on the most prominent regional pollution problems. Many NGOs are already working on hot spot problems, others are open and interested in re-orienting their activities in this direction. In each project, the transboundary character of the pollution problem should be addressed, either by involving partners from neighbouring countries or by raising the awareness on the transboundary aspect from a national perspective.
- The projects selected and awarded should have demonstration and model character for the DRB. As the Danube PRP has shown (especially in its Transboundary Analysis), there are many similarities among local pollution problems and the constraints and barriers to overcome. The SGP offers an opportunity to *implement small-scale, low-tech measures* having significant pollution reduction effects, such as the introduction and expansion of organic farming, manure handling methods, constructed wetlands for rural sewage treatment, wetland restoration, more efficient pollution control and monitoring etc. For the end of the SGP, it is therefore important to summarise and widely spread the results gained and to share the practical experience with other parts of the DRB faced with similar problems (see below). This SGP may even become a policy guideline for governments looking for inexpensive ways to reduce their local and transboundary pollution problems.
- Identification of SGP project indicators able to measure the benefits/success in terms of nutrient reduction: It is important to give preference to those project proposals having developed and built-n indicators not only for direct pollution reduction measures (e.g. treatment of sewage; improvement or change of production processes) but also indirect indicators through education, training and awareness-raising projects (e.g. monitor the educated/trained persons' daily behaviour prior and after; count the media reports and the reached audience over time; count new contacts to the polluting industry).

- Multi-stakeholder co-operation projects (one NGO together with e.g. industry, community, government agency): While the previous SGP already had many such projects, the role of cross-sectoral communication and co-operation should be further strengthened in this part of Europe. In this respect, NGOs are still considered as low-importance stakeholders, whose innovative spirit/motivation and pro-active role is not sufficiently recognised. On the other hand, such "promoted" co-operation can also improve the competence of NGOs on the technical level.
- Thorough pre-information of the SGP through national NGO meetings: This will deal both with the new SGP and its conditions and with more general, basic information about the relevance of the DRPC, the ICPDR, the DEF, the causes and effects of water pollution and the national and international efforts to mitigate them. The series of these meetings in all Danube countries would secure a higher general awareness about why this Danube SGP exists and what the NGO community can do and is invited to do. The meeting should end with a "project idea stock exchange" to foster new NGO contacts and better NGO project proposals.
- Project administration should secure:
  - Information about the SGP (pre-information meeting, call with submission procedures)
  - Contacting to the national NGO communities
  - Selection and awarding procedure (this should include one representative from ICPDR and WWF as independent bodies; DEF member organisation may want to also submit projects and should therefore not be involved at this level)
  - Contracting and reporting
  - Advise to NGOs on administrative aspects
  - SGP administration and reporting to ICPDR
- Project quality assurance service should be provided by a SGP co-ordinator who communicates with the NGO contact person and visits each selected project during the implementation phase. This is to support NGOs in solving various problems (technical, administrative, co-operation) and to secure a good orientation and progress of each SGP project with respect to the regional objectives. As the SGP experience has shown, such a service is needed and could happen both during the submission phase, at half way through the implementation and possibly also in the final reporting stage. This person would link between the ICPDR, the SGP implementing agency and the NGO community on non-administrative aspects.
- Final international presentation event where e.g. the five best projects would be presented to the public, the media and governments: It is assumed that many national and local governments would benefit from the results and experiences made in some of the practical projects. Due to the constraints of most government budgets in the Danube Basin, such small-scale but efficient pollution reduction and stakeholder co-operation projects would serve as models for other parts of the country and the Danube Basin. The time and location of the event could be linked to a regular ICPDR meeting.
- A complementing SGP should be initiated in Germany and Austria to also raise the local awareness about transboundary pollution problems in the upper part of the Danube Basin, which still substantially contributes to the nutrient loads of the Danube. The fact that GEF cannot support projects in these EU countries should not prevent similar nutrient reduction projects from being implemented there. The possible financial sources, size and character of the SGP and the number of projects supported should be assessed in winter 2000/2001 by the two country delegations. The ICPDR Secretariat, WWF and DEF may be involved in the SGP preparation and project selection.

5.2 Concept for DEF Activities

The institutional strengthening and capacity building of the NGO community in the Danube River Basin should focus on the structure of the Danube Environmental Forum.

Justification:

1. The DEF is one of the very few NGO networks in this region of Europe and it is the only one directly linked to the Danube Convention/ICPDR. Article II (DEF Objectives) of its "Memorandum of Foundation" provides the following definition of its objectives:

a) "to promote international support to the future sustainable development of the Danube River region on issues such as biodiversity, land use, environmental education, etc.;

b) as the NGOs representative body to ensure future NGOs participation in the International Commission for the Protection of the Danube River structures and other Danube institutions;

c) *to promote sustainable financial mechanisms ensuring permanent NGOs representation in the Danube Rive-related governmental programs*."

2. NGOs, and in particular the DEF with its combined regional and local member structure, secure through their involvement in the ICPDR activities a high level of public information and public participation between the DRPC/ICPDR and the general public. Public awareness raising on specific environmental issues is one of the key objectives of all environmental NGOs, and consequently of the DEF. Therefore, the strengthening of the DEF will increase the capacities of the ICPDR in awareness raising and public information.

The support of the UNDP/GEF Danube Regional Project should therefore focus on ***capacity building*** *to secure better NGO co-operation, communication and representation*:

- ✓ Institutional development of DEF: It should support the main institutions and actors of the DEF to secure baseline funding and improve their efficiency and outputs, and specifically:
  - **DEF Secretariat:** improved service capacity for DEF members, other NGOs, ICPDR and the general public (information center for all persons and institutions interested in gaining information about the DEF work and access to NGO resources)
  - **DEF Speakers:** improved capacities to co-operate internally and with ICPDR
  - **DEF National Focal Points:** improved capacities to communicate with other local NGOs
  - **DEF meeting bodies:** regular meetings of DEF board and General Assembly.
- ✓ Public awareness raising (education, information and monitoring) is needed within the NGO community in the Danube basin and within the general public (local people) about the needs for local and transboundary water management, pollution abatement, wetland conservation and restoration. This should become a key activity especially of the DEF National Focal Points, as they can - from an independent side - complement governmental activities to tackle pollution and water protection problems. Unlike the Small Grants Programme, which will necessarily focus on *local* point issues (hot spots) and will, therefore, not address nation-wide issues, the DEF with its National Focal Points should run more general, *nation-wide* public awareness raising campaigns.

  One simple activity of the DEF should be a regular publication of information via the "**Danube Watch**" magazine (via a special DEF page). The same applies to a **DEF homepage** which is already under preparation.
- ✓ Policy work: stronger involvement in the ICPDR and its working groups; more competent engagement in important regional issues (water-related environment sector); capacity building in local NGO communities; provision of experts, expert statements, studies and data (e.g. monitoring).

5.3 Concept for Public Awareness

The new UNDP/GEF Programme offers for the first time the possibility to link and complement various awareness raising activities under a joint umbrella. It is therefore proposed that public awareness raising activities should be conducted on various levels which can be partly interconnected. A special role is assigned to the NGO community, whose public awareness activities should be strengthened and more oriented to the nutrient pollution problem:

- Via the Danube Watch magazine: The "DW" magazine could increase its attractiveness since it is a unique and important source of information for the region. For the future, further development steps should include:
  - ✓ Development and implementation of a new **Danube Watch concept** (magazine contents, production/printing/distribution) that would be prepared by the new publisher (new contract) in co-operation with the ICPDR Secretariat; the objective is a closer link to the GEF nutrient reduction programme and in particular to other awareness-raising activities (e.g. Small Grants Program, folder, homepage, DEF awareness campaign)
  - ✓ Production of new, partly **Specialised Issues** of Danube Watch
  - ✓ Introduction of a specialized **"DEF/NGO Forum"** in Danube Watch
  - ✓ Installation of a DW "**Readers Online Forum**" on the ICPDR homepage (possibly as a link to the publishers homepage where the DW web-page will be established)
- Via the ICPDR homepage : Open access to information and decisions helps to create accountability and to support sound environmental policies. The recent improvement of the Danube PCU homepage and the upcoming inclusion into the ICPDR homepage will increase the number of its "visits" and potential users. Therefore, the homepage has a good potential to meet information and awareness-raising needs.

  The installation of a homepage makes sense only if it provides substantial information. So far, the ICPDR homepage is not accessible to the broad public and restricts simple and useful information from the Danube region contained in various new studies and data. This refers, for instance, to the UNDP/GEF PRP whose outputs are in fact attractive documents which will satisfy many needs of public interest and which have no reason to be kept internal (regardless of the fact that there is also a more complicated possibility to get a copy from the ICPDR Secretariat). As long as such information is not shown to the public, its support for such international donor programmes will remain very low (see e.g. the ongoing critique of Hungarian NGOs).

  For the future, i.e. with the start of the new UNDP/GEF programme at the latest, this has to be radically changed. It is hoped that the incorporation of the Danube PCU homepage will result in the immediate availability of most of the information not yet available on that homepage. Second, all new ICPDR documents which have already been approved for publication by the ICPDR body should then be published:
  - ✓ General information about the geography and nature of the Danube Basin
  - ✓ Information about the Danube Protection Convention, the ICPDR and its bodies
  - ✓ Information about other legal frameworks including the EU Water Framework Directive
  - ✓ Results from the projects conducted under the EPDRB including the Phare-SIP and the UNDP/GEF PRP (there is a tremendous amount of important and useful information from this programme in particular)
  - ✓ Regularly updated calendar of events
  - ✓ Regularly updated information about important issues such as the Tisza pollution spills, the Steering Group and Expert Working Group meetings (contact, mandate, tasks, annual reports, meeting minutes), the new UNDP/GEF Small Grants Program
  - ✓ "Danube Watch" including its newly suggested "Readers Online Forum"
  - ✓ Links to ICPDR members and observers (e.g. WWF, DEF)

- Via a new ICPDR information folder: This could be a concise coloured leaflet (e.g. A 1 or A2 folded to A4 size; 40% photos and maps) which would briefly inform about the mandate, tasks and activities of the ICPDR and its various bodies, on the Danube Protection Convention and the overall environmental situation in the Danube River Basin.

  This would be produced for the following target groups:

  - ✓ For guests and correspondence between the ICPDR and national government focal points;
  - ✓ At conferences, meetings, workshops where the ICPDR gives presentations;
  - ✓ At public events organized or co-organized by the ICPDR.

  The production of **national versions** may be appropriate but should rather become a (self-funded) task of the national government. Also, it could become part of the national public awareness raising campaigns run by DEF, in which case a degree of customazation would be needed (some local issues to be included).

- Via the Small Grants Programme: This would include

  - ✓ a series of information workshops at the beginning of the SGP in each of the 11 eligible countries which would use half a day on raising the awareness of the national NGO community about the environmental pollution problems, Danube Convention, the ICPDR, DEF, the UNDP/GEF programme. It is assumed that over 300 NGOs would be addressed and directly informed through expert speeches, papers and other illustrative material that they would be able to use for their various activities.
  - ✓ through the implementation of the SGP's local projects aimed at nutrient reduction activities. It is expected that these very concrete local activities would be communicated to the media and the local public, and at the end of the SGP to the international media to be invited to the SGP final event.

- Via an NGO campaign conducted by the Danube Environment Forum National Focal Points: As the DEF is the only region-wide network (apart from the ICPDR) which is committed to raising public awareness on the Danube environmental problems, it is the appropriate institution to run such a campaign. However, the DEF is still weak in its professional experience in the actual *campaigning* sector, i.e. how to develop and implement an international campaign. It is therefore suggested that a professional public awareness/communication expert should consult, train and support the DEF national focal points.

  The campaign topics would focus on nutrient pollution and its monitoring/mitigation/reduction/ prevention, with a mix of basin-wide aspects (e.g. transboundary river and pollution management, EU accession process and its implications) and national issues (e.g. on changing intensive agriculture, promoting constructed wetlands in rural areas, cleaning an important river stretch). Unlike the SGP, this campaign would have a more *national* character addressing the governmental efforts (water protection, bilateral and multilateral agreements, environmental education programmes etc.), the daily behaviour of consumers and model activities of the industry.

  The campaigns are expected to run for two years, plus a six-month preparatory period and two months for wrapping up and evaluation. The public awareness/communication expert will cooperate with 3 local campaigners (e.g. two pollution experts, one PR/education person) working at the DEF national focal point. There should be a **regional campaign meeting** prior to the start of the campaign, involving two representatives from all DEF national focal points, to jointly prepare, harmonise and co-ordinate the overall campaign.

6 PROGRAMME COMPONENTS FOR THE GEF DANUBE REGIONAL PROJECT

6.1 Component Small Grants Programme (SGP)

- **Small Grants Programme** for implementation in two phases, $ 1,000,000 each:
  - Eligible: all environmental NGOs from 11 Danube Basin countries (CZ, SK, H, SLO, HR, B-H, YU, BG, RO, MD and UA)
  - Maximum grant per project: $ 20,000
  - Expected results: about 50 projects per call (theoretically appx. 4 per DRB country)
  - Administration by sub-contractor/implementing agency: 10 to 15% of the budget

  Sub-Total SGP **$ 2,000,000**

Suggested Timing for the SGP:

2001	July:	SGP preparation
	September:	Pre-information meetings in 11 countries and call for submission
	November:	Phase 1 submission, selection, awarding
	December:	Contracting
2002	January:	Phase 1 projects start
	February:	First quality assurance visits
	October:	2nd quality assurance meetings
2003	June:	Finalisation of Phase 1
	August:	Evaluation of project results
	October:	First regional SGP presentation event
	November:	Phase 2 call for submission
2004:	January:	Submission, selection, awarding
	February:	Contracting
	March:	Phase 2 projects start
	April:	First quality assurance visits
	December:	2nd quality assurance meetings
2005:	September:	Finalisation of Phase 1
	October:	Evaluation of project results
	November:	Finalisation of SGP
	December:	2nd regional presentation event

- **Recruitment of International/National Experts** for project evaluation and programme coordination preparation ($ 106,000):

  Travel: 4 visits to 4 projects in 11 countries ($ 40,000):

  Sub-Total : **$ 146,000**

- **National Pre-Information meeting**

  Invitation (REC lists!) sent out to all NGOs known to work on water and environment issues, brief introduction into the meeting and request to think about potential projects .

Day 1:	noon	Arrival of participants
	14:00	Introduction to Pollution problems of the DRB
		Information about the Danube Protection Convention, ICPDR, GEF program
		Response by the government (national activities)
		Response by the DEF (national focal point)
		Report about previous SGP (including presentation of 2 model projects)
Day 2:	9:00	The new SGP - objectives, structure/timing, criteria Discussion
		"SGP Stock-exchange": possibility to discuss project ideas and aspects both with other NGOs and with representatives from the ICPDR and SGP implementing agency
	13:00	end and departure

Sub-Total (50 NGO representatives, 1 night, 2 meals and meeting facility): **$ 55,000**

- **"End of SGP" evaluation meeting**

  Invitation to all NGOs who participated in the SRP and to cooperating Government agencies to evaluate the results of the SGP and to develop follow-up initiatives (programmes and financial support) :

Sub-Total : 50 participants, 1 night, 2 meals and meeting facility: **$ 44,000**

TOTAL Cost for 5 years : **$ 2,245,000**

6.2 Component DEF Structure Development

DEF institutional support

Secretariat	secretary, office costs, web page	$ 18,000
Speakers (3)	part-time office work (10 h/week), travel	$ 27,000
Board	room; accommodation, meals & travel for 12 persons	$ 10,000
General Assembly	accommodation, meals and travel for 40 persons	$ 15,000
National Focal Points	11 countries (not in D, A): fees and office; organization of annual national NGO meetings	$ 40,000
	Per year	$ 100,000

TOTAL Cost for 5 years : **$ 500,000**

6.3 Component Public Awareness

6.3.1 Danube Watch magazine

Cost of one edition, including preparation, editorial work, printing and mailing : $ 15,000

Sub-Total for 5 years : **$ 300,000**

6.3.2 ICPDR homepage with DEF/NGO page

To be developed and maintained by ICPDR

6.3.3 New ICPDR information Folder

Production of information folder (organisation, editorial work, folder design, selection of photos, adoption of maps, preparation for print etc.):	$ 15,000
Printing of 3x10,000 copies (2001, 2003, 2005) :	$ 20,000
Sub-Total for 5 years:	**$ 35,000**

6.3.4 DEF public awareness campaign

National and intern. public awareness/communication experts :	$ 146.000
Travel:	$ 40,000
1 regional co-ordination meeting: 2 DEF persons/country, 2 days	$ 14,000
11 national campaigns:	$ 280,000
Development and production of awareness raising materials	$ 420,000
Sub-Total cost for 5 years:	**$ 900,000**
TOTAL Cost for 5 years :	**$ 1,235,000**

6.4 Overview of Programme Components

6.1. Component Small Grants Programme:	**$ 2,245,000**
6.2. Component DEF Structure Development:	**$ 500,000**
6.3. Component Public Awareness:	**$ 1,235,000**

STRENGTHENING THE IMPLEMENTATION OF NUTRIENT REDUCTION MEASURES AND TRANSBOUNDARY COOPERATION IN THE DANUBE RIVER BASIN

DEVELOPMENT OF PROCESS, STRESS REDUCTION AND ENVIRONMENTAL STATUS INDICATORS TO MONITOR NUTRIENT REDUCTION AND ITS EFFECTS IN THE DANUBE RIVER AND THE BLACK SEA

REPORT IN SUPPORT OF THE PROJECT BRIEF

AUGUST 2000

International Commission for the Protection of the Danube River

UNDP/GEF Assistance

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1 INTRODUCTION

This Summary Report is an integral component for the preparation of the GEF/UNDP funded project entitled "Strengthening Implementation of Nutrient Reduction Measures and Transboundary Cooperation in the Danube River Basin". The basic task of this preparatory work is to prepare a qualified material basis for the elaboration of a complete "Danube Regional Project" to be submitted to the GEF Council.

The purpose of this report is to provide an overview of the international water indicators, in line with emerging GEF policies - process, stress reduction and environmental status indicators, which will be used to track the short and long-term impacts of this project, prior and after the implementation of nutrient reduction action plan, within the Danube river basin.

The log frame of the project has been specifically designed in a way that lends itself to the straightforward identification of relevant process, stress reduction, and environmental status indicators.

The attributes identified as important in assessing the key indicators are:

(i) relevance

(ii) precisely defined and scientifically credible

(iii) easy to detect, record and interpret

(iv) sensitive to stress on the water pollution management, ecological or social systems or responsive to changes in time and/or space.

The evaluation of effectiveness of the project activities and outputs will depend on whether indicators have successfully been limited to the key areas of sustainability, how they have been defined, the amount of information they hold potentially, and only lastly, what survey and data collection methods are used.

Using indicators give a means of:

(i) measuring progress and identifying policy needs, as baselines to measure change from a certain date or state, or as targets to reflect tangible performance objectives

(ii) assessment of the gap between the current state and a reference state, and of effectiveness of measures which have been taken

The proposed indicators are divided in primary and actual indicators, given an estimation of whether they could be applied in the process of implementing of project activities.

2 PROCESS INDICATORS

In the context of the forthcoming Danube regional project (DRP) process indicators are quantitative measures against which aspects of policy reforms can be measured. The use of process indicators allows assessment of the significance of the procedures, activities or measures leading to the development of the legal and institutional frame for transboundary co-operation within the Danube river basin in implementing pollution control and nutrient reduction measures.

The main process indicators, which can be used to monitor the effects of legal and institutional reforms that are going to take place on the national and regional levels as a result of performing the proposed activities, include:

2.1 Implementation of international conventions

A range of national, bilateral, regional, and international agreements and conventions attempts to protect the Danube's aquatic ecosystem by establishing obligations for individual or joint effort compliance. The Danube River Protection Convention is the most significant legal frame for cooperation of the contracting parties to assure environmental protection of ground and surface waters in the Danube river basin. Out of 13 countries in the Danube river basin, eleven states and the European Commission have singed, and most of them have ratified the Danube River Protection Convention (DRPC) which came into force in October 1998.

The effective participation of actors involved in defining national priorities, in implementing regional and basin wide measures, and in ensuring adequate transboundary co-operation is considered as process indicators. In addition, this indicator can monitor the underlying processes leading to the DRPC implementation and evaluate the effectiveness of measures taken during the implementation process.

The proposed indicators can monitor the effectiveness of the efforts taken by the Danube countries to implement and to develop the necessary mechanisms for effective implementation of the Convention. The indicators can identify:

(i) what is changing (transboundary co-operation improved, institutional and legal reform in place, etc)

(ii) why is it changing (improve environmental quality status, etc)

(iii) why is it important (increase quality of life, etc)

(iv) what can be done about it (introduce good agricultural practices, create nutrient reduction mechanism, etc).

There are many ways of organising this type of indicators: according to the DRPC objectives, (sustainable water use, biodiversity conservation, benefit sharing, etc), by article of the DRPC (issue) or simply as a comparison over time (biological indicators are far more effective if they are measured against a baseline). The baseline can be set up having in mind the time of the DRPC's final ratification, before major interference by industrial or agricultural sector or as agreed by the countries, through a set of characteristics for the basin.

2.2 Implementation of bilateral or multilateral agreements

This indicator measures capacity of the Danube countries to implement the bilateral or multilateral agreements and assesses future requirements. Examination of the set of national reports, recommendations and actions, which will focus on measures taken for the implementation of those agreements, will indicate response indicators employed by countries in the preparation of these reports and suggest areas where capacity-building is required or strengthened.

2.3 Development and implementation of new policies, legislation and mechanism for compliance

There is a great body of laws, regulations and protocols on the national level. Environmental and water pollution control, fishing, shipping, and the protection of critical habitat are well regulated by most of the Danube countries. However, the complexity of these regulations, insufficient financing, fragmentation of institutional responsibilities, low national commitments, institutional weakness, conflict among parties, ambiguities in jurisdiction, and lack of enforcement capacity impede the implementation of their legal provisions. In addition, regionally, there are only very few structures which have the mandate, political authority, financial resources, or implementation capacity to enforce or carry out multiparty agreements.

The development of adequate national and regional legislation and the existence of compliance mechanism will facilitate measuring of project progress.

2.4 Use of compliance schedule as a policy tool in the new water legislation

At least until recently, governments across Danube transition countries had an implicit "take-it-easy" approach on enterprises, many of which were prohibited from borrowing and subject to other uneconomic restrictions. This has led to the authorities' inability to impose penalties or set prices for environmental goods and services at economic levels to achieve acceptable emissions, and to enterprises' indifference to operating with a valid permits. Instead, two approaches have been taken, investment co-financing and compliance schedules. There are several advantages linked to the use of compliance schedule which refer to the increased flexibility for polluters, provide opportunities for least cost solutions to compliance, reduced regulatory agency burden to implement and defining options for addressing past pollution damages.

As the transition countries are still favourable to the regulatory tradition, the indicators will measure:

(i) Creation of the institutional capacity to design programs of compliance

(ii) Introduction of a credible enforcement system

(iii) Existence of adequate tools for monitoring

(iv) Use of non-compliance fines

(v) Inspection resources available to detect violations

2.5 Introduction of legal and institutional reforms in transition countries

How far Danube countries have advanced in the preparation of legal and institutional environmental reforms closely parallels their economic and political development. However, in most transition countries in the Danube basin, the legislative and institutional reform process is not complete.

Since 1989, many changes have occurred in environmental legislation as a result of political and economic reforms and changes in ownership structures. Some countries changed nearly the whole set of environmental legislation immediately after 1989 as a result of the need to substantially change the approach towards environmental protection. The intention was to create a comprehensive, co-ordinated legal system that could allow application of cross-media regulations and new environmental protection instruments, such as EIA, compliance schedules and market-based economic incentives. The new policy instruments, both legal and financial, required developing and enacting a comprehensive environmental law. Broader implementation of financial instruments (realistic resource prices, pollution charges and fines, product charges, taxes on natural resources and tradable permits) require still more progress.

2.6 Improvement of institutional capabilities river basin committees

For the transition countries in the Danube River Basin, efficient and equitable allocation of waters, supply oriented physical actions which refer to water resources infrastructures and corresponding operating rules and sustainable financing options represent a challenging task for the policy makers and planners to foresee in time and adopt the social structures of water resources development, in the complex of rapidly transition context.

One of these structures are River Basin Committees which can co-ordinate the efforts of all those involved and represent all interests within a sub-basin which use the water resource and contribute to water pollution. This will lead to the improvement of the water quality and use, through increased decentralisation, democratisation and sustainable financing in the water sector. The purpose of River Basin Committees is to serve as a forum for co-ordinating the policies of integrated management of the basin water resources, avoiding the water users' conflict of interests, establishing priorities in the achievement of the water pollution abatement investments, ensuring public participation in decision making, and encouraging new developments aimed at increasing the water use sustainability. The number of river basin committees, which will be created in the Danube countries and which are effectively working is a proposed measurable process indicator.

2.7 Establishment of inter-ministerial mechanisms for nutrient reduction

The inter-ministerial mechanism for pollution control and nutrient reduction shall be created at the national level by most of the Danube countries. Based on the existence of such national structures, the effects of implementing project activities can be quantitatively monitored.

2.8 Improve achievements of the ICPDR/ Expert Groups and Working Groups

With the view to strengthen regional cooperation, in response to the DRPC provisions, the Danube countries have established the International Commission for the Protection of the Danube River (ICPDR). The ICPDR establishes the institutional frame for pollution control and the protection of water bodies and it sets also a common platform for sustainable use of ecological resources and integrated river basin management.

The Expert Groups established within ICPDR can take actions to identify and agree measures and propose strategies and approaches for implementation of pollution control and nutrient reduction, which will reduce emissions to the Danube River and Black Sea.

2.9 Adoption and implementation of EU legislation

Environment community policies are grounded on the concept of sustainable development, by integrating environment policies in the sector development policies of Member States.

To join the European Union (EU), the transition countries need to harmonise their legislative and institutional framework with EU requirements. Harmonisation is an effective way to improve the state of the environment in the Danube river basin. Further, the transition countries have not yet addressed harmonisation among themselves, limiting co-operation to bilateral agreements and conventions.

The Danube accession countries have committed into a process aiming the adoption of the environment *Acquis Communautaire*, as well as the creation of institutions required for its implementation and enforcement. The Program for the Adoption of the Environment *Acquis Communautaire* refers to the achievement of measures leading on short and medium term to the harmonization of national legislation with that existing in European Union, as well as the institutional development required to implement the environment legislation at the national level. The results of programs for harmonization of the environment legislation can be evaluated at the national level as one of the major impact of the project.

2.10 Adoption and implementation of National Environmental Action Plan

Danube countries have applied either strategic oriented (top-down) or action oriented (bottom-up) approaches when developing their environmental policy documents. The majority of countries started with the preparation of the strategic, long-term environmental policy papers and followed with action-oriented plans (Bulgaria, Czech Republic, Hungary, Romania, and Slovakia). Other countries (Slovenia) prepared an action-oriented environmental program.

The Danube countries are engaged in a number of national or donors financed activities that are directly related to the developing of national environmental action plans that address the Danube issues. Each country will elaborate, update and implement a National Environmental Action Plan (NEAP) or a Strategic Action Plan (SAP), which will specifically address domestic problems and propose pollution control and nutrient reduction measures.

The relevant national policy documents (i.e. environmental strategy studies, action plans and programs), concentrate on the following issues: environmental policy development, implementation mechanisms, institutional strengthening, and improvement of legislative and regulatory framework, investment priorities and international co-operation.

NEAP/SAP represents a planning instrument which approaches the main environment concerns in line with those international conventions whereupon each individual country is part, as well as with the environment European Directives.

Currently NEAP is up-graded in line with the Program for the Adoption of the *Acquis*, turning this way into a basic element to meet the conditions required by the European Union integration.

2.11 Introduction of new principles and approaches

Integrated water resources management

A consensus has emerged that a more comprehensive approach to water resources management is needed -- one that is cross-sectoral, integrates ecological and development needs, and is based on holistic analyses of the carrying capacity of the water environment. In this approach, the river basin, groundwater system, coastal area, or large marine ecosystem typically serves as a management unit on which to base changes in the way that sectoral development activities are conducted and how priority environmental interventions are made. Such a comprehensive approach that integrates actions across sectors is new to most transition countries, difficult to implement, and even harder to achieve when actions must be co-ordinated among countries.

Integration of environmental requirements into economic policies

Current Danube countries policy promotes both environmental improvement and economic development. With the view that economic growth leads inevitably to increased environmental pollution, development of feasible methods for national economic policies that would more fully measure the environmental aspects of changes in productivity, assets, and welfare resulting from economic growth is one of the priority of the governments in Danube river basin.

This proposed indicator can measure the effects of:

(i) the linkages between voluntary international environmental standards (e.g. ISO 14000) and expansion of (or barriers to) international trade and effects on environmental quality

(ii) the effects of pollution control expenditures on national income and economic growth in each of the Danube countries

(iii) the relationship between environmental performance and profitability at the plant level including the impact of alternative approaches to achieving environmental compliance involving technology innovation and pollution prevention methods.

Polluter and beneficiary pays principle

In addition to drafting new and comprehensive environmental legal acts, the Danube countries are modernising their environmental regulations by eliminating gaps and improving the consistency of existing regulations. Framework environmental acts and their amendments include such principles as polluter pays, prevention and precautionary, beneficiary pays, etc. However, many of them remain just a declaration of intent and are not properly enforced.

In addition, EU environmental policy is an essential component of the Internal Market and takes into account the keeping of high environment standards by enforcing the broad accepted principles in the field and namely the material polluter liability, the prevention pollution at source and the assignment of liabilities of economic and social players involved at local, regional and national level. The beneficiary of water/environmental service must pay for the service.

The transition countries government's interest in this policy tool is motivated by the need:

(i) to encourage polluters to find low-cost or no-cost control measures to improve their environmental performance

(ii) to generate revenues for environmental fund

(iii) to send a clear signal that the country is following the international trend to place environmental policy on a polluter/beneficiary pay principle.

Innovative economic instruments (system of incentives and fines)

Direct environmental protection instruments include environmental standards, restrictions, compliance schedules, and permits. The countries mainly use monetary penalties to enforce environmental legislation. However, the concept of economic instruments (charges and fees) has not yet been fully implemented in the Danube transition countries. Environmental charges, fees and fines are generally more widely used than taxes. A few countries have adopted incentive financial instruments on a limited basis.

The proposed indicator is referring to the number of economic instruments introduced at the national level by the Danube countries.

Improvement of local communities/NGO participation, dissemination, communication and involvement in the decision making process

To ensure full participation and ownership of the programme by the Danube countries, in particular River Basin Management Plans and implementation of EU Water Framework Directive, ongoing consultations through open forum meetings with government representatives, district and local officials, and the public are strongly encouraged. In addition, direct dialogues and negotiations between private sector, non-governmental interests, and governmental representatives in the region will be an important aspect of the programme, to generate undertakings with tangible results. The number of NGO and the number of public hearings organised at the country level during permitting process may reflect a positive effect of the proposed project.

3 STRESS REDUCTION INDICATORS

In the context of the forthcoming Danube Regional Project, stress reduction means events, measures and actions which lead to actual reduction in pressure on the aquatic systems of the Danube river basin and on the Black Sea.

Bearing in mind what a regional Danube project can achieve, the most essential stress reduction issues and related stress reduction indicators can be outlined as follows:

3.1 Rehabilitation, upgrading and new construction of municipal WWTPS

Primary and actual stress reduction indicators:

- Aggregated "population equivalent" (pe) and anticipated annual reduction of N, P, BOD5 AND COD (t/year) of existing municipal WWTP, brought into appropriate operation by rehabilitation measures;
- Aggregated "population equivalent" (pe), and anticipated annual reduction of N, P, BOD5 AND COD (t/year) of existing WWTP, upgraded in terms of nutrient elimination technology;
- Aggregated "population equivalent" (pe), and anticipated annual reduction of N, P, BOD_5 AND COD (t/year) of newly constructed WWTPS (split by mechanical, biological and advanced treatment technology).

In the case of adequate design and capacity the rehabilitation of existing WWTPS are usually the most cost effective measures with regard to nutrient reduction.

The implementation of advanced N+P elimination technology is in the majority of the middle and down stream DRB countries very critical, as the significantly higher operation cost lead usually to cost covering tariffs which are currently hardy to afford by the poorer segments of the population.

As the construction of new WWTPS has to take into account the criterion of affordability, a phased implementation with stepwise increasing treatment/effluent standards is usually the most appropriate strategy in the majority of the middle and down stream DRB countries.

The potential EU accession countries have (with certain transition periods) in any case to fulfill the requirements of the EU urban wastewater treatment directive.

According to the data provided by the draft "Five Year National Nutrient Reduction Action Plans" for the 13 DRB countries, the 156 proposed municipal WWTP projects have investment requirements of about EUR 3.4 billion and the following anticipated annual nutrient reduction:

- N: 31 500 (t/year)
- P: 7 400 (t/year)
- BOD_5: 181 000 (t/year)
- COD: 351 000 (t/year).

3.2 Rehabilitation, upgrading and new construction of industrial WWTPS

Actual stress reduction indicators:

- Anticipated annual reduction of n, p, $BOD_{5,}$ cod (t/year) from rehabilitation and upgrading of existing WWTPS, and construction of new WWTPS.

According to the data provided by the draft "five year national nutrient reduction action plans" the 44 proposed industrial WWTP projects have investment requirements of about EUR 267 million and the following anticipated annual nutrient reduction:

- ⇨ N: 3 400 (t/year)
- ⇨ P: 3 700 (t/year)
- ⇨ BOD5: 39 700 (t/year)
- ⇨ COD: 78 700 (t/year).

The rehabilitation and construction of industrial WWTP are usually very cost-effective measures with regard to phosphorus and cod reduction; in addition they usually achieve significant reduction of particular toxic substances.

3.3 Rehabilitation, upgrading and new construction of point-source related agricultural WWTPS

Primary and actual stress reduction indicators:

- ➢ Number of different categories of animals (cattle, pigs, etc) connected to appropriate agricultural WWTPS;
- ➢ Anticipated annual reduction of N, P, BOD5, COD (t/year) from rehabilitation / upgrading of existing WWTP and new construction of WWTP.

According to the data provided by the draft "five year national nutrient reduction action plans" the 21 proposed point-source related agricultural projects have investment requirements of about eur 113 million and the following anticipated annual nutrient reduction:

- ⇨ N: 6 700 (t/year)
- ⇨ P: 1 100 (t/year)
- ⇨ BOD5: 9 500 (t/year)
- ⇨ COD: 14 900 (t/year).

The rehabilitation and construction of point-source related agricultural WWTP are usually very cost effective point-source measures with regard to reduction of nitrogen.

3.4 Restoration or new creation of wetlands

Primary and actual stress reduction indicators:

- ➢ Area (ha) of restored or newly created wetlands;
- ➢ Anticipated annual reduction of N, P, BOD5, COD (t/year) from restoration of existing wetlands and creation of new wetlands;

According to the data provided by the draft "Five Year National Nutrient Reduction Action Plans" the 22 proposed wetland projects have investment requirements of about EUR 113 million and the following anticipated annual nutrient reduction:

- ⇨ N: 6 700 (t/year)
- ⇨ P: 1 100 (t/year)
- ⇨ BOD5: 9 500 (t/year)
- ⇨ COD: 15 000 (t/year).

The restoration and creation of wetlands are usually the most cost effective point-source measures with regard to reduction of nitrogen.

3.5 Implementation of surface water related protected areas and adequate buffer zones between agricultural areas and surface water bodies

Primary stress reduction indicators:

- Creation of surface water related protected areas (ha), (split by degree of protection);
- Creation of agricultural buffer zones along surface waters (length in km).

Actual stress reduction (measured in actual nutrient load reduction in surface waters) cannot be assessed in general terms.

3.6 Implementation of agricultural management reforms aiming at appropriate, respectively reduced utilisation of agro-chemicals and manure

Primary stress reduction indicators:

- Reduction of utilised chemical fertilisers (t/ha/year), (split by main crop categories);
- Reduction of utilised manure (t/ha/year), (split by main crop categories);
- Reduction of utilised pesticides (t/ha/year), (split by main crop categories).

Actual stress reduction (measured in actual nutrient load reduction in surface waters) cannot be assessed in general terms.

3.7 Shut down of polluting production sites, respectively modernisation of outdated production technologies

Primary and actual stress reduction indicators:

- Cases of shut down of polluting production sites (factories, mines, etc)
- Anticipated annual reduction of N, P, BOD_5 and COD (t/year).

Actual stress reduction (measured in actual nutrient load reduction in surface waters) cannot be assessed in general terms, but can be done on a case to case basis.

3.8 Phase-out of phosphorus containing detergents

Primary stress reduction indicators:

- Reduction of phosphorus components from utilisation of detergents / washing powders (kg /capita/year).

Actual stress reduction (measured in actual nutrient load reduction in surface waters) cannot be assessed in general terms. A rough assessment can be done on the basis of the number of population connected to centralised sewerage systems and municipal WWTPS with different effluent standards.

3.9 Better enforcement of wastewater discharge permits in compliance with specified discharge parameters

Primary stress reduction indicators:

- Number of discharge permits in compliance with appropriately specified discharge parameters.

Actual stress reduction (measured in actual nutrient load reduction in surface waters) cannot be assessed in general terms.

4 ENVIRONMENTAL STATUS INDICATORS

Environmental status indicators are information tools. They summarise data on complex and sometimes conflicting environmental issues to indicate the overall status and trends of Danube ecosystem. In the context of implementation of the proposed project activities, they can be used to assess national performance and to signal key issues to be addressed through policy interventions and other actions.

These indicators gauge the usefulness of nutrient reduction measures to human populations and aquatic ecosystem and assess the sustainability of use. Much of the utility value of water pollution control and nutrient reduction measures will be country-specific. However, indicators might track those elements of Danube ecosystem that - because they are traded on international markets or provide transboundary life-support services - are of regional or global importance. Two categories of environmental status indicators are proposed to measure the impacts of implementing nutrient reduction measures within the Danube river basin:

(i) indicators measuring ecosystem goods

(ii) indicators measuring ecosystem services.

4.1 Indicators measuring ecosystem goods

Human-caused changes in ecosystems generally result in a decrease of population sizes of many species, and an increase in populations of a few others. Both increases and decreases in comparison to the postulated baseline are significant and are sensitive measures for changes in the state of the biodiversity in a country, region or for a global comparison.

Ecosystem structure variables are most promising because they can offer a lot of information on the state of ecosystems over large areas. Identifying key-ecosystem structure variables that can indicate if the ecosystem is functioning correctly or not can capture many aspects of quality. For example, a measure of quality might be the total number of well-specified habitat types observed within a sample area.

Each country can chose its own, appropriate, bio-geographic or ecosystem-specific and standardised core set of quality variables. The core set can be gradually established by starting with a basic set of easily affordable measurable quality variables, providing a picture of the overall national or regional biodiversity state.

The indicators can measure the:

- ⇨ Water quality (water as an ecosystem good having economic value, to be used for water supply for various purposes)
- ⇨ Species risk
- ⇨ Percent of wild species with known medicinal uses
- ⇨ Biological diversity
- ⇨ Ecosystem communities

4.2 Indicators measuring ecosystem services

These include ecological processes that provide "life support" services to humans and environment, such as soil conservation and watershed protection. Also, this indicator provides an impression of the biodiversity losses or gains at the Danube ecosystem level as a result of industrial and agricultural activities and increased nutrient load.

- ⇨ Percent of transboundary waters with increased water quality river class
- ⇨ Percent of transboundary watershed area assessed as "low risk of environmental pollution"
- ⇨ Self-regenerating and man-made area as percentage of total area with reference to wetlands restoration
- ⇨ Annual land use change from self-regenerating area into agriculture
- ⇨ Share of rivers dammed or channelled in order to reduce erosion and agricultural run-off as the percent of the whole river per country
- ⇨ Amount of agricultural area lost in 10 years due to pollution and erosion as percentage of agricultural area brought into agriculture in the same period, per country

4.3 Standard Operational Procedure for Monitoring of Benthic Macroinvertebrates in the frame of Transnational Monitoring Network

The main purpose of the SOP for monitoring of the benthic macro invertebrates in the frame of the Trans National Monitoring Network was to find common methods for sampling, analysis, numerical evaluation and presentation for bio monitoring that can be applied over the entire Danube river basin. The SOP covers macro invertebrates only and is focused on the numerical evaluation for the system of saprobity by means of the Saprobic Index. This system is adopted for the internationally agreed sampling stations and does not apply necessarily to national monitoring networks. Other biological groups of aquatic ecosystem are exclude like algae, water plants, fish, birds and mammals as well as river related (semi) terrestrial systems of riparian vegetation and flood plains. However, it is recognised that these elements are an integral part of the river ecosystem. So the macro invertebrates sampling and biological assessment is a first step in the development of a more comprehensive ecological assessment of river quality.

The SOP covers sampling (choice of sampling site, period of sampling, frequency, sampling device), collections, preservation, transport, taxa identification, quality assurance and quality control, numerical evaluation and classification/presentation of results.

The most of Danubian countries are interesting in the revising of the set of bioindicators.

- In Germany, the activities on the Danube are co-ordinated by Bayerisches Landesamt fur Wasserwirtschaft (Water Research Institute for Bavaria). The List of the Water Organisms Taxa published in 1990 contains general information of the water organisms, the way of evaluation of abundance, calculation of saprobic index and other needed information. The list has 4246 records – organisms – from many selected aquatic organisms.
- In Austria, the revised list of benthic fauna has been recently published. Austria has a long experience with biological assessment of water quality that is compiled in the Fauna Aquatica Austriaca, a comprehensive species inventory of Austrian aquatic organisms with ecological notes. On a routine basis macro invertebrates, phyto-benthos and ciliates are sampled in rivers and the Saprobic Index is calculated. Results are classified and presented in yearbooks in geographical from with a colour coding or river reaches. Furthermore a far more detailed en complex evaluation is applied for specific purposes in which the aquatic ecosystem is thoroughly described for abiotic and biotic components.

- In Bulgaria, saprobity is determined by Pantle & Buck index for the Transnational Monitoring Network (TNMN) sites only. The German DIN norm is used to calculate the Saprobic Index. Also quality classes are defined for macro zoobenthos species diversity (Shannon), matching degree and dominating degree. In the national network a biotic index is in use which is adapted from the Irish Q-value. Every 5 kilometres of a river is assessed. The biological quality is divided into 10 classes. This method has been chosen for its cost-effectiveness and relative ease in required determination skills.
- In Czech Republic, there is a long tradition in using the saprobity system for routine monitoring of rivers, just like in Austria. Regular measurements are made from the sixties in the national monitoring network. Since 1975 a more detailed assessment is made. Besides routine monitoring some projects are executed. At the moment a biological monitoring prediction model for macro invertebrates (called 'Perla' (a stonefly species) is being developed following the RIVPACS approach. This model can make a prediction on the natural reference community at a certain site when some abiotic features are known. The prediction is based on a database with target communities, which is nearly completed. The actual sampled community at that site can then be compared to the predicted one. The difference is a measure for the extent of ecological stress. For the river Morava, a Danube tributary, a survey of population species diversity of fish and benthos is included.
- In Hungary a biotic index has been developed in the past, adjusted from the western European biotic indices. However this assessment is not supported by the government and hence not implemented into a routine monitoring practice for rivers. For TNMN the Saprobic Index is based on indicators outline by Gulyas (1998).
- Slovenian water authorities use the Saprobic Index method (Pantle & Buck, modified by Zelinka & Marvan) for bio monitoring. The index and classification is based on the examination of periphyton and macro invertebrates at the sampling site. (Sampling according to ISO 7828(E), 1985, ISO 8265(E), 1988). A basis for Slovenian biological evaluation of the water quality of running waters are the as complete as possible species identification of organisms composing the communities, their semi-quantitative determination (abundance scale 1-3-5) as well as the knowledge of their ecology. In some cases it may become appropriate to complement the Saprobic Index with a personal evaluation of specific conditions of the water and the riverbed.

4.4 Preliminary set of indicators for the Danube River Basin

4.4.1 Existing sets of indicators in the Danube River Basin

Within the framework of the International Commission for the Protection of Danube River (ICPDR) and the Monitoring, Laboratory and Information Management Expert Group (MLIM/EG), some years ago, an inventory was made amongst Danube countries on water quality classification methods. These methods were compared with the current practices in some EU-countries. Basic conclusion of that comparative analyses was that the applied surface water quality standards forming the basis of classification of water bodies in the different riparian countries are not compatible and as a consequence of the differences in principles and values, the regular classifications of the countries can not be compared directly and can not be used for basin-wide considerations.

Biological monitoring and assessment of water quality in Danube river basin has a fairly long tradition, especially with respect to system of saprobity. However, the monitoring and assessment by the system of saprobity can be done in several ways and allows some variation between countries, like the biological group that is considered, different saprobic index values and valences for one species, the method of sampling, counting of individuals and calculation of the Saprobic index.

Besides the saprobity system some other developments on bio monitoring are going on in Danube river basin. Biological assessment can consist of many aspects because of the complexity of the aquatic ecosystem and presence of several biotic components or groups that indicate different aspects. Therefore, from the point of view or living parts of the river ecosystem the following aspect can be distinguished:

- bacteriological assessment (Faecal coliformes or Escherichia coli, Salmonella, saprophytes);
- assessment of trophic status (i.e. chlorophyll-a concentration, phytoplankton species composition);
- ecotoxicological assessment by means of bioassays in the laboratory (acute and chronic test with crustaceans (Daphnia magna), algae (Scenedesmus quadricauda,) and fish, Microtox, Toxkits like Rototox, Thamnotox). But also accumulation laboratory experiments and field measurements and i.e. measurement of PCB in fish in river Morava;
- saprobiological assessment using phytobenthos (periphyton), macroinvertebrates (macrozoobenthon), phytoplankton.

4.4.2 Preliminary set of indicators for the Danube River Basin

Most Danube countries apply the Saprobic index for evaluation and presentation of water quality based on macroinvertebrates (macrozoobenthon) for the running watercourses. Various indices and class limit values are in use. The species indicator list varied also, due to country specific additions or modifications. The saprobity is often classified in 5 classes (x,o,b,a,p), but the water quality classification by means of the Saprobic index in 4 main classes, in some cases completed with 3 in-between classes giving a total of 7 classes.

Based on the available nformation and recommendations of projects for the Danube River Basin and in line with new proposed European Water Framewok Directive, some communities of organisms have been compiled.

Running water courses are covered by the communities of benthic fauna - macrozoobenthos (macroinvertebrates, zoobenthos, zoobenthon), benthic flora – periphyton (phytobenthos) and macrovegetation (water macrophytes). This groups of water organisms are a good indicators of a long term changes in the river, as well as the indicators of pollution point sources. Their use for the assessment of biotic conditions is spreaded in most of Danube countries. Stagnant waters (e.g. large reservoirs, riparian lakes) should be monitor from the plankton (phytoplankton and zooplankton) and macrophytes point of view. This biological assessment system reveals a measure for the ecosystem stress due to organic substances and related oxygen consumption. The saprobity system uses species-specific indicator values, which indicates the tolerance for organic load. Measurements of water fauna and flora should be based on the qualitative (species diversity) and quantitative (abundancy or relative (estimated) abundancy) investigation.

The applied taxonomic level of identification is governed by the objectives of the biomonitoring. It is recommended to perform identification of taxa at species level whenever possible. However, for distinct groups determination literature and keys may not cover species level for all orders, families or genera.

For calculation of the Saprobic Index often an estimate of the abundance is sufficient. When this method is applied the exact number of individuals per species in the sample is not known and cannot be used for other purposes. It is advised to count in principle real numbers. Afterwards it is still possible to make a classification in abundance. Obtained data can be processed by the calculation of Saprobic Index and assessed by the agreed classification scheme.

The presentation of the ecological status as a result of monitoring biological quality elements is to be presented into 5 classes. The next table present a proposal for classification of Saprobic Index of natural rivers in Danube basin**.**

Class	**I**	**II**	**III**	**IV**	**V**
ecological status	high	good	moderate	poor	bad
Saprobic Index	< 1.8	1.81-2.3	2.31-2.7	2.71-3.2	>3.2

The preliminary set of indicators contains about 6 000 aquatic organisms corrected and modified according to the published sources of references. The organisms have been devided to five groups: zoobenthos (macroinvertebrates, macrozoobenthon), periphyton (phytobenthos), phytoplankton, zooplankton and water macrovegetation (water macrophytes).

Bioindicator study performed in Yugoslavia in the frame of UNEP/Habitat BTF and ICPDR on 23-28 August 1999 is a good contribution to the knowledge of benthic macroinvertebrates of the Yugoslavian stretch of the river Danube as well as the accumulation capacity of the benthic species, mainly mussels.

Primarily the results on bioaccumulation should be considered as excellent. Based on the outcome of concentration of the mercury, PAHs and PCBs in the mussels' samples it can be said that the results are in a good correlation with the concentration of the mentioned pollutants in sediment. Two mussel species have been analyzed from the accumulation of pollutant point of view. *Anodonta anatina* was more frequent organisms than *Sinanodonta woodiana.*

The analyses of the pollutants in the benthic organisms will be included into the program of the Joint Danube Survey. In addition, the next phase of the Trans National Monitoring Network of the Danube River Basin will include analyses of the organic and inorganic pollutants in the biota.

As for the species diversity the number of identified taxa at the individual sites ranged from 6 to 21 depending on the pollution and substrate condition as well. Mainly the snails and mussels have been found in the investigated stretch of the Danube.

Beside the species diversity, additional data are needed for presentation or/and classification of the biological status. For calculation of Saprobic Index an estimate of abundance is sufficient. When field estimates of certain species of groups have been made, they should be proportionally added to the species that are positively identified and counted.

Because of the differences in the biogeochemical characteristics of the Danube river itself and in the related sub-catchments of the tributaries along the Danube, it is important to monitor and characterise the specific biotic and abiotic compartments in the particular areas. Differences in the biodiversity of the aquatic life and in the chemical composition of the abiotic compartment sediment call for reliable information on the specific characteristics.

Effective water quality management requires appropriate monitoring programme to identify significant pollutants affecting the health of the aquatic life and limiting the intended water uses, particularly public water supplies. The appropriate monitoring programme should provide reliable, quality assured (checked and verified), validated data: (a) on the abundance of different aquatic organisms, biological population, on the biodiversity in the aquatic ecosystem; (b) on the type of the pollutants affecting, harming the aquatic life and intended water uses; and (c) on the concentrations of these pollutants in the different compartments, matrices in the aquatic environment. Implementation of the monitoring programme should provide these data in the selected matrix at all representative sampling sites/positions with appropriate sampling frequency allowing quality/pollution assessment, pollutant load calculation in space and time.

It is very important to distinguish the natural background and the anthropogenic input in the case of pollutants also occurring naturally, to establish baseline levels for man-made (synthetic) pollutants and to evaluate pollution trends in space and time. Establishment of historical trends, comparison of pollutant concentrations in samples collected at present and in the past, requires availability of appropriate samples (reference materials) on long-term basis.

There is a need to establish the biological sample bank for the Danube river basin, where the biological reference samples will be collected at representative sites of the selected areas of the river basin. The samples will be preserved and kept in the sample bank for the following purposes: (a) for later scientific (i.e., taxonomic) revision and comparative purposes, according to newly arising questions; (b) organs of selected organisms, (e.g., mussels, fishes) will be freeze-dried, grounded, homogenised for chemical analysis, to be used as biological reference materials; (c) education and training; and (d) quality assurance.

The collected samples will be appropriate for estimating long term environmental changes and will include types of samples representing:

- communities (the sample contains species assemblages) such as phytoplankton, zooplankton and periphyton,
- species (species are sorted, taxa are separated) such as benthon and fish.

The selection of referential sites will include:

- undisturbed (unpolluted) sites indicating high biodiversity and characterised by clear water indicator taxa, representing high quality, reference conditions for ecological status assessment, and
- sites representing special pollution situation.

The characteristics of the processed samples will be documented, archived in a computerised data bank, the processed, preserved sample and/or the selected individuals of different species will be put in the sample bank and stored there in such a way that the sample bank can serve the request of the participating laboratories for five years at least.

After sample collection and preparation, the biological specimen sample bank will be used for education, training purposes for biologists in the Danube river basin as capacity building.

It will be also particularly important to prepare specific organisms (species) unique in the Danube river basin in addition to the common species, with contribution from the biologists of individual Danube countries.

ANNEX 9 Danube / Black Sea Basin Programmatic Approach

Addressing Transboundary Priorities in the Danube/Black Sea Basin: A Programmatic Approach

Introduction:

The GEF, its Implementing Agencies, the European Community and others are working together to assist the 17 countries in the Danube/Black Sea basin in addressing their top priority transboundary waters issues. The GEF Secretariat, UNDP, the World Bank and UNEP, in consultation with other key donors, the International Commission for the Protection of the Danube River, the Black Sea Commission and the Danube and Black Sea Secretariats/PIU, have prepared this draft strategy paper in order to:

- Describe the collaboration among the Implementing Agencies, funding partners and Danube/Black Sea basin countries in the first "GEF Programmatic Approach" to a geographic area in the GEF International Waters focal area;
- Inform the GEF Council on the approach being taken by the GEF Implementing Agencies in the Danube/Black Sea basin;
- Provide a framework for interagency and inter-governmental cooperation and coordination in addressing transboundary issues in the Danube/Black Sea basin;
- Help to leverage and coordinate additional inputs to the region from other donors;
- Provide guidance and orientation for the development of the Danube and Black Sea GEF Regional Projects;
- Serve as a tool to assure coherence between donor activities and the policies and strategies of the respective Conventions;
- Provide guidance to assure coherence between donor activities and the objectives and work programs of the respective Secretariats;
- Establish a common agreement among the countries and Agencies for objectives and programmatic indicators that will be utilized to measure progress over the five year program.
- Support the efforts of EU accession countries in the Danube/Black Sea basin to comply with EU Water Directives (nitrate, phosphate) and the forthcoming Water Framework Directives.

This basin-wide, multi-stakeholder collaboration is needed to accelerate on-the-ground implementation of measures and to consolidate gains made in jointly reversing nutrient over-enrichment and toxics contamination of the Danube/Black Sea basin (see Annex 2) under the Global Programme of Action (GPA) to protect the Marine Environment from Land-Based Activities. The participating countries have the opportunity to shorten by one-half the time frame for significant environmental improvements that have taken 2-3 decades to accomplish for other transboundary waterbodies in Europe and North America. This draft was shared and discussed with the countries at the recent basin-wide Stocktaking meeting as part of preparing their collaborative projects for consideration by the GEF Council in Fall, 2000.

Objectives and Programmatic Indicators:

Objective 1:

In support of the implementation of the Black Sea Strategic Action Plan and the "Common Platform for Development of National Policies and Actions for Pollution Reduction under the Danube River Protection Convention", and taking into account the mandate of the Sofia and Bucharest Conventions, Danube/Black Sea basin countries adopt and implement policy, institutional and regulatory changes to reduce point and non-point source nutrient discharges, restore nutrient 'sinks', and prevent and remediate toxics "hot spots".

Indicator: By 2005, 100% of participating countries introduce one or more policy or regulatory measures (including P-free detergents) to reduce nutrient discharges in the agricultural, municipal, or industrial sectors, to restore nutrient sinks (wetlands, flood plains), and to prevent and remediate toxics "hot spots", and 50% adopt multiple measures, towards goals of maintaining 1997 levels of nutrient inputs to the Black Sea, and substantially reducing toxics contamination in the basin.

Objective 2:

Countries gain experience in making investments in nutrient reduction and prevention and remediation of toxics "hot spots".

Indicator: 100% of participating countries implement one or more investments in agricultural, municipal, land use or industrial sectors for nutrient discharge reduction, nutrient sink restoration, and prevention and remediation of hot spots of toxic substances, some with GEF assistance, by 2005 to accompany expected baseline investments.

Objective 3:

Capacity of the Danube and Black Sea Convention Secretariats is increased through permanent status, sustainable funding, and development of international waters process, stress reduction and environmental status indicators adopted through Convention processes.

Indicators: PCU/PIU functions evolve into Convention Secretariats (Danube already in place); payments of contributions by all contracting parties made for 2000 and pledged for the period beyond project duration; nutrient control, toxics reduction and ecosystem indicators assessing processes in place, stress reduction, and environmental status, are developed, harmonized and adopted for reporting to Secretariat databases by 2005.

Objective 4:

Country commitments to a cap on nutrient releases to the Black Sea at 1997 levels and agreed targets for toxics reduction for the interim, and possible future reductions or revisions using an adaptive management approach after 2004 are formalized into specific nutrients control and toxics discharge protocol(s) or Annex(es) to both Conventions.

Indicator: Countries adopt protocols or annexes to their two conventions and/or develop legally binding "Action Plans" regarding nutrients and toxics reduction commitments as part of their obligations under the GPA for Land-Based Sources of pollution to the Danube/Black Sea basin by 2005 towards agreed goal to restore the Sea to 1960's environmental status. For the Danube, such a commitment will be contained in the revised Nutrient Reduction Plans (coherent with the ICPDR Joint Action Programme) and developed in accord with the application of the relevant EU Water Directives.

Objective 5:

Implementing Agencies, the European Union, other funding partners and countries formalize nutrient and toxics reduction commitments into IA, EU and partner regular programs with countries.

Indicators: Regular programs of IA's and EC support country nutrient and toxics reduction commitments during 2000-2005 as part of expected baseline activities and incorporate them into CCF (UNDP), GPA Office Support (UNEP), CAS (WB), and EU (Accession support) by 2005.

Objective 6:

Pilot techniques for restoration of Danube/Black Sea basin nutrient sinks and reduction of non-point source nutrient discharges through integrated management of land and water resources and their ecosystems in river sub-basins by involving private sector, government, NGO's and communities in restoration and prevention activities, and utilizing GEF Biodiversity and MSP projects to accelerate implementation of results.

Indicators: All countries in basin begin nutrient sink restoration and non-point source discharge reduction by 2005 through integrated river sub-basin management of land, water and ecosystems with support from IA's, partners and GEF through small grants to communities, biodiversity projects for wetlands and flood plain conservation, enforcement by legal authorities and holistic approaches to water quality, quantity and biodiversity of aquatic ecosystems.

The Danube/Black Sea Basin: A Programmatic Approach

To accomplish the objectives summarized above aimed at addressing Danube/Black Sea basin pollution reduction, with particular attention to nutrients and toxic substances, in the most efficient and coordinated manner possible, the GEF and its Implementing Agencies are proposing a strategic programme of capital investments, economic instruments, development and enforcement of environmental law and policy, strengthening of public participation, and monitoring of trends and compliance. The programme would include both GEF and non-GEF (EC, EBRD, IA regular programs, etc.) elements.

Operationally, within the GEF International Waters and Biodiversity focal areas, the interagency programmatic approach proposed for the Danube/Black Sea basin includes twelve principal elements:

Elements of the Programmatic Approach:

1. *A GEF Black Sea regional project implemented (in cooperation with the Black Sea Commission) jointly by the three GEF Implementing Agencies (UNDP, UNEP, World Bank) under the leadership of UNDP;*

2. *A GEF Danube River basin regional project implemented (in cooperation with the ICPDR) jointly by the three GEF Implementing Agencies (UNDP, UNEP, World Bank) under the leadership of UNDP;*

UNDP, UNEP and the World Bank propose to develop and jointly implement two regional projects aimed at addressing transboundary environmental degradation in the Danube/Black Sea basin through policy and legal reform, public awareness raising, and institutional strengthening. Each project will be operated through or closely linked to the respective Black Sea and Danube Secretariats in Istanbul and Vienna. The two projects will each focus on the following areas within the Danube and Black Sea convention countries, with the GEF lead agency shown for each:

a) Actions to revise and/or create nutrients and toxics reduction protocol / annex to the Black Sea and Convention alternatively a legally binding Action Plan for the Danube countries under the Danube River Protection Convention in accordance with the Global Programme of Action to Protect the Marine Environment from Land Based Activities and taking into account the EU Water Directives for EU Accession countries (UNEP);

b) Activities to develop and implement policies and legislation aimed at addressing sectoral causes of nutrient and toxics releases, such as phosphate detergent phase-out, agricultural reform, cleaner production in industry, etc. (UNDP);

c) Policy and legislative reforms aimed at promoting the protection and restoration of critical nutrient sinks, particularly wetlands and floodplains (UNDP);

d) Strengthening of the institutional capacities of the Black Sea and Danube Secretariats to build in long-term capacity to understand, address and monitor levels and impacts of transboundary nutrients and toxics (UNDP);

e) Public awareness raising in support of basin-wide nutrient and toxics reduction efforts (UNDP);

f) Harmonization of water regulatory standards (in line with EU regulations, where applicable) among the Danube/Black Sea basin countries to include similar nutrient and toxics reduction provisions (UNDP);

g) Development of Black Sea and Danube River basin Monitoring and Evaluation indicators harmonized among countries for process, stress reduction and environmental status indicators (UNDP);

h) Strengthening of the Information System to allow interactive information exchange and update and development of public area for specific topics of nutrient reduction;

i) Support to further development of NGO activities at national and regional level;

j) Establishment of Small Grants Fund to reinforce community based actions for nutrient reduction with particular attention to agricultural reform projects, wetland restoration and use of lagoons for nutrient reduction;

k) Feasibility studies for a nutrients emission trading system at the national and regional levels. The World Bank will coordinate an overall study for the Black Sea basin as a whole while the ICPDR/KfW will carry out a study specific to the Danube River Basin towards the possibility of developing economic instruments for nutrient management in the Danube River Basin.

3. The GEF Dnieper Basin Environment Programme (DBEP):

The Dnieper River transports some 20,000 tons of nitrogen annually to the Black Sea, further exacerbating the Black Sea's eutrophication problem. A GEF project to assist the riparian countries of the Dnieper River (Russia, Belarus and Ukraine) in the development and implementation of a Transboundary Diagnostic Analysis and a Strategic Action Programme for the Dnieper River basin was approved by GEF in March, 1998 and will commence full implementation in September, 2000. Inter alia, the project will assist the Dnieper basin countries in identifying, prioritizing and addressing both point and non-point sources of nutrient and toxics pollution to the Dnieper and the downstream Black Sea, through legal, policy and institutional reforms and priority investments. The GEF Dnieper project is designed to enable full coordination of project activities with the Danube/Black Sea basin Programmatic Approach.

4. The World Bank-GEF Strategic Partnership

The Partnership will finance incremental costs associated with the reduction of nutrient loads and discharges into the Danube River, its tributaries, the Black Sea and other rivers which feed it. Three types of projects (or combination thereof) would be eligible for financing under the Partnership:

a) Wetland restoration or creation, that reduce nutrients discharge or loads;

b) Reform and improvement of agriculture and land management practices with impact on nutrient use and/or diffuse discharges through run-off;

c) Wastewater treatment in small communities (normally with a population less than 100,000) and small industries or large ones if opportunity exists.

The Partnership would finance specific components of World Bank or bilateral financed projects. Baseline costs would be covered by a combination of national financing, a World Bank --- or other IFI ---loan and grant funds from other sources. The GEF financed component would leverage additional funds (including national funds) in at least a 1:2 ratio against the amount of the GEF grant. Self-standing GEF-financed projects without a corresponding World Bank loan or bilateral financing could be also considered, in exceptional cases, if important policy reforms would be accomplished by the GEF grant or where national funding, in cash and in-kind, is at least as large as GEF funding (i.e. 1:1 ratio).

Eligible projects must have: (i) the endorsement of the country's GEF focal point; (ii) be included in the country's Black Sea or Danube National Environmental Program and selected as a priority investment; (iii) form part of the Regional Environmental Program, as approved by the respective Commission; and (iv) the proposing country be up to date on contributions to the Black Sea and/or Danube Secretariat(s). This would include an explicit recognition from the countries that the transboundary control of nutrients is a priority issue in their NEAP/NAPs.

As in the case of all GEF financed projects, eligible projects will be prepared, appraised and implemented under the same terms as a regular World Bank project and subject to the standard World Bank review

process before being submitted to the GEF Secretariat. Therefore, institutional requirements, sustainability, financial, economic, social and environmental conditionality normally required in World Bank projects would also apply to Partnership projects.

Whenever a project has additional global benefits, such as biodiversity preservation (i.e. through the recovery of a Ramsar site), the existence of such additional benefits would be a positive factor, but not constitute an eligibility criteria, even though it could lead to additional incremental GEF resources. In any case, nutrient removal is the essential eligibility condition for all projects.

The World Bank is preparing the Strategic Partnership proposal for consideration at the November, 2000 meeting of the GEF Council. A figure of approximately $60 million would be reserved for nutrient reduction investments under the Strategic Partnership as described above. Additional contributions will be solicited from bilateral donors. If approved, the World Bank could then vet projects directly through the GEF Secretariat without having to bring each separate project to Council. Two concepts, Bulgaria Wetland Restoration and Romanian Agricultural Reform, have already been approved as likely components of the investment programme. The GEF Secretariat would review and approve projects based on the criteria summarized above.

The World Bank will also promote the Partnership, the investments it supports and the programmatic approach in its country dialogues, include the Black Sea and Danube perspectives in relevant World Bank Country Assistance Strategies (CASs) as they are updated, and promote policies that address nutrient reduction as part of country dialogues.

5. Georgia: World Bank GEF Agricultural Development Project II

The overall development objective of the project is to increase agricultural production sustainably, while reducing pollution of natural resources. The project includes reforms targeting prevention of nutrient releases. It represents the first phase of a ten-year Program, to be implemented in three phases, for the reform of on-farm agricultural and environmental practices. Under phase one, GEF would support the costs of implementing measures aimed at improving on-farm environmental practices, such as storage and management of manure water quality monitoring, which over the long term would reduce nutrients from entering the Black Sea.

6. GEF Biodiversity and Medium-Sized Projects in the Danube/Black Sea basin

GEF Biodiversity and Medium Sized Projects in the Danube/Black Sea basin to address toxic hot spots and nutrient sinks, test different approaches and catalytically accelerate on-the-ground results. These include:

<u>Biodiversity Projects:</u>

Integrated Coastal Management Project, Georgia (World Bank; WP entry 7/98)

Danube Delta Biodiversity, Romania (World Bank; WP entry 4/92)

Biodiversity Conservation in the Azov-Black Sea Ecological Corridor, Ukraine (World Bank; WP entry 1/98)

Danube Delta Biodiversity, Ukraine (World Bank; WP entry 4/92)

Integrated Biodiversity Conservation and Wetland Management for the Mid-Pripyat River and Floodplains (UNDP, PDF-A)

Medium-Sized Projects:

Transfer of Environmentally Sound Technology (TEST) to Reduce Transboundary Pollution in the Danube River Basin (UNDP; MSP concept approved by GEF December, 1999; brief in preparation, UNIDO as Executing Agency)

Building Environmental Citizenship to Support Transboundary Pollution Reduction in the Danube: A Pilot Project in Hungary and Slovenia (UNDP; MSP approved November, 1998; implementation commences April, 2000; REC as Executing Agency)

7. Nutrient control and reduction Projects executed by European Bank for Reconstruction and Development (EBRD) under the new GEF 'Expanded Opportunities for Executing Agencies':

EBRD's main focus is to identify bankable investment projects together with supporting activities to facilitate these investments. EBRD contributes to pollution reduction in the Danube and Black Sea Basin by financing projects particularly in the municipal and industrial sectors, and by applying environmental appraisal procedures and international environmental standards to all of the Bank's operations in the region.

Danube Pollution Reduction Programme: Financing of Pollution Reduction Projects by Local Financial Intermediaries (IA: UNDP):

The main objective of the project is to facilitate principally small and medium sized private sector investment projects in the industrial and agricultural sector. The project would identify mechanisms, using the Bank's local financial intermediaries within the relevant countries to provide to the private sector financial resources, including loans and GEF grants for eligible components for the reduction of pollutants that are responsible for the degradation of the aquatic environment in the Danube River Basin and the Black Sea. Considering the pilot character of the investments, the proposed project will initially concentrate on Slovenia.

8. Accelerated implementation of environmental management programs for mining related "hot spots" identified by the Danube SAP and TDA.

This activity would support accelerated actions to address "hot spots" in the Danube River Basin and other basins associated with mining operations and tailing ponds. This would allow for targeted investments, consistent with ICPDR proposed actions for prevention and control of accidental pollution, to improve emergency warning systems, develop preventive management programs and undertake selected priority investment actions. The activity would complement ongoing UNEP and EU activities to support the development and implementation of medium and long-term preventive measures for management of operating, decommissioned and abandoned tailing dams at priority "hot spots" in the Danube River Basin. This would provide a mechanism to enhance joint efforts in the Tisza River basin and other areas where similar "hot spots" exist and there is a significant need for improved preventive management programs.

9. European Union

The European Union is a major political and financial actor in the Central and Eastern European and NIS area mainly through its enlargement and NIS relations' policies.

The enlargement of the EU to the ten candidate countries of Central and Eastern Europe will involve:

- The adoption and implementation by these countries of the EU environmental legislation and standards as a prerequisite for their entry into the Union
- The financial assistance by the EU to these countries toward the development of the infrastructures necessary for the implementation of the EU legislation

The financial assistance will involve primarily the pre-accession financial instruments PHARE and ISPA.

In March 1998 the Commission, the World Bank and the EBRD signed a Memorandum of Understanding on pre-accession financing. This was updated in March 2000 to take account of the new pre-accession financial instruments (ISPA and SAPARD) and to extend co-operation to cover the NIS countries.

The Memorandum includes commitments to:

- Co-ordinate project implementation;
- Implement co-financing projects jointly which foster the adoption of the EU legislation;
- Identify future co-financing opportunities which could foster accession;
- Be as flexible as possible with the delivery of the grants.

The PHARE-funded Large Scale Infrastructure Facility (€ 250 million for 1998-99) was developed to co-finance accession-related projects in transport and environment with the international financing institutions (IFIs). Realising that environmental projects would take much longer to put together than transport ones, DG Environment of the European Commission co-operated with the World Bank to develop a pipeline of viable projects to enable environment to take a reasonable share of the new Facility, screening all projects for accession relevance. The result was a substantial list of environmental co-financing projects for 1998 and 1999 (50% of the total Facility).

The **ISPA** instrument has some €500 million a year to spend on environmental infrastructure investment over the period 2000-06. The minimum size of projects is normally € 5 million, and there is money for project preparation. Although the ISPA Regulation does not formally require co-financing with the IFIs, this is greatly encouraged. ISPA needs a project pipeline, while the grants could make it easier for the IFIs to lend to the accession countries.

DG ENV is developing a Priority Environmental Investment Programme for Accession **(PEPA)**, which aims to develop investment strategies, priorities and a project pipeline for all Community sources of finance and potentially non-Community such as the World Bank. World Bank officials have participated actively at a number of meetings to promote this project.

The EU has concluded Partnership and Cooperation Agreements with each one of the Newly Independent States. In this context it is providing financial assistance through the use of the TACIS programme. The new TACIS Regulation foresees greater assistance on environmental pre-investment activities.

To date Phare and Tacis have contributed about € 18 million to the Black Sea Environment Programme and about € 8 million to the Danube Environment Programme. The latest € 4.6 million Tacis programme to the BSEP is ending in 2000. It gave support to the Black Sea Implementation Unit and to BSEP Activity Centers in Georgia, Russia and Ukraine.

Under the new Tacis Regional Programme 2000 currently under preparation the European Commission is planning on a € 12 million Black Sea Investment Support Programme for 2001-2003. The overall objectives of this programme will be :

Investment support

Co-financing with IFIs of pilot investments yielding significant environmental benefits. These might include the following in particular:

- Waste water treatment (including nutrient removal)
- End of pipe industrial discharge treatment (including upstream industrial facilities and oil terminals)
- Grants to new industrial facilities designed to minimise polluting discharges
- Landfills to replace marine waste dumping
- Prevention/remediation of oil spills from shipping
- Construction of harbour facilities

The investments should be available for all riverine countries and would include up-stream as well as coastal sites. Tacis should provide both technical assistance, including project preparation, and investment grants in the form of interest subsidies or otherwise.

Institutional support

Continuation of the work of the Black Sea Commission is of crucial importance for concerted action of the riparian countries to tackle the problems of the Black Sea.

Support may also be included to the three Activity Centres in order to fulfill the regional coordinating role for which they have also been designated . These are:

- Batumi, Georgia: biodiversity monitoring and development of strategy;
- Odessa, Ukraine: water quality monitoring and development of strategy;
- Krasnodar, Russia: coastal zone management.

EU is also anticipating a project on Nutrient Management in the Danube River Basin and its impact on the Black Sea (total cost 3,5 million €) as part of its 5th Framework Programme.

It will be important to seek the close cooperation of the EU programmes in the Danube and Black Sea areas with those of the GEF, the World Bank, the EBRD etc. so that synergies can be found in the execution of these programmes.

10. European Bank for Reconstruction and Development (EBRD)

EBRD has carried out pre-investment regional and sector studies in the Danube River Basin and technical co-operation projects in Hungary and Romania. The Bank's main focus is to identify and to promote investment projects together with supporting activities to facilitate these investments. The Bank attaches particular importance to promoting environmentally orientated operations in line with its mandate, both through "stand-alone" operations with primarily environmental objectives, such as upgrading of waste water management and solid and hazardous waste management, and also by financing environmental improvements in the industrial often as part of a larger-scale restructuring and modernisation investment.

EBRD municipal environmental infrastructure projects under implementation:

Municipal Utilities Development Programme (MUDP) I and II, Romania:
Water and wastewater sector loans to two programmes covering 6 and 10 cities, respectively. As well as improving the water quality of the Danube River and the Black Sea, the municipal infrastructure investments will also bring the water companies in line with EU environmental standards.

Maribor water and waste-water BOT project, Slovenia:
Loan to finance construction of a wastewater treatment plant in Maribor, Slovenia's second largest city. The project will have a major positive impact on the water quality of the Drava River.

Budapest Waste Water Services, Hungary:
The Bank has invested in the partly privatised Budapest Municipal Sewerage Company (BMSC). BMSC has subsequently developed an environmental action plan which will bring the facilities into compliance over time with both Hungarian and EU environmental standards.

Zaporozhia-Water Utility Development & Investment Programme, Ukraine:
The project is financing investments in the water supply and waste-water sector and enhancing the financial and operational performance of Vodokanal, the municipally owned water and waste-water company of Zaporizhia . The project will reduce discharges of untreated waste water into the Dnieper river and, ultimately, the Black Sea.

Brno-Modrice Waste-Water Treatment Plant, Czech Republic:

Loan to the water utility of the city of Brno to finance the extension and upgrading of the Brno-Modice waste-water treatment plant and part of the city's sewerage network, contributing to the further reduction of the pollution of the River Svratka.

Zagreb landfill rehabilitation, Croatia:

EBRD has funded the rehabilitation of one of the largest uncontrolled landfills in Europe to bring the landfill in line with EU environmental standards. The project includes a leachate collection and treatment facility to prevent discharge into the Sava River, a tributary to the Danube.

EBRD municipal environmental infrastructure projects under preparation:

- Sofia Water, Bulgaria
- Zagreb Waste-water treatment plant, Croatia
- Municipal Environment Loan Facility, Romania
- Sevastopol Water, Ukraine
- Municipal Utilities Development Programme, Ukraine

EBRD industrial projects under implementation:

Slovalco Aluminium Smelter, Slovak Republic:

EBRD made a loan and took equity to enable the company to complete the construction and operation of a new smelter and to shut down inefficient and polluting aluminium smelters and plants. Slovalco is now in full compliance with EBRD's environmental covenants and is a "zero emission plant", with all process waters being recycled and no wastewater discharges being discharged from the site.

Ambro/Sical, Romania:

An EBRD loan to Ambro to modernise its pulp and paper production facilities is also resulting in improvements in environmental conditions at the plant, including improvements in the treatment of black liquor, waste-water and sludge.

Further examples of EBRD-supported industrial projects under implementation in the water and wastewater management sector in the Danube catchment area are:

- Egis (pharmaceutical industry), Hungary
- Borchodchem (chemical industry), Hungary
- TVK (chemical industry), Hungary
- Petrom (petro-chemical industry), Romania
- Somatra zink smelter, Copca Mica, Romania
- ALRO aluminium smelter, Slotina, Romania
- Phoenix copper smelter, Baia Mare, Romania
- Policolor (print and ink factory), Bukarest, Romania, and Ruse, Bulgaria
- PIRDOP copper smelter, Bulgaria
- Sodi (Solvay-processing), Bulgaria
- Celhart (pulp and paper), Bulgaria.

The Bank has also undertaken environmental investments in the agribusiness sector focusing, typically, on the control of waste-water discharges, the improvement of waste-water treatment and the protection of groundwater.

11. UNDP Country Cooperation Frameworks/Regional Cooperation Frameworks

UNDP is supporting the Programmatic Approach through interventions under both its Environment and Governance focus areas. Under Environment, during the pilot phase Danube and Black Sea projects UNDP provided over $2 million in support to Danube/Black Sea basin issues through projects such as:

- Ukraine: Improving Environmental Monitoring Capacity ($1.099 million; 1995-1999)
- Ukraine: Environmental Impact Assessment Demonstration ($138,000; 1997-2000)
- Russia: Water Quality Evaluation and Prediction in Areas Affected by the Chernobyl Accident ($278,000; 1997-2000).
- Georgia: Capacity Building for the Ministry of Environment ($620,000; 1998-2000)

The Danube/Black Sea Basin Programmatic Approach has a strong focus on facilitating legal, policy and institutional reform in support of transboundary pollution reduction. These new laws, policies and institutions can only be effective if they have the appropriate level of trust, legitimacy and credibility in civil society. In addition, as has been the case in the West, environmental protection is being propelled more and more by public demand. UNDP is supporting the empowerment of individuals and NGOs with skills and information to increase their involvement in the environmental policymaking and enforcement processes. During the Danube and Black Sea pilot phase programs, UNDP provided assistance totaling nearly $6 million to the Black Sea basin countries in support of governance, democracy and public participation. Sample projects included:

- Regional Umbrella Program to Support Democracy, Governance and Participation in Europe and the CIS ($2.153 million, 1997-1999)
- Moldova: Governance and Democracy: Strengthening the Judicial and Legislative Systems ($1.739 million, 1996-1999).
- Georgia: Capacity Building for the Ministry of the Environment ($0.620 million, 1998-2000).
- Regional Programme on the Environment and Development ($1.8 million, 1997-1999). National Agenda 21's, policy reforms, institutional strengthening, public participation and networking, strengthening of inter-sectoral cooperation.

In addition, through the GEF Small Grants Programme in Turkey, UNDP supported a survey of monk seals and their habitats along the Black Sea coast, a coastal management programme in the Black Sea province of Trabzon, and a small scale Waste Water and Sanitation Project in the town of Hacimahmutlu.

Through its ongoing support to Environment and Governance in the Central European and CIS countries, UNDP will continue to provide the framework for successful implementation of the key reforms envisioned under the Programmatic Approach. During the five year period of the programme, UNDP will support, inter alia, the following projects which support the goals of the Programmatic Approach:

- Implementing Local Agenda 21's in Turkey: Phase II (includes 3 Black Sea provinces of Trabzon, Samsun and Zonguldak); ~$100,000.

- Turkey: National Programme for Environmental Management and Sustainable Development (includes efforts to combat desertification); $100,000.

- Management Planning for Conservation of Fen Mire Biodiversity in Belarus (Dnieper River Basin), $143,000.

- Ukraine: Promoting and Strengthening Horizontal Cooperation (supports Ukraine's process of triple transition to statehood, democracy and a market-oriented economy by acquainting Ukrainian government officials and policymakers with relevant reform experiences in other countries of the region, Asia and Latin America); $65,000.

- Support to Economic, Social and Administrative Reforms in Ukraine (aimed at facilitating the implementation of the government's economic, social and administrative reform programme by providing timely and effective expertise to develop and implement policy reform initiatives); $704,000.

- Czech Republic, Slovakia and Slovenia: National Capacity Building for Sustainable Development (institutional strengthening, integration of SD principles into selected sectoral policies and programmes, enhancing SD awareness); $300,000.

In addition, the GEF SGP will increase its links with the Black Sea Environment Programme through projects in the Biodiversity and International Waters focal areas. 7 of 33 recently submitted project concepts have direct relevance to Black Sea environmental issues, including protection of the Mersin Fish (*Huso*), a threatened species; raising public awareness to prevent Black Sea pollution; and a small size waste water treatment project in Samsun.

12. Other Programs:

- World Wildlife Fund: Lower Danube Green Corridor
- Integrated Management of the Carpathian River Basins (GEF project concept)
- Preparation of an Annex to the DRPC for the protection of ecosystems and nature conservation

Future Considerations Not Addressed in the Programmatic Approach.

Two activities not addressed in this Programmatic Approach will be considered at a later date. The first is the Black Sea-Bosphorus Straits-Mediterranean Sea Marine Electronic Highway (MEH) Feasibility Study, and the second an International Waters Fisheries Component. Regarding the MEH, the Black Sea GEF project identified shipping as a transboundary issue and mechanisms needed to support environmental management, and the Secretariat is in a position to set environmental management shipping guidelines, but this effort lends itself to a private sector initiative. The International Waters fisheries component is currently under preparation and will be considered and integrated into the Programmatic Approach, once operational guidelines have been prepared.

Annex 1

Transboundary Issues in the Danube/Black Sea Basin

It is widely agreed that regional scale eutrophication driven by excess nutrient inputs, primarily from riverine sources, is the major transboundary issue impacting the Danube/Black Sea basin. As a result of the pollution source inventory conducted during the preparatory work for the Black Sea Strategic Action Plan, it has been possible to gather data on the inputs of dissolved nitrogen and phosphorus compounds to the Black Sea (as of 1995). To the best of our knowledge[1], some 14% of total nitrogen are from Bulgaria, 27% from Romania, 12% from Ukraine, 10% from the Russian Federation, less than 1% from Georgia, 6% from Turkey and about 30% from the non-coastal countries (Austria, Belarus, Bosnia and Herzegovina, Croatia, Czech Republic, Former Yugoslavia, Germany, Hungary, Moldova, Slovakia, Slovenia). In the case of phosphorus, the figures are Bulgaria, 5%; Romania, 23%; Ukraine, 20%; Russia, 13%; Georgia 1%; Turkey 12% and 26%, for the remaining countries, a similar story to that of nitrogen.

According to the GEF Operational Strategy (p.48-49), the GEF strategy is to meet the agreed incremental costs of:

Implementing measures that address the priority transboundary environmental concerns.

Control of land-based sources of surface and groundwater pollution that degrade the quality of international waters….High priority is also placed on abatement of common contaminants such as nutrients,…

The Black Sea Strategic Action Plan states (p.10):

29. A Black Sea Basin Wide Strategy, negotiated with all states located in the Black Sea basin, should be developed to address the eutrophication problem in the Black Sea. The objective of the Strategy should be to negotiate a progressive series of stepwise reductions of nutrient loads, until agreed Black Sea water quality objectives are met. Such a Basin Wide Strategy may also be required to ensure the reduction of inputs of other pollutants into the Black Sea, in particular oil.

30. Given that the Danube is the largest single source of nutrient inputs into the Black Sea, it is imperative that strategies for the reduction of nutrients be adopted for this river.

The Common Platform for the Development of National Policies and Actions under the Danube River Protection Convention (DRPC) (chapter 3.2.4) states:

The eutrophication by nutrients from land-based sources of pollution is one of the most serious environmental problems of the Black Sea, one of the key explanations for its environmental decline and the principal cause for the degradation of the Black Sea environment. The main causes of negative regional effects on the Black Sea ecosystems include:

- *Pollution by untreated municipal and industrial wastes,*
- *Pollution from agricultural activities,*
- *Reduction of wetlands and forested areas.*

In the framework of the DRPC implementation the following goals and objectives have to be achieved:

[1] Topping, G., H. Sarikaya and L.D. Mee (1998) Sources of pollution to the Black Sea. In: Mee, L.D. and G. Topping (Eds) (1999 *in press*) Black Sea Pollution Assessment. UN Publications, New York, 380, 280pp

Strategic Goals:

- *to improve aquatic ecosystems and biodiversity*
- *to maintain and improve water resources quality and quantity (sustainable use)*
- *to prevent, reduce and control water pollution from point and diffuse sources, in particular where hazardous substances and nutrients are involved;*
- *to prevent and control transboundary impact and contribute to the Protection of the Black Sea from land-based pollution sources*

Specific objectives for the main sectors:

- *to ensure biological and advanced waste water treatment in the municipal and industrial sector*
- *to promote the use of BAT and the adoption of BEP in all industries, particularly those involving hazardous substances*
- *to promote the adoption of BEP and sustainable land use in agriculture*

As a result of the severe economic downturn in the region following the political upheavals of the early 1990's, the near collapse of the industrial and agricultural sectors in the Danube/Black Sea basin countries has resulted in some modest short-term reductions in nitrogen and phosphorus inputs to the Black Sea from the Danube and probably other rivers. In recognition of this "window of opportunity" to catalyze improvements in the status of the Black Sea ecosystem, the Joint Danube-Black Sea Technical Working Group identified the following goal for the next seven years:

The long-term goal is for all Black Sea basin countries to take measures to reduce nutrient levels and other hazardous substances to such levels necessary to permit Black Sea ecosystems to recover to similar conditions as those observed in the 1960s.

As an intermediate goal, urgent control measures should be taken by all countries in the Black Sea basin, in order to avoid that discharges of nitrogen and phosphorus to the Black Sea exceed those levels observed in 1997. This will require countries to adopt and declare strategies that permit economic development whilst ensuring appropriate practices and measures to limit nutrient discharge, and to rehabilitate ecosystems which assimilate nitrogen and phosphorus. This target, monitored and reported annually, shall be reviewed in 2007 with a view to considering further measures that may be required for meeting the long-term objective.

The strategy put forth below integrates the technical, policy, legal, institutional and investment frameworks summarized in the preceding sections.

Addressing Danube/Black Sea Basin-wide Eutrophication through Reduction and Sequestering of Nutrient Releases:

The Joint Danube-Black Sea Technical Working Group identified four key measures which could be taken to reduce nutrient discharges to the Danube/Black Sea basin. These include:

1. Reform of agricultural policies to reduce non-point source run-off of fertilizers and manure (buffer zones, manure storage clamps, erosion control, organic agriculture, etc.);

2. Improved municipal and industrial wastewater treatment to capture nutrients, particularly using alternative technologies with low capital and O&M costs (e.g. constructed wetlands, advanced integrated ponding systems, etc.);

3. Rehabilitation of key basin ecosystems (e.g. wetland restoration) to enhance their capacities as nutrient 'sinks';

4. Changes in consumer practices (including use of phosphate free detergents), including legislation (where needed), enforcement and public awareness.

Annex 2

Preserving the Danube/Black Sea basin Environment: A brief history

The Black Sea was formed only seven or eight thousand years ago when changing sea level sent Mediterranean water through the Bosphorus valley into what was until then a large freshwater lake. Human populations emerged and flourished in the basin, with little apparent negative impacts on the Sea or the rivers that feed it. Though not very biologically diverse compared with open seas at similar latitudes, the Black Sea developed remarkable and unique ecosystems, particularly in its expansive northwestern shelf where the sea is relatively shallow. Today, the Danube/Black Sea basin encompasses 17 countries and supports a population of over 160 million people over an area of about …square kilometers. Over the last 30-40 years, as a result of rapid and largely unsustainable development, industrialization and the 'green revolution', the Black Sea and many of the rivers that feed it have become severely degraded, with effects including:

- Loss of species diversity;
- Severe eutrophication over large areas (particularly in the NW shelf) due to excess inputs of nutrients;
- Declining water quality due to persistent inputs and levels of hydrocarbons and other chemicals from both marine and land-based sources;
- Landscape degradation due to unplanned coastal and watershed development;
- Introduction of exotic species (at least 26 in the Black Sea) with major impacts on the ecosystem and on commercial fisheries;
- Overfishing which together with the environmental factors led to a decrease in the diversity of Black Sea commercial species from 26 species to 6 in less than two decades;
- Increased frequency of outbreaks of waterborne diseases such as cholera and frequent beach closures due to poor coastal water quality.

Donor and National Activity:

Recognizing the declining status of the Danube/Black Sea basin environment, in recent years both the governments of the region and the international community have taken steps to remediate the degradation of the Danube/Black Sea basin and to prevent future impacts through a variety of reforms. Beginning in 1993, the Black Sea Environment Programme (BSEP) was created with both donor and national funding, including major inputs from the GEF and the European Union's TACIS and Phare programs. The BSEP focused on enabling activities, capacity building, and the preparation and approval of regional and national 'Strategic Action Plans' (SAP's). The BSEP focal areas included Emergency Response, Pollution Monitoring, Biodiversity, Integrated Coastal Zone Management, Fisheries, Database Management and Geographic Information System, Environmental Economics and Investments, NGO's, Information and Communication and Policy and Legislation.

Similarly, in 1991, GEF, the European Union and the countries of the Danube River basin created the Environmental Programme for the Danube River Basin (EPDRB), designed to support the Danube countries in their long term objective of improving the environmental management of the Danube river basin. EPDRB supported SAP and NAP preparation, monitoring, collection and assessment of data, emergency response systems, pre-investment studies, institutional strengthening, capacity building and reinforcement of NGO activities.

Concurrently, GEF and other donor-supported environmental protection activities have been underway in other Danube/Black Sea Basin rivers, including the Dnipro (GEF), Dniester (various), Don (World Bank) and Prut (Tacis) Rivers, and the Sea of Azov (Dutch).

Legal Framework:

Both the Black Sea and the Danube, the largest river in the basin, have developed and ratified international conventions (Black Sea Convention, Danube River Protection Convention) whose objectives pertain to the prevention of pollution of the Danube/Black Sea basin. The Danube River Protection Convention came into

force in October, 1998, the Black Sea Convention in February, 1994. A number of the basin countries are also parties to the UN Economic Commission for Europe's Convention on the Protection and Use of Transboundary Watercourses and International Lakes. Most countries are also party to several other relevant conventions, including the Convention on Biological Diversity, Convention on Wetlands of International Importance (Ramsar Convention). At the national level, numerous policies, laws and regulations exist relating to protection of Danube/Black Sea basin resources, but exhibit a wide range of implementation, compliance and enforcement. In most countries, legislation to address some of the priority problems, especially transboundary ones, identified by the programs noted above is still in its infancy. In the Danube River Basin, most countries, especially those in the accession process to the European Union are actually revising their policy and legal frame for environmental and water protection to be coherent with EU water directives.

Policy Framework:

The BSEP was the first programme to develop a systematic approach to policy development through the application of a Transboundary Diagnostic Analysis and a Strategic Action Plan (SAP). The Black Sea SAP, contains 59 specific commitments on policy regarding measures to reduce pollution, improve living resources management, encourage human development in a manner which does not prejudice the environment, and take steps towards improving financing for environmental projects. In adopting this plan, the Black Sea governments have committed themselves to a process of profound reform in the manner in which environmental issues are addressed in the Black Sea and its basin. Preparation of National Action Plans to operationalize the SAP at the national level is also underway.

Concurrently, the Environmental Programme for the Danube River Basin adopted a Danube River SAP in 1994 (revised in 1999 as a Common Platform for National Policies and Actions under the DRPC) which provides direction and a framework for achieving the goals of regional integrated water management and riverine environmental management expressed in the Danube River Protection Convention. The most recent GEF intervention in the Danube sought to operationalize elements of the SAP and Convention through the preparation of a Pollution Reduction Programme (PRP) which was completed in July, 1999. Over $5 billion in investments, primarily at the national level and targeting 'hot spots', were identified and project files prepared.

Preparation of a Strategic Action Programme and support to its implementation is also planned in the Dnipro River Basin through UNDP-GEF and IDRC assistance.

Institutional Framework

Several emerging or operational institutions have key roles to play in the identification and implementation of activities aimed at the remediation and protection of the Danube/Black Sea basin waters and ecosystems. Key among these are the Commission on the Protection of the Black Sea Against Pollution and the Secretariat of the Black Sea Commission, and the International Commission for the Protection of the Danube River and its Permanent Secretariat, each with responsibility for coordinating implementation of the respective Conventions. The Danube Secretariat and the ICPDR Expert Groups (Monitoring, Laboratory, Information Management Expert Group, Emission Expert Group, Accidental Emergency Warning and Prevention Expert Group and Ad-hoc Expert Group for Implementation of EU Water Framework Directives and River Basin Management) are fully operational and financially sustainable whereas the Black Sea Secretariat has experienced repeated delays in overcoming political and bureaucratic challenges to its establishment. It is hoped that these will be overcome shortly (April, 2000) and the Black Sea Secretariat will come into existence in late 2000 or early 2001. In addition, donor-supported activities have resulted in the creation of non-permanent institutions such as the Black Sea PIU and Danube PCU responsible for coordination of the respective environment programmes.

Investment Framework:

Both the Black Sea and Danube Environment programmes have supported the identification and preparation of investments aimed at remediating and preventing environmental degradation in the Danube/Black Sea

basin. Collectively, the 13 countries of the Danube River Basin invested approximately $560 million in municipal and industrial wastewater treatment, agricultural water pollution reduction, wetlands protection and water resources management in 1997-98. An additional $4.29 billion in water sector investments is planned for the next 2-5 years. For the Black Sea riparians, a total of nearly $100 million in water sector investments are underway or near completion.

ANNEX 10 Relevance of the GPA for Land-Based Sources of Pollution in the frame of the DRPC

STRENGTHENING THE IMPLEMENTATION OF NUTRIENT REDUCTION MEASURES AND TRANSBOUNDARY COOPERATION IN THE DANUBE RIVER BASIN

ENHANCING INTERNATIONAL COOPERATION AND LEGAL PROVISIONS FOR REDUCTION OF NUTRIENT INPUT IN THE DANUBE RIVER BASIN

REPORT IN SUPPORT OF THE PROJECT BRIEF

AUGUST 2000

International Commission for the Protection of the Danube River

UNDP/GEF Assistance

Introduction

This study was prepared by a legal consultant to the United Nations Environment Programme / Regional Office for Europe (UNEP/ROE) in the framework of the PDF-B project "Strengthening the Implementation of Nutrient Reduction Measures and Transboundary Cooperation in the Danube River Basin" of the Global Environment Facility (GEF).

The main purpose of the study is to provide recommendations to UNEP on which legal steps are required in order to enhance the implementation of the Global Programme of Action (GPA)[1] in the Danube River basin, with particular focus on the issue of pollution by nutrients.

The paper includes:

- An introduction to the problem of eutrophication in the Danube River and in the Black Sea;
- Description of legal/policy response required or actually undertaken;
- Assessment of implementation of the GPA in the Danube River basin;
- Recommendation of proposed actions to be considered by Danube Basin Countries and stakeholders.

The paper was drawn up in consultation with key stakeholders, such as the Secretariat of the International Commission for the Protection of the Danube River (Secretariat of ICPDR), UNEP/ROE, and the UNEP/GPA Coordination Office. Scientific advice was provided by Professor Helmut Kroiss of the Technical University in Vienna in Austria.

Pollution by Nutrients in the Danube River Basin and in the Black Sea

The Danube and Black Sea Basins

On its way from the Black Forest to the Black Sea, the Danube crosses 11 countries, more than any other river in the world, representing a high diversity of cultural, economic and social characteristics. The Danube is the second largest river of Europe, its catchment area comprises areas in17 countries and over 800.000km^2, which are part of the Black Sea catchment area of an estimated 2.300.000 km^2. Therefore, the Danube provides for a large part of the input of water - and of pollution - from rivers to the Black Sea.

Eutrophication in the Black Sea

The last decades have seen a considerable increase in the input of nutrients (nitrogen and phosphorus) and into the Black Sea. As a result of eutrophication, excessive alga growth has been observed in areas of the Danube delta and of the Black Sea. The lack of oxygen in the water led to decrease in fish stocks and marine living resources. The peak of eutrophication was reached in the early 1990's. This situation led to the awareness that there is an urgent need for action in order to improve the ecological situation by controlling the release of nutrients into the aquatic environment.

[1] Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, adopted in Washington DC on 3 November 1995

Recent improvements

Since 1992, an improvement of the ecological situation has been observed in the Black Sea. Alga growth has decreased and stocks of certain fish species are slowly recovering. This improvement was mainly due to two factors. In the more upstream countries, efforts that started in the past decades in wastewater treatment and in implementing new agricultural policies are showing effect, resulting in stabilization and reduction of nutrient input. Nevertheless, further efforts will be necessary in agricultural policies as well as wastewater treatment in order to reduce the input of nutrients.

The other, more important factor was the economic transition of the Central and Eastern European Countries. Economic decline resulted in a significant reduction (e.g. estimates of about 15% reduction in total input of N and P to the Danube between 1988/89 and1992) of pollution from nutrients, mainly due to decrease of agricultural and industrial activity. As economic recovery takes place, it will be a challenge to stabilize and further reduce input of nutrients to a sustainable level.

Main Sources of Nutrients

The main sources of nutrients entering the Black Sea from the Danube come from agriculture (>1/2), from communal discharges (>1/4), from industry and from background sources. Discharges can be from “point sources” (e.g. from communal wastewater discharge, agricultural point source) or from “diffuse sources”, such as from agriculture/groundwater infiltration or erosion.

The scientific knowledge about the interrelations of hydrology, pollution and water quality of the Black Sea and Danube basins is constantly improving. The Transnational Monitoring Network (TNMN) and the resulting Danube Water Quality Model (DWQM) produced results, which can provide a sound basis for policy decisions. Nevertheless, many important factors still remain to be solved, e.g. with regard to an exact assessment of national shares of nutrient input into the Danube River.

Towards a Common Policy Response to Pollution by Nutrients and other Pollutants in the Danube River Basin

Background

The Danube basin comprises some of the most performing economies of the European Union, as well as countries with economies in transition, some of them just recovering from a conflict situation. Nevertheless, as demonstrated by the report [2] prepared in the framework of this GEF PDF-B project, many DRPC countries are either implementing / approximizing to EU legislation, others are planning to harmonize their legislation with the EU *acquis.* Two countries are already members of the European Union (Germany, Austria), some are harmonizing their legislation with a view of joining the EU in the near future (Czech Republic, Hungary, Slovenia) or later (Slovakia, Croatia, Romania and Bulgaria).

FR Yugoslavia and Bosnia Herzegovina find themselves in a special situation, but nevertheless, have expressed their interest of harmonizing their legislation to the EU law and

[2] “Existing and Planned policies and Legislation relating to Nutrient Control and Reduction”, Draft Summary Report for Danube Regional Project, ICPDR-UNDP/GEF, June 2000 e.g., Table 14.5 “Planned Schedule for Approximation of National Legislation to EU Legislation”

policies. Moldova and Ukraine have also expressed the interest of taking into account the aspect of harmonization with EU policies in the development of national policies in the framework of cooperation with the EU in the field of environment protection.

Policy approach of relevant EU legislation

The current state of EU legislation is marked by one major event: the recent adoption of the "European Water Framework Directive"[3] (WFD) of 18 July 2000. The Water Framework Directive will reform the EU water policy, setting out a new common approach to water management, as well as common objectives and principles, common definitions and basic measures. It is designed to prevent further deterioration and to protect and enhance the quality and quantity of aquatic ecosystems.

Key elements of the Directive relevant to the reduction of pollution by nutrients or other substances include:

- Protection of all surface waters, including maritime coastal waters, and groundwaters in their quality and quantity with a proper ecological dimension;
- Emissions and discharges to be controlled by y a *combined approach* (see below);
- Integrated river basin management across administrative and political borders with coordinated programmes of measures, including the establishment of River Basin Districts and River Basin Management Plans.

The EU Water Framework Directive in its Article 10 stipulates a *combined approach* to be taken for the control of discharges from point and diffuse sources into surface waters. This combined approach includes:

- Emission controls based on Best Available Techniques (BAT);
- Relevant emission limit values;
- In the case of diffuse impacts the controls including Best Environmental Practices (BEP).

Control measures are set out more specifically in several EU Directives, to which the Water Framework Directive makes reference. These directives include, amongst others, the Directive concerning integrated pollution prevention and control (IPPC-Directive), the directive concerning urban waste water-treatment and the directive concerning the protection of waters against pollution caused by nitrates from agricultural sources ("nitrate directive").

The following table gives an overview of the most relevant EU legal acts:

[3] Directive of the European Parliament and of the Council establishing a framework for Community action in the field of water policy

Table 1:
Examples of relevant EU-legislation and underlying principles:

European Parliament and Council Directive establishing a framework for Community action in the field of water policy (“European Water Framework Directive”, WFD)	• Combined approach of water quality objective approach and emission limits value approach used to mutually reinforce each other. • Water quality standards • “Good surface water status” to be achieved within 15 years • Use of notions of “Best Available Techniques” and Best Environmental Practices for point and diffuse sources • River Basin Districts and River Basin Management Plans to be established.
Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment.	• Emission limitation for treatment and discharge of urban waste water and waste water from certain industrial sectors • Identification of “sensitive areas”, where there is a requirement of appropriate treatment of waste-water for the removal of nutrients
Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources	• Reduction and prevention of emission from nitrates from agricultural sources • Designation of “vulnerable zones”. • Establishment of codes of “good agricultural practice” and “action programmes”.
Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control	• Integrated prevention and control of pollution from industrial activities • Installation permit shall include emission limit value for relevant pollutants • Emission limit value shall be based on best available techniques (BAT). Additional measures to be taken if required by environmental quality standards

Targets and timeframes of WFD:

- **Prevent deterioration of surface and ground waters;**
- **Achieve good surface and groundwater status within 15 years of entry into force of WFD;**
- **Review of the environmental impact of human activity and Economic Analysis of water use within 4 years of entry into force of WFD;**
- **River Basin Management Plan completed by end of 2004, reviewed every six years.**

Integrated River Basin Management

One of the main innovations of the EU Water Framework Directive (WFD) is to create a single system of water management: the river basin management on the European level, following and complementing positive examples of initiatives taken forward by the States concerned for e.g. the Rhine or Danube basin. This policy is based on the recognition that the best model for a single system of water management is management by river basin – the natural geographical and hydrological unit – instead of according to administrative or political boundaries.

This development is also of particular relevance for the Danube basin. Therefor, several provisions of the WFD merit special consideration.

Establishment of River Basin Districts

The "River Basin District" is the main unit for management of river basins under the WFD. It is composed of the "area of land and sea, made up of one or more neighboring river basins together with their associated groundwaters and coastal waters" (Article 2 para. 15). The EU Member States shall identify river basins and assign them to river basin districts.

A river basin covering the territory of more than on EU Member State shall be assigned to an international River Basin District (Article 3 para. 3 of the WFD).

Conclusion: The Danube Basin will be assigned to an "International River Basin District" by EU and accession countries.

Paragraph 5 of Article 3 stipulates a principle of cooperation for River Basins Districts, which extend beyond the territory of the EU. In this case, the Member States concerned "shall endeavour to establish appropriate coordination with the relevant non-Member States, with the aim of achieving the objectives of this Directive throughout the River Basin District. For international River Basin Districts the Member States concerned shall together ensure this coordination and may, for this purpose, use existing structures stemming from international agreements.

According to Article 18 of the DRPC, the International Commission for the Protection of the Danube River (ICPDR) can, in addition to affairs explicitly entrusted to the International Commission, "deal with all other affairs the Commission is entrusted with by mandate from the Contracting Parties".

Conclusion: ICPDR could perform coordination of International River Basin District with EU member and non-member countries, when entrusted by mandate from the DRPC Contracting Parties.

River Basin Management Plans

Article 16 of the WFD requires that for each River Basin District a River Basin Management Plan should be elaborated. In the case of an international River Basin District extending beyond the boundaries of the Community, Member States shall endeavour to produce a single River Basin Management Plan.

Where this is not possible, the plan shall at least cover the portion of the international River Basin District lying within the territory of the Member State concerned. The River Basin Management Plan shall cover various elements, which are listed in Annex VII of the WFD.

Conclusion: Danube Countries could consider establishing a joint International River Basin Management Plan for the Danube River basin.

Scope of application

As already stated in the preamble of the WFD, “an effective water policy must take account of the vulnerability of aquatic ecosystems located near the coast and estuaries or in gulfs or relatively closed seas, as their equilibrium is strongly influenced by the quality of inland waters flowing into them”. Consequently, according to Article 1 of the WFD, the “purpose of this Directive is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwaters”, thereby including “coastal waters” into the territorial scope of application of the WFD.

Furthermore, the definition of “surface water” in Article 2 paragraph 1 of the WFD also includes coastal waters. Paragraph 15 of Article 2 stipulates that “associated […] coastal waters shall be included into the River Basin District. “Coastal waters” are defined by Article 2 paragraph 7 of the WFD as ”surface water on the landward side of a line every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters”.

Conclusion: The quality of coastal waters of participating countries should be taken into account in the International River Basin Management Plan.

Environmental Objectives and Water Quality Status

According to Article 4 paragraph 1 subparagraph (a) (i) of the WFD, “Member States shall implement the necessary measures to prevent deterioration of the status of all bodies of surface water”. Subparagraph (a) (ii) stipulates that “Member States shall protect, enhance and restore all bodies of surface water [...] with the aim of achieving good surface water status at the latest 15 years after the date of entry into force of this Directive”.

Conclusion: The International River Basin Management Plan should contain targets and timeframes, including transitional provisions, for the reduction of the pollution by nutrients (and other pollutants).

Protected Areas

According to Article 6 of the WFD, “protected areas” shall be established in each River Basin District. Such protected areas shall include, in particular, “nutrient sensitive areas, including areas designated as Vulnerable Zones under the nitrate Directive and areas designated as Sensitive Areas under the urban waste-water Directive (Paragraph 1 - iv of Annex IV of the WFD).

According to Article 3 paragraph 2 of the nitrates Directive, all known areas of land in their territories which drain into nitrate polluted waters and which contribute to pollution shall be designated as “vulnerable zone”, requiring special action programmes.

The urban waste-water Directive requires that freshwater body, estuary or coastal water which are found to be eutrophic or which in the near future may become eutrophic shall be identified as “sensitive areas” (Annex II-A). Discharges from urban waste water treatment plants (of agglomerations of more than 10.000 persons) situated in the catchment area of a sensitive area, and which contribute to the pollution of such area, are subject to emission limits regarding concentration or for percentage of reduction of nutrients (Article 5, paragraph 5 of urban waste-water Directive).

Conclusion: Danube countries could consider establishing Vulnerable Zones and Sensitive Areas within the basin as Protected Areas under the International River Basin Management Plan.

Table: Some of main innovations of WFD vs. Danube River Protection Convention

	WFD	***DRPC***
Scope of application	• Inland surface waters, including transitional waters and *coastal waters* • Groundwater	Hydrological river basin
Quality standards and objectives	“Good surface waters status” within 15 years (Article 4 paragraph 1 WFD)	To be developed under Article 7 paragraph 4 DRPC
River Basin Management Plan	Yes	No
Protected Areas	Yes	No

Implementation of the Global Programme of Action

Requirements of the Global Programme of Action (GPA)

The Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) was adopted by 108 Governments and the European Commission in 1995. It is the response of the international community to the fact that a large part of the pollution of the world's oceans (estimated 80%) is caused by human activities on land. Therefore, marine protection is an issue of everybody, living in a coastal or landlocked country.

By adopting the GPA, States declared that the protection and management of the global water resources has to be based on a basin wide approach. This means that all countries lying within the catchment area of a hydrological basin of a water resource should cooperate to protect the water resource in question.

The GPA is aimed to be "*a source of conceptual and practical guidance* to be drawn upon by national and/or regional authorities in devising and implementing sustained action to prevent, reduce, control and/or eliminate marine degradation from land based activities".

The GPA gives recommendations for action at the national level, and at the level of regional and international cooperation. Furthermore, the GPA provides guidance for "recommended approaches by source category", including a chapter on nutrients, which are of particular relevance for this study.

The objectives of the GPA with regard to nutrients are to:

- identify marine areas where nutrient inputs are causing or are likely to cause pollution;
- reduce nutrient inputs into the areas identified;
- reduce the number of marine areas where eutrophication is evident,
- protect and restore areas of natural denitrification.

Action at the national level

Recommendations for Reduction of Pollution from Land Based Sources

On the national level, the GPA lists activities in the following fields, which are valid for reduction of all pollution from land-based activities, some of them being of particular relevance also for nutrient reduction:

- Identification and assessment of problems, such as identification of contaminants and of sources of degradation (e.g., point sources and diffuse sources of pollution), as well as identification of "areas of concern" (ecologically sensitive areas);
- Establishment of priorities for source categories and areas affected;
- Setting management objectives for priority problems, including goals, targets and timetables;
- Identification, evaluation and selection of strategies and measures, including e.g. implementation of best available techniques and best environmental practices, product substitution, waste treatment etc.

GPA Recommendations for Nutrient Reduction

With particular regard to the source category of nutrients, the GPA recommends different national action, policies and measures to be taken at the national levels. The GPA requires:

- the identification of areas where nutrient inputs are likely to cause pollution;
- the identification of point sources and diffuse sources of nutrient input;
- the adoption of appropriate cost-effective policy instruments, including regulatory measures, economic instruments and voluntary agreements, such as activities relates to sewage treatment, integration of best environmental practice (BEP), best available techniques (BAT), integrated pollution prevention and information campaigns;
- to strengthen capacity on the local level (urban development and agriculture);
- scientific research;
- to protect and restore potential natural sinks such as wetlands.

Implementation enhanced by DRPC

A thorough assessment of the nutrients problem and of the action required or undertaken at the national level is included in the report "Five Year National Nutrient Reduction Action Plan"[4], which has been prepared in the context of the PDF-B phase of the present project. The following table gives an overview of the implementation of some of the key elements of the GPA at the national level regarding nutrients:

	Identification of point / diffuse sources of nutrient input	Nutrient Reduction Plan adopted	Completion of Appropriate Policy instruments	Product substitution of P-free detergents	Need of legislative changes identified
Germany	Yes	No	Partly	Yes	No
Austria	Yes	No	Partly	Yes	No
Czech Republic	Yes	No	Short term		Yes
Slovakia	Yes	No	Mid-term	Control planned	Yes
Hungary	Yes	No	Short term	No plan	Yes
Slovenia	Yes	No	Short term	No plan	Yes
Croatia	Yes	No	Mid-term	No plan	Yes
FR Yugoslavia	Yes	No	Long-term		Yes
Bosnia-Herzegovina	Yes	No	Long-term	No plan	Yes
Romania	Yes	No	Mid-term	In discussion	Yes
Bulgaria	Yes	No	Mid-term	No plan	Yes
Moldova	Yes	No	Long-term	No plan	Yes
Ukraine	Yes	No	Mid-term	No plan	Yes

It can be concluded that the implementation of the GPA is on the way, mainly driven by activities under the DRPC as well as the process of approximation of legislation to EU policies. For example, under the current GEF PDF-B project an exhaustive assessment of sources of nutrient pollution has been prepared, in order to provide the basis for the development of "national nutrient reduction plans".

All of the Danube countries with two exceptions identified a need for legislative changes on the national level, in order to implement the planned policy reforms for nutrient reduction. The implementation of appropriate policy tools is just at the beginning.

[4] " Five Year National Nutrient Reduction Action Plan", draft summary report for the Danube Regional Project, ICPDR – UNDP/GEF, June 2000

A number of measures at the national level remain to be implemented. An effective implementation of a strategy, including identification of problem, establishment of objectives and implementation of activities in line with the guidance contained in the GPA, will be enhanced by the elaboration of national nutrient reduction plans.

Conclusion: Work on elaboration of National Nutrient Reduction Plans has been started under the umbrella of the ICPDR.

Action at the Regional Level

GPA Recommendations for Reduction of Pollution from Land Based Sources

The GPA recognizes that "regional and subregional cooperation and arrangements are crucial for successful action to protect the marine environment from land-based activities". The objective should be to "strengthen and, where necessary, create new regional arrangements and joint actions to support effective action, strategies and programmes.

The GPA recommends the following activities:

- Participation in international regional and subregional marine and freshwater agreements or arrangements. Where necessary, existing agreements should be strengthened or new ones being negotiated ;
- Effective functioning of regional and subregional arrangements, including securing of funding and cooperation with multilateral financing agencies, adoption of programmes of action, information clearing house, inter-institutional cooperation, cooperation between secretariats and conventions ;
- Adequate secretarial support for regional and subregional agreements.

GPA Recommendations for Reduction of Pollution by Nutrients

Specifically for the issue of eutrophication, the GPA recommends:

- the establishment of common criteria for the identification of eutrophication problems;
- the identification of marine areas where nutrients are causing pollution;
- the identification of areas for priority actions;
- the estimation of uniform approaches to the calculation of anthropogenic nutrient input with the aim of improving estimation of these inputs;
- the development and implementation of programmes for reducing nutrient input, paying particular attention to the agricultural sector;
- to establish mechanisms for assessing the effectiveness of the measures taken; and
- to develop strategies for reducing eutrophication.

Assessment of Implementation

There are two regional conventions in force, which have direct relevance for the protection of the Black Sea:

The Convention on the protection of the Black Sea against pollution was adopted in April 1992 in Bucharest and came into force in 1994. It is not a basin-wide convention, but covers the six Black Sea riparian States.

It is supplemented by a Protocol on the Protection of the Black Sea Marine Environment against Pollution from Land Based Sources, which is an integral part of the Convention.

The assessment of the implementation of the GPA through the Black Sea Convention and the identification of legislative needs is subject of a detailed report prepared by Mr. I. Zrazhevski, consultant to UNEP under the framework of this PDF-B phase. One of the questions arising is whether an assessment of the Black Sea Protocol on land based sources would indicate that it requires amendment in order to enhance implementation of the recommendations of the GPA.

The Danube River Protection Convention (DRPC) was adopted in 1994 and entered into force in October 1998. Its scope covers 13 Danube River countries, most of which have already ratified the Convention. The DRPC is based on the basin-wide approach. As a river basin convention it is “land based” by nature; therefore, its provisions can be directly compared to the LBS Protocols of Regional Seas agreements, including the Black Sea Convention and the Barcelona Convention.

Several subsidiary bodies have been established under the DRPC, which address many of the recommendations of the GPA.

- Accident Emergency Prevention and Warning System Expert Group;
- Emission Expert Group;
- Monitoring Laboratory and Information Management Group;
- Strategic Expert Group; and
- Ad Hoc Expert Group for implementation of EU Water Framework Directive and River Basin Management.

In order to provide an overview of the legal and institutional framework and measures of implementation, a comparative analysis can be done of the above-mentioned regional instruments. The table below lists some of the recommendations of the GPA and the relevant provisions/implementation measures in the two LBS Protocols felt more relevant and the DRPC, as well as the new European system of the WFD.

GPA Recommendations	LBS Protocol 1996 Mediterranean Sea	LBS Protocol Black Sea	WFD	DRPC
	Not yet in force	In force	Entry into force expected 2000	In force
Basin Management Approach	Other States within hydrological basin invited to cooperate in implementation	• "Coastal" convention. Black Sea Convention is open for accession by other States. • Joint Ad Hoc Technical Working Group ICPDR- ICPBS[5]	River Basin Districts, including associated coastal waters, to be established	• Implemented by Articles 1,2 and 3 of the Convention. • Joint Ad Hoc Technical Working Group ICPDR-ICPBS
BAT/BEP	Annex IV Protocol	No	• Article10 WFD • Related EU Directives	Annex I DRPC
Secretarial Support	Yes	Yes	Yes	Yes
Cooperation in Monitoring	Article 8 of Mediterranean Protocol	Article 15 of Black Sea Protocol	Article 8 WFD	• Article 9 • Monitoring, laboratory and information management expert group. • Transnational Monitoring Network (TNMN) and Danube Water Quality Model (DWQM)
Harmonization of emission limitation	Article 7: Common guidelines, standards and criteria to be developed	Article 6: Common guidelines, standards and criteria to be developed	• Article 10 WFD "Combined approach" • Article 11 controls for priority substances and priority hazardous substances • Limitations of related EU Directives	• Article 7 DRPC: Emission limits and water quality objectives to be developed • Emission expert group
Regional Strategic Action Plan adopted for nutrient reduction	Not yet	To be developed under present project	• River Basin Management Plan to be produced (Article 13 WFD) • Programmes of measures (Article 11 WFD)	Joint Action Plan to be developed under proposed project
Information clearing house	Yes	Yes	Yes	Yes
Implementation of programmes with other international agencies	Yes	Yes	Yes	Yes

[5] ICPBS: International Commission for the Protection of the Black Sea, "Istanbul Commission"

The Danube River basin - which forms an important hydrological "sub-basin" to the Black Sea basin – is almost entirely covered by the DRPC. The assessment of the implementation of the GPA in the Black Sea basin shows that the DRPC presently offers an appropriate legal framework for the implementation of the GPA on a regional level. The DRPC contains similar provisions, which are contained in the LBS Protocols examined, and which are sometimes more far-reaching than the LBS provisions, e.g., by implementing a basin wide approach for its sub-basin. Therefor, as far as the Danube River basin is concerned, it can be noted that presently the DRPC is supplementing the Black Sea Convention.

Furthermore, the adoption of a common policy approach in line with the EU legislation is providing a considerable impetus to harmonization of policies and to implementation of pollution reduction in the Danube River Basin.

On the side of practical implementation, considerable work remains to be done. The proposed Danube Regional Project proposes implementation measures to be undertaken, which will provide for a reduction in nutrient transport to the Black Sea of estimated 27% for Phosphorus and 14% of Nitrates.

The GPA requires the development of a regional strategy for reduction of pollutants including nutrients. Such action plan should contain the identification and assessment of the problem, the fixing of objectives (such as clear targets and timeframes), measures to achieve these objectives and a mechanism in order to review the effectiveness of the measures taken. Until presently, many activities have been undertaken, but no such regional action plan – which could serve as a common platform for implementation of nutrient reduction measures on the national level - was adopted.

Close co-operation with stakeholders, such as the International Commission for the Protection of the Black Sea (ICPBS), will be required in order to ensure full compatibility of this process with related work currently undertaken, such as the (possible) development of an amended Protocol on land-based sources to the Black Sea Convention. UNEP will continue to play a catalytic role in order to enhance this process.

Conclusions:

- **Most of the action recommended by the GPA is taken by DRB countries in the framework of participation in the DRPC, including its Commission and subsidiary bodies, and by implementing a common policy approach;**
- **The necessary secretarial support is provided by the Secretariat of the ICPDR;**
- **Common platform of action for implementation, such as a Joint Action Programme for the Danube River basin, should be developed and adopted in order to implement pollution reduction measures following the recommendations of GPA.**

Action at the international level

GPA Recommendations for LBS Pollution

Activities at the international level, which are recommended by the GPA, fall into the following categories:

- capacity building, including the mobilization of experience in support of national and regional action, as well as a clearing house mechanism;
- mobilization of financial resources, including the GEF;
- international institutional framework, with UNEP playing a catalytic role between the institutions concerned;
- additional areas of international cooperation, such as waste water treatment and management as well as Persistent Organic Pollutants

GPA Recommendations for Reduction of Pollution by Nutrients

Specifically for the issue of reduction of pollution by nutrients, the following activities are recommended at the international level:

- Participation in a clearing-house for providing information about BEP / BAT to reduce or eliminate causes of eutrophication;
- Strengthening of international programmes for capacity building for identification of areas where eutrphication is causing or is likely to cause pollution, Nutrient control and removal technique, application of BEP in aquaculture and agriculture;
- Technical cooperation for reduction of release of nutrients, including environmentally sound land-use techniques, planning and practices,
- Provision of forums for establishing criteria for determining the circumstances in which nutrients are likely to cause pollution,
- Maintaining existing international quality assurance and quality control procedures relevant to eutrophication.

GPA Strategic Action Plan on Sewage

In the period 2000 – 2001 a major mandated task of the UNEP/GPA Co-ordination Office is to forward and coordinate the implementation of the GPA Strategic Action Plan on Municipal Wastewater. A Global Conference Process is part of this action plan.

The main aim of the Strategic Action Plan is to initiate and facilitate a process, which leads to the development and implementation of national strategies on sewage. An innovative element of this strategy is the exploration of possibilities for public-private partnerships. There are a number of economic sectors, such as tourism, mariculture, and urban development, which can benefit from a healthier environment.

At present, pre-investment studies to identify suitable socio-economic opportunities are being carried out, with the support of the UNEP/GPA Coordination Office, in four regions: the East Asian Seas, the South Asian Seas, Eastern Africa, and the South-East Pacific. In addition, a number of case studies on the environmental, social, and economic benefits of addressing sewage are under preparation.

At a later stage, the UNEP/GPA Coordination Office, in partnership with governments and organizations such as the World Health Organisation, United Nations Centre for Human Settlements (Habitat), and the United Nations Development Programme, will be promoting development and implementation of national strategies on sewage.

Public Participation and Compliance

22 invited Experts of the ECE/UNEP network of Experts on Public Participation and Compliance drew up a “Guidance on Public Participation in Water Management and Framework for Compliance with Agreements on Transboundary Waters”[6]. These guidelines aim at promoting the full and effective implementation of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki 1992, “Water Convention).

The Guidance on public participation in water management gives recommendations in the field of public participation in decision-making and recommends the development of a

[6] Published by United Nations, New York and Geneva, 2000

communication strategy for each catchment area. Many of these recommendations are taken into account within the respective regional systems of the Danube and the Black Sea Conventions. UNEP could contribute to this aim by developing a Black Sea basin-wide communication strategy for public awareness, promoting the issue of the reduction of pollution of the Black Sea in the Danube basin and *vice versa*.

The Framework for Compliance recommends the establishment of a compliance review procedure in agreements on transboundary waters in order to facilitate compliance more effectively, as well as to introduce non-confrontational, non-judicial and consultative procedures to review compliance and resolve disputes. So far, no agreement on transboundary waters in the ECE region is currently following developments in global environmental agreements and providing a compliance review procedure.

Assessment of Implementation

A great part of this action is taken into account by the work under the DRPC as well as the Black Sea Convention. The proposed regional project will be a good example for international cooperation undertaken.

A crucial element is the cooperation between the two Commissions, which has led to the setting up – with the assistance of UNDP/GEF and UNEP - of a Joint Ad Hoc Technical Working Group in 1997. One outcome of this cooperation is the preparation of a draft Memorandum of Understanding between the two Commissions, which has not yet been signed.

Taking into account the number of activities, which are planned in relation to Danube and Black Sea Conventions and their close interrelation, further strengthening of this successful co-operation is crucial. UNEP is called upon to play a “catalytic role” in this process.

Furthermore, the synergies between the work of the UNEP GPA Co-ordination Office and the Danube / Black Sea Commissions should be further strengthened and exploited. Part of this cooperation could be the consideration of the future GPA Strategic Action Plan on Sewage, which could be appropriately undertaken in a Joint meeting. Furthermore, it is important that the GPA recommendations will be taken into account when implementing activities in the framework of the Danube and Black Sea Regional projects, e.g. by implementing joint pilot projects. Of particular interest will be to draw upon the experience of the GPA Coordination Office in enhancing public-private partnerships.

UNEP could contribute to the promotion of public awareness on the protection of the Black Sea and Danube by developing and implementing one basin-wide communication strategy, promoting the issue of protection of the Black Sea in the Danube basin and *vice versa.* The Framework for Compliance should be brought to the attention of the Danube and the Black Sea Countries.

Conclusions:

- **Cooperation between Danube and Black Sea Commissions should be continued and strengthened through the work of the Joint Ad Hoc Working Group and the signature and implementation of a MoU between the Black Sea / Danube Commissions;**
- **UNEP shall continue to play a catalytic role between the institutions concerned;**
- **GPA Strategic action plan on Sewage shall be considered by Danube and Black Sea countries in a joint meeting and integrated into implementation activities under ICPDR and ICPBS, e.g. by the joint implementation of pilot projects.**
- **UNEP should develop a common communication strategy for Danube and Black Sea basins;**
- **The Framework of Compliance with Agreements on Transboundary Waters should be brought to the attention of and considered by the Joint Ad Hoc Technical Working Group or a joint meeting.**

Summary of Conclusions:

- The Danube Basin will be assigned to an “International River Basin District” by EU and accession countries;
- ICPDR could perform coordination of International River Basin District with EU member and non-member countries;
- Parties of DRPC could consider establishing a joint International River Basin Management Plan;
- The coastal waters of the participating Danube River Basin countries would have to be taken into account in the International River Basin Management Plan;
- The International River Basin Management Plan should contain targets and timeframes, including transitional provisions, for the reduction of the pollution by nutrients (and other pollutants);
- Danube countries could consider establishing Vulnerable Zones and Sensitive Areas within the basin as Protected Areas under the International River Basin Management Plan;
- Work on elaboration of National Nutrient Reduction Plans has been started under the umbrella of the ICPDR;
- Most of the action recommended by the GPA is undertaken by DRB countries in the framework of participation in the DRPC, including its Commission and subsidiary bodies, and by implementing a common policy approach;
- The necessary secretarial support is provided by the Secretariat of the ICPDR
- There is a need of establishing a common platform of action for implementation, such as a Joint Action Programme for the Danube River basin;
- Cooperation between Danube and Black Sea Commissions should be continued and strengthened via the work of the Joint Ad Hoc Working Group;
- UNEP shall continue to play a catalytic role between the institutions concerned;
- The MoU between ICPDR and ICPDS should be signed and implemented;
- GPA Strategic action plan on Sewage shall be considered by Danube and Black Sea countries in a joint meeting and integrated into implementation activities under ICPDR and ICPBS, e.g. by the joint implementation of pilot projects;
- UNEP should develop a common communication strategy for Danube and Black Sea basins;
- The Framework of Compliance with Agreements on Transboundary Waters should be brought to the attention of and considered by the Joint Ad Hoc Technical Working Group or a joint meeting.

Recommendations

Parties to the DRPC may consider:

- to develop and implement a Joint Action Programme for the Danube River basin, which should serve as a common regional platform for implementation. The Joint Action Programme shall be elaborated with the participation of the ICPBS (or in consultation with the Joint Danube-Black Sea Technical Working Group), in order to achieve complementarity between the Joint Action Programme and the amended Protocol on LBS possibly to be developed under the Black Sea Convention. The Joint Action Programme should include clear objectives and timeframes for reduction of nutrient pollution.

- The Joint Action Programme should aim at establishing a joint International River Basin Management Plan, including the coastal waters of the participating Danube River Basin countries and establishing Vulnerable Zones and Sensitive Areas within the basin as Protected Areas under the International River Basin Management Plan. ICPDR should perform the coordination of the International River Basin District with EU member and non-member countries.

- The Cooperation between Danube and Black Sea Commissions should be continued and the MoU between ICPDR and ICPDS should be signed and implemented. UNEP shall continue to play a catalytic role between the institutions concerned.

- GPA Strategic Action Plan on Sewage shall be considered by Danube and Black Sea countries in a joint meeting and integrated into implementation activities under ICPDR and ICPBS, e.g. by the joint implementation of pilot projects. The Framework for Compliance with Agreements on Transboundary Waters of the ECE/UNEP Network of Experts on Public Participation and Compliance shall be considered by the ICPDR-ICPBS Joint Ad Hoc Technical Working Group or a joint meeting.

- UNEP/ROE should develop a common communication strategy for the Black Sea and the Danube.

Activities for consideration to be undertaken by UNEP

UNEP should inform the Danube and Black Sea Countries (or members of the Joint Danube-Black Sea Technical Working Group) on its activities and call for a meeting. The meeting should consider this report and the similar report for the Black Sea, comment on both of them and recommend UNEP/ROE the follow-up actions. As regards the development of a Joint Action Plan for Danube River basin Countries, the meeting should elaborate on policy issues and advise on the indicators assessing effectiveness of the Joint Action Plan.